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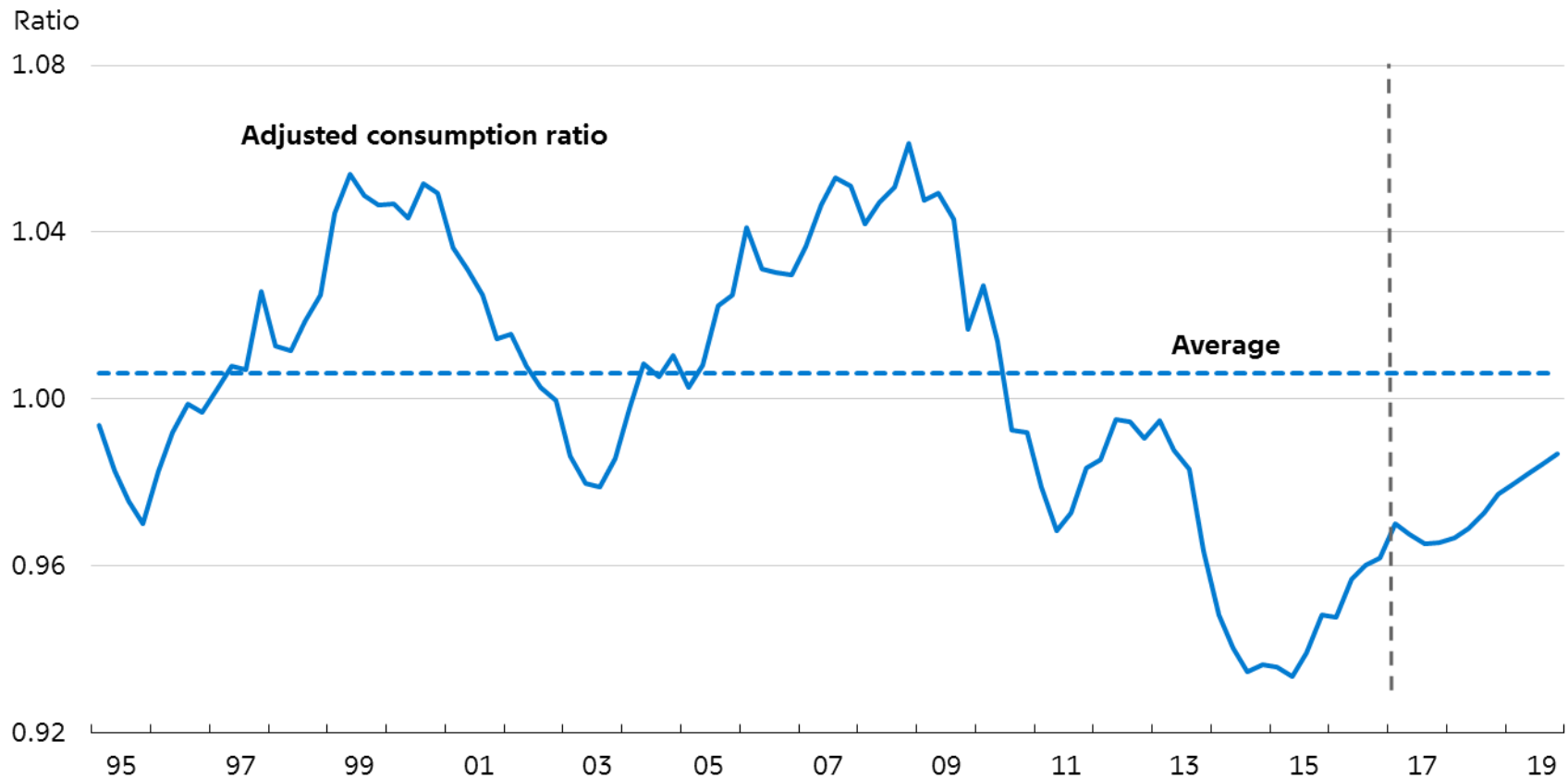
## CONSUMPTION AND SAVINGS IN A LOW INTEREST RATE ENVIRONMENT

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# Private consumption has been weak since the crisis



Note: Average of the current and three previous quarters. The consumption ratio is consumption relative to disposable income where disposable income has been adjusted for capital pension taxation, etc. Average from 1995 until the 4th quarter of 2016.  
Source: Statistics Denmark and own calculations.

# Agenda

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Consumption development for different groups of households

Marginal propensity to consume out of housing wealth

Sensitivity of consumption to increasing interest rates (the cash-flow channel)

# Preview of conclusions

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Borrowers have increased their speed of consolidation during the years of negative policy rates – while savers as well as borrowers with low gross debt have increased their consumption

Marginal propensity to consume out of housing wealth around 4-6 per cent – and asymmetric

Moderate effect of increasing rates on consumption (through the cash-flow channel)

Low interest rates may have countered an even larger drop in private consumption than what has actually been observed.

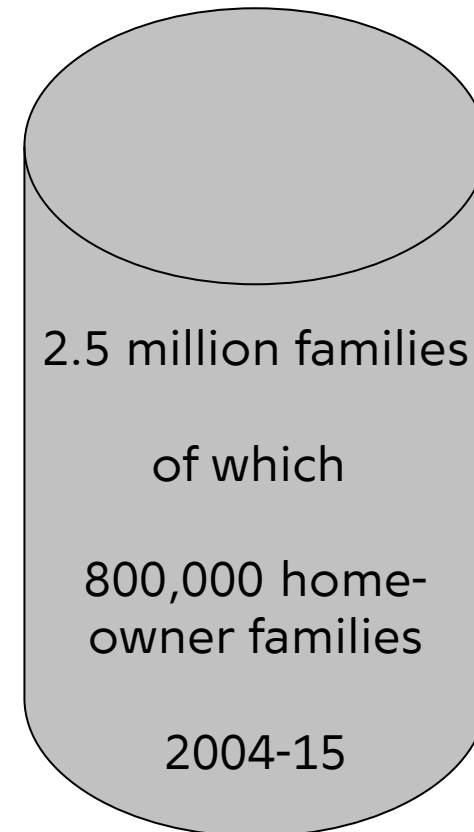
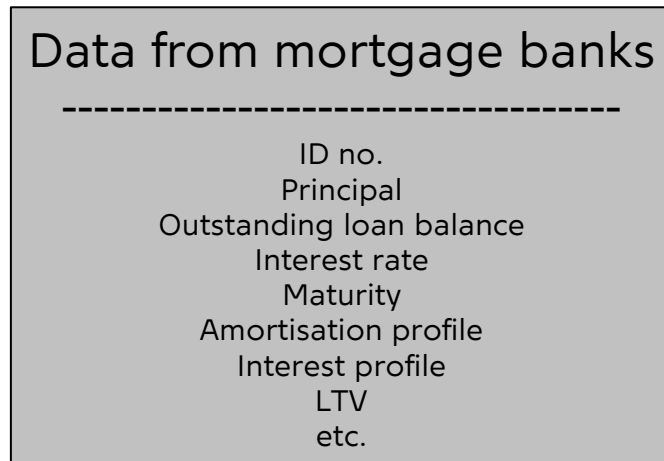
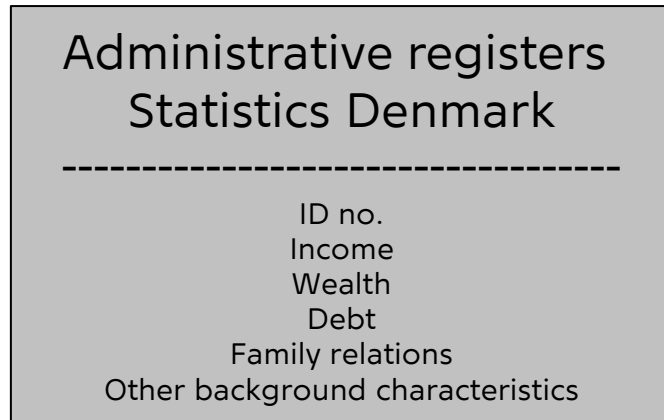
# Data and consumption measures



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# Detailed microdata covering Danish families

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# Imputing consumption from income and wealth data

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Start from accounting identity :  $C = Y^d - S$

Imputed measure:  $C^{imp} = Y^d - \Delta NW$

Challenge: 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:

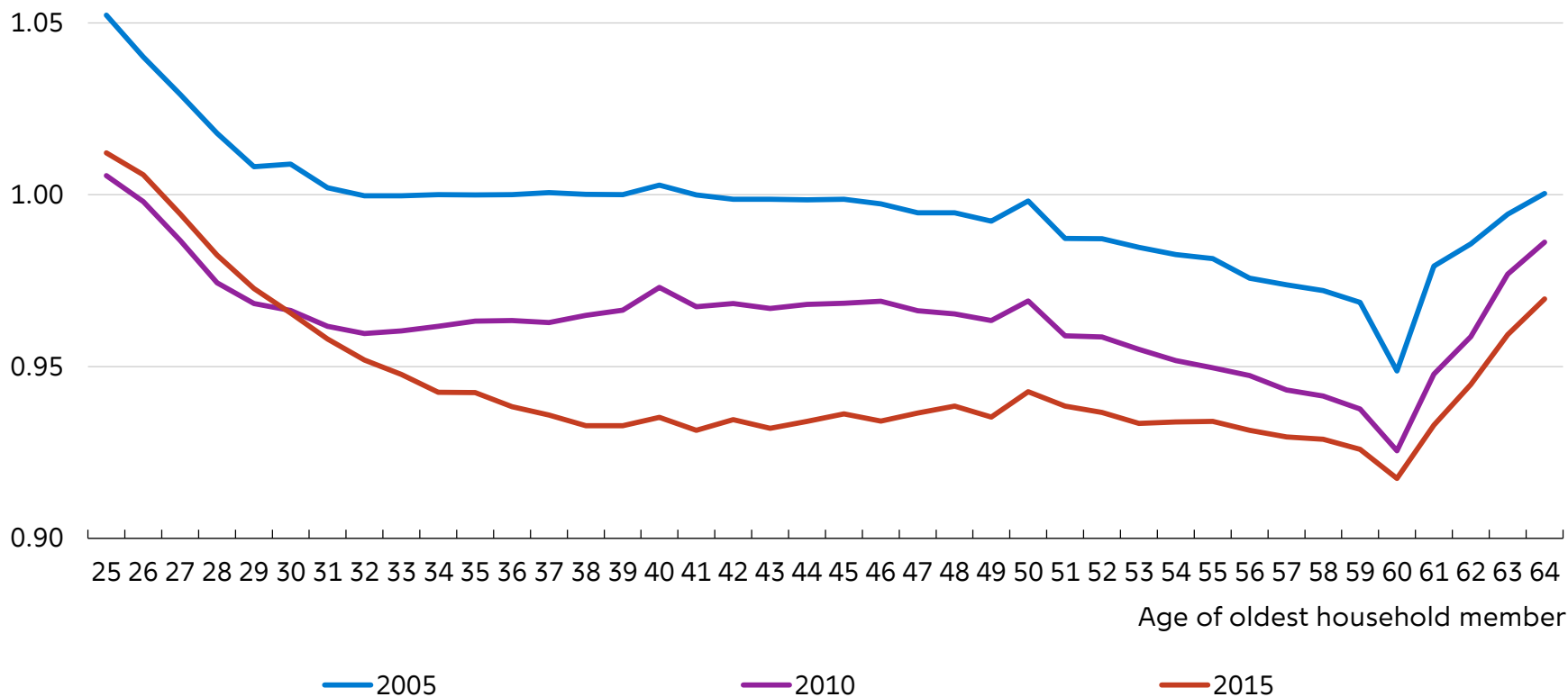
- Housing: Exclude families who are involved in a real estate trade
- Saving in pension schemes: Accurate data for contributions
- Stocks: Crude adjustment for capital gains based on overall stock market development

# Consumption developments 2003-15



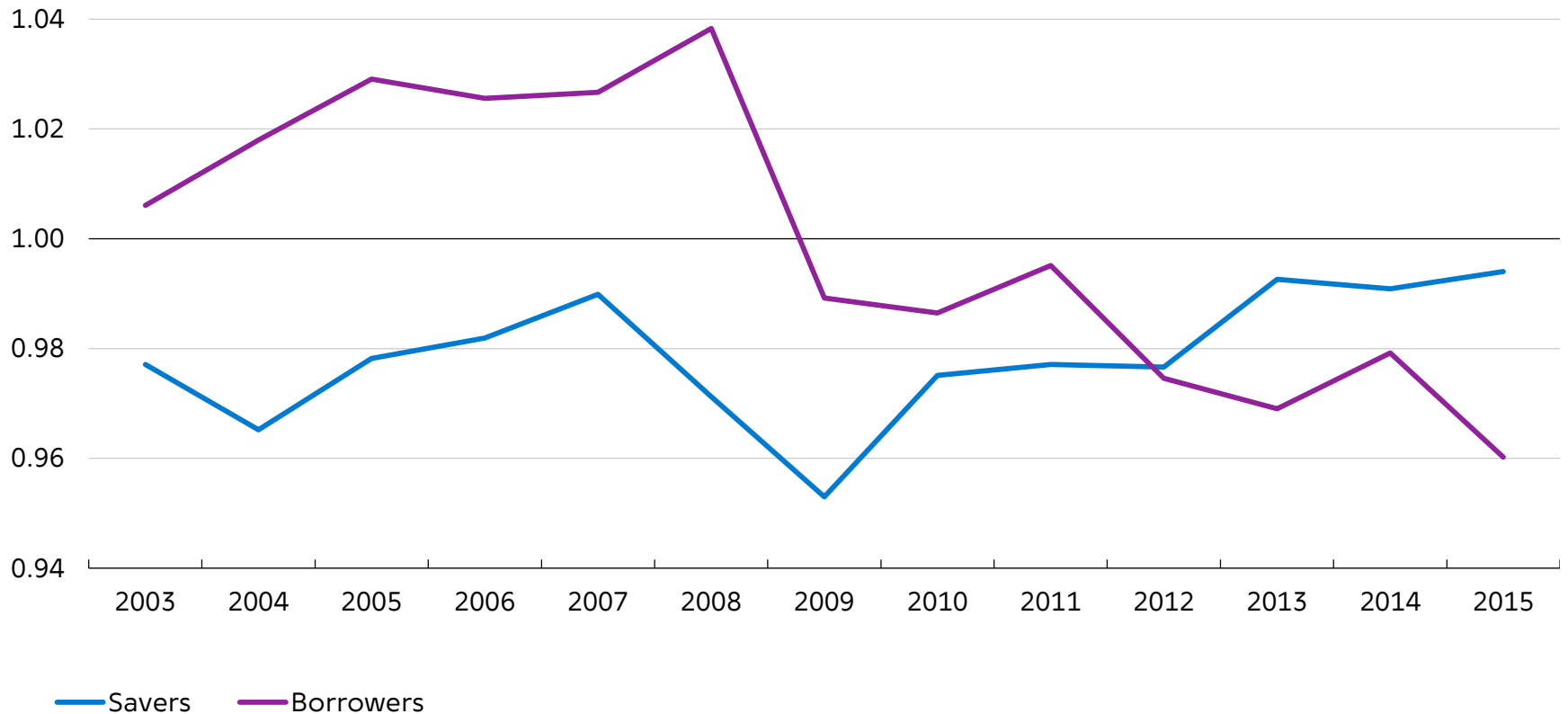
# Consumption rates by age

Median consumption to income ratio



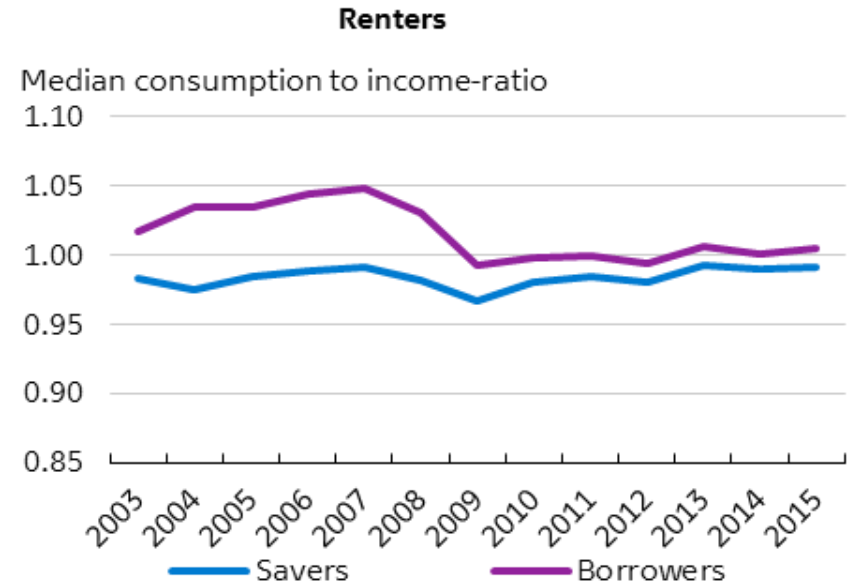
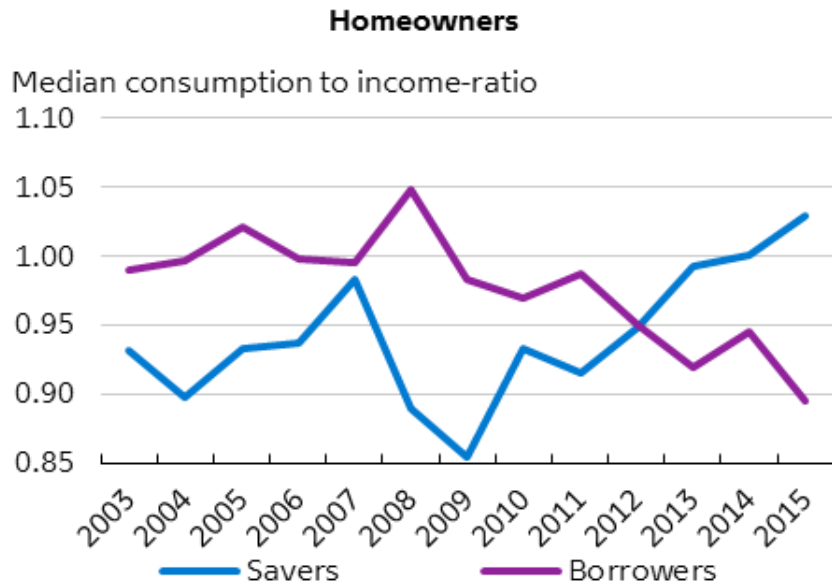
# Borrowers vs. savers

Median consumption to income ratio



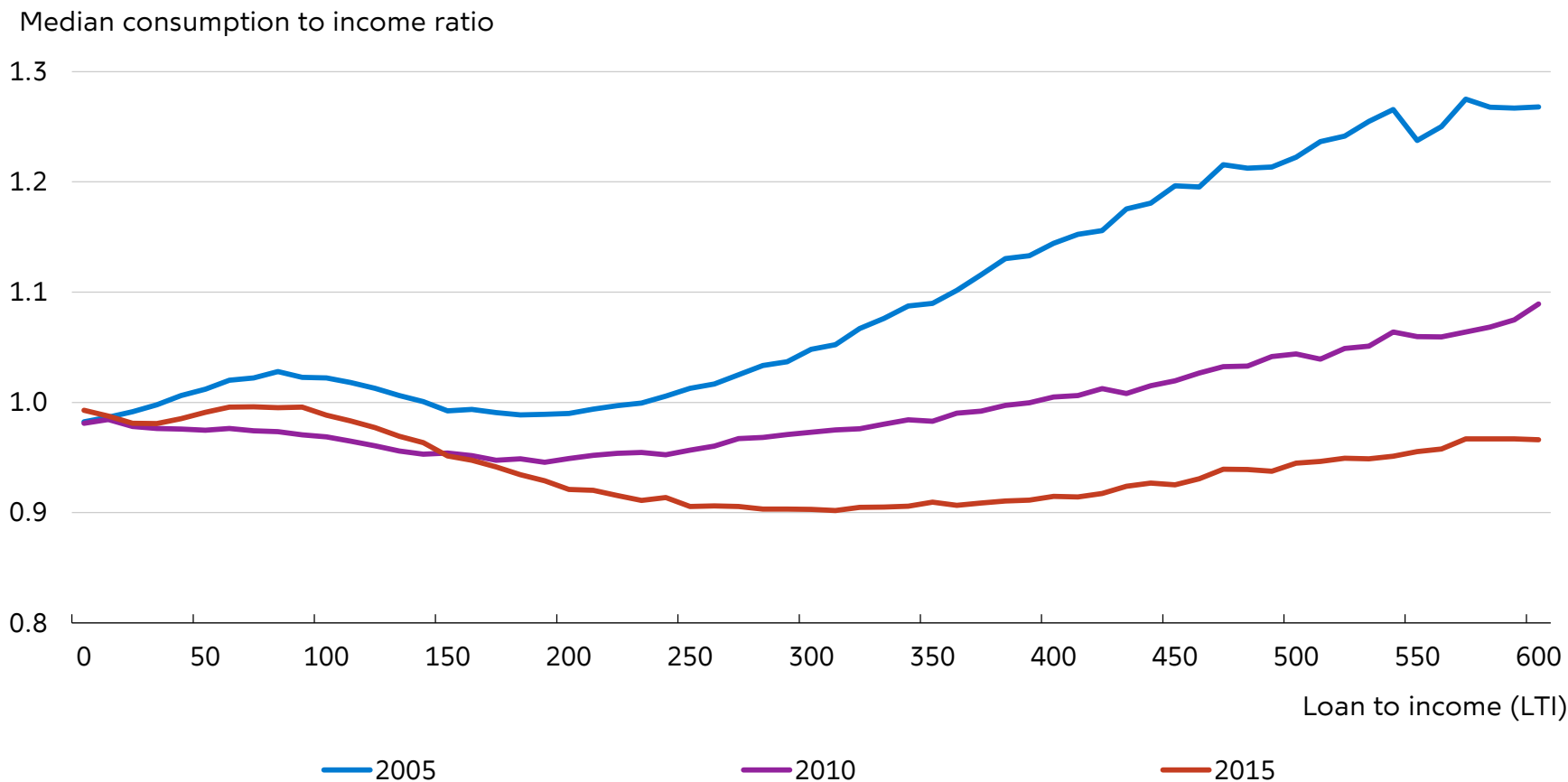
Note: Borrowers are defined as households whose financial liabilities exceed their financial assets (excluding pension savings) and vice versa for savers.

# Homeowners vs. renters

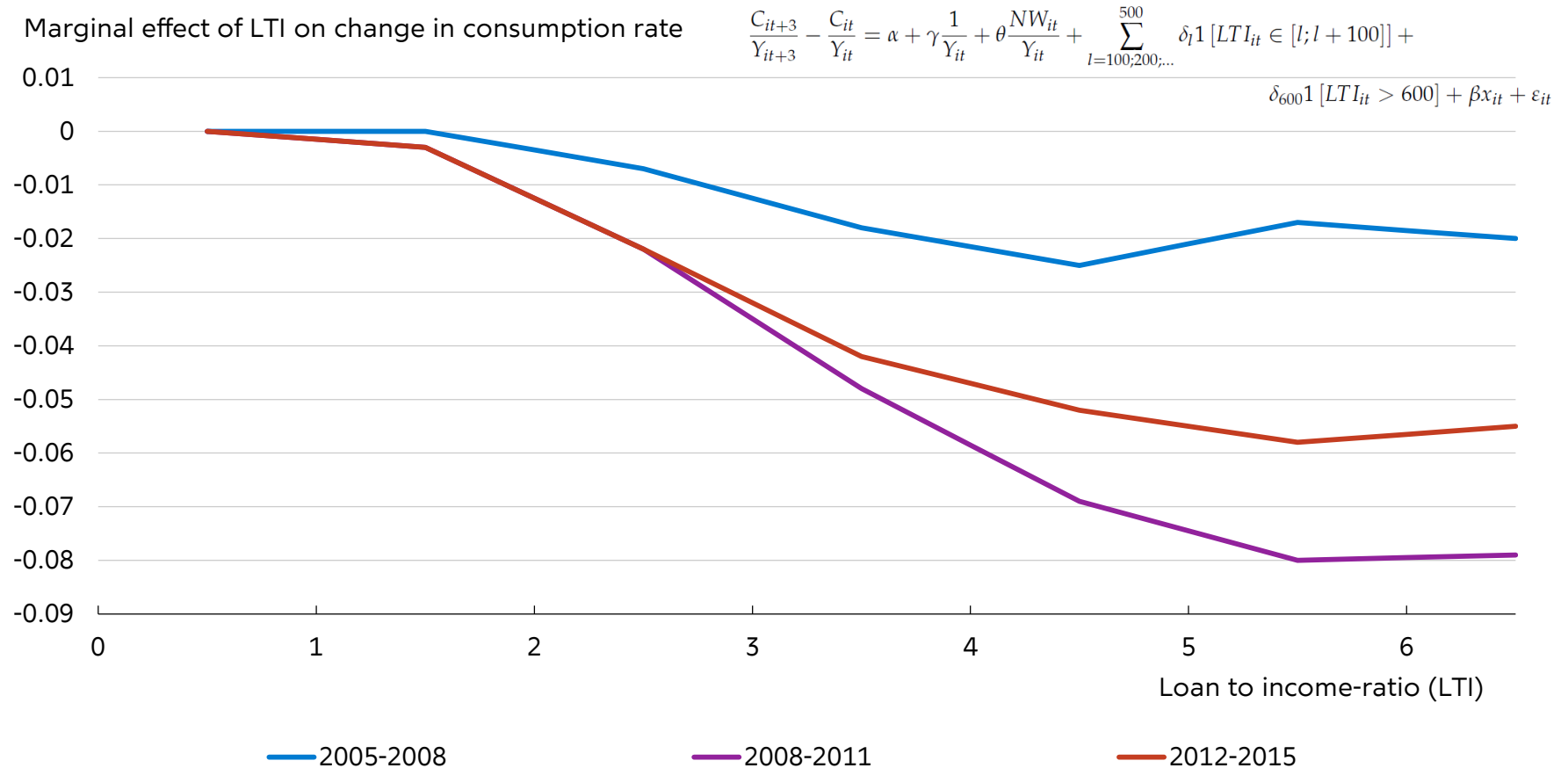


Note: Borrowers are defined as households whose financial liabilities exceed their financial assets (excluding pension savings) and vice versa for savers.

# Consumption rates and gross debt



# Gross debt and change in consumption



Note: Based on a regression of consumption rates as a function of LTI-dummies + control variables. Only homeowners with negative net liquid wealth (borrowers) are included in the regression. The marginal effects presented are measured relative to households with LTI between 0 and 1.

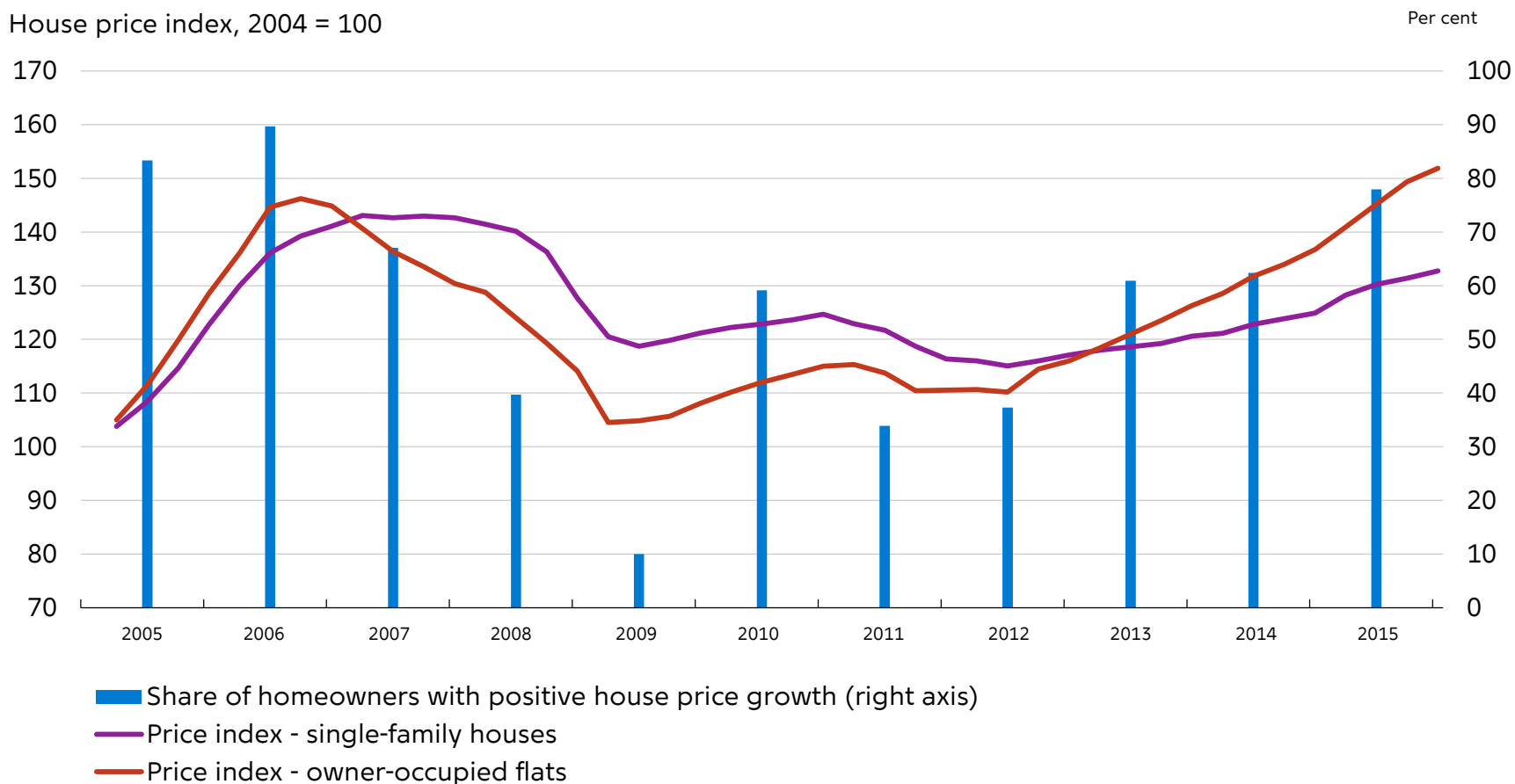
# House prices and consumption



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# House price developments

House price index, 2004 = 100

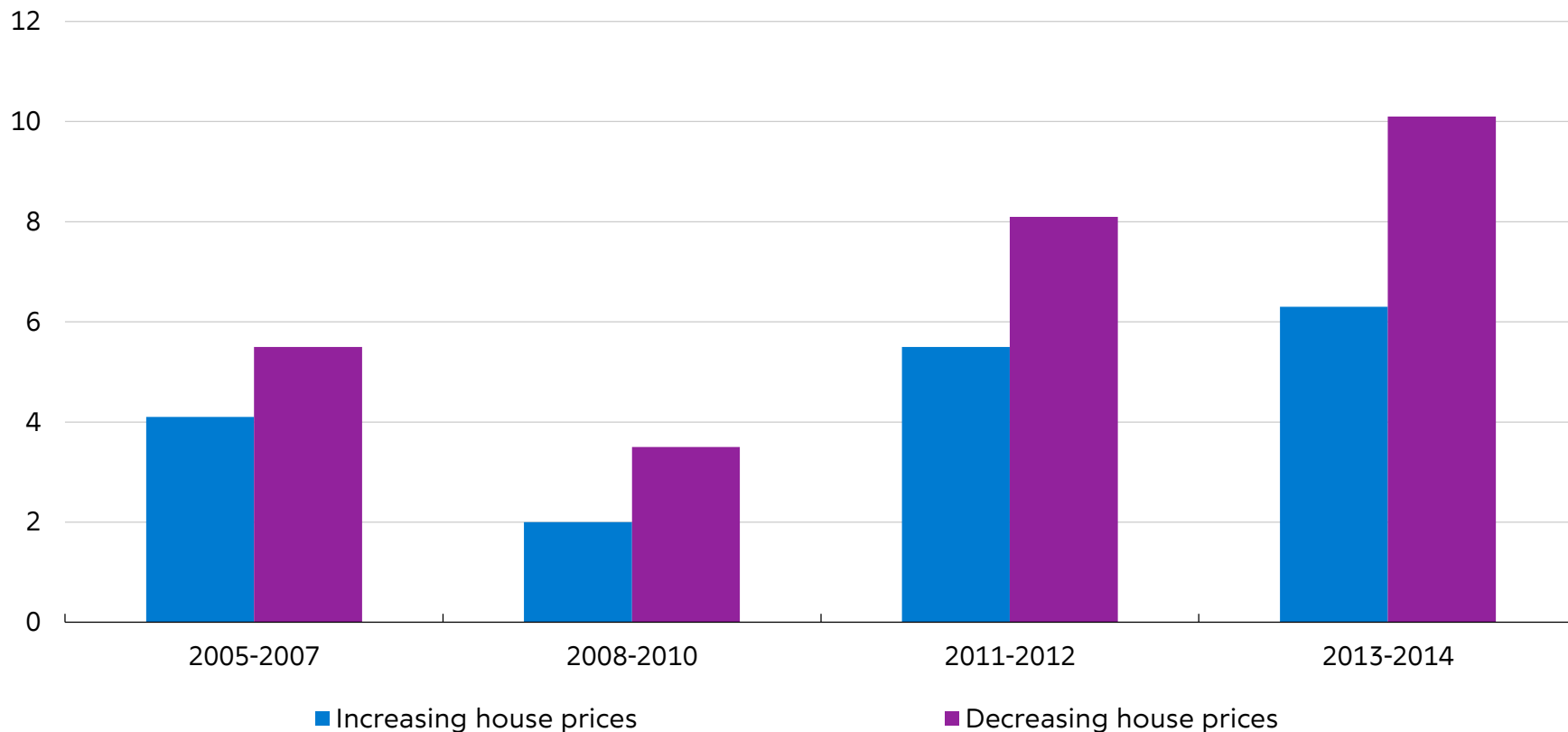


Source: Statistics Denmark and own calculations

# MPC out of housing wealth:

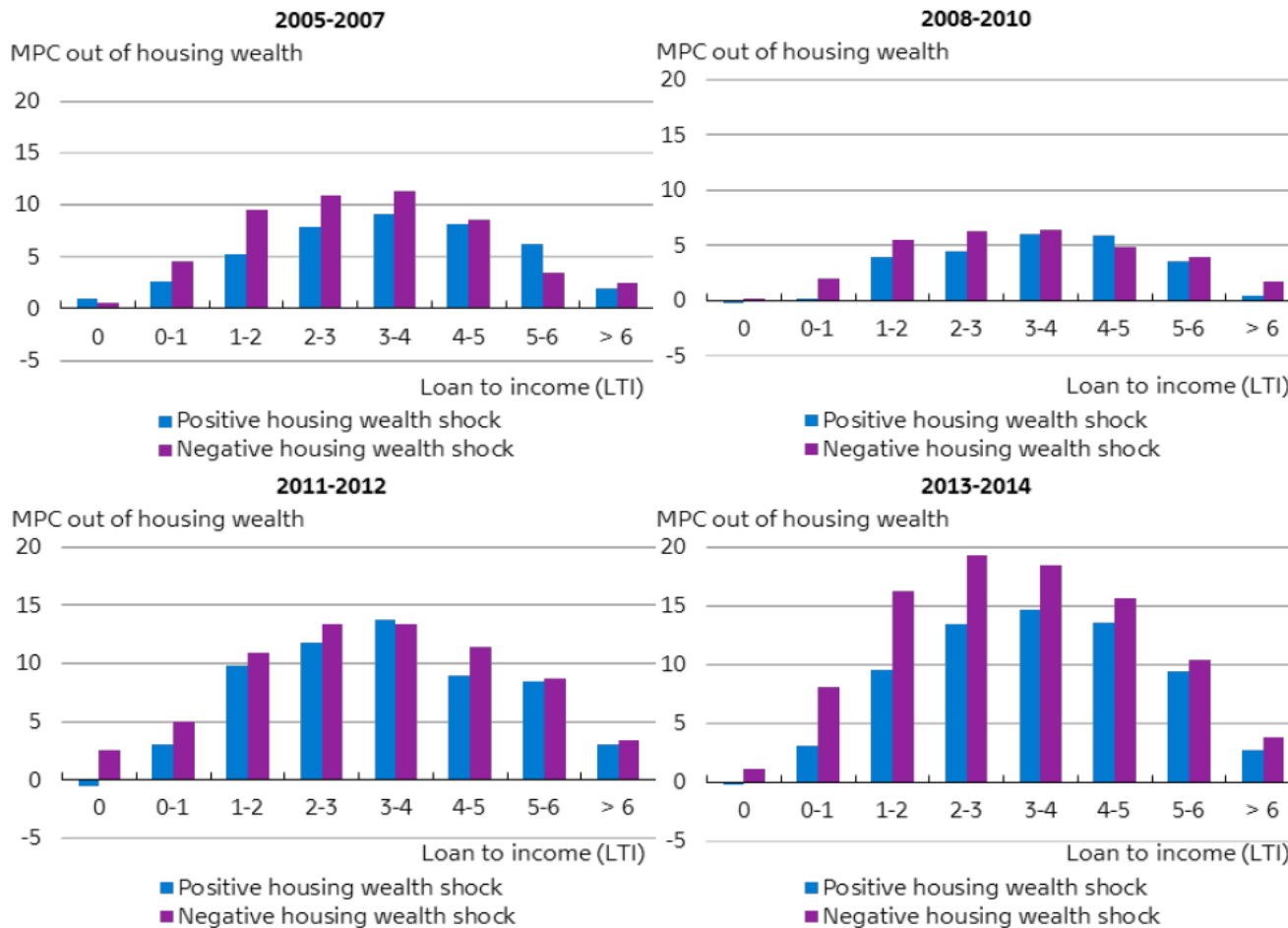
$$\frac{\Delta C_{it}}{Y_{it}} = \alpha + \gamma \frac{\Delta HE_{it-1}}{Y_{it}} + \delta \frac{\Delta Y_{it}}{Y_{it}} + \beta X_{it} + \varepsilon_{it}$$

Marginal propensity to consume out of housing wealth, per cent





# MPC out of housing wealth across LTI-groups

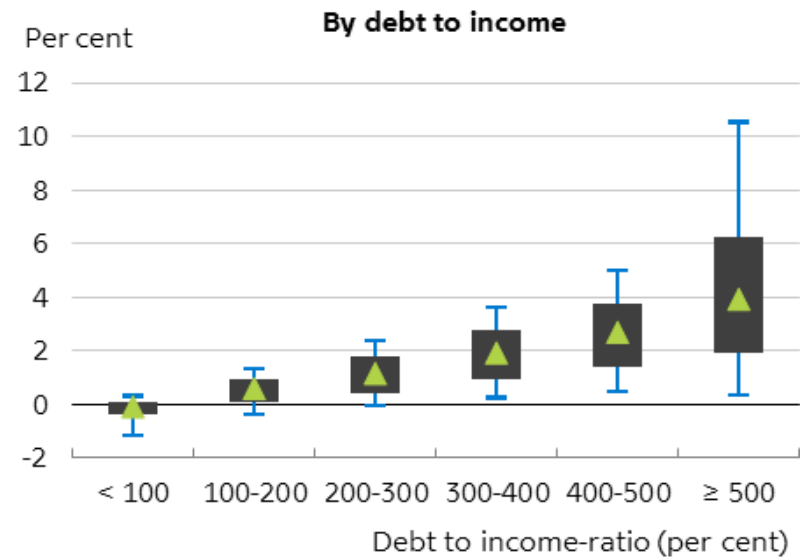
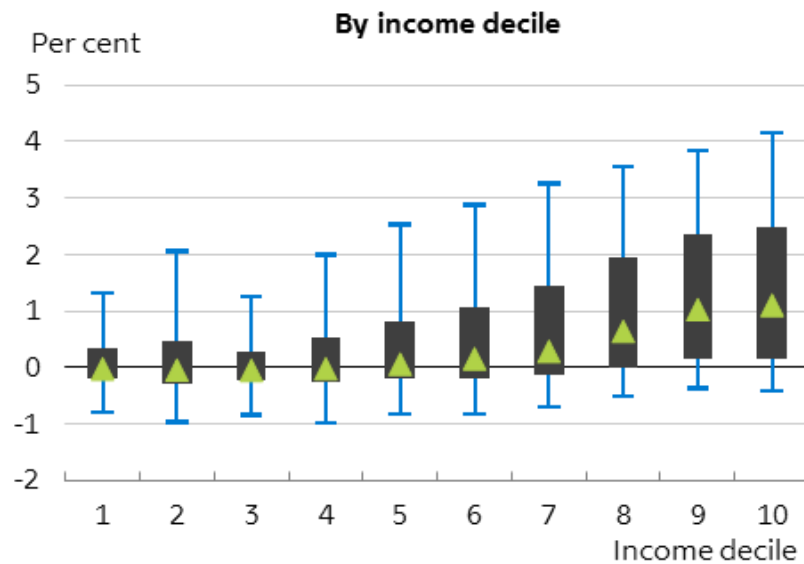


**How sensitive is consumption to rising rates (the cash-flow channel)?**



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# Cash-flow effect of increasing rates



# Conclusion

# Conclusions

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