Transatlantic Mortgage Credit Crisis
– the Role of Financial Structure and Regulation

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Structure of the Presentation

Research question: causes of mortgage credit boom / busts specific to system design, regulation, policy design

Empirical basis: mortgage crises countries on both sides of the Atlantic, 2007 bis

Section 1: candidates

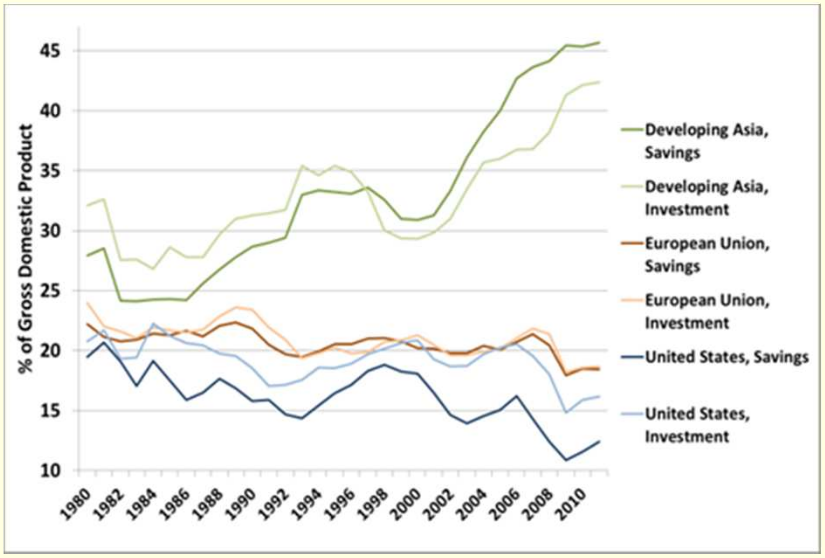
1. Mortgage finance system design
2. Intermediary (banking / insurance) regulation
3. Consumer protection regulation
4. Intermediary competition, arbitrage
5. Mortgage & housing (fiscal) policy failures

Section 2: hierarchies of causes and policy lessons

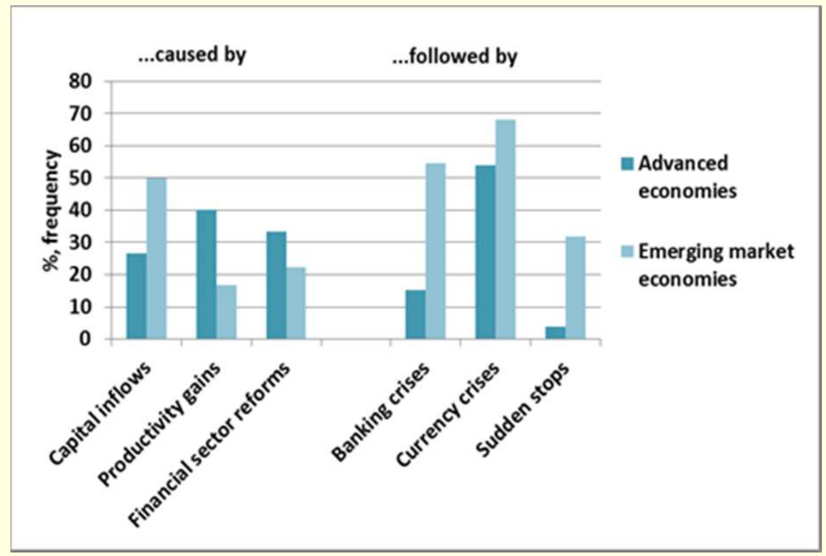
Source: Finpolconsult.

Structural / Regulation Causes vs. Macro Causes

Gross savings and investment as a % of GDP, 1980 – 2010



Causes and Consequences of Credit Booms in 47 Economies, 1960 - 2010



Credit boom: current account deficit = capital account deficit*
10/20/30 years of current account deficit cause **Dutch Disease**: bias towards non-tradeable sectors (real estate, finance)

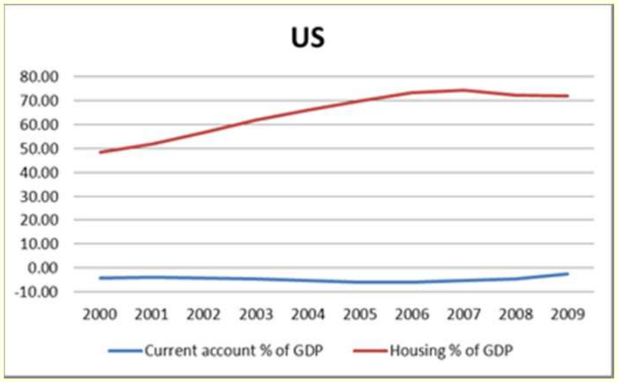
Credit bust / crisis: current account deficit + capital account surplus** = balance of payment deficit (loss of reserves) →devaluation or solvency crisis *Portfolio inflows, **portfolio outflows, capital flight

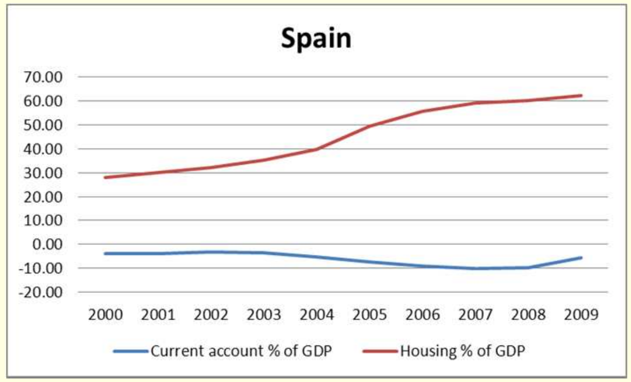
Credit boom = **interaction of capital inflow, financial innovation and deregulation**
Mortgage credit boom / bust analysis historically often disregards capital inflows (e.g. IMF GFSR April 2011)

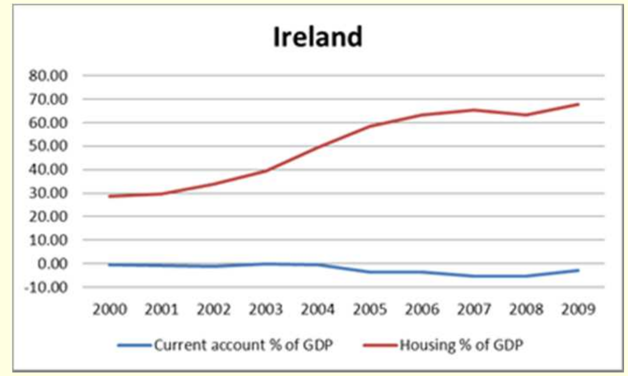
Source: IMF data & analysis

Housing Loans and Current Account Deficit (% of GDP)

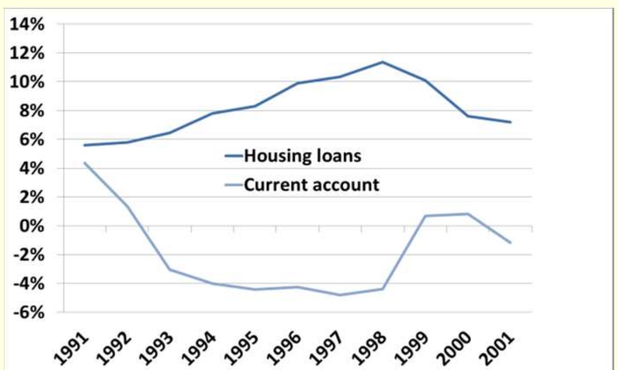
2000 - 2010



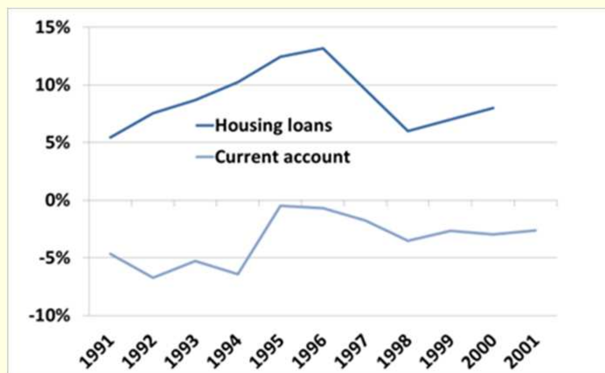


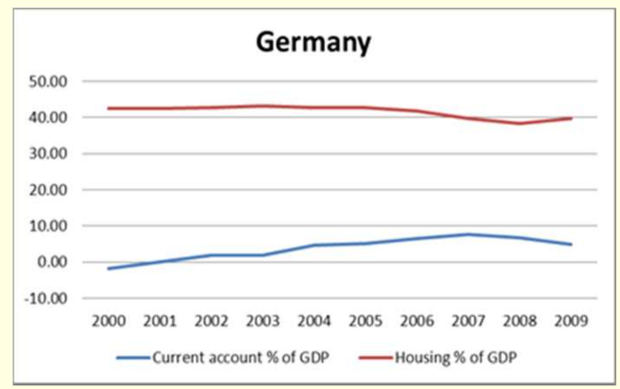


Colombia, 1991 - 2002



Mexico, 1991 - 2002



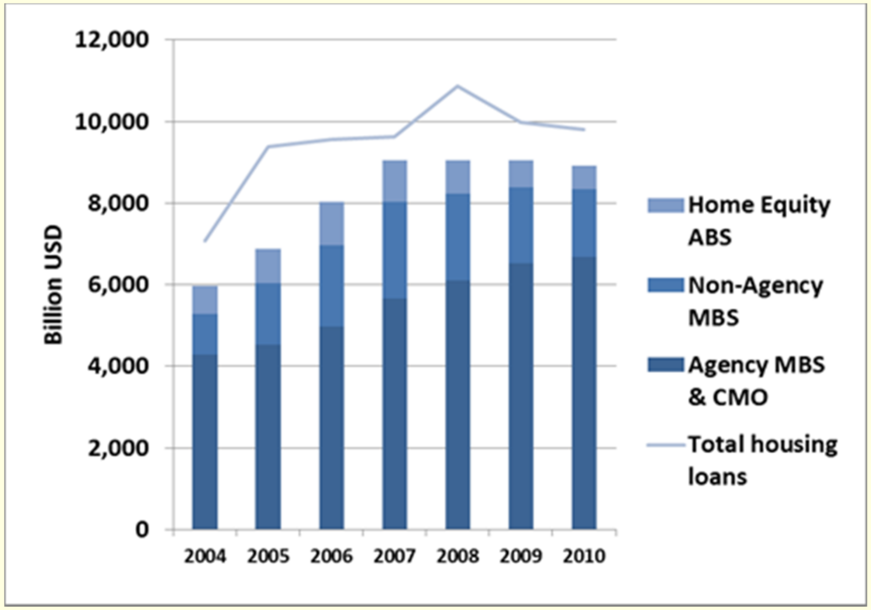


Housing loans are easy to originate, tradeable portfolio via pooling, or use of tradeable bank / agency debt = almost perfect substitute for cross-border sovereign finance.

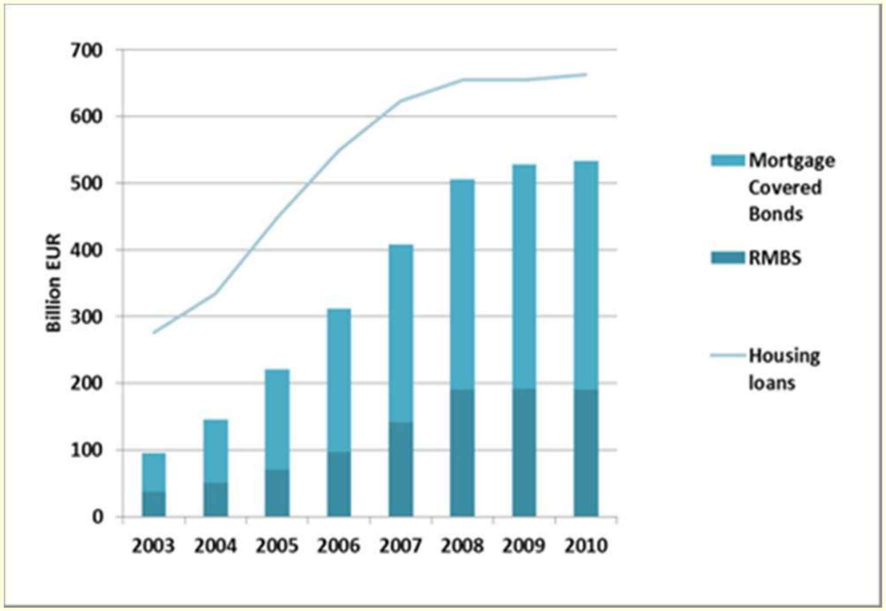
Source: IMF, Finpolconsult.

Role of Mortgage-related Securities

United States 2004 – 2010
(capital mkts & insurance-based system)



Spain 2003 – 2010
(bank-based system)



Housing finance **system design = credit intermediary design + funding exit design**

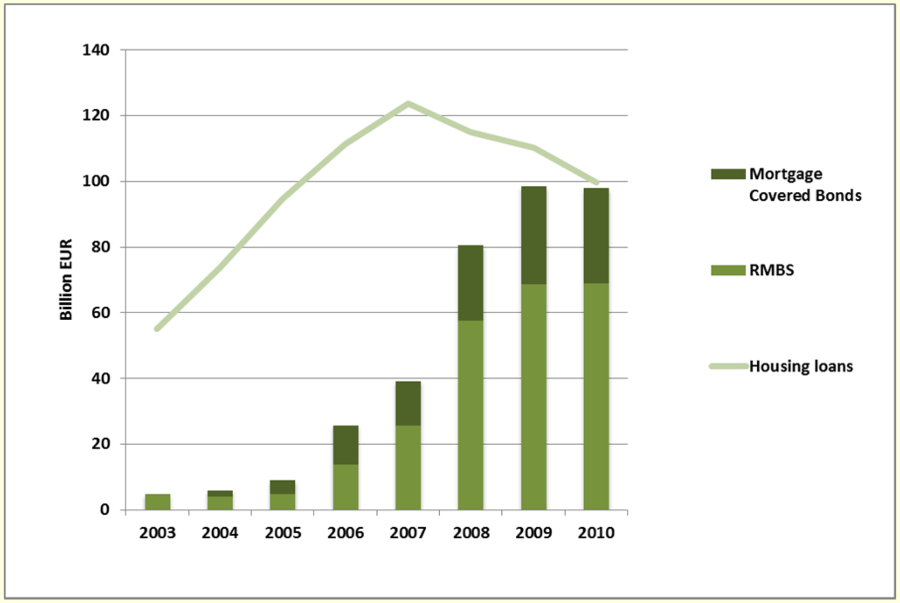
- **Insurance/structured finance**: U.S.: GSE + MBS, Finco's + structured finance, commercial banks + ABS (+ deposits)
- **Banking**: Spain: commercial banks + MBS + covered bonds (+ deposits)

Conclusion: on the macro level, European commercial banks did not materially act differently from U.S. GSE/Finco/Bank mix. **Main carrier of credit boom** were **debt securities**.

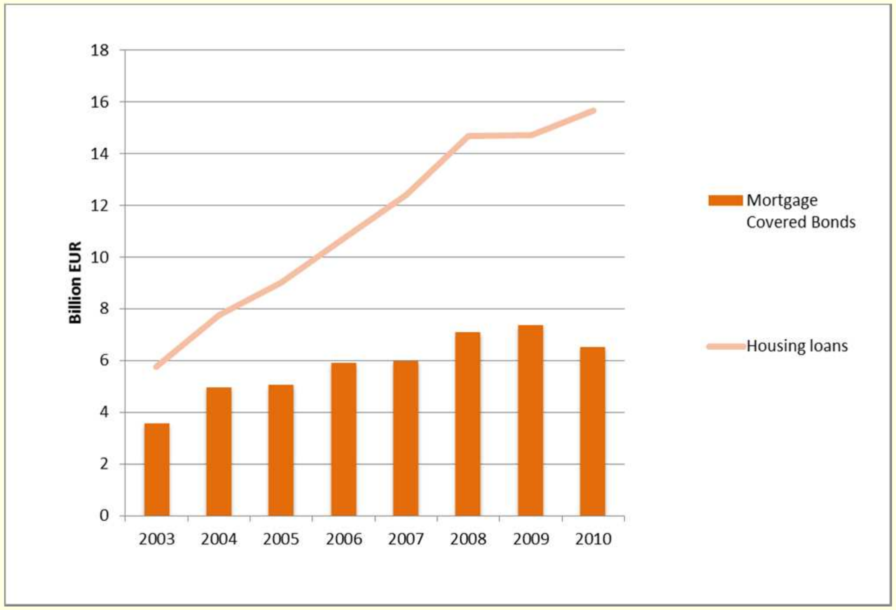
Source: Finpolconsult.

Role of Unsecured Cross-border Bank Debt / FX Swaps

Ireland 2003 – 2010



Hungary 2003 - 2010



Ireland: foreign bank entrants bidding up deposit rates + interbank deposits
Hungary: foreign bank entrants bidding up deposit rates + interbank deposits plus FX swaps
Similar constellations:

- Turkey: bank syndications and IB X-currency swaps
- Mexico, Colombia 1990s cross-border bank deposits

Type of funding exit hardly matters, as long as debt is liquid and tradeable. **Debt securities & interbank allow lending beyond an exhausted local deposit base.**
Regulator strategies: limit loan-to-deposit ratio (Ireland IMF / Hungary Austrian reg);
Alternative: **capital account controls**

Source: Central Banks, Finpolconsult.

Financial Regulation – No Rocket Science

Regulation items

Borrowers

- Leverage
- Mismatch
- Real asset (house price) valuation

Intermediaries

- Leverage
- Mismatch
- Financial asset valuation

No reason to treat borrowers systematically different from intermediaries.

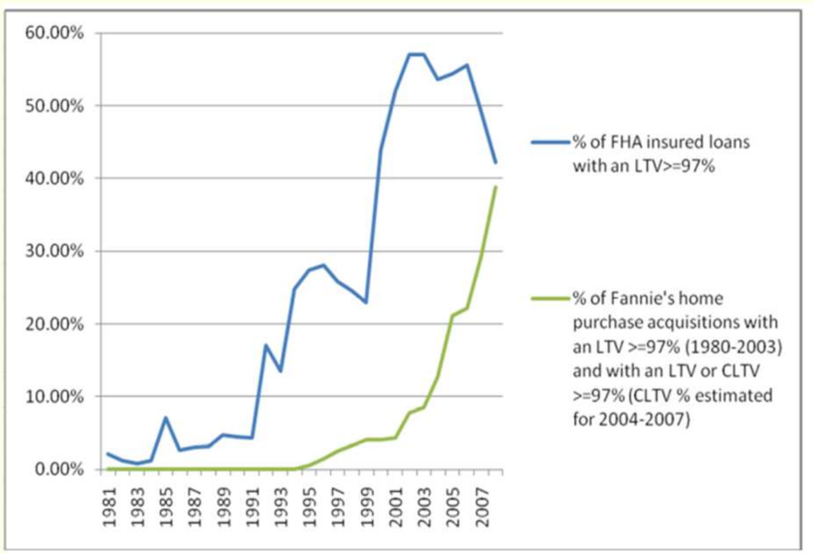
PPT will focus on borrowers, overlooked regulation dimensions.

Theoretical foundations

- Borrower capital risk formula:
  Capital risk = mismatch risk
  + net asset value risk
  - Mismatch risk = (duration of assets – duration of liabilities*liability value / asset value) *change in interest rates. (*leveraged duration gap*)
  - Net asset value risk = change in asset value – change in liability value
- Real asset valuation formula:
  House price = imputed rent stream / interest rate (consol)
  Full sector models: Di Pasquale/Wheaton, Renaud include space markets, i.e. models imputed rent cycles.

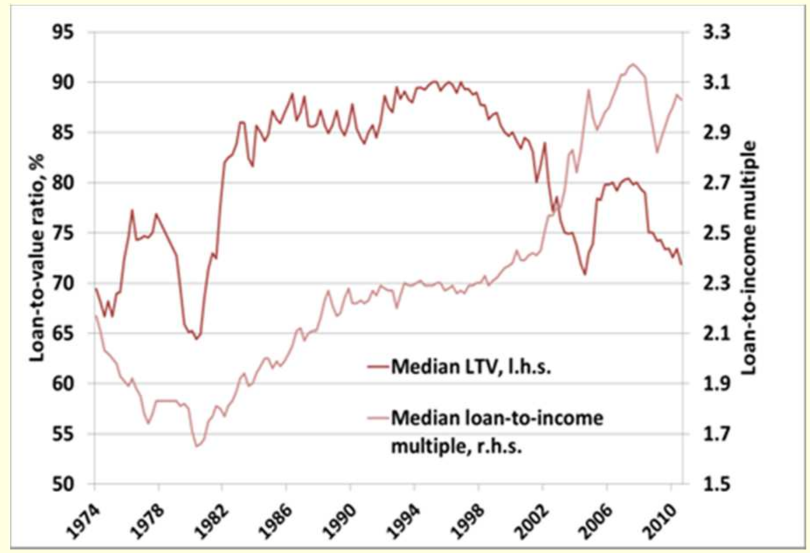
Borrower Leverage: Third-party vs. Lender Self-Insurance

U.S. very high-LTV lending incidence by FHA, Fannie 1981 - 2008



- Third-party insurance (agencies, private MI)
- **Monotonously increasing LTV (until crash)**
  - S&L LTV liberalization 1971 (mortgage insurance 80%→95%)), coinciding with Freddie creation.
  - FHA very high-LTV since the mid-1980s, Fannie since late 1990s

UK median loan-to-value and –to-income ratios 1974 - 2010

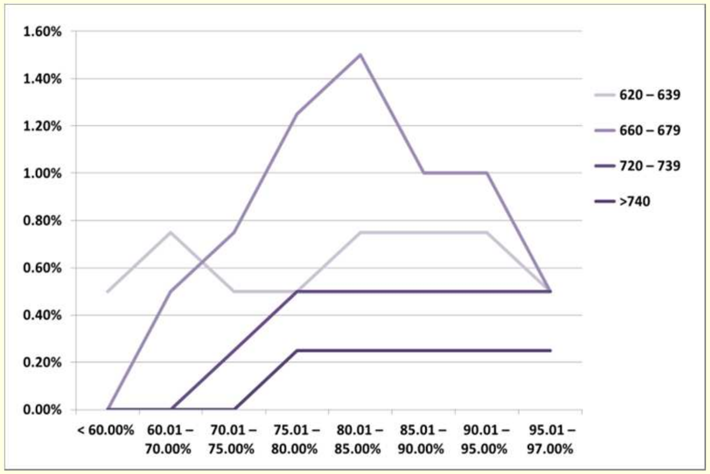


- Third-party insurance followed by lender self-insurance
- **Hump-shaped LTV curve**
  - Increase with liberalization of the 1980s
  - Some learning effect after early 1990 bubble
  - Collapse after 2007; **re-regulation?**

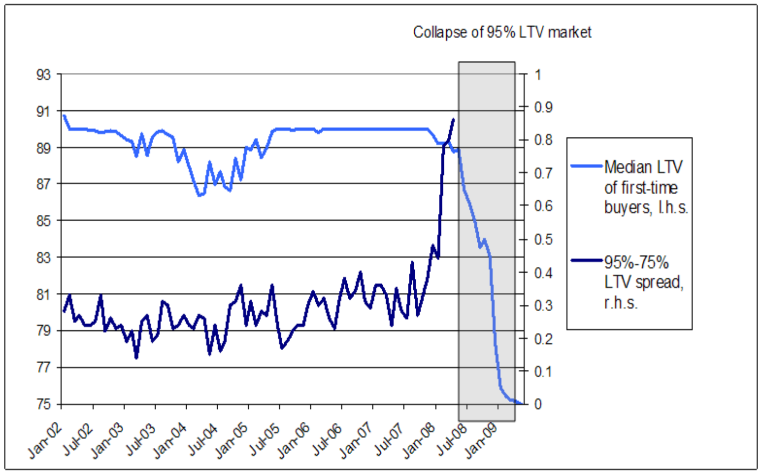
Source: LHS E. Pinto, RHS – Council of Mortgage Lenders

..but Third-party Insurance may Help to Avoid Sudden Stop

US Fannie Loan Purchase Agreement Haircuts, June 2008 vs. April 2011



UK high LTV market conditions 2002 - 2009



Third-party insurance

- **Procyclical:**
  - LLPA for higher LTV/lower scores and GSE guarantee fees rise after 2008
- **Anticyclical:**
  - **Forbearance: private MI** kept alive by GSE, i.e. formally 95% market remained intact
  - **Streamlined refinancing iniatitive** to temporarily increase LTVs (reduce LLPAs, guarantee fees).

Lender self-insurance

- **High-LTV market disappears**.
- Policy intervention (equity loan program) discouraged by austerity pressure.
- Strong reduction of homeownership rate de-facto accepted
- But UK had promoted the rental sector under Labor

Source: LHS - Fannie Mae, RHS – Council of Mortgage Lenders, Bank of England, Finpolconsult

Capital Gains vs. Cash Savings as Sources of Equity Finance

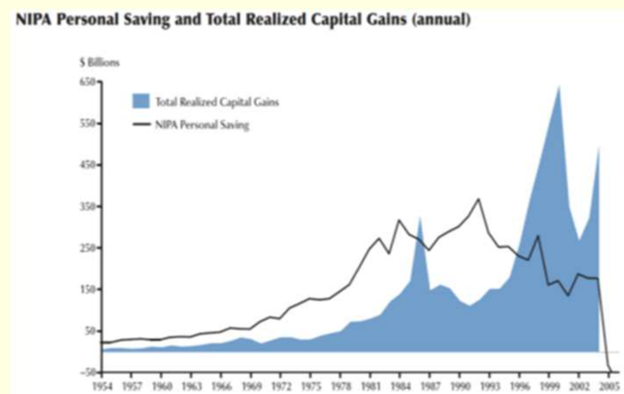
England vs. Germany, Sources of Equity for Owner-occupied Housing, mid/end 2000s

Sources of equity	England	Germany
Data source	Communities & local gov	Infratest (private)
Period	2007/08	2004/07
Survey population	Owners	Buyers
Survey size	ca 20,000	1327
Proceeds from sale of previous home	52	>11
Savings	39	>71
Gift or loan from family or friend	6	23
Inherited money	4	
Loan to cover deposit/bridging loan/Bausparen	2	34
Money paid by local authority/housing association	1	1
Windfall	1	n.a.
Money paid by private landlord	0	n.a.
Sweat money	n.a.	15
Other	3	n.a.
No other source	11	n.a.

U.S. vs. Germany, Motives for Household Savings

Motives for saving	United States		Germany	
Data source	Federal Reserve SCF		Infratest	
Period	2007		2010	
	Percent	Rank	Percent	Rank
Education	8.4	4	5	5
For the family	5.5	5	n.a.	n.a.
Buying own home	**4.2**	**6**	**46**	**3**
Purchases	10	3	58	2
Retirement	33.9	1	60	1
Liquidity	32	2	4	6
Investments	1.6	7	28	5
No particular reason	1.1	8	n.a.	n.a.
Does not save	3.3	n.a.	n.a.	n.a.
Homeownership rate 2009	67.3%		55.6%	

U.S. Household Savings & Capital Gains, 1954 - 2005



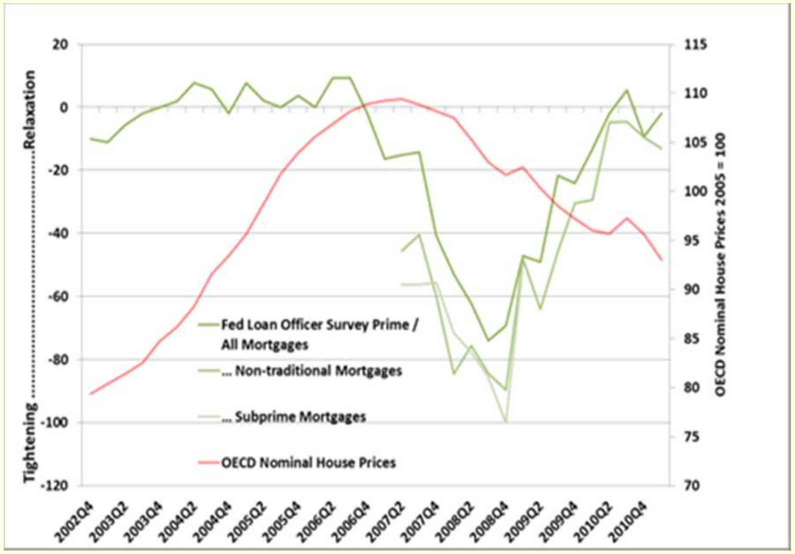
In a low inflation/deleveraging world, it makes more economic sense to save and wait rather than buy early, leverage up with the help of high-LTV lending/insurance.

Qualified Residential Mortgage concept (e.g. 80% LTV) is a **function of available equity generation options**:

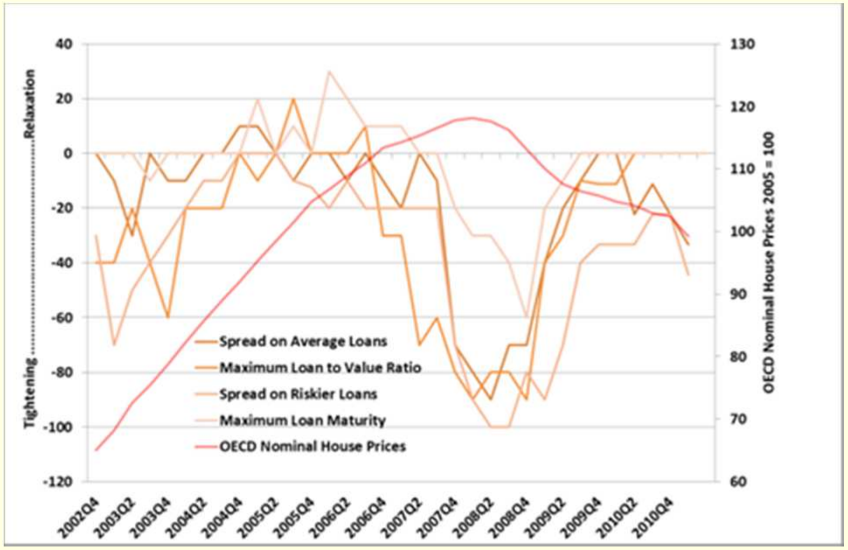
- U.K. proposal for 'equity loans', no fiscal savings support
- U.S. no specific proposal, no fiscal savings support
- Germany fiscal contract savings for housing support integrated into general old age retirement tax support

Poor Underwriting Standards are Often Caused by House Price Risk, not Causal to House Price Risk

United States, 2002 - 2010



Spain , 2002 - 2010



Many issues on the agenda of regulators (e.g. **Financial Stability Board**) are the **result of price risk**:

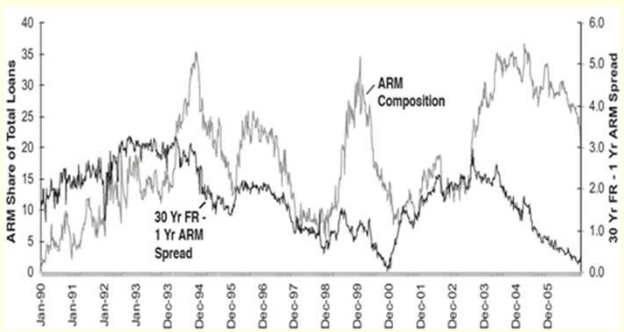
- **Cyclical increase in loan-to-value ratios** (as opposed to structural) ; constant LTV rule?
- **Extension** of **loan maturities** and **negative amortization** features
- Higher frequency of **interest-only periods and initial teaser rates**
- **Lower spreads** for both prime and non-prime lending
- **Low-documentation** lending

These cyclical features can be traced for both crisis, and non-crisis, countries!
Can a follow-on effect of inflation be credibly regulated away?

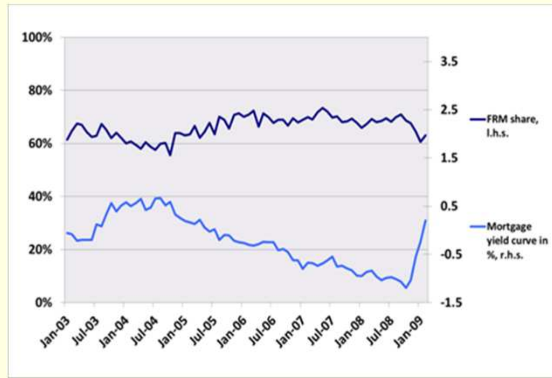
Source: Federal Reserve, Bank of Spain, Finpolconsult.

Borrower Mismatch – ARM and FX Credits

U.S.



Germany

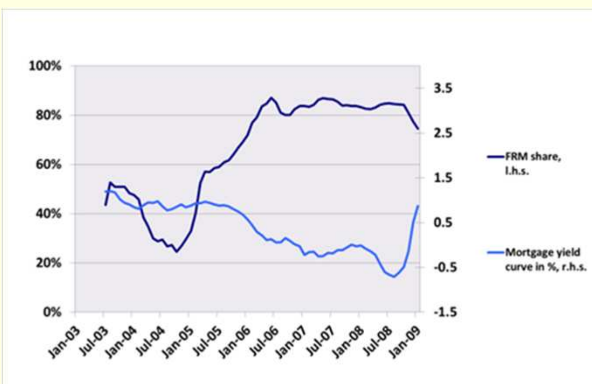


Europe: ARM share beyond 70%

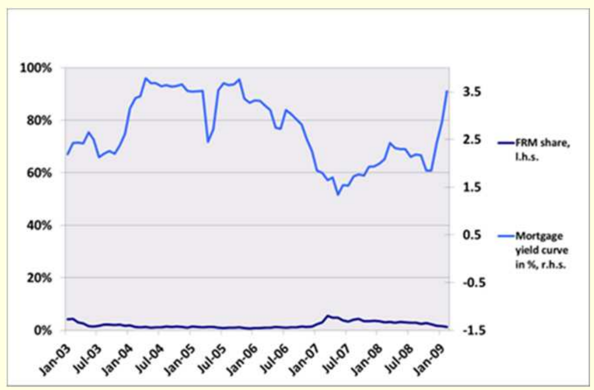
- Index trackers in Western & Southern Europe
- Foreign currency ARM in CEE

U.S. 'option ARM' and initial teaser rates with **rising trend since 1990**
Result of financial liberalization 1980s, rate decompression 1990s
BIS/IMF analyses confirm linkage to market and house price booms.

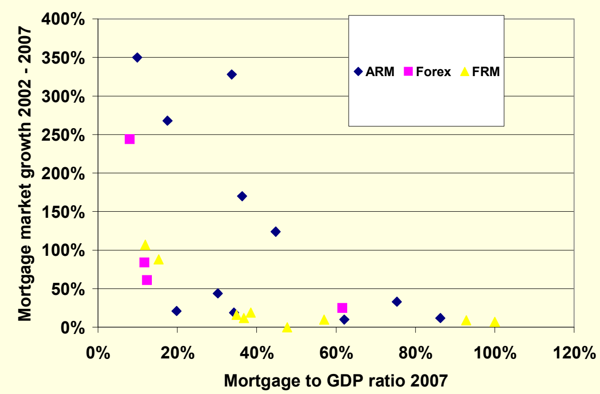
Belgium



Spain



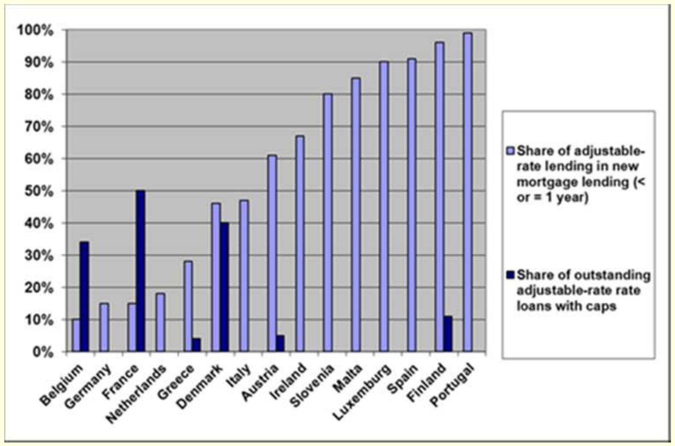
ARM / FX Share, Market Growth in the EU



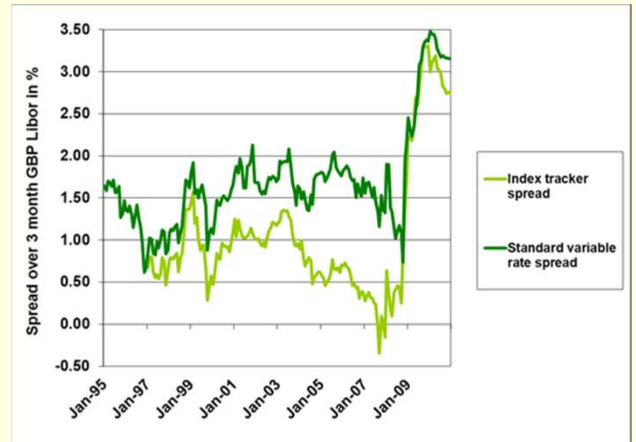
Source: MBAA, ECB, Finpolconsult.

Aggressive ARM Pricing & Bailouts, Limited Ex-ante Protection

Eurozone – Use of ARM Rate Caps and ARM Share



UK Index Tracker vs. Reviewable Rate Product Pricing



ARM and FX introduced by **commercial banks** where it best matches their funding conditions; crowding-out of traditional mortgage banks (also U.S. conflict GSE vs. private label)

Caps basically only **where FRM exists**

FX study finds **limited evidence for 'carry trade of the small man'**

Consumer protection introduces **additional bias** (e.g. prepayment indemnities Spain vs. Germany); usually against FRM

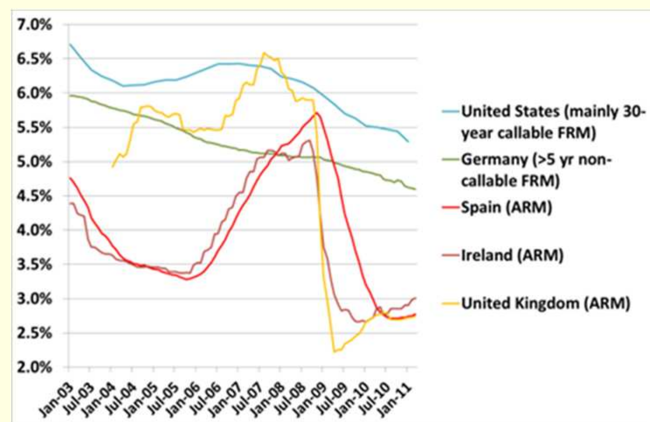
Generally **non-risk-adjusted pricing**

Relative **default risk** of products **manipulated by central bank bail-outs.**

ARM destroy returns for individual savers, institutions.

Policy Interventions Bail out ARM Borrowers

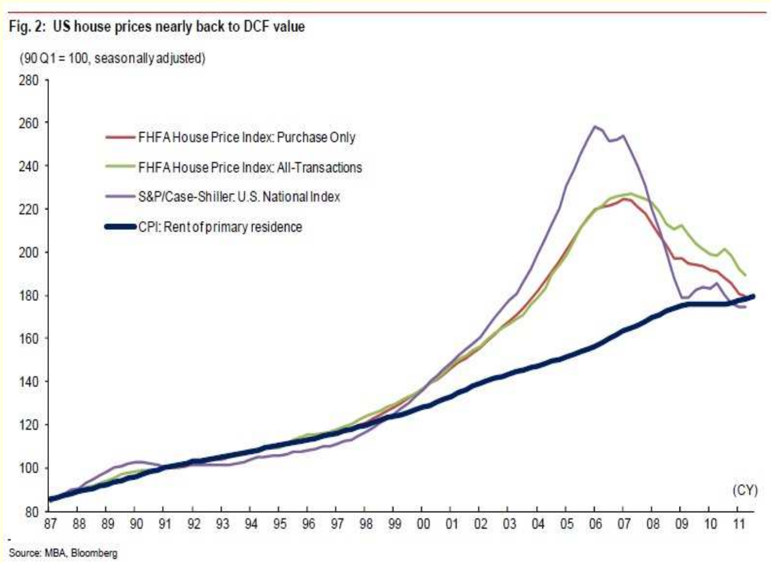
Key Mortgage Portfolio Interest Rates 2003-2011



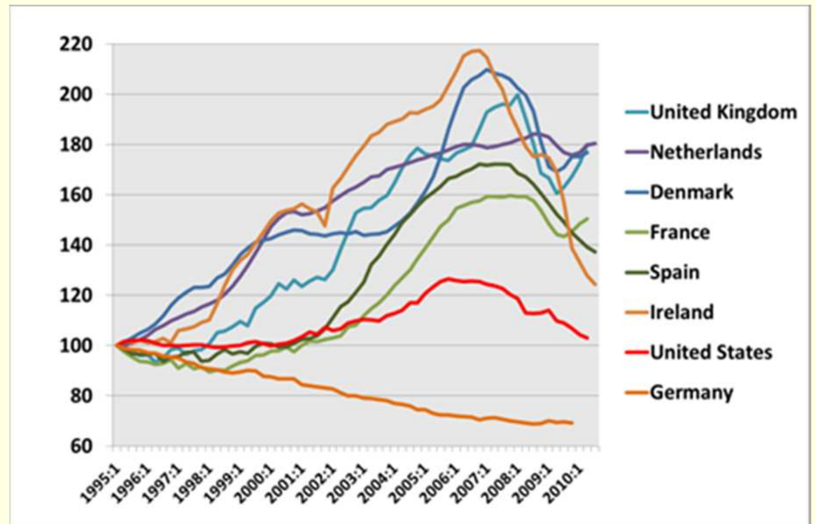
Source: ECB, Bank of England, Finpolconsult.

House Price Valuation Issues

U.S. House Price and Rental Trends, 1987 - 2011



Europe vs. U.S. House Price to Income Ratios, 2005 = 100



- **Discounted cash-flow valuation** ('income') method is **superior** to 'open market' valuation in matching long-term values (Koo, Shiller, many others).
  - Still either contract prices or 'open market values' are the norm in retail.
  - In commercial mortgage finance, DCF is the norm.

Regulators cannot agree on standard (Financial Stability Board)

Jurisdictions should ensure that lenders adopt appraisal standards and methods (e.g. income approach, cost approach, or sales comparison approach) that lead to realistic and substantiated property appraisals.[4] Property appraisals should be supportable and therefore reflect the current price level and the property's function as collateral over the entire life of the mortgage. Property appraisals should not reflect expected future house price appreciation.

House Price Valuation Issues II

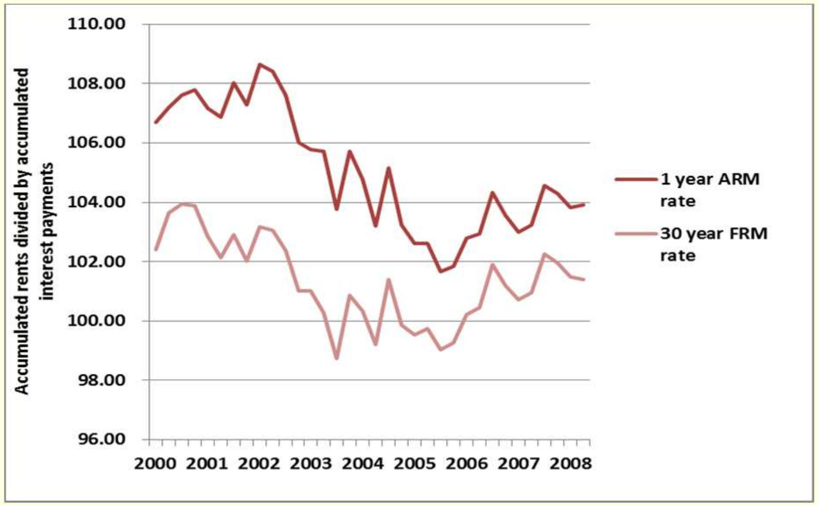
Technical Issues

- DCF method **needs constraints even from equity investor perspective**:
  - **Long-term expected rental values**, e.g. full housing market model or at least long-term moving averages.
  - Minimum discount factor: **taking ARM rates leads to higher / volatile valuations (CHART)**.
- **Bank / debt investor is in an asymmetric risk position**, equity investor in a symmetric position, hence **additional constraints** are needed:
  - E.g. **haircuts** subtracting from the DCF method, or its components (rent assumptions).

Policy Issues

- **Tax revenue** esp. **of local governments directly tied to high valuations**.
- **Profits** of other mortgage-related industries are **directly tied to** the outcome of **high valuations**.
  - e.g. appraiser or real estate agent profits. → Strategies to delink profits from valuations needed.

U.S. 3- year forward-looking rental yield index, discounted by ARM vs. FRM



→House prices are both higher and more volatile, when priced over ARM discount factors.

Source: Finpolconsult.

Other Regulation Issues

Financial Regulation

Commercial banks have enjoyed massive subsidies that have **pushed mortgage specialists aside**:

- No checks against ARM and FX lending to consumers, i.e. convenient hedging for banks.
- No leverage limits, preferential mortgage capital treatment → Basel III leverage ratio
- No matching limits under Basel II →Basel III net stable funding ratio
- No proprietary anti-speculation rules →Volcker Rule
  - NOTE: taking liquidity and interest rate risk in long duration mortgage finance IS proprietary speculation.

Secondary mortgage markets have been massively distorted by **lax securities regulation, 'charter competition'**

- Credit centralized instead of decentral (GSE)
- Structured finance instead of originator credit support
- Declining covered bond, other asset backed standards

Consumer protection

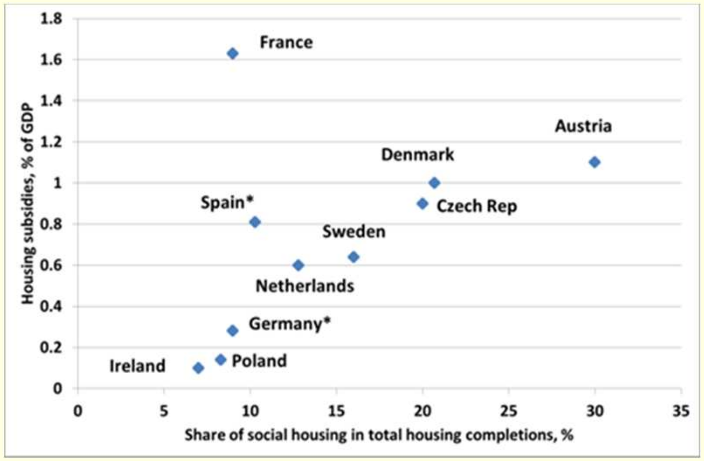
Impact of liberalization: dominance of transparency rules and lack of product/practices regulation.

- Even in transparency, contradictory and manipulated rules. E.g. effective interest rates in mortgages vulnerable to duration, rate assumption.
- No risk transparency standard combining price information with product risk character.
- Almost no ex-ante downside risk limitations for consumers.
- Almost no limitations to financial innovation.
- U.S. creation of subprime by accident through 1980s abolition of loan rate usury ceiling.
- Fuzzy 'responsible lending' rules instead of clear rules.
- Credit intermediaries almost unregulated.
- Highly variable consumer discharge / insolvency regimes, lack of systematic pre-foreclosure solutions avoiding defaults.

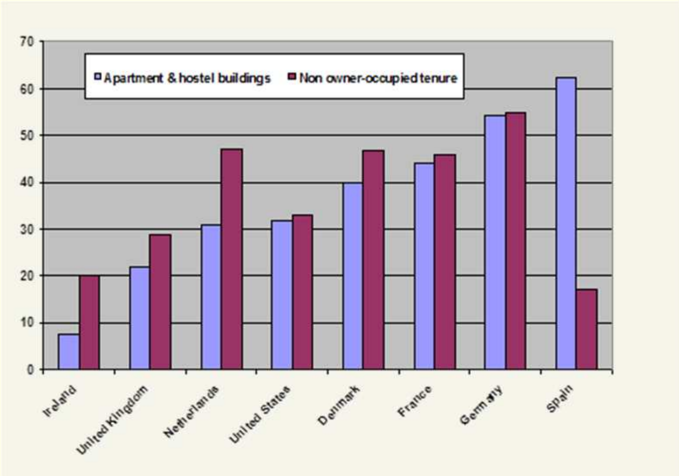
Europe discussing harmonization since 30 years, U.S. de-facto harmonization via GSE in some areas.

Fiscal Policy Issues

Public subsidy budgets and social housing construction in selected European countries, 2005



Share of multi-family housing and non-owner occupied tenure in the US and selected European countries, ca. 2005



High-leverage mortgage markets **can remain stable, if social rental is present (Netherlands, Denmark, Austria)** and leverage is targeted to middle class.

Chronic lack of rental housing adds to vulnerability:

- **U.S.:** governments have **actively discriminated against multi-family housing** now since the 1930s. Unintended New Deal consequence.
- **Spain**: **legacy of rent controls** led to de-facto discrimination in a large multi-family building stock. Subprime market during the 2000s tied to extremely low ARM rates.
- **Ireland:** complete **neglect of social housing** led directly to large subprime market during 2000s.

UK: rental housing has been **revived in the 1990s.** Housing associations replaced council housing. Buy-to-let market. Mortgage market relatively resilient.

Source: European Housing Ministers, Finpolconsult.

Synopsis of Crisis Causes

Housing Finance Systems Have Become Riskier, Vulnerable to Given Liquidity Shock

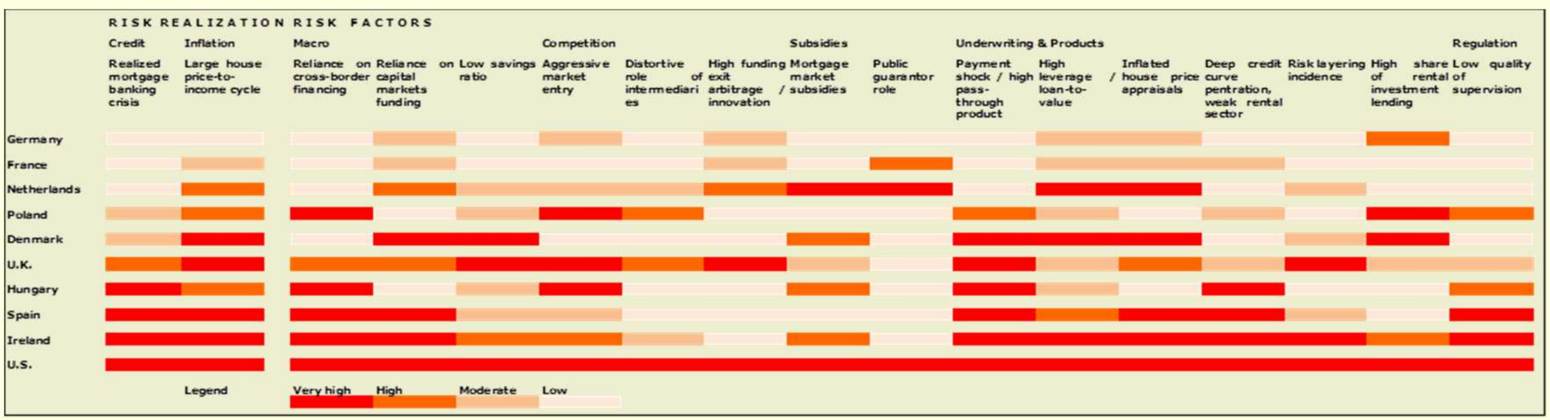
Vulnerability of systems featuring **high borrower leverage, mismatch, dubious valuations, small rental sector** to a given liquidity shock is maximal.

Such **risk layering increases the impact of a given liquidity shock on prices, credit growth** (pass-through).

Liquidity shocks themselves are **maximized by financial innovation, autonomous (portfolio) capital flows, aggressive cross-border entry**. Interaction between flows and innovation central (vs. IMF).

Once house price and credit **inflation is produced**, this **dominates all other** commonly cited **risk factors**..

House Price / Credit Risk Realizations and Risk Factors in Selected European Countries



Source: Finpolconsult.

Conclusion: Two ‘Volcker Rules’ for the Mortgage Markets

First Rule:

Discourage leveraged interest rate risk speculation by borrowers with their most important financial asset, equity in housing

Second Rule:

Discourage (leveraged) interest risk speculation by mortgage lenders and force interest rate risk to be taken by institutions.

Supporting policies:

Restrain central bank liquidity policies and **refocus central banks on safeguarding price stability, including house prices,** instead of pump-priming the economy.

Restrain cross-border capital market flows transmitting expansive central bank policies globally. Taxing short-term cross-border portfolio flows, reducing dependence on cross-border bank and bond markets, and developing local bond markets will be stabilizing.

Implement fiscal (housing) policies that reduce pressure on the financial system to aggressively expand the credit curve.

Stop making the mortgage market a political priority: homeownership should be a private risk-return-based investment decision.

Annex I: Mortgage Market Crisis Management & Regulation Efforts

Policy option	United States	Europe
Central bank policies	'Unsuccessful' Fed bailout as credit crunch pre-empts prepayments; lender recapitalization is priority.	'Successful' ECB/BoE bailout as ARM react directly to rates; yet conceals structural consumer insolvency (inability to pay normal rates).
Fiscal policies	FHA refinancing of private Subprime. Restructuring programs HAMP/HARP. GSE/mortgage tax deduction reform (?) Fed buys/repos w Treasury guaranty.	ECB credit easing (private ABS repo, covered bond purchases). ESFS backs nationalization of bank debt. National write-down policies/bank recaps.
Legislation, general	Dodd-Frank, interagency guidances.	Proposed EU Directive, EBA rules pending (?).
Legislation, transparency	Single-page information sheet (plan).	ESIS and APRC mandatory.
Legislation, underwriting	Qualified residential mortgage (LTV limits); specific responsible lending rules (fully-index/amortizing).	Responsible lending rules in proposed EU Directive. Wide national discretion range (ex. Forex, from ban, HU, to stress-testing, PL).
Legislation, products	ARM caps mandatory. Prepayment penalties on high-rate loans outlawed.	UK: non-conforming ban (?), forex bans in AT and HU. Suitability criteria via EU Directive (?).
Legislation, funding	Basel III (leverage ratio), skin in the game f. MBS, covered bond law	CRD (leverage ratio unclear), skin in the game f. MBS
Foreclosure prevention	De-facto foreclosure moratoria and restructurings.	De-facto foreclosure moratoria and restructurings (IRE, LAT, HU).
Institution-building	Consumer Financial Protection Bureau	None (in consumer protection)

Source: Finpolconsult.

Annex II: EU Directive on Residential Property Lending (2011 proposal)

Issue	Proposed Directive	Proposal
Pre-contractual information / credit intermediaries	Standard advertisement info & ESIS. Intermediary authorization, registration, supervision, professional requirements.	In addition: specific cooling-off period; tripartite ESIS development. *Comment: excessive focus of Directive on intermediaries only laterally problematic in EU.*
APRC	Broad APRC (CCD definition) mandatory	Both narrow and broad (cost of credit) APRC for national / international comparison; combined product APRC; realistic maturity and adjustable-rate assumptions.
Creditworthiness assessment	Appropriate processes, data and borrower information access. Duty to credit denial.	In addition: mandatory stress-testing, based on the specific product, amortization and loan-to-value offered.
Advice	Minimum standards, no requirement for banks or credit intermediaries.	Labeling of independent credit intermediaries (advisors). Financial education program.
House price valuation	Not in Directive.	House price valuation standard (discounted cash flow).
Loan to value rules	Not in Directive; CRD mortgage definition.	See stress testing requirement.
Amortization rules	Not in Directive.	See stress testing requirement.
Products, general	Suitability in conjunction with credit assessment, criteria delegated to KOM. No action on Forex.	See stress testing, standardizations below and delegations.
Early repayment (FRM)	Early repayment right subject to conditions. Member State discretion on indemnities.	Universal early repayment right. Standardization of indemnities (non-callable FRM).
Rate adjustment (ARM)	Not in Directive.	Mandatory caps (but NOT mandatory indexation, 1988 CCD), including for Forex (form of ARM).
Non-regulated areas / delegations	5 year review of post-contractual stage regulation need. Limited number of delegations.	Interaction process between Member State and KOM analogous to State Aid re more far-reaching rules. Missing : e.g. loan assignment, linked contracts (developer/bank), foreclosure and consumer insolvency.

Source: Finpolconsult.