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The wealth and debt of Danish families

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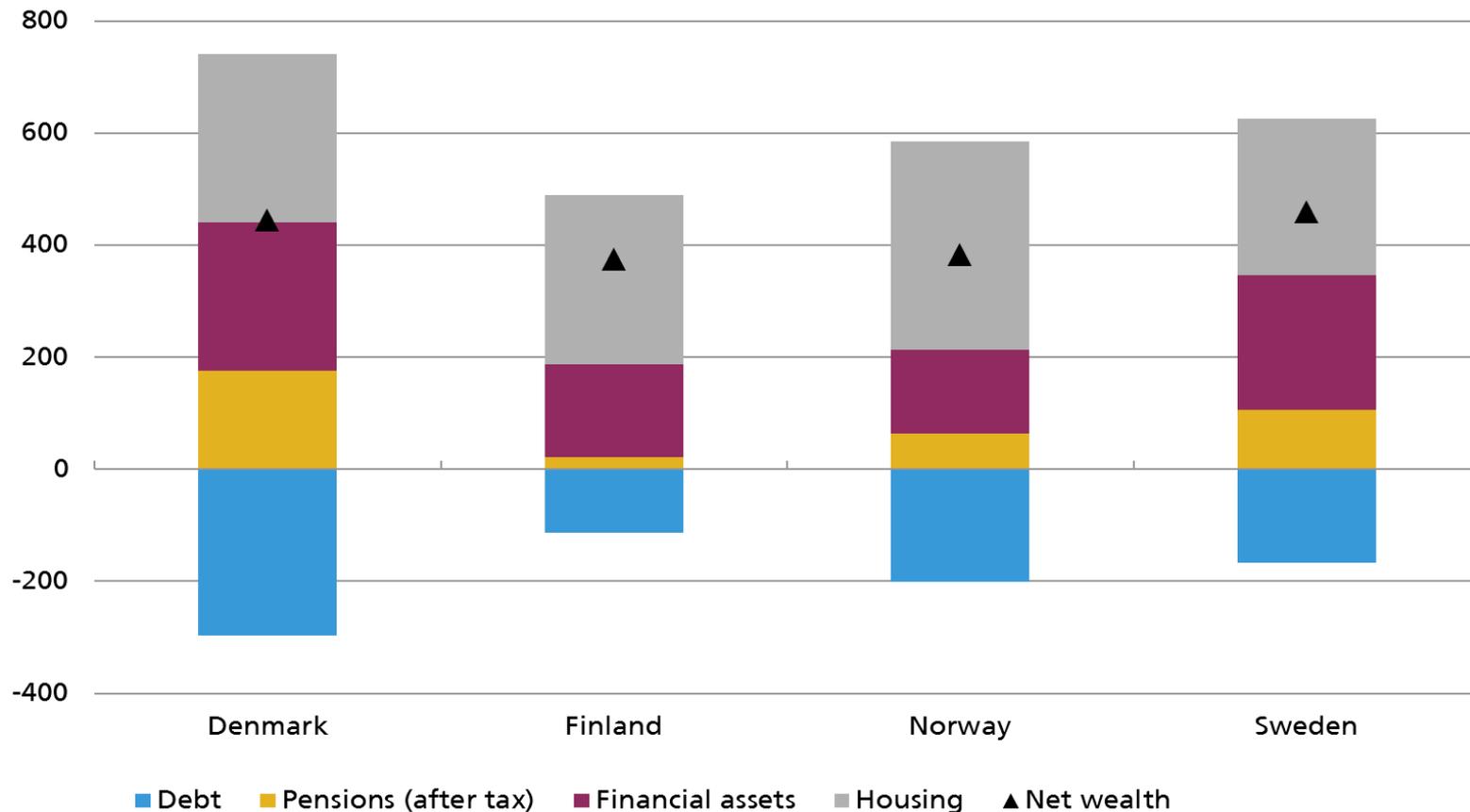
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Danish families have large balance sheets

- but net wealth comparable to other Nordic countries

Household debt and assets, 2012

Per cent of disposable income



Research agenda

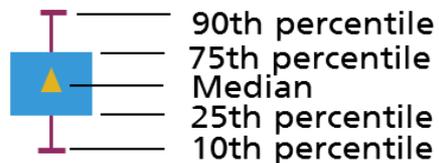
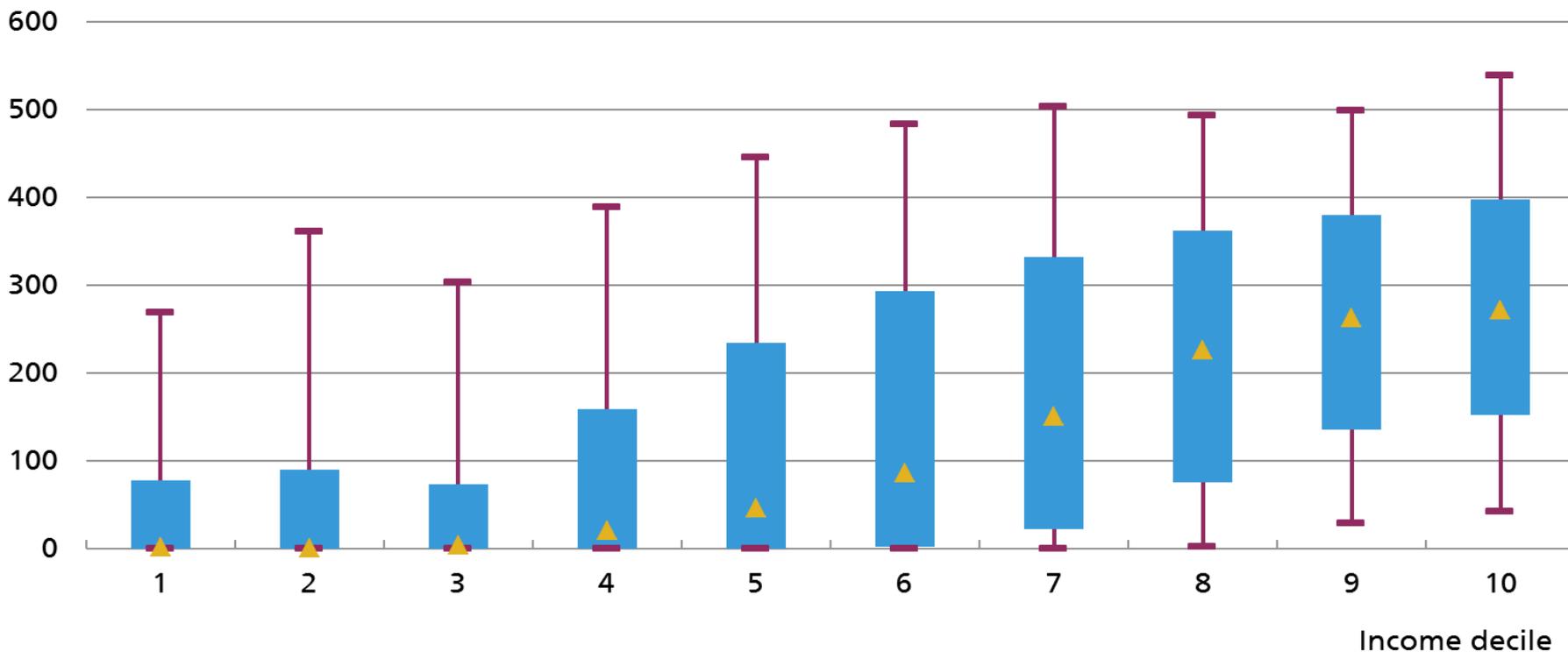
1. Do high debt levels among Danish households pose a threat to financial stability?
 - How are debt and debt-to-income ratios distributed across families?
 - How robust are Danish families to e.g. interest rate hikes or unemployment?
2. Do high debt levels among Danish households pose a threat to macroeconomic stability?
 - How sensitive are families to hikes in interest rates?
 - Did a high debt overhang amplify the reduction in consumption during the crisis?
3. Specific topics in financial stability
 - E.g. Do families with high LTV and interest-only loans differ in their savings behaviour from other families?

Detailed microdata covering Danish families

- Detailed annual data on income, wealth, debt and family relations of every adult member of the Danish population; more than 2.5 million families 2002-12.
- Main data source is tax returns. Collected by Danish tax authorities, organised, anonymised and made available to researchers by Statistics Denmark.
- Background information from other registers: age, education, area of residence, home ownership status, area of residence etc.
- Very detailed data on all loans from mortgage banks to private individuals in 2009-14: Information on initial principal, remaining balance, interest rate, maturity, fixed vs. adjustable rate, amortization, LTV ratio, and *borrower ID*.

Debt-to-income ratios higher among high-income families

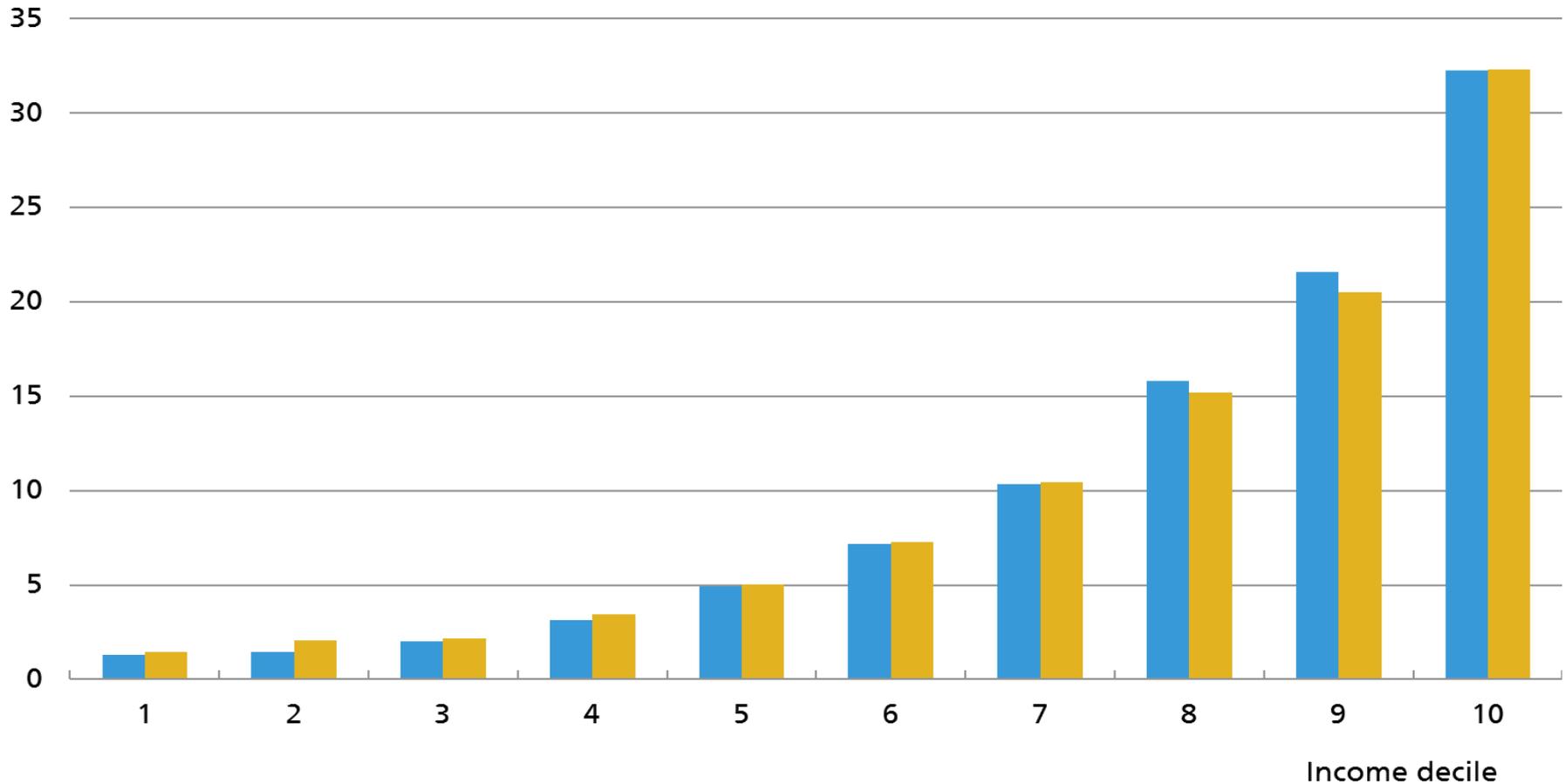
Debt-to-income ratio, per cent of income after tax



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Debt is highly concentrated among high-income families...

Share of total debt stock, per cent



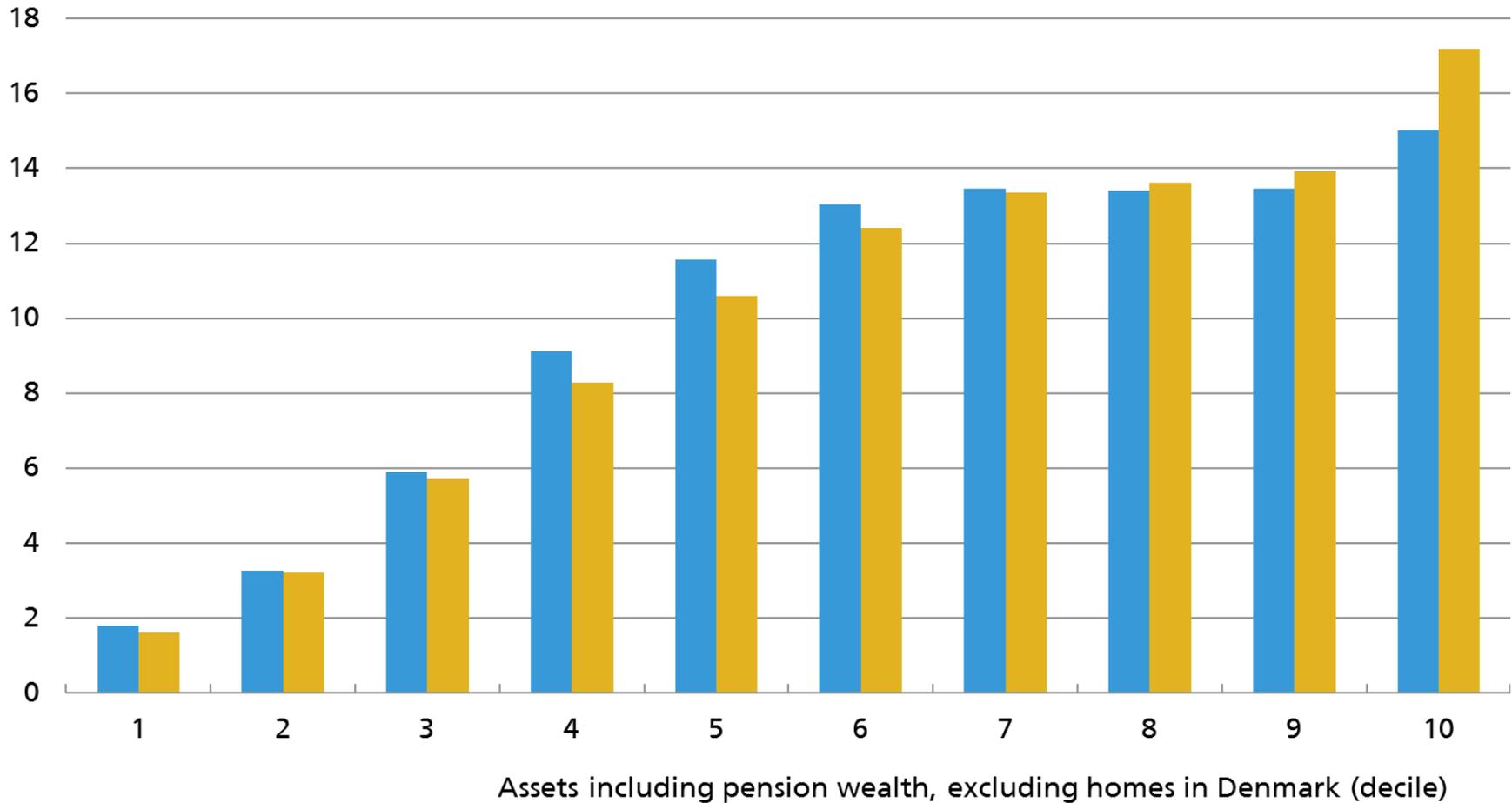
■ 2002 ■ 2010



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... and among families with large financial assets

Share of total debt stock, per cent



■ 2003 ■ 2010

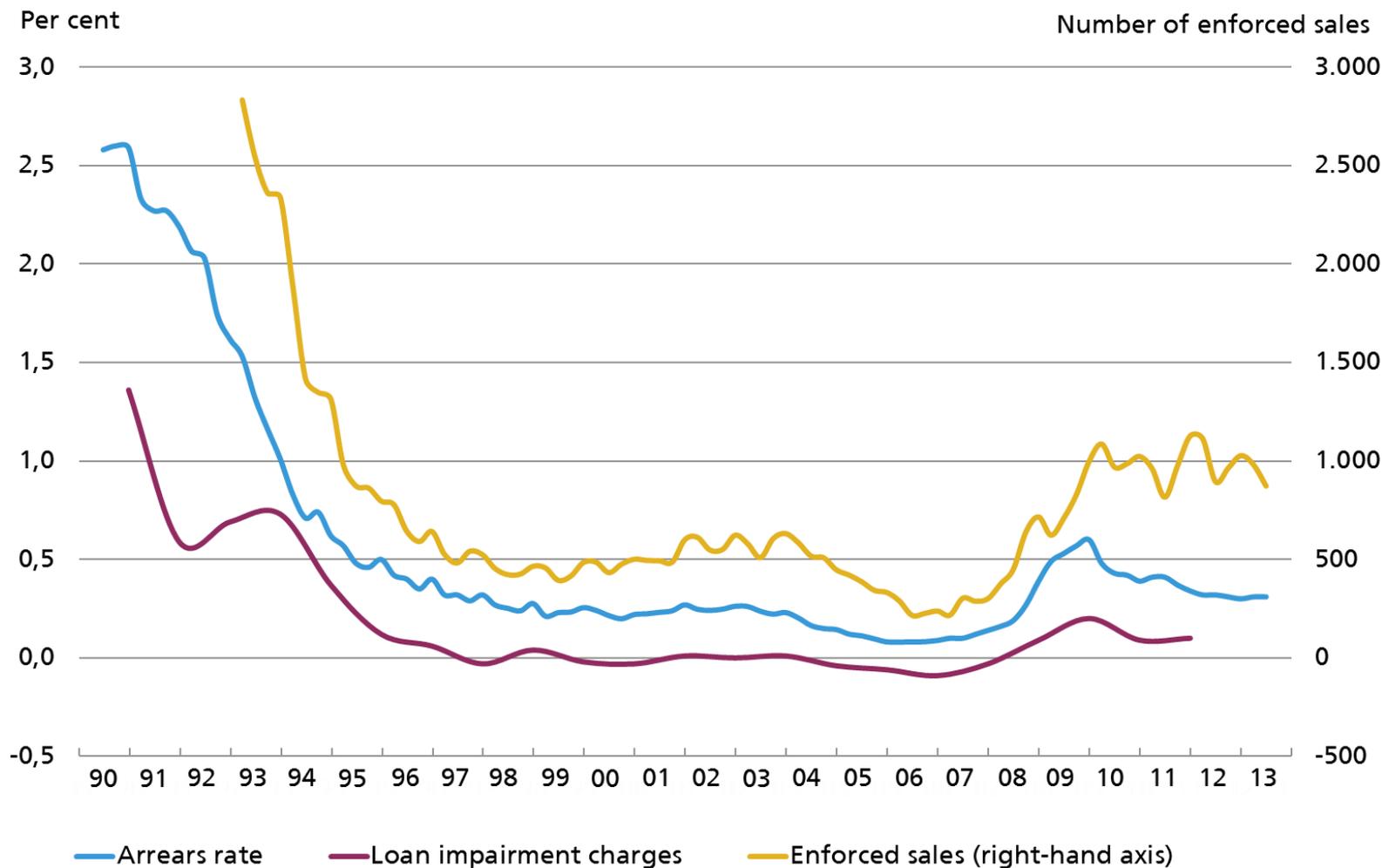


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Example 1 – Financial stability:

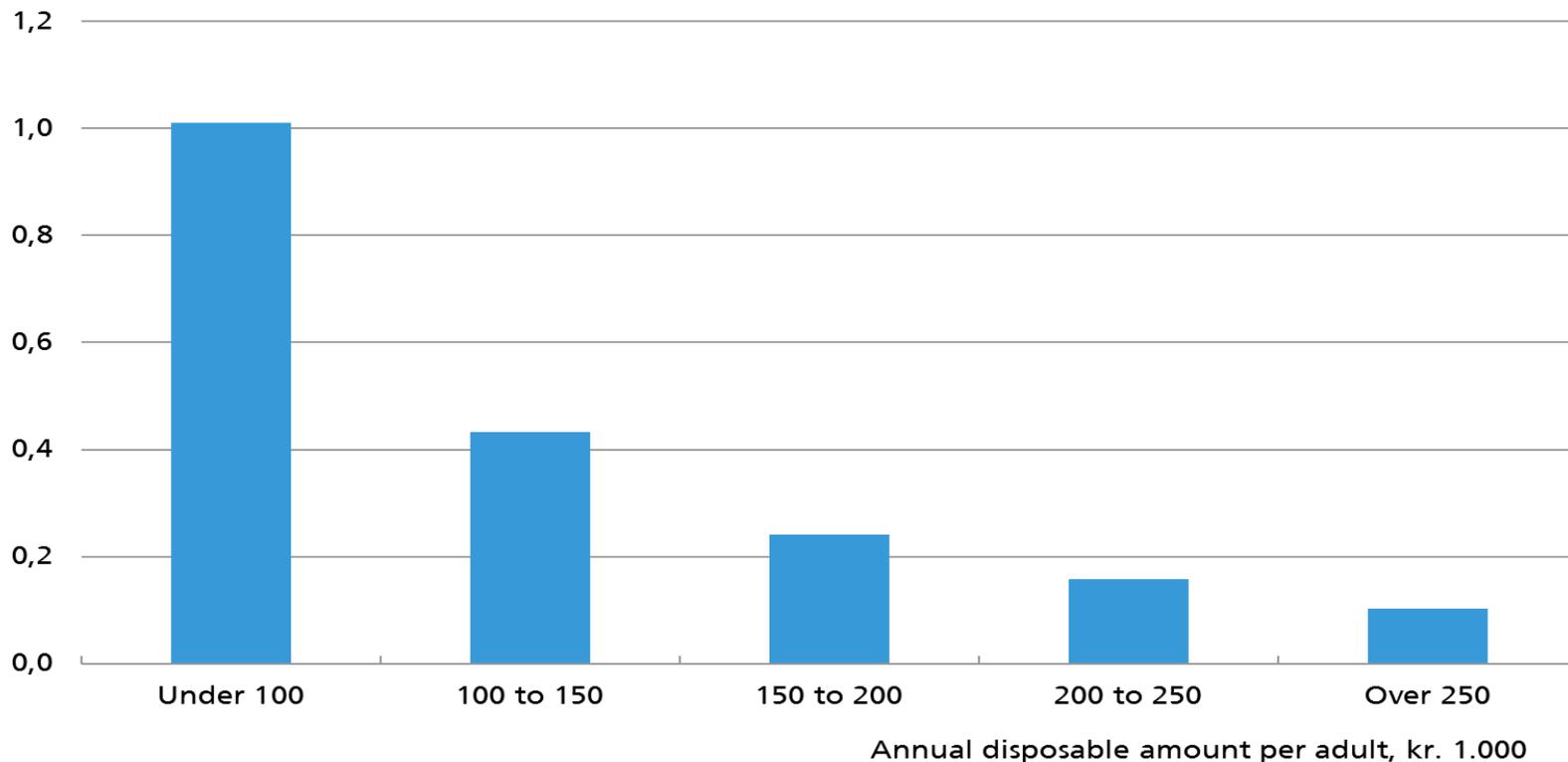
How robust are families to interest rate increases and unemployment?

Arrears rate for mortgage loans remained low during financial crisis, and has since fallen



Few families fall into mortgage arrears, even among those with tight finances

Families in mortgage arrears as a share of the total number of families with mortgage debt, per cent



Same picture when controlling for change in income, stock of liquid assets and home equity, pension wealth, and a range of family characteristics.

Macroeconomic stress tests : Only very modest increase in no. of families in mortgage arrears

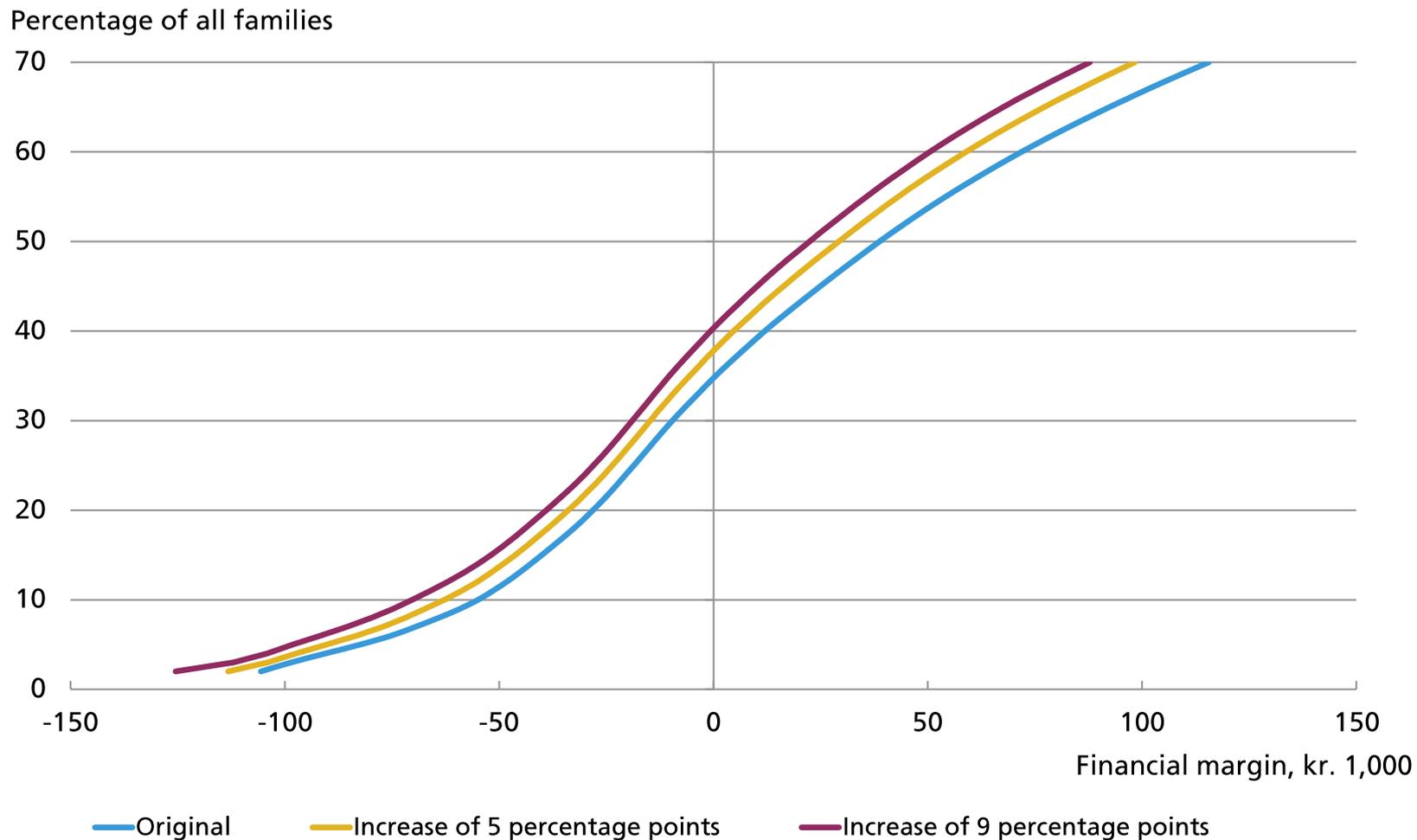
EXPECTED EFFECTS IN SCENARIOS

Table 10

	Scenario 1	Scenario 2
<i>Macroeconomic assumptions</i>		
Change in interest rates, percentage points	5.7	0.0
Change in gross unemployment, percentage points	4.0	4.5
Change in house prices, per cent	-14.0	-16.5
Change in stock prices, per cent	-46.0	-46.0
<i>Expected consequences</i>		
Average change in probability of arrears for families not hit by unemployment, percentage points	0.19	0.04
Average change in probability of arrears for families hit by unemployment, percentage points	2.06	1.47
Average change in probability of arrears for all families taken as one, percentage points	0.29	0.13
Expected increase in the number of families in arrears by 105 days on the June instalment	2,816	1,236

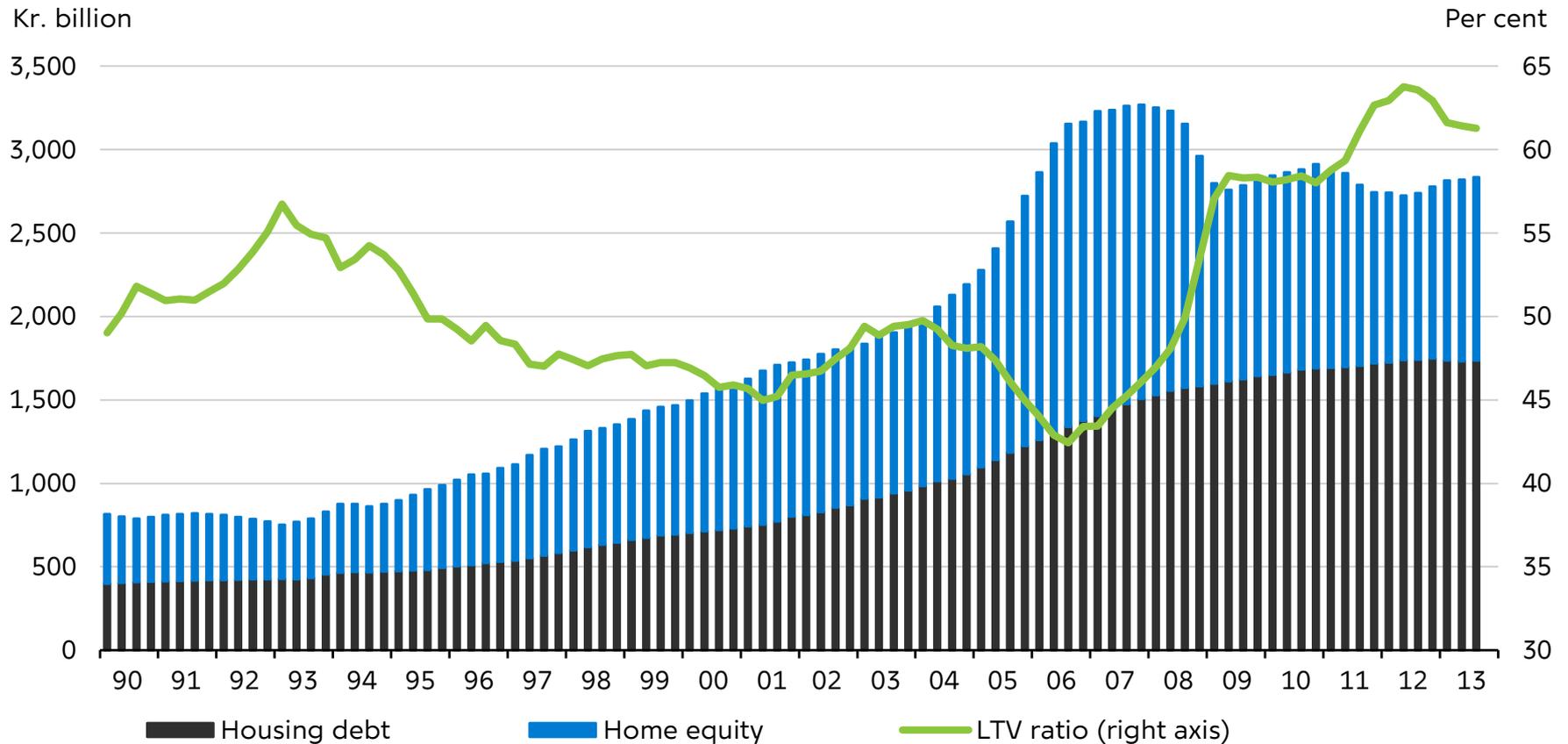


Families' resilience to interest rate shocks



**Example 2 – Macroeconomic stability:
Did a high debt overhang amplify the
reduction in consumption during the
crisis?**

Aggregate LTV ratio is at a high level



Leverage and consumption – what do we hope to learn from microdata?

- The question: Did LTV ratios play an independent role in Danish households' consumption decisions during the financial crisis?

An example	Household A	Household B
<i>Before the crisis</i>		
Home value	2.0	1.0
Debt	1.5	0.5
Net worth	0.5	0.5
LTV ratio, per cent	75.0	50.0
<i>After the crisis</i>		
Home value	1.8	0.8
Debt	1.5	0.5
Net worth	0.3	0.3
LTV ratio, per cent	83.3	62.5

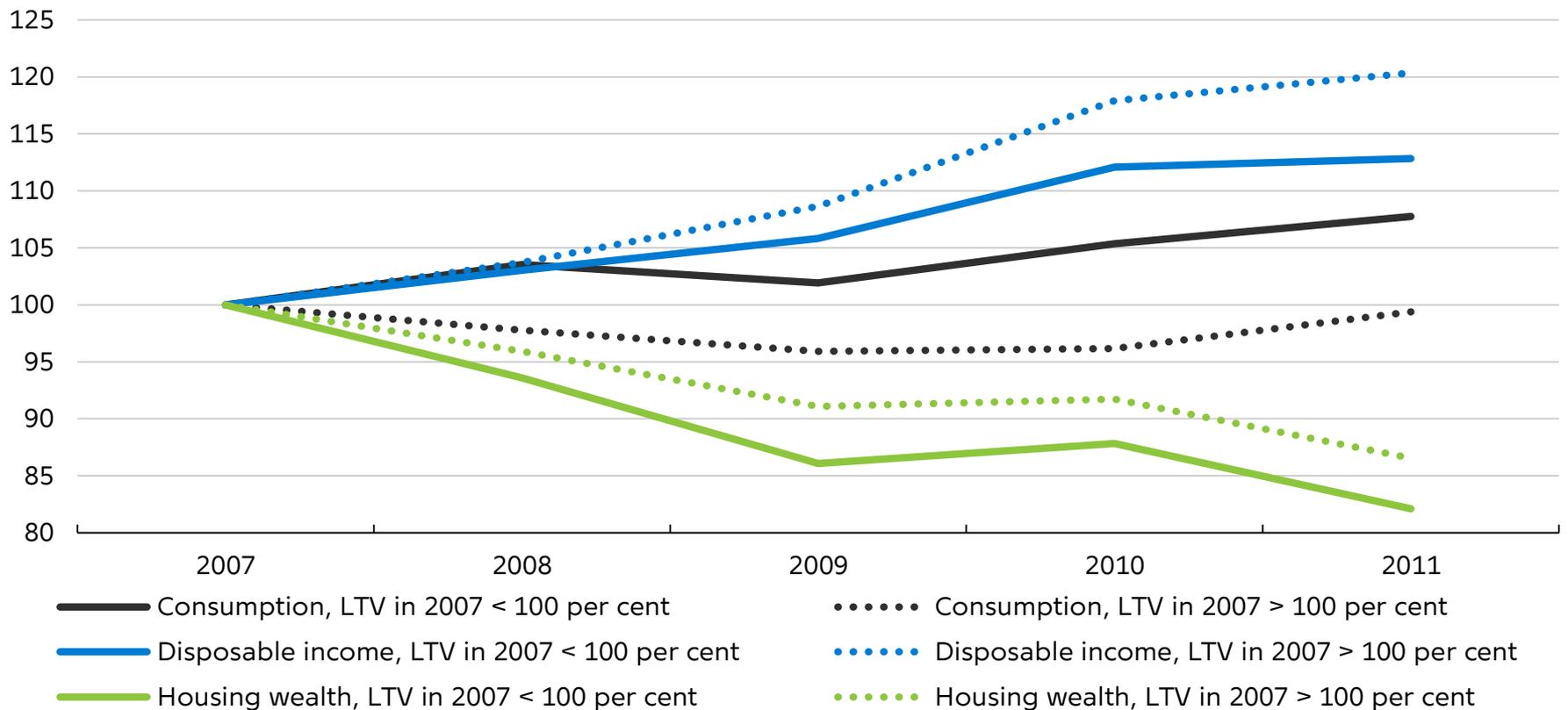
- Empirical strategy: Analyze correlation btw. LTV ratio in 2007 and subsequent development in consumption at the household level, given other household characteristics.

Imputing consumption from income and wealth data

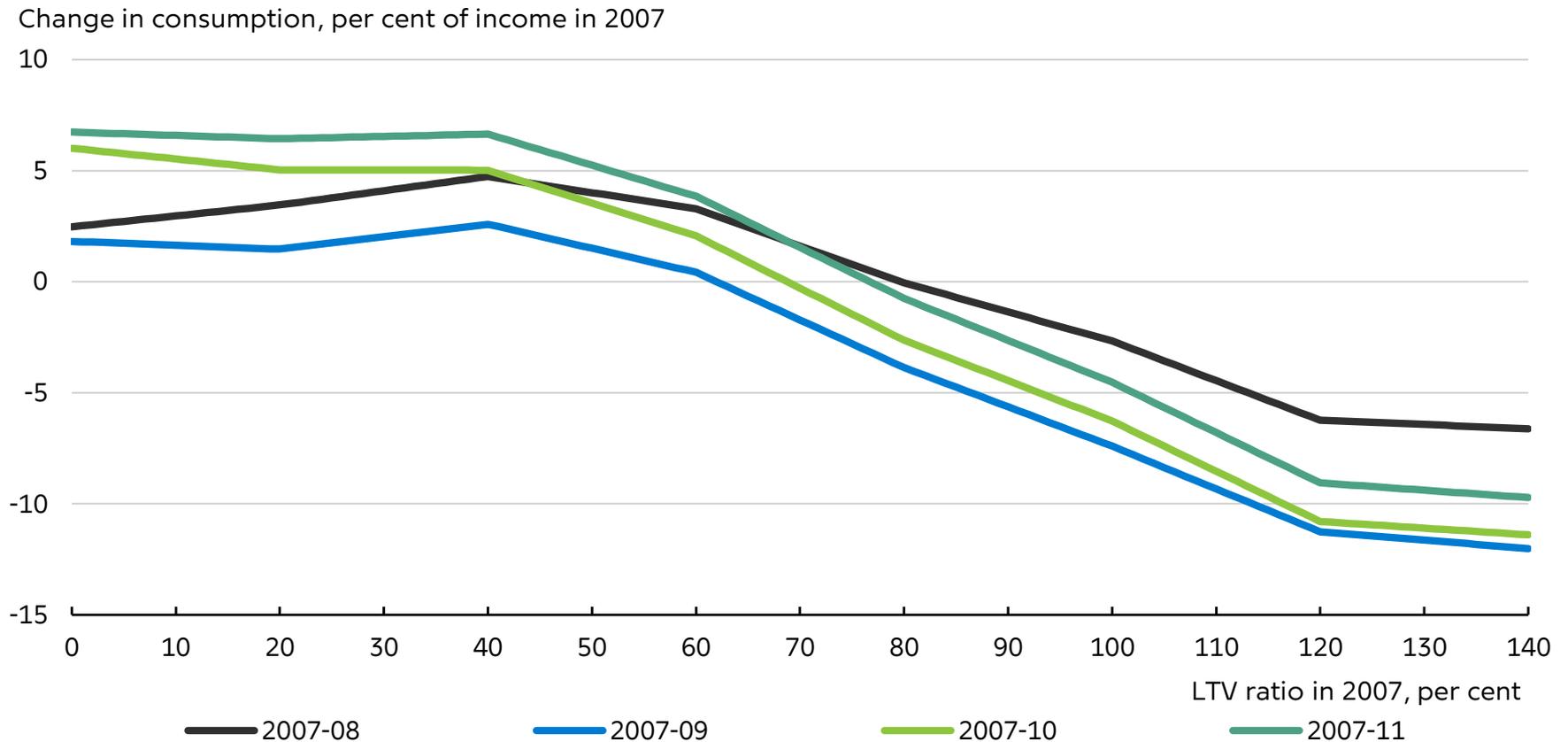
- Start from accounting identity : $C = Y^d - S$
- Imputed measure: $C^{imp} = Y^d - \Delta NW$
- Problem: Change in net worth can generally not be separated into changes in stock of assets (saving) and changes in asset prices (capital gains or losses).
- Important exceptions:
 - Housing: Exclude families who are involved in a real estate trade
 - Saving in pension schemes: Have accurate data for contributions
 - Stocks: Crude adjustment for capital gains based on overall stock market development.

Highly indebted households reduced consumption more during the crisis

Index 2007 = 100



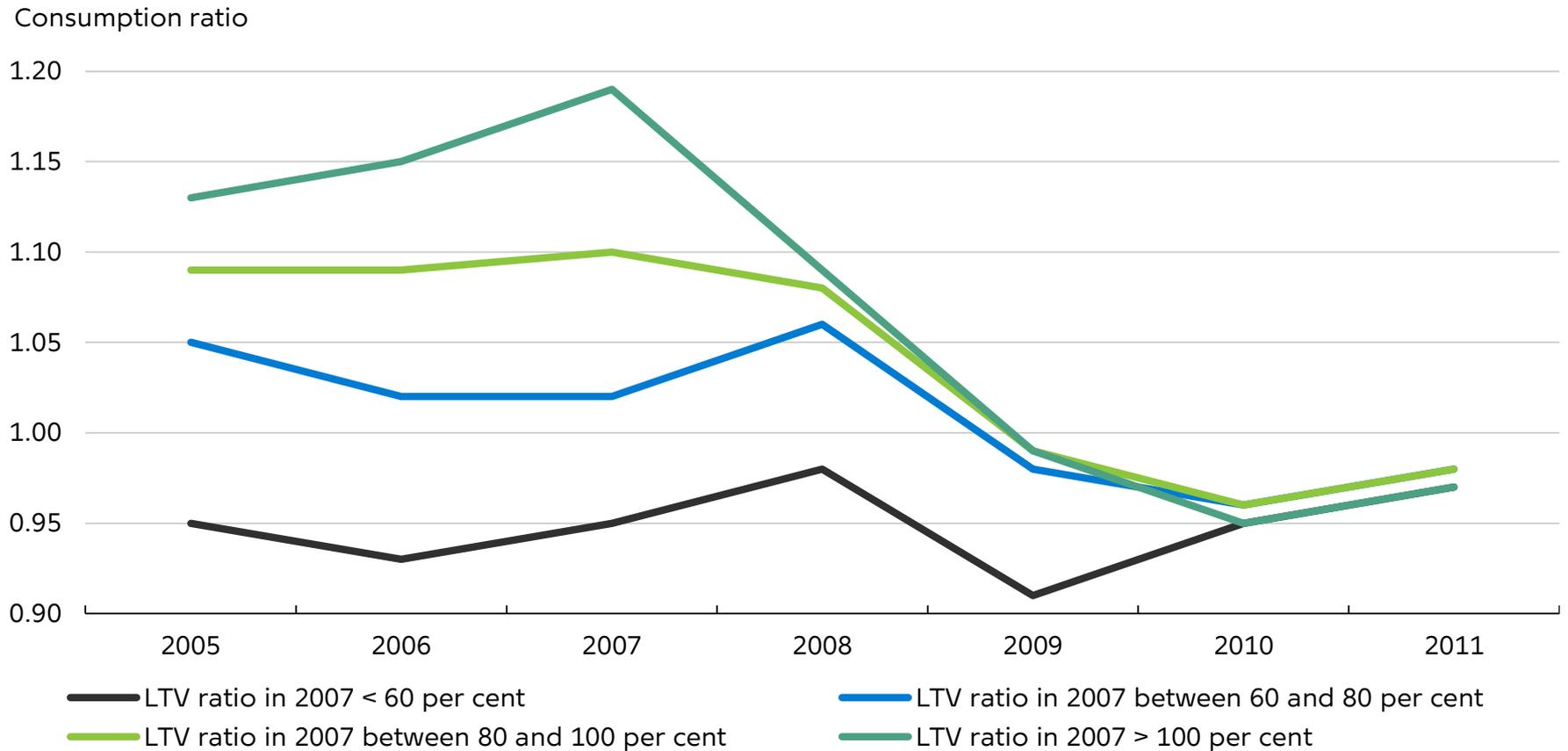
Regression results presented graphically



Possible interpretations

1. Precautionary saving motive
 - Even if credit constraints are currently non-binding, households may wish to insure themselves against the risk of future binding constraints.
 - Can trigger self-imposed efforts to bring LTV ratios down.
 - One way to do that is to reduce consumption.
2. Credit / liquidity constraints
 - Access to credit limited, not just for high-LTV households
 - But those who demand credit are more likely to have high LTV ratio
 - High LTV in 2007 and reduction in consumption both driven by something else (time preferences, myopia?), no causal effect
3. Life-cycle behaviour / regression to the mean?
 - After a lot of debt-financed spending, normal to cut back
 - No role for neither LTV ratios nor credit conditions

Consumption levels before and during the crisis

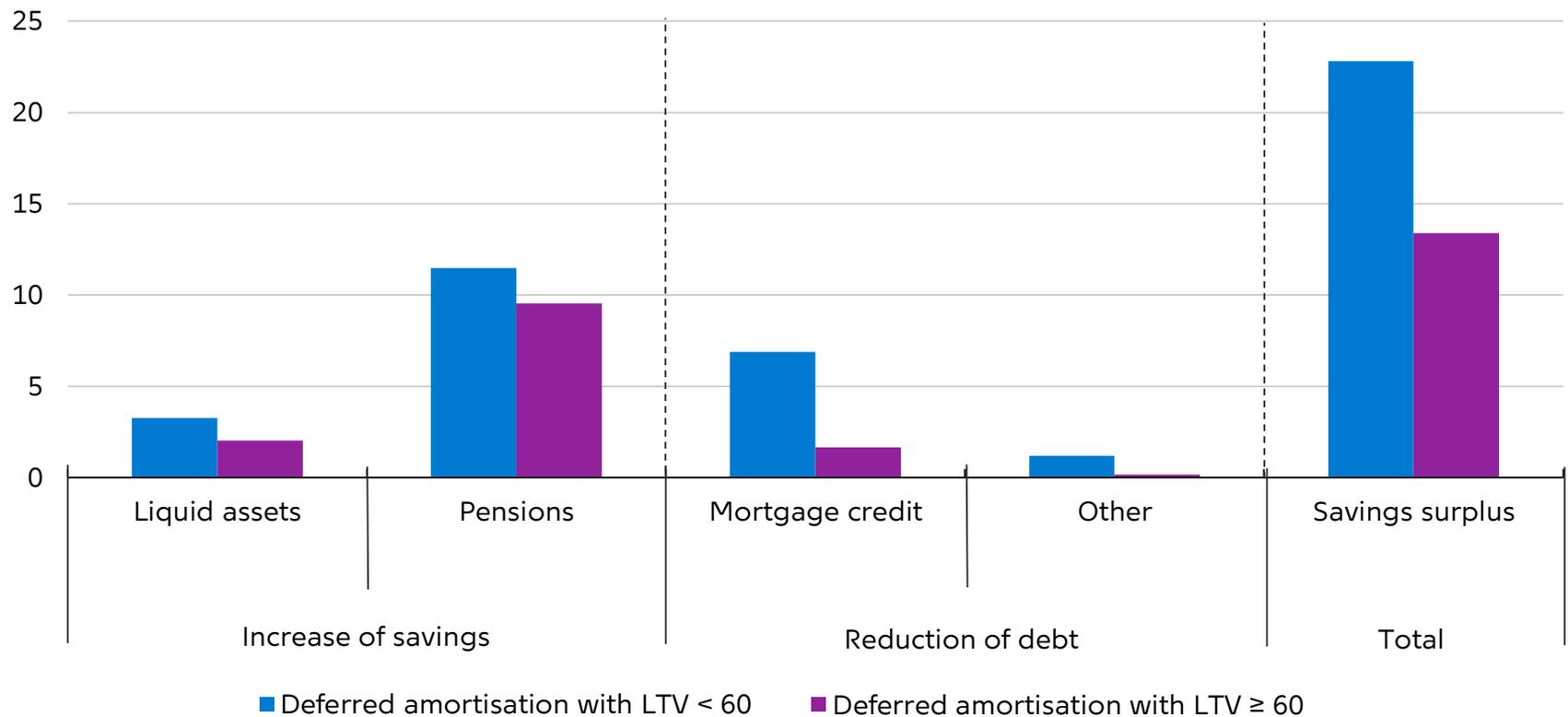


Example 3 – Specific topics in financial stability:

Families with interest-only loans

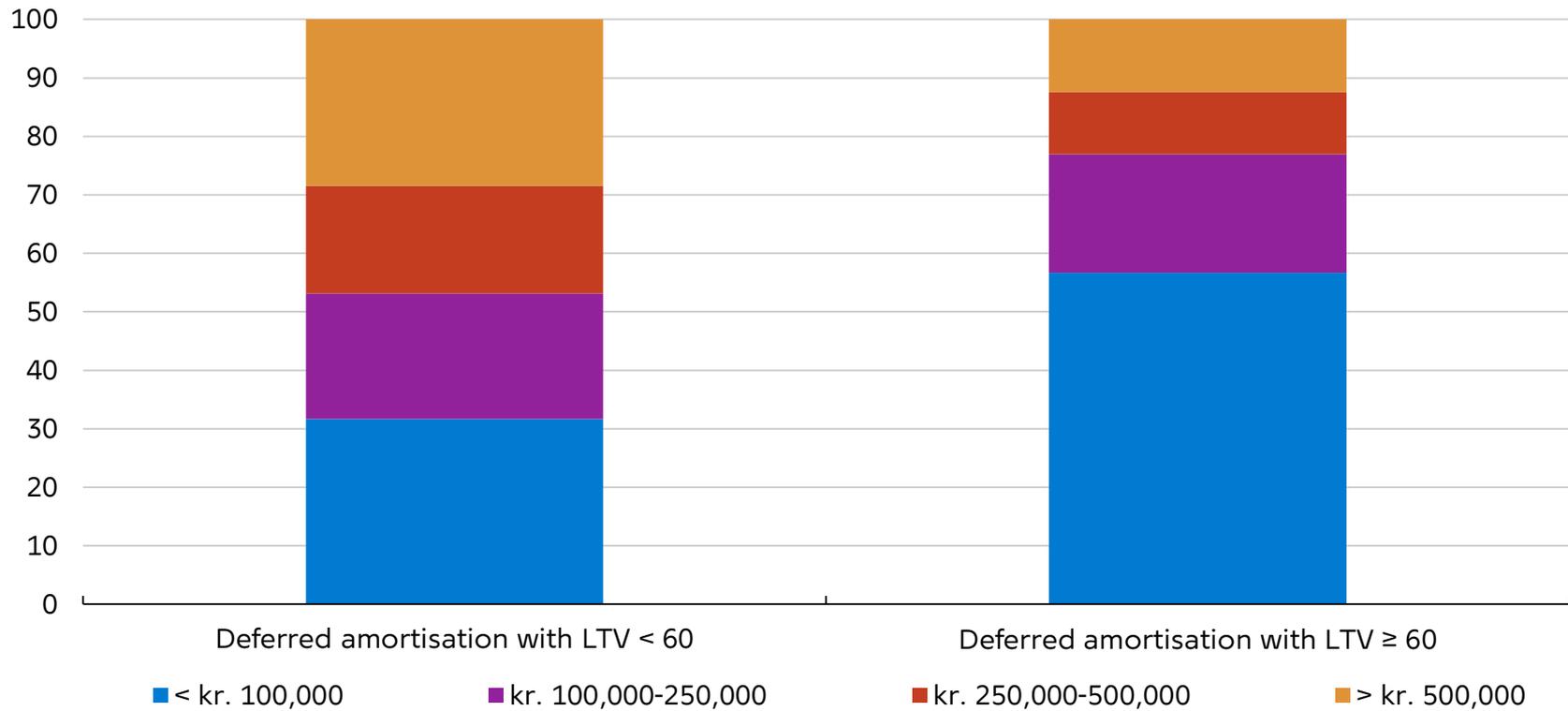
Families with interest-only loans and high LTVs have lower savings ratios

Average savings and amortisation ratios, per cent of disposable income



Families with interest-only loans and high LTVs have fewer liquid assets

Per cent



Conclusions

Conclusions

- Financial stability
 - The high debt level among Danish households does not pose a direct threat to the stability of the Danish mortgage credit sector.
 - Debt concentrated among families with high ability to repay
 - Danish families' willingness and ability to service mortgage loans are resilient to even very large adverse shocks
 - But issues relating to specific topics, e.g. interest only loans
- Macroeconomic stability
 - Household finances sensitive to interest rate fluctuations
 - Strong correlation between high pre-crisis LTV ratios and drop in consumption during the financial crisis.
 - Suggests a destabilizing effect of high indebtedness during times of financial unrest.
 - Financial stability may be affected indirectly through corporate sector.