

Household Saving through Recessions and Crises

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Executive Summary

Introduction

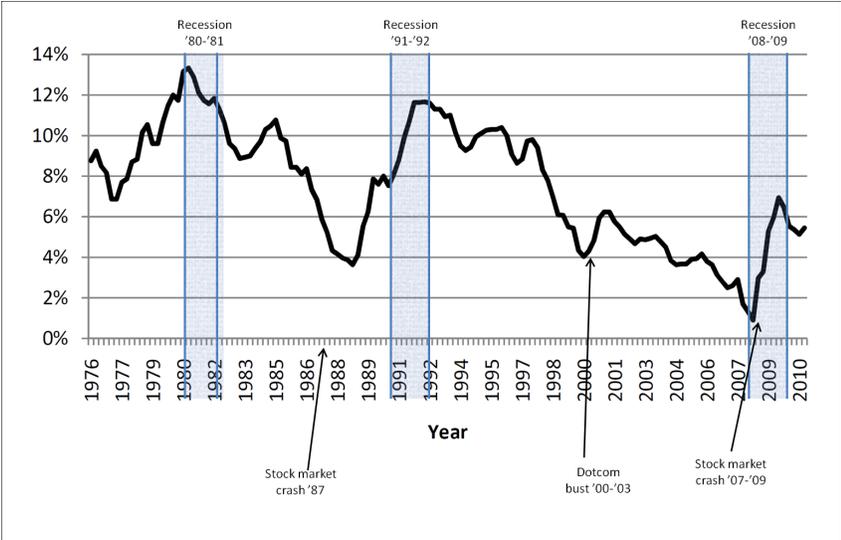
One of the striking aspects of the current recession, and of recent recessions, has been the extent that consumption has collapsed in the recession, relative to the fall in income. This has led to savings rates in the aggregate data spiking: for example, from 0.5% to 8.5% in the UK in the 2008-09 recession. The natural question to ask is why are households not willing to borrow or run down savings to smooth consumption through recessions. There are two aims of this paper: first, we use micro data on individual behaviour to analyse which individuals cut their consumption, and how the resulting spikes in savings behaviour differ by the age of the individual when the recession strikes. Second, we use a calibrated life-cycle model to explain the rise in the savings ratio through recessions and asset price crashes.

At the heart of our analysis is a careful definition of what a recession means for an individual consumer, and the use of a life-cycle model of behaviour to analyse how consumers respond to recessions. The first component is a fall in the level of income. This fall comprises an aggregate component, but there is also substantial heterogeneity among individuals in the size of the fall they experience. Behaviour differs according to whether this aggregate shock to income is transitory or permanent. To the extent that this is transitory, income bounces back after the recession ends, and this should lead to reductions in saving and consumption smoothing. If it is permanent, consumption will fall by the amount that income falls. The second component is that recessions are often accompanied

by sharp declines in asset prices, which erode individuals' wealth and cause a permanent reduction in wealth. Of course, the extent that wealth is eroded depends on choices the individual has made about holdings of risky assets and may well depend on age, and this again generates substantial heterogeneity in the way a recession impacts on individuals. This wealth loss may induce individuals to increase saving to rebuild their balance sheets. The fall in asset prices also affects the demand for credit as the fall in asset prices increases the debt to asset ratio of individuals with mortgages and other debts, and this leads to a desire to deleverage. The third component of recessions is a rise in the uncertainty associated with future income, partly due to increased probabilities of job loss, and partly due to the reorganisation of production which follows recessions and which results in increased permanent risk. Finally, there is a reduction in the supply of credit. This fall in the supply of credit is partly through a contraction of existing lines of credit, and partly through a contraction in the availability of new lines of credit. Both act to increase individual saving: the former acts directly through forcing those close to their borrowing limits to pay back debt; the latter acts indirectly because individuals have less ability to self-insure future shocks through increasing their borrowing.

We focus on UK data and the empirical pattern of savings that we are trying to understand is shown in Figure 1. We use UK data to estimate the inputs into the model and then simulate behaviour through different sorts of recession.

Figure 1: Savings Ratios over Time



Life-Cycle Model of Saving in Recessions

Our model of saving behaviour assumes that individuals live for a known, finite lifetime. In each period of their life, they choose how much to consume or save, and whether to allocate their savings to a risky or safe asset. There is uncertainty over income, partly idiosyncratic, partly aggregate due to business cycle variations. Heterogeneity among individuals arises due to different realisations of their idiosyncratic shocks. We also consider ex-ante heterogeneity in preferences and in expected income paths. The inputs into the model are estimated directly from the data.

We consider the risky asset to be a composite asset of equity and housing. This asset is fully liquid. Individuals are able to borrow at the risk-free rate and many individuals do borrow and purchase the risky asset. This generates a certain amount of leverage, which declines with age, but borrowing is restricted to three times an individual's current income.

We model the aggregate state of the economy as following a 2 state Markov process, with the economy being either in a boom or a recession. The probability of a boom persisting is high (0.9), whereas the probability of a recession persisting is only 0.5. We consider three different models of what happens in a recession:

1. Aggregate income shock: when a recession occurs, the income of all individuals is subject to a negative shock. This aggregate shock to income comprises both a negative transitory effect reducing income for the duration of the recession, and a negative permanent effect which reduces income both in the recession and after the recession ends.
2. Aggregate income shock and increased idiosyncratic uncertainty: in addition to the fall in mean income, the variance of idiosyncratic permanent shocks rises in the recession. We take the estimates of the increased variance from Blundell, Low and Preston (2009).
3. Aggregate income shock and credit market tightening: we model a credit tightening as being on the supply of new credit lines. This implies that so long as consumers pay back the interest on their loans, they will not be affected directly by the reduction in credit.

In each of the three models, there is also a probability of a crash in asset prices occurring, and this probability is higher in recessions than in booms.

Data and Estimates

We use data from the 1976-2009 UK Family Expenditure Survey. We divide the sample into 10-year date-of-birth cohorts. Our sample covers three recessions: 1980-1981, 1990-1991 and 2008-2009.

Our estimates of the income process show that, from the perspective of the individual consumer, recessions are permanent: income growth is 3% lower in each year of a recession and that lower growth is never reversed. These permanent shocks to income are not significantly different either across recessions or across age groups. There is no significant transitory effect.

We calculate savings rates as the proportion of cohort level income that is actively saved. Once we allow for a time trend and age effects, savings rates are 4% higher in recessions. This rise happens in the first full year after the recession starts, and falls back quickly after the recession ends. This pattern is observed across all age groups.

Simulations and Conclusions

We use our estimates of the income process and process for the risky asset to simulate behaviour through recessions, assuming that the realised recession lasts two periods, and using the three different models of recessions outlined above. We assume that no asset price crash is realised in the recessions, but separately from these three simulations, we simulate behaviour following an asset price crash.

In the first type of recession, where there is only an aggregate effect on income, consumption falls sharply when the recession starts, falls further when the recession persists into the second year, and then bounces back, overshooting its long-term level. The bounce back occurs because the end of the recession means that the probability of experiencing the aggregate negative shock next period is lower and so savings are run down. This effect of a large fall in consumption followed by an overshooting of the long term level is more pronounced when the recession is of the second type, with idiosyncratic uncertainty higher in the recession. Both recessions also affect the demand for credit and the amount of leverage that individuals are willing to hold: in both cases, households deleverage by moving out of the risky asset and reducing their demand for debt. This behaviour is particularly pronounced among the young, and generates the patterns of savings behaviour that we observe in the data. The third type of recession where credit supply is reduced has less of an impact on behaviour: we model the reduction in credit as a reduction in the availability of new credit and this does not have a direct effect causing households to deleverage. There is a small effect as households realise that additional borrowing will

be harder if they were to need it, but the effect of this contraction of supply is substantially less than the effect of the reduced demand for credit.

The simulations of the crash in the price of the risky asset show, as expected, that older and more patient households are much more affected. Savings rates rise following the crash, and in contrast to the effect of the recession, remain high as households try to restore their wealth holdings. The fall in asset prices also makes households appear more leveraged because their debt holdings are unchanged, and this leads households to move out of equity, and to pay back their debt in the periods after the crash.

The conclusion on how we can match the observed increase in savings rates across all age groups is that we need both an increase in uncertainty in the recession and an asset price crash. With just an asset price crash, and without the increase in uncertainty, there is no spike up in savings rates: rather, the savings rate remains high for a prolonged period. The spike up and then fall back in the saving rate requires uncertainty to be resolved. On the other hand, the asset price crash is necessary to explain why older households respond substantially to recessions.

These results are preliminary, but give a flavour of what can be learnt by modelling how individuals behave through recessions, highlighting how individuals of different ages will behave differently, and highlighting the need to use micro level data rather than just aggregate data to understand movements in the macroeconomy.