Macroeconomics for Business (ME2720)
The Financial System

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The Financial System

A Flow Model of the Economy
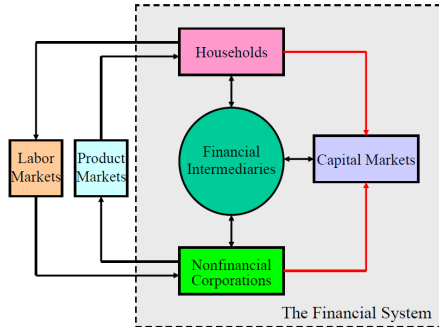
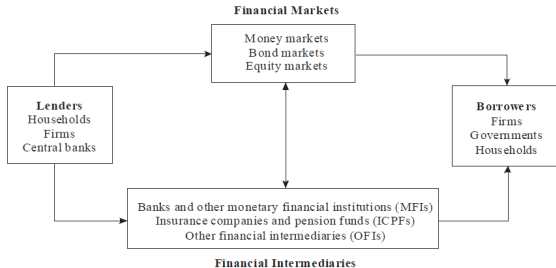## OVERVIEW FROM ALLEN AND CARLETTI

Figure 1. An overview of the financial system

Financial Markets

Money markets
Bond markets
Equity markets

Lenders
Households
Firms
Central banks

Borrowers
Firms
Governments
Households

Banks and other monetary financial institutions (MFIs)
Insurance companies and pension funds (ICPFs)
Other financial intermediaries (OFIs)

Financial Intermediaries

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17

4

## A Functional Perspective of the Financial System

- The evolution of the financial system can be described as an innovation spiral, in which:
  - Organized markets and intermediaries compete with each other in a static sense, and
  - Complement each other in a dynamic sense.
  - Source: Merton (1995).

- Financial innovation drives toward the goal of greater economic efficiency
  - By reducing transaction costs.

- The main objective of the financial system is to allocate resources in the economy. It is to provide:
    1. Ways of clearing and settling payments.
        - Facilitating the exchange of goods, services and assets.
    2. A mechanism of the pooling of resources.
        - Faciliting the undertaking of large, indivisible enterprise.
    3. Ways to transfer economic resources through time and space.
        - E.g., life-cycle allocation of consumption and firm investment.
    4. Ways of managing risk.
        - Risk pooling and risk sharing opportunities.
    5. Price information.
        - Faciliting decentralized decision making across the economy.
    6. Ways of dealing with incentive problems.
        - E.g., asymmetric information.

The Innovation Spiral

- The evolution of the financial system can be described as an innovation spiral.

- Examples:
    - General technological development and lowering of transactions costs has intensified competition.
    - The ATMs started to be accessible to the wider public starting in the 1970s.
    - Credit cards.
    - Liquid markets for commercial paper enabling money-market mutual funds to compete with banks.
    - Venture capital.
    - FinTech.

Why Not Simply Focus on Current Institutions?

- Financial markets differ in size, complexity, and technology across countries and over time.
  - Due to political, historical, cultural differences...

- Even the institutions with the same names do not perform the same things over time.

- Therefore: the functions of the financial markets as anchor in the analysis.
  - Functions vary less over time and space.
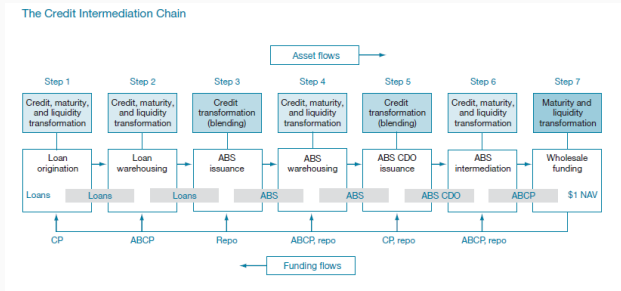 - Insitutional form follows function.
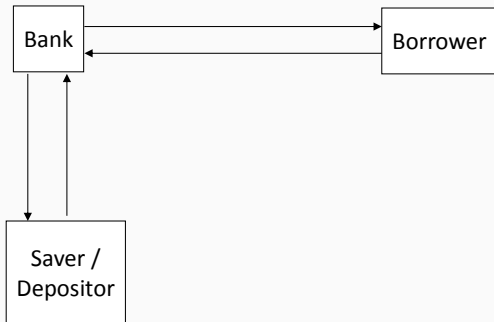
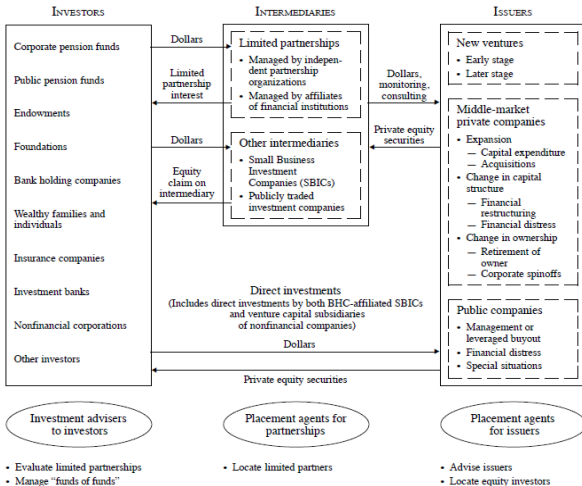Diagram 1. Organized private equity market

Table 3
Evolution of stock market capitalization over GDP
Stock market capitalization to GDP is the ratio of the aggregate market value of equity of domestic companies to GDP. Sources are in the Data Appendix, which is available on request from the authors.

Country	1913	1929	1938	1950	1960	1970	1980	1990	1999
Argentina	0.17				0.05	0.03	0.11		0.15
Australia	0.39	0.50	0.91	0.75	0.94	0.76	0.38	0.37	1.13
Austria	0.76					0.09	0.03	0.17	0.17
Belgium	0.99	1.31			0.32	0.23	0.09	0.31	0.82
Brazil	0.25						0.05	0.08	0.45
Canada	0.74		1.00	0.57	1.59	1.75	0.46	1.22	1.22
Chile	0.17				0.12	0.00	0.34	0.50	1.05
Cuba	2.19								
Denmark	0.36	0.17	0.25	0.10	0.14	0.17	0.09	0.67	0.67
Egypt	1.09				0.16		0.01	0.06	0.29
France	0.78		0.19	0.08	0.28	0.16	0.09	0.24	1.17
Germany	0.44	0.35	0.18	0.15	0.35	0.16	0.09	0.20	0.67
India	0.02	0.07	0.07	0.07	0.07	0.06	0.05	0.16	0.46
Italy	0.17	0.23	0.26	0.07	0.42	0.14	0.07	0.13	0.68
Japan	0.49	1.20	1.81	0.05	0.36	0.23	0.33	1.64	0.95
Netherlands	0.56		0.74	0.25	0.67	0.42	0.19	0.50	2.03
Norway	0.16	0.22	0.18	0.21	0.26	0.23	0.54	0.23	0.70
Russia	0.18								0.11
South Africa				0.68	0.91	1.97	1.23	1.33	1.20
Spain							0.17	0.41	0.69
Sweden	0.47	0.41	0.30	0.18	0.24	0.14	0.11	0.39	1.77
Switzerland	0.58					0.50	0.44	1.93	3.23
UK	1.09	1.38	1.14	0.77	1.06	1.63	0.38	0.81	2.25
US	0.39	0.75	0.56	0.33	0.61	0.66	0.46	0.54	1.52

Causes of Financial Development

- Popular explanations:
  - Demand
  - Legal institutions (enforcement of contracts, etc.)

- Interest group theory (e.g., Rajan and Zingales, 2003):
  - Incumbents do not want financial development because they do not want competition.
  - New firms do!

- Incumbents' position weakened by both cross border trade and capital flows.

Recent Signs of Capital Misallocation

- The financial sector (as a share of the economy) has grown over the last 20-30 years (Greenwood and Scharfstein, 2013).
  - Growth from fees (e.g., active asset management).
- Labor and capital share are falling – profit share increasing due to markups (Barkai, 2017).
- The positive relationship between capital allocation and investment opportunities breaks down mid 1990s (Lee, Shin and Stulz, 2016).
- Capital flows to productive and investing firms up to around 2000, but not after that. Lack of competition and short-term behavior appear to explain this shift (Gutierrez and Philippon, 2016).

# Valuation

Basic Valuation

- It is about figuring out the timing and risk of cash flow streams connected to the asset:

$$PV = \frac{CF_1}{(1 + r_1)} + \frac{CF_2}{(1 + r_2)^2} + ... + \frac{CF_N}{(1 + r_N)^N} = \sum_{n=1}^{N} \frac{CF_N}{(1 + r_n)^n}$$

- Numerator: captures timing of cash flows.
  - CF now are different from CF later.
- Denominator: captures risk of cash flows.
  - Risk creates significant challenges.

Framework of the Financial Analysis

1. Cash raised from investors (seeling financial assets)
2. Cash invested in real assets (tangible and intangible)
3. Cash generated by operations
4. Cash reinvested
5. Cash returned to investors (debt repayments, dividends, etc.)
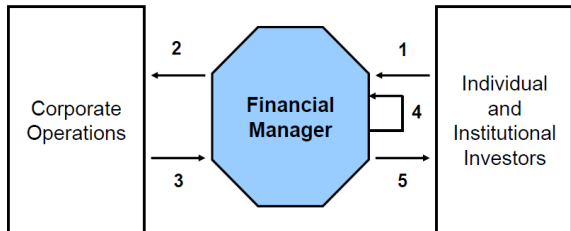
Financial Contracts And Instruments

The Equity vs. Debt Contract

- Properties of the equity vs. debt contract:
    - Residual claim on cash flows vs. Fixed claims on cash flows.
    - Unlimited upside vs. Limited upside.
    - Important role in management vs. No role in management.
    - Perpetual vs. Fixed maturity.
    - Dividends vs. Interest payments.
    - Not tax deductible vs. Tax deductible.
    - No risk of bankruptcy vs. Risk of bankruptcy.

- Types of equity and debt contracts:
    - Public equity and debt.
        - Equity and debt issued on a public market.
    - Private equity and debt.
        - Equity in corporations not listed on an exchange and bank loans.

Table 3. Holdings of shares listed on Swedish marketplaces, per sector
Per cent

Sector	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Non-financial companies	9.0	9.4	9.5	9.1	9.2	12.0	11.5	11.9	12.4	13.5
Financial companies										
Banks, finance institutions, etc.	2.5	2.2	1.6	2.1	2.2	1.8	2.3	1.9	2.2	1.9
Investment companies	5.2	5.6	5.4	5.3	5.4	5.3	5.5	5.4	5.6	5.3
Mutual funds	11.2	10.9	11.4	12.6	12.3	11.9	11.5	11.7	11.8	11.9
Insurance companies, pension institutions	8.1	8.3	9.0	9.1	8.9	8.7	8.3	8.0	8.1	7.5
Financial companies, total	27.0	27.0	27.4	29.1	28.8	27.7	27.6	27.0	27.7	26.6
Public sector										
Central government	4.5	4.5	4.6	4.7	3.8	3.1	2.9	2.0	1.8	1.4
Local government	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social insurance funds	3.2	3.2	3.5	3.4	3.1	3.3	2.8	2.8	2.6	2.5
Public sector, total	7.8	7.8	8.2	8.1	6.9	6.4	5.7	4.8	4.4	3.9
Households	14.3	13.4	14.5	13.9	13.3	11.2	10.9	10.9	11.1	11.9
Non-profit making organisations										
Companies	2.1	2.0	2.1	1.8	1.6	1.7	1.9	2.2	2.5	2.3
Households	2.7	2.4	2.5	2.5	2.4	2.2	2.2	2.2	1.9	1.8
Rest of the world	37.2	38.0	35.8	35.4	37.8	38.7	40.3	41.0	39.9	40.0
All sectors, total	100	100	100	100	100	100	100	100	100	100

Note. The major decline in households' equity wealth in 2011 is largely due to the many transfers taking place of shareholdings from the household sector to the non-financial corporate sector.
Source: Statistics Sweden

Valuation of Equity: The DCF Model

- Discounted Free Cash Flow (DCF) Model:

$$V_0 = \frac{FCF_1}{1 + r_{WACC}} + ... + \frac{FCF_N}{(1 + r_{WACC})^N} + \frac{V_N}{(1 + r_{WACC})^N}$$

- Valuing the stock with the DCF-model:

$$P_0 = \frac{V_0 + Cash_0 - Debt_0}{\text{Shares Outstanding}_0}$$

Owners of Debt in Sweden

Table D. Issuers and investors on the bond market
SEK billion

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Issuers in the bond market										
Central government	812	768	753	741	802	796	761	801	794	785
Mortgage institutions	747	821	937	1 035	1 105	1 241	1 159	1 223	1 267	1 317
Banks	115	196	298	290	290	297	372	509	538	526
Municipalities and county councils	20	21	18	18	18	30	40	63	89	106
Non-financial companies	117	143	164	169	188	192	210	283	330	380
Other credit market companies	81	90	88	71	78	94	70	115	136	154
Total	1 891	2 037	2 257	2 324	2 482	2 650	2 612	2 994	3 155	3 267

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Investors on the bond market										
AP funds	301	326	266	268	293	308	315	318	406	400
Insurance companies	701	744	834	1 114	1 087	1 205	1 219	1 194	1 310	1 297
Banks	281	337	475	473	346	364	370	431	420	468
Rest of the world	545	537	459	462	462	581	701	896	800	741
Companies and others	63	93	223	7	294	191	7	154	220	361
Total	1 891	2 037	2 257	2 324	2 482	2 650	2 612	2 994	3 155	3 267

Sources: Statistics Sweden, annual reports (AP funds) and the Riksbank

Bonds

- Sovereign bonds: issued by countries.
    - Considered risk free. No default risk.

- Corporate bonds: issued by corporations.
    - Credit risk from risk of default

- Investors pay less for bonds with credit risk than they would for an otherwise identical default-free bond.

Bond Terminology

- Bond Certificate
  - States the terms of the bond.

- Maturity Date
  - Final repayment day.

- Term
  - The time remaining until the repayment date.

- Coupon
  - Promised interest payments.

- Face Value
  - Notional amount used to compute the interest payments.

Valuation of Bonds

- Cash flows associated with a bond: coupon payments (CPN) and notional amount (FV).

- Discounting the cash flows connected to the bond:

$$P_0 = \frac{CPN_1}{1 + YTM_1} + ... + \frac{CPN_N}{(1 + YTM_N)^N} + \frac{FV_N}{(1 + YTM_N)^N}$$

- Difference from DCF: Here you know P_0, CPN and FV and solve for YTM.
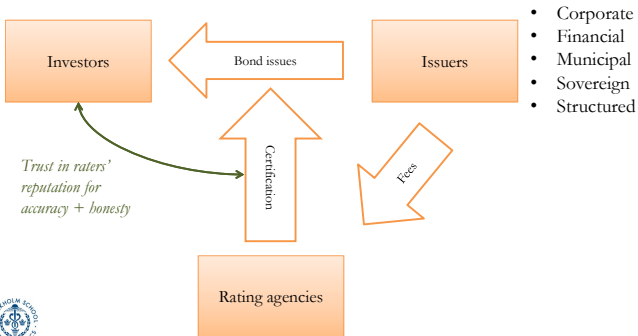
Macroeconomics Application:
Financing A Low Carbon Economy

Finance and Market Failures

- There are **three market failures**:
    - Environmental externality – Internalize costs.
    - Knowledge externality – Internalize gains.
    - Capital market imperfections.
        - Limited collateral value, agency costs, etc.
        - Debt vs equity financing.

Finance and Market Failures

- It is about lowering the cost of capital of investing in low carbon assets – which means lower expected return for investors.
    - Accounting standards and transparency.
    - Investor protection.
    - Etc.

- Needs to affect pricing of high and low carbon emitting technologies:
    - Policy landscape: Subsidies "dirty" vs "clean" technologies.
    - Research subsidies in clean technologies (lower price on low carbon assets).
    - Carbon tax (higher price on high carbon assets).

Financing A Low Carbon Economy: Back to Basics

1. Cash raised from investors (seeling financial assets)
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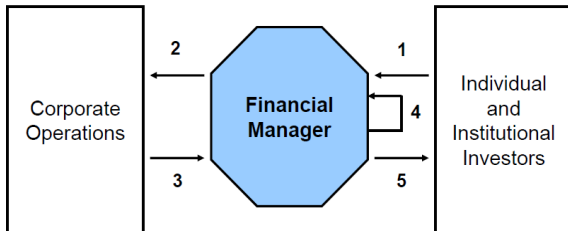
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- Numerator: captures timing of cash flows.

- Denominator: captures risk of cash flows.

We're Done!

- Thanks!