Introduction to the Financial System

Michael McMahon

Warwick
To Cover

1. The Abouts
2. Syllabus
3. Assignments and Grading
4. Some philosophical points about Economics
5. Introducing the financial system:
   5.1 The Basic Concept
   5.2 People
   5.3 Institutions
   5.4 Financial intermediation
   5.5 Financial Instruments
   5.6 Introducing bank balance sheets
   5.7 Effect on the macroeconomy
The Abouts
About the course

Game of 2 halves!

Part 1  Michael McMahon
Part 2  Marcus Miller

• Money and banking
• Practical emphasis - how it really is.
• UK/European emphasis
The Abouts
About the course

The main aims of the course are to:

- Explain the structure of modern financial systems;
- Outline the origins of money;
- Give an overview of the role of interest rates in the economy, and consider a number of issues relating to the optimal design of monetary policy institutions;
- Give an overview of the implementation of monetary policy in practice;
- Examine the issues surrounding the Economic and Monetary Union (EMU) in Europe.
The Abouts
About the course

The first half of the course is broadly split into 3 areas:

1. The financial system - institutions, instruments and the links between them;
The first half of the course is broadly split into 3 areas:

1. The financial system - institutions, instruments and the links between them;
2. Monetary policy - the theory and the practice;
The Abouts
About the course

The first half of the course is broadly split into 3 areas:

1. The financial system - institutions, instruments and the links between them;
2. Monetary policy - the theory and the practice;
3. Economic and Monetary Union (EMU) - economics of the €.
By the end of this course, students should be able to:

- Understand the main elements of the financial system;
- Outline and give a detailed justification of the main goals of monetary policy;
- Assess the relative merits of different countries’ monetary policy institutions;
- Critically discuss a whole range of current monetary and economic issues;
- Understand the foundations of European Monetary Union and its current challenges.
The Abouts

Textbooks and internet resources

- The Economics of Money, Banking and Financial Markets, by Mishkin
- The Economics of Money, Banking and Finance, by Howells and Bain
- Readings and other links will be placed on the course website
- The Economist magazine, The FT, WSJ, etc...
Basics Concepts You Must Be Aware Of

GDP - Real versus Nominal Concepts

Nominal GDP in year $t = \sum_{i=1}^{N} p_{it} \cdot q_{it}$ (1)

Real GDP (year $K$ prices) in year $t = \sum_{i=1}^{N} p_{iK} \cdot q_{it}$ (2)

Defining the price level as a deflator

$\text{Base } Z \text{ deflator}_t = \frac{\text{nominal GDP}_t}{(\text{real GDP in year } Z \text{ prices})_t}$ (3)

Calculating growth

Growth between $t$ and $t + 1 = \left( \frac{X_{t+1}}{X_t} - 1 \right)$ (4)

$\approx \ln X_{t+1} - \ln X_t$
Philosophical Points about Economics

- Economics is a way of thinking - not a set of laws and rules
- This framework for thinking can then be applied to many topics
  - Freakonomics
- Empirical work is very tricky
The Basic Concept

**Definition**

A financial system is defined as a set of markets for financial instruments, and the individuals and institutions who trade in those markets, together with the regulators and supervisors of the system.[Howells and Bain, 2003]

The basic function of the financial system is to transfer resources from those with excess funds for investment, to those who require more funds for investment.
The Basic Concept

The Financial System

Lenders

Saving

Borrowers

Return

Money and Banking (1): Introduction 11 / 42
The People
Borrowers

- Firms
- Households
- The government
- Foreigners - varies
The People
Lenders

- Households
- The government
- Firms
- Foreigners - varies

Same people - but usually in a different order.
Why do Lenders Lend?

Lenders will worry about:

- the return that they can get.
- the risk surrounding this return:
  - default risk
  - income risk
  - inflation risk
- liquidity

If we wish to encourage more lending, one way is to increase the return which we offer to lenders.
What determines borrowers behaviour?

Borrowers will worry about:

- the return that they must pay to get the funds;
- the terms of this return;
  - for example, debt is not state-contingent while equity is.
- the length and flexibility of the borrowing;
  - firms will not wish to have debts which are too easily recalled.
The Financial Account

Like in double-entry book-keeping, all deficits (borrowing) must have an offsetting surplus (lender).

In the national accounts, it is possible to look at the financial accounts of different sectors over time.

In Europe:

- Private Non-Financial Corporations (PNFCs)
- Monetary and Financial Institutions (MFIs)
- Government
- Households (and NPISH)
- Foreigners
How the Matches Occur

Lending can be:

1. Completely direct
   - lenders seeking out other agents who need to borrow.
2. Direct lending through a market.
3. Through financial intermediation:
   - direct; or
   - through a market.
The Basic Concept

The Financial System

Lenders

Borrowers

Direct

Financial Intermediation

Banks

Saving

Return

Bank Loan

Money and Banking (1): Introduction
The Different Types of Market

There are lots of different financial markets for each different type of instrument (later)

- Primary versus secondary markets
- OTC versus exchange markets
  - Dealers versus Brokers
- Money-market versus capital market (maturity)
Financial Intermediation

**Definition**

Institutions that borrow funds from people who have saved and in turn make loans to others. [Mishkin, p.7]

So financial intermediates include banks, but will also include pension funds, insurance companies, etc...

Why go through a financial intermediate:

- Reduced transaction costs
- Risk diversification
- Maturity transformation
- Reduce Asymmetric Information
  - Adverse Selection
  - Moral Hazard
Financial Intermediation

Asymmetric Information (also very important in insurance)

1. Adverse Selection
   - Occurs *before* the transaction
   - Only choose those who are most risky - therefore potentially not choose anyone at all

2. Moral Hazard
   - Occurs *after* the transaction
   - Once they have the service, their behaviour changes in undesirable ways.
The Different Types of Instruments

The main two instruments to distinguish are:

• **Equity**
  • May get an annual share of profits as dividend
  • Owns part of the company \( \Rightarrow \) voting right
  • Price varies depending on supply and demand

• **Debt**
  • Contractually fixed return
    • per period interest
    • principal at maturity date
  • Preferential debtor
  • No voting right
No Single Interest Rate

There is NOT 1 single interest rate:
The Different Types of Instruments - US

Money-market instruments

• Treasury Bills
• Negotiable bank certificates of deposit
• Commercial paper
• Repos
• Eurodollars

Capital market instruments

• Stocks
• Mortgages (includes residential and commercial/farm)
• Corporate bonds
• Overall government bonds (includes state/local, and agencies)
• Consumer loans
# The Different Types of Instruments - US

**Money Market Instruments**

<table>
<thead>
<tr>
<th>Type of instrument</th>
<th>Level in US $, billions</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Treasury Bills</td>
<td>216</td>
</tr>
<tr>
<td>Negotiable bank certificates of deposit</td>
<td>317</td>
</tr>
<tr>
<td>Commercial Paper</td>
<td>122</td>
</tr>
<tr>
<td>Repo agreements</td>
<td>57</td>
</tr>
<tr>
<td>Eurodollars</td>
<td>55</td>
</tr>
</tbody>
</table>
## The Different Types of Instruments - US

### Money Market Instruments

<table>
<thead>
<tr>
<th>Type of Instrument</th>
<th>1980</th>
<th>1990</th>
<th>2000</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Treasury Bills</td>
<td>8</td>
<td>9</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Negotiable bank certificates of deposit</td>
<td>11</td>
<td>9</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Commercial Paper</td>
<td>4</td>
<td>10</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Repo agreements</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Eurodollars</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>
## The Different Types of Instruments - US

### Capital Market Instruments

<table>
<thead>
<tr>
<th>Type of Instrument</th>
<th>Level (% of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate Stocks</td>
<td>57  71  180  144</td>
</tr>
<tr>
<td>Residential Mortgages</td>
<td>40  50  56  76</td>
</tr>
<tr>
<td>Commercial and Farm Mortgages</td>
<td>13  14  12  15</td>
</tr>
<tr>
<td>Corporate Bonds</td>
<td>13  17  23  24</td>
</tr>
<tr>
<td>Government Bonds</td>
<td>18  22  29  36</td>
</tr>
<tr>
<td>Consumer Loans</td>
<td>13  14  12  15</td>
</tr>
</tbody>
</table>
Regulation

Financial services are a highly regulated industry (and have been for a long time). But why do we regulate financial services?

• Banking relies on confidence of public
  • fractional reserves system
  • liquidity mismatch between assets and liabilities
• Contagion...
• Consumer protection...not caveat emptor!
Problems because of regulation:

- Moral hazard
- Compliance costs
- Costs of entry and exit are higher - more monopoly power!
### Bank Balance Sheets

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserves</td>
<td>Checkable Deposits</td>
</tr>
<tr>
<td>Securities</td>
<td>Time Deposits</td>
</tr>
<tr>
<td>Loans</td>
<td>Borrowings</td>
</tr>
<tr>
<td>Other assets (e.g. physical capital)</td>
<td>Bank Capital</td>
</tr>
</tbody>
</table>

- Reserves 4%
- Securities 23%
- Loans 66%
- Other assets (e.g. physical capital) 7%
- Checkable Deposits 7%
- Time Deposits 59%
- Borrowings 26%
- Bank Capital 8%

**decreasing liquidity**

**Basic idea is to make more on the assets than you pay on the liabilities ⇒ profits**
Bank T-accounts

**T-account ≡ Change in balance sheet**

New account opened with cash (£100)

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserves + £100</td>
<td>Deposits + £100</td>
</tr>
</tbody>
</table>

If opened with a cheque from another bank, pretty much the same - cash in process of collection.
### Bank T-accounts

Reserves = RR + ER

Assumes a 10% required reserves (% of deposits)

- ...but no (little) interest on reserves!
- So want to make use of the excess reserves of £90

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Reserves</td>
<td>+£10  Deposits</td>
</tr>
<tr>
<td>Excess Reserves</td>
<td>+£90</td>
</tr>
</tbody>
</table>
Bank T-accounts

Can create new loans of £90

- First assume money immediately leaves bank after put in customer’s account

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Reserves</td>
<td>+£9 -£9</td>
<td>Deposits</td>
</tr>
<tr>
<td>Excess Reserves</td>
<td>-£90 +£81 -£81</td>
<td>+£90</td>
</tr>
<tr>
<td>Loans</td>
<td>+£90</td>
<td></td>
</tr>
</tbody>
</table>
Bank T-accounts

Can create new loans of £90

- Or if money stays in the bank...have 81 of excess reserves
- Can repeat the process

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Reserves</td>
<td>+£9</td>
</tr>
<tr>
<td>Excess Reserves</td>
<td>-£90 + £81</td>
</tr>
<tr>
<td>Loans</td>
<td>+£90</td>
</tr>
<tr>
<td>Deposits</td>
<td>+£90</td>
</tr>
</tbody>
</table>
Could have bought securities worth £90

- This assumes I buy the securities off someone outside my bank
- What if I bought securities off one of my own customers?

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Reserves</td>
<td></td>
</tr>
<tr>
<td>Excess Reserves</td>
<td>-£90</td>
</tr>
<tr>
<td>Loans</td>
<td></td>
</tr>
<tr>
<td>Securities</td>
<td>+£90</td>
</tr>
</tbody>
</table>
Bank Management (briefly)

1. Liquidity and Reserve management
2. Asset and liability management
3. Capital adequacy - trade-off
   - Capital prevents failures (cushion against drop in value of assets);
   - Capital lowers return to shareholders;
4. Credit risk and interest rate risk
Liquidity and Reserve management

Consider the Bank which created the £90 of extra loans and kept no excess reserves (assume this is the whole balance sheet of the firm):

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Reserves £10</td>
<td>Deposits £100</td>
</tr>
<tr>
<td>Excess Reserves 0</td>
<td></td>
</tr>
<tr>
<td>Loans £90</td>
<td></td>
</tr>
</tbody>
</table>

If there is a (relatively small) £10 withdrawal of deposits, deposits drop by £10 and reserves would be exhausted (-£10). The Bank is about to fail - they have a reserve shortage of £9...
Liquidity and Reserve management

Consider the Bank which created the £90m of extra loans and kept no excess reserves (assume this is the whole balance sheet of the firm):

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Reserves</td>
<td>£0</td>
</tr>
<tr>
<td>Excess Reserves</td>
<td>0</td>
</tr>
<tr>
<td>Loans</td>
<td>£90</td>
</tr>
<tr>
<td>Deposits</td>
<td>£90</td>
</tr>
</tbody>
</table>

They need to:

- Borrow the required reserves, at a cost, from other banks (borrowing liabilities + £9, reserves + £9);
- Borrow the required reserves, at the discount rate, from the CB;
- Try to recall loans worth £9 and put the money into reserves;
- Could sell securities or physical capital for £9m.
Bank Management (briefly)

1. Liquidity and Reserve management
2. Asset and liability management
3. Capital adequacy - trade-off
   • Capital prevents failures (cushion against drop in value of assets);
   • Capital lowers return to shareholders;
4. Credit risk and interest rate risk
The Macroeconomic Effects of Financial Markets

Problem

Why might the financial system have macroeconomic effects?
Questions?