FINANCIAL MARKETS AND INSTITUTIONS

MORTGAGE MARKETS

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Prof. Alberto Dreassi – adreassi@units.it

DEAMS
University of Trieste

AGENDA

- Purpose and features of mortgages
- Types of mortgages
- Secondary mortgage markets and their role in the financial crises

PURPOSE AND FEATURES

- Long-term loan
- Secured by real estate
- Especially for residential home purchases but also commercial/industrial assets
- Repayment involves periodic payments of principal and interest (amortisation), as opposed by balloon loans
- IR can be fixed, variable, or a combination with several possible variations

PURPOSE AND FEATURES

- IR are influenced by:
  - market rates, duration, discount points at contract's inception
  - collateral's quality (lien), down payments (f.i. 80/20) and insurance (P/C, life and private mortgage insurance – PMI)
  - debtors' quality: credit scoring, available income, current equity and debt structure, history, etc.
  - lenders' strategy and expectations

PURPOSE AND FEATURES

Amortisation plans (variations exist, these are the most recurrent):

- Example: principal 100k€, IR 7%, maturity 10y, yearly inst., fees: 1.000 upfront, 50€/inst.
  - "French": fixed installment

Year	Instalment	Principal	Interest	Debt paid	Debt res.	CF
0					100.000	-99.000
1	14.238	7.238	7.000	7.238	92.762	14.288
2	14.238	7.744	6.493	14.982	85.018	14.288
3	14.238	8.287	5.951	23.269	76.731	14.288
4	14.238	8.867	5.371	32.135	67.865	14.288
5	14.238	9.487	4.751	41.622	58.378	14.288
6	14.238	10.151	4.086	51.774	48.226	14.288
7	14.238	10.862	3.376	62.636	37.364	14.288
8	14.238	11.622	2.616	74.258	25.742	14.288
9	14.238	12.436	1.802	86.694	13.306	14.288
10	14.238	13.306	931	100.000	0	14.288

  - "Italian": fixed principal

Year	Instalment	Principal	Interest	Debt paid	Debt res.	CF
0					100.000	-99.000
1	17.000	10.000	7.000	10.000	90.000	17.050
2	16.300	10.000	6.300	20.000	80.000	16.350
3	15.600	10.000	5.600	30.000	70.000	15.650
4	14.900	10.000	4.900	40.000	60.000	14.950
5	14.200	10.000	4.200	50.000	50.000	14.250
6	13.500	10.000	3.500	60.000	40.000	13.550
7	12.800	10.000	2.800	70.000	30.000	12.850
8	12.100	10.000	2.100	80.000	20.000	12.150
9	11.400	10.000	1.400	90.000	10.000	11.450
10	10.700	10.000	700	100.000	0	10.750

PURPOSE AND FEATURES

Amortisation plans: calculation

	French	Italian
Principal (t)	$R \cdot v^{n-t+1}$	$\frac{K}{n}$
Interests (t)	$R \cdot (1 - v^{n-t+1})$	$\frac{K}{n} \cdot (n-t+1) \cdot i$
Installment (t)	$K \cdot a_{n\neg i}$	$\frac{K}{n} \cdot [1 + i \cdot (n-t+1)]$

- *K*=total debt
- *n*=number of installments
- *i*=interest rate
- *t*=t-th period
- *R*=installment
- $a_{n\neg i} = \frac{i}{1-v^n}, v^n = \frac{1}{(1+i)^n}$

PURPOSE AND FEATURES

Among several variations, main types involve:

- can be guaranteed by public agencies (f.i. veterans)
- IR: fixed or variable (adjustable rate – ARM), with or without caps/floors, also in combination (f.i. fixed installment, variable rate)
- increasing installments, such as graduated payment (GPM, designed to allow credit qualification) and growing equity (GEM, designed to allow early repayment)
- decreasing ("option") installments offered in the past but extremely risky for lenders
- second (multiple) mortgages on same collateral are possible
- reverse annuity (RAM) increasingly diffused among elders

SECONDARY MORTGAGE MARKETS

- Mortgages are per se illiquid for lenders
- Partially also for borrowers (but: laws and regulation)
- Illiquidity threatens lenders:
  - IR risk (A/L mismatch, but also reinvestment of future flows)
  - default risk / market risk of collateral
  - loan servicing could be expensive (administrative costs)
  - loan origination itself could generate considerable returns

SECONDARY MORTGAGE MARKETS

- Financial intermediaries contributed to build secondary mortgage markets:
  - Initially, by selling loans to other investors and therefore freeing liquidity and transferring material risks
  - After, by having government facilities buying mortgages from originators and contributing to the emerging mortgage banks
  - Recently, through securitisation

SECONDARY MORTGAGE MARKETS

Securitisation:

- Issue securities backed by specific assets (mortgages, MBS) to fund new acquisitions from originators
- Useful for a number of small-size loans, unstandardised, with different maturities and other economic features, towards borrowers with different credit scores, costly to service, uncertain in default rates
- Process:
  - Creation of a pool of mortgages, serving as collateral
  - Acquisition is funded through new securities whose return and reimbursement depends on cashflows from the original pool
  - Risks are transferred to investors
  - Securities could be tranched to imply greater or lower risks of default (CDOs, collateralised debt obligations) or different maturities (CMOs, collateralised mortgage obligations): hence, +/– IR
  - Allows liquidity to originator but also diversification to investors

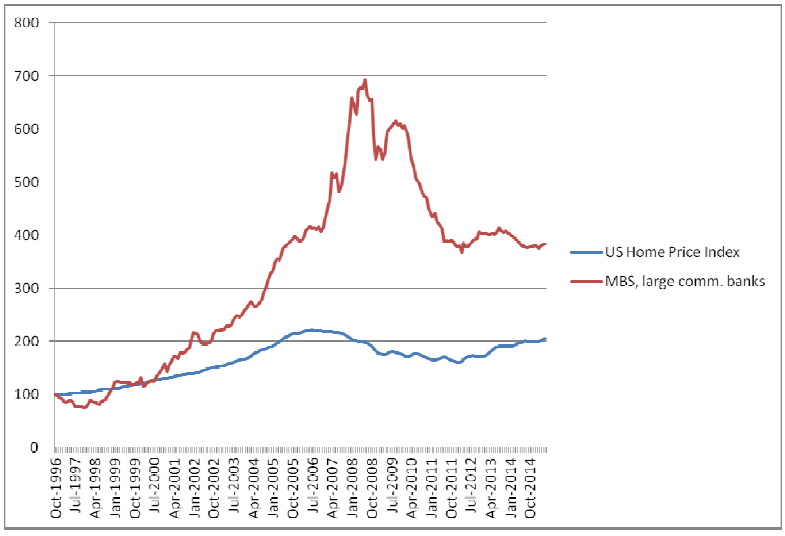
SECONDARY MORTGAGE MARKETS

What went wrong in 2006-07 (briefly)?

- To help selling securities in an increasingly saturated market economic features became more competitive: higher IR, aggressive tranching, multiple-level securitisations, etc.
- Some originators increase appeal of new securities by issuing a financial guarantee to investors (hence, retaining significant amounts of risk)
- With huge levels of demand, more risky mortgages were issued to be securitised afterwards (subprime/alt-a/NINJA mortgages)
- Demand was especially fueled by real-estate bubbles
- When default rates on mortgages began to rise, borrowers had little to lose (house values were decreasing below their outstanding debt)
- Low transparency levels on securities and on risk retention levels contributed to unprecedented and unpredicted portfolio losses for investors

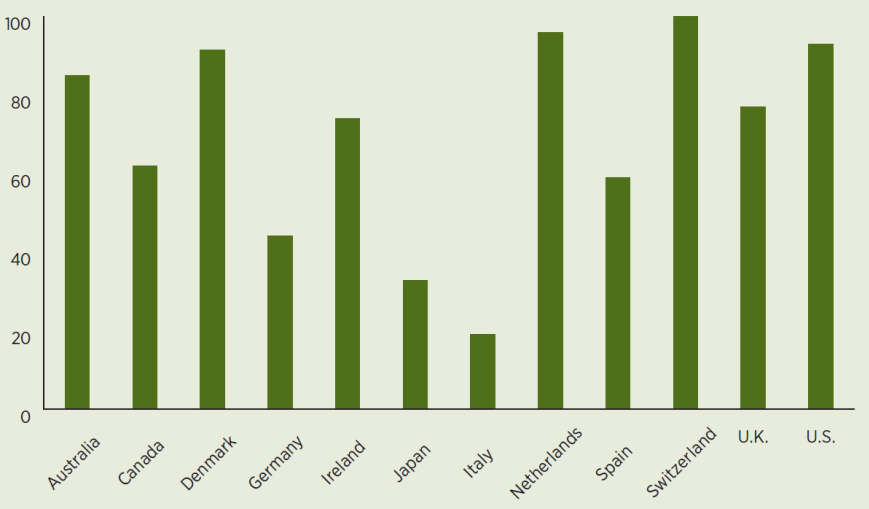
EXAMPLES

Is there a relationship between house prices and secondary mortgage markets?



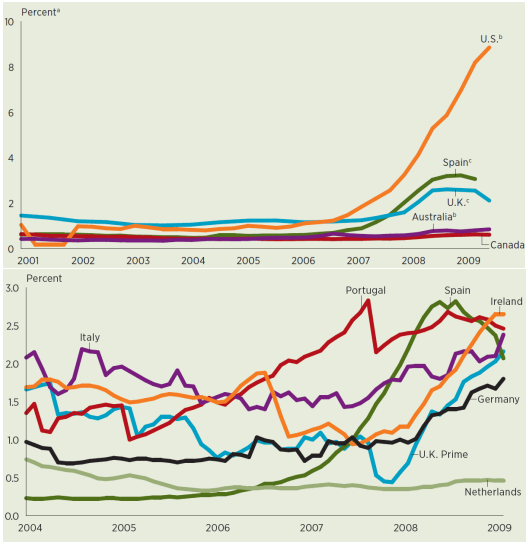
EXAMPLES

Country differences, mortgage debt outstanding / GDP (2008)



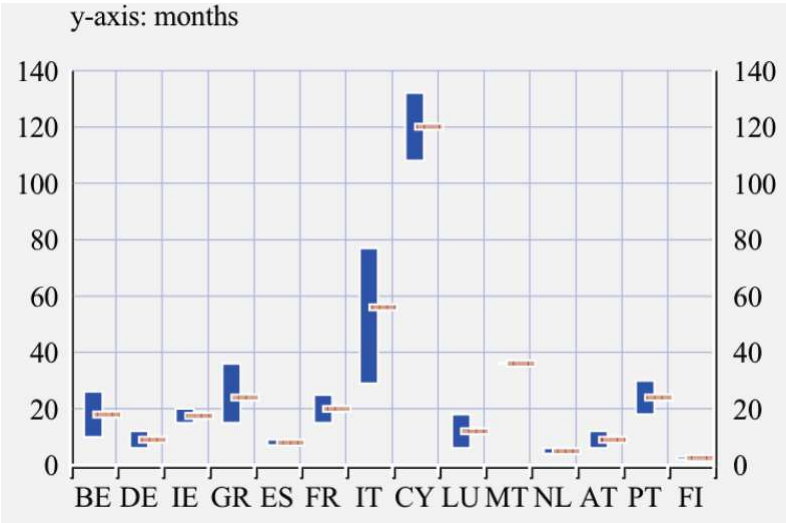
EXAMPLES

Country differences, defaults and 30d+ arrears



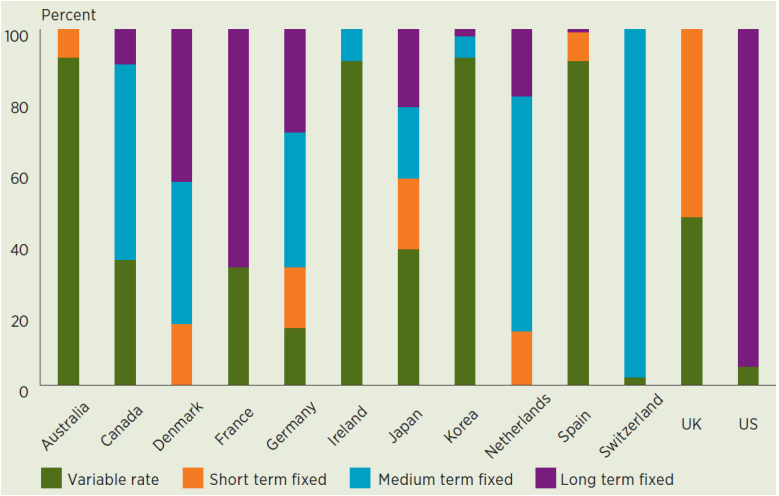
EXAMPLES

Country differences, duration of foreclosures



EXAMPLES

Country differences, mortgage debt by interest type



EXAMPLES

Country differences, mortgage debt by funding source