Lecture 1: Introduction to data and theoretical concepts

In this introductory lecture we are going to spend part of the session looking at some basic banking data as background for the more theoretical work in the course. The second half is revision of key economic and financial concepts which pervade the course, and an account of the economics of the financial system as a whole.

Bank’s balance sheet and profit and loss

- balance sheets from individual institution
How does it differ from a commercial company?
- Low equity
- Low fixed assets
- Assets are loans and securities
- Liabilities are deposits
- Off balance sheet activities
- Ownership structure

- comparing balance sheets across countries
Some key components of balance sheets

- profit and loss from individual institution
- comparing profit and loss across countries

Royal Bank of Scotland

Company Announcement -
2000 Pro Forma Interim Results

Consolidated Balance Sheet as at 30 June 2000

	Actual 30 June 2000 £m
Assets	
Cash and balances at central banks and items in the course of collection	**6,449**
Treasury bills and other eligible bills	**5,332**
Loans and advances to banks	**37,324**
Loans and advances to customers	**156,292**
Debt securities and equity shares	**54,297**
Intangible fixed assets	**12,121**
Other assets	**24,132**

	295,947
Long-term assurance assets attributable to policyholders	**10,258**

Total assets	**306,205**

Liabilities	
Deposits by banks and items in the course of transmission to other banks	**35,472**
Customer accounts	**166,221**
Debt securities in issue	**23,614**
Other liabilities	**37,348**
Subordinated liabilities	**10,092**
Minority interests	**759**
Shareholders' funds including non-equity interests	**22,441**

	295,947
Long-term assurance liabilities to policyholders	**10,258**

Total liabilities	**306,205**

Memorandum items:	
Contingent liabilities and commitments	**99,699**

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Consolidated Profit and Loss Account (pro forma basis)

	6 months ended 30 June 2000 £m	6 months ended 30 June 1999 £m
Interest receivable	**7,059**	6,005
Interest payable	**4,191**	3,412
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Net interest income	**2,868**	2,593
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Dividend income	**17**	18
Fees and commissions receivable	**1,970**	1,753
Fees and commissions payable	**(394)**	(334)
Dealing profits	**574**	526
Other operating income	**489**	552
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	2,656	2,515
General insurance - earned income	**621**	425
- reinsurance	**(171)**	(78)
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Non-interest income	**3,106**	2,862

Total income	**5,974**	5,455
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Administrative expenses		
- staff costs	**1,747**	1,771
- premises and equipment	**425**	430
- other	**769**	673
Depreciation of tangible fixed assets	**389**	399
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Operating expenses	**3,330**	3,273
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Profit before other operating charges	**2,644**	2,182
General insurance - gross claims	**462**	356
- reinsurance	**(139)**	(67)
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Profit before provisions for bad and doubtful debts	**2,321**	1,893
Provisions for bad and doubtful debts	**284**	242
Amounts written off investments	**26**	12
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Group operating profit before goodwill amortisation and integration costs	**2,011**	1,639

Goodwill amortisation	**308**	280
Integration costs	**189**	-
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Group profit before tax	**1,514**	1,359
Tax	**(548)**	(484)
	--------	**--------**
	966	875
	--------	**--------**
Group profit after tax	**966**	875
Minority interests	**(22)**	(27)
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Profit after minority interests	**944**	848
Preference dividends	**162**	145
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Profit attributable to ordinary shareholders	**782**	703
Basic earnings per ordinary share	**29.5p**	26.6p
Adjusted earnings per ordinary share (Note 6)	**46.1p**	37.2p

ROA=annualised pre tax profit/assets
ROE=APTP/equity
Cost-income ratio=operating expenses/total income
Margin=annualised net interest income/assets

Banking market structure

Number of banks, size, efficiency

Indicators of banking capacity (1995)

	Population per institution	Population per branch	Population per employee	Population per ATM/cash dispenser	Population density per sq.km
Belgium	67,333	1315	133	2778	352
Denmark	46,044	2381	112	4830	121
Germany	23,400	1719[1)]	108	2283	229
Greece	584,105	4545	260	7757	79
Spain	123,270	1190	168	1468	78
France	97,800	2272	142	2544	106
Ireland	61,661	3100	175	3891	51
Italy	60,786	2326	159	2695	190
Netherlands	89,080	2325	138	2816	379
Austria	7,626	1402	106	2380	96
Portugal	212,704	2778	162	2688	107
Finland	14,488	2632	159	1123	15
Sweden	78,571	3448	204	3759	20
United Kingdom	104,285	3572	144	2793	239
United States	11,025	3778	139	2143	28

Banks’ restructuring

	Concentration (share of 5 largest banks in total assets)			Number of branches				Employment			
	1990	1997	2003	1990	1997	2003	Change	1990	1997	2003	Change
US	13	21	24	72.8	77.3	84.8	0.0	1911	1847	2129	0.0
Japan	42	39	42	24.7	25.4	22.7	–11.8	593	561	447	–27.8
Germany	17	17	22	43.3	47.1	38.2	–22.3	696	751	732	–3.5
France	52	38	45	25.7	25.5	26.2	0.0	399	386	384	–3.8
UK	49	47	41	19.0	14.3	12.9	–32.4	423	360	360	–15.0
Italy	24	25	27	17.7	25.6	29.9	0.0	324	343	341	–4.3
Canada	83	87	87	8.7	9.4	10.4	0.0	211	264	279	0.0
Spain	38	47	55	35.2	37.6	39.4	0.0	252	242	239	–6.6
Australia	65	69	77	6.9	6.1	4.9	–31.2	357	308	344	–3.4
Netherlands	74	79	84	8.0	7.0	3.7	–54.1	123	120	140	–9.6
Belgium	48	57	83	8.3	7.4	5.6	–33.2	79	77	75	–5.6
Sweden	70	90	90	3.3	2.5	2.0	–37.2	45	43	42	–7.7
Austria	35	44	44	4.5	4.7	4.4	–6.2	75	75	75	–2.4
Switzerland	54	73	80	4.2	3.3	2.7	–35.9	120	107	100	–16.8
Norway	68	59	60	1.8	1.6	1.2	–32.9	31	24	22	–22.4
Finland	65	77	79	3.3	1.7	1.6	–55.8	50	30	27	–49.3

Introduction to theoretical concepts

Asymmetric information and incentive problems

Adverse selection: pricing policy induces low average quality of sellers in market, where asymmetric information prevents buyer from distinguishing quality
Example of adverse selection (lemons)

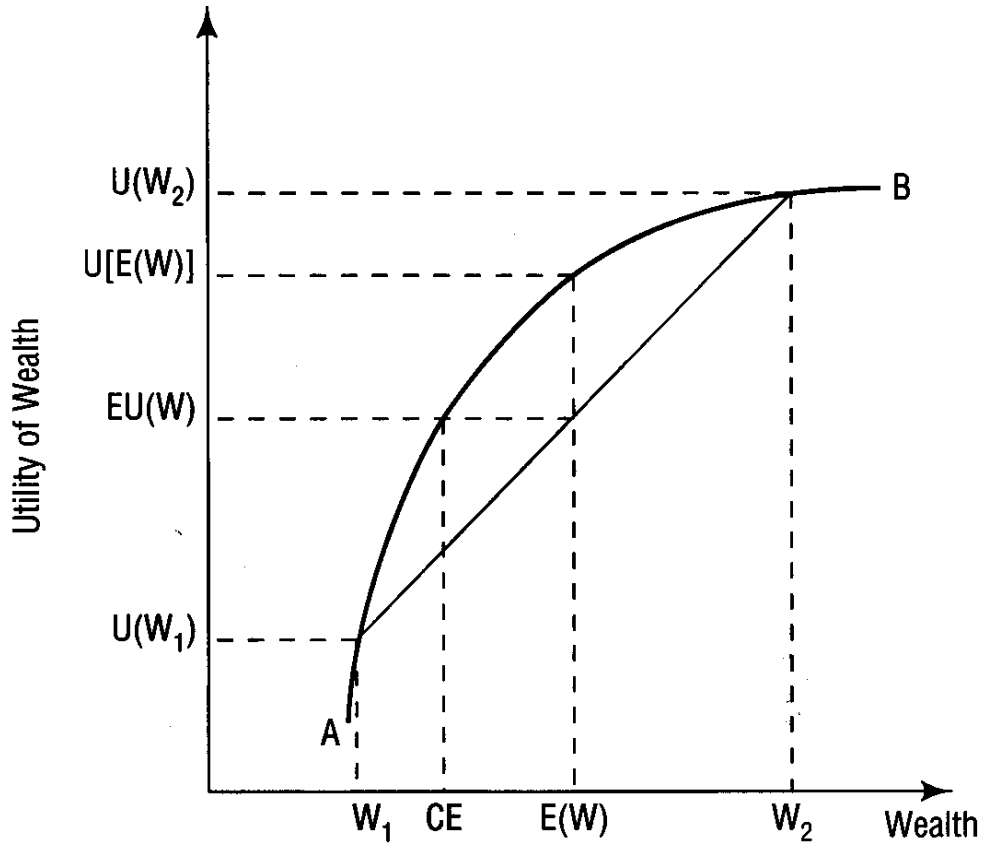
Moral hazard: incentive of beneficiary (agent) of a fixed value in presence of asymmetric information and incomplete contracts, to change behaviour after contract has been signed, to maximise wealth to the detriment of provider of the contract (principal). Example:

Production plan	Payoff in period 2		Market value in period 1		
	State 1	State 2	Total	Debt	Equity
a	7	7	7	5	2
b	1	10	5.5	3	2.5

Distinction of moral hazard from fraud

Risk preferences

Concept of risk aversion using the utility/wealth diagram (below) – individuals more risk averse than banks.



Diversification

e.g. in bank loan book

$$\sigma_p^2 = y_A^2\sigma_A^2 + 2y_Ay_B\,\mathrm{Cov}(A,B) + y_B^2\sigma_B^2$$

$$\mathrm{Cov}(A,B) = \rho_{AB}\sigma_A\sigma_B$$

$$\sigma_p^2 = y_A^2\sigma_A^2 + 2y_Ay_B\,\rho_{AB}\sigma_A\sigma_B + y_B^2\sigma_B^2$$

Case of positive and negative correlations

Options

Traded by banks and concept applicable widely. Definition of put and call options.

$$C(t=1) = \begin{cases} X - P_c & \text{if } X > P_c \\ 0 & \text{if } X \le P_c. \end{cases}$$

$$P(t=1) = \begin{cases} P_p - X & \text{if } X < P_p \\ 0 & \text{if } X \ge P_p. \end{cases}$$

Importance of volatility- enhances value

Market efficiency

$$E(P_{t+1} \mid P_t) = E(P_{t+1} \mid P_t, P_{t-1}, P_{t-2}, \ldots, P_0).$$

Overall definition - weak (historical information) semi strong (all public information) and strong form (all available information). More efficient, less role for intermediaries such as banks

Market completeness

Whether there are securities markets available which cover all states of nature - limits ability to insure against contingencies. Gives role to intermediaries

	1	2	3
Security 1 payoff	10	20	15
Security 2 payoff	15	0	25

Nash equilibrium

Transact and selfishly maximise non-co-operative game, equilibrium when neither can gain by changing his actions. Can have multiple equilibria - good and bad, depending on trust and information.

Applications include bank runs

		Prisoner 1	
		Confess	Silent
Prisoner 2	Confess	1.1	4.0
	Silent	0.4	5.5

Functions of the financial system

Institutional form of the financial system evolves over time but functions are constant (adapt and improve under competitive pressure)
Concept of “innovation spiral”
Question which institutions fulfil functions more efficiently:

(1) The provision of means for **clearing and settling payments** to facilitate exchange of goods, services and assets.
(2) The provision of a mechanism for **pooling of funds** from individual households so as to facilitate large-scale indivisible undertakings, and the subdivision of shares in enterprises to facilitate diversification.
(3) The provision of means to **transfer economic resources** over time, across

geographic regions, countries or among industries.
(4) The provision of means to **manage uncertainty and control risk**.
(5) Providing **price information**, thus helping to co-ordinate decentralised decision making in various sectors of the economy.
(6) Providing means to **deal with incentive problems** when one party to a financial transaction has information the other does not, or when one is an agent of the other, and when control and enforcement of contracts is costly (e.g. moral hazard).

Note links to theoretical concepts –
agency, efficiency etc.

The evolution of financial systems

Stylised analysis of how financial systems evolve:

- **Bank oriented phase**
- **Market oriented phase**
- **Securitised phase**

In all phases banks provide liquidity and payments services but locus of other activities switches to markets and institutional investors

Underlying forces: - technological developments, deregulation, wealth of individuals, see following data

Different types of financial system:
- Market oriented (UK, US, Canada) more securitised.
- Bank dominated (Germany, Japan, France, Italy) remain in earlier phases

Aspects of financial structure 2000 (1970)

Percent	Size indicator (total financial assets/GDP)	Financial intermediation ratio	Of which: bank intermediation	Of which: institutional intermediation
UK	9.7 (4.7)	0.52 (0.32)	0.44 (0.58)	0.38 (0.28)
US	8.4 (4.1)	0.44 (0.33)	0.21 (0.58)	0.44 (0.31)
Germany	7.9 (2.9)	0.45 (0.44)	0.73 (0.84)	0.23 (0.10)
Japan	11.9 (3.8)	0.52 (0.39)	0.24 (0.45)	0.17 (0.10)
Canada	6.6 (4.7)	0.47 (0.29)	0.38 (0.45)	0.35 (0.23)
France	11.4 (4.4)	0.39 (0.34)	0.65 (0.94)	0.46 (0.05)
Italy	7.1 (3.4)	0.35 (0.36)	0.64 (0.98)	0.31 (0.06)

Household sector assets 2000 (1970)

Percent	Equities	Bonds	Deposits	Institutional investment
UK	17 (24)	1 (7)	22 (34)	56 (23)
US	25 (36)	7 (13)	12 (28)	49 (22)
Germany	16 (10)	10 (8)	34 (59)	34 (15)
Japan	3 (12)	5 (6)	54 (55)	31 (14)
Canada	27 (27)	5 (14)	25 (31)	41 (22)
France	37 (26)	2 (6)	25 (49)	23 (6)
Italy	26 (11)	19 (9)	25 (45)	30 (10)

Corporate sector liabilities, 2000 (1970)

Percent	Equities	Bonds	**Loans**
UK	67 (49)	7 (7)	21 (15)
US	63 (55)	14 (14)	10 (15)
Germany	49 (27)	1 (3)	37 (47)
Japan	29 (16)	10 (2)	40 (48)
Canada	54 (46)	18 (12)	12 (15)
France	70 (41)	4 (3)	14 (54)
Italy	52 (32)	1 (8)	30 (60)

Household and corporate assets and liabilities/GDP 2000 (1970)

Percent	Household assets	Household liabilities	**Corporate liabilities**
UK	310 (182)	80 (39)	308 (137)
US	284 (190)	75 (48)	196 (117)
Germany	178 (78)	74 (38)	167 (85)
Japan	291 (98)	84 (38)	274 (168)
Canada	217 (148)	68 (51)	166 (143)
France	235 (114)	46 (42)	417 (177)
Italy	228 (92)	30 (7)	178 (92)