EC307 ECONOMIC POLICY IN THE UK

MACROECONOMIC POLICY

THE TRANSMISSION OF MONETARY POLICY

Summary

This lecture gets inside the 'black box', discussing the transmission mechanism of monetary policy, outlining the interest rate, exchange rate, money and credit channels.

Reading

Monetary Policy Committee (1999), "The transmission mechanism of monetary policy", Bank of England
http://www.bankofengland.co.uk/publications/other/monetary/montrans.pdf

Bank of England (2002), "The Bank of England's operations in the sterling money markets"
http://www.bankofengland.co.uk/markets/money/stermm3.pdf

Bank of England "Operational notice for Open Market Operations" 14 March 2005
http://www.bankofengland.co.uk/markets/money/opnotice050211.pdf
too detailed for our purposes, but useful to skim

Hall, Simon (2001), "Credit channel effects in the monetary transmission mechanism**",** *Bank of England Quarterly Bulletin* Winter
http://www.bankofengland.co.uk/publications/quarterlybulletin/qb010404.pdf

Mishkin, Frederic (1995), "Introduction", *Journal of Economic Perspectives*, 9, Symposium on the Monetary Transmission Mechanism, 3-10.
skimming through the rest of the symposium might also be useful

HM Treasury (2003), "EMU and the monetary transmission mechanism"
http://www.hm-treasury.gov.uk./documents/international_issues/the_euro/assessment/studies/euro_assess03_studhampshire.cfm
Chapters 0-3: http://www.hm-treasury.gov.uk./media/555/F2/adhamp03_123_319.pdf
Chapters 4-7: http://www.hm-treasury.gov.uk./media/C0F/02/adhamp03_4567r_189.pdf
goes beyond what is covered in these notes

On the yield curve:
Blanchard, Olivier (2006), *Macroeconomics* (4th edition), chapter 15 "Financial markets and expectations".

THE TRANSMISSION OF MONETARY POLICY

Instrument = the repo rate (see BoE 2002 or BoE 1999 p.5 for information)
Affects other interest rates
Affects asset prices
Affects expectations
Affects spending (by consumers and companies)
Affects GDP and inflation

Repo rate change → market interest rates change

- Short-term interest rates, in same direction - market rates (market), bank base rates (on loans, administered), bank deposit rates (administered)
- Long-term interest rates can go either way

Repo rate change → asset prices and exchange rate change

- Bond prices = *f*(1/long-term interest rate)
- Equity prices
- Exchange rate

Repo rate change → expectations change
Can go either way, increasing uncertainty about policy impact. Importance of credibility and transparency.

Effects on individuals

- Interest rate on debts and savings: disposable income, incentives to save or spend.
- Financial and housing wealth.
- Relative price of foreign vs. domestic goods.
- Expectations.

All affect consumer spending.

- Mortgages = 80% of personal debt. Most in UK floating rate.
- Intertemporal substitution of consumption.

- Financial wealth.
- Housing wealth = a major component of *gross* personal wealth. Effects through 'feeling poorer/richer' and collateral.
- Debts.

- Consumer confidence and expectations.

- Exchange rate can affect level of spending if wealth/debt is denominated in a foreign currency.
- Otherwise affects composition of spending.

Individual heterogeneity. MPC can only take account of effect on aggregate effect over all individuals. e.g. person living off interest from savings.

Source: Bank of England (2002), p.16.

Box: The Bank of England's wire services announcements on 27 March 2002

9.45 am Initial liquidity forecast Stg 1750 mn shortage
A round of fixed rate operations is invited. The Bank's repo rate is 4.0%.
The operations will comprise repos to 11 April and outright offers of bills maturing on or before 11 April
Principal factors in the forecast:
Maturing outright purchases -109
Maturing bill/gilt repo -1402
Bank/Customer transactions +120
Rise in note circulation -315
Maturing settlement bank late repo facility -75
Bankers balances above target +10

9:51 am Total amount allotted – Stg 1550 mn
of which – outright Stg 0 mn, repo Stg 1550 mn

2.30 pm No revision to liquidity forecast. Residual shortage – Stg 200 mn
A round of fixed rate operations is invited. The Bank's repo rate is 4.0%.
The operations will comprise repos to 11 April and outright offers of bills maturing on or before 11 April.

2.36 pm Total amount allotted – Stg 200 mn
of which – outright Stg 0 mn, repo Stg 200 mn

3.30 pm No residual shortage.
Deposit Facility: bids are invited for the purchase from the Bank of overnight DBV at a rate of 3.0%

3.36 pm No use has been made of the Deposit Facility.

4.20 pm Final liquidity forecast revision – Stg 1800 mn
Residual shortage – Stg 50 mn
The settlement bank late repo facility is available.

4.31 pm Stg 50 mn has been provided in the settlement bank late repo facility

Source: Monetary Policy Committee (1999), p.5.

How the Bank sets interest rates

The Bank implements monetary policy by lending to the money market at the official repo rate chosen by the MPC. The Bank's dealing rate changes only when the MPC decides that it should. Arbitrage between markets ensures that the MPC's decisions are reflected across the spectrum of short-term sterling markets.

The Bank holds on its balance sheet assets acquired from its counterparties in its money-market operations. These are mostly private sector obligations; they are short-term, and a proportion of them matures every business day. This means that at the start of each day, the private sector is due to pay money to the Bank to redeem these obligations. However, in order to do so, the Bank's counterparties typically have to borrow additional funds from the Bank. This gives the Bank the opportunity to provide the necessary finance once more, at its official repo rate. The fact that this 'stock of refinancing' is turning over regularly is the main factor creating the demand for base money (the 'shortage') in the market each day.

The panel below shows the announcements that the Bank's dealers made to the market on 8 April, a day on which rates were changed. At 9.45 am, the Bank announced the estimated size of that day's shortage and the main factors behind it. At 12 noon, it published the outcome of the MPC meeting, and market rates adjusted immediately. The first round of operations was not conducted until 12.15 pm, but the knowledge that the dealing rate would be 5.25%, down from 5.5%, moved market rates ahead of that. The bulk of the day's shortage was financed at 12.15 pm, and the (downwardly revised) remainder in a further round of operations at 2.30 pm.

In its open market operations, the Bank deals with a small group of counterparties who are active in the money market: banks, securities dealers and building societies are eligible to take on this role. Finance is provided primarily in the form of repo, which is short for 'sale and repurchase agreement'. Counterparties sell assets to the Bank with an agreement to buy them back in about a fortnight's time, and the repo rate is the (annualised) rate of interest implied by the difference between the sale and repurchase price in these transactions. The assets eligible for repo are gilts and sterling Treasury bills, UK government foreign-currency debt, eligible bank and local authority bills, and certain sterling bonds issued by supranational organisations and by governments in the European Economic Area. The Bank also buys outright Treasury bills and other eligible bills.

On non-MPC days, the first round of operations is held at 9.45 am rather than 12.15 pm. The timetable is otherwise the same. If the remaining shortage is not entirely relieved at 2.30 pm, the Bank holds a round of overnight operations at 3.30 pm. If the system is still short at 4.20 pm, the Bank deals directly with the settlement banks, whose accounts at the Bank of England need to be in credit at the end of the day. But on 8 April, no operations were needed at 3.30 pm or 4.20 pm.

Bank of England messages to money markets via screen services on 8 April 1999

9.45 am Initial liquidity forecast Stg 1150 mn shortage
Principal factors in the forecast
Treasury bills and maturing outright purchases –596
Maturing bill/gilt repo –216
Bank/Exchequer transactions –180
Rise in note circulation –105
Maturing settlement bank late repo facility –39
Bankers' balances below target –20
12.00 pm BANK OF ENGLAND REDUCES INTEREST RATES BY 0.25% TO 5.25%
The Bank of England's Monetary Policy Committee today voted to reduce the Bank's repo rate by 0.25% to 5.25%.
The minutes of the meeting will be published at 9.30 am on Wednesday 21 April.
12.15 pm Liquidity forecast revision—Stg 1100 mn
A round of fixed-rate operations is invited. The Bank's repo rate is 5.25%. The operations will comprise repos to 22 and 23 April and outright offers of bills maturing on or before 23 April.
12.24 pm Total amount allotted—Stg 900 mn
of which—outright Stg 57 mn, repo Stg 843 mn
2.30 pm Liquidity forecast revision—Stg 1000 mn. Residual shortage—Stg 100 mn
A round of fixed-rate operations is invited. The Bank's repo rate is 5.25%. The operations will comprise repos to 22 and 23 April and outright offers of bills maturing on or before 23 April.
2.35 pm Total amount allotted—Stg 100 mn
of which—outright Stg 16 mn, repo Stg 84 mn
3.30 pm No residual shortage
No further operations invited
4.20 pm No liquidity forecast revision
No residual shortage
The settlement bank late repo facility will not operate today

Chart 1: Stock of money market refinancing and daily shortages

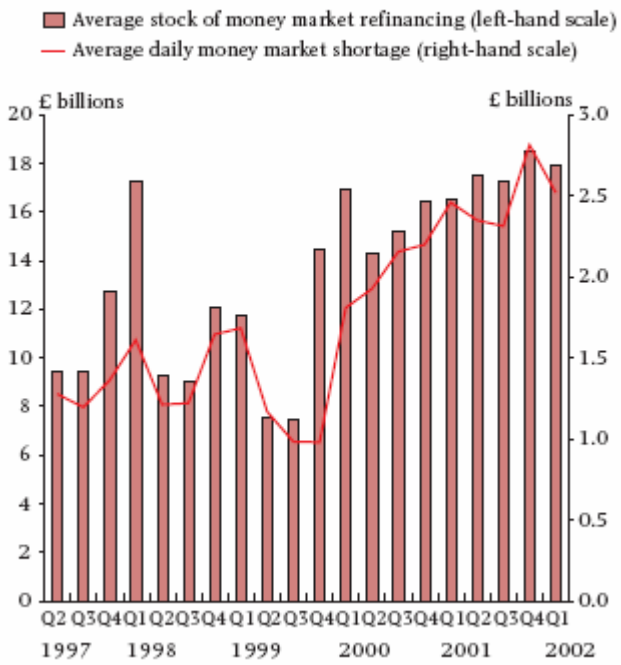


Chart 4: Refinancing provided in the Bank's open market operations

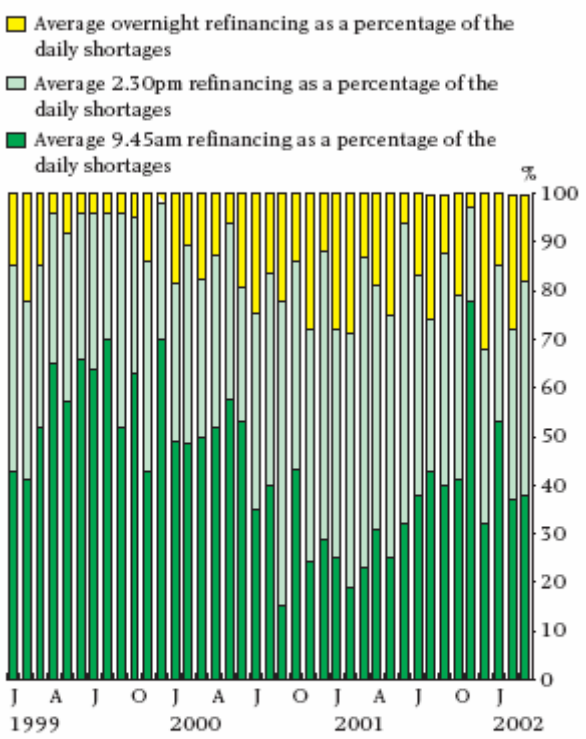
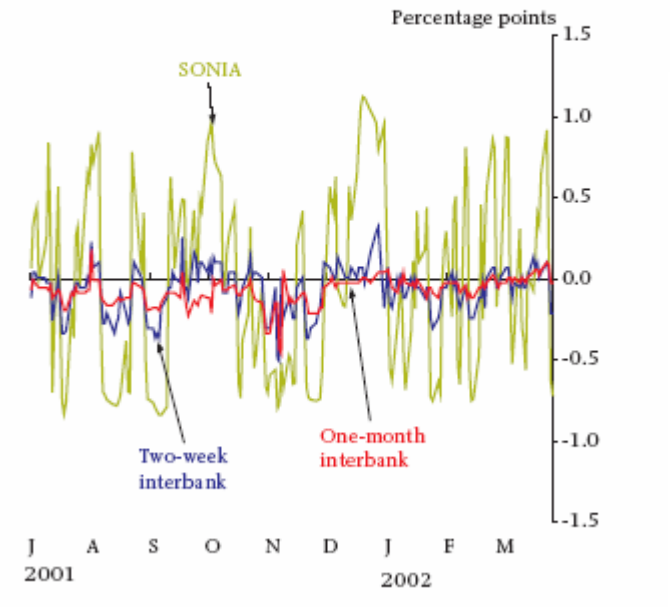


Chart 3: Spread of SONIA, two-week and one-month interbank rates minus the Bank's repo rate



Redistributional effects: net borrowers worse off following rate rise, net savers better off. Different mpcs.

Effects on firms
- Interest rate on debts and liquid assets: cash flow, effect on cost of holding inventory, effect on cost of capital.
- Collateral effects.
- Exchange rate effect on demand for product.
- Expectations.

All affect firms' investment.

- Bank borrowing or other variable-rate loans.
- Liquid assets - cash-rich firms.
- Effect on cost of capital: bonds (long-term interest rate); equities (? e.g. access to international capital markets).
- Collateral for small firms (credit channel).

- Exchange rate effects on product demand (inputs too).

- Expectations and business confidence - particularly important for irreversible investment decisions.

Impact depends on nature of business, size of firm, and sources of finance.

Effect on GDP
= sum of effect on individuals and firms (+ government spending + net exports).

Second-round effects
- even if e.g. firm unaffected directly by interest rate, asset price or exchange rate change, could be affected by change in others' spending. [steel manufacturer - car manufacturer]
- can be anticipated, so confidence/expectations alter quicker

Time lags
- in transmission to other interest rates (esp. some retail rates and mortgage rates)
- unanticipated demand changes affect inventories, which affect demand, gradually working back through the supply chain
- empirical evidence for industrialised countries: peak in effect of monetary policy change on GDP = after 1 year
- lag depends on many other factors, including expectations and confidence, stage of business cycle, world economic events
- so lags are 'long, variable and uncertain'

Effect on inflation
Change in GDP affects inflation via the output gap

Long-run GDP is determined by supply-side factors
- technical progress, capital accumulation, size of labour force, quality of labour force
Monetary policy cannot directly affect the long-run growth rate

'Potential GDP' = output level at which firms are at 'normal' capacity and are under no pressure to change output or product prices faster than the expected rate of inflation
- at potential GDP, no pressure either way on price inflation, employment such that no pressure either way on unit cost growth
- difficult to measure (changes in labour supply, industrial structure, labour market reforms)
NB Potential output is consistent with inflation target only if agents' inflation expectations = inflation target - importance of transparency and credibility

Output gap = actual GDP - potential GDP
- positive: output > sustainable level, excess demand, BoP problems, wage (labour shortage) and price (increased margins) inflation pressure

Heterogeneity: differences in output gaps across sectors
- numerical link between output gap and inflation difficult to establish with certainty
- empirical evidence for industrialised countries: peak in effect of monetary policy change on inflation = after up to 2 years

What about money?
For each path of the repo rate, there is an implied path for monetary aggregates.
In the long-run, there is a positive relationship: sustained price rises cannot occur without an expansion of the quantity of money.
If set repo rate (rather than money), money and inflation are caused by other variables.
Money expands as repo rates fall: more loans, more deposits; more retail sales mean more demand for cash.
Possible leading indicator, but problems of instability.

(Bank lending channel: shocks emanating from banking system - credit crunch, removal of 'Corset' in UK)

How big is the effect of the repo rate on GDP and inflation?
See Charts 1 and 2.

Source: Britton, Eric and Whitley, John (1997), "Comparing the monetary transmission mechanism in France, Germany and the United Kingdom: some issues and results", Bank of England Quarterly Bulletin (May), pp.152-162.
http://www.bankofengland.co.uk/publications/quarterlybulletin/qb970202.pdf

Chart 1
Output response

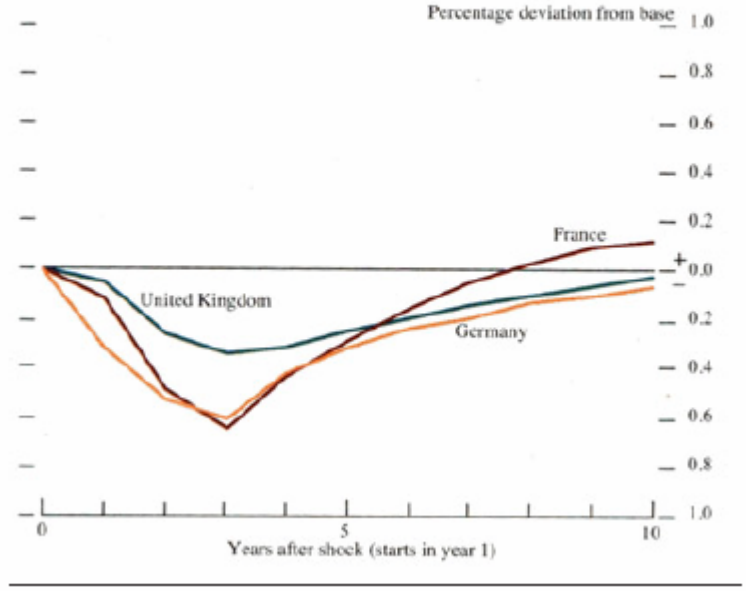
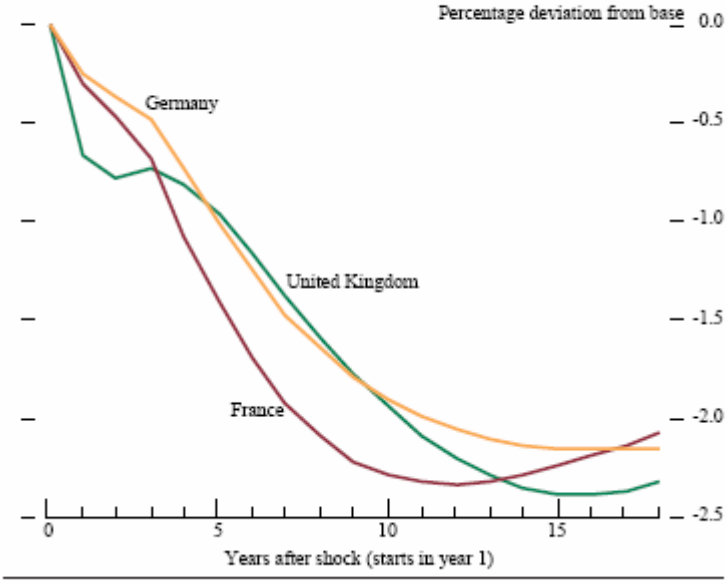


Chart 2
Price level response



Mishkin (1995)

The interest rate channel

$\downarrow M \rightarrow \uparrow i \rightarrow \downarrow I \rightarrow \downarrow Y$

Keynesian view: contractionary monetary policy raises interest rates, which increases cost of capital, leading to a decline in investment spending and hence a fall in output. Keynes focused on business decisions. Could also operate through consumers' decisions about housing and consumer durables (I).

How does it work?

Higher short-term nominal interest rate + sticky prices

$\rightarrow$ (maybe only temporarily) higher real long-term interest rate

$\rightarrow$ lower business fixed I, residential housing I, consumer durable I, inventory I

$\rightarrow$ lower Y.

Questionable: How strong are the interest rate effects on these aspects of spending?

The exchange rate channel

$\downarrow M \rightarrow \uparrow i \rightarrow \uparrow E \rightarrow \downarrow NX \rightarrow \downarrow Y$

Realisation that monetary policy has international effects.

Domestic real interest rates rise $\rightarrow$ own-currency deposits more attractive relative to foreign deposits $\rightarrow$ rise in relative value of these $\rightarrow$ appreciation of domestic currency $\rightarrow$ domestic goods more expensive than foreign $\rightarrow$ fall in net exports $\rightarrow$ output decline.

Monetarists: transmission mechanism = a black box.

- Tend to emphasise the 'universe' of relative asset prices and real wealth
- Consider that transmission mechanism may change over business cycles
- Criticise interest rate channel for focusing on just one relative asset price, the interest rate

2 particular channels are often emphasised by monetarists:

Other asset price effects

- $\downarrow M \rightarrow \downarrow P_e \rightarrow \downarrow q \rightarrow \downarrow I \rightarrow \downarrow Y$

Starting from the right hand side:

Tobin's q theory of investment:

- q is firm's market value relative to replacement cost of capital
- high q $\rightarrow$ issuing equity is lucrative because of high share price, so firm is able to fund a lot of I, so firms do both
- low q $\rightarrow$ firms take over other firms rather than make new I (since other firms are cheap relative to the cost of capital)

Then, how does monetary policy affect equity prices?

1. Restrictive monetary policy reduces consumers' money balances; to restore them, consumers cut back spending, including spending on equities.
2. Restrictive monetary policy raises interest rates on bonds, making them more attractive than equities.

- $\downarrow M \rightarrow \downarrow P_e \rightarrow \downarrow \text{wealth} \rightarrow \downarrow C \rightarrow \downarrow Y$

Wealth effects on consumption (Modigliani):

- in life cycle model, consumption depends on lifetime wealth = human, real, financial capital
- financial wealth is largely equities, so lower equity prices reduce wealth, reducing consumption

(Path from money to equity prices is as above)

This type of effect could operate through housing wealth as well as financial:
- restrictive monetary policy raises the opportunity cost of investing in housing / land, reducing price of these, reducing stock of wealth ...

The credit channel
Distinctions between monetary and credit channels:
- between money and credit (asset and liability side of balance sheet);
- between whether banks / financial institutions play a special role (yes in credit channel, no in monetary channel);
- whether agency problems are important (again yes, no).

2 distinct paths fall within the 'credit channel' heading:
- *bank lending channel*
- *balance-sheet channel*

bank lending channel
$\downarrow$M $\rightarrow \downarrow$bank deposits $\rightarrow \downarrow$bank loans $\rightarrow \downarrow$I $\rightarrow \downarrow$Y

- Banks play a special role in financial system. Some borrowers - e.g. small businesses, households - are heavily dependent on banks as source of finance. Why? Because of pronounced asymmetric info problems with these potential borrowers (large firms can go to the markets). Micro reasoning involves banks possessing information about their own customers that it is costly for other potential lenders to acquire (e.g. about risk characteristics), so these banks are willing to lend when others are not. The consequence of heavy dependence on bank finance is that interest rates on bank loans have a disproportionate effect on spending by these borrowers - rather than market interest rates and rates charged by other financial intermediaries. This means that bank assets are not perfect substitutes for other types of loan. Then, decisions made by banks about borrowing-lending spreads have an impact on nominal spending.
- Possible criticism of the 'realism' of this mechanism: after financial innovation of last decade(s), banks play less important role in credit markets.

balance sheet channel
Shocks to banks' balance sheets - e.g. financial deregulation, change in riskiness of portfolios - can have real effects. These effects are mainly thought to operate through net worth of businesses. Unlike the bank lending channel outlined above, there is no reason to think that the balance sheets have any less important effect on behaviour now.

A monetary contraction can lower net worth by reducing equity capital as described earlier. And lower net worth of borrowers $\rightarrow$ less collateral to hold against potentially risky loans $\rightarrow$ less ability to counter the adverse selection problem that banks can't tell how risky borrowers are (if collateral were available this can guarantee banks some return; plus only less-risky borrowers would be prepared to put up collateral) $\rightarrow$ lower lending $\rightarrow$ lower I.
i.e. $\downarrow M \rightarrow \downarrow P_e \rightarrow \uparrow$adverse selection $+ \uparrow$moral hazard $\rightarrow \downarrow$lending $\rightarrow \downarrow I \rightarrow \downarrow Y$

Alternatively, higher interest rates can reduce borrowers' cash flow, also aggravating adverse selection and moral hazard problems:

$\downarrow M \rightarrow \uparrow i \rightarrow \downarrow$borrowers' cash flow $\rightarrow \uparrow$adverse selection $+ \uparrow$moral hazard $\rightarrow \downarrow$lending $\rightarrow \downarrow I \rightarrow \downarrow Y$

The balance sheet channel can also work via households' balance sheets:
- lower bank lending can lower expenditure, particularly that on durables and housing
- higher interest rates can reduce household cash flow
The credit channel would then work in the same way as described for firms above.

In addition, liquidity effects might be important. Rather than affecting banks' willingness to lend, monetary policy might affect consumers' willingness to borrow.
- higher interest rates (or a cut in the money supply leading to a reduction in equity prices which reduces the value of financial assets, making consumers less secure financially) lead to a greater chance of financial distress, which affects households' 'portfolio decision': consumers would rather hold liquid assets rather than illiquid housing or durables (since any distress sale of these would be less likely to recoup their value - think of negative housing equity). This switch of assets from physical investments to financial investments can reduce output:

$\downarrow$M $\rightarrow \downarrow P_e \rightarrow \downarrow$financial assets $\rightarrow \uparrow$chance of financial distress
$\rightarrow \downarrow$consumer durable and housing expenditure $\rightarrow \downarrow$I $\rightarrow \downarrow$Y

- alternatively, higher interest rates reduce cash flow, increasing chance of financial distress (cash flow working on consumer willingness to spend, not banks' willingness to lend)

In summary, the credit channel through which monetary policy might be transmitted to the economy is characterised by:
- a focus on the liabilities side of economic agents' balance sheet (i.e. a focus on borrowing by firms and households, rather than on the money they hold, which appears on the assets side of their balance sheets);
- concentration on the role of banks and other financial institutions (and, in particular, a focus on the asset side of banks' balance sheets, i.e. their lending to firms and households);
- emphasis on the importance of agency problems stemming from informational imperfections.

Cecchetti (1995 – part of same Symposium as Mishkin paper) emphasises that the credit channel focuses on the *distributional* implications of monetary policy. In contrast to the traditional IS-LM view, whereby policy changes are only important insofar as they affect aggregate outcomes, the credit channel view notes that in reality, some agents will be hit harder than others: the effect is far from evenly spread. So, the incidence of policy differs across agents. Importantly, the differential impact of policy may have nothing to do with the 'inherent creditworthiness' of investment projects.