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WELLBEING EFFECTS RELATED TO FCA INTERVENTIONS

REPORT FOR THE FINANCIAL CONDUCT AUTHORITY

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EXECUTIVE SUMMARY

This research, commissioned by the Financial Conduct Authority (FCA), seeks to further develop the FCA's understanding of the potential impact of its interventions on consumer wellbeing, and to provide monetary values for outcomes associated with such interventions. These monetary values may then be used as part of the appraisal and evaluation of the FCA's interventions.

To do this, this research uses longitudinal data with information on households' finances and on individuals' wellbeing.[1] We take a subjective wellbeing approach to monetise the potential benefits generated by the FCA's regulatory interventions—specifically generated by changes in consumers' indebtedness status and level. This means that we first estimate how much a change in indebtedness status or an increase in debt affects wellbeing, and that we then translate this quantitative relationship originally expressed in life satisfaction units into its equivalent monetary amount. The use of wellbeing as a means of appraising and evaluating public policy has gained increasing recognition in recent years, as exemplified by the publication of supplementary Green Book guidance on using wellbeing in appraisal and evaluation.[2]

The report has two strands. Firstly, it validates and expands on previous research commissioned by the FCA to produce updated estimates of the wellbeing impact of debt and arrears.[3] Secondly, it estimates the wellbeing effects associated with other consumer outcomes different to indebtedness but still related to FCA interventions, such as seeking help or advice because of debt.

For the first strand of the research, we improve on previous estimates by using more robust econometric methods. We also use more recent survey data from the Office for National Statistics' Wealth and Assets Survey (WAS) which underpinned the previous research, and draw on new data from Understanding Society (USoc)—the UK's largest household longitudinal survey—which is linked to data from a Credit Reference Agency (CRA). Our updated estimates validate a number of findings from the previous research, and we provide a number of new results: we find statistically significant estimates for predicted reductions in wellbeing from holding debt from several sources that the previous research did not address; and we report evidence of continued impact on current wellbeing from past indebtedness. The results of this strand of research draw on both the WAS and CRA-linked USoc and can be found in section 4.1.1. The report provides a set of monetary values, derived from using the WELLBY approach described in the Green Book supplementary guidance,[4] for the statistically significant coefficients that we estimate through robust models. These are presented in section 4.2.

Results for the second strand of research show that, although when using static fixed-effects models we find statistically significant wellbeing impacts for several outcomes of interest, when we adopt

[1] Longitudinal data refers to data on multiple individuals and for which each individual is observed over multiple time periods.
[2] Sara MacLennan, Iven Stead, and Allan Little, "Wellbeing Guidance for Appraisal: Supplementary Green Book Guidance", 2021, accessed February 2024.
[3] Simon Garforth-Bles, Christopher Warner, and Kieran Keohane, "The Wellbeing Effects of Debt and Debt-Related Factors", 2020, accessed February 2024.
[4] The WELLBY approach consists in multiplying the coefficients representing the effect of a change in indebtedness status on life satisfaction, measured on a 0-10 scale, by the monetary value of a single WELLBY, which is the value of a one-unit change in life satisfaction for one year.

more robust models to deal with causality issues such as endogeneity in the outcomes of interest, we do not identify significant relationships between wellbeing and the outcomes explored. We therefore do not provide monetary values for such outcomes. The results of this strand of research, which draws on the WAS, can be found in section 4.1.2.

Lastly, the report offers a number of suggestions for future research into the relationship between wellbeing, debt, and other outcomes of interest to the FCA.

1. INTRODUCTION

The Financial Conduct Authority (FCA) undertakes regulatory interventions in pursuit of its strategic objective to ensure financial services markets function well and its three operational objectives to: secure an appropriate degree of protection for consumers, protect and enhance the integrity of the UK financial system, and promote effective competition in the interests of consumers in relevant markets. Deciding whether to intervene in financial markets, and understanding whether past interventions were socially beneficial, requires the FCA to balance the costs of intervening, such as greater regulatory burdens on financial intermediaries, with the benefits, such as improved financial wellbeing for consumers. Such decisions can be informed by cost-benefit analysis, which sets out the costs and benefits associated with an intervention and, where possible, seeks to quantify and monetise them.

To support its evidence base on quantifying the potential benefits of regulatory interventions to consumers, the FCA has previously commissioned research which estimated the effect of debt on subjective wellbeing.[5,6] The research used wellbeing valuation to place a monetary value on changes in household debt, and entry into debt, to produce estimates for use in appraisal and evaluation.[7]

This report aims to build on, and refine, elements of this previous research. It is organised into two strands. In the first strand, we use newly available data to refine and triangulate monetary estimates of the impact of debt on wellbeing, which were first produced as part of the previous analysis. In the second strand, we consider a broader set of outcomes relating to financial wellbeing which are relevant to the FCA's interventions.

This report also considers how impacts differ across income groups, and how the impact of being in debt on wellbeing changes over time for an individual given how long they are in debt for.

The report draws heavily on supplementary guidance to the Green Book which sets out how the concept of wellbeing can be used in Green Book appraisal and evaluation.[8]

The structure of the report is as follows:

- **Chapter 2** summarises existing evidence on the effect of debt, arrears, and other financial wellbeing outcomes of interest on subjective wellbeing.
- **Chapter 3** describes the data and methodology used in the research, including the approach used to value changes in wellbeing.
- **Chapter 4** summarises the econometric results and monetary values, and discusses caveats and limitations to the analysis, as well as areas for future research.

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[5] Simon Garforth-Bles, Christopher Warner, and Kieran Keohane, "The Wellbeing Effects of Debt and Debt-Related Factors", 2020, accessed February 2024.

[6] For conciseness, we use wellbeing and subjective wellbeing interchangeably.

[7] Wellbeing valuation is a recognised approach to value non-market outcomes, which uses wellbeing data and econometric modelling. See box 20 of HM Treasury, "The Green Book", 2022, accessed February 2024.

[8] Sara MacLennan, Iven Stead, and Allan Little, "Wellbeing Guidance for Appraisal: Supplementary Green Book Guidance", 2021, accessed February 2024.

2. LITERATURE REVIEW

Financial wellbeing is viewed as one of the essential domains of an individual's subjective wellbeing in seminal research, and is the most relevant of all these domains to the FCA.[9] It is also recognised in the Office for National Statistics' domains of national wellbeing which lists personal finance as a driver of wellbeing, alongside other domains such as health, relationships, where we live, and what we do.[10]

Brueggen et al. (2017) construct a commonly cited framework of financial wellbeing and its components, which lists a range of underlying personal and financial characteristics such as an individual's financial assets and liabilities, as well as other subjective elements such as their financial knowledge and behaviours.[11] These characteristics can in turn be influenced by contextual factors such as government policy and regulations.

To inform our analytical approach, and prior expectations, we undertook a literature review covering both strands of the research. We first consider the relationship between debt and wellbeing, drawing on the literature review undertaken by Garforth-Bles et al. (2020), as well as newly published research. We then consider literature evidence on the impact of a wider set of financial wellbeing-related outcomes relevant to the FCA's interventions.

2.1 THE RELATIONSHIP BETWEEN DEBT AND WELLBEING

Garforth-Bles et al. (2020) summarised existing evidence on the relationship between debt and subjective wellbeing.[12] Their review included a discussion of several research design issues such as appropriate proxy measures of wellbeing and debt which this research draws on.

The review found that there is limited existing research which uses robust econometric methods to study the effect of debt and arrears on wellbeing— with the preferred measure of wellbeing being life satisfaction.[13,14] As part of the current research, we identified two further studies of relevance which were published since 2020.[15]

Garforth-Bles et al. (2020) also considered analytical complexities relevant to wellbeing valuation such as adaptation, and heterogeneity in the relationship between outcomes of interest and other factors such as income.[16]

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[9] Diener et al. (1999) list financial satisfaction as one of seven domains underpinning subjective wellbeing alongside others such as work, family, leisure and health.

[10] Office for National Statistics, "UK Measures of National Well-being user guide", accessed February 2024.

[11] Figure 1, Brueggen E.C. et al. (2017)

[12] Pp. 4-7 of Garforth-Bles et al. (2020)

[13] Robust econometric methods refer to any method which reaches at least a level 3 on the Maryland Scientific Methods Scale.

[14] Subjective wellbeing is typically quantified using life satisfaction. Box 5 of MacLennan et al. (2021)

[15] The two additional papers identified are Coste et al. (2020), and Bialowolski & Weziak-Bialowolska (2021).

[16] Adaptation refers to the phenomenon observed in academic literature that people adapt to many life events (both positive and negative) such that wellbeing impacts can change over time. A comprehensive meta-analysis by Luhmann et al. (2012) suggests that adaptation is not a foregone conclusion, and depends on the event in question.

In this section and more generally throughout the report, by "negative" relationship between a type of debt and wellbeing we mean that an increase in the type of debt is associated with a decrease in wellbeing.

2.1.1 Total debt, arrears, and types of debt

On total debt, Garforth-Bles et al. (2020) find no significant relationship between total household debt held and wellbeing. This is not necessarily surprising in a UK context as most of this household debt is mortgage debt, which is associated with the acquisition of an asset that confers benefits to the owner, such as a sense of security.[17] Similarly, Coste et al. (2020) show no effect of entering indebtedness on wellbeing in a panel of Swiss households. As such, marginal changes in debt, or simply entering into debt do not appear to impact wellbeing.

Turning to arrears debt, Garforth-Bles et al. (2020), Coste et al. (2020), and Bialowolski & Weziak-Bialowolska (2021) all find a negative and significant impact of entering into arrears debt on subjective wellbeing of around -0.4 (or around 80% of the effect of becoming unemployed).[18,19,20,] The coefficients are similar and comparable in magnitude to the result of Clarke et al. (2021) who use an Australian panel dataset to quantify the effect of an individual experiencing a major worsening in their finances on their wellbeing. Garforth-Bles et al. (2020) also find that the negative impact holds when considering marginal increases in arrears debt.

Looking at how impacts differ by type of debt, Brown & Gray (2016) show for a panel of Australian households that an increase in unsecured debt is associated with a reduction in life satisfaction whereas an increase in mortgage debt is not.[21] This is similar to the finding in Garforth-Bles et al. (2020) that increases in high-cost debt lead to reductions in life satisfaction, and to the finding of Bialowolski & Weziak-Bialowolska (2021) who find that taking on credit card debt negatively impacts life satisfaction.[22] The literature to date suggests that the subjective wellbeing impacts of debt are limited to certain more expensive forms of debt.

In contrast to Brown & Grey (2016) who find no effect of mortgage debt on subjective wellbeing, both Garforth-Bles et al. (2020) and Bialowolski & Weziak-Bialowolska (2021) find that increases in mortgage debt are associated with improvements in wellbeing.[23] This may reflect the inability to

[17] Garforth-Bles et al. report mean total debt in their sample of £44,080, of which £40,410 is mortgage debt.
[18] In the case of Bialowolski & Weziak-Bialowolska (2021), it is specifically mortgage arrears which are referred to.
[19] Coste et al. (2020) and Garforth-Bles et al. (2020) find that entering arrears is associated with a -0.39 and -0.36 fall in life satisfaction respectively. Bialowolski & Weziak-Bialowolska (2021) use a 1-5 scale and find an effect of -0.21, or roughly -0.4 on a 0-10 scale.
[20] Benchmark effect of entering unemployment from What Works Centre for Wellbeing systematic review. What works centre for wellbeing, "Briefing: Unemployment, (re)employment, and wellbeing", 2017, accessed April 2024.
[21] In their linear-log model with life satisfaction on a 0-10 scale, Brown & Gray (2016) find that a 1% increase in unsecured debt is associated with a -0.017 decrease in life satisfaction – a similar magnitude to Garforth-Bles et al. (2020) who find that a 1% increase in high-cost debt is associated with a -0.021 decrease in life satisfaction.
[22] Bialowolski & Weziak-Bialowolska (2021) also find that student loan debt negatively impacts life satisfaction in a US context. Given differences in typical repayment terms of student loans in the US and UK, we do not believe this is relevant here.
[23] Garforth-Bles et al. (2020) note that this finding is presumably driven by an omitted variable despite controlling for net property wealth, home ownership, number of houses owned and household size. They suggest this could be due to the use of

adequately control for factors positively correlated with acquiring mortgage debt, and wellbeing (e.g. having a good credit score). Similarly, Garforth-Bles et al. (2020) and Bialowolski & Weziak-Bialowolska (2021) also find a positive effect of either a hire purchase agreement, or a car lease on subjective wellbeing. In both cases where a positive effect is observed, this may be because of imperfect controls for the enjoyment derived from a newly acquired asset of substantial value such as a house or car.

2.1.2 Changes in wellbeing over time when an outcome persists

The persistence of subjective wellbeing impacts has important implications for the appraisal of interventions, but how the wellbeing impact of an outcome evolves over time if the outcome persists is unclear a priori. Adaptation refers to the general phenomenon that individuals adjust to a positive or negative shock to their wellbeing, eventually returning either entirely to their pre-shock level of wellbeing ("complete adaptation") or partially ("partial adaptation"). In some cases, no adaptation occurs, or the impact of the outcome on wellbeing may even worsen over time as it persists.

A comprehensive meta-analysis by Luhmann et al. (2012) suggests that adaptation to adverse life events can occur but the extent to which it occurs, if it occurs at all, depends on the event in question. Clarke & Georgellis (2013) provide evidence that the impact of some outcomes, such as being unemployed, may even grow over time.

There is limited evidence to date on how, and whether, individuals adapt to changes in their levels of debt. Clark et al. (2021) look at the intertemporal relationship between life satisfaction and whether an individual has had a major worsening in their financial situation such as a bankruptcy. They find that a past worsening in an individual's financial situation continues to be associated with a reduction in life satisfaction for up to two years.

2.1.3 Heterogeneity

The evidence to date on how the wellbeing impacts of debt differ by an individual's characteristics suggests financially vulnerable individuals may be more adversely affected, though there is scant literature to draw meaningful conclusions.

Clark et al. (2021) find that the negative wellbeing impacts of a worsening of an individual's financial situation are larger for those at the bottom of the wellbeing distribution. In other words, those with lower levels of wellbeing, who are more likely to exhibit other features of low wellbeing such as low income or unemployment, are more adversely affected. Garforth-Bles et al. (2020) show that, for the unemployed and economically inactive, the negative impact of high-cost debt and being in arrears is around twice as large compared to those in employment.

age-group dummies which do not perfectly capture the inverse U-shape in the relationship between age and life satisfaction observed in the literature, and acquiring a property is associated with being in an age-group on the upward part of the curve.

2.2 THE RELATIONSHIP BETWEEN FINANCIAL WELLBEING OUTCOMES AND SUBJECTIVE WELLBEING

The second strand of this research looks at the impact of a wider range of financial wellbeing related outcomes of relevance to the FCA on life satisfaction, such as those set out in the framework in Brueggen et al. (2017). Research to date in this area has been limited.

Bialowolski et al. (2021) study the role of financial fragility in determining subjective wellbeing using panel data in the US. They define someone as financially fragile if they do not have sufficient liquidity to pay for a $400 emergency expense.[24] Using this measure, they do not find an association between financial fragility and wellbeing, as measured by life satisfaction. Ruberton et al. (2016) find that after controlling for income, indebtedness, and spending, having greater liquidity in a combined checking and savings account was positively associated with life satisfaction.

Schepen & Burger (2022) use a fixed effects estimator and the Dutch Household Survey to show there is a positive association between regarding professional financial advice as an individual's most important source of financial advice and wellbeing, compared to other sources of financial advice, such as parents, friends and acquaintances, and "self-study". They attribute this to professional financial advice leading to better financial knowledge, and more appropriate behaviour, itself leading to higher levels of wellbeing.

[24] The question asked is: Suppose you had an emergency expense that amounts to $400. Based on your current financial situation, how would you pay for this expense?' (1) temporarily borrow money from friends and family; (2) use the money that is currently in my checking/savings account or with cash; (3) use money from a bank loan or line of credit; (4) use a payday loan, deposit advance or overdraft; (5) sell or pawn something; (6) I would not be able to pay this expense right now; (7) other. Individuals not selecting (2) are defined as financially fragile.

3. DATA AND METHODOLOGY

3.1 DATA

Our analysis draws on two datasets:

- The **Wealth and Assets Survey (WAS)**, a biennial longitudinal survey conducted by the Office for National Statistics (ONS), which is representative of Great Britain.
- **Understanding Society (USoc)**, the UK's largest longitudinal household panel conducted by the Institute for Social and Economic Research at the University of Essex, which is representative of the UK as a whole. We use a version of USoc which is linked to data collected by a Credit Reference Agency (CRA) and is available to the FCA. We refer to this as "CRA-linked Understanding Society". A comparable dataset has been released, which is available via secure access through the UK Data Service.[25]

We set out key details for each of these in Fig. 1. We undertake several steps to process these datasets for use in our analysis, which we summarise below.[26]

Fig. 1. Description of Wealth and Assets Survey and CRA-linked Understanding Society

	Wealth and Assets Survey	CRA-linked Understanding Society
Source	Office for National Statistics, accessed through UK Data Service (safeguarded version)[27]	Institute for Social and Economic Research at the University of Essex, accessed at the FCA
Years covered	2010 to 2020	2012 to 2021
Frequency	Biennial	Annual
No. individuals per wave	15,000-30,000[28]	9,000-17,000[25]
Wellbeing variable	Life satisfaction (0-10)	Life satisfaction (1-7, rescaled to 0-10)
Debt and other variables of interest	Variables that capture individuals' attitudes towards financial products, and their knowledge and use of financial products (see section 3.1.3) Amount of debt held across 17 types of credit product or types of creditor (see Fig. 12 for full list), and by status of repayment	Amount of debt held across 11 types of credit product, and by status of repayment (number of months of missed payments on debt products held)

[25] Understanding Society: Main Survey, Linked Credit Reference Agency (CRA) Dataset, 2009-2021: Secure Access

[26] Data cleaning code should be referred to for a complete understanding of how the data has processed.

[27] Office for National Statistics, Social Survey Division. (2023). Wealth and Assets Survey, Waves 1-5 and Rounds 5-7, 2006-2020. [data collection]. 18th Edition. UK Data Service. SN: 7215, DOI: http://doi.org/10.5255/UKDA-SN-7215-18.

[28] Figures rounded to nearest thousandth.

Control variables	Standard wellbeing regression controls[29]; wealth controls (net household property wealth, net household financial wealth, household physical wealth); gross household income; ownership controls (tenure, number of vehicles owned, number of homes owned)	Standard wellbeing regression controls[30]; gross household income; wealth controls (value of house and number of cars owned)
Relevant features	Debt amounts and status of repayment are self-reported	Debt amounts and status of repayment are taken from Credit Reference Agency data

3.1.1 Processing of WAS data

For each wave of the WAS, a household and a person file are available. The person file contains life satisfaction data and other demographic controls, while the household file contains debt, income, and wealth (at the household level). For each wave we join the two files using a household identifier. Having done this for every wave, we join all waves into one data set, and generate a unique personal identifier for each individual.

The WAS provides household level variables for a group of credit products.[31] We use these variables as provided in the data, and we construct a second version that includes arrears due for the same type of debt, provided in separate variables.

The WAS also asks respondents about loans for which the respondent owes any debt, across 11 types of loan,[32] but, unlike the variables mentioned above, the WAS does not provide variables with the amount of outstanding debt under each type of loan.[33] We therefore produce variables for the outstanding amount of debt owed under each type of loan using information on loan type, the amount of regular repayment, the frequency of instalments, the number of months and years until full repayment, and arrears owed. As this information is at the person level, we aggregate loan amounts at the household level.

Arrear debt is the aggregation of arrear components provided by the WAS and is the sum of arrears on mortgage debt, mail order debt, hire purchase agreement debt, formal loans, and household bill arrears (all at the household level). Arrears are defined in the WAS as occurring if an individual or

[29] Dolan (2008) set out the main determinants of subjective wellbeing which, where correlated with both subjective wellbeing and the outcome of interest, it is necessary to control for. In WAS we control for household size, number of dependent children, marital status, age, education level, employment status, region, and health.

[30] In CRA-USoc we control for tenure, marital status, age, region, highest qualification, job status, satisfaction with health, household size, and number of children under 16.

[31] Mortgage debt; current account overdraft; debt on credit, store, and charge cards; mail order debt; debt from hire purchase agreements; loans from the Student Loan Company; and student loans from banks

[32] Personal loan; cash loan; loan from a pawnbroker / cash converter; loan from credit union; loan from the Social Fund; loan from employer; loan from a friend, relative, or other private individual; loan from the Student Loan Company; student loan from a bank or building society; loan from a pay day lender; other type of loan.

[33] Formal loans being all of the 11 types except loans from "a friend, relative, or other private individual" and loans from the Student Loan Company.

household has missed two or more consecutive repayments. The WAS does not provide the amount of arrears on card debt but provides an indicator for it. We therefore construct a binary variable for being in arrears and assign an "in arrears" status if either individuals are in arrears on their card debt, or if they have arrears on debt types for which the WAS provides arrear amounts.

Flag values in the data corresponding to unasked and non-applicable questions are converted to zeros in cases where respondents are screened out of questions based on previous responses. For instance, arrear amounts are not asked if respondents state they do not have arrears.

We do not remove outliers from the data as the WAS identifies cross-sectional outliers and large changes between waves, and amends the data where evidence exists to support amendments.[34] The overall approach to processing the WAS is consistent with that taken by Garforth-Bles et al. (2020).

3.1.2 Processing of CRA-linked Understanding Society

The CRA-linked Understanding Society dataset is constructed using the longitudinal household survey, Understanding Society, which is linked to data from a Credit Reference Agency.

The CRA data contains information on individuals' levels of personal debt, as well as debt held by the individual in joint accounts. In our analysis we estimate the impact on wellbeing of changes in household level debt. Therefore, using family identifiers available in the USoc data and CRA product identifiers indicating whether an account is jointly held, we aggregate debt levels for households that have more than one member in the USoc and CRA datasets.

The CRA data has a monthly frequency, and has outstanding balances for 11 credit products.[35] The data contains flags for missed repayments, and individuals are defined as being in arrears if two or more repayments are missed.[36] For most credit products with arrears, the amount of arrears owed for each credit product is derived by multiplying the number of months of missed payments by the product's monthly regular repayment.[37,38] For mortgages, an alternative approach is used.[39] For credit cards and store cards, if a payment was missed, the product's minimum payment is estimated by finding the minimum payment, as a percentage of statement balance, made across the product's

[34] Page 13 of UK Data Service, "Wealth and Assets Survey Quality and Methodology Document (QMI)", 2022, accessed March 2024.

[35] Mortgages, personal loans, motor finance loans, retail finance loans, home-collected high-cost credit, household bill arrears, credit cards, other running card accounts, authorised overdrafts, unauthorised overdrafts, and arrears on telephone bill accounts.

[36] This is consistent with the definition used in the Wealth and Assets Survey.

[37] Personal loans, motor finance loans, retail finance loans, home-collected high-cost credit.

[38] Monthly repayment amounts were derived from the regular repayment amount and the regular repayment frequency (where the repayment frequency was not already monthly).

[39] When the CRA dataset indicates a mortgage payment has been missed, we look at the monthly difference in debt balance and compare it to the value of a full regular repayment missed to allow for partial repayments of debt. The result is that arrear values will fall between zero and the full monthly repayment value depending on the change in mortgage balance. Because we cannot determine what proportion of a mortgage repayment is interest from the CRA dataset, this approach may result in a slight overestimation of mortgage arrears for some accounts.

history that did not produce a missed payments flag.[40] For products that are to be paid off in full each month, the product's arrears value is taken to be the product's total balance when payments were missed.[41] Households are considered to be in arrears until they pay off the value of arrears owed or they default.

Given that for some credit products, particularly mortgage debt and credit cards, arrears are imputed from the data available in the CRA dataset, there is some uncertainty surrounding the validity of USoc-CRA arrears values and some caution should be taken interpreting results using the constructed arrears variable.

Ten waves of USoc data are joined onto the CRA data using unique personal identifiers available in both datasets. The CRA entry for the month and year when the USoc interview takes place is used to reflect the individual's financial situation at the time of interview. For consistency with the WAS, life satisfaction is converted from the 1-7 scale used in USoc to a 0-10 scale.[42]

3.1.3 Wider outcomes of interest related to FCA interventions

For the first strand of the research we consider the wellbeing impact of entering into debt and arrears, of entering into specific cost-categories of debt, and holding specific debt products. We also consider how changes in the levels of debt held across these various types of debt impact wellbeing. This strand of the research draws on both the Wealth and Assets survey, and the CRA-linked USoc.

The second strand of the research aims to produce wellbeing values for a wider set of outcomes relevant to the FCA's interventions. To this end, in collaboration with the FCA, we defined a set of proxy variables for each outcome (Fig. 2). These proxies were drawn from the Wealth and Assets survey, which covers a range of financial behaviours and knowledge, and were not constructed specifically to act as proxies for outcomes which the FCA's interventions aim to impact on.

Fig. 2. List of wider outcomes of interest mapped to proxies in the Wealth and Assets Survey[43]

Outcome of interest	Proxy	Additional details	Sample restrictions
Increased suitability of financial products	Understanding enough about pensions to make decisions about saving for retirement	Based on the "OUnder" variable in the WAS. Measured using a 1-5 Likert scale from strongly agree to strongly disagree. Understanding enough is defined as the respondent answering "strongly agree" versus "neither agree nor disagree", "tend to	None

[40] A ceiling of 3% was applied to this estimate to account for the fact that many credit card users will make payments that far exceed the minimum payment every month to minimise interest accrued. A 3% threshold was chosen after consultation with FCA experts.

[41] This applies to household bills and charge cards where the balance must be paid off in full each month.

[42] Done using the conversion formula supplied in Green Book supplementary guidance. Sara MacLennan, Iven Stead, and Allan Little, "Wellbeing Guidance for Appraisal: Supplementary Green Book Guidance", 2021, accessed February 2024

[43] The WAS is a much richer dataset in the detail it provides on individuals' financial behaviours and knowledge than CRA-linked USoc, so all proxies are derived using WAS.

		disagree", or "strongly disagree". Category "tend to agree" is coded separately.	
Increased suitability of financial products	Not contributing towards a pension because of not trusting pension companies and schemes	Based on "pocnmsc" and "OPens" variables in the WAS. Defined as a respondent changing status from not contributing towards a pension due to a lack of trust, to contributing towards a pension. Individuals who do not contribute for other reasons are coded separately.	Individuals outside of contribution age excluded
Increased suitability of financial products	Mortgage repayments are a heavy burden	Based on "dburdh" and "Marrs" variables in the WAS. Defined as either household being in mortgage arrears, or stating that keeping up with mortgage payments as a "heavy burden". Respondents in this category are compared to those for whom mortgage payments are either "somewhat of a burden" or "not a burden at all".	Individuals without a mortgage excluded
Improving customer treatment for customers in adverse circumstances	Seeking help or advice because of debt in the last two years	Based on "DBurdA" variable in the WAS. Individual has sought help or advice for debt. Respondents in this category are compared to those who have not sought help or advice.	Restricted to individuals in arrears debt and in bottom three income quartiles
Increased consumer access to specific financial products	Knowing how to access past pension pots	Based on the "pfacc" and "AllRet" variables in the WAS. Individuals who know how to access all their past retained pensions schemes are compared to those who do not.	Individuals without past retained pension schemes excluded
Seeking financial information from appropriate sources	Use of a financial institution or professional financial advisor in the last year to find out anything about money	Based on "advsrc" variable in the WAS. Individuals who receive formal / professional advice (e.g., from a financial institution or financial advisor) are compared to those who received no advice.	Restricted to individuals in arrears
Increased consumer access to specific financial products	Able to use financial products to meet unexpected major expense (equivalent to respondents' "whole income for a month or more")	Based on "FndCash" variable in the WAS. Respondents who state they are able to "borrow the money (including use and overdraft)" in addition to being able to "get help from family / friends" and finding "some other way (e.g., sell something, earn extra money, cut spending)" are compared to those who: - Would "not be able to find the money"	None

		- Would only be able to either "get help from family / friends" or find "some other way (e.g., sell something, earn extra money, cut spending)"	
Increased consumer access to specific financial products	Holding a financial product	Respondents with each of specific products are compared to those without.[44] Also, respondents with any financial product are compared with those who do not hold a financial product.	Individuals in top three income quartiles excluded

3.1.4 Summary statistics

Fig. 12 in the Appendix presents summary statistics for the dependent variable and independent variables of interest for both datasets.

3.2 ECONOMETRIC APPROACH

This section describes the main variables in our analysis and our econometric modelling approach, and we focus largely on the process of identifying the most reliable econometric model to use for each main independent variable.

3.2.1 Dependent variable and main independent variables

The dependent variable in our analysis is life satisfaction, the preferred measure of subjective wellbeing for monetising WELLBYs. In line with the Green Book supplementary guidance, we treat life satisfaction as cardinal.[45]

In our analysis we estimate the impact on life satisfaction of two sets of independent variables, which we refer to as the first and second strands of the research.

Models for the first strand of the research estimate the impact of changes in debt on life satisfaction. Life satisfaction is observed at the individual level. Debt is measured at the household level, as we assume that households pool resources such that it is household debt as a whole which best captures the impact of debt on wellbeing.[46] This approach is consistent with Garforth-Bles et al. (2020) as well as

[44] Constructed based on multiple variables in the WAS. Full list of products are: mortgage, life insurance, investments, credit card, loans, general insurance, savings account, current account and personal pension.

[45] The cardinality assumption implies that a given change in life satisfaction is worth the same to an individual regardless of where it occurs on the life satisfaction scale.

[46] Households in the population and in the sample will be a mix of financially integrated households and households that are less so. Our estimates will pick up the average effect across both types of households, and weighted in favour of the most prevalent type of household.

other studies in the literature including Brown & Gray (2016), Bialowolski & Weziak-Bialowolska (2021), and Coste et al. (2020).[47]

Within the first strand of research, we measure two sets of outcomes:

- Becoming indebted or entering into arrears (expressed as a binary change)
- Changes in levels of indebtedness or arrears (expressed in continuous form)

We consider the following forms of debt and arrears: individual credit products available in the WAS (see list in Fig. 21) and the CRA-linked Understanding Society (see list in Fig. 23), an aggregation of debt products into "high-cost", "standard-cost", and "other" debt categories, and arrears debt.[48]

We estimate the changes in levels of indebtedness using a linear-log form, in line with previous research carried out by Garforth-Bles et al. (2020) which tested the suitability of different functional forms.[49][50] For all debt variables we also add one-period lags such that we can estimate the impact on current wellbeing of changes in levels of debt experienced in the previous time-period.[51]

Models for the second strand of the research use as independent variables a set of proxies to capture individuals' attitudes towards financial products, their understanding of financial products, and their access to them. These are detailed in Fig. 2.

For all models we also test whether the impact on wellbeing of experiencing a given outcome, or a change in levels of debt, differs by household income. Specifically, we are interested in whether negative financial events and circumstances, and increases in debt levels, negatively impact low-income households more than high-income households. We do this by interacting our main independent variables with income quartiles.

3.2.2 Econometric models

As the datasets on which this research is based have a panel structure, we are able to apply panel-data econometric methods. These consist of static fixed-effects models as applied in Garforth-Bles et al. (2020), and dynamic panel models. Dynamic refers to the inclusion of past values of the dependent variable as control variables, addressing potential persistence in the variable over time. Both sets of models exploit within-individual variation—that is, they measure the average impact on wellbeing of a

[47] However, we recognise that different types of households may manage their own and joint finances in different ways. For households that are not financially integrated, we would expect a smaller impact on the wellbeing of a household member following an increase in other household members' level of debt.

[48] See Fig. 21 for aggregation by cost in WAS which are defined as in Garforth-Bles et al. (2020), and Fig. 23 for aggregation by cost in USoc-CRA.

[49] We add a small positive amount where debt amounts are zero.

[50] A logarithmic transformation could capture non-linearities better, especially if the relationship is expected to be diminishing at higher levels of debt.
An alternative modelling approach would have used a discrete choice model which accounts for zeros in the outcome variable along with potential neglected dynamics and endogeneity in some of the control variables. To the best of our knowledge, such estimator does not currently exist. Indeed, whilst a Pseudo-Poisson Maximum Likelihood estimator could account for non-linearity, adequately deal with heteroscedasticity and more importantly the zeros in the outcome variable, this estimator would fail to properly account for any potential sources of endogeneity in our models.

[51] In the case of the WAS, a one-period lag represents the impact of changes in debt two years prior. For the CRA-linked Understanding Society, a one-period lag represents the impact of changes in debt one year prior.

change in the independent variable experienced by the same individual, rather than relying on differences across individuals. This is preferred as it allows the models to control for time-invariant personal characteristics, such as attitudes towards risk, which may be correlated with both debt and wellbeing.

The reliability of static fixed-effects models and panel data models depend on whether or not a set of assumptions is satisfied: for each main independent variable that we explore in this research, we conduct two initial tests to inform which of the two econometric models is the most appropriate to adopt in each case. We list these below, and provide more detail in the Appendix.

Exogeneity test on main independent variables

We conduct an exogeneity test on whether the regressors are correlated with the error term, in which case coefficients produced without the use of a suitable instrument would be biased.[52] Consistent with Garforth-Bles et al. (2020), when we consider the impact of debt on wellbeing, these tests do not lead us to reject that debt is exogenous.[53]

However, tests conducted on models where we estimate the impact on wellbeing of the proxy variables in Fig. 2 suggest that several of these proxies are endogenous. This implies that, for this set of endogenous regressors, static fixed-effects models of the type applied in Garforth-Bles et al. (2020) may not be reliable. This is because static fixed-effects models do not address reverse causality and omitted variable bias from time-varying characteristics that are correlated with the regressor of interest and wellbeing.[54,55]

Testing for serial correlation

We also conduct a serial correlation test. Where this test suggests that serial correlation may be present, this implies that static models may suffer from functional form misspecification by ignoring persistence over time in the dependent variable.

Static fixed-effects models

Where our tests provide no evidence of serial correlation nor endogeneity in our regressors, we apply static fixed-effects models as in Garforth-Bles et al. (2020) considering these to be reliable for this set of characteristics within the data.

Specifically, the static fixed-effects models we adopt take on the following form[56]:

$$LS_{it} = \beta_0 \ln(Debt_{it}) + \beta_1 \ln(Debt_{it-1}) + \mu_i + \tau_t + \theta_{rt} + X'_{it}\gamma + u_{it}$$

[52] Details on all tests which we relied on in producing our results, as well as more detailed information on dynamic panel models, can be found in Appendix 2.

[53] See footnote 29 of Garforth-Bles et al. which reports the results of a strict exogeneity test.

[54] Reverse causality refers to changes in wellbeing affecting the level of debt as well as changes in debt affecting wellbeing.

[55] An example of a time-varying factor correlated with debt and wellbeing and not controlled for might be the death of a family member.

[56] This equation represents the models in the first strand of research. For the second strand of research the main independent variable is a binary or categorical variable and therefore modelled with a linear-linear model.

Where LS_{it} is the level of life satisfaction of individual i at time t; $Debt_{it}$ is the level of household debt of individual i at time t; μ_i are individual-level fixed effects; τ_t are time fixed-effects; θ_{rt} are time and region fixed-effects; X'_{it} is a vector of time-varying explanatory variables[57]; and u_{it} is the idiosyncratic error term.

In practice, as discussed in section 4.1, we can reject the presence of serial correlation for only one model in the second strand of the research. We are not able to reject the presence of serial correlation in any of the static fixed-effects models in the first strand. In all cases where we cannot reject the presence of serial correlation, dynamic panel models—where these pass model validity tests—are more reliable.

Dynamic panel models

Serial correlation implies that, in static fixed-effects models, either the standard errors or both the standard errors and the coefficients may be unreliable. Therefore, where our tests suggest that there is serial correlation in our models, we apply dynamic panel models, considering these to be more reliable than static models. We estimate these using generalised method of moments (GMM) estimators.[58]

The dynamic models adopted in this research control for individual and time fixed effects.[59] Specifically, with respect to the static fixed-effects models, the dynamic panel models add a lag of the dependent variable as a control variable and therefore are as follows[60]:

$$LS_{it} = \alpha LS_{it-1} + \beta_0 \ln(Debt_{it}) + \beta_1 \ln(Debt_{it-1}) + \mu_i + \tau_t + X'_{it}\gamma + u_{it}$$

In dynamic panel models the lagged dependent variable is included as a control variable, but is by construct endogenous. Other variables of interest may also be found to be endogenous from tests mentioned above. In both cases, dynamic panel models identify appropriate instruments within the dataset with which to instrument for endogenous regressors. Internal instruments are made up of distant lags of endogenous variables including the lagged dependent variable,[61] as well as of variables considered to be exogenous.[62]

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[57] See Fig. 1 for the list of control variables included in the models.

[58] The use of dynamic panel methods in the wellbeing literature is still nascent and limited to a few examples. One such example is from Blaise & Dillenseger, "Informal Caregivers and Life Satisfaction: Empirical Evidence from the Netherlands", 2023.

[59] It is also worth noting that dynamic models produce short-run coefficients that are not directly comparable with coefficients from static models, which constitute long-run impacts. The long-run coefficients of the dynamic models can be derived by dividing the short-run coefficient by (1 - α).

[60] We also drop time-region fixed effects in the dynamic models as we do not find that they contribute significantly. We also use a slightly reduced number of control variables for the same reason.

[61] Recent lags of the dependent variable are used as control variables, while more distant lags are used as instrumental variables.

[62] The relevant identification assumptions of instrumental variables in a dynamic panel data model include: relevance (the instrumental variables must be correlated with the endogenous regressors); exogeneity (the instrumental variables must be uncorrelated with the error term in the regression equation); exclusion restriction (this assumption requires that the instrumental variables are only related to the dependent variable through their correlation with the endogenous regressors); and absence of measurement error (instrumental variables should be accurately measured and free from measurement error).

As we have noted, for the first strand of models that estimate the impact of changes in the level of debt on wellbeing, the exogeneity test referred to above does not reject that debt is exogenous, and so we treat it as exogenous and do not instrument for it.[63][64] However, for the second strand of research, we are led to reject that several wider outcomes of interest are exogenous, and so we treat them as endogenous and use internal instruments to instrument for them.

In this report we only present the results of dynamic models if they satisfy a set of model validity tests, which we list and describe in the Appendix.

3.3 USING WELLBEING ADJUSTED LIFE YEARS (WELLBYS)

To monetise the coefficients produced by our econometric models for use in cost-benefit analysis, we use the Wellbeing Adjusted Life Years (WELLBY) approach set out in Green Book supplementary guidance. The discussion which follows builds up to a set of recommendations for applying the values set out in Fig. 10.[65]

The monetary value of a single WELLBY is the value of a one-unit change in life satisfaction for one year. The central WELLBY value in 2023 prices is £15,300, and is an average of two studies.[66,67] There are also low and high WELLBY values based on the lower and upper values from the two studies. WELLBY values represent a constant unit value, meaning both losses and gains are valued equally.

Multiplying the central WELLBY value by the relevant coefficient from the respective econometric model gives the value of the outcome occurring for one year.

3.3.1 Future benefits and adaptation

Where an outcome, such as entering arrears, has a statistically significant effect on an individual's subjective wellbeing and persists for multiple years due to an intervention, the value of the outcome should be aggregated over the number of years for which it persists. Outcomes which continue to

[63] This means that in the dynamic models in the first strand of research we only instrument for the lagged dependent variable, and for income which is widely recognised as being endogenous.

[64] Theoretically, there are other variables that could potentially influence both debt and wellbeing that are not accounted for. Some examples are financial literacy, psychological factors, and social support. However, statistically speaking, having tested for the exogeneity of debt variables, it can be argued that these theoretical correlations are not likely to induce an endogeneity issue in our models.

[65] These recommendations are based on the current state of the literature as of early 2024, and should be reviewed at regular intervals for their ongoing suitability. The WELLBY approach had not been published at the time when the previous report was written, and so an alternative approach was used.

[66] See Annex 2 of MacLennan et al. (2021) for a discussion of how the WELLBY value is derived.

[67] The value reported in the Green Book supplementary guidance of £13,000 is in 2019 prices. As such, an adjustment has been made to render this in current prices as per the guidance. For example, to derive the central WELLBY, the 2019 value of £13,000 is multiplied by the ratio of the 2023 ONS GDP deflator to that in 2019 to express it in current prices, giving a value of £15,378. This is then multiplied by the ratio of real GDP per capita in 2023 to real GDP per capita in 2019, raised to the power 1.3 to give a value of £15,260, which is rounded to the nearest hundred. The second adjustment is done to hold constant the utility value of a one-unit change in life satisfaction.

occur in future periods should be discounted according to the Green Book discount rate for health-related outcomes of 1.5%.[68]

We conducted exploratory analysis to inform possible adaptation profiles for the outcomes of interest for this research,. We focussed this analysis on the first strand of the research, and looked at the current period impact of debt and arrears held in the previous period.

Referring to the dynamic panel model equation outlined above, β_0 is the impact on current wellbeing of a change in the current level of debt or indebtedness status.[69] Because of the inclusion of the lagged dependent variable, the impact on current wellbeing of a change in the level of debt or indebtedness status from the previous time period is $\alpha\beta_0 + \beta_1$.[70] The impact on current wellbeing of a change in the previous period debt and current debt is therefore $\alpha\beta_0 + \beta_0 + \beta_1$. We test the significance of these composite lagged terms using simulations of the asymptotic distributions of the estimators.[71] The table below summarises which estimates of impact on current wellbeing are relevant for changes in debt in different time periods.

Fig. 3. Estimates of impact on current wellbeing relevant for changes in debt in different time periods

Description of change	Impact on current wellbeing	Significance levels determined by
Change in current debt only	β_0	Standard error on β_0
Change in previous-period debt only	$\alpha\beta_0 + \beta_1$	Simulations of the asymptotic distributions of the estimators
Change in current and previous-period debt	$\alpha\beta_0 + \beta_0 + \beta_1$	Simulations of the asymptotic distributions of the estimators

To establish the length of the time-period for which coefficients are valid we take a data and model driven approach. In the table below we set out what the impacts on future wellbeing are predicted to be given a present change in debt status lasting one or more years across the two datasets used in the first strand of our research. The coefficients refer to those in the dynamic panel model equation above.

As the WAS is biennial and we add one lag of debt in our equation, we focus on impacts for up to four years. Since the CRA-linked Understanding Society dataset has an annual structure, we recursively derive impacts from models on this data for up to year four for consistency. Statistical significance of

[68] The health discount rate is used instead of the standard discount rate, as the "wealth effect" is excluded to avoid implying diminishing marginal utility of changes in future life satisfaction.

[69] For models where the main independent variable is in continuous form, the impact on current life satisfaction in points on a 0-10 scale of a current increase in debt by 1% is approximately β_0 / 100.

[70] For models where the main independent variable is in continuous form, the impact on current life satisfaction in points on a 0-10 scale of a previous-period increase in debt by 1% is approximately $(\alpha\beta_0 + \beta_1)$ / 100.

[71] In this report we only report composite lagged terms as statistically significant if their 95% confidence interval constructed using simulations of the asymptotic distributions of the estimators does not include zero.

composite terms different from those in the table above are all determined using simulations of the asymptotic distributions of the estimators. We only present monetised values for statistically significant impacts up to four years after the start of a change in debt status, and we assume that if an impact in a given year is not statistically significant then no impacts beyond that are significant.

Fig. 4. Modelling of future impacts given a current change in debt status

Dataset	Change in debt lasting [X] year(s)	Life satisfaction change in…			
		Year 1	**Year 2**	**Year 3**	**Year 4**
WAS	**One year**	β_0	$\alpha\beta_0 + \beta_1$	$\alpha\beta_0 + \beta_1$	$\alpha(\alpha\beta_0 + \beta_1)$
WAS	**Two years**	β_0	β_0	$\alpha\beta_0 + \beta_1$	$\alpha\beta_0 + \beta_1$
WAS	**Three years**	β_0	β_0	$\alpha\beta_0 + \beta_0 + \beta_1$	$\alpha\beta_0 + \beta_0 + \beta_1$
WAS	**Four years**	β_0	β_0	$\alpha\beta_0 + \beta_0 + \beta_1$	$\alpha\beta_0 + \beta_1$
CRA-USoc	**One year**	β_0	$\alpha\beta_0 + \beta_1$	$\alpha(\alpha\beta_0 + \beta_1)$	$\alpha^2(\alpha\beta_0 + \beta_1)$
CRA-USoc	**Two years**	β_0	$\alpha\beta_0 + \beta_0 + \beta_1$	$\alpha(\alpha\beta_0 + \beta_0 + \beta_1) + \beta_1$	$\alpha[\alpha(\alpha\beta_0 + \beta_0 + \beta_1) + \beta_1]$
CRA-USoc	**Three years**	β_0	$\alpha\beta_0 + \beta_0 + \beta_1$	$\alpha(\alpha\beta_0 + \beta_0 + \beta_1) + \beta_1 + \beta_0$	$\alpha[\alpha(\alpha\beta_0 + \beta_0 + \beta_1) + \beta_1 + \beta_0] + \beta_1$
CRA-USoc	**Four years**	β_0	$\alpha\beta_0 + \beta_0 + \beta_1$	$\alpha(\alpha\beta_0 + \beta_0 + \beta_1) + \beta_1 + \beta_0$	$\alpha[\alpha(\alpha\beta_0 + \beta_0 + \beta_1) + \beta_1 + \beta_0] + \beta_1 + \beta_0$

For the second strand of research (outcomes presented in Fig. 2), we only explicitly model the contemporaneous impacts, meaning we only suggest applying the monetary values for a maximum of two years.

3.3.2 Wellbeing of other household members

We recommend treating changes in financial outcomes as household goods, meaning the estimated changes in wellbeing accrue to all adult members of the household.[72] [73]

Changes in a household's financial situation, such as changes in household arrears which are observed to impact an individual's wellbeing, will impact on other household members' wellbeing. This may occur firstly because the other adult household members' benefit equally from, for example, the alleviation of stress that comes from a reduction in arrears, and secondly because other household members' benefit from the improved wellbeing of the observed individual.[74]

Drawing on Census data, we make the informed assumption for the purposes of this research that the number of adults per household is two.[75] Where available, more precise and context-specific estimates should be used.[76]

[72] It is not appropriate to apply WELLBYs to children given the way they are derived. Children are also unlikely to benefit to the same extent as adults due to changes in finance-related outcomes. It may nevertheless be argued that children do benefit from changes in the household's financial situation, so this represents an unquantified and unmonetised benefit.

[73] Garforth-Bles et al. (2020) measure debt at the household-level but do not explicitly make the recommendation to treat debt as a household good.

[74] Powdthavee (2009) that a one-point improvement in an individual's life satisfaction leads to a 0.3 point change in their spouse's life satisfaction

[75] Example household size estimated using Census 2021 data which shows that the average household has 2.4 members, and that 82% of the population is over the age of 18.

[76] For example, the Census data on which the assumption of two adult household members is based is collected for England and Wales only, meaning an adjustment may be needed where an intervention is UK wide.

4. RESULTS

4.1 ECONOMETRIC RESULTS

This section sets out the results of our econometric modelling. It describes which econometric model we apply to estimate the wellbeing impact of changes in our outcomes of interest, the magnitude and significance of the coefficient of each outcome of interest, and the reliability of each model in accordance with our modelling approach described in section 3.2.2.[77] Where relevant, we also discuss evidence of differences in impact by household income.

For the comparable models that estimate the impact of debt on wellbeing, we briefly compare the results from this research with the results from Garforth-Bles et al. (2020). For these models we also report evidence of how and whether changes in past levels of debt continue to impact present wellbeing.

4.1.1 Debt and arrears

In this section we discuss the results of the models of the first strand of the research. For these models, where we estimate the impact of a change in debt on life satisfaction both in continuous and binary form, there is evidence of serial correlation. As such, we apply dynamic models in line with the model-selection process set out in section 3.2. Exogeneity tests don't lead us to reject the hypothesis that our main independent variables are exogenous, and so we treat them as exogenous, consistent with Garforth-Bles et al. (2020). All dynamic models presented for this set of models pass model validity tests. At the end of each sub-section we collate into tables the statistically significant coefficients produced from reliable models for the first strand of research. Full results can be found in regression tables in Appendix 2 in the same order as discussed in this section.

The impact of arrear debt

Dynamic modelling on both datasets suggests that having arrears, and increases in arrears, are associated with a drop in life satisfaction. However, the magnitude and statistical significance of the coefficients differ across the two datasets used to explore the relationship.

Our dynamic models run on the WAS suggest that entering arrears is statistically significantly associated with a 0.41-point drop in life satisfaction.[78,79] To put this in context, this is around 80% of the effect of becoming unemployed (circa -0.5) according to a systematic review.[80] The WAS also suggests that a ten-percent increase in arrear debt is associated with a 0.006-point drop in life

[77] Where significant results are not observed in this section, this may be due to a lack of statistical power to pick up a small change in wellbeing, or simply that the outcome tested does not impact wellbeing.

[78] Throughout section 4.1 we refer to identifying a statistically significant effect if the p-value on the coefficient of the variable of interest is smaller than 0.05, i.e., significant at the 95% level.

[79] In this section, coefficients on binary variables are rounded to the nearest second decimal place.

[80] What Works Wellbeing, "Unemployment, (Re)employment, and Wellbeing", March 2017, accessed March 2024.

satisfaction.[81,82] These results are similar in magnitude to those presented in Garforth-Bles et al. (2020). Therefore our updated estimates provide validation to these previous results while at the same time using an econometric method which can be considered more robust.

On the other hand, equivalent models run on CRA-linked Understanding Society data find that having arrear debt does not significantly reduce life satisfaction at the 5% significance level—though it does at the 10% level. Changes in the level of debt measured in continuous form are also not statistically significantly associated with a reduction in life satisfaction. Both point estimates are several times lower than the respective estimates from the WAS.

There are several potential explanations why the point estimates for arrears in the two different datasets differ. The first is that, even though the CRA-linked Understanding Society dataset measures debt objectively, as noted in section 3.1.2 there is uncertainty around how accurate the measure of total arrears is, given that it is built off multiple products for each of which a set of assumptions is required to estimate arrears components. Secondly, it may be that in some credit products, such as household bills, an individual is formally in arrears but is unaware of their arrears status; it may therefore be possible that while a positive arrears status in the WAS measures a conscious inability to repay overdue debt since it is self-reported, estimates on CRA-linked Understanding Society data do not in some cases pick up the impact of being in arrears since some individuals may not be conscious of having such status. If this is true, it may explain why the impact of arrear debt observed in CRA-linked Understanding Society is lower than observed in the WAS.

Dynamic panel modelling on the WAS also identifies a statistically significant impact on life satisfaction of having debt both in the current and in the previous period. On average, an individual's level of life satisfaction is 0.68 points lower if in both periods they had arrear debt.

Finally, we do not find in either dataset that the impact of entering arrears, and of increases in arrears, differ by income group.

In the figure below we report the significant coefficients from the dynamic panel models run on the WAS mentioned in this section.

[81] In a linear-log model, the interpretation is that a 1% increase in debt is associated approximately with a (ß/100) point change in life satisfaction.

[82] In this section, coefficients on continuous debt variables are rounded to the nearest third decimal place.

Fig. 5. Significant coefficients from reliable models in strand one of research (arrear debt)

Debt variable (and model number)	Change in debt variable	Timing of change in debt variable (time t or t-1)	Predicted change in life satisfaction at time t (in points on a 0-10 scale)	Source
Arrear debt (4)	Having a positive amount of debt	t	-0.41	WAS
Arrear debt (4)	Having a positive amount of debt	Both t-1 and t	-0.68	WAS
Arrear debt (2)	10% increase in debt	t	-0.006	WAS
Arrear debt (2)	10% increase in debt	Both t-1 and t	-0.010	WAS

Notes: All coefficients from the table above are derived from valid dynamic panel models and are statistically significant at least at the 5% significance level. Model details can be found in the appendix. Predicted changes in life satisfaction are rounded to the nearest second decimal place for binary debt variables and third decimal place for continuous debt variables.

The impact of high-cost debt

Our dynamic models run on the WAS suggest that entering into high-cost debt is associated with a 0.17-point drop in life satisfaction. This represents a new finding as the hypothesis was not tested in the previous research. When modelling the impact of increases in high-cost debt, we again find that changes in high-cost debt negatively affect wellbeing: according to our model a ten-percent increase in high-cost debt decreases life satisfaction by 0.003 points.

Dynamic modelling on WAS data provides us with significant results for the impact on current wellbeing of holding high-cost debt in the current and previous time-period. We find that, on average, individuals are worse off in the present by 0.28 life satisfaction points if in both periods they had positive high-cost debt compared to if they did not.

When looking at whether the impact of high-cost debt differs by household income, we find from the WAS data some limited evidence that the negative impact on wellbeing of increases in high-cost debt is greatest for households in the bottom 25% of the income distribution.

However, similar to our results for arrear debt, dynamic models run on CRA-linked Understanding Society do not find that having high-cost debt, nor changes in the level of high-cost debt, significantly impacts life satisfaction.[83]

[83] With regards to standard-cost debt, we do not find from either dataset a significant impact on wellbeing from entering into standard-cost debt, but we find from CRA-linked Understanding Society that a 10% increase in standard-cost debt is significantly associated with a decrease in same-period life satisfaction. However, the coefficient (-0.002) is so small that its monetised value is not economically meaningful.

Fig. 6. Significant coefficients from reliable models in strand one of research (high-cost debt)

Debt variable (and model number)	Change in debt variable	Timing of change in debt variable (time t or t-1)	Predicted change in life satisfaction at time t (in points on a 0-10 scale)	Source
High-cost debt (20)	Having a positive amount of debt	t	-0.17	WAS
High-cost debt (20)	Having a positive amount of debt	Both t-1 and t	-0.28	WAS
High-cost debt (18)	10% increase in debt	t	-0.003	WAS
High-cost debt (18)	10% increase in debt	Both t-1 and t	-0.005	WAS

Notes: All coefficients from the table above are derived from valid dynamic panel models and are statistically significant at least at the 5% significance level. Model details can be found in the appendix. Predicted changes in life satisfaction are rounded to the nearest second decimal place for binary debt variables and third decimal place for continuous debt variables.

The impact of debt by individual credit product

Dynamic modelling on WAS data suggests that, among high-cost credit products, using current account overdrafts and increases in overdraft debt are significantly associated with a reduction in wellbeing. On average, individuals experience a 0.20-point decrease in life satisfaction if they enter their overdraft, while a 10% increase in overdraft debt is associated with a 0.003-point drop in life satisfaction. The former represents a new finding not explored in past research, and the latter suggests that the true impact of an increase in overdraft debt may be slightly larger than was previously thought.

Among other high-cost credit products in the WAS data, having debt—and increases in debt—from cash loans are statistically significant and negatively affect wellbeing.[84]

We do not find statistically significant relationships for any individual standard-cost credit products in the WAS data. Among sources of debt present in the WAS and which are not from specific credit products we find that having arrears on household bills significantly reduces wellbeing: going into bill arrears reduces life satisfaction by 0.53 points and a 10% increase in bill arrears significantly reduces life satisfaction by around 0.008 points—an appreciably larger impact than was previously estimated.

Modelling on the CRA-linked Understanding Society data also identifies a number of significant relationships between wellbeing and holding individual credit products. As in the WAS data, individuals' wellbeing drops on average when they have an overdraft on their current account and, as expected, the drop is larger for unauthorised overdrafts than for authorised overdrafts. Having debt

[84] We however recommend treating this result with caution, since the number of individuals with positive amounts of household cash loan debt hovers between one hundred and two hundred per wave, and so the coefficients are not derived from sample sizes as large as those from which other coefficients are derived. Increases in debt from loans from pawnbrokers and cash converters also significantly reduce life satisfaction, but each wave features fewer than thirty positive accounts, and we therefore do not recommend applying the results for this type of debt.

from personal loans and having debt from home-collected high-cost credit are also found to be associated with lower life satisfaction. From this data we also identify a number of other negative coefficients that are significantly different from zero; however, we do not report these in the table below as their magnitude is too small to be meaningfully monetised.[85]

For a number of specific types of debt in both data sources we find that the impact of having debt and increases in debt in the previous time-period is statistically significant. For example, from the WAS we find that on average an individual's life satisfaction is 0.93 points lower if they had household bill arrears both in the current and in the previous time period, compared with not having had household bill arrears in either period.

With the exception of mortgage debt, our dynamic models do not identify significant evidence that increases in debt from specific credit products or sources of debt negatively affect low-income households more than high-income households.

Fig. 7. Significant coefficients from reliable models in strand one of research (debt by individual credit product)

Debt variable (and model number)	Change in debt variable	Timing of change in debt variable (time t or t-1)	Predicted change in life satisfaction at time t (in points on a 0-10 scale)	Source
Current account overdraft debt (36)	Having a positive amount of debt	t	-0.20	WAS
Current account overdraft debt (36)	Having a positive amount of debt	Both t-1 and t	-0.41	WAS
Current account overdraft debt (34)	10% increase in debt	t	-0.003	WAS
Current account overdraft debt (34)	10% increase in debt	t-1	-0.003	WAS
Current account overdraft debt (34)	10% increase in debt	Both t-1 and t	-0.007	WAS
Debt from cash loans (36)	Having a positive amount of debt	t	-0.66	WAS
Debt from cash loans (36)	Having a positive amount of debt	t-1	-1.02	WAS
Debt from cash loans (36)	Having a positive amount of debt	Both t-1 and t	-1.68	WAS

[85] These can be seen in models 34 and 36. The coefficients omitted all have three zero decimal places following a 10% increase in the respective debt type.

Debt from cash loans (34)	10% increase in debt	t	-0.009	WAS
Debt from cash loans (34)	10% increase in debt	t-1	-0.014	WAS
Debt from cash loans (34)	10% increase in debt	Both t-1 and t	-0.023	WAS
Household bill arrears (36)	Having a positive amount of debt	t	-0.53	WAS
Household bill arrears (36)	Having a positive amount of debt	Both t-1 and t	-0.93	WAS
Household bill arrears (34)	10% increase in debt	t	-0.008	WAS
Household bill arrears (34)	10% increase in debt	Both t-1 and t	-0.013	WAS
Debt from personal loans (47)	Having a positive amount of debt	t	-0.10	CRA-USoc
Debt from personal loans (47)	Having a positive amount of debt	Both t-1 and t	-0.11	CRA-USoc
Home-collected high-cost credit (47)	Having a positive amount of debt	t	-0.23	CRA-USoc
Current account authorised overdrafts (47)	Having a positive amount of debt	t	-0.08	CRA-USoc
Current account authorised overdrafts (47)	Having a positive amount of debt	Both t-1 and t	-0.09	CRA-USoc
Current account unauthorised overdrafts (47)	Having a positive amount of debt	t	-0.19	CRA-USoc
Current account unauthorised overdrafts (47)	Having a positive amount of debt	Both t-1 and t	-0.23	CRA-USoc

Notes: All coefficients from the table above are derived from valid dynamic panel models and are statistically significant at least at the 5% significance level. Model details can be found in the appendix. Predicted changes in life satisfaction are rounded to the nearest second decimal place for binary debt variables and third decimal place for continuous debt variables.

4.1.2 Wider outcomes of interest to the FCA

We next discuss the results of the models of the second strand of research, where we estimate the wellbeing impact of experiencing the outcomes set out in Fig. 2. In this sub-section we describe our estimation of these impacts in accordance with the modelling approach set out in 3.2.2. In summary, our preferred modelling approach, which differs by specific outcome, does not show that any of the outcomes explored statistically significantly affect individuals' wellbeing. Below we expand on how we draw this conclusion.

For all the models relating to these outcomes, we test whether there is serial correlation. We find no evidence of serial correlation only for one proxy—"seeking help or advice because of debt in the last two years". As we are not able to reject the hypothesis that the outcome is exogenous, its impact can reliably be estimated with a static fixed-effects model. This model suggests that the outcome does not statistically significantly affect wellbeing. The table below presents its coefficient and standard error, while a fuller description of the model can be found in Fig. 25.

Fig. 8. Outcomes for which results from static fixed-effects models are reliable

Proxy	Model type
	Static Fixed-effects model
Seeking help or advice because of debt in the last two years	-0.117 (0.152)

Notes: Standard error in parentheses (*** p<0.01, ** p<0.05)

We find that, for all other proxies, serial correlation is present.[86] We in any case run static fixed-effects models for these proxies—presented in Fig. 9—but note that standard errors on these models, or both the standard errors and the coefficients, may be unreliable. As such, we would not recommend that such estimates be used in applications.

The reliability of the static fixed-effects models could potentially therefore be improved upon by adopting dynamic panel models instead. For two proxies, the dataset allows us to build valid dynamic models, but we do not find that the outcomes statistically significantly impact wellbeing. For five proxies the models fail to identify appropriate instruments within the dataset.[87]

[86] In one case the sample size is too small to reliably test for serial correlation and so we conservatively assume that serial correlation is present in the model.

[87] The reasons for this may include one or more of the following: the absence within the dataset of appropriate instruments for a given outcome; a small number of time periods due to questions with which outcomes are proxied being introduced in the WAS only in later waves; a small sample size due to sample restrictions; and a number of "switchers" that is too small for the model to pick up enough variation in the data.

Fig. 9. Outcomes for which dynamic panel modelling is required to produce reliable results

Proxy	Model type	
	Static Fixed-effects model	**Dynamic GMM model**
Understanding enough about pensions to make decisions about saving for retirement	0.0552** (0.0258)	0.0859 (0.0773)
Not contributing towards a pension because of a lack of trust in pension schemes	-0.0466 (0.0643)	0.134 (0.212)
Mortgage repayments are a heavy burden	-0.398*** (0.0522)	Instruments not appropriate to build a reliable model with internal data
Able to use financial products to meet unexpected major expense	0.293*** (0.0376)	Instruments not appropriate to build a reliable model with internal data
Knowing how to access past pension pots	-0.186 (0.113)	Instruments not appropriate to build a reliable model with internal data
Use of a financial institution or professional financial advisor in the last year to find out anything about money	0.0876 (0.325)	Instruments not appropriate to build a reliable model with internal data
Holding a financial product	-0.0805 (0.183)	Instruments not appropriate to build a reliable model with internal data

Notes: Standard error in parentheses (*** p<0.01, ** p<0.05). Dynamic models considered not to be reliable if the p-values on the Jochmans Portmanteau test and the Two-Step Sargan-Hansen Test are smaller than 0.05.

4.2 MONETISATION OF ECONOMETRIC RESULTS

Based on the results presented in section 4.1, in Fig. 10 we compile monetary values for the preferred models in the first strand of the research, assuming the impacts persist for one year.[88] Appendix 3 contains monetary values for the low, central, and high scenarios, and under different assumptions for how long debt persists in the first strand of research.

As described in section 4.2.1, careful attention should be paid when applying the values so that the impact of any intervention is not overclaimed. Whilst we have presented values for outcomes

[88] For variables which are continuous, we monetise a 10% change. For these variables, we do not recommend the values be applied to individuals with very low levels of arrears and/or debt as the model coefficients represent average effects, and may not reflect the experiences of these individuals. As a suggestion, a cut-off of the 25th percentile of debt could be used.

persisting up to four years in Appendix 3, analysts should carefully consider whether an impact of this length can reasonably be claimed.

Two worked examples are set out below:

- **An individual enters into high-cost debt and stays in high-cost debt for a year**, after which their debt is cleared. The wellbeing value of this change to households is the value of being in high-cost debt in the first year (-£5,130), after which there is no residual impact.
- **An individual's level of account overdraft increases by 10%, before returning to its previous level after one year**. At sample means for those with any current account overdraft in the WAS, this would be equivalent to an increase of around £90. The wellbeing value of this change to households is -£100 in the first year, which persists for two years before decaying to -£10 in the fourth year.[89]

Further information on how the monetary values are derived is provided in Appendix 3.

Fig. 10. Monetisation of debt coefficients under the central scenario over a four-year time period assuming debt persists for one year

		Year				
Outcome	**Dataset**	**1**	**2**	**3**	**4**	**Notes**
Total arrears	WAS	-£190	-	-	-	10% change in the outcome
Has arrears	WAS	-£12,430	-	-	-	
Total high cost	WAS	-£90	-	-	-	10% change in the outcome
Has high-cost debt	WAS	-£5,130	-	-	-	
Total current account overdraft	WAS	-£100	-£100	-£100	-£10	10% change in the outcome
Has current account overdraft	WAS	-£6,120	-£6,330	-£6,230	£-470	
Total cash loans	WAS	-£270	-£440	-£430	-£30	10% change in the outcome
Has cash loan	WAS	-£20,310	-£30,620	-£30,170	-£2,270	
Total household bill arrears	WAS	-£240	-	-	-	10% change in the outcome

[89] Derived as follows: 1) Estimate the change in life satisfaction as: Coefficient on total arrears * Ln(100-% change in outcome)/100. 2) Multiply the central WELLBY in 2023 prices (£15,300) by the change in life satisfaction (-0.015), which gives a per-person value of around -£225. 3) Multiply this figure by two, assuming two adults per household to give a wellbeing value of -£450.

Has household bill arrears	WAS	-£16,000	-	-	-	
Has personal loans	USoc	-3,110	-	-	-	
Has home-collected high-cost credit	USoc	-£6,980	-	-	-	
Has an unauthorised overdraft	USoc	-£5,640	-	-	-	
Has an authorised overdraft	USoc	-£2,593	-	-	-	

Note: Monetary values rounded to the nearest ten. Dashes represent insignificant results.

4.2.1 Applying the values in practice

The application of Green Book principles in relation to sensitivity analysis is important when applying the values. Given the uncertainty that remains about the value of a WELLBY, Green Book supplementary guidance suggests that sensitivity analysis is undertaken using a low, central, and high value.

Fig. 11 sets out an initial set of recommendations for applying the values in practice using a low, central, and high scenario to generate an interval associated with each outcome. These scenarios are used where appropriate to provide monetary values of outcomes in section 4. The resulting values should be applied to households, rather than individuals, as the monetary values represent a value in WELLBY terms to the household.

When applying the values, attention should also be paid to the principles of impact evaluation set out in the Magenta Book.[90] The values should only be applied for the share of households for whom the intervention causes a change in the outcome which otherwise would not have been realised. The values should also only be applied for an appropriate length of time given the available evidence on the impact of an intervention.

[90] HM Treasury, "Magenta Book: central government guidance on evaluation", 2020, accessed March 2024.

Fig. 11. Applying wellbeing values in practice: A low, central, and high scenario for households[91,92]

Low scenario	Central scenario	High scenario
• Apply the low WELLBY value of £11,700 (in 2023 prices) to the coefficient. • Treating the outcome as a household good, multiply by the number of adults in the household (e.g. two) • If the outcome persists for multiple years, apply the coefficients in Fig. 26 • Discount future values by 1.5%	• Apply the central WELLBY value of £15,300 (in 2023 prices) to the coefficient. • Treating the outcome as a household good, multiply by the number of adults in the household (e.g. two) • If the outcome persists for multiple years, apply the coefficients in Fig. 26 • Discount future values by 1.5%	• Apply the upper WELLBY value of £18,800 (in 2023 prices) to the coefficient. • Treating the outcome as a household good, multiply by the number of adults in the household (e.g. two) • If the outcome persists for multiple years, apply the coefficients in Fig. 26 • Discount future values by 1.5%

4.3 LIMITATIONS & CAVEATS

In addition to the limitations and caveats set out in the report, the FCA should also be aware that the relative nascency of the field of wellbeing valuation and the use of WELLBYs means that attention should be paid to how the field evolves. As new research is produced, it may be that views on best-practice, as expressed for example in Green Book guidance, also evolve. In this case, the recommendations set out in this report, as well as the monetary values estimated, may need to be updated.

The monetary values themselves should also be updated on a yearly basis such that they reflect changes in the value of a WELLBY over time due to changes in prices and real incomes.[93]

4.4 AREAS FOR FUTURE RESEARCH

This research has used advanced panel econometric methods and the most suitable datasets currently available to seek to identify the wellbeing impact of debt, and a set of wider financial outcomes.

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[91] The low, central and high WELLBY values in 2019 prices are £10,000, £13,000, and £16,000 respectively.

[92] For large changes in life satisfaction (greater than around 0.5 points), the Green Book supplementary guidance (p.57) suggests a sensitivity test may be run using the log income approach. We have not considered this here, as we do not generally find effects this large, and as the resulting monetary values are larger, and hence less conservative.

[93] For example, to derive the central WELLBY for 2023, the 2019 value of £13,000 is multiplied by the ratio of the ONS GDP deflator in 2020 to that in 2019 to express it in current prices, giving a value of £15,378. This is then multiplied by the ratio of real GDP per capita in 2023 to real GDP per capita in 2019, raised to the power 1.3 to give a value of £15,260, which is then rounded to the nearest hundred. The second adjustment is done to hold constant the utility value of a one-unit change in life satisfaction. Due to diminishing marginal utilities in income, the value of each additional pound in terms of the utility it buys falls over time as the economy grows. As such, a greater monetary sum is needed to confer the same level of utility when overall consumption is higher, meaning WTP for a WELLBY increases if real income growth is positive. As GDP per capita fell between 2019 and 2023, the opposite effect is observed.

However, the current state of research in this area means that potentially important avenues to explore remain for future research to address. We consider several of these below.

This research has used econometric methods to look at how changes in an individual's financial circumstances impact their wellbeing. In doing so, it has sought to overcome the potential shortcomings of the static fixed effects models identified in the previous research. The results of this research could be validated in the future using "natural experiments". These are events, such as policy changes, which influence the outcomes of interest without also being correlated with subjective wellbeing.

Specifically in relation to the first strand of research, the intertemporal relationship between debt and wellbeing could be explored further using CRA-linked Understanding Society as it contains higher frequency data on debt that was not fully exploited in this research.

The second strand of our research identified a number of proxies for outcomes of interest to the FCA (Fig. 2). These were drawn from existing data sources and were not constructed specifically to act as proxies for outcomes which the FCA's interventions aim to impact on. The FCA may wish to consider whether it would be possible to work with one or more of the data providers whose data this report has drawn on to include questions aimed at capturing outcomes of interest more precisely. It may also consider whether its own Financial Lives Survey could be adapted to this end.[94]

For the second strand of this research in particular, there may be value in repeating the modelling undertaken in several years once additional waves of the Wealth and Assets Survey are available. This would permit a better understanding of the longer-term adaptation profile. It would also increase the sample size available for analysis, providing a better chance of observing a statistically significant impact where a true impact exists.

Lastly, this research included econometric models which sought to identify the wellbeing impact of particular types of debt products. As an extension, a similar exercise could be undertaken to seek to identify the wellbeing impact of different types of arrears.

[94] Noting that the Financial Lives Survey in its current form cannot be used as it is not longitudinal, and does not capture life satisfaction.

APPENDIX 1 – SUMMARY STATISTICS AND REGRESSION OUTPUTS

Fig. 12. Summary statistics for key variables for Wealth and Assets Survey and CRA-linked Understanding Society

	Wealth and Assets Survey		CRA-linked Understanding Society	
Variable	**Mean**	**SD**	**Mean**	**SD**
Life satisfaction (0-10)	7.58	1.80	6.80	2.17
Total arrears (£)	1,719	3,232	1,422	2,014
Whether in arrears (%)	4.8%		3.3%	
Mortgage debt (£)	134,094	137,004	147,152	187,593
High-cost debt				
Debt from mail order accounts (£)	920	2,329		
Current account overdraft debt (£)	906	2,068		
Unauthorised current account overdraft debt (£)			110	311
Debt from cash loans collected at home (£)	1,868	2,858	1,633	1,957
Debt from payday loans (£)	5,436	10,623		
Debt from loans from pawnbrokers / cash converters (£)	126	199		
Debt from other running card accounts (charge cards and mail order) (£)			886	1,387
Standard-cost debt				
Authorised current account overdraft debt (£)			927	1,394
Debt from credit / store / charge cards (£)	2,899	4,671	3,247	5,475
Debt from personal loans (£)	8,546	8,667	8,458	7,806
Debt from hire purchase agreements (£)	5,921	7,490		

Debt from loans from credit unions (£)	2,383	4,175		
Debt from motor finance loans (£)			13,287	11,695
Debt from retail finance loans (£)			1,259	2,510
Other debt				
Debt from loans from family, friends, and/or relatives (£)	4,386	5,983		
Debt from loans from employers (£)	3,443	3,923		
Debt from loans from the Student Loans Company (£)	21,960	21,160		
Debt from other student loans (£)	18,162	16,376		
Household bill arrears (£)	1,527	2,922		
Household bills (£)			1,034	1,279
Telephone bills (£)			168	161
Debt from loans from the Social Fund (£)	698	839		
Debt from other loans (£)	9,673	21,583		
Share who strongly agree with "understanding enough about pensions to make decisions about saving for retirement" (%)	54%			
Share who do not contribute towards a pension because they "do not trust pension schemes" (%)	1%			
Share either in mortgage arrears, or who view their mortgage payments as a "heavy burden" (%)	6%			
Of those in arrears and in bottom three income quartiles, share who have sought advice or help because of debt in last 2 years (%)	28%			
Of those who have a retained pension scheme (or schemes), share who are able to access all schemes they have (%)	69%			

Of individuals in arrears, share of individuals who have made use of a financial institution or professional financial advisor in the last year to find out anything about money (%)	25%
Share of individuals who can pay for a major unexpected expense by: • Borrowing the money, including using an overdraft (%) • Using existing savings, investments, or current account funds (%)	29% 46%
Of those in the lowest income quartile, share who have a financial product (investments, a mortgage, life insurance, a card, formal loans, a savings account, a current account, or a pension) (%)	99%

Notes: SD = Standard deviation. Summary statistics use latest available waves of the two respective datasets and are weighted. Life satisfaction from CRA-linked Understanding Society is rescaled to a 0-10 scale. Debt figures in pounds are for individuals who have positive debt for the type of debt reported. Figures are rounded to the nearest integer.

Fig. 13. Impact of arrear debt on wellbeing (source: WAS)

Variable	Model			
Dependent variable: Life satisfaction (0-10)	**Static Fixed-Effects (1)**	**Dynamic GMM (2)**	**Static Fixed effects (3)**	**Dynamic GMM (4)**
$\text{Arrear debt (natural log)}_{it}$	-0.0657*** (0.0135)	-0.0655*** (0.0229)		
$\text{Arrear debt (natural log)}_{it-1}$	-0.0168 (0.0123)	-0.0288 (0.0386)		
$\text{Has arrear debt}_{it}$			-0.409*** (0.0833)	-0.409*** (0.144)
$\text{Has arrear debt}_{it-1}$			-0.150* (0.0797)	-0.236 (0.233)
Control variables	Non-arrear debt, wealth controls, income, ownership controls, socio-economic and demographic controls	Non-arrear debt, wealth controls, income, ownership controls, socio-economic and demographic controls	Has non-arrear debt, wealth controls, income, ownership controls, socio-economic and demographic controls	Has non-arrear debt, wealth controls, income, ownership controls, socio-economic and demographic controls
Individual fixed effects?	Yes	Yes	Yes	Yes
Year fixed effects?	Yes	Yes	Yes	Yes
Year * region fixed effects?	Yes	No	Yes	No
Observations	56,403	43,401	56,403	43,401
Individuals	28,697	15,695	28,697	15,695

Notes: Source: Wealth and Assets Survey. Robust standard errors clustered at person level reported in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Standard errors in dynamic models apply Windmeijer correction. Debt is measured at the household level. The full set of controls can be found in Fig. 1. Dynamic model controls exclude age group and region. All static models fail serial correlation test. Key debt variables are tested for exogeneity using the Durbin-Wu-Hausman test, and test fails to reject exogeneity, and are assumed to be exogenous in dynamic models. All dynamic models pass Nickell bias test, Jochmans Portmaneteau test, and two-step Sargan-Hansen test of overidentifying restrictions (p-value > 0.05).

Fig. 14. Impact of arrear debt on wellbeing by household income (source: WAS)

Variable	Income quartile	Model			
Dependent variable: Life satisfaction (0-10)		**Static Fixed-Effects (5)**	**Dynamic GMM (6)**	**Static Fixed-Effects (7)**	**Dynamic GMM (8)**
$\text{Arrear debt (natural log)}_{it}$		-0.0246	0.0216		
		(0.0403)	(0.0661)		
$\text{Arrear debt (natural log)}_{it}$	First	-0.0523	-0.0904		
		(0.0428)	(0.0702)		
	Second	-0.0153	-0.0713		
		(0.0456)	(0.0728)		
	Third	-0.0571	-0.0839		
		(0.0468)	(0.0741)		
$\text{Has arrear debt}_{it}$				-0.120	0.147
				(0.266)	(0.398)
$\text{Has arrear debt}_{it}$	First			-0.371	-0.545
				(0.279)	(0.421)
	Second			-0.0835	-0.356
				(0.298)	(0.445)
	Third			-0.391	-0.636
				(0.313)	(0.479)
Control variables		Non-arrear debt, wealth controls, income, ownership controls, socio-economic and demographic controls	Non-arrear debt, wealth controls, income, ownership controls, socio-economic and demographic controls	Has non-arrear debt, wealth controls, income, ownership controls, socio-economic and demographic controls	Has non-arrear debt, wealth controls, income, ownership controls, socio-economic and demographic controls
Individual fixed effects?		Yes	Yes	Yes	Yes
Year fixed effects?		Yes	Yes	Yes	Yes

Year * region fixed effects?		Yes	No	Yes	No
Observations		56,403	43,401	56,403	43,401
Individuals		28,697	15,695	28,697	15,695

Notes: Source: Wealth and Assets Survey. Robust standard errors clustered at person level reported in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Standard errors in dynamic models apply Windmeijer correction. Debt is measured at the household level. The full set of controls can be found in Fig. 1. Dynamic model controls exclude age group and region. All static models fail serial correlation test. Key debt variables are tested for exogeneity using the Durbin-Wu-Hausman test, and test fails to reject exogeneity, and are assumed to be exogenous in dynamic models. All dynamic models pass Nickell bias test, Jochmans Portmaneteau test, and two-step Sargan-Hansen test of overidentifying restrictions (p-value > 0.05). Coefficients from dynamic models are short-run impacts. The omitted category in the interaction terms is the top income quartile. Income and interactions between income quartiles and main independent variables are considered to be endogenous and are therefore instrumented for in dynamic models.

Fig. 15. Impact of arrear debt on wellbeing—static models (source: CRA-linked Understanding Society)

Variable	Income quartile	Model			
Dependent variable: Life satisfaction (0-10)		**Static Fixed-Effects (9)**	**Static Fixed-Effects (10)**	**Static Fixed effects (11)**	**Static Fixed-Effects (12)**
		Interactions: No	**Interactions: Yes**	**Interactions: No**	**Interactions: Yes**
Arrear debt (natural log)$_{it}$		-0.0064***	-0.0040		
		(0.0016)	(0.0033)		
Arrear debt (natural log)$_{it-1}$			-0.0012		
			(0.0015)		
Arrear debt (natural log)$_{it}$	First		-0.0052		
			(0.0042)		
	Second		-0.0021		
			(0.0041)		
	Third		-0.0009		
			(0.0040)		
Has arrear debt$_{it}$				-0.191***	-0.1172
				(0.045)	(0.0945)
Has arrear debt$_{it-1}$					-0.0355
					(0.0431)
Has arrear debt$_{it}$	First				-0.1577
					(0.1224)
	Second				-0.0642
					(0.5888)
	Third				-0.0231
					(0.8423)
Individual fixed effects?		Yes	Yes	Yes	Yes
Wave fixed effects?		Yes	Yes	Yes	Yes
Wave * region fixed effects?		Yes	Yes	Yes	Yes
Observations		112,799	112,786	112,799	112,786

Individuals		16,955	16,955	16,955	16,955

Notes: CRA-linked Understanding Society. Robust standard errors clustered at person level reported in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Debt is measured at the household level. The full set of controls can be found in Fig. 1. All static models fail serial correlation test. The omitted category in the interaction terms is the top income quartile. Arrear debt for running accounts is not included as a method of deriving arrears could not be established.

Fig. 16. Impact of arrear debt on wellbeing—dynamic GMM models (source: CRA-linked Understanding Society)

Variable	Income quartile	Model			
Dependent variable: Life satisfaction (0-10)		**Dynamic GMM (13)**	**Dynamic GMM (14)**	**Dynamic GMM (15)**	**Dynamic GMM (16)**
		Interactions: No	**Interactions: Yes**	**Interactions: No**	**Interactions: Yes**
$\text{Arrear debt (natural log)}_{it}$		-0.0038 (0.0023)	-0.0066 (0.0118)		
$\text{Arrear debt (natural log)}_{it-1}$		0.0028(0.0021)	0.0031 (0.0021)		
$\text{Arrear debt (natural log)}_{it}$	First		-0.0055 (0.0151)		
	Second		0.0066 (0.0145)		
	Third		0.0084 (0.0139)		
$\text{Has arrear debt}_{it}$				-0.1177* (0.0685)	-0.1859 (0.337)
$\text{Has arrear debt}_{it-1}$				0.0794 (0.0609)	0.0859 (0.0609)
$\text{Has arrear debt}_{it}$	First				-0.1752 (0.4329)
	Second				0.1728 (0.4131)
	Third				0.241 (0.397)
Individual fixed effects?		Yes	Yes	Yes	Yes
Wave fixed effects?		Yes	Yes	Yes	Yes
Wave * region fixed effects?		No	No	No	No
Observations		65,670	65,670	65,670	65,670
Individuals		18,048	18,048	18,048	18,048

Notes: CRA-linked Understanding Society. Standard errors in dynamic models apply Windmeijer correction (*** p<0.01, ** p<0.05, * p<0.1). Debt is measured at the household level. The full set of controls can be found in Fig.

1. The omitted category in the interaction terms is the top income quartile. Income and interactions between income quartiles and main independent variables are considered to be endogenous and are therefore instrumented for in dynamic models. Debt is treated as exogenous following testing on WAS data (use of a different software package did not allow comparable testing on CRA-linked Understanding Society data). All dynamic models pass Nickell bias test, Arellano-Bond test for autocorrelation, and two-step Sargan-Hansen test of overidentifying restrictions (p-value > 0.05). Arrear debt for running accounts is not included as a method of deriving arrears could not be established.

Fig. 17. Impact of debt, by cost, on wellbeing (source: WAS)

Variable	Model			
Dependent variable: Life satisfaction (0-10)	**Static Fixed-Effects (17)**	**Dynamic GMM (18)**	**Static Fixed effects (19)**	**Dynamic GMM (20)**
High cost debt (natural log)$_{it}$	-0.0206***	-0.0317***		
	(0.00542)	(0.00859)		
High cost debt (natural log)$_{it-1}$	-0.00521	-0.0199		
	(0.00489)	(0.0163)		
Standard cost debt (natural log)$_{it}$	-0.000678	0.000938		
	(0.00251)	(0.00363)		
Standard cost debt (natural log)$_{it-1}$	-0.00712***	0.00101		
	(0.00263)	(0.00747)		
Has high cost debt$_{it}$			-0.109***	-0.168***
			(0.0329)	(0.0521)
Has high cost debt$_{it-1}$			-0.0223	-0.100
			(0.0303)	(0.0993)
Has standard cost debt$_{it}$			-0.0103	0.00606
			(0.0184)	(0.0257)
Has standard cost debt$_{it-1}$			-0.0418**	0.0286
			(0.0200)	(0.0514)
Control variables	Mortgage debt, other debt, wealth controls, income, ownership controls, socio-economic and demographic controls	Mortgage debt, other debt, wealth controls, income, ownership controls, socio-economic and demographic controls	Has mortgage debt, has other debt, wealth controls, income, ownership controls, socio-economic and demographic controls	Has mortgage debt, has other debt, wealth controls, income, ownership controls, socio-economic and demographic controls
Individual fixed effects?	Yes	Yes	Yes	Yes
Year fixed effects?	Yes	Yes	Yes	Yes
Year * region fixed effects?	Yes	No	Yes	No
Observations	56,403	43,401	56,403	43,401

Individuals	28,697	15,695	28,697	15,695

Notes: Source: Wealth and Assets Survey. Robust standard errors clustered at person level reported in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Standard errors in dynamic models apply Windmeijer correction. Debt is measured at the household level. The full set of controls can be found in Fig. 1. Dynamic model controls exclude age group and region. All static models fail serial correlation test. Key debt variables are tested for exogeneity using the Durbin-Wu-Hausman test, and test fails to reject exogeneity, and are assumed to be exogenous in dynamic models. All dynamic models pass Nickell bias test, Jochmans Portmaneteau test, and two-step Sargan-Hansen test of overidentifying restrictions (p-value > 0.05). Arrear debt is included in each debt category. The list of credit products that each category is made up of can be found in Fig. 21.

Fig. 18. Impact of debt, by cost and household income, on wellbeing (source: WAS)

Variable	Income quartile	Model			
Dependent variable: Life satisfaction (0-10)		**Static Fixed-Effects (21)**	**Dynamic GMM (22)**	**Static Fixed effects (23)**	**Dynamic GMM (24)**
High cost debt (natural log)$_{it}$		-0.00620	-0.00144		
		(0.00793)	(0.0120)		
High cost debt (natural log)$_{it}$	First	-0.0158	-0.0410**		
		(0.0136)	(0.0209)		
	Second	-0.0303**	-0.0239		
		(0.0124)	(0.0176)		
	Third	-0.0109	-0.0227		
		(0.0106)	(0.0161)		
Has high cost debt$_{it}$				-0.0348	0.0249
				(0.0519)	(0.0781)
Has high cost debt$_{it}$	First			-0.0914	-0.234*
				(0.0815)	(0.127)
	Second			-0.155**	-0.150
				(0.0773)	(0.111)
	Third			-0.0341	-0.128
				(0.0670)	(0.102)
Standard cost debt (natural log)$_{it}$		-0.000162	0.00387		
		(0.00380)	(0.00584)		
Standard cost debt (natural log)$_{it}$	First	-0.00589	-0.0174		
		(0.00661)	(0.0110)		
	Second	0.00806	-0.00176		
		(0.00564)	(0.00916)		
	Third	-0.00622	-0.00406		
		(0.00513)	(0.00793)		
Has standard cost debt$_{it}$				-0.00159	0.0208
				(0.0294)	(0.0449)

$\text{Has standard cost debt}_{it}$	First			-0.0356	-0.108
				(0.0478)	(0.0790)
	Second			0.0411	-0.0149
				(0.0423)	(0.0682)
	Third			-0.0453	-0.00454
				(0.0401)	(0.0611)
Control variables		Mortgage debt, other debt, wealth controls, income, ownership controls, socio-economic and demographic controls	Mortgage debt, other debt, wealth controls, income, ownership controls, socio-economic and demographic controls	Has mortgage debt, has other debt, wealth controls, income, ownership controls, socio-economic and demographic controls	Has mortgage debt, has other debt, wealth controls, income, ownership controls, socio-economic and demographic controls
Individual fixed effects?		Yes	Yes	Yes	Yes
Year fixed effects?		Yes	Yes	Yes	Yes
Year * region fixed effects?		Yes	No	Yes	No
Observations		56,403	43,401	56,403	43,401
Individuals		28,697	15,695	28,697	15,695

Notes: Source: Wealth and Assets Survey. Robust standard errors clustered at person level reported in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Standard errors in dynamic models apply Windmeijer correction. Debt is measured at the household level. The full set of controls can be found in Fig. 1. Dynamic model controls exclude age group and region. All static models fail serial correlation test. Key debt variables are tested for exogeneity using the Durbin-Wu-Hausman test, and test fails to reject exogeneity, and are assumed to be exogenous in dynamic models. All dynamic models pass Nickell bias test, Jochmans Portmaneteau test, and two-step Sargan-Hansen test of overidentifying restrictions (p-value > 0.05). Arrear debt is included in each debt category. The list of credit products that each category is made up of can be found in Fig. 21. The omitted category in the interaction terms is the top income quartile. Income and interactions between income quartiles and main independent variables are considered to be endogenous and are therefore instrumented for in dynamic models.

Fig. 19. Impact of debt, by cost, on wellbeing—static models (source: CRA-linked Understanding Society)

Variable	Income quartile	Model			
Dependent variable: Life satisfaction (0-10)		**Static Fixed-Effects (25)**	**Static Fixed-Effects (26)**	**Static Fixed effects (27)**	**Static Fixed-Effects (28)**
		Interactions: No	**Interactions: Yes**	**Interactions: No**	**Interactions: Yes**
High cost debt (natural log)$_{it}$		-0.0004	0.0011		
		(0.0008)	(0.0013)		
High cost debt (natural log)$_{it-1}$		-0.0017**	-0.0016**		
		(0.0008)	(0.0008)		
High cost debt (natural log)$_{it}$	First		-0.0013		
			(0.0020)		
	Second		-0.0026		
			(0.0017)		
	Third		-0.0019		
			(0.0015)		
Has high cost debt$_{it}$				-0.0076	0.0329
				(0.0224)	(0.0353)
Has high cost debt$_{it-1}$				-0.0462**	-0.0443**
				(0.0211)	(0.0212)
Has high cost debt$_{it}$	First				-0.0433
					(0.0555)
	Second				-0.0728
					(0.0484)
	Third				-0.0050
					(0.0436)
Standard cost debt (natural log)$_{it}$		-0.0011*	-0.0014		
		(0.0006)	(0.0006)		
Standard cost debt (natural log)$_{it-1}$		-0.0009	-0.0009		
		(0.0006)	(0.0006)		

Standard cost debt (natural log)$_{it}$	First		0.0009 (0.0015)		
	Second		0.0004 (0.0014)		
	Third		0.0002 (0.0013)		
Has standard cost debt$_{it}$				-0.0292 (0.0773)	0.0361 (0.0315)
Has standard cost debt$_{it-1}$				-0.0235 (0.0177)	-0.0239 (0.0177)
Has standard cost debt$_{it}$	First				0.0209 (0.0446)
	Second				0.0111 (0.0417)
	Third				-0.0067 (0.0393)
Individual fixed effects?		Yes	Yes	Yes	Yes
Wave fixed effects?		Yes	Yes	Yes	Yes
Wave * region fixed effects?		Yes	Yes	Yes	Yes
Observations		112,799	112,786	112,799	122,786
Individuals		16,955	16,955	16,955	16,955

Notes: Source: CRA-linked Understanding Society. Robust standard errors clustered at person level reported in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Debt is measured at the household level. The full set of controls can be found in Fig. 1. Arrear debt is included in each debt category. All static models fail serial correlation test. The list of credit products that each category is made up of can be found in Fig. 23. The omitted category in the interaction terms is the top income quartile.

Fig. 20. Impact of debt, by cost, on wellbeing—dynamic GMM models (source: CRA-linked Understanding Society)

Variable	Income quartile	Model			
Dependent variable: Life satisfaction (0-10)		**Dynamic GMM (29)**	**Dynamic GMM (30)**	**Dynamic GMM (31)**	**Dynamic GMM (32)**
		Interactions: No	**Interactions: Yes**	**Interactions: No**	**Interactions: Yes**
High cost debt (natural log)$_{it}$		-0.0018 (0.0011)	-0.0075** (0.0032)		
High cost debt (natural log)$_{it-1}$		-0.0005 (0.0010)	-0.0006 (0.0011)		
High cost debt (natural log)$_{it}$	First		0.0094* (0.0054)		
	Second		0.0089* (0.0047)		
	Third		0.0059 (0.0041)		
Has high cost debt$_{it}$				-0.0485 (0.0314)	-0.2055** (0.0900)
Has high cost debt$_{it-1}$				-0.0130 (0.0298)	-0.0161 (0.0300)
Has high cost debt$_{it}$	First				0.2534* (0.1494)
	Second				0.2431* (0.1302)
	Third				0.1581 (0.1138)
Standard cost debt (natural log)$_{it}$		-0.0017** (0.0008)	-0.0015 (0.003)		
Standard cost debt (natural log)$_{it-1}$		-0.0002 (0.0008)	-0.0001 (0.0008)		
Standard cost debt (natural log)$_{it}$	First		0.0003 (0.0047)		

	Second		0.0000 (0.0042)		
	Third		-0.0006 (0.0037)		
$\text{Has standard cost debt}_{it}$				-0.0467* (0.0250)	-0.0606 (0.0924)
$\text{Has standard cost debt}_{it-1}$				-0.0051 (0.0250)	-0.0032 (0.0252)
$\text{Has standard cost debt}_{it}$	First				0.0298 (0.1425)
	Second				0.0270 (0.1265)
	Third				0.0088 (0.1143)
Individual fixed effects?		Yes	Yes	Yes	Yes
Wave fixed effects?		Yes	Yes	Yes	Yes
Wave * region fixed effects?		No	No	No	No
Observations		65,670	65,670	65,670	65,670
Individuals		18,048	18,048	18,048	18,048

Notes: CRA-linked Understanding Society. Standard errors in dynamic models apply Windmeijer correction (*** p<0.01, ** p<0.05, * p<0.1). Debt is measured at the household level. The full set of controls can be found in Fig. 1. The omitted category in the interaction terms is the top income quartile. Income and interactions between income quartiles and main independent variables are considered to be endogenous and are therefore instrumented for in dynamic models. Debt is treated as exogenous following testing on WAS data (use of a different software package did not allow comparable testing on CRA-linked Understanding Society data). All dynamic models pass Nickell bias test, Arellano-Bond test for autocorrelation, and two-step Sargan-Hansen test of overidentifying restrictions (p-value > 0.05). The list of credit products that each category is made up of can be found in Fig. 23.

Fig. 21. Impact of debt, by credit product, on wellbeing (source: WAS)

Variable	Model			
Dependent variable: Life satisfaction (0-10)	**Static Fixed-Effects (33)**	**Dynamic GMM (34)**	**Static Fixed effects (35)**	**Dynamic GMM (36)**
Mortgage debt (natural log)$_{it}$	0.00801*	0.00657		
	(0.00470)	(0.00732)		
Mortgage debt (natural log)$_{it-1}$	-0.00560*	0.0286**		
	(0.00306)	(0.0131)		
Has mortgage debt$_{it}$			0.0983*	0.0870
			(0.0511)	(0.0778)
Has mortgage debt$_{it-1}$			-0.0553*	0.308**
			(0.0318)	(0.138)
High-cost debt				
Mail order debt (natural log)$_{it}$	-0.0119	-0.0191		
	(0.0108)	(0.0159)		
Mail order debt (natural log)$_{it-1}$	0.0123	-0.0200		
	(0.0102)	(0.0282)		
Has mail order debt$_{it}$			-0.0751	-0.137
			(0.0578)	(0.0899)
Has mail order debt$_{it-1}$			0.0752	-0.155
			(0.0549)	(0.161)
Current account overdraft debt (natural log)$_{it}$	-0.0215***	-0.0352***		
	(0.00581)	(0.00997)		
Current account overdraft debt (natural log)$_{it-1}$	-0.00879	-0.0498**		
	(0.00663)	(0.0229)		
Has current account overdraft debt$_{it}$			-0.116***	-0.201***
			(0.0368)	(0.0610)
Has current account overdraft debt$_{it-1}$			-0.0403	-0.194*
			(0.0327)	(0.107)
Cash loan debt (natural log)$_{it}$	-0.0123	-0.0927**		

	(0.0267)	(0.0443)		
Cash loan debt (natural log)$_{it-1}$	-0.00944	-0.144**		
	(0.0239)	(0.0674)		
Has cash loan debt$_{it}$			-0.106	-0.662**
			(0.184)	(0.311)
Has cash loan debt$_{it-1}$			-0.00610	-0.972**
			(0.156)	(0.494)
Payday loan debt (natural log)$_{it}$	-0.0605	-0.0252		
	(0.0695)	(0.0960)		
Payday loan debt (natural log)$_{it-1}$	-0.0182	0.0754		
	(0.0565)	(0.0849)		
Has payday loan debt$_{it}$			-0.275	-0.0466
			(0.468)	(0.703)
Has payday loan debt$_{it-1}$			-0.0885	0.471
			(0.391)	(0.658)
PCC debt (natural log)$_{it}$	-0.142	-0.419**		
	(0.110)	(0.203)		
PCC debt (natural log)$_{it-1}$	0.129	-0.197		
	(0.0968)	(0.231)		
Has PCC debt$_{it}$			-0.859	-2.136*
			(0.681)	(1.188)
Has PCC debt$_{it-1}$			0.621	-0.822
			(0.448)	(1.388)
Standard-cost debt				
Card debt (natural log)$_{it}$	-0.00312	-0.00128		
	(0.00278)	(0.00373)		
Card debt (natural log)$_{it-1}$	-0.00365	0.00277		
	(0.00317)	(0.00754)		
Has card debt$_{it}$			-0.0190	-0.00556
			(0.0189)	(0.0250)

Has card debt$_{it-1}$			-0.0163	0.0271
			(0.0221)	(0.0479)
Personal loan debt (natural log)$_{it}$	-0.000979	0.000392		
	(0.00386)	(0.00539)		
Personal loan debt (natural log)$_{it-1}$	-0.0119***	-0.00696		
	(0.00383)	(0.00981)		
Has personal loan debt$_{it}$			-0.0244	-0.0142
			(0.0329)	(0.0455)
Has personal loan debt$_{it-1}$			-0.102***	-0.0625
			(0.0324)	(0.0840)
Hire purchase debt (natural log)$_{it}$	0.00409	0.00310		
	(0.00305)	(0.00434)		
Hire purchase debt (natural log)$_{it-1}$	-0.00335	-0.00321		
	(0.00310)	(0.00660)		
Has hire purchase debt$_{it}$			0.0286	0.0286
			(0.0241)	(0.0345)
Has hire purchase debt$_{it-1}$			-0.0227	-0.00747
			(0.0243)	(0.0532)
Credit Union loan debt (natural log)$_{it}$	-0.0363	0.0155		
	(0.0287)	(0.0466)		
Credit Union loan debt (natural log)$_{it-1}$	-0.0377	0.0680		
	(0.0255)	(0.0510)		
Has Credit Union loan debt$_{it}$			-0.278	0.123
			(0.217)	(0.359)
Has Credit Union loan debt$_{it-1}$			-0.177	0.622
			(0.176)	(0.406)
Other debt				
Student Loan Company debt (natural log)$_{it}$	-0.00290	0.0107		
	(0.00554)	(0.00852)		
Student Loan Company debt (natural log)$_{it-1}$	-0.00650	-0.00152		

	(0.00532)	(0.0130)		
Has Student Loan Company debt$_{it}$			-0.0312	0.0949
			(0.0518)	(0.0799)
Has Student Loan Company debt$_{it-1}$			-0.0574	-0.00623
			(0.0488)	(0.122)
Other student debt (natural log)$_{it}$	0.0130	0.0428***		
	(0.0103)	(0.0134)		
Other student debt (natural log)$_{it-1}$	0.00795	0.0433**		
	(0.0102)	(0.0185)		
Has other student debt$_{it}$			0.111	0.399***
			(0.0938)	(0.123)
Has other student debt$_{it-1}$			0.0806	0.431***
			(0.0923)	(0.167)
Social Fund debt (natural log)$_{it}$	0.0366	0.0720		
	(0.0395)	(0.0618)		
Social Fund debt (natural log)$_{it-1}$	0.0743***	0.0727		
	(0.0285)	(0.0813)		
Has Social Fund debt$_{it}$			0.242	0.471
			(0.231)	(0.362)
Has Social Fund debt$_{it-1}$			0.368**	0.350
			(0.163)	(0.456)
Employer loan debt (natural log)$_{it}$	0.00738	-0.0261		
	(0.0379)	(0.0445)		
Employer loan debt (natural log)$_{it-1}$	0.0354	-0.0142		
	(0.0292)	(0.0429)		
Has employer loan debt$_{it}$			0.169	-0.136
			(0.260)	(0.322)
Has employer loan debt$_{it-1}$			0.292	-0.216
			(0.189)	(0.318)
Loan from family or friends (natural log)$_{it}$	-0.0163	-0.0325*		

	(0.0119)	(0.0184)		
Loan from family or friends (natural log)$_{it-1}$	-0.000678	-0.0304		
	(0.00982)	(0.0247)		
Has loan from family or friends$_{it}$			-0.148	-0.269*
			(0.0945)	(0.143)
Has loan from family or friends $_{it-1}$			-0.0184	-0.247
			(0.0837)	(0.195)
Other loan debt (natural log)$_{it}$	0.00439	0.0119		
	(0.0130)	(0.0168)		
Other loan debt (natural log)$_{it-1}$	0.00576	0.00221		
	(0.0140)	(0.0259)		
Has other loan debt$_{it}$			0.0381	0.0891
			(0.106)	(0.138)
Has other loan debt$_{it-1}$			0.0671	-0.0257
			(0.114)	(0.215)
Household bill arrears (natural log)$_{it}$	-0.0730***	-0.0837***		
	(0.0154)	(0.0265)		
Household bill arrears (natural log)$_{it-1}$	-0.0319**	-0.0498		
	(0.0141)	(0.0444)		
Has household bill arrears $_{it}$			-0.476***	-0.527***
			(0.0923)	(0.160)
Has household bill arrears $_{it-1}$			-0.249***	-0.363
			(0.0861)	(0.254)
Control variables	Wealth controls, income, ownership controls, socio-economic and demographic controls	Wealth controls, income, ownership controls, socio-economic and demographic controls	Wealth controls, income, ownership controls, socio-economic and demographic controls	Wealth controls, income, ownership controls, socio-economic and demographic controls

Individual fixed effects?	Yes	Yes	Yes	Yes
Year fixed effects?	Yes	Yes	Yes	Yes
Year * region fixed effects?	Yes	No	Yes	No
Observations	56,403	43,401	56,403	43,401
Individuals	28,697	15,695	28,697	15,695

Notes: Source: Wealth and Assets Survey. Robust standard errors clustered at person level reported in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Standard errors in dynamic models apply Windmeijer correction. Debt is measured at the household level. The full set of controls can be found in Fig. 1. Dynamic model controls exclude age group and region. All static models fail serial correlation test. Key debt variables are tested for exogeneity using the Durbin-Wu-Hausman test, and test fails to reject exogeneity, and are assumed to be exogenous in dynamic models. All dynamic models pass Nickell bias test, Jochmans Portmaneteau test, and two-step Sargan-Hansen test of overidentifying restrictions (p-value > 0.05). Arrear debt is included in each debt category. “PCC debt” stands for debt from loans from pawnbrokers or cash converters.

Fig. 22. Impact of debt, by credit product and household income, on wellbeing (source: WAS)

Variable	Income quartile	Model			
Dependent variable: Life satisfaction (0-10)		**Static Fixed-Effects (37)**	**Dynamic GMM (38)**	**Static Fixed effects (39)**	**Dynamic GMM (40)**
Mortgage debt (natural log)$_{it}$		0.0155**	0.0165		
		(0.00707)	(0.0125)		
Mortgage debt (natural log)$_{it}$	First	-0.0191**	-0.0307*		
		(0.00901)	(0.0171)		
	Second	-0.0130*	-0.0229*		
		(0.00695)	(0.0133)		
	Third	-0.00672	-0.0116		
		(0.00557)	(0.00998)		
Has mortgage debt$_{it}$				0.161**	0.220
				(0.0784)	(0.142)
Has mortgage debt$_{it}$	First			-0.191**	-0.348*
				(0.0949)	(0.182)
	Second			-0.139*	-0.278*
				(0.0759)	(0.147)
	Third			-0.0841	-0.157
				(0.0618)	(0.112)

High-cost debt					
Mail order debt (natural log)$_{it}$		0.0536**	0.0704		
		(0.0271)	(0.0472)		
Mail order debt (natural log)$_{it}$	First	-0.0587*	-0.103*		
		(0.0342)	(0.0594)		
	Second	-0.0745**	-0.0739		
		(0.0324)	(0.0572)		
	Third	-0.0124	-0.0322		
		(0.0295)	(0.0532)		
Has mail order debt$_{it}$				0.329**	0.310
				(0.142)	(0.212)
Has mail order debt$_{it}$	First			-0.405**	-0.432
				(0.184)	(0.282)
	Second			-0.489***	-0.375
				(0.174)	(0.276)
	Third			-0.131	-0.170
				(0.159)	(0.262)
Current account overdraft debt (natural log)$_{it}$		-0.00294	0.00831		
		(0.0109)	(0.0159)		

Current account overdraft debt (natural log)$_{it}$	First	-0.0176	-0.0493*		
		(0.0182)	(0.0291)		
	Second	-0.0418**	-0.0383		
		(0.0165)	(0.0247)		
	Third	-0.0366**	-0.0574**		
		(0.0150)	(0.0230)		
Has current account overdraft debt$_{it}$				-0.0180	0.0824
				(0.0702)	(0.108)
Has current account overdraft debt$_{it}$	First			-0.0881	-0.349*
				(0.117)	(0.187)
	Second			-0.198*	-0.165
				(0.106)	(0.158)
	Third			-0.214**	-0.327**
				(0.0954)	(0.150)
Cash loan debt (natural log)$_{it}$		-0.143***	-0.179**		
		(0.0447)	(0.0778)		
Cash loan debt (natural log)$_{it}$	First	0.102*	0.0953		
		(0.0571)	(0.0891)		
	Second	0.301***	0.344***		

		(0.0752)	(0.0989)		
	Third	0.122	0.165**		
		(0.0902)	(0.0750)		
Has cash loan debt$_{it}$				-1.157***	-1.660***
				(0.433)	(0.569)
Has cash loan debt$_{it}$	First			0.863*	1.172*
				(0.487)	(0.629)
	Second			2.193***	2.640***
				(0.651)	(0.781)
	Third			1.016	1.605***
				(0.779)	(0.603)
Payday loan debt (natural log)$_{it}$		-0.00763	-0.0420		
		(0.0528)	(0.0761)		
Payday loan debt (natural log)$_{it}$	First	-0.124	0.113		
		(0.180)	(0.127)		
	Second	0.136	0.0645		
		(0.114)	(0.137)		
	Third	0.0892	0.111		
		(0.159)	(0.295)		

Has payday loan debt$_{it}$				-0.0382	-0.216
				(0.364)	(0.484)
Has payday loan debt$_{it}$	First			-0.339	0.473
				(1.301)	(0.880)
	Second			1.061	1.076
				(0.819)	(1.387)
	Third			0.738	0.710
				(1.109)	(1.922)
PCC debt (natural log)$_{it}$		-0.211	-0.333		
		(0.173)	(0.299)		
PCC debt (natural log)$_{it}$	First	-0.113	0.00235		
		(0.247)	(0.276)		
	Second	-0.000966	0.188		
		(0.200)	(0.245)		
	Third	(omitted)	(omitted)		
Has PCC debt$_{it}$				-1.371	-1.472
				(0.953)	(1.564)
Has PCC debt$_{it}$	First			-0.426	-1.034
				(1.384)	(1.429)

	Second			0.188	0.568
				(1.073)	(1.926)
	Third			(omitted)	(omitted)
Standard-cost debt					
Card debt (natural log)$_{it}$		-0.00413	-0.00698		
		(0.00548)	(0.0101)		
Card debt (natural log)$_{it}$	First	-0.000735	0.00492		
		(0.00990)	(0.0197)		
	Second	0.0142*	0.0207		
		(0.00825)	(0.0169)		
	Third	-0.00107	0.00413		
		(0.00772)	(0.0148)		
Has card debt$_{it}$				-0.0195	-0.0432
				(0.0391)	(0.0727)
Has card debt$_{it}$	First			-0.0118	0.0472
				(0.0667)	(0.132)
	Second			0.0836	0.140
				(0.0570)	(0.118)
	Third			-0.00581	0.00543

				(0.0543)	(0.107)
Personal loan debt (natural log)$_{it}$		0.000584	0.00759		
		(0.00697)	(0.0118)		
Personal loan debt (natural log)$_{it}$	First	-0.00268	-0.0299		
		(0.0147)	(0.0258)		
	Second	-0.0118	-0.0155		
		(0.0118)	(0.0186)		
	Third	-0.00548	-0.0108		
		(0.00993)	(0.0166)		
Has personal loan debt$_{it}$				-0.0103	0.0549
				(0.0591)	(0.101)
Has personal loan debt$_{it}$	First			-0.0585	-0.256
				(0.122)	(0.215)
	Second			-0.0808	-0.122
				(0.0987)	(0.156)
	Third			-0.0377	-0.118
				(0.0870)	(0.146)
Hire purchase debt (natural log)$_{it}$		0.00429	0.00516		
		(0.00598)	(0.00906)		

Hire purchase debt (natural log)$_{it}$	First	-0.000329	0.00990		
		(0.0128)	(0.0219)		
	Second	-0.00256	-0.0113		
		(0.00927)	(0.0156)		
	Third	0.000701	0.00693		
		(0.00813)	(0.0132)		
Has hire purchase debt$_{it}$				0.0260	0.0365
				(0.0484)	(0.0752)
Has hire purchase debt$_{it}$	First			0.00748	0.0258
				(0.0975)	(0.166)
	Second			-0.0535	-0.120
				(0.0740)	(0.121)
	Third			0.0297	0.0650
				(0.0653)	(0.105)
Credit Union loan debt (natural log)$_{it}$		-0.0794**	0.848		
		(0.0375)	(0.999)		
Credit Union loan debt (natural log)$_{it}$	First	0.0987	-0.914		
		(0.0817)	(1.049)		
	Second	-0.0331	-1.076		

		(0.0677)	(1.051)		
	Third	0.112	-1.010		
		(0.128)	(1.022)		
Has Credit Union loan debt$_{it}$				-0.598*	6.591
				(0.312)	(7.877)
Has Credit Union loan debt$_{it}$	First			0.609	-7.092
				(0.579)	(8.246)
	Second			-0.236	-8.100
				(0.488)	(8.110)
	Third			0.912	-7.716
				(1.092)	(8.115)
Other debt					
Student Loan Company debt (natural log)$_{it}$		0.00113	0.00538		
		(0.00802)	(0.0141)		
Student Loan Company debt (natural log)$_{it}$	First	-0.0481**	-0.0740*		
		(0.0227)	(0.0436)		
	Second	-0.00695	0.0108		
		(0.0151)	(0.0269)		
	Third	0.00335	0.00259		

		(0.0125)	(0.0247)		
Has Student Loan Company debt$_{it}$				0.0110	0.0293
				(0.0756)	(0.132)
Has Student Loan Company debt$_{it}$	First			-0.439**	-0.654*
				(0.205)	(0.370)
	Second			-0.0557	0.160
				(0.138)	(0.245)
	Third			0.0180	0.0293
				(0.117)	(0.231)
Other student debt (natural log)$_{it}$		0.0120	-0.0170		
		(0.0210)	(0.0285)		
Other student debt (natural log)$_{it}$	First	0.00258	0.0750		
		(0.0416)	(0.0963)		
	Second	-0.0201	0.0256		
		(0.0283)	(0.0412)		
	Third	0.00355	0.0816**		
		(0.0247)	(0.0399)		
Has other student debt$_{it}$				0.125	-0.127
				(0.187)	(0.248)

Has other student debt$_{it}$	First			-0.0784	0.541
				(0.363)	(0.596)
	Second			-0.196	0.256
				(0.251)	(0.368)
	Third			0.0171	0.717**
				(0.221)	(0.351)
Social Fund debt (natural log)$_{it}$		0.0471	0.546		
		(0.230)	(0.709)		
Social Fund debt (natural log)$_{it}$	First	-0.0164	-0.562		
		(0.233)	(0.736)		
	Second	0.180	-0.409		
		(0.244)	(0.769)		
	Third	(omitted)	(omitted)		
Has Social Fund debt$_{it}$				0.435	-0.189
				(1.202)	(3.438)
Has Social Fund debt$_{it}$	First			-0.191	0.332
				(1.226)	(3.541)
	Second			1.076	1.429
				(1.312)	(4.300)

	Third			(omitted)	(omitted)
Employer loan debt (natural log)$_{it}$		-0.00136	0.0558		
		(0.0512)	(0.0739)		
Employer loan debt (natural log)$_{it}$	First	0.0397	0.0207		
		(0.109)	(0.0801)		
	Second	0.0395	-0.168		
		(0.141)	(0.124)		
	Third	-0.0645	-0.204		
		(0.0813)	(0.138)		
Has employer loan debt$_{it}$				-0.0131	0.399
				(0.399)	(0.443)
Has employer loan debt$_{it}$	First			0.379	0.0389
				(0.710)	(0.473)
	Second			0.445	-0.694
				(0.848)	(1.787)
	Third			-0.420	-1.628
				(0.620)	(1.027)
Loan from family or friends (natural log)$_{it}$		0.0449	0.0741**		
		(0.0299)	(0.0329)		

Loan from family or friends (natural log)$_{it}$	First	-0.0515	-0.0866		
		(0.0509)	(0.0904)		
	Second	-0.0439	-0.0803		
		(0.0411)	(0.0581)		
	Third	-0.0754**	-0.156***		
		(0.0378)	(0.0473)		
Has loan from family or friends$_{it}$				0.351	0.673**
				(0.256)	(0.278)
Has loan from family or friends$_{it}$	First			-0.469	-1.063*
				(0.399)	(0.637)
	Second			-0.432	-0.768
				(0.351)	(0.474)
	Third			-0.575*	-1.306***
				(0.315)	(0.386)
Other loan debt (natural log)$_{it}$		0.00329	0.0121		
		(0.0239)	(0.0293)		
Other loan debt (natural log)$_{it}$	First	0.000224	-0.0103		
		(0.0528)	(0.0727)		
	Second	0.0131	-0.0364		

		(0.0417)	(0.0548)		
	Third	0.0622	0.0171		
		(0.0435)	(0.0536)		
Has other loan debt$_{it}$				0.0224	0.0503
				(0.215)	(0.274)
Has other loan debt$_{it}$	First			0.130	0.292
				(0.420)	(0.590)
	Second			0.172	-0.156
				(0.348)	(0.484)
	Third			0.481	0.144
				(0.391)	(0.463)
Household bill arrears (natural log)$_{it}$		-0.133*	-0.0620		
		(0.0726)	(0.0921)		
Household bill arrears (natural log)$_{it}$	First	0.0575	0.0203		
		(0.0750)	(0.0972)		
	Second	0.0540	-0.0674		
		(0.0793)	(0.106)		
	Third	0.0348	0.0261		
		(0.0803)	(0.104)		

Has household bill arrears $_{it}$				-0.922**	-0.473
				(0.468)	(0.614)
Has household bill arrears $_{it}$	First			0.424	0.182
				(0.482)	(0.642)
	Second			0.479	-0.303
				(0.506)	(0.702)
	Third			0.255	0.420
				(0.520)	(0.696)
Control variables		Wealth controls, income, ownership controls, socio-economic and demographic controls	Wealth controls, income, ownership controls, socio-economic and demographic controls	Wealth controls, income, ownership controls, socio-economic and demographic controls	Wealth controls, income, ownership controls, socio-economic and demographic controls
Individual fixed effects?		Yes	Yes	Yes	Yes
Year fixed effects?		Yes	Yes	Yes	Yes
Year * region fixed effects?		Yes	No	Yes	No
Observations		42,270	30,311	42,270	30,311
Individuals		25,335	13,376	25,335	13,376

Notes: Source: Wealth and Assets Survey. Robust standard errors clustered at person level reported in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Standard errors in dynamic models apply Windmeijer correction. Debt is measured at the household level. The full set of controls can be found in Fig. 1. Dynamic model controls exclude age group and region. All static models fail serial correlation test. Key debt variables are tested for exogeneity using the Durbin-Wu-Hausman test, and test fails to reject

exogeneity, and are assumed to be exogenous in dynamic models. All dynamic models pass Nickell bias test, Jochmans Portmaneteau test, and two-step Sargan-Hansen test of overidentifying restrictions (p-value > 0.05). Arrear debt is included in each debt category. “PCC debt” stands for debt from loans from pawnbrokers or cash converters. The omitted income quartile category is the top quartile. Income and interactions between income quartiles and main independent variables are considered to be endogenous and are therefore instrumented for in dynamic models.

Fig. 23. Impact of debt, by credit product, on wellbeing—static models (source: CRA-linked Understanding Society)

Variable	Income quartile	Model			
Dependent variable: Life satisfaction (0-10)		**Static Fixed-Effects (41)**	**Static Fixed-Effects (42)**	**Static Fixed effects (43)**	**Static Fixed-Effects (44)**
		Interactions: No	**Interactions: Yes**	**Interactions: No**	**Interactions: Yes**
Mortgage debt (natural log)$_{it}$		-0.0005 (0.0009)	0.0006 (0.0011)		
Mortgage debt (natural log)$_{it-1}$		-0.0005 (0.0008)	-0.0005 (0.0008)		
Mortgage debt (natural log)$_{it}$	First		-0.0043*** (0.0016)		
	Second		-0.0019 (0.0012)		
	Third		-0.0012 (0.001)		
Has mortgage debt$_{it}$				-0.0218 (0.0316)	0.0186 (0.0364)
Has mortgage debt$_{it-1}$				-0.0152 (0.0277)	-0.0155 (0.0278)
Has mortgage debt$_{it}$	First				-0.1483*** (0.0556)

	Second				-0.0645 (0.0425)
	Third				-0.0384 (0.0355)
High-cost debt					
Home collected high cost credit (natural log)$_{it}$		-0.0052** (0.0020)	-0.0054 (0.0036)		
Home collected high cost credit (natural log)$_{it-1}$		-0.0006 (0.0019)	-0.0008 (0.0019)		
Home collected high cost credit (natural log)$_{it}$	First		0.0028 (0.0047)		
	Second		0.0032 (0.0123)		
	Third		0.0017 (0.0122)		
Has home collected high cost credit debt$_{it}$				-0.1506** (0.0591)	-0.1525 (0.1083)
Has home collected high cost credit debt$_{it-1}$				-0.0160 (0.0544)	-0.0190 (0.0546)
Has home collected high cost credit debt$_{it}$	First				0.0782 (0.1385)

	Second				-0.0312 (0.1273)
	Third				-0.0312 (0.1273)
Unauthorised current account overdraft debt (natural log)$_{it}$		-0.0033* (0.002)	-0.0061* (0.0037)		
Unauthorised current account overdraft debt (natural log)$_{it-1}$		-0.0007 (0.0016)	-0.0006 (0.0016)		
Unauthorised current account overdraft debt (natural log)$_{it}$	First		-0.0019 (0.0021)		
	Second		-0.0018 (0.0018)		
	Third		-0.0014 (0.0016)		
Has unauthorised current account overdraft debt$_{it}$				-0.0921* (0.0536)	-0.1659* (0.1008)
Has unauthorised current account overdraft debt$_{it-1}$				-0.0174 (0.0447)	-0.0140 (0.0448)
Has unauthorised current account overdraft debt$_{it}$	First				0.1363 (0.1471)
	Second				-0.0164 (0.1428)
	Third				0.1749 (0.1401)

Other running card debt (natural log)$_{it}$		0.0009 (0.0009)	0.0029** (0.0014)		
Other running card debt (natural log)$_{it-1}$		-0.0014 (0.0009)	-0.0013 (0.0009)		
Other running card debt (natural log)$_{it}$	First		-0.0025 (0.0022)		
	Second		-0.0027 (0.0019)		
	Third		-0.0032** (0.0017)		
Has other running card debt $_{it}$				0.0262 (0.0242)	0.0842** (0.038)
Has other running card debt $_{it-1}$				-0.0384 (0.0236)	-0.0353 (0.0237)
Has other running card debt $_{it}$	First				-0.0739 (0.0608)
	Second				-0.0745 (0.0526)
	Third				-0.0915* (0.0467)
Standard-cost debt					
Authorised current account overdraft debt (natural log)$_{it}$		-0.0024*** (0.0008)	-0.0012 (0.0012)		

Authorised current account overdraft debt (natural log)$_{it-1}$		0.0005 (0.0007)	0.0005 (0.0007)		
Authorised current account overdraft debt (natural log)$_{it}$	First		-0.0019 (0.0021)		
	Second		-0.0018 (0.0018)		
	Third		-0.0014 (0.0016)		
Has authorised current account overdraft debt$_{it}$				-0.0659*** (0.0221)	-0.0337 (0.0344)
Has authorised current account overdraft debt$_{it-1}$				0.0124 (0.0212)	0.0131 (0.0212)
Has authorised current account overdraft debt$_{it}$	First				-0.0472 (0.0605)
	Second				-0.0499 (0.0515)
	Third				-0.0389 (0.0453)
Credit card and store card debt (natural log)$_{it}$		-0.0004 (0.0006)	-0.0008 (0.0010)		
Credit card and store card debt (natural log)$_{it-1}$		-0.0001 (0.0006)	-0.0002 (0.0006)		
Credit card and store card debt (natural log)$_{it}$	First		0.0017 (0.0015)		

	Second		-0.0001 (0.0013)		
	Third		0.0003 (0.0012)		
Has credit card and store card debt$_{it}$				-0.0131 (0.0179)	-0.0244 (0.0285)
Has credit card and store card debt$_{it-1}$				-0.0036 (0.0175)	-0.0044 (0.0175)
Has credit card and store card debt$_{it}$	First				0.0453 (0.0437)
	Second				-0.0007 (0.0385)
	Third				0.0076 (0.0349)
Motor finance debt (natural log)$_{it}$		-0.0009 (0.0008)	-0.0013 (0.0011)		
Motor finance debt (natural log)$_{it-1}$		0.0000 (0.0008)	0.0000 (0.0008)		
Motor finance debt (natural log)$_{it}$	First		-0.0017 (0.0022)		
	Second		-0.0005 (0.0017)		
	Third		0.0023* (0.0014)		

Has motor finance debt$_{it}$				-0.0301 (0.0253)	-0.0444 (0.0357)
Has motor finance debt$_{it-1}$				0.0027 (0.0259)	0.0022 (0.0259)
Has motor finance debt$_{it}$	First				-0.0503 (0.0694)
	Second				-0.0139 (0.0547)
	Third				0.0747* (0.0448)
Personal loan debt (natural log)$_{it}$		-0.0013* (0.0007)	-0.0021** (0.001)		
Personal loan debt (natural log)$_{it-1}$		-0.0008 (0.0007)	-0.0008 (0.0007)		
Personal loan debt (natural log)$_{it}$	First		-0.0002 (0.0019)		
	Second		0.0017 (0.0014)		
	Third		0.0014 (0.0012)		
Has personal loan debt$_{it}$				-0.0389* (0.0211)	-0.0672** (0.0303)
Has personal loan debt$_{it-1}$				-0.0235 (0.0215)	-0.0242 (0.0215)

Has personal loan debt$_{it}$	First				-0.0078 (0.0596)
	Second				0.057 (0.0453)
	Third				0.0457 (0.0389)
Retail finance debt (natural log)$_{it}$		-0.0006 (0.0006)	-0.0010 (0.0009)		
Retail finance debt (natural log)$_{it-1}$		-0.0001 (0.0006)	-0.0001 (0.0006)		
Retail finance debt (natural log)$_{it}$	First		0.0003 (0.0018)		
	Second		0.0010 (0.0015)		
	Third		0.0000 (0.0013)		
Has retail finance debt$_{it}$				-0.0205 (0.0181)	-0.0306 (0.0274)
Has retail finance debt$_{it-1}$				-0.0045 (0.0188)	-0.0049 (0.0188)
Has retail finance debt$_{it}$	First				0.0107 (0.0518)
	Second				0.0300 (0.0428)

	Third				-0.0016 (0.0369)
Other debt					
Household bill arrears (natural log)$_{it}$		-0.0019 (0.0036)	-0.0031 (0.0105)		
Household bill arrears (natural log)$_{it-1}$		0.0015 (0.0040)	0.0013 (0.004)		
Household bill arrears (natural log)$_{it}$	First		0.0000 (0.0123)		
	Second		0.0017 (0.0122)		
	Third		0.0032 (0.0123)		
Has household bill arrears $_{it}$				-0.0546 (0.1035)	-0.0757 (0.3063)
Has household bill arrears $_{it-1}$				0.0413 (0.1143)	0.0366 (0.1141)
Has household bill arrears $_{it}$	First				-0.0140 (0.3564)
	Second				0.0366 (0.3539)
	Third				0.0727 (0.3623)

Telephone bill arrears (natural log)$_{it}$		0.0018 (0.0042)	0.0124 (0.0079)		
Telephonebill arrears (natural log)$_{it-1}$		-0.0044 (0.0043)	-0.0044 (0.0043)		
Telephonebill arrears (natural log)$_{it}$	First		-0.0116 (0.0123)		
	Second		-0.0103 (0.011)		
	Third		-0.019* (0.0108)		
Has telephone bill arrears $_{it}$				0.0429 (0.1157)	0.3442 (0.2181)
Has telephone bill arrears $_{it-1}$				-0.1229 (0.1184)	-0.1224 (0.1182)
Has telephone bill arrears $_{it}$	First				-0.3296 (0.3382)
	Second				-0.289 (0.3041)
	Third				-0.5394* (0.2982)
Individual fixed effects?		Yes	Yes	Yes	Yes
Wave fixed effects?		Yes	Yes	Yes	Yes
Wave * region fixed effects?		Yes	Yes	Yes	Yes

Observations		112,799	112,786	112,799	112,786
Individuals		16,955	16,955	16,955	16,955

Notes: CRA-linked Understanding Society. Robust standard errors clustered at person level reported in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Debt is measured at the household level. The full set of controls can be found in Fig. 1. All static models fail serial correlation test. The omitted category in the interaction terms is the top income quartile. Arrear debt is included. The omitted income quartile category is the top quartile.

Fig. 24. Impact of debt, by credit product, on wellbeing—dynamic GMM models (source: CRA-linked Understanding Society)

Variable	Income quartile	Model			
Dependent variable: Life satisfaction (0-10)		**Dynamic GMM (45)**	**Dynamic GMM (46)**	**Dynamic GMM (47)**	**Dynamic GMM (48)**
		Interactions: No	**Interactions: Yes**	**Interactions: No**	**Interactions: Yes**
Mortgage debt (natural log)$_{it}$		-0.0002 (0.0013)	0.0051** (0.0024)		
Mortgage debt (natural log)$_{it-1}$		-0.0006 (0.0009)	-0.0004 (0.0009)		
Mortgage debt (natural log)$_{it}$	First		-0.0092* (0.0048)		
	Second		-0.0101** (0.004)		
	Third		-0.007** (0.0032)		
Has mortgage debt$_{it}$				-0.0044 (0.0435)	0.1753** (0.0828)
Has mortgage debt$_{it-1}$				-0.0205 (0.0318)	-0.0134 (0.0321)
Has mortgage debt$_{it}$	First				-0.3122* (0.1638)
	Second				-0.3365** (0.1373)

	Third				-0.2333** (0.1109)
High-cost debt					
Home collected high cost credit (natural log)$_{it}$		-0.0076*** (0.0029)	-0.0178 (0.0166)		
Home collected high cost credit (natural log)$_{it-1}$		0.0028 (0.0027)	0.0031 (0.0027)		
Home collected high cost credit (natural log)$_{it}$	First		0.0073 (0.0219)		
	Second		0.0139 (0.0200)		
	Third		0.0145 (0.0184)		
Has home collected high cost credit debt$_{it}$				-0.2284*** (0.0839)	-0.5309 (0.4853)
Has home collected high cost credit debt$_{it-1}$				0.0872 (0.0778)	0.0944 (0.0788)
Has home collected high cost credit debt$_{it}$	First				0.2263 (0.6414)
	Second				0.4072 (0.5841)
	Third				0.4316 (0.5401)

Unauthorised current account overdraft debt (natural log)$_{it}$		0.0068***	-0.0253***		
		(0.0026)	(0.0081)		
Unauthorised current account overdraft debt (natural log)$_{it-1}$		-0.0012	-0.0014		
		(0.0026)	(0.0026)		
Unauthorised current account overdraft debt (natural log)$_{it}$	First		0.0327***		
			(0.0127)		
	Second		0.0243**		
			(0.0117)		
	Third		0.0178		
			(0.0112)		
Has unauthorised current account overdraft debt$_{it}$				-0.1855***	-0.6936***
				(0.071)	(0.2211)
Has unauthorised current account overdraft debt$_{it-1}$				-0.0316	-0.0380
				(0.07)	(0.0708)
Has unauthorised current account overdraft debt$_{it}$	First				0.8868**
					(0.3461)
	Second				0.6534**
					(0.318)
	Third				0.5009
					(0.3063)
Other running card debt (natural log)$_{it}$		0.0009	-0.0011		
		(0.0012)	(0.0033)		

Other running card debt (natural log)$_{it-1}$		0.0000 (0.0012)	0.0000 (0.0012)		
Other running card debt (natural log)$_{it}$	First		0.006 (0.0056)		
	Second		0.0031 (0.0049)		
	Third		0.0010 (0.0042)		
Has other running card debt $_{it}$				0.0247 (0.0342)	-0.0256 (0.0919)
Has other running card debt $_{it-1}$				-0.0007 (0.0326)	0.0002 (0.0328)
Has other running card debt $_{it}$	First				0.1507 (0.1556)
	Second				0.0824 (0.1361)
	Third				0.0189 (0.1180)
Standard-cost debt					
Authorised current account overdraft debt (natural log)$_{it}$		-0.0030*** (0.0011)	-0.0016 (0.0028)		
Authorised current account overdraft debt (natural log)$_{it-1}$		0 (0.0011)	0 (0.0011)		

Authorised current account overdraft debt (natural log)$_{it}$	First		-0.0042 (0.0052)		
	Second		-0.0031 (0.0045		
	Third		0.0003 (0.0038)		
Has authorised current account overdraft debt$_{it}$				-0.0847*** (0.0318)	-0.0386 (0.08)
Has authorised current account overdraft debt$_{it-1}$				-0.0012 (0.0324)	-0.0016 (0.0325)
Has authorised current account overdraft debt$_{it}$	First				-0.1368 (0.1493)
	Second				-0.0974 (0.1306)
	Third				0.005 (0.1103)
Credit card and store card debt (natural log)$_{it}$		-0.0003 (0.0008)	-0.0040 (0.0026)		
Credit card and store card debt (natural log)$_{it-1}$		0.0004 (0.0008)	0.0004 (0.0008)		
Credit card and store card debt (natural log)$_{it}$	First		0.0052 (0.0044)		
	Second		0.0050 (0.0038)		

	Third		0.0052 (0.0033)		
Has credit card and store card debt$_{it}$				-0.0107 (0.0247)	-0.1258 (0.0781)
Has credit card and store card debt$_{it-1}$				0.0107 (0.0247)	0.0117 (0.0247)
Has credit card and store card debt$_{it}$	First				0.1578 (0.1308)
	Second				0.1551 (0.1133)
	Third				0.1679 (0.0983)
Motor finance debt (natural log)$_{it}$		0.0002 (0.0011)	0.0022 (0.0024)		
Motor finance debt (natural log)$_{it-1}$		-0.001 (0.0011)	-0.0008 (0.0011)		
Motor finance debt (natural log)$_{it}$	First		-0.0078 (0.0053)		
	Second		-0.0041 (0.0043)		
	Third		-0.0006 (0.0036)		
Has motor finance debt$_{it}$				0.0008 (0.0355)	0.0617 (0.0761)

Has motor finance debt$_{it-1}$				-0.0294 (0.0364)	-0.0236 (0.0365)
Has motor finance debt$_{it}$	First				-0.2416 (0.1704)
	Second				-0.1249 (0.1378)
	Third				-0.0137 (0.1145)
Personal loan debt (natural log)$_{it}$		-0.0032*** (0.001)	-0.0007 (0.0022)		
Personal loan debt (natural log)$_{it-1}$		0.0001 (0.0009)	0.0002 (0.0009)		
Personal loan debt (natural log)$_{it}$	First		-0.0047 (0.005)		
	Second		-0.0027 (0.0039)		
	Third		-0.0042 (0.0032)		
Has personal loan debt$_{it}$				-0.1018*** (0.0309)	-0.0246 (0.0712)
Has personal loan debt$_{it-1}$				0.0024 (0.0296)	0.0068 (0.0298)
Has personal loan debt$_{it}$	First				-0.1388 (0.155)

	Second				-0.0753 (0.1236)
	Third				-0.131 (0.1018)
Retail finance debt (natural log)$_{it}$		-0.0014 (0.0009)	-0.0006 (0.0021)		
Retail finance debt (natural log)$_{it-1}$		0.0011 (0.0009)	0.0012 (0.0009)		
Retail finance debt (natural log)$_{it}$	First		0.0020 (0.0042)		
	Second		0.0008 (0.0035)		
	Third		-0.0038 (0.0031)		
Has retail finance debt$_{it}$				-0.0405 (0.0264)	-0.0192 (0.0613)
Has retail finance debt$_{it-1}$				0.0359 (0.027)	0.0378 (0.0272)
Has retail finance debt$_{it}$	First				0.0649 (0.1231)
	Second				0.0252 (0.1021)
	Third				-0.1138 (0.0900)

Other debt					
Household bill arrears (natural log)$_{it}$		0.0030 (0.0051)	-0.0066 (0.0365)		
Household bill arrears (natural log)$_{it-1}$		0.0108** (0.0054)	0.012** (0.0055)		
Household bill arrears (natural log)$_{it}$	First		-0.0058 (0.0439)		
	Second		0.0237 (0.0410)		
	Third		0.0162 (0.0399)		
Has household bill arrears $_{it}$				0.0850 (0.1465)	-0.1321 (1.0616)
Has household bill arrears $_{it-1}$				0.3276** (0.1572)	0.3609** (0.1584)
Has household bill arrears $_{it}$	First				-0.2307 (1.2731)
	Second				0.6127 (1.1953)
	Third				0.4011 (1.1696)
Telephone bill arrears (natural log)$_{it}$		0.0089 (0.0058)	0.0227 (0.0175)		

Telephonebill arrears (natural log)$_{it-1}$		-0.0049 (0.0061)	-0.0044 (0.0061)		
Telephonebill arrears (natural log)$_{it}$	First		-0.0242 (0.0261)		
	Second		-0.0209 (0.0238)		
	Third		-0.0112 (0.0242)		
Has telephone bill arrears $_{it}$				0.2377 (0.1607)	0.6437 (0.4821)
Has telephone bill arrears $_{it-1}$				-0.1388 (0.1671)	-0.1254 (0.1689)
Has telephone bill arrears $_{it}$	First				-0.712 (0.7223)
	Second				-0.5991 (0.6516)
	Third				-0.3516 (0.6683)
Individual fixed effects?		Yes	Yes	Yes	Yes
Wave fixed effects?		Yes	Yes	Yes	Yes
Wave * region fixed effects?		No	No	No	No
Observations		65,659	65,659	65,659	65,659
Individuals		18,048	18,048	18,048	18,048

Notes: CRA-linked Understanding Society. Standard errors in dynamic models apply Windmeijer correction (*** p<0.01, ** p<0.05, * p<0.1). Debt is measured at the household level. The full set of controls can be found in Fig. 1. The omitted category in the interaction terms is the top income quartile. Income and interactions between income quartiles and main independent variables are considered to be endogenous and are therefore instrumented for in dynamic models. Debt is treated as exogenous following testing on WAS data (use of a different software package did not allow comparable testing on CRA-linked Understanding Society data). Dynamic models pass Nickell bias test, Jochmans Portmaneteau test, and two-step Sargan-Hansen test of overidentifying restrictions (p-value > 0.05). Arrear debt is included in each debt category.

Fig. 25. Impact on wellbeing of wider outcomes of interest to the FCA

Proxy (and model)	Serial correlation present in model?	Exogeneity test	Coefficient and standard error	Observations and individuals	Model and estimator	Reliability (poor / good)
Understanding enough about pensions to make decisions about saving for retirement (49)	Yes	Exogeneity rejected	0.0552** (0.0258)	70,920 38,496	Static Fixed effects	Poor
Understanding enough about pensions to make decisions about saving for retirement (50)	Yes	Exogeneity rejected	0.0859 (0.0773)	20,883 7,920	Dynamic GMM	Good
Not contributing towards a pension because of a lack of trust in pension schemes (51)	Yes	Exogeneity rejected	-0.0466 (0.0643)	62,475 34,561	Static Fixed effects	Poor
Not contributing towards a pension because of a lack of trust in pension schemes (52)	Yes	Exogeneity rejected	0.134 (0.212)	18,387 7,001	Dynamic GMM	Good

Mortgage repayments are a heavy burden (53)	Yes	Exogeneity rejected	-0.398*** (0.0522)	31,790 18,173	Static Fixed effects	Poor
Seeking help or advice because of debt in the last two years (54)	No	Exogeneity not rejected	-0.117 (0.152)	3,579 2,777	Static Fixed effects	Good
Knowing how to access past pension pots (55)	Yes	Sample size too small to run test	-0.186 (0.113)	8,422 7,933	Static Fixed effects	Poor
Use of a financial institution or professional financial advisor in the last year to find out anything about money (56)	Sample size too small to run test	Sample size too small to run test	0.0876 (0.325)	1,585 1,424	Static Fixed effects	Poor
Able to use financial products to meet unexpected major expense (57)	Yes	Exogeneity rejected	0.293*** (0.0376)	118,305 56,727	Static Fixed effects	Poor
Holding a financial product (58)	Yes	Exogeneity not rejected	-0.079 (0.166)	35,211 20,285	Static Fixed effects	Poor

Notes: Source: Wealth and Assets Survey. Robust standard errors clustered at person level reported in parentheses (*** p<0.01, ** p<0.05, * p<0.1). Standard errors in dynamic models apply Windmeijer correction. Model 58 controls for demographic and social-economic characteristics. Models 49 to 52 and Model 57 also control for household income. Models 53 and 55 additionally include financial and ownership controls, and Models 54 and 56 also include controls for arrear and non-arrear debt. Dynamic model controls exclude age group and region. Exogeneity test refers to Durbin-Wu-Hausman test. All dynamic models presented pass Nickell bias test, Jochmans

Portmaneteau test, and two-step Sargan-Hansen test of overidentifying restrictions (p-value > 0.05), whereas where a static model is labelled as "poor" and a dynamic model is not presented, at least one of these tests fails. Coefficients from dynamic models are short-run impacts. When we run model 58 including separate dummies for holding individual financial products, we only find a statistically significant coefficient on having an ISA, trust, bonds, or shares (coefficient: 0.0965; standard error: 0.0464) but we are still unable to validly run a dynamic model. For reliable models, we find no statistically significant differences by household income.

APPENDIX 2 – ADDITIONAL DETAIL ON ECONOMETRIC MODELLING

This section provides some additional detail on statistical tests and models applied in our research.[95]

1. Testing for Endogeneity and Serial Correlation

We begin our analysis by employing two essential tests: the Durbin-Wu-Hausman (DWH) test for endogeneity and the Wooldridge test for serial correlation. These tests are crucial for ensuring the correct functional form and identification strategies are used in developing econometric models that are robust and fit for purpose.

1.1 Durbin-Wu-Hausman (DWH) Test for Endogeneity

The DWH test examines the presence of endogeneity in a regression model estimated via instrumental variables (IV). Its null hypothesis asserts that an Ordinary Least Squares (OLS) estimator of the same equation would produce consistent estimates. A rejection of the null suggests significant effects of endogenous regressors on the estimates, necessitating the use of instrumental variables techniques.

In practical terms, the DWH test involves comparing the coefficients estimated through IV methods with those obtained through OLS. If the coefficients significantly differ, it indicates that the endogeneity of regressors affects the OLS estimates, highlighting the need for IV estimation.

Our tests on the models in strand one of the research fail to reject that debt might be exogenous, while in the second strand of research these tests suggest that several outcomes of interest may be endogenous.

1.2 Wooldridge Test for Serial Correlation

The Wooldridge test, also known as the Wooldridge test for autocorrelation, detects autocorrelation in the residuals of a regression model. Autocorrelation arises when error terms exhibit correlation with one another, indicating residual patterns unaccounted for by explanatory variables. A rejection of the null hypothesis of no serial correlation implies the presence of autocorrelation in the residuals.

In practice, the Wooldridge test involves estimating a regression model and then examining the residuals for patterns indicative of autocorrelation. If the test statistic is significant at a chosen significance level, typically 0.05, it suggests the presence of serial correlation, necessitating adjustments in the model specification.

[95] This section is not however meant to provide a complete guide for such tests and models. Particularly for GMM models we instead recommend the following references: Cameron, A. C., and P. K. Trivedi "Microeconometrics: Methods and applications" (2005) Cambridge: Cambridge University Press (See Chapter 6); and Wooldridge, J. M. "Applications of generalized method of moments estimation" (2001) Journal of Economic Perspectives 15(4): 87-1.

It should be noted that the rejection of the null hypothesis of no serial correlation in the residuals doesn't necessarily mean that a dynamic panel data model is preferable to a static panel data model. It implies that there might be a need to account for the autocorrelation in the model specification.

Dynamic panel data models include lagged dependent variables or lagged explanatory variables to capture temporal dependencies. If autocorrelation is present in the residuals, it indicates that there might be some serial dependence that isn't being adequately captured by a static model. In such cases, a dynamic panel data model may be a preferable choice because it allows for the inclusion of lagged variables to address this issue.

In our research, serial correlation is detected in all strand one models, as well as in all strand two models except for one model.

2. Dynamic Panel Data Modelling and Generalized Method of Moments (GMM) Estimation

The Generalized Method of Moments (GMM) approach can address serial correlation and endogeneity. GMM offers several advantages in addressing these challenges:

Handling Endogeneity: GMM can address endogeneity by using instrumental variables or exploiting orthogonality conditions between regressors and error terms. By incorporating instruments that are correlated with endogenous regressors but uncorrelated with error terms, GMM models can produce consistent estimates even in the presence of endogeneity. Specifically in our research, this is an advantage in the models explored in the second strand of the research (investigating the impact of wider outcomes of interest to the FCA on wellbeing) for which we sometimes find the outcome of interest to be endogenous. For the models in the first strand of the research (investigating the impact of debt on wellbeing) we do not need to rely on this advantage provided by GMM models, as our statistical tests do not reject exogeneity and therefore we do not need to instrument for debt.

Robustness to Serial Correlation: GMM estimators are robust to serial correlation in panel data models. They efficiently correct for autocorrelation in residuals by employing suitable moment conditions derived from the model's theoretical properties.

Efficient Utilization of Information: GMM models utilize moment conditions derived from the model's theoretical properties. These moment conditions exploit available information efficiently, especially in over- or under-identified models, where the number of moment conditions differs from the number of parameters to be estimated.

Flexibility in Model Specification: GMM models allow researchers to impose restrictions on parameters of interest and incorporate identifying assumptions. This flexibility enhances the model's ability to capture complex relationships and dynamics in panel data.

Consistency and Efficiency: Under appropriate conditions, GMM estimators are consistent and asymptotically efficient. As the sample size increases, GMM estimators converge in probability to the true parameter values, and their variances converge to zero.

3. Validity Tests for GMM Estimation

If established that dynamic panel models are better suited than static models for the application, it is important to conduct validity tests to ensure the reliability and validity of the results. Given the short

time dimension of our panel dataset, we do not use the Arellano-Bond test given that this requires at least four time-periods. Instead, we use the Jochmans Portmanteau tests which has been shown to be a relatively more powerful test when modelling panel data with a short time period. We apply the following three diagnostic tests to our model. Throughout this report we only present dynamic models as reliable if they pass all three tests.

3.1 Jochmans Portmanteau Test

The Jochmans Portmanteau test assesses the validity of moment conditions that are crucial for GMM estimation. It examines whether the moments are uncorrelated with one other, which is essential for the efficiency and consistency of GMM estimates. By testing the orthogonality of moment conditions, this test provides diagnostic information about the validity of the GMM estimation procedure.

3.2 Nickell Bias Test

The Nickell bias test compares coefficient estimates on lagged variables from dynamic pooled OLS and dynamic fixed effects models to identify bias introduced by using lagged dependent variables as instruments. Specifically, comparing the coefficient estimates of lagged variables obtained from dynamic pooled OLS and dynamic fixed effects models, one would observe an upward bias in the pooled OLS estimates and a downward bias in the fixed effects estimates. The “true” coefficient lies somewhere between these two biased estimates.

3.3 Two-Step Sargan-Hansen Test of Overidentifying Restrictions

The two-step Sargan-Hansen test checks the validity of overidentifying restrictions in GMM estimation, ensuring the appropriateness of instruments used. By examining the orthogonality of residuals with instruments, this test verifies whether the number of instruments used in GMM estimation is excessive or properly specified.

APPENDIX 3 – MONETISATION GUIDANCE AND FULL TABLE OF MONETARY VALUES

This section provides a step-by-step guide to monetising the coefficients set out in section 4. It also provides monetary values under the central high scenario described and for several permutations of debt persistence.

To monetise the coefficients, the following steps should be undertaken:

- Convert the 2019 WELLBY values (low, medium and high) into the relevant price year. This can be done using the formula on p.57 of the Green Book supplement on wellbeing guidance for appraisal, noting that GDP per capita refers to real GDP per capita.[96]
- Multiply this set of values by the assumed average number of adults per household in the population of interest (e.g. two) to arrive at a household WELLBY given that changes in financial outcomes are treated as household goods.
- Derive the WELLBY value to the household of the outcome occurring as below for binary and continuous variables respectively:
- For binary variables, multiply the relevant coefficient by the relevant WELLBY value (low, medium, high) to obtain the value of the outcome.
- For continuous variables, calculate the change in life satisfaction as: $\beta_k * (\ln(100 - \delta)/100)$, where β_k is the coefficient of interest, and δ is the assumed percentage change in the variable.[97] Multiply this change in life satisfaction by the relevant WELLBY value (low, medium, high) to obtain the value of the outcome.
- For impacts in years two, three and four derive the WELLBY values as in Step 2, and apply the Green Book discount rate of 1.5%.

A worked example is provided in footnote 93.

[96] Sara MacLennan, Iven Stead, and Allan Little, "Wellbeing Guidance for Appraisal: Supplementary Green Book Guidance", 2021, accessed February 2024.

Fig. 26. Monetisation of coefficients using central WELLBYs for a two-person household under various lengths of debt persistence (2023 prices and incomes)

Dataset	Type of debt and description of change	Change in debt lasting [X] year(s)	Wellbeing value (central WELLBY for a two-person household)			
			Year 1	**Year 2**	**Year 3**	**Year 4**
WAS	**Arrear debt (positive debt)**	**One year**	-12430	Not significant	Not significant	Not significant
WAS	**Arrear debt (positive debt)**	**Two years**	-12430	-12250	Not significant	Not significant
WAS	**Arrear debt (positive debt)**	**Three years**	-12430	-12250	-20020	Not significant
WAS	**Arrear debt (positive debt)**	**Four years**	-12430	-12250	-20020	-19720
WAS	**Arrear debt (10% increase)**	**One year**	-190	Not significant	Not significant	Not significant
WAS	**Arrear debt (10% increase)**	**Two years**	-190	-190	Not significant	Not significant
WAS	**Arrear debt (10% increase)**	**Three years**	-190	-190	-280	Not significant
WAS	**Arrear debt (10% increase)**	**Four years**	-190	-190	-280	-280
WAS	**High-cost debt (positive debt)**	**One year**	-5130	Not significant	Not significant	Not significant
WAS	**High-cost debt (positive debt)**	**Two years**	-5130	-5050	Not significant	Not significant

WAS	**High-cost debt (positive debt)**	**Three years**	-5130	-5050	-8350	Not significant
WAS	**High-cost debt (positive debt)**	**Four years**	-5130	-5050	-8350	-8230
WAS	**High-cost debt (10% increase)**	**One year**	-90	Not significant	Not significant	Not significant
WAS	**High-cost debt (10% increase)**	**Two years**	-90	-90	Not significant	Not significant
WAS	**High-cost debt (10% increase)**	**Three years**	-90	-90	-150	Not significant
WAS	**High-cost debt (10% increase)**	**Four years**	-90	-90	-150	-150
WAS	**Current account overdraft debt (positive debt)**	**One year**	-6120	-6330	-6230	-470
WAS	**Current account overdraft debt (positive debt)**	**Two years**	-6120	-6030	-6230	-6140
WAS	**Current account overdraft debt (positive debt)**	**Three years**	-6120	-6030	-12180	-6140
WAS	**Current account overdraft debt**	**Four years**	-6120	-6030	-12180	-12000

	(positive debt)					
WAS	**Current account overdraft debt (10% increase)**	**One year**	-100	-100	-100	-10
WAS	**Current account overdraft debt (10% increase)**	**Two years**	-100	-100	-100	-100
WAS	**Current account overdraft debt (10% increase)**	**Three years**	-100	-100	-200	-100
WAS	**Current account overdraft debt (10% increase)**	**Four years**	-100	-100	-200	-200
WAS	**Debt from cash loans (positive debt)**	**One year**	-20310	-30620	-30170	-2270
WAS	**Debt from cash loans (positive debt)**	**Two years**	-20310	-20010	-30170	-29720
WAS	**Debt from cash loans (positive debt)**	**Three years**	-20310	-20010	-49880	-29720
WAS	**Debt from cash loans (positive debt)**	**Four years**	-20310	-20010	-49880	-49140
WAS	**Debt from cash loans (10% increase)**	**One year**	-270	-440	-430	-30

WAS	**Debt from cash loans (10% increase)**	**Two years**	-270	-270	-430	-420
WAS	**Debt from cash loans (10% increase)**	**Three years**	-270	-270	-690	-420
WAS	**Debt from cash loans (10% increase)**	**Four years**	-270	-270	-690	-680
WAS	**Household bill arrears (positive debt)**	**One year**	-16000	Not significant	Not significant	Not significant
WAS	**Household bill arrears (positive debt)**	**Two years**	-16000	-15760	Not significant	Not significant
WAS	**Household bill arrears (positive debt)**	**Three years**	-16000	-15760	-27440	Not significant
WAS	**Household bill arrears (positive debt)**	**Four years**	-16000	-15760	-27440	-27030
WAS	**Household bill arrears (10% increase)**	**One year**	-240	Not significant	Not significant	Not significant
WAS	**Household bill arrears (10% increase)**	**Two years**	-240	-240	Not significant	Not significant
WAS	**Household bill arrears (10% increase)**	**Three years**	-240	-240	-390	Not significant
WAS	**Household bill arrears**	**Four years**	-240	-240	-390	-390

	(10% increase)					
CRA-USoc	**Debt from personal loans (positive debt)**	**One year**	-3110	Not significant	Not significant	Not significant
CRA-USoc	**Debt from personal loans (positive debt)**	**Two years**	-3110	-3270	Not significant	Not significant
CRA-USoc	**Debt from personal loans (positive debt)**	**Three years**	-3110	-3270	-3290	Not significant
CRA-USoc	**Debt from personal loans (positive debt)**	**Four years**	-3110	-3270	-3290	-3290
CRA-USoc	**Home-collected high-cost credit (positive debt)**	**One year**	-6980	Not significant	Not significant	Not significant
CRA-USoc	**Home-collected high-cost credit (positive debt)**	**Two years**	-6980	-6870	Not significant	Not significant
CRA-USoc	**Home-collected high-cost credit (positive debt)**	**Three years**	-6980	-6870	Not significant	Not significant
CRA-USoc	**Home-collected high-cost**	**Four years**	-6980	-6870	Not significant	Not significant

	credit (positive debt)					
CRA-USoc	**Current account authorised overdraft (positive debt)**	**One year**	-2590	Not significant	Not significant	Not significant
CRA-USoc	**Current account authorised overdraft (positive debt)**	**Two years**	-2590	-2550	Not significant	Not significant
CRA-USoc	**Current account authorised overdraft (positive debt)**	**Three years**	-2590	-2550	-2750	Not significant
CRA-USoc	**Current account authorised overdraft (positive debt)**	**Four years**	-2590	-2550	-2750	-2710
CRA-USoc	**Current account unauthorised overdraft (positive debt)**	**One year**	-5640	Not significant	Not significant	Not significant
CRA-USoc	**Current account unauthorised overdraft (positive debt)**	**Two years**	-5640	-5560	Not significant	Not significant
CRA-USoc	**Current account unauthorised overdraft**	**Three years**	-5640	-5560	-6840	Not significant

	(positive debt)					
CRA-USoc	**Current account unauthorised overdraft (positive debt)**	**Four years**	-5640	-5560	-6840	-6740

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