# Housing Finance across Countries: New data and new analysis

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**(based on joint work with Anton Badev, Ligia Vado, and Simon Walley)**

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# Motivation

- Large variation in the depth and penetration of mortgage markets around the world

- Underdeveloped housing finance systems symptom of general shallowness of financial systems?

- Or are there specific country factors explaining cross-country variation in mortgage market development?

- Housing finance is important, both on individual and society level

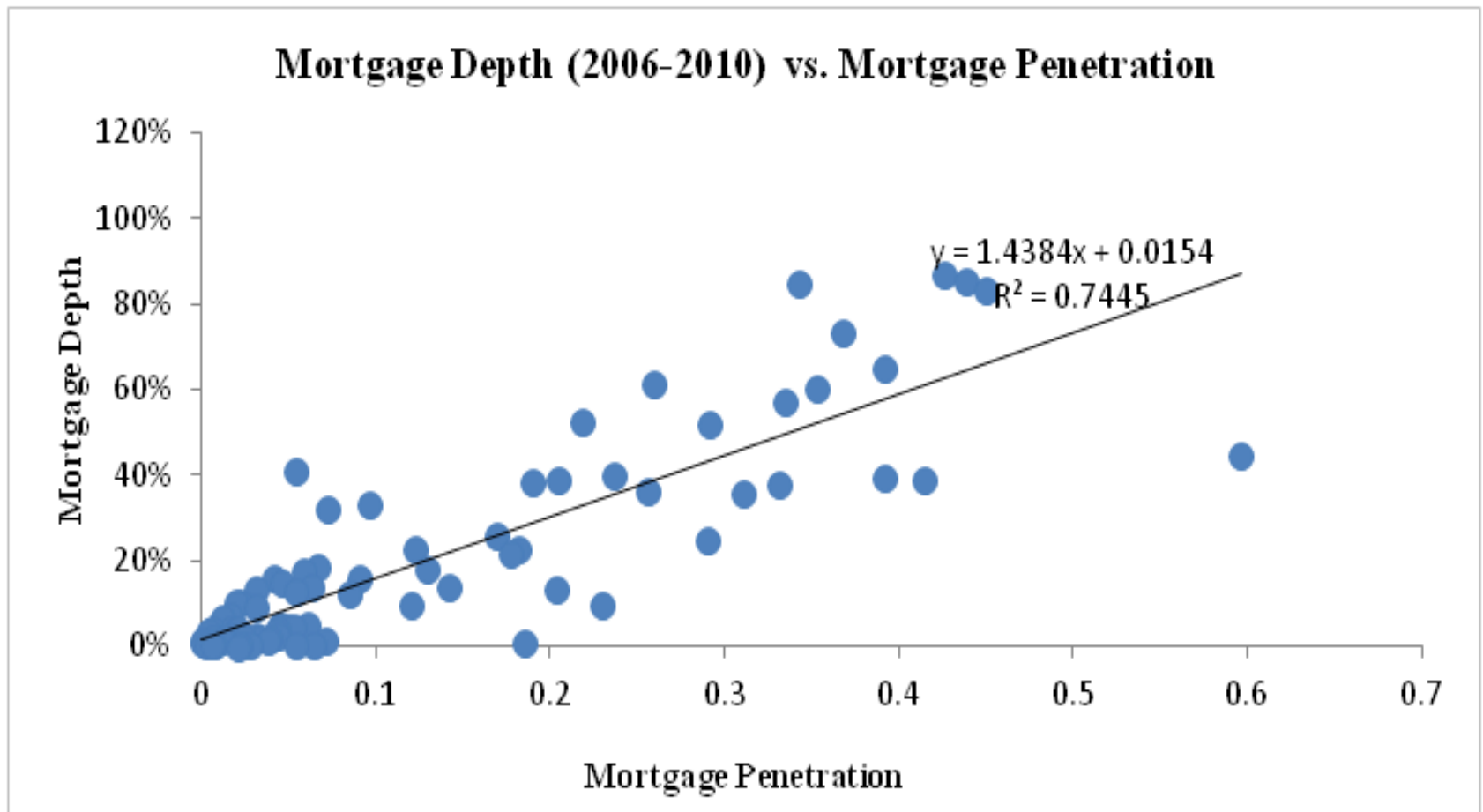- Important trade-off: Deepening vs. stability

# A large cross-country variation in depth of mortgage markets



**Mortgage Depth (2006–2010)**
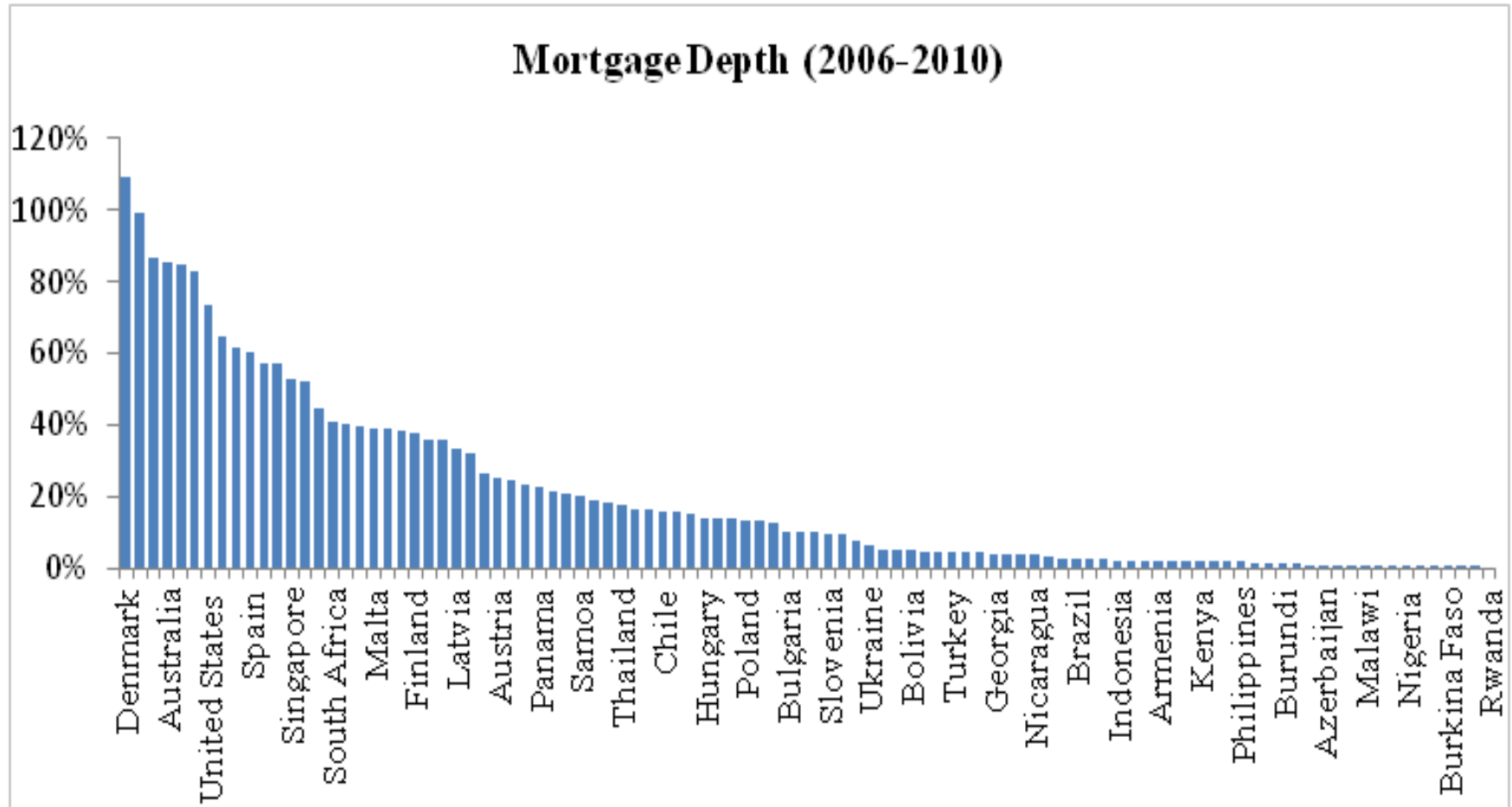
# A similar large variation in mortgage penetration



Mortgage Penetration (2006-2010)
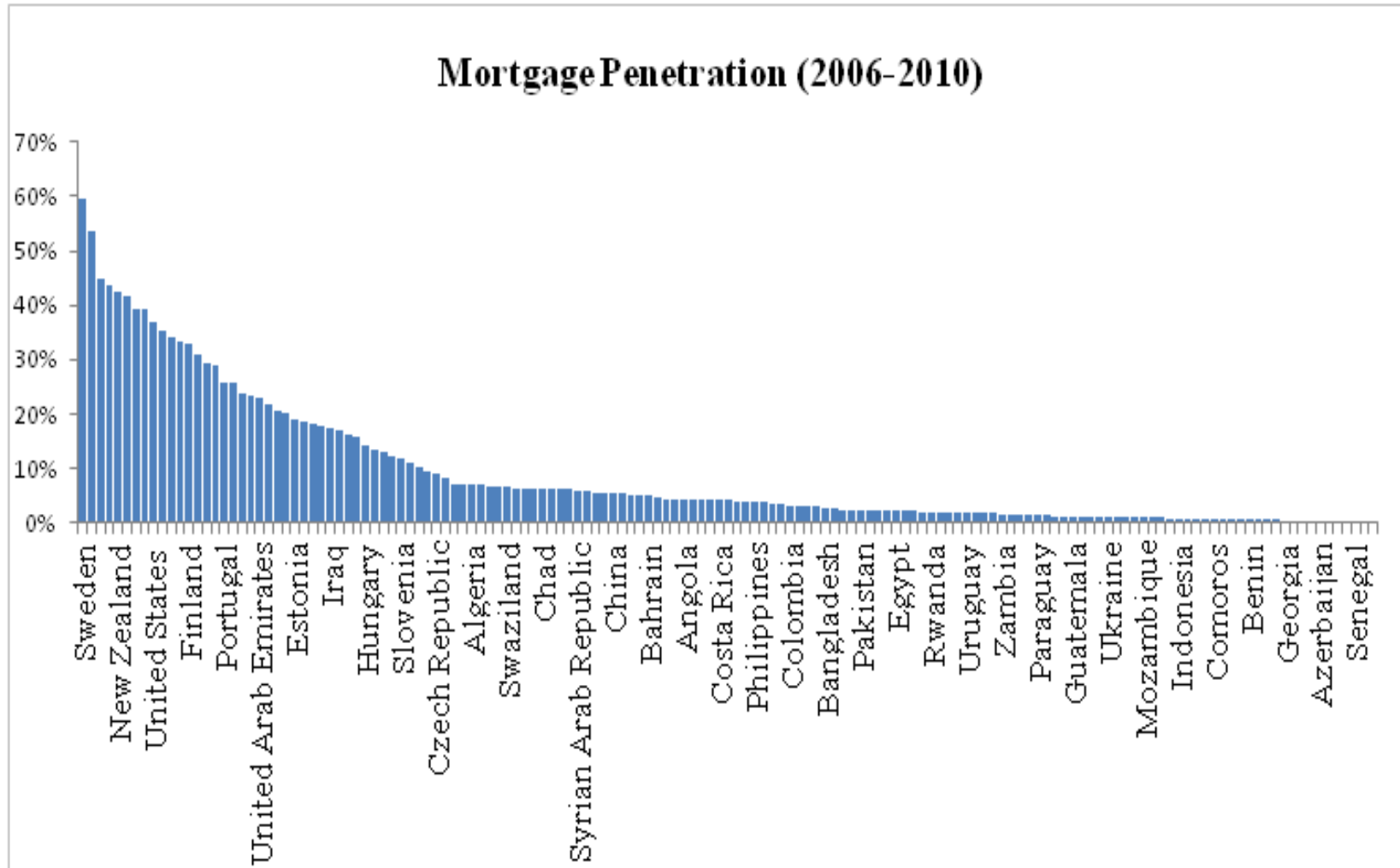
# Depth vs. Penetration



**Mortgage Depth (2006–2010) vs. Mortgage Penetration**

y = 1.4384x + 0.0154
R² = 0.7445
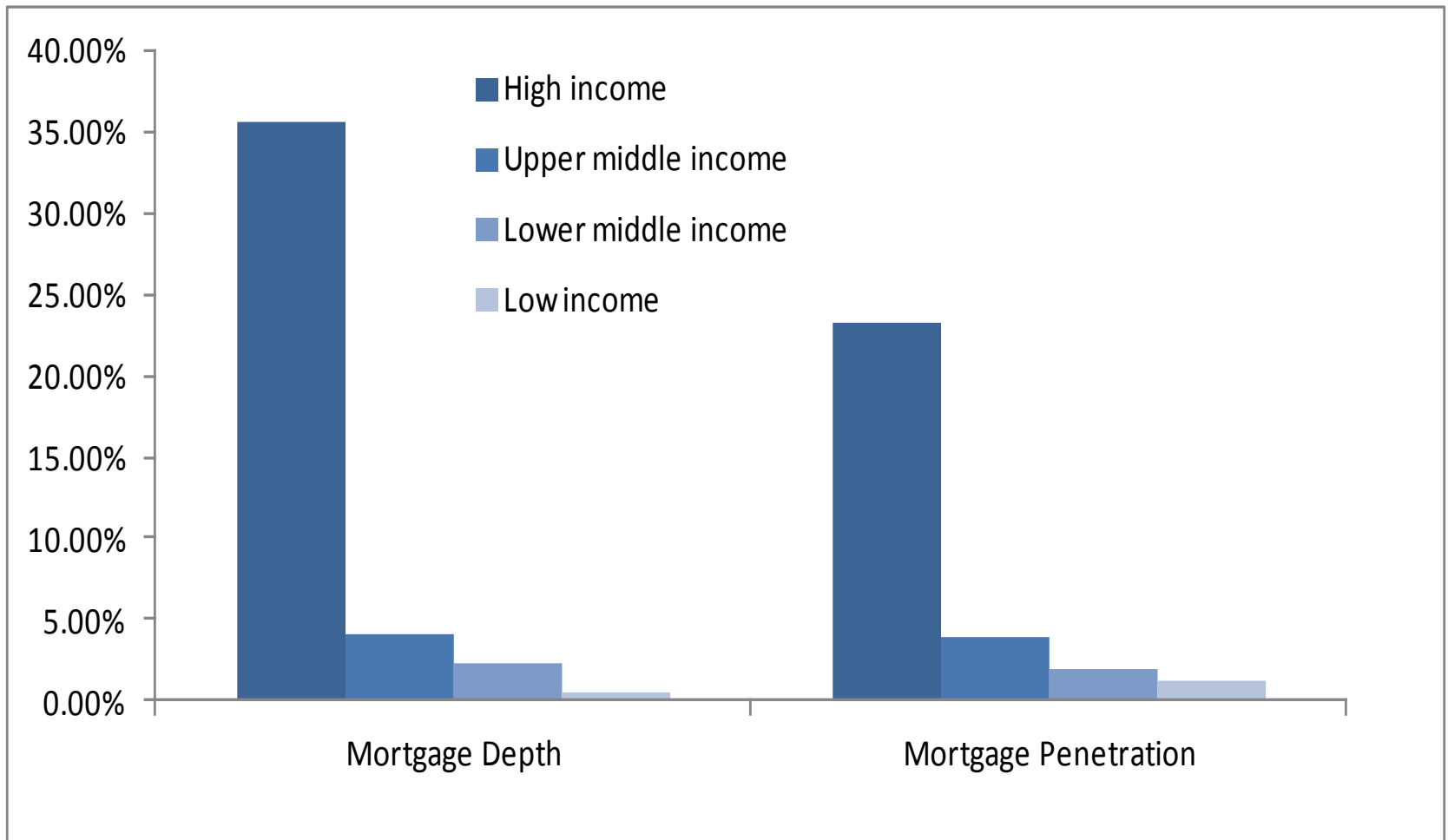
# Mortgage Depth vs. Private Credit to GDP
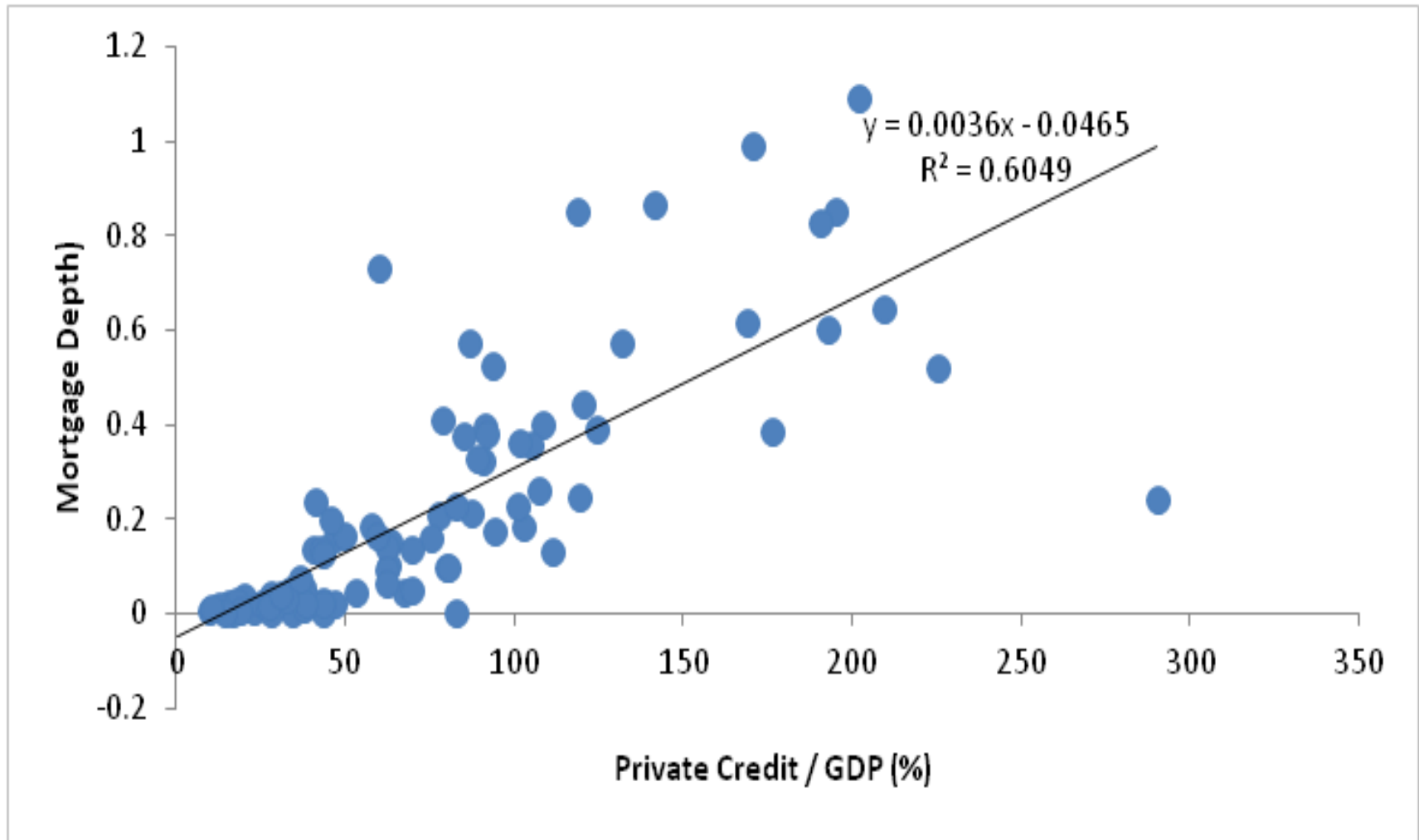
# Mortgage vs. account penetration



Scatter plot of Mortgage penetration (y-axis, 0.00 to 0.70) vs. Account penetration (x-axis, 0 to 1). Trend line: y = 0.1496x + 0.0246, R² = 0.1476.
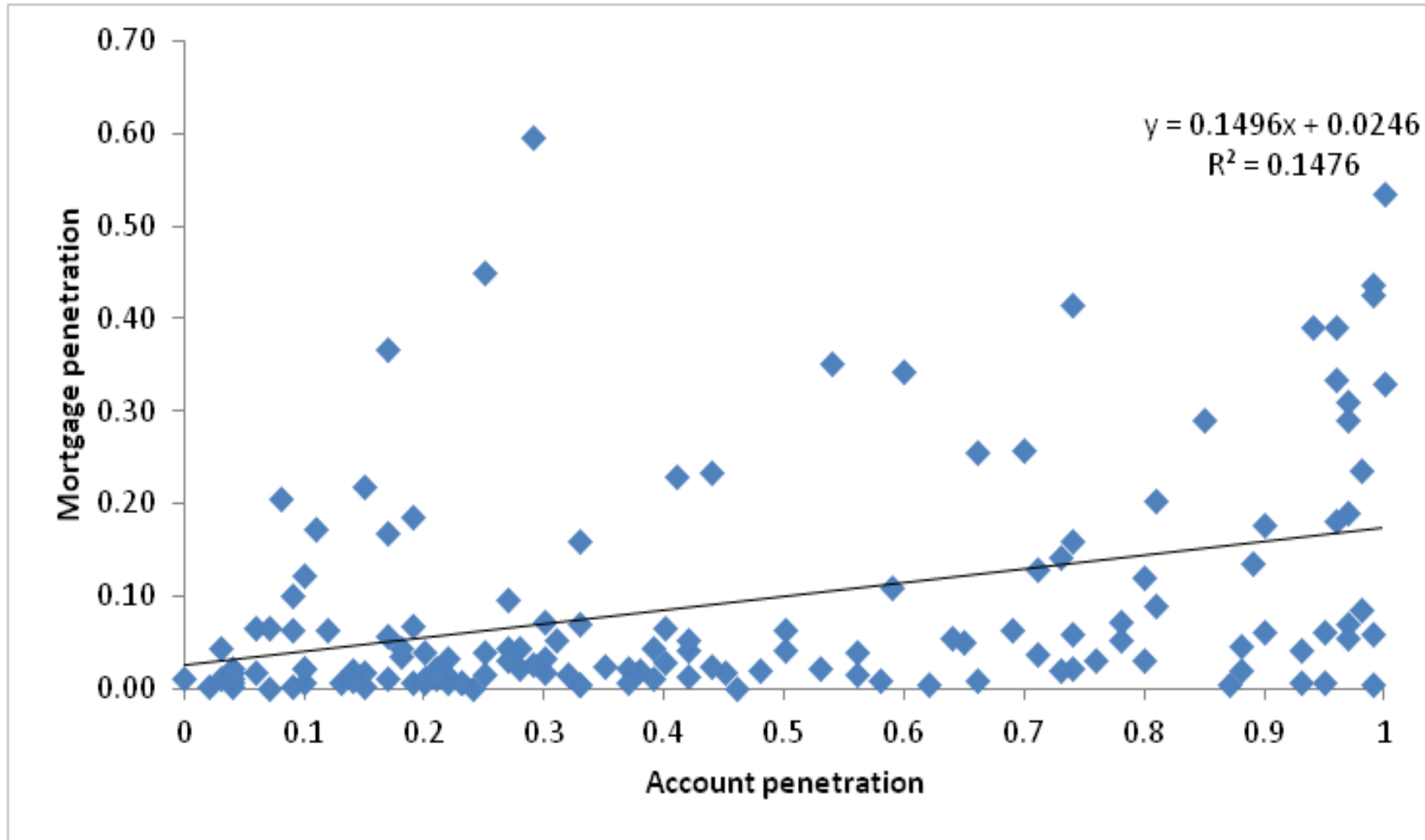
# Mortgage markets – a "luxury good"?

# Mortgage markets – a "luxury good"?



$y = 8\text{E-}05e^{0.8107x}$
$R^2 = 0.53$

Mortgage Debt-to-GDP Ratio (New)

Log of GDP per capita

$y = 0.0214x^2 - 0.281x + 0.9265$
$R^2 = 0.6973$

Outstanding loan to purchase a home, older adults (% age 25+)

Log of GDP per capita
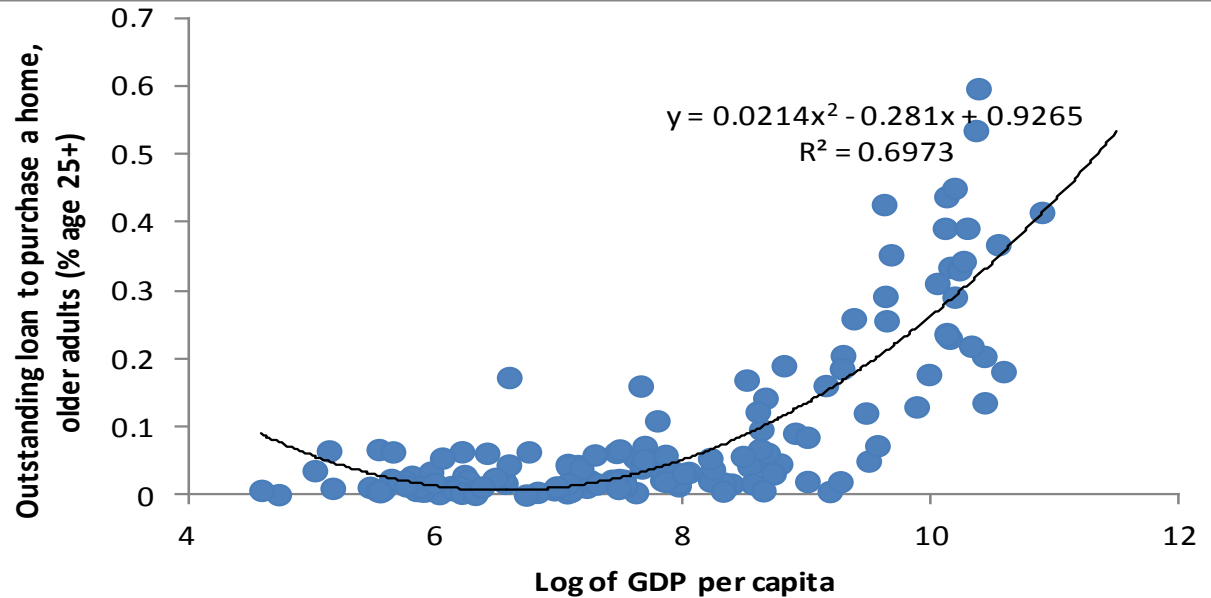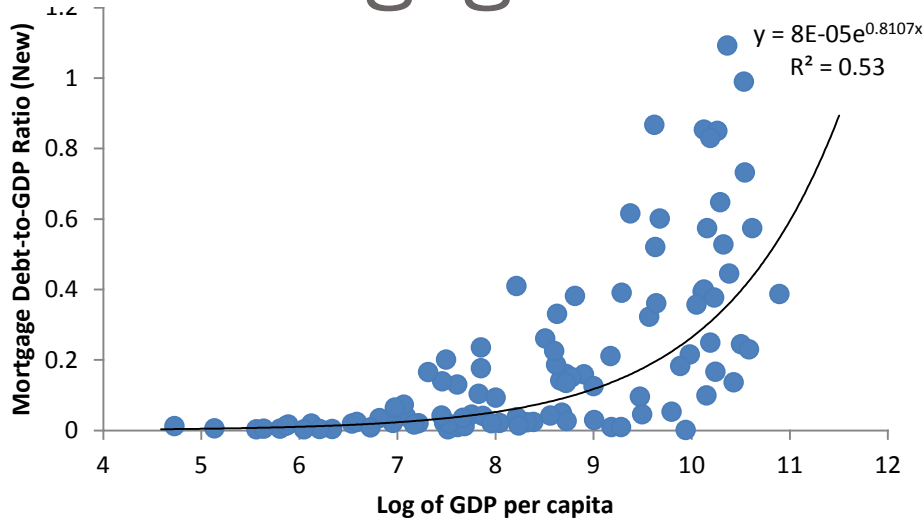
# Price stability helps mortgage markets



$$y = 0.3463e^{-0.286x}$$
$$R^2 = 0.3621$$
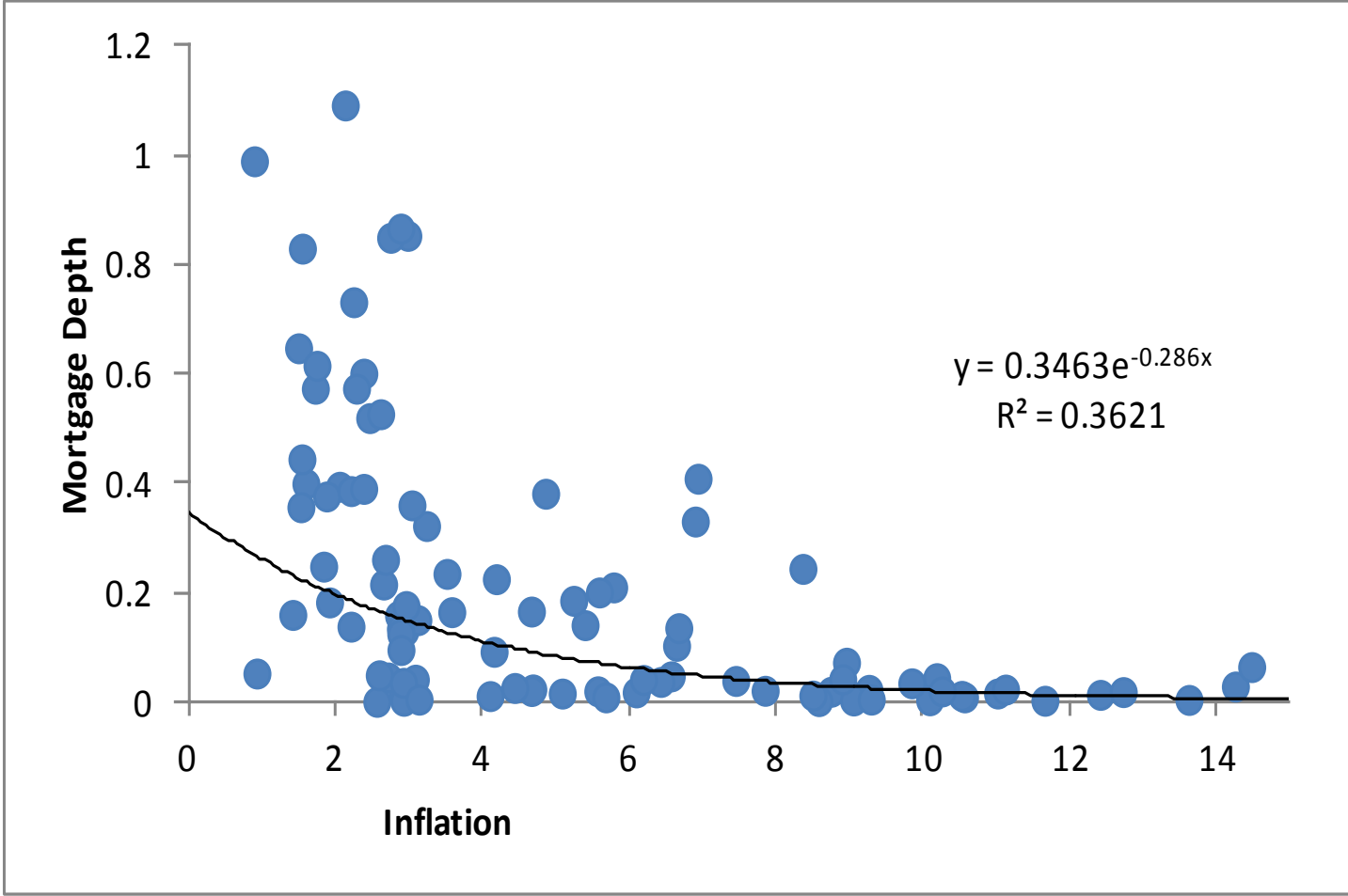
# Multi-variate analysis - summary

- Socio-economic variables:
  - Age dependency ratio: positive
  - Population growth: positive with Mortgage Penetration
  - Urban population: inconsistent across cross-sectional and panel regressions (correlation with GDP per capita?)
  - No significant relationship: population density
- Banking sector variables:
  - Government bank ownership: negative
  - Foreign bank ownership: insignificant
  - Restrictions on banks' activities: negative
  - Competition/concentration: mostly insignificant

# Multi-variate analysis– summary (2)

- Financial sector variables
  - Development of insurance sector: positive
  - Development of equity and private bond markets: positive
  - Development of public bond markets: negative
- Institutional variables:
  - Procedures for construction permits: negative
  - Creditor rights: positive
  - Credit information sharing: positive in within country panel estimations

# Multi-variate analysis– summary (3)

- Funding of mortgage markets
  - Mortgage bonds: positive
  - Not much more significant relationship
- Government support and subsidies: insignificant

# Benchmarking exercise

- What is the "natural" level of Mortgage Depth or Penetration given socio-economic and demographic country characteristics

- Related to concept of financial depth frontier, but without long-term institutional and policy variables

- 3 possible outcomes:
  - Low predicted value: socio-economic constraints
  - Below predicted value: policy constraints
  - Above predicted value: very conducive regulatory and taxation system, possibility of overheating

# Predicted and actual values of Mortgage Depth by income group
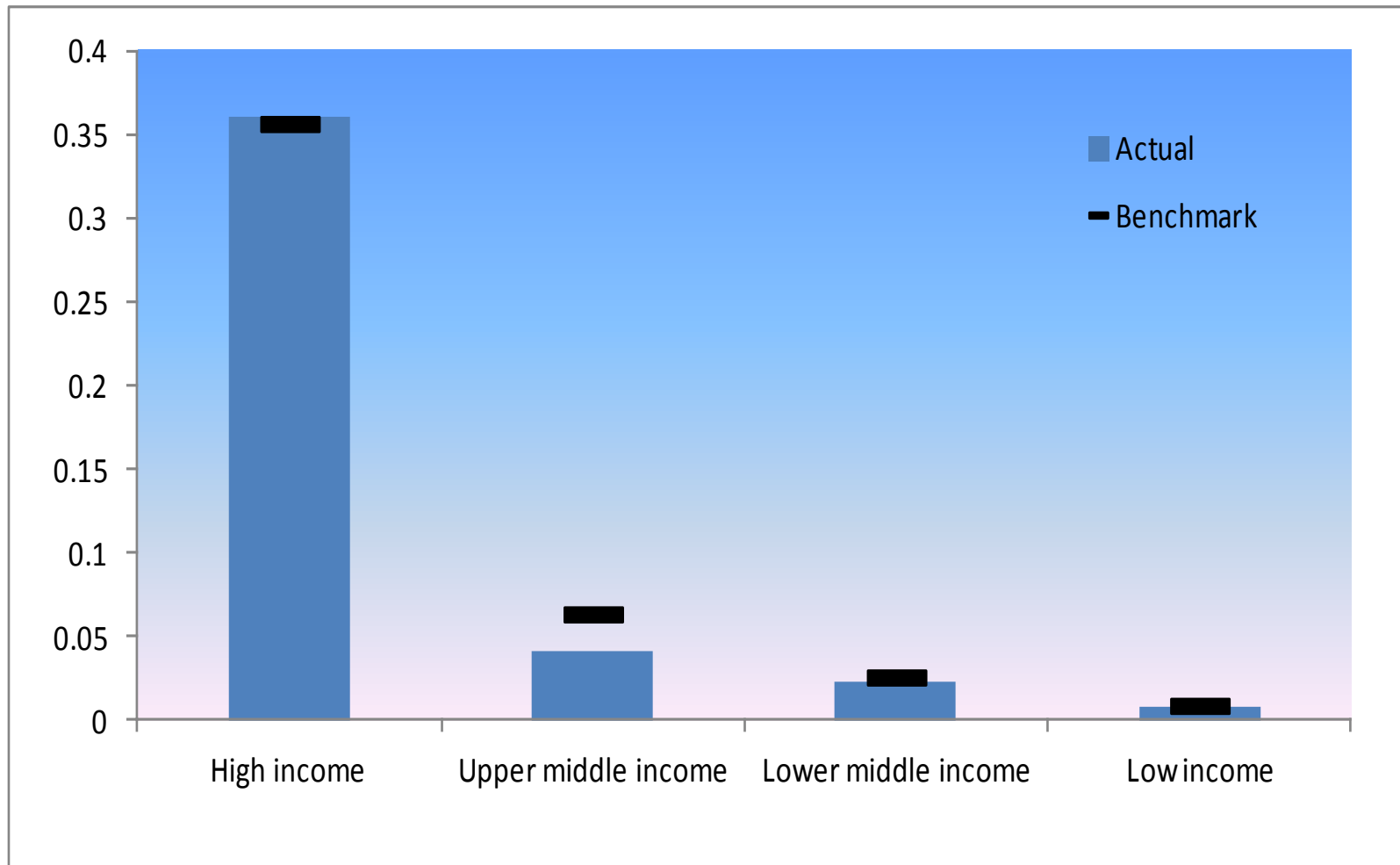
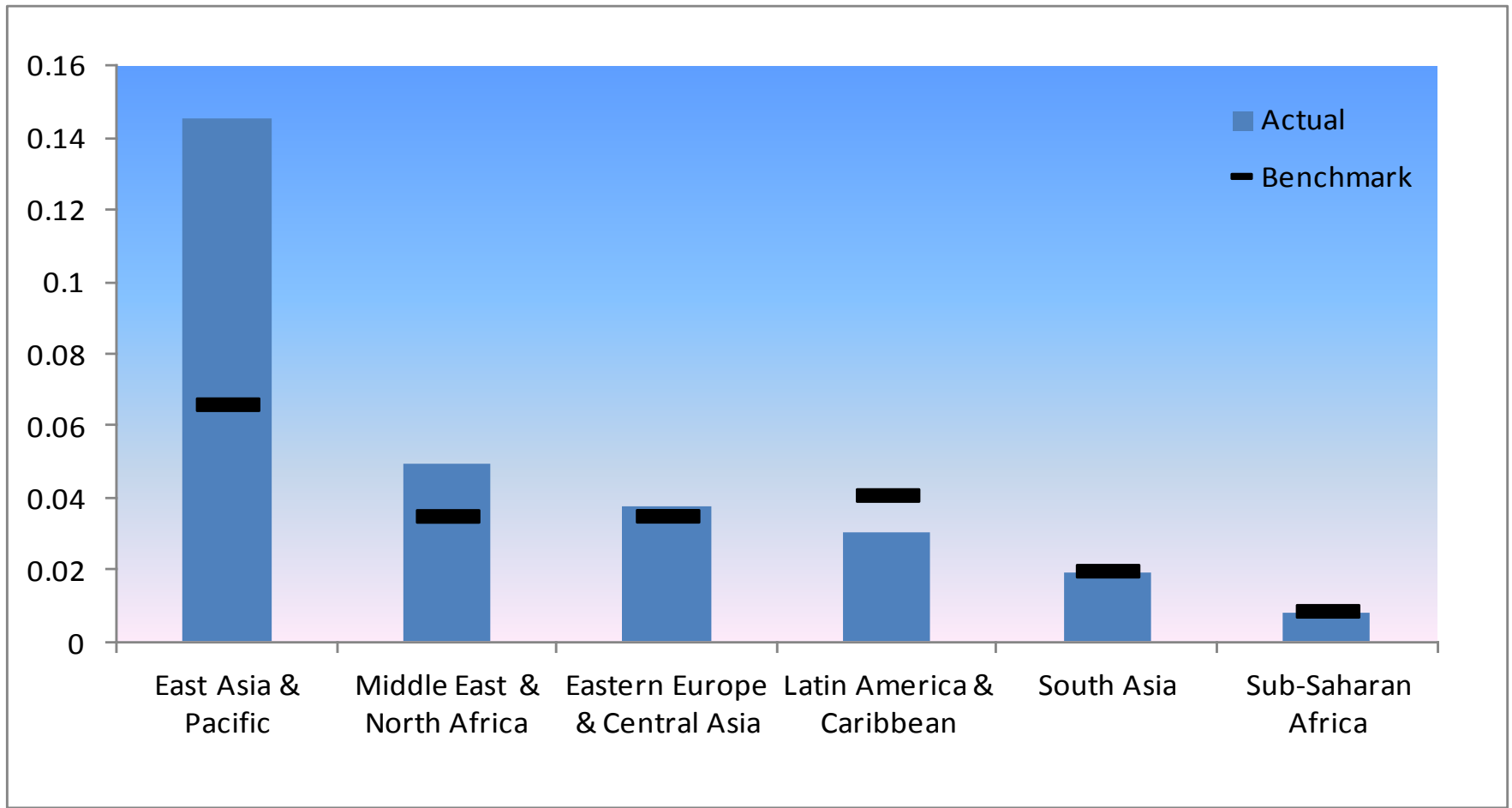Predicted and actual values of Mortgage Penetration by income group
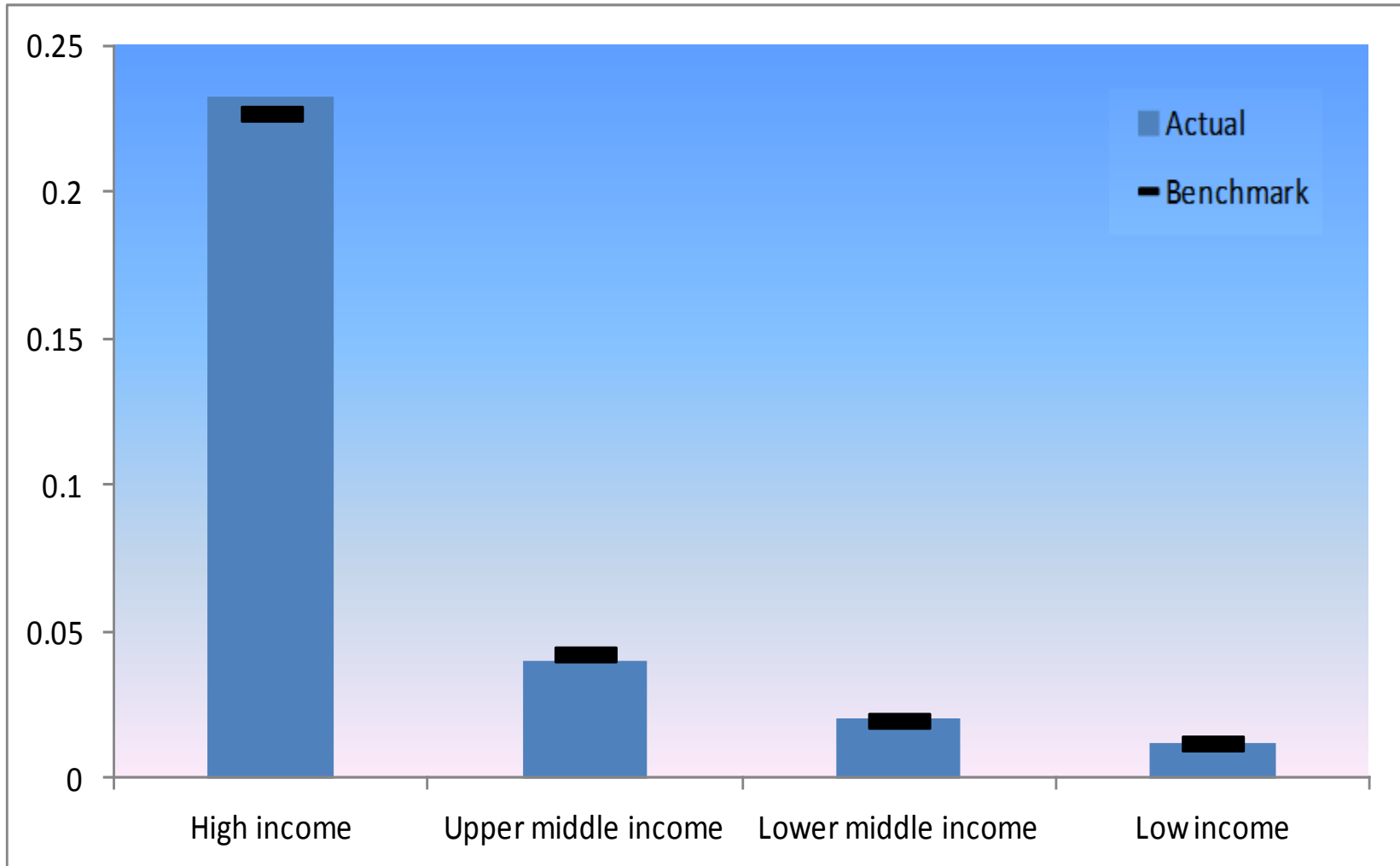
# Predicted and actual values of Mortgage Depth by region

Predicted and actual values of Mortgage Penetration by region
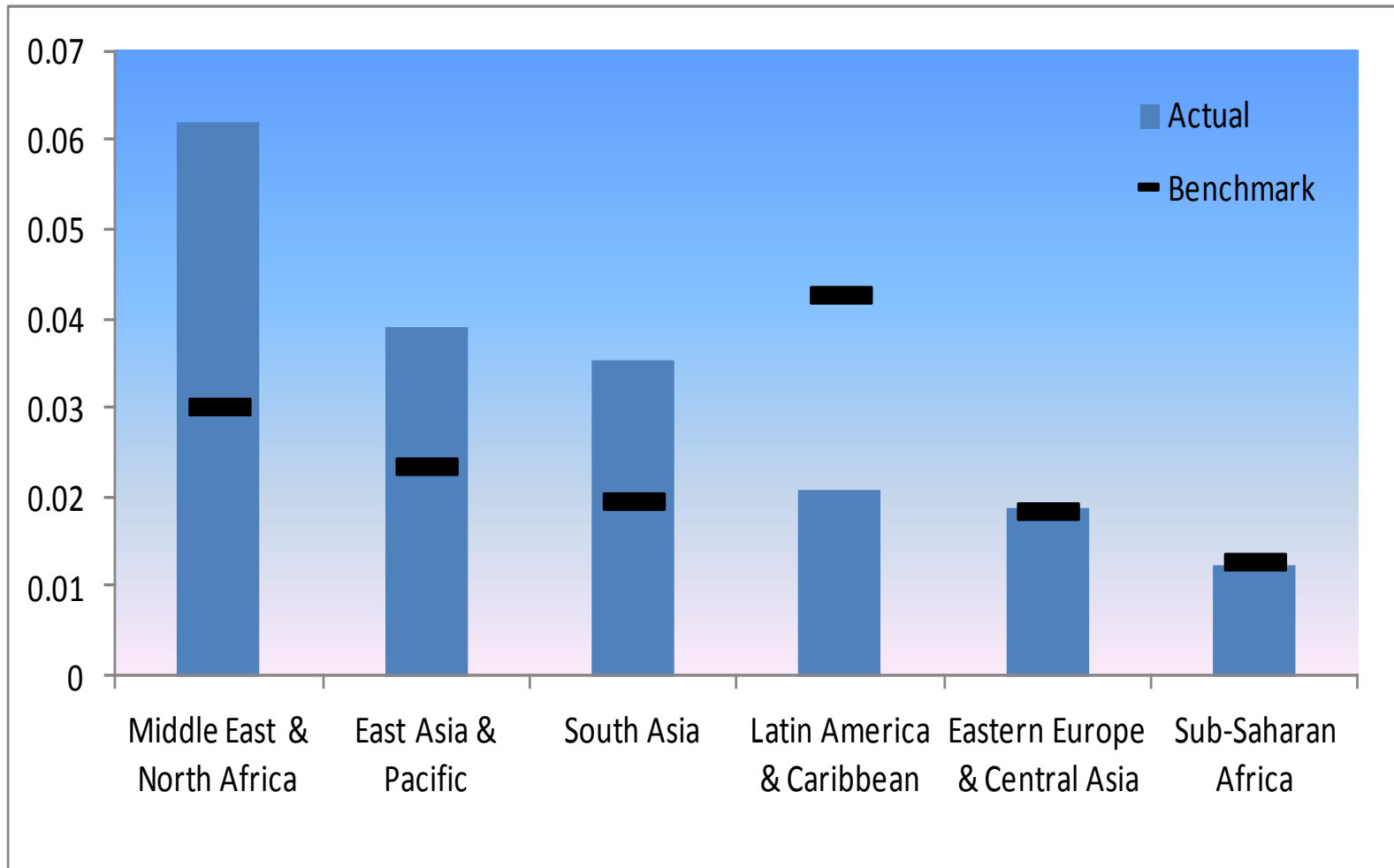
| | |
|---|---|
| Macao SAR, China | 1.162 |
| Bahamas, The | 0.744 |
| Japan | 0.572 |
| Cyprus | 0.388 |
| Italy | 0.286 |
| | |
| France | 0 |
| India | 0 |
| Panama | 0 |
| Nigeria | 0 |
| United Arab Emirates | -0.002 |
| | |
| Australia | -0.405 |
| United Kingdom | -0.424 |
| Netherlands | -0.474 |
| New Zealand | -0.632 |
| Denmark | -0.659 |

Mortgage Depth Gap = predicted - actual

| | |
|---|---|
| Japan | 0.382 |
| Hong Kong SAR, China | 0.161 |
| United States | 0.147 |
| Italy | 0.141 |
| Argentina | 0.115 |
| Germany | 0.109 |
| | |
| Austria | 0 |
| Canada | 0 |
| Honduras | 0 |
| India | 0 |
| Israel | 0 |
| Kuwait | 0 |
| Niger | 0 |
| Panama | 0 |
| Singapore | 0 |
| Tajikistan | 0 |
| | |
| Netherlands | -0.179 |
| Denmark | -0.227 |
| Sweden | -0.228 |
| New Zealand | -0.273 |

Mortgage Penetration Gap = predicted - actual

# Variation within countries

| | | | | | | |
|---|---|---|---|---|---|---|
| Ireland | 1998 | 0.002 | | Spain | 1997 | 0.027 |
| Ireland | 1999 | -0.033 | | Spain | 1998 | 0.000 |
| Ireland | 2000 | -0.036 | | Spain | 1999 | 0.020 |
| Ireland | 2001 | -0.032 | | Spain | 2000 | -0.006 |
| Ireland | 2002 | -0.047 | | Spain | 2001 | -0.011 |
| Ireland | 2003 | -0.063 | | Spain | 2002 | -0.003 |
| Ireland | 2004 | -0.166 | | Spain | 2003 | 0.006 |
| Ireland | 2005 | -0.265 | | Spain | 2004 | -0.046 |
| Ireland | 2006 | -0.260 | | Spain | 2005 | -0.152 |
| Ireland | 2007 | -0.276 | | Spain | 2006 | -0.164 |
| Ireland | 2008 | -0.222 | | Spain | 2007 | -0.193 |
| Ireland | 2009 | -0.240 | | Spain | 2008 | -0.152 |
| Ireland | 2010 | -0.277 | | Spain | 2009 | -0.142 |
| | | | | Spain | 2010 | -0.188 |

# Housing Prices in Ireland, Spain, and the U.S.
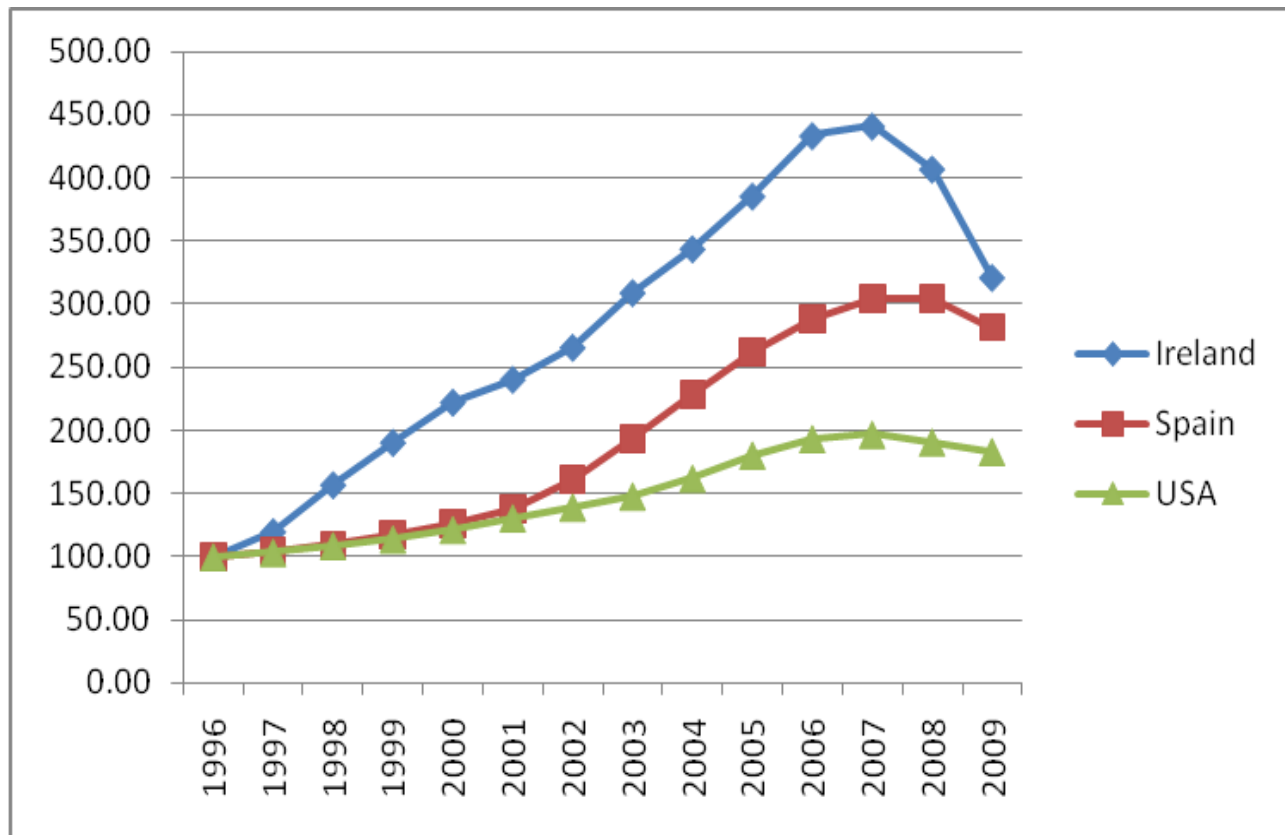
# What have we learned?

- Many determinants of financial deepening also associated with mortgage market development
  - Mortgage markets integral part of financial deepening process
- Mortgage market development very "income-elastic" – luxury good?
- Joint development with other long-term contractual savings institutions/markets
  - Part of "lengthening financial contracts" agenda
- Government's role: negative to irrelevant beyond institution building

# Mortgage markets: Deepening vs. stability

- Mortgage finance systems critical part of a developed financial system
  - Part of lengthening contracts agenda
  - Important for urban development (piecemeal construction due to piecemeal funding)
  - Important for individuals, households and societies
  - But: home-owner vs. renter society?
- Housing boom-and-bust cycles at core of many banking crises over past century
  - Fixed supply, at least in short-term, animal spirits, linked to credit cycles
  - Critical to financial stability agenda
  - Problem of household overindebtedness, with critical social and macroeconomic repercussions
  - Relative roles of monetary and macroprudential policies
- Double-faced role of government policies
  - Help to jump-start and deepen mortgage markets
  - Fuel boom cycles with tax incentives and subsidies
  - The role of politics!

# Looking forward

- Research
  - More data:
    - Mortgage market structure: maturity, LTV ratios, range of products, loan currency and structure of mortgage providers, funding structure
    - Regulatory and taxation framework
  - More analysis: identification!  Link specific policy changes to variation in mortgage depth and penetration
  - More benchmarking: take "temperature" of mortgage market
- Policy:
  - Careful trade-off between social goals of homeownership and avoiding overindebtedness
  - Given the importance of mortgages as collateral, how to reduce sensitivity of lending cycles to house prices?
  - New macroprudential rules, targeted at mortgage lending

# Thank you

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