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Abstract

This paper investigates the marginal propensity to consume for the UK households across di erent socio-economic groups. It uses the Family Expenditure Survey, a repeated cross section of British Households, which reports expenditure, income, and household characteristics from quarter 1 of 1986 to quarter 1 of 2016. Since each household is interviewed only once we construct pseudo-panels based on the socio-economic status of the household head. We nd that households with higher socio-economic status have lower marginal propensity to consume. We also nd that the marginal propensity to consume increased after the 2007-2009 nancial crisis. This study supports the hypothesis that credit constraints are more serious for lower income groups.

Keywords :

JEL classi cation : D1, D9, D14.

1 Introduction

Estimates of the marginal propensity to consume from changes in income have usually found that households are more sensitive to changes in income than is predicted by

changes for four di erent socio-economic groups. The key contribution of the paper is that it is the rst paper that compares the marginal propensity to consume of different types of British household. It will examine how the four socio-economic groups di er and whether these di erences are consistent with the hypothesis that lower socio-economic groups are more likely to be liquidity constrained, and hence more sensitive to changes in their income.

2 Literature Review

A large literature has been published on the marginal propensity to consume with many showing how household consumption responds to changes in economic resources. The Permanent Income Hypothesis, as outlined by Milton Friedman (1957), suggests only permanent and unexpected income shocks result in a major revision in consumption. This theory suggests that people use borrowing and saving to smooth income fluctuations and they should not respond to changes in income that are fully anticipated. Therefore, an estimation of the marginal propensity to consume out of anticipated income changes should yield insignificant results. For example, an anticipated promotion at work, that can result in change in income level, should not affect the marginal propensity to consume at the time it happens since the expectation of the income change is already included in the information set. Instinctively, when lagged consumption and income are included as instruments in regression a consumption decision is made based on information available at time $t-1$. Hence, the marginal propensity to consume out of predictable changes in income on the basis of past information should be statistically insignificant.

The theory also suggests that rational agents' desired consumption is determined by permanent income, while they have access to credit market; suggesting that when households face a temporary reduction in income to continue consuming as before they need to have access to debt to finance this consumption. This is important because, for example, if a group of households are excluded from the credit market, they are

likely to react strongly to anticipated changes in income.

The permanent income hypothesis has been tested and rejected over time with liquidity constraints as one of the main reason for rejecting the hypothesis. Hall et al. (1978) demonstrates that given the inclusion of lagged consumption, no other variable observed in earlier periods should have any explanatory power for current consumption. He nds households respond di erently to di erent sources of income variations and concludes that aggregate consumption should be modelled for optimal choice of a single, fully rational, and forward looking agent ie. Euler equation approach. Hall (1978) rejects the implications of the pure life cycle-permanent income; arguing households display \excess sensitivity" to predictable changes in income. His results suggest 80 percent of households follow the permanent income hypothesis, but that 20 percent of households are \rule-of-thumb" consumers who consume a xed proportion of their current income. Hall (1978) does not mention the reason for rejection of hypothesis.

Similarly Flavin (1985) tests the Permanent Income Hypothesis using US Annual Aggregate data and shows marginal propensity to consume to be di erent from zero and reports excess sensitivity for the proportion of the population subject to liquidity constraints. This could not be attributed to myopic behavior of the individual since the inclusion of unemployment rate as the proxy for liquidity constraint changes the marginal propensity to consume both in magnitude and signi cance. Without the liquidity constraint proxy, she nds the marginal propensity to consume to be 0.37.

The relationship between liquidity constraint and consumption, in the light of permanent income hypothesis, has received considerable attention from economists. It is worthwhile to look at some studies that consider evidence from individual households expenditure surveys. Runkle (1991) considered home-ownership status as measure of ease of access to borrowing. He assumes that home-owners are less constrained and show less excess sensitivity. He directly tests for liquidity constraints using panel data on individual households and nds no evidence of liquidity constraints. He suggests that the failure of the permanent-income hypothesis is due to aggregation bias. Jappelli et al (1998), exploited the Survey of Consumer Finance to estimate the probability of a household being constrained. They studied food consumption changes in response to anticipated income changes from Panel Study of Income Dynamics and found no evidence for much excess sensitivity associated with the possibility of constraints. Later, Jappelli et al. (2010) established the probability a household was denied access to credit and refused Permanent Income Hypothesis for households with lower probability of access to credit.

Shapiro and Slemrod (1995) interviewing households after announcement of tax reduction concluded that 40% of people interviewed planned to spend the extra cash. Taking the predictable nature of this transitory income increase, Souleles (2002) exploited the anticipated income increase induced by pre-announced tax refunds to test the Permanent Income Hypothesis. Given the predictable nature of this changes in income, it should thus not alter consumption in the year of its receipt, he nds that consumption is excessively sensitive to anticipated tax-cuts with a marginal propen-

sity to consume of 35% to 60%. In a similar paper, Parker (1999), using the CEX,

aggregation biases, and more importantly conceals the heterogeneity in consumption behaviour across di erent types of household. They advocate using household survey data where the income changes are traced for each family over time. Using such data allows us to capture the consumption behaviour of households with di erent household characteristics. However, there are limited number of household panel data sets available with relatively small sample size that often experience attrition and non-response. Hence, most existing studies have been conducted on using US data. The data used in our study is not a true panel. Instead, following Browning, Deaton and Irish (1985) and Attanasio and Weber (1993), we construct a Pseudo-panel. We group individuals who share the same socio-economic status into cohorts, and use the averages within these cohorts as observations in our pseudo panel.

A further criticism of this literature is the nature of proxy for the credit constraint. For example, McCarthy (1995) and Jappelli used level of wealth, Pistaferri (2012) cash-on-hand, Zeldes (1989) used asset to income ratio, and Runkle (1991) used home-ownership to classify the households as constrained or unconstrained. These commonly

The FES was discontinued in 1994. Between 1995 and 2002 it was replaced by the Expenditure and Food Survey (EFS). Although it categorized the expenditure variables in a slightly di erent way, the main change is that the survey replaced paper questionnaires with directly digitally recorded responses. It is nevertheless comparable with the earlier FES survey. This survey was renamed the Living Costs and Food Survey (LCF) in 2002 when changes were made to make it comparable to other household surveys in the rest of the European Union. This last change resulted in the some slight changes in the individual expenditure categories.

The use of FES is prompted by Attanasio and Weber (1995). They encourage the use of micro household data rather than the aggregate data commonly used in the study of household consumption and argue that the individuality of agents are better preserved in Survey data, hence, more useful when studying households' behaviour. Additionally, we combine data from the FES, the EFS and the LCF surveys. Thus it will use data from 1986 to the rst quarter of 2016. The data was combined using the 2001 consumption categories contained in the Living Cost and Food Survey (known as Classi cation of Individual Consumption by Purpose, COICOP). This allows us to construct a harmonized overall measure of total and non-durable consumption for each household that is constructed consistently between the surveys. Combining the surveys using identical de nitions of the consumption categories enables us to have thirty years of data, a considerably longer period than each individual survey covers.

The questions on income are the same across all three surveys. There are separate questions on wages, second jobs, self-employed income, non-wage income and social

transfers (e.g. bene ts). The key question we exploit in our analysis is the question `what is the normal weekly disposable income of the household?'. This formulation of the question has some advantages. While it is not necessarily the household's income in any particular week, it will be a measure of the household's normal (or expected) level of income, and thus, we claim, a good proxy for the households' permanent income. It is changes in permanent income (or normal income) which should cause changes in the level of consumption of the household (according to the Permanent Income Hypothesis), rather than unpredictable and temporary changes in current income.

The survey data used in this paper is compared to the National Account data in gure 1. The gure shows the average level of overall consumption in the three household surveys (using the left-hand scale and plotted with a solid line), and average household consumption given by the national account data (using the right-hand scale and plotted with a dashed line)[1]. The household survey data uses three di erent surveys, and the gure shows that there is a break in 1992 when the survey switched from the FES to the EFS, and a further break when the survey switched from the

similar that shown in the national account data. The major difference seems to be the sub-prime recession was longer and deeper in the national account data than in the LCF. Nevertheless, the similarities in the broad trends gives us confidence that the use of the survey data is sensible.

3.1 Constructing Pseudo-Panel

Since households are only interviewed once in the household surveys, we can not construct a true household panel. This problem can be overcome by following the approach suggested in Browning, Deaton and Irish (1985); creating a pseudo-panel with the use of cohorts from repeated cross-sections where we create groups of households with shared characteristics. In this approach, individuals sharing some common characteristic are grouped into cohorts, and the average level of consumption and income within each time period and for each cohort is constructed. Both Deaton (1985) and Attanasio and Weber (1995) used year-of-birth to define the cohorts, while Maki et al (2001) defined cohorts based on the level of education.

The key issue we investigate in our paper is the marginal rate of consumption for different groups. We will define groups which are likely to differ in the extent to which they are liquidity constrained. Kempson and Whyley (1999), looking at US data, argued that employment status and ethnicity were good determinants for whether a household is excluded from borrowing. Demirguc-Kunt and Klapper (2013) found that age and employment status are also good predictors of whether a household has access to credit markets. Unfortunately the households do not report their level

of education in each of the waves of the survey used in this study. Hence in this study we will de ne the cohorts based on the socio-economic group of each household. We construct four socio-economic groups, \Professional", \Skilled", \Unskilled", and \Unoccupied"; households with a higher socio-economics status are less likely to be liquidity constrained, and hence socio-economic groups are a good proxy for the level of nancial exclusion the household experiences.

While the pseudo-panel is not a true panel, since the same households are not used in both time periods, it nevertheless does have some advantages. The key advantage is that the sample response rate will not change over time, since, unlike a true panel, it will not su er from attrition. As a result, the results from using a pseudo-panel may well be more reliable.

We then investigate the relationship between expenditure and income. Other important factors determining consumption including real interest rates, household characteristics such as age of the household reference person, number of adults plus number of children to make up the family size are also included in the consumption function as control variables.

same trend. It is reported in column 4 and it is the highest in value at $696.00 which is about 77% of disposable income for \Professional" households. It decreases to $567.00 for \Skilled" households however, at 92% there is an increase as percentage of disposable income for \Skilled" households compared to the \Professional" households. The average weekly expenditure decreases again for \Unskilled" households $471.00, however, as the percentage of their disposable income, there is an increase to 97.5% compared to the \Skilled" households. Weekly average total expenditure is the lowest at $314.00 for the \Unoccupied" households. This socio-statistic group has the highest expenditure level as the percentage of their disposable income compared to other groups at 105.7%.

This trend persists for the expenditure on non-durable goods that is reported in column 5 of table 1. Expenditure on non-durable goods and services consists about 54.5% of households total expenditure out of disposable income. It is $489.50, 54.5% of their disposable income, for\Professional" huseholds. There is an increase in spending on non-durable goods and services as percentage of disposable income as the household socio-economic status moves from higher to lower skilled employment. Expenditure on non-durable goods and services $410.00, 66.5% of disposable income, for \Skilled" households. It is $351.80, 73.50% of disposable income, for \Unskilled" households and It is $237.45, 79.70% of disposable income, for \Unoccupied" households. This table shows that households in higher socio-economic groups consume lower percentage of their disposable income in each category of expenditure compared to those in lower socio-economic groups. This is specially important results, since by design, the

households available funds after their normal average expenditure on goods and services are deducted, determines the amount of credit entitlement for the households. Therefore, as the percentage of expenditure out of the disposable income increases, the amount of credit a household can access decreases.

3.2 Financial Crisis

We believe that the 2007-2009 recession is likely to have had an important effect on the behavior of households. Access to saving and borrowing is a necessary for households to smooth their consumption. The ability of households to obtain credit was dramatically affected by the policy changes after the financial crisis. The Credit Conditions Survey by Bank of England[2] reports a fall in the availability of secured and unsecured credit to households since mid-September 2008 with a view to further reduction in the coming months, Bank of England (2008). This financial crisis transmitted into real economy in October 2008 when the Bank of England started lowering the interest rate initially, from 5% to 4.5%, and eventually falling to 0.5% in March 2009.

Table 2 shows the time line of events happened between 2007-2009 that resulted in one of the worst global financial crisis in history. The initial warning signs came early in 2007, when three major US mortgage providers folded during the sub-prime

[2]Credit Conditions Survey is a quarterly survey released by Bank of England in which Lenders are asked about secured and unsecured lending to households, to non-financial corporations, small businesses, and to non-bank financial firms in the past three months and the coming three months. The survey is used by the Bank of England's to assess the latest developments in bank funding and household and corporate credit conditions.

mortgage crisis. The crisis later spread across Europe, including UK, causing volatility in the stock market. The UK government had to bail out faltering banks, including temporary nationalisation of the Northern Rock. The crisis deepened in the summer of 2008 when Lehman Brothers, after being refused a bailout by the US government, announced their bankruptcy. This incident caused panic amongst global bankers, leading to the Great Recession. The stock market crashed shortly afterwards. Banks become reluctant to loan and credit markets continued to tighten. Figure 2 shows how consumer credit fell sharply in 2007-2008. This slow down in credit hits the lowest in 2008.

It was thought that easy lending and mortgage default are a key reason for behind the nancial crisis, as well as the changes in interest rate. We have divided the sample into two periods, where the break point is at the end of the third quarter in 2008 as banks increasingly tightened their lending criteria. This follows Blinder (2013) who de ne the beginning of the credit crunch to be the bankruptcy of Lehman Brothers. This is the point at which the access to credit was harder and limited resulting in a reduction in credit to the household sector. This reduction in credit is likely to have a ected the ability of households to smooth consumption; in particular, an ability to borrow during and after the nancial crisis is expected to a ect the capacity of households to manage temporary income declines.

We explore the e ect of the nancial crisis on household consumption. The aim is to nd out if households' marginal propensity to consume di ers before and after the nancial crisis to see whether the crisis resulted in a change in the households'

$$\ln C_{it} = + \sum_{i=1}^{4} \ln Y_{it} + r_t + Z_{it} + \varepsilon_{it} \quad (1)$$

On the left hand side, we have change in logarithm of the consumption, $\ln C$ for group i between periods $t-1$ and t.[3] On the right had side, we have the predictors of changes in consumption growth; the measure of predictable income changes, $\ln Y$, and the real interest rate, r_t and control variables for the household characteristics Z, ε is the error term. The subscript i denotes the socio-economic groups. These cohorts are defined for "socio-economic" status of the households; "Professional", "Skilled", "Unskilled", and "Unoccupied". The regression includes the interest rate r_t and a set of controls for household characteristics Z_t. We follow Pistaferri (2001), and include time-varying components such as family size and age.

The equation 1 is estimated for total consumption and consumption of non-durable goods and services. The key variable of interest is λ indicating the marginal propensity to consume out of anticipated changes in income. The implications of the permanent income hypothesis we expect $\lambda = 0$. This in turn implies that changes in consumption are not predictable, thus delivering the well known martingale consumption result (Hall, 1978). Previous income is certainly one of most important determinants of household consumption and needs to be controlled in order to properly evaluate income change on consumption level. To overcome this problem we use the instrumental variable method of estimation to generate an unbiased estimation of

[3] Following Jensen's inequality, the arithmetic average of logarithm of reported values are calculated for expenditure and income rather than the customary logarithm of the arithmetic average.

In the rst stage anticipated changes in income is regressed on the instruments to obtain coe cients that re ect the amount of variation in income changes attributable to this set of instruments.

The rst stage coe cient is used to generate predicted value for income changes. This predicted income contains all the information set held by agents up to time t 1 that helps them make expenditure decisions. This predicted value of income changes is

set at time $t \quad 1$, $_{t \ 1}$. Examples of such information could be possibility of promotion at work or nancial literacy of the agents that are hard to capture adequately from our data set.

We tested the power and validity of the instruments; four lags of income changes and consumer con dence indicator, lagged once. The values of the F statistics is 35.93. The power of the instruments easily exceeds the conventional minimum standard of power of F = 10. In addition, Hansen's (1982) test for over-identi cation is consistent with the validity of our instruments. The J-statistic follows a chi-square distribution with 4 degrees of freedom. We fail to reject the null hypothesis that the instruments are valid.

The variables used in equation 1 are expected to capture the variation in the marginal propensity to consume for households in di erent socio-economic groups.

As well as reporting results for the full sample, we also reports results for two sub-periods; before and after the nancial crisis of 2007. This enables us to investigate whether the marginal propensity to consume changed during the nancial crisis. We anticipate that the nancial condition of household, borrowing and credit access, changed during the nancial crisis due to the changes in bank's lending policies. If households access to credit changed then it will a ect their marginal propensity to consume after the crisis. Our data includes the Financial Crisis of 2007 during which a change in borrowing criteria and tightening of the nancial conditions limited households' credit access signi cantly[4]. These changes were communicated with the public

[4]See: Financial Stability Report by the Bank of England, October 2008.

prior to implementation allowing the households to adjust consumption a few quarters before it actually occurs. As explained in section 2, we consider September 2008 as the point of expected tightening of the borrowing conditions. We then evaluate the marginal propensity to consume out of a households expected change sin income before and after the crisis.

5 Results

In this section, we report the results for the marginal propensity to consume for di er-ent socio-economic groups. We de ned as consumption all expenditure items except mortgage and rent payments. The expenditure values are in ation adjusted to the 2015 price level. The regression equation 1 included income growth instrumented by four lags of changes in income growth and lag of changes in the consumer con dence index and it is augmented by controls for a set of household characteristics including family size, age, and the real interest rate. We established the marginal propensity to consume from predicted changes in income using the full sample, and two sub-samples, before and after the nancial crisis of 2007. We ran separate regressions for total expenditure and the expenditure on non-durable goods and services.

Results for the marginal propensity to consume out of the expected changes in income are reported in table 3. Results are shown for the full sample of households in columns 1-2, as well as the sub-samples from before the nancial crisis in columns 3-

households have di erent levels of marginal propensity to consume depending on the households' socio-economic status.

Results for the change in total consumption for the full sample is reported in column 1. Results show that the marginal propensity to consume (MPC) out of expected changes in income is not statistically signi cant for the professional (socio-economic group 1) and the skilled (socio-economic group 2). The MPC is is 0.94 for unskilled households (socio-economic group 3), and statistically signi cant at 1%. The MPC for unoccupied (socio-economic group 4) is 0.75 and signi cant at 5%. The results also indicate an increase in the MPC out of expected changes in income for total household consumption as the socio-economic status increases; apart from the unusually high coe cient for the unskilled (socio-economic group 3). The existing literature, (See: Flavin, 1984 and Campbell et al, 1989), reports the MPC between 0.3 and 0.7. While our results for the professional and skilled households (socio-economic groups 1 and 2) at 0.53 and 0.59 are similar to the existing literature, the MPC seems to be much higher for unskilled and unoccupied households at 0.94 and 0.75 respectively.

The second column in table 3 reports the marginal propensity to consume (MPC) of non-durable goods and services out of expected changes in income for households in di erent socio-economic groups. Results are signi cant for all four categorise of households with the lowest MPC of 0.47 for the professional Households (socio-economic group 1). With the exception of the skilled households (socio-economic group 2) with MPC of 0.93, MPC gradually increases to 0.65 for unskilled and 0.80 for unoccupied

households. Coe cients are statistically signi cantly di erent from each other.

These results indicates that households with di erent socio-economic rstly alter their expenditure when permanent income changes, secondly the degree at which they alter the expenditure is di erent in households with di erent socio-economic groups. These results are consistent with our belief that socio-economic status is a good proxy for households access to credit.

5.1 Financial Crisis

To explore the e ect of the nancial crisis, we divided our data into two sub-samples; the period up to 2008, and the period after 2008. If the nancial crisis reduced the availability of credit to the household sector, then we would expect the marginal propensity to consume from predicted changes in income to increase after the crisis. Moreover, it is likely that the change is not the same for households in di erent socio-economic groups.

Results for changes in total consumption prior to the nancial crisis is reported

propensity to consume compared to those in higher socio-economic groups. socio - economic level of household is a good proxy for households' access to credit.

Estimates of the marginal propensity to consume for total consumption after the nancial crisis is reported in column 5. With the exception of the professional households in socio-economic group 1, the trend of increasing magnitude persists. However, the coe cients are di erent from those prior to the nancial crisis shown in column 3, both in magnitude and statistical signi cance. It is interesting results for professional households in socio-economic group 1 since the marginal propensity to consume has changed from 0.4 and statistically insigni cant prior to the nancial crisis to signi cant at 1% after the nancial crisis of 2007. However, the coe cient is not signi cantly di erent from 1. The coe cient for households in group 2 and group 3 are not statistically signi cant. However, surprisingly, the marginal propensity to consume out of predicted changes in income on non-durable goods and services for unskilled households in socio-economic group 3 show signi cant decrease after the nancial crisis. It is 0.54 and not statistically signi cant after the nancial crisis compared to the marginal propensity to consume for the same group of households prior to the nancial crisis of 2007 that was 0.93 and signi cant at 5%.

Marginal propensity to consume(MPC) out of predicted changes in income for non-durable goods and services after the nancial crisis of 2007 is reported in Column 6, table 3. With the exception of unskilled households in socio-economic group 3, the marginal propensity to consume for non-durables follows the same trend as the total consumption. The marginal propensity to consume for the the professional households

in socio-economic group 1 has signi cantly increased to to proximately one after the nancial crisis of 2007, same result is indicated for unoccupied households in socio-economic group 4. The results do not show the same increase across the households from higher to lower groups, however, the marginal propensity to consume is statistically di erent from each other for households in di erent socio-economic groups.

6 Conclusion

A basic assumption of the permanent income hypothesis is that individuals have free access to the credit market, lending and borrowing at the same rate enabling households to smooth consumption as the current income level changes. According to the permanent income hypothesis predictable changes in permanent income should not alter consumption level; the coe cient, , should be approximately zero.

Overall results show that for most part professional and skilled households, indicate lower marginal propensity to consume compared to unskilled and unoccupied. While Hall (1978) states around 80% of the households plan their expenditure following the permanent income hypothesis, our results suggest this percentage to be around 50%, when investigating total expenditure. Results for the full sample expenditure on non-durable goods and services also rejects the permanent income hypothesis, indicating the marginal propensity to consume of more than zero and signi cant for all four socio-economic groups. Our ndings are consistent with those of Flavin (1993), who is using unemployment as a proxy for liquidity constraints.

The financial crisis had a significant effect on the households' expenditure behaviour. Prior to the 2007 financial crisis, the results suggest that around half of households were following the permanent income hypothesis. However, the results after financial crisis shows only professional households that is a quarter of households follow the permanent income hypothesis.

Results for the consumption of non-durable goods and services is even more interesting as it indicates the same drop in the percentage of households following the

the idea that professional households, who are least likely to be credit-constrained, are more likely to follow Permanent Income Hypothesis. It also con rms that households with lower socio-economic status have higher marginal propensity to consume. The evidence presented by this paper when using household data adds further support to earlier studies in the rejection of the Permanent Income Hypothesis. Firstly, our ndings show that households react to anticipated changes in income by altering their consumption. Secondly, and more interestingly, the marginal propensity to consume out of anticipated changes in income is signi cantly lower for households in upper socio-economic status. This gradually falls when moving from upper socio- economic groups to lower socio- economic groups.

This alteration in consumption is even more signi cant during and after a nancial crisis, with tightening of credit by banks as one possible explanation. This resulted

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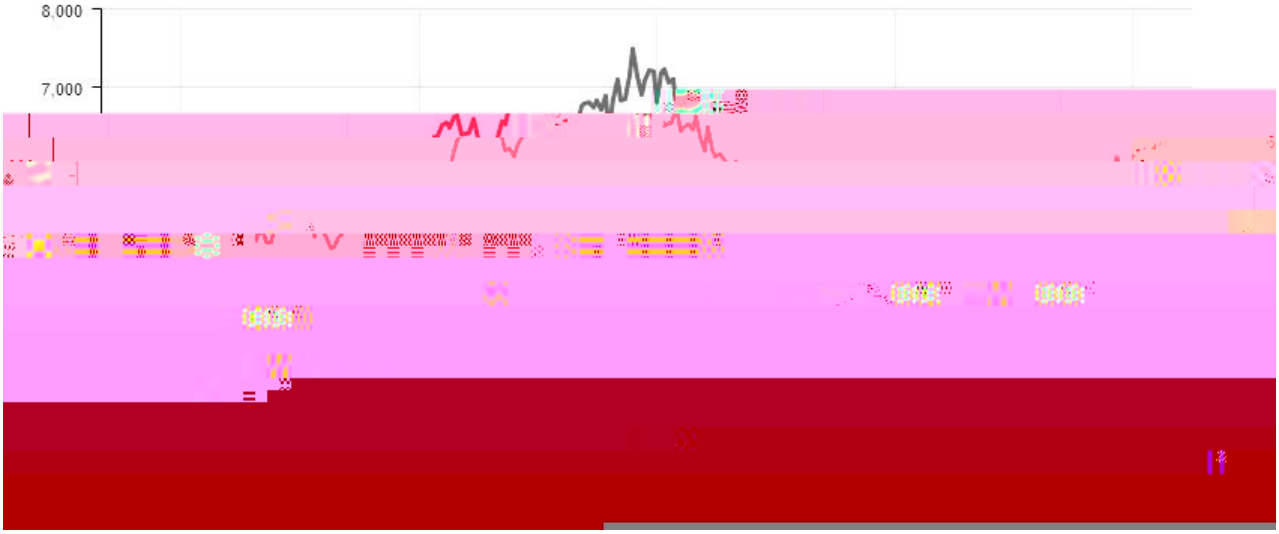
Figure 1: Households' Average Total Expenditure in the FES and National Accounts

Notes: This gure plots the households' average expenditure in the Household Survey and National Accounts. The continuous black line representing the Household Survey data is our own calculation using UK household expenditure survey data from rst quarter 1996 to rst quarter 2016 for survey based line. The dashed gray line represents the National Accounts is from ONS for National Accounts data. The left axis is the households' average annual expenditure calculated using the Family Expenditure Survey. The right axis is the households' average annual expenditure from National Account data.

Figure 2: UK Consumer Credit



Notes: Changes of total (excluding the Student Loans Company) sterling gross consumer credit lending to individuals (in sterling millions) seasonally adjusted. Source: Bank Of England.

Table 1: Summary Statistics, tab:tab1, updated 04/06/19

Socio-economic Group	Observations	Disposable Income	Total Consumption	Non-durables Consumption
Professional	40,107	905.00	696.00 (77%)	489.50 (54%)
Skilled	34,378	590.00	567.00 (96%)	410.00 (69%)
Unskilled	37,879	524.50	471.00 (90%)	351.80 (67%)
Unoccupied	31,218	310.43	314.00 (101%)	237.45 (76%)

Notes: Source: Own calculation using UK household expenditure survey data from rst quarter 1996 to rst quarter 2016. All values are in British Pounds. Prices are de ated using the BOE price index for year 2015 to convert nominal prices to current prices. Expenditure as percentage of disposable income in parentheses.

Table 2: Economic and Financial Events 2007-2009

2007	Jan	Sub-prime downgrade (US)	Ownit Mortgage Solutions Inc., American Freedom Mortgage, Inc., Mortgage Lenders Network USA Inc. folded.
	Feb	HSBC warning (US)	The bad debt provisions for 2006 to be 20% higher than expected to roughly $10 :5 bn.
	Mar	Sub-prime collapse	Sub-prime lenders declared bankruptcy, including Accredited Home Lenders Hldg, New Century Fin., DR Horton & Countrywide Fin.
	Aug	UK stock market volatility (UK)	Banks begin to stop lending to each other due to market fears.
	Sep	Northern Rock crisis (UK)	Northern Rock sought emergency funding from the BOE, rst run on a bank for more than a century.
2008	Feb	Nationalized Northern Rock (UK)	Struggling Northern Rock is to be nationalized for a temporary period.
	Mar	Bear Stearns Bailout (US)	The rm was bought out by JP Morgan
	Sep	Lehman Brothers Bankruptcy (US)	Government protection for Lehman's $60 bn in uncertain mortgage assets was rejected.
		Nationolized Fortis (EU)	European banking and insurance giant was partly nationalized to ensure its survival.
		Bradford Bingley (UK)	The government takes control its $50 bn of mortgages and loans. Savings operations and branches are sold to Spain's Santander.
		HBOS crisis (UK)	It had to be rescued by Lloyds TSB after a huge drop in its share price.
		Washington Mutual and Wachovia (US)	Two more American banks collapsed.
		Irish banking crisis	

Table 3: Regression Results

	Full Sample		Year<=2008 Q3		Year>2008 Q3	
VARIABLES	c_{it}	c_{it}^{nd}	c_{it}	c_{it}^{nd}	c_{it}	c_{it}^{nd}
ln Y_{1t}	0.537	0.466*	0.401	0.348	1.892***	1.454**
	(0.345)	(0.270)	(0.380)	(0.277)	(0.581)	(0.630)
ln Y_{2t}	0.594	0.975***	0.638	0.952*	0.261	0.762*
	(0.570)	(0.369)	(0.764)	(0.516)	(0.627)	(0.414)
ln Y_{3t}	0.942***	0.651**	0.931**	0.729**	0.541	0.269