Online complement C1 – Models for consumption and housing prices in France

Consumption function

In the mid-1990s, many papers were written on French household consumption behaviour. The traditional Keynesian consumption function conditioned consumption on income and inflation, so as to capture the real money balance effects: when inflation is higher, households need to save more if they have an objective in terms of purchasing power of wealth. This Keynesian consumption function fitted French data fairly well before about 1990, supported by the fact that most households held regulated savings accounts at that time in France: current accounts and savings accounts had accounted for 63% of households total assets at the end of 1977 when the pension system was nearly 100% pay as you go, as it is still today. As state pension rights are difficult to evaluate, they are never taken into account, although they are not negligible. The median pension rights amounted to 149 300 euros whereas the median financial wealth amounted to 32,610 euros in 2004 (Buffard & Girardot, 2010). Pension rights are much less unequally distributed than financial wealth.

Ostry and Levy (1995) used the Campbell forward looking model of "saving for a rainy day", augmented by the volatility of income, to test the permanent income hypothesis and found it was still accepted by French data. Cadiou (1995) and Ostry and Levy (1995) find an increase in the impact of the interest rates on consumption following the financial deregulation after 1984. Bonnet and Dubois (1995) do not find any stable wealth effects but do find a significant impact of the change in unemployment rate, as does Cadiou (1995). Finally, a number of these papers and Sicsic and Villetelle (1995) test the impact of financial deregulation measured as the change in the ratio of consumer credit to disposable income over 1986-1990 and find it significant. Sicsic and Villetelle (1995) especially show that a simple model with financial deregulation performs as well as other models with the change in unemployment for example. Although the change in the ratio of consumer credit over income was the best indicator for the impact of financial deregulation at that time, it is not satisfactory because the endogeneity of consumer credits is not correctly treated.

For more recent evidence, consumption functions are published in the papers presenting the three macro-econometric models that are currently used by French institutions to forecast or analyse economic evolutions. In the Banque de France model (Baghli *et al.*, 2003), the consumption function is estimated over a long time span and is very close to that of Sicsic and Villetelle (1995), the long term saving rate depends on an indicator of deregulation and real money balance effects. In the OFCE model (Chauvin *et al*., 2002), the saving rate depends on an indicator of deregulation and change in real income growth. The model of Insee and the Ministry of finance (Bardaji *et al.*, 2017) is very similar. It also includes the effect of the change in unemployment rate, in short term interest rate and car-scrapping schemes.

Wealth effects

Empirical work on wealth effects in France came after the first previously cited strand of literature. They are not incorporated in macro-econometric models on the grounds that they suffer from unstable coefficients, and were not seen as major determinants of consumption in France. They have been estimated on macro-data, because there was no common survey of micro-data on household consumption, income and wealth, until recently. The estimates for the long-term impact are presented in table 1. The various methodologies used across studies, as well as the sample chosen, may impact the results and are pointed out below.

Many papers estimated wealth effects for France in a context of international comparison by estimating a consumption function for each country separately, without taking into account the cross-country dispersion, which differs from intertemporal one. To our knowledge, Boone *et al.* (2001) were among the first ones. However, they estimated the co-integration vector between consumption, wealth and

income without taking into account the potential endogeneity of the variables, which was also the case of Fraisse (2004). Bertaut (2002), Beffy and Monfort (2003), IMF (2004), Catte *et al.* (2004), Slacalek (2009) and Aviat *et al.* (2007) took this problem into account by using dynamic ordinary least squares (DOLS). Barrell and Davis (2007) and Byrne and Davis (2003) used unrestricted Error Correction Models (ECM) estimated via non-linear least squares.

Table C1-1
Long-term impact of wealth on consumption in France

	Sample	MPC (as a percentage)			Elasticity (as a percentage)		
		Total	Financial	Housing	Total	Financial	Housing
Arrondel *et al.* (2014)		0.5	0*	0.7	2.9	0	2.1
De Bonis & Silvestrini (2012)			1.4			3.0	*
Chauvin & Damette (2010)	1987Q1-2008Q4	1.0	4.0	2.0	10.0	10.0	6.0
Aviat *et al*. (2007)	1985Q1-2006Q1	0.4			2.3		
Barrell & Davis (2007)	1980Q1-2001Q4	3.1			17.8		
Barrell & Davis (2007)	1980Q1-2001Q4	3.6			20.8		
Slacalek (2009)	1970Q2-2003Q2	3.2	2.6	2.0*	18.5	5.5	7.3
Slacalek (2009)	1970Q2-2003Q2	4.6*	2.9	2.3*	26.6	6.1	8.4
Catte *et al*. (2004)	1979Q2-2002Q1		1.4	0.0		3.0	0.0
IMF country report (2004)	1982Q1-2003Q4		2.5	0.5		5.3	1.9
Fraisse (2004)	1971Q4-2003Q2	1.6			9.2		
Beffy and Monfort (2003)	1978Q1-2000Q4	2.5			14.0		
Byrne and Davis (2003)	1972Q2-1998Q4		3*			16.3	
Bertaut (2002)	1978Q1-1998Q4		4.7			10.0	
Boone *et al*. (2001)	1970Q1-1996Q2	2.5	6.8	4.2	12.3	12.0	13.1

Notes: According to Aviat *et al.* (2007), an increase in wealth by 100% implies an increase in consumption by 2.4%. Taking into account the average ratio of wealth over consumption during 1995-2005, this means that an increase by 1 euro of financial wealth induces an increase by 0.4 cent in annual consumption. Estimation results directly computed by the authors are in bold. The other results are derived, using elasticity = (MPC) x (wealth to consumption ratio). * indicates that estimates are *not* significant.
Sources: Cited papers.

In most cases, authors used total consumption and total disposable income, the exceptions being IMF (2004) which used non-durable consumption; Aviat *et al*. (2007) and IMF (2004) used non-property income, and Slacalek (2009) and Catte *et al.* (2004) used labour income (respectively before or after tax). Authors estimated either marginal propensity to consume or elasticities, or semi-elasticities for Boone *et al.* (2001). Estimation in elasticities might be mis-specificied if the sum of the elasticities to income and to wealth is not equal to 1. The condition was usually imposed, but not in Bertaut (2002). Barrell and Davis (2007) used dummy variables to account for the impact of financial liberalisation. However, if they did consider the increasing outstanding amount of credit in the second half of the eighties, they did not take into account the reversal that came in 1991-1992, when banks restricted housing credits when bad loans increased too much. Byrne and Davis also test the impact of illiquid versus liquid wealth (elasticity of 2.5 %, significantly different from 0, for illiquid wealth and 2.6 %, not significantly different from 0, for liquid wealth). All these studies estimated only the impact of a permanent change in wealth on consumption. Most authors found a significant impact of wealth on consumption in France, albeit smaller than in the United States. The lack of robustness of the results is highlighted in Bertaut (2002) and Byrne and Davis (2003). Omitting the difference in assets and the impact of financial deregulation was certainly one reason for this, as shown by the present paper.

Using the French Wealth Survey and the Household Budget Survey, Arrondel *et al.* (2014) report relatively low MPCs for financial wealth but find large disparities between households. Taking into account these disparities, the average MPC of the households for financial wealth would be around 2 cents per euro (as in the estimate by Chauvin and Muellbauer). The MPCs indeed range from 0 for the almost wealthiest (percentiles 90 to 99 in net wealth), whose illiquid assets represent up to 78% of their financial wealth, to 11 cents per euro for the less wealthy (under median net wealth), whose liquid assets

represent over 60% of their financial wealth. This indeed suggests differentiating the effects of liquid from illiquid financial assets because they differ in terms of nature but also in terms of ownership.

The MPC for housing wealth proves to be less heterogeneous between households, ranging from 0.007 to 0.011 for homeowners on microdata. This effect is a pure wealth effect for home owners. Micro data cannot account directly for the impact on non-owners of an increase in house price, as in macro estimates. This may take the form of a need to build a larger down payment in order to buy housing, so that an increase in house price may actually decrease consumption for this category of people. One hint at the micro level is that, independent of their position in the income distribution, young households (i.e. households whose head is up to 34 years old) are more likely renters compared to older households (Fatica & Prammer, 2017).

Housing prices

Information showing the complexity of the French housing market is available in Friggit (2018). Indeed, modelling French housing prices has been a daunting task recently. Bessone *et al.* (2005) and Antipa and Lecat (2013) use, among others, a structural approach broadly comparable to that used in this paper. House prices are explained by housing stock in volume, a proxy for households' income and user cost, and in addition by population or number of households in Antipa and Lecat. Antipa and Lecat find a break in 2002 in the co-integrating vector, which may be due, according to them, to financial changes and housing policies. In particular, the birth of the euro changed competition rules in the financing sector. In France, the duration of housing loans increased significantly, from 11.8 years in 1989 to 14.3 years in 1999 and 20 years in 2008 according of the Observatory of real estate and Banque de France. When they introduce the borrowing capacity of households in the co-integrating vector, the break in 2002 does not disappear but housing prices appear to be much nearer their equilibrium level in 2011. Both papers highlight the fragility of the results, because of measurement problems and omitted variables. More recently, Avouyi-Dovi *et al.* (2017) cannot fully account for the recent evolution of French house prices, even by taking into account potential instability.

Table C1-2
Long-term elasticities of different variables on house prices

	Bessone *et al.* (2005)	Antipa & Lecat (2013)	Antipa & Lecat (2013)	Antipa & Lecat (2013)	Antipa & Lecat (2013)	Antipa & Lecat (2013)
Sample	1986-2005	1992-2002	1992-2002[(a)]	1992-2002	1992-2002	1992-2002
Housing stock	-3.57	-5.04	-4.98	-7.51	-6.30	
Households' income[(b)]	8.26	1.02	1.68	1.24		
Borrowing capacity[(c)]					1.14	1.12
User cost	-0.07	-0.71	-0.45	-0.52		
Population		17.86	15.1		21.59	
Number of households				10.51		13.64

(a) User cost takes into account the anticipation of downturn, revealed by the stock of unsold new houses.
(b) The proxy for household income is consumption of non-durables for Bessone *et al*. (2005).
(c) Borrowing capacity is the maximum amount households can borrow, knowing that the housing debt service cannot exceed one third of the income in France and taking into account the duration of the loans actually observed.
Sources: Cited papers.

Online complement C2 – Estimates for the credit conditions indices

There are no available data to measure credit conditions directly in France before 2003. This paper adopts a "latent variable approach", where credit conditions indicators for housing and non-housing loans are proxied by spline functions guided by institutional information on credit market liberalization. Ogive (or smooth transition) dummies (OD) take the values 0.05, 0.15, 0.3, 0.5, 0.7, 0.85, 0.95, 1 over an 8-quarter interval beginning in the first quarter of year i.

Table C2-1
Estimates for the consumer credit conditions index

Sample	**1981Q2-2016Q4**		**1981Q2-2008Q3**	
	coefficient	t-ratio	coefficient	t-ratio
Variables				
OD1981	0.47	4.9	0.44	5.0
OD1982	-0.20	-3.4	-0.17	-3.3
OD1983	0.14	2.8	0.12	2.6
OD1987	0.39	5.5	0.35	5.6
OD1989	0.27	5.7	0.29	5.9
OD2013	-0.11	-3.8	-	-
Annual inflation$_{t-1}$	-3.03	-18.4	-2.99	-18.0
Inflation acceleration (4-quarter moving average)$_{t-1}$	-19.0	-3.3	-16.8	-3.2

Notes: The coefficient estimate for the Ogive Dummy starting in 1981Q1 is 0.47 over the sample 1981Q1-2016Q4, 0.44 over the sample 1981Q1-2008Q3. All coefficients are significant at the 1% level. The estimates are based on maximum likelihood estimation of the 6-equation system in TSP (Time Series Processor) 5.1.
Sources: Insee; authors' calculations.

Table C2-2
Estimates for the mortgage credit conditions index

Sample	1981Q2-2016Q4		1981Q2-2008Q3	
	coefficient	t-ratio	coefficient	t-ratio
Variables				
D_1981	-0.11	-4.1	-0.13	-4.0
D_1984	0.10	6.0	0.11	5.5
D_1986	0.25	19.0	0.25	14.3
D_1991	-0.02	-1.6	-0.03	-1.5
D_1993	-0.10	-4.9	-0.10	-4.5
D_1994	-0.16	-5.6	-0.15	-4.7
D_1999	0.22	13.3	0.20	10.7
D_2001	0.04	3.3	0.04	3.1
D_2003	0.16	9.1	0.13	5.7
D_2006	0.04	1.9	0.05	2.1
D_2011	-0.05	-3.3	-	-
D_2013	-0.09	-7.1	-	-
D_2016	0.05	1.5	-	-

Notes: The coefficient estimate for the Ogive Dummy starting in 1981Q1 is -0.11 over the sample 1981Q1-2016Q4, -0.13 over the sample 1981Q1-2008Q3. All coefficients are significant at the 1% level, except those for 1991, 2006 and 2016. The estimates are based on maximum likelihood estimation of the 6-equation system in TSP (Time Series Processor) 5.1.
Sources: Insee; authors' calculations

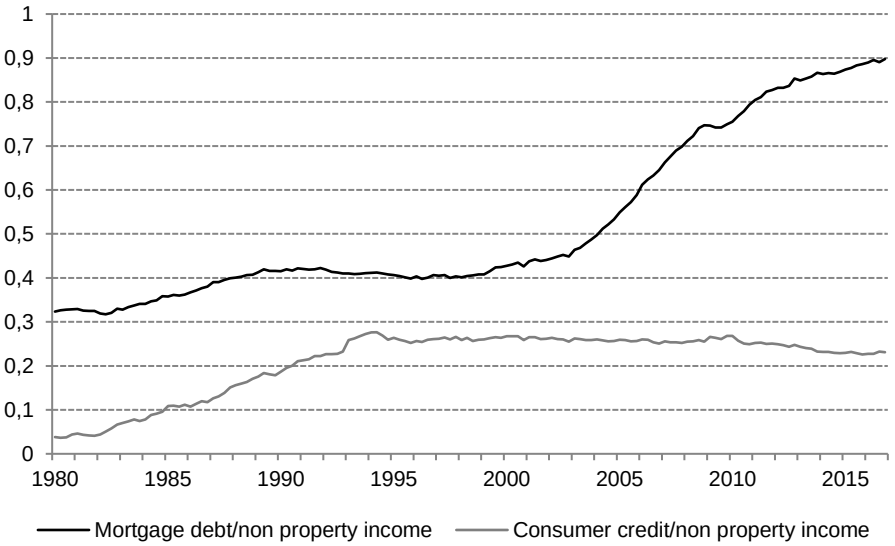
Online complement C3 – Financial innovation and its impact on consumer and housing loans in France

In the aftermath of the World War II in France, loans were mostly allocated to productive investment and housing because of the reconstruction effort. Thus, consumer credit was probably even more rationed than housing loans in this post-war phase of credit controls. Financial innovation arrived in two steps in France, from 1984 on and at the end of the 1990s (see Box).

In the mid-1980s, the French financial system changed from a very strict monitoring of new loans by the government to a free determination by banks of the loans they provide (Melitz, 1990; Icard & Drumetz, 1994). At the same time, non-financial firms were allowed to finance themselves directly on stock and bond markets. Thus, at the end of the deregulation process in 1987, banks had more resources to be dedicated to households, whether as consumer or housing loans. Deregulation also impacted the way interest rates for consumer and housing loans were settled, as loans to households were mostly granted by institutions that were under the control of the government or via loans that were subject to a contract with the State (so-called "*prêts conventionnés*"). In this paper, this is taken into account in the interest rates in housing and consumer loans.

During this first step of financial deregulation, the ratio of the stock of consumer credit over income doubled from 7% in 1983 to 14% in 1987, admittedly from a low level, and never returned to its pre-deregulation level. In percentage rates of growth, the stock of housing loans grew more slowly than consumer credit in the 1980s. Since consumer credits have far shorter average durations than housing loans, rapid growth in new consumer credits translates into rapid growth in the stock (figure C3-1).

Figure C3-1
Ratios of housing loans and consumer credit to annualised non-property income



Sources: Banque de France; Insee.

The second step of financial innovation occurred in the late 1990s through a change in securitisation. The legal framework for securitisation was introduced in France by Act 88-1201 of 23 December 1988 that created the FCC (*fonds communs de créances* – a French equivalent to US 'special purpose vehicles'). However, it was modernised by the Order of 13 June 2008 which extended its purpose and legal forms (Birouk & Cassan, 2012). The new legal framework diversified the types of assets eligible for securitisation from bank loans only to trade receivables, insurance risks, debt securities, etc. It also broadened the scope of the eligible securitisation techniques (replenishment of vehicles, broader credit enhancement methods, active management of portfolios and resale of acquired assets) and the types of

securities that securitisation vehicles can issue (in addition to units in FCCs – which are due to be phased out, units in securitisation funds, short-term debt securities such as commercial paper or other short-term securities, etc.). From the end of 2009 to June 2012, the stock of residential mortgage backed securities (RMBS) increased by 18.4 billion euros (i.e. 1.4% of households' disposable income). Over the same period, the stock of securitised consumer loans decreased by 12.4 billion euros.

Box – Timetable for financial deregulation (ECB, 2009)

1982: Liquid saving accounts benefitting from tax rebates can be opened in any bank.
1984: Bank specialisation requirements reduced.
1987: Elimination of credit controls.
1999: Reform of securitisation of housing loans.
1999: Reduced early repayment fees for housing loans.
2008: Modernised framework for securitisation

Online complement C4 – The housing market in France

In France in 2010, owner-occupiers represent 55 % of households, which is close to the euro area where they represent 60%, between Germany where they represent only 44 % of the population and Spain or Italy where they represent respectively 83 % and 69 % (Arrondel *et al*., 2016).

Housing loans are largely fixed rate loans and the self-discipline of banks to approve housing loans is tight in France. The average debt-service ratio, the monthly repayments on loans (interest payments + capital reimbursement) relative to current income reached its peak, 32%, in 2009. The proportion of debt-service ratios in excess of 35% reached a peak of around 29% in 2008-10, but has hovered around 22-23% since 2013, despite lower nominal interest rates. The upward trend from the late 1990s, and partial reversal, in both measures is likely to have been related to the increase in the average duration of housing loans from 13 years in 1999 to 17.4 years in 2005, and 20 years in 2008, dropping back a little thereafter.

Fatica and Prammer (2017) show that the income gradient of ownership is very steep both in Germany and France, where high-income households are three times more likely to own their residence than households in the first income quintile. Independent of their position in the income distribution, young households (i.e. households whose head is up to 34 years old) are more likely to be renters compared to older households. This arguably reflects both the typical hump-shape of age-income profiles and the fact that down-payment requirements reduce housing affordability for people at the initial stages of wealth accumulation.

The average loan to value ratio for new housing loans since 2001 has averaged at around 80% at the lower end of the range in the euro area. Around half of loans have been at 85% or above and about one third at 95% or above in this period. These high values are likely to be related to the fact that separate financial guarantees and insurances cover the majority of mortgages, enhancing the ability of the bank to recover its losses from the borrower (Avouyi *et al*., 2014).

Early repayments and renegotiation were very rare before 2000 because of fees due by owners when renegotiating their loans with their bank, by law. As noted above, the fees were cut in 1999. Finally, equity release is forbidden and housing is hardly ever used as a guarantee for consumer credit. Thus, housing prices affect loans essentially through purchases of housing rather than through refinancing existing homes. More information on the French mortgage market can be found in Laferrère and Le Blanc (2012).

Online complement C5 – Equations for consumer credit and liquid assets

Consumer credit

The stock of consumer credit would be expected to have similar drivers to those for consumption, and interest rate effects would be expected, given controls for increased credit supply. We propose the following long-run formulation for the log of consumer debt:

$$\ln(cdebt_t/y_t) = u_{0t} + u_{1t}\ln ncr_t + u_{2t}rcr_t + u_{3t}E_t\ln\left(\frac{y_t^p}{y_t}\right) + u_{4t}\ln(hp_{t-1}/y_{t-1}) + u_5 demog_t + u_6(long-run\ solution\ for\ \ln c/y).$$

Here, the intercept is time-varying and increases with *CRCCI*, the credit conditions indicator applying to consumer credit. The nominal interest rate on consumer credit, *ncr* and/or the real rate rcr_t is expected to have a negative sign and could have coefficients time-varying with *CRCCI*. Income growth expectations are included. A potentially important reason for unsecured borrowing is to supplement mortgage borrowing. Thus, one would expect the house price to income ratio to have a similar effect on unsecured borrowing as on mortgage borrowing.

Since a major reason for consumer credit is to finance consumption, especially of durables, the long-run solution from the consumption function in equation (2) is included. The parameter u_6 should be expected to be at least 1.

The estimated long-run solution shown in Table C5-1. The speed of adjustment of 0.24, is far higher than for mortgages, as befits short duration loans. The effect of consumer credit conditions is normalised and the quantitative effect is large. The real interest rate for consumer loans has a significant negative effect but the nominal rate does not and nor does permanent/current income. Demography again matters for the long-run solution, with a negative coefficient for the proportion of adults over retirement age. The effect is calibrated at -2.5, close to the freely estimated value. This implies that the level of consumer debt for this age group is around one third of that of remaining adults, which is consistent with cross-section data. The long-run solution from the consumption function is calibrated to have a coefficient of 1 in the consumer credit equation. Freely estimated, the coefficient is around 1.2 with a standard error of 0.7, so that the plausible value of 1 is statistically acceptable. Other coefficients in the system are hardly affected by the calibration.

In the short-run dynamics, the annual change in the unemployment rate has a significant positive effect, paralleling results for Germany in Geiger *et al.* (2016). In other words, consumer debt appears to be used to help consumers maintain spending during periods of higher unemployment. An impulse dummy is also included for 1985Q1, and for 1993Q1, the latter possibly connected with short-term shocks associated with the ERM crisis of late 1992.

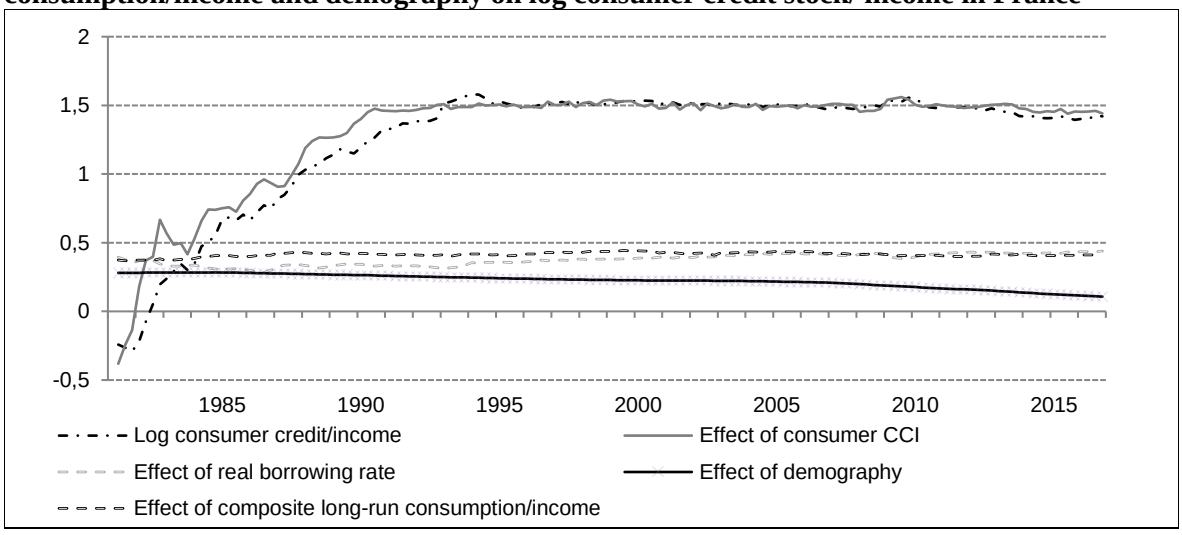
The decompositions of the long-run solutions into the different components shown in Figures C5-1 reveal the dominant effect of the consumer credit conditions index, particularly in the 1980s and 90s. Omitting the credit conditions index for consumer credit has drastic consequences for the consumer credit equation. The speed of adjustment collapses from 0.24 to 0.06, the fit deteriorates sharply and the long-run solution makes little economic sense, with a positive effect for the interest rate. It is incontrovertible that there was a significant consumer credit liberalisation in the 1980s, which needs to be taken into account in modelling the stock of non-housing consumer credit.

Table C5-1
Estimates of the long-run solution for the consumer credit stock equation for France

Dependent Variable = $\Delta \ln cdebt_t$	Symbol	1981Q2-2016Q4		1981Q2-2008Q3		1981Q2-2016Q4 Excluding *CRCCI*	
		coefficient	t-ratio	coefficient	t-ratio	coefficient	t-ratio
Speed of adjustment	μ	0.24	9.9	0.26	10.2	0.06	5.5
Long-run coefficients for log (real cdebt/y)							
Constant	u_0	-1.74	-14.0	-1.70	-13.6	-0.62	-4.9
Credit conditions index: *CRCCI*	u_{0c}	1	-	1	-	0	-
Real interest rate for consumer credit	u_1	-1.2	-4.8	-1.3	-4.2	0.2	0.2
Composite wealth and house price effect from consumption equation	u_6	1	-	1	-	1	-
Post-retirement adults/total adults	u_5	-2.5	-	-2.5	-	-2.5	-
Diagnostics							
Equation standard error		0.0167		0.0175		0.0243	
DW		1.84		1.84		1.88	
R-squared		0.786		0.792		0.545	

Note: All coefficients are significant at the 1% level except when omitting the credit conditions index. Maximum likelihood estimation of the 6-equation system in TSP (Time Series Processor) 5.1. Equation standard errors are RMSEs of the residuals
Sources: Banque de France; Insee; authors' calculations.

Figure C5-1
Long-run effects of consumer credit conditions, interest rates, composite long-run log consumption/income and demography on log consumer credit stock/ income in France



Sources: Banque de France; Insee; authors' calculations.

Liquid assets

There is an extensive literature on the demand for money, including household demand for broad money, i.e. liquid assets. The literature discusses three aspects of the demand for broad money. The first is the transactions demand and hence the need for a scale variable such as income. The second focuses on portfolio influences introducing other wealth components and opportunity costs. The third is a buffer stock view of money, introducing uncertainty and a precautionary motive. Since unsecured debt can also serve a buffer stock role in maintaining consumption under temporary declines in income,

one would expect increased access to unsecured credit to *reduce* the demand for liquid assets. However, higher real returns on liquid assets should increase demand for them. Recent inflation and losses in illiquid financial assets should lead households to wish to save more in liquid form. Further, as one motive for saving in the form of liquid assets is to build up a deposit for an envisaged housing down-payment, house price developments can be expected to have the reverse of the implications for this component of liquid assets as for mortgage demand: higher house prices relative to income should increase demand for liquid assets, but mortgage credit liberalization should offset this.

In the equation below, s_{0t} is the time-varying intercept, expected to decline as access to credit increases. Since money market funds have once been popular with French households thanks to a specific tax policy, an average of the real interest rate on regulated deposits and the money market rate is included. The following four terms are the potentially time-varying impacts of the log ratio of permanent to current income and the log house price to income ratio, demography, and the log illiquid financial asset to income ratio.

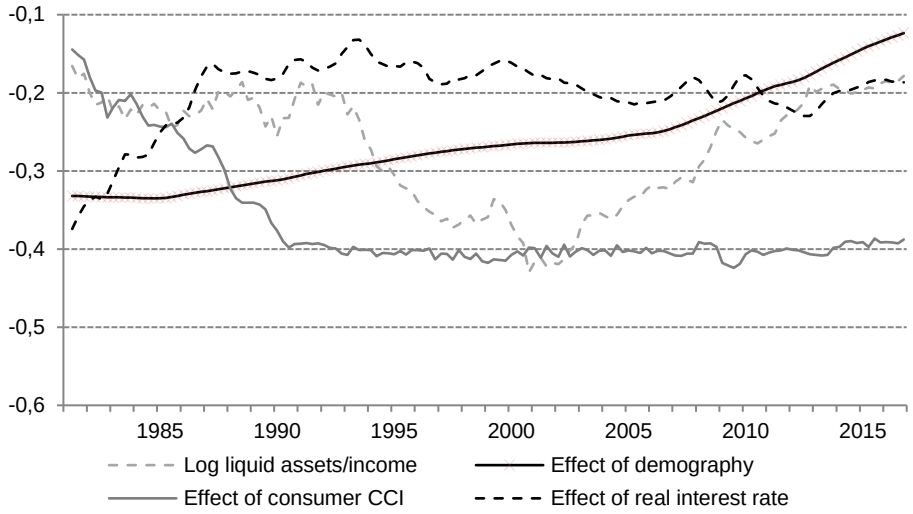
$$\ln(LA_t/y_t) = s_{0t} + s_1\, rdepr_{t-1} + s_{3t}E_t \ln\left(\frac{y_t^p}{y_t}\right) + s_{4t}\ln(hp_{t-1}/y_{t-1}) + s_5 demog_t + s_6\ln(IFA_{t-1}/y_t)$$

Empirically, the negative effect of increased access to consumer credit, which limits the demand for liquid assets as a buffer stock, is offset by the positive effect of higher real returns on liquid assets (Figure C5-2a). The coefficient on log permanent/ current income is not significant, though negative. Liquid assets indeed rise with house prices, but rise less when mortgage credit conditions ease. This might be an evidence for the need to build up a down-payment for housing purchase. The demographic specification for the long-run solution reverses that for consumer debt: adults over the retirement age tend to hold far higher levels of liquid assets than do younger adults. The coefficient is calibrated at 3, slightly below the freely estimated value. The negative effect of illiquid financial asset accumulation on liquid assets might reflect the rise in long term insurance policies in household portfolios, partly due to fiscal incentives, indirectly a kind of substitution effect (Figure C5-2b). The coefficients are remarkably stable for the sample ending in 2008Q3.

Short run dynamics include the lagged rate of change of liquid assets and the two-quarter change in log real per capita income. This suggests that a temporary fall in income is met by running down liquid assets to buffer consumption. This parallels a similar finding for Germany.

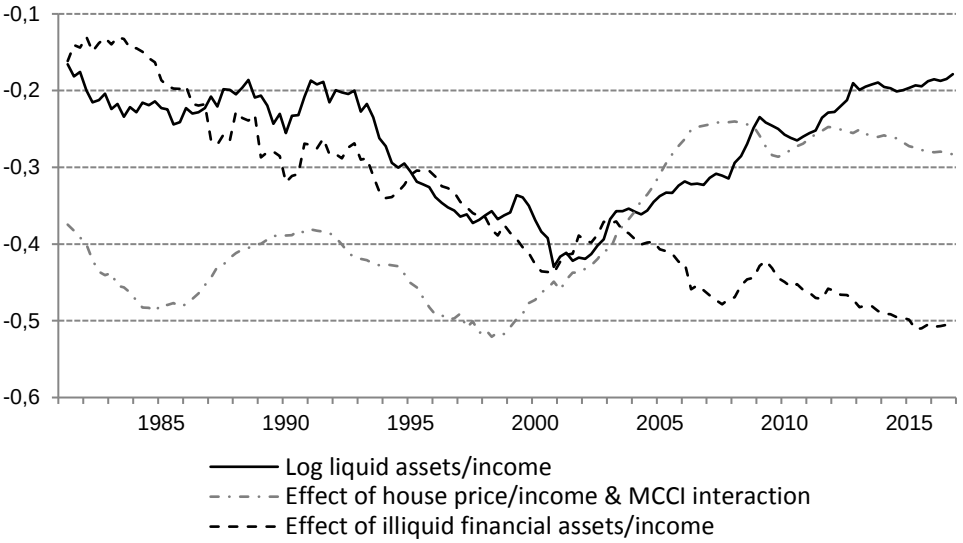
The effect of excluding credit conditions from the liquid assets equation is to reduce the speed of adjustment by a quarter and to reduce the significance of the real interest rate. However, unlike the consumer debt equation, the long-run solution still makes economic sense.

Figure C5-2a
Long-run effects of consumer credit conditions, real interest rates and demography on the log ratio of liquid assets to income.



Sources: Banque de France; Insee; authors' calculations.

Figure C5-2b
Long-run effects of the composite log house price to income ratio and the log ratio to income of illiquid financial assets.



Sources: Banque de France; Insee; authors' calculations.

Table C5-2
Estimates of the long-run solution for the stock of liquid assets equation for France

Dependent Variable = $\Delta \ln LA_t$	Symbol	1981Q2-2016Q4		1981Q2-2008Q3		1981Q2-2016Q4 Excluding *CRCCI, MCCI*	
		coefficient	t-ratio	coefficient	t-ratio	coefficient	t-ratio
Speed of adjustment	ρ	0.12	5.8	0.13	4.5	0.09	4.5
Long-run coefficients for log (real LA/y)							
Constant	s_0	-2.3	-6.7	-2.3	-5.7	-2.1	-2.3
Credit conditions index: *CCI*	s_{00c}	-0.20	-3.9	-0.22	-3.4	0	-
Real rate of return	s_1	2.5	4.1	3.0	4.6	0.8	1.3
Log house prices/y	s_4	0.59	4.8	0.59	4.0	0.49	6.2
MCCI x log(house prices/y)	s_{4c}	-0.36	-1.4	-0.42	-1.4	0	-
Ratio of post-retirement age group/adults	s_5	3	fix	3	fix	3	fix
Log illiquid assets/income	s_6	-0.32	-7.3	-0.33	-5.9	-0.48	-9.4
Diagnostics							
Equation standard error		0.00874		0.00948		0.00886	
DW		1.74		1.81		2.02	
R-squared		0.385		0.400		0.370	

Notes: For specifications including credit conditions indices, all coefficients are significant at the 1% level, except for the interaction of mortgage credit conditions and log house prices/income. Maximum likelihood estimation of the 6-equation system in TSP (Time Series Processor) 5.1. Equation standard errors are RMSEs of the residuals
Sources: Banque de France; Insee; authors' calculations.

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