

CREDIT MARKET IMPERFECTIONS, CREDIT FRICTIONS AND FINANCIAL CRISES

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Outline

- Credit Market Imperfections and Consumption.
- Asymmetric Information and the Financial Crisis.
- Limited Commitment and the Financial Crisis: Collateral.

Credit Market Imperfections and Consumption

- Assume that lenders can lend at a lower interest rate, r_1 , than the one faced by borrowers, r_2 (e.g., a higher interest rate as compensation for a bank's credit risks).
- The government borrows and lends at the interest rate that lenders face, r_1 .
- This implies that Ricardian equivalence does not hold, in general.

Budget constraints

Current-period budget constraint :

$$c + s = y - t \quad (1)$$

Future-period budget constraint :

$$c' = y' - t' + s(1 + r_1) \quad \text{if lender, } s \geq 0 \quad (2)$$

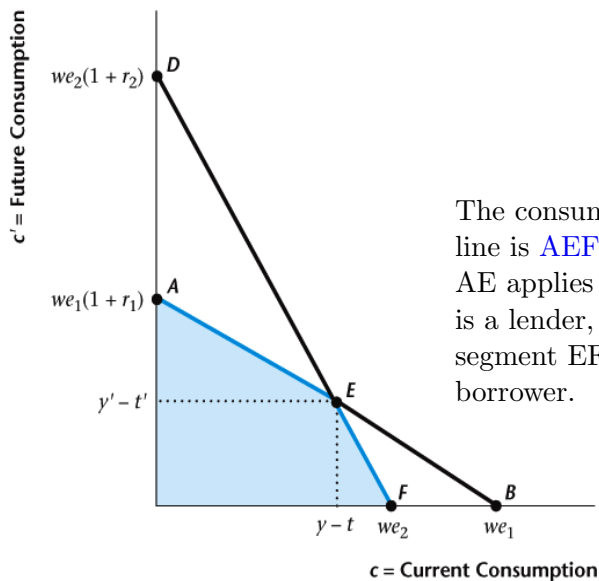
$$c' = y' - t' + s(1 + r_2) \quad \text{if borrower, } s \leq 0 \quad (3)$$

Equations (2)–(3) can be used to find s , for a saver and a borrower respectively, and then plugged into equation (1) to obtain the lifetime budget constraints for the saver and the borrower.

$$c + \frac{c'}{1 + r_1} = y + \frac{y'}{1 + r_1} - t - \frac{t'}{1 + r_1} = we_1 \quad \text{if } c < y - t$$

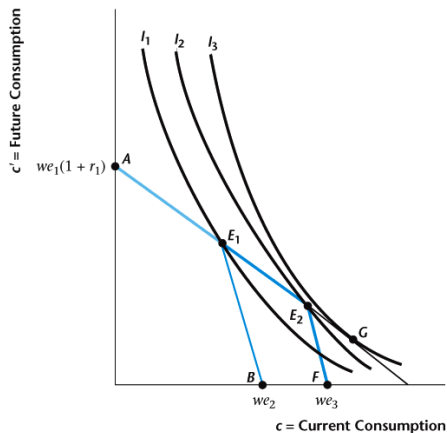
$$c + \frac{c'}{1 + r_2} = y + \frac{y'}{1 + r_2} - t - \frac{t'}{1 + r_2} = we_2 \quad \text{if } c \geq y - t$$

A consumer with different lending and borrowing rates



The consumer's budget line is **AEF**: segment AE applies if consumer is a lender, and segment EF if a borrower.

Effects of a tax cut for a consumer with different lending and borrowing rates



The consumer receives a current tax cut, with a wealth-neutral future increase in taxes; this shifts the budget constraint from AE_1B to AE_2F . The consumer's optimal consumption bundle shifts from E_1 to E_2 , and the consumer spends the entire tax cut.

Lessons

- The government is effectively making a low-interest loan (Δt at the rate r_1) available to a consumer through a tax-cut scheme, which the consumer would willingly take
- This is very different from the case with no credit market imperfections, where the consumer will save the entire tax cut to pay higher future taxes
- To the extent that credit market imperfections are important in practice, there can be beneficial effects of positive government debt

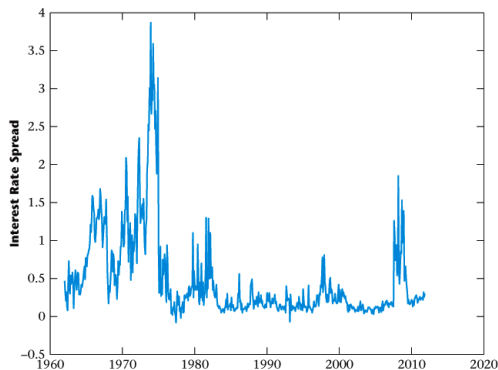
Credit Market Imperfections and the Financial Crisis

- Two key credit market *frictions*: asymmetric information and limited commitment
- **Asymmetric information**: Would-be borrowers know more about their characteristics than do lenders
- **Limited Commitment**: Borrowers may choose to default—lender can overcome limited commitment with **collateral** (e.g., auto loans, mortgages)

Asymmetric Information and the Financial crisis

- Asymmetric information may give rise to kinked budget constraints
- Quality of information in credit markets declined significantly during 2008, interest rate spreads went up, lending and aggregate activity went down

Asymmetric information and interest rate spreads



The difference between the interest rates on prime short-term corporate paper and short-term Government of Canada debt. The spread was particularly high during the 1974–1975 and 2008–2009 recessions.

Asymmetric Information in Credit Markets. A model

- Market structure: banks, depositors, and borrowers—good and bad
- Lending carried out through **banks**, which take deposits and loan them out
- Deposit rate at banks is r_1 , loan rate is r_2 : $r_2 > r_1$
- Fraction a of borrowers never defaults, fraction $1 - a$ always defaults—bank cannot tell the good borrowers from the bad ones
- All **good borrowers** identical, borrow the amount L
- **Bad borrowers** mimic the good ones, borrowing the same amount L
- Total amount of deposits L
- Banks earn zero profit in equilibrium

Bank's profit

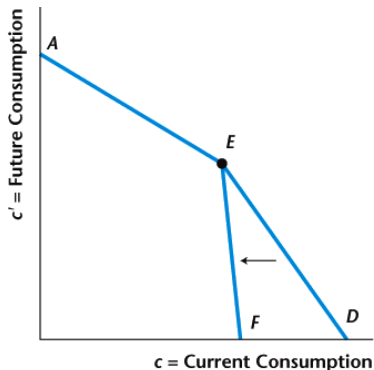
$$\pi = aL(1 + r_2) - L(1 + r_1) = L[a(1 + r_2) - (1 + r_1)] = 0.$$

It follows that

$$r_2 = \frac{1 + r_1}{a} - 1 = \underbrace{\frac{r_1}{a}}_{> r_1 \text{ if } a < 1} + \left[\underbrace{\frac{1}{a} - 1}_{> 0 \text{ if } a < 1} \right].$$

- There is a default premium, $r_2 > r_1$, when $a < 1$.
- The default premium increases as a decreases. How does it affect the budget constraint?

Reduction in Quantity of Creditworthy Borrowers, $a \downarrow$



During the financial crisis, the average borrower was perceived to be more likely to default, interest rate spreads increased, lending decreased and current consumption expenditures fell

Effect of a Decrease in the Fraction of Creditworthy Borrowers

- Default premium increases—even good borrowers face higher loan rates
- Budget constraint shifts in
- Consumption falls for all borrowers
- Matches observations from the financial crisis—increase in credit market uncertainty, reduction in lending, decrease in consumption expenditures

Limited Commitment and the Financial Crisis

- Borrowers need incentives not to default on their debts—these incentives are typically provided by **collateral requirements**
- Examples: House is collateral for a mortgage loan, car is collateral for a car loan
- Can be potentially important for macro: a decline in collateral value will lower the quantity of lending and will lead to a drop in current aggregate consumption

Example

- H = quantity of housing owned by consumer
- p = price of housing
- Assume that housing is illiquid—cannot be sold in the current period. However, it is possible to borrow against housing wealth, with a collateral constraint

Consumer's Constraints

Lifetime budget constraint:

$$c + \frac{c'}{1+r} = y - t + \frac{y' - t' + pH}{1+r} = we$$

Collateral constraint:

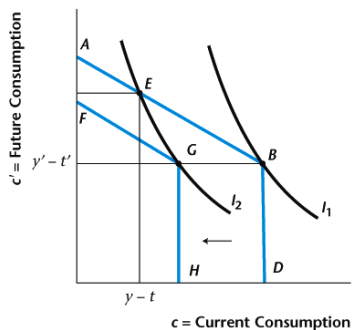
$$-s(1+r) \leq pH \Leftrightarrow -s \leq \frac{pH}{1+r}$$

Since $c + s = y - t$, we can write

$$c = y - t - s \leq y - t + \frac{pH}{1+r}.$$

What happens if the value of the collateral falls, that is, if $p \downarrow$?

Limited commitment with a collateral constraint

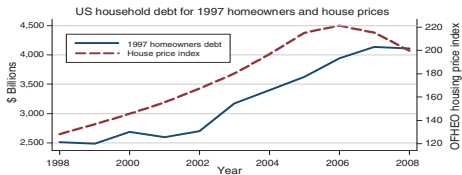
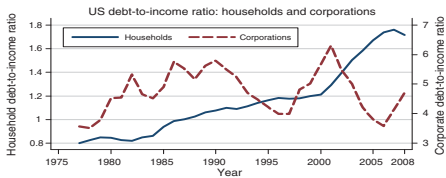
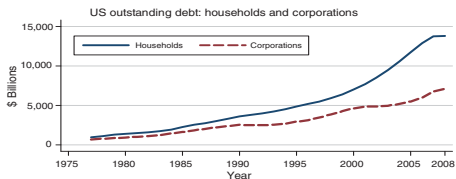


Initially the budget constraint is ABD and it shifts to FGH with a decrease in the price of collateral. An **unconstrained consumer** will choose first a bundle of consumption on segment AB , and then on segment FG smoothing out the fall in her wealth by cutting both current and future consumption. For a **constrained consumer**, this causes no change in future consumption but current consumption drops by the same amount as the decrease in the value of the collateral since for her $c = y - t + \frac{pH}{1+r}$.

Implications for the recent financial crisis?

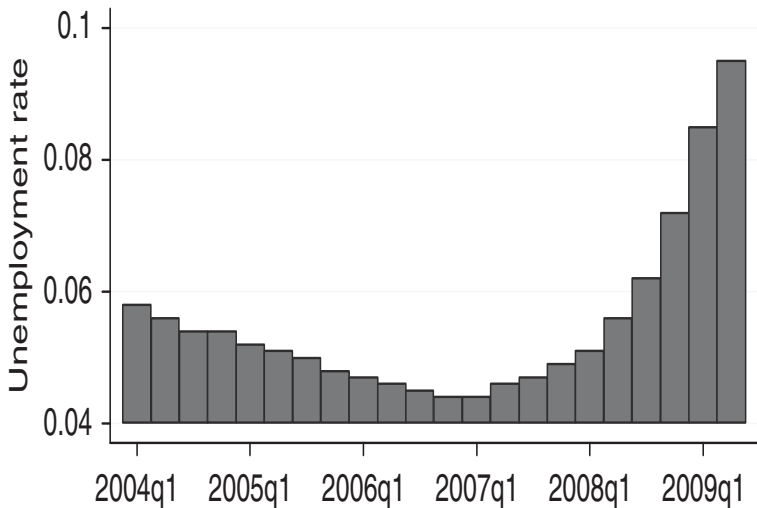
- The price of housing in the US declined by about 33% from its peak in April 2006 to November 2011
- As a large fraction of consumer expenditures has been financed by mortgage debt a 33% drop in the value of collateralizable wealth can have large effects on the macroeconomy

House price growth and debt



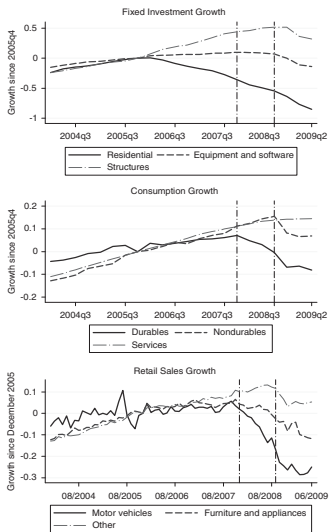
Source: Mian and Sufi (AER 2011).

Unemployment Rate



Source: Mian and Sufi (IMF 2010).

GDP components during and prior the Great Recession



Note: The top two panels present investment and consumption data from the National Income and Product Accounts. The bottom panel presents monthly retail sales data from the Department of Commerce. Each series represents the cumulative growth rate since the fourth quarter of 2005.

Source: Mian and Sufi (IMF 2010).

Readings

- Stephen Williamson. 2013. Macroeconomics. Fourth Canadian Edition. Chapter 10, pp. 317–328.
- Mian and Sufi's blog: <http://houseofdebt.org/>