Housing Prices, Household Debt, and Macroeconomic Risk: Problems of Macroprudential Policy I

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Background 1

- Rising housing prices and household debt in Sweden
- The Swedish FSA (Finansinspektionen, FI):
  - "The big problem today is that household indebtedness may contribute to or reinforce a recession."
  - "Even if the financial-stability risks are judged to be small at present, high and rising debt-to-income ratios among many borrowers therefore poses an elevated macroeconomic risk."
  - "The households' debt is still increasing faster than their income and housing prices are still high. Consequently, the need for action remains."

Background 2

- The action: Tighter lending standards
- New compulsory amortization requirements: 3% of mortgage at origination (LTV>70%, LTI>4.5), corresponding to 3/(1-0.3)= 4.3 pp pre-tax mortgage-rate increase (30% capital-income tax)
- FI recommending tighter affordability (KALP) interest-rate stress test: 7% instead of 6%
- Encouraging tighter banks' internal LTI limits (average 5.5)
- Before tightening:
  6% affordability interest-rate stress test on interest-only loan
- After tightening: Equivalent to 7+4.3 = 11.3% on interest-only loan
- Equivalent to about 10 pp increase over prevailing mortgage rates (about 1.5%)
- Compare with BOE FPC affordability interest-rate stress test:
  Bank Rate 3 pp above prevailing rates anytime within next 5 years

Three questions

1. Are Swedish housing prices too high?
2. Is Swedish households' debt too high?
3. Does Swedish household indebtedness imply an "elevated macroeconomic risk"?

- Answers?
- FI: **Yes** on all three questions
- LS: **No** on all three

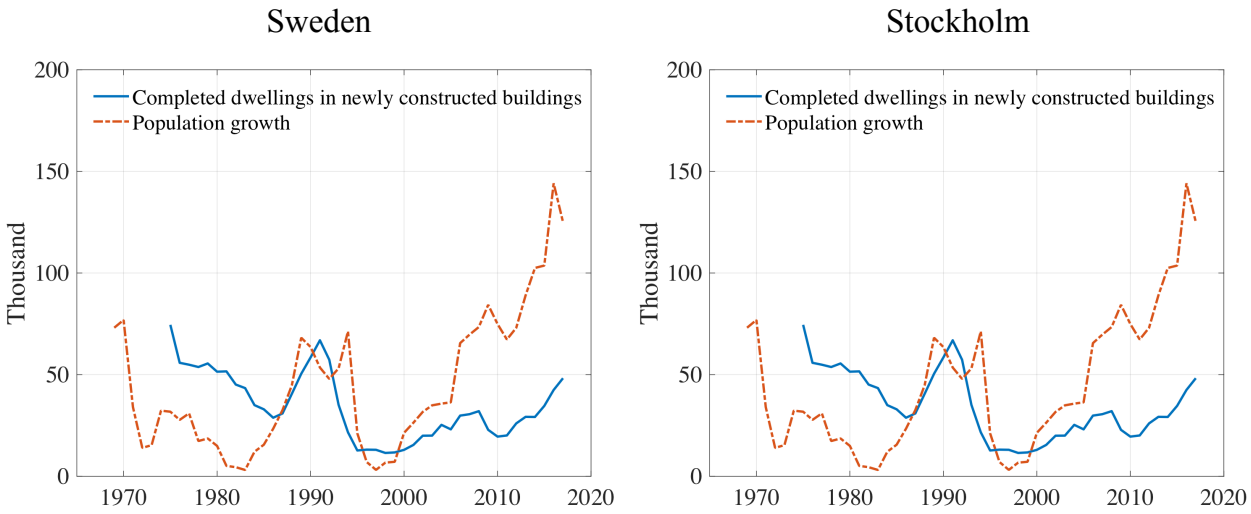
Much is good with Swedish macroprudential policy

- Finansinspektionen (FI) has taken a series of actions to make sure that banks are well capitalized (minimum bank capital 24% of RWA, current capital 28% of RWA, 22% CET1) and very resilient in stress tests
- FI *Mortgage Market Report* with stress tests of households: Households have substantial and over time increasing debt-service capacity and resilience to housing-price falls, interest-rate increases, and income losses due to unemployment.
- LTV cap of 85%; average LTV 63% for new mortgages, 55% for total stock.

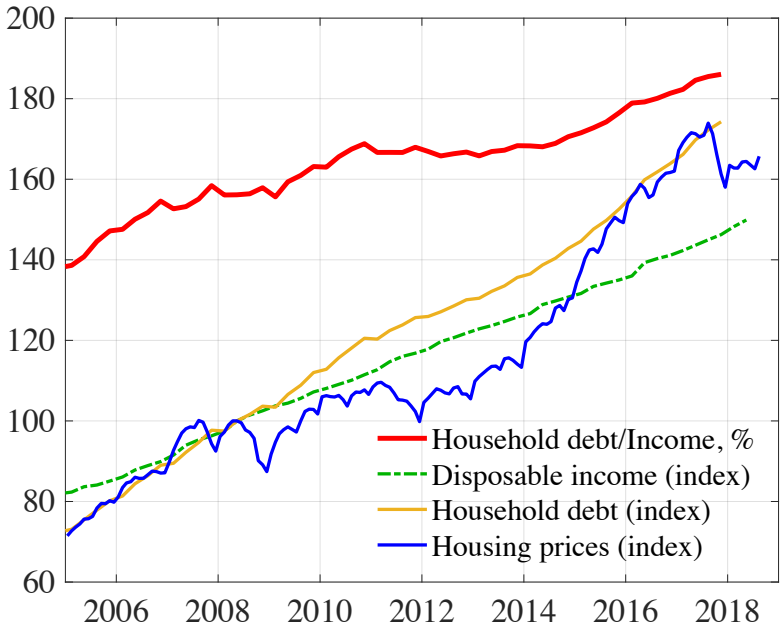
1. Are Swedish housing prices to high?

- A structural problem in housing market in the main cities
  - Demand is increasing because of rapid urbanization, rising incomes, falling mortgage rates, lack of a functioning rental market (rent control),…
  - Supply is insufficient because of restrictions on land use, building regulations, regional planning problems, local permit handling times, local special regulations, …
  - Not surprising if housing prices and debt have risen

Completed dwellings in newly constructed buildings lags behind population growth

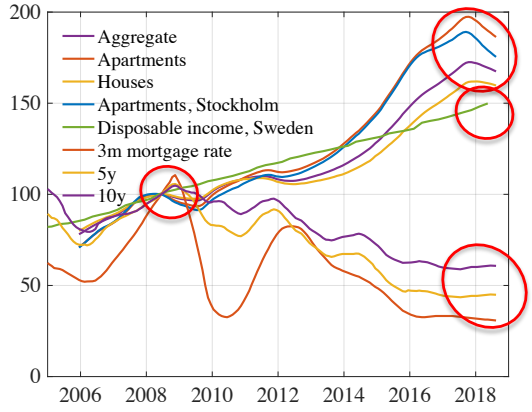


Household DTI ratio, disposable income, debt, and housing prices



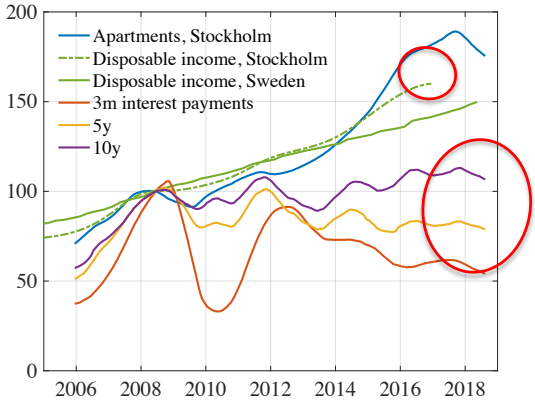
Housing prices, disposable income, mortgage rates: Sweden and Stockholm

Housing prices, disp. income, mortgage rates



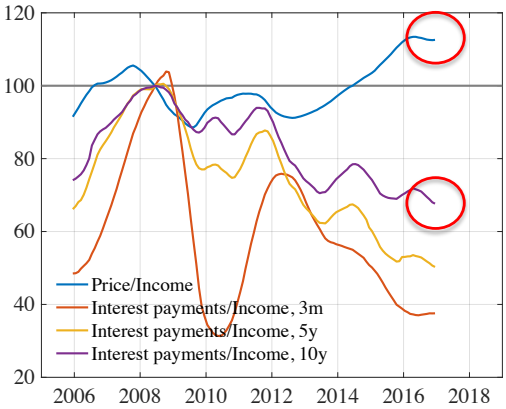
- Stock/Flow problematic (PriceTI, PriceTRent, DTI)
- Trend in interest rates, structural trends
- Stock/Stock (LTV) and Flow/Flow (IPTI, DSTI, UCTI) better
- PTI, DTI relevant because repayment out of income? Misunderstanding! Details

Sth housing prices, disp. income, and interest payments



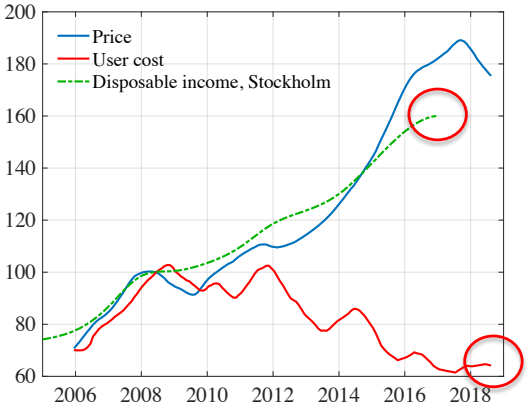
- Interest payments = Price x mortgage rate (3m, 5y, 10y)

Stockholm housing prices to income and interest payments to income

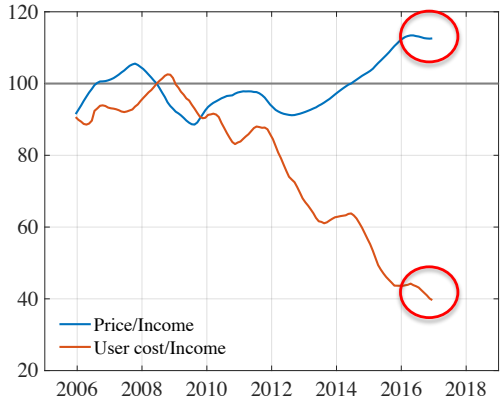


Stockholm housing prices to income and user cost to disposable income

Housing prices, disp. income, user cost

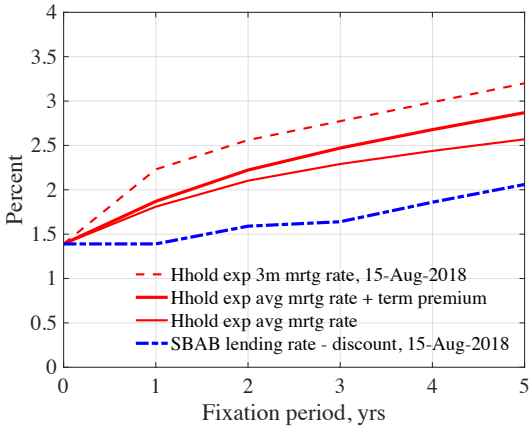


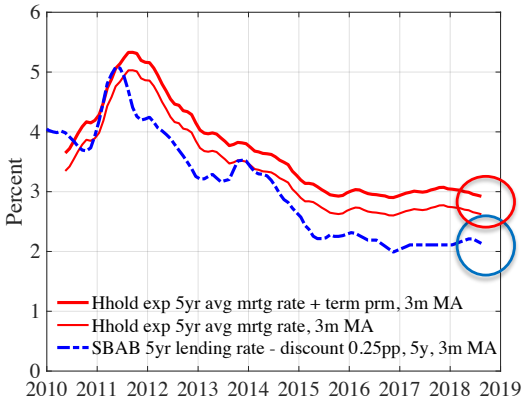
Housing prices to income and user cost to income



- User cost = Imputed rent = Real post-tax interest payments + real cost of equity + operating and maintenance cost – real post-tax capital gains (10 yr mortgage rate, 2% inflation, 30% capital-income tax, zero real post-tax capital gains assumed)

Households' interest-rate expectations higher than those of the lenders





- 5-yr mortgage rate
- Household expected 5 yr average (w/ and w/o added term premium)

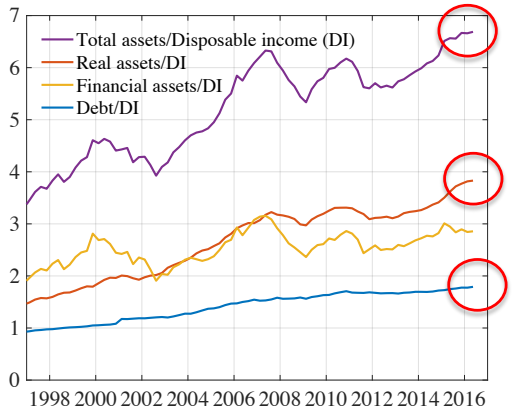
1. Are Swedish housing prices to high? No

- User costs have fallen relative to income much more than housing prices have risen
- No evidence of speculation in future capital gains (user cost calculated for zero capital gains)
- Absolute valuation: User cost of average Stockholm studio (SEK 2,800/m) is 16% of median net income of Stockholm 25-29-year-old individuals
- No evidence of too high household expectations of future interest rates
- No evidence of too high household expectations of future housing prices (Evidens survey)
- Altogether no evidence of housing being overvalued

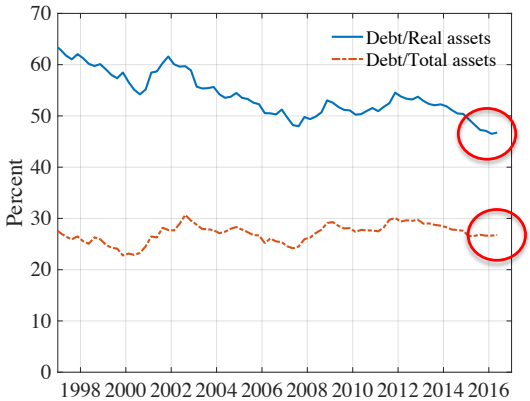
Details

2. Is Swedish household debt too high?

Household assets and debt to income (excl. large collective-pension claims)

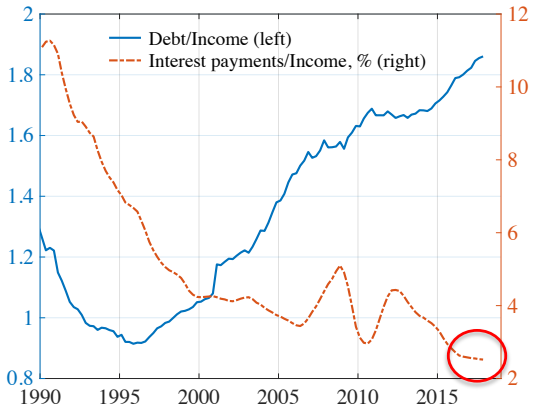


Household debt/real assets and debt/total assets



- Real assets = Housing = Singe-family houses, tenant-owned apartments, and second homes
- Debt/Real assets, downward trend
- Debt/Total assets, relatively stable

Household's interest payments/disposable income at historical low

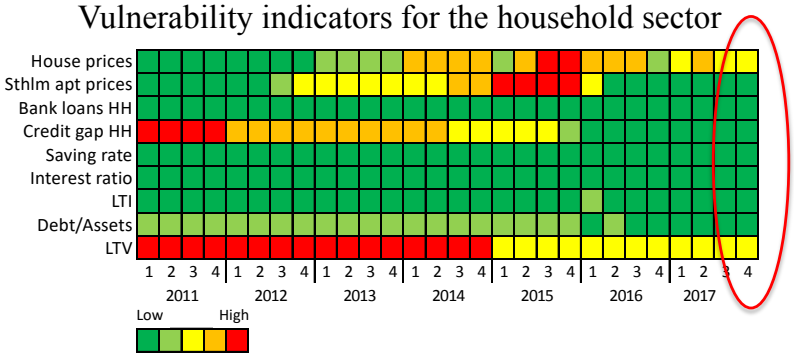


FI: Risks to financial stability from household debt "relatively small"

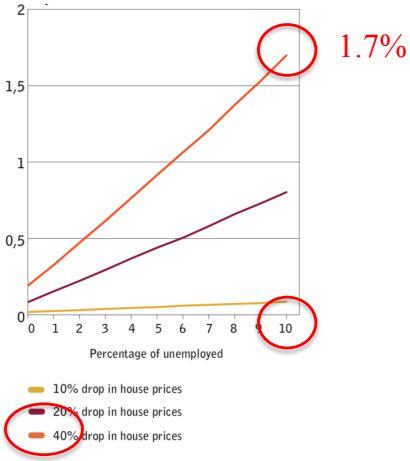
- "FI's judgment is that the financial-stability risks associated with households' debt are relatively small.
- … This is because the mortgage holders generally have good possibilities to continue to pay their interest and amortization also if interest rates rise or incomes fall.
- …The households have also on average good margins to manage a fall in housing prices.
- …In addition, the Swedish banks are judged to have satisfactory capital buffers if credit losses nevertheless would materialize."

FI: Risks to financial stability from household debt "relatively small"

Vulnerability indicators for the household sector



Share of households with "double trigger" at housing-price fall and unemployment increase



1.7%

- Stress tests on households
- "Double trigger": Both being underwater and having cash-flow problem due to income fall.

2. Is Swedish household debt too high? No

- There is no evidence that Swedish household debt is too high given housing prices and the value of household assets
- Household debt/total assets is on a downward trend, debt/housing is stable
- LTV limit of 85%, average LTV 63% for new borrowers and 55% for all borrowers: Ample housing equity
- Households have good and increasing debt-service capacity and resilience to housing-price falls, interest-rate increases, and income losses due to unemployment
- Thus, probability of credit losses on mortgages are very small; should they nevertheless materialize, banks have sufficient capital to absorb losses

3. Does Swedish household indebtedness pose an "elevated macro risk"?

- FI: "The risks presently associated with households' debt mainly concern that
  highly indebted households may reduce their consumption substantially if
  (1) interest rates rise or (2) incomes fall,
  and that this might in turn
  reinforce a future economic downturn.
- ... [H]igh and rising debt-to-income ratios among many borrowers therefore pose an elevated macroeconomic risk."
- FI believes in causality between high DTI ratios and subsequent consumption falls in a recession or crisis

(1) Interest sensitivity of consumption 1

- Hhold cash-flow more interest-sensitive with more debt
- But interest rates are endogenous, not exogenous
- In bad times, interest rates are lower, cash-flow better (different from 90s crisis and fixed exchange rates)
- High debt and variable interest rates provide insurance against bad times: An automatic stabilizer

(1) Interest sensitivity of consumption 2

- Stronger cash-flow channel in monetary policy (Flodén et al., Hughson et al., Gustafsson et al., Cumming)
- Easier for Riksbank to stabilize consumption, aggregate demand (smaller policy-rater changes needed)
- If mortage rate-policy rate spread would rise (investor doubts), lender liquidity problem, not solvency problem: Lending of last resort (NDO and Riksbank)
- Risk for recession may actually fall, not rise

(2) Income sensitivity of consumption 1

- FI for support refers to three studies of the experience in Denmark (Andersen et al. 2016), the U.K. (Bunn & Rostom 2014, 2015), and the U.S. (Baker 2017)
- But these studies contradict FI:
- Andersen: "our results do not support any interpretation of the data that involves a negative causal effect of a high debt level on subsequent consumption growth"
- BR15: "[We] take care not to interpret the observed relationships [between the level of household indebtedness and subsequent spending adjustment] as being proved to be causal."

(2) Income sensitivity of consumption 2

- Baker: "debt has little or no independent relationship with the [income] elasticity of spending when controlling for liquidity and the ability of households to access credit. ... Overall, these results indicate that the primary reasons consumption responses are higher among highly indebted households are credit and liquidity constraints."
- Note: Tighter lending standards increase credit and liquidity constraints:
  They may cause the problem they are supposed to solve!

What is going on? Correlation vs. causality!

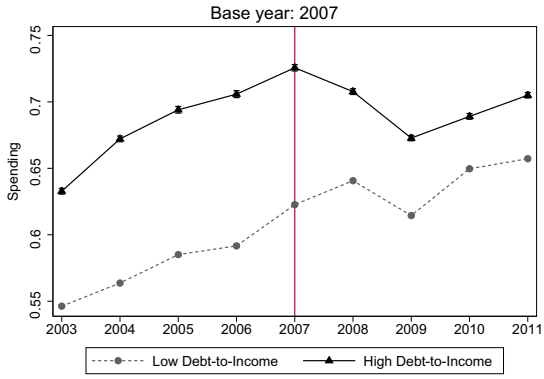
- Correlation between pre-crisis household DTI ratios and consumption fall during crisis (ADJ, BR, Baker, Mian & Sufi, Dynan, …)
- Correlation does not imply causality
- High DTI and subsequent consumption fall may be caused by common factor
- The evidence is that the common factor is the housing collateral channel, which allows HEW-financed overconsumption (Housing-Equity Withdrawal, a.k.a. Mortgage Equity Withdrawal)

Collateral channel (Duca et al., Muellbauer, M&S)

- Rising housing prices increases value of collateral
- Allows overconsumption financed by HEW
- Debt-financed overconsumption increases DTI
- Crisis: Falling housing prices, tighter lending standards, debt-financed overconsumption stops, consumption falls
- Debt-financed overconsumption causes both high pre-crisis DTI and crisis fall in consumption
- The strength of the collateral channel very different across countries (Muellbauer)

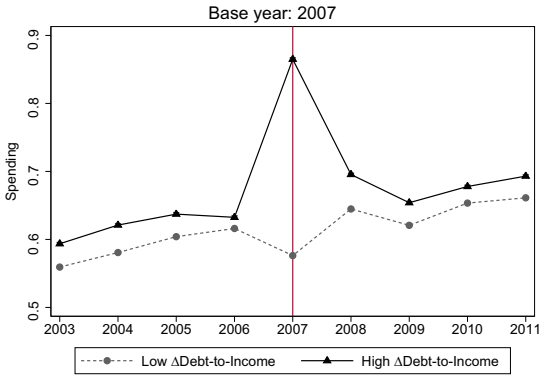
Denmark: Andersen, Duus, and Jensen 2016
(individual registry data, 0.5 mn home-owning Danes)

Spending relative to 2007 pre-tax income for households with high and low DTI



- Highly indebted households spent more pre-crisis
- Highly indebted households reduced their spending more
- Correlation DTI – spending fall

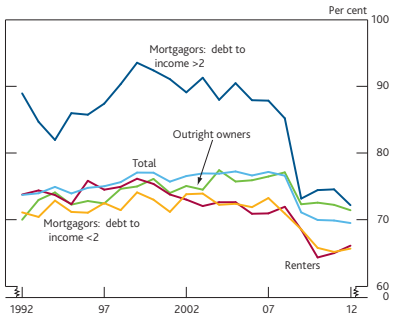
Spending relative to 2007 pre-tax income for households with high and low change in DTI 2006-2207



- High consumption explained by previous DTI increase
- When DTI change included in regression, **crisis spending fall correlated with pre-crisis DTI increase, not with DTI level (indicating HEW!)**

UK: Bunn & Rostom 2014 (QB), 2015 (SWP)
(synthetic panel of LCF survey, not individual data)

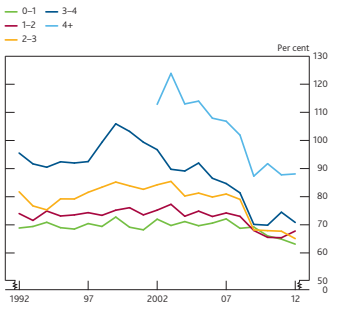
Chart 6 UK non-housing consumption as a share of income[a]



Sources: Living Costs and Food (LCF) Survey, ONS and Bank calculations.

(a) Non-housing consumption as a share of income net of mortgage interest payments. Data are scaled so that the total matches the National Accounts. Debt to income ratio is calculated using secured debt only.

Chart 7 UK mortgagors non-housing consumption as a share of income by debt to income ratio group[a]

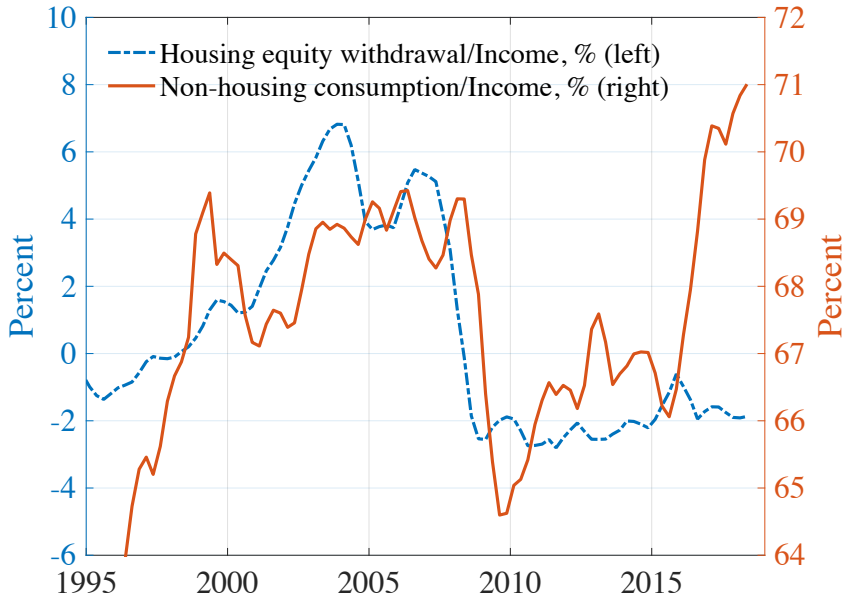


Sources: Department for Communities and Local Government (DCLG), LCF Survey, ONS and Bank calculations.

(a) Data for 4+ not shown before 2002 as they are erratic and are based on a small sample. Non-housing consumption as a share of income net of mortgage interest payments. Data are scaled so that the total matches the National Accounts. Debt to income ratio is calculated using secured debt only.

- Similarity to ADJ figures
- Highly indebted households spent more pre-crisis and reduced their spending more during the crisis
- Correlation pre-crisis DTI – crisis spending fall (regression in BR 2015)
- BR do not examine the role of the change in the DTI
- Most likely to get the same result as ADJ: When DTI change included in regression, **crisis spending fall correlated with pre-crisis DTI increase, not with DTI level**

HEW and non-housing consumption to disposable income, UK



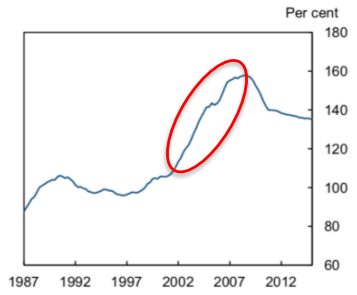
Household consumption and DTI in Denmark and the UK:

Denmark

Household consumption and DTI

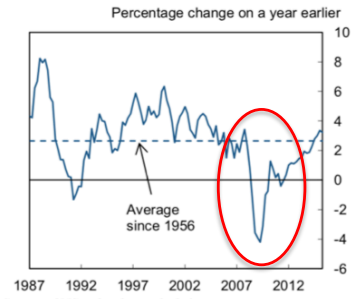
UK

Chart 1: Household debt to income ratio[(a)]



Sources: ONS and authors calculations.
(a) Gross debt as a percentage of a four-quarter moving sum of disposable income. Includes all liabilities of the household sector except for the unfunded pension liabilities and financial derivatives of the non-profit sector. The household disposable income series is adjusted for financial intermediation services indirectly measured (FISIM).

Chart 2: Household spending[(a)]

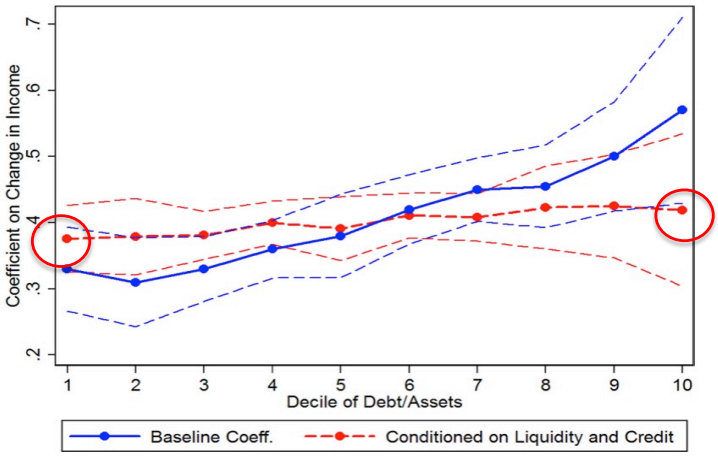


Sources: ONS and authors calculations.
(a) Chained-volume measure.

- Considerable similarity
- Crisis consumption fall
- Pre-crisis debt increase

US: Baker 2018
(individual data, several mn Americans)

Consumption elasticity with respect to income across debt/asset deciles



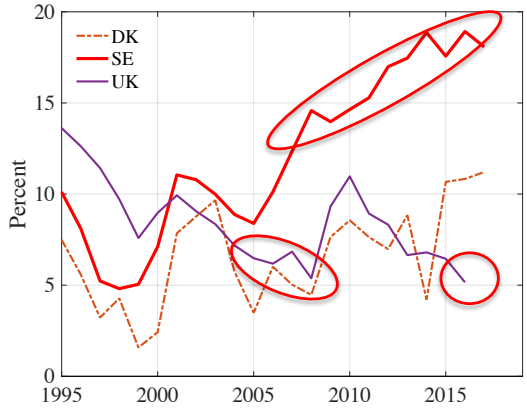
- "Debt has little or no independent relationship with the [income] elasticity of spending when controlling for liquidity and the ability of households to access credit. ...
- Overall, these results indicate that the primary reasons consumption responses are higher among highly indebted households are credit and liquidity constraints."

Correlation between pre-crisis DTI and crisis consumption fall due to overconsumption financed by HEW

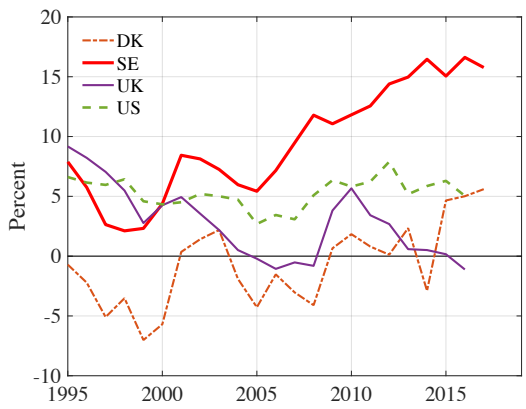
- The evidence is that consumption that fell in Denmark, the U.K., and the U.S. was mainly unsustainable overconsumption financed by debt increases (HEW), which could not continue when the crisis came
- Shows up in low savings rate (undersaving)
- If indication of unsustainable overconsumption financed by HEW: Risk of future consumption adjustement!
- But no evidence of unsustainable HEW-financed overconsumption in Sweden

Saving rates in Denmark, Sweden, the UK, and the US

Gross saving rates (Eurostat)

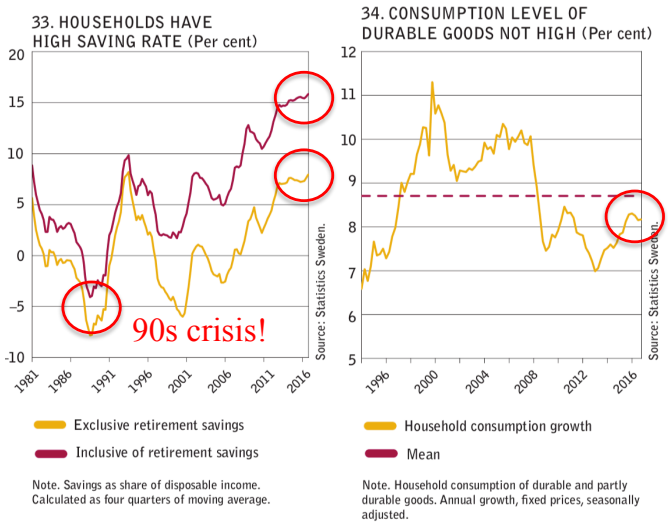


Net saving rates (OECD)



FI agrees: No evidence of unsustainable overconsumption in Sweden

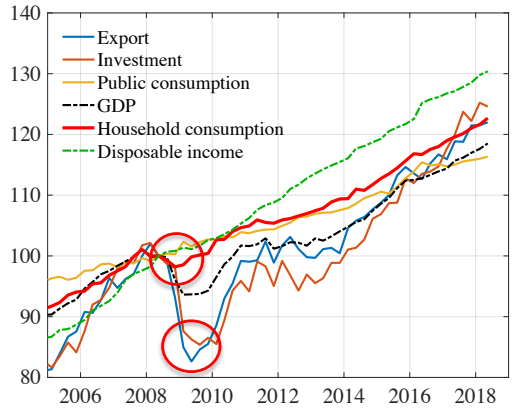
- FI: "Despite optimistic expectations and high margins between income and expenses, households are currently being relatively cautious.
  The total household saving rate is high and has increased even more over the past few quarters (see Diagram 33).
  Household consumption of durable goods, which is an indicator of household optimism, is in line with the historical average (see Diagram 34)."

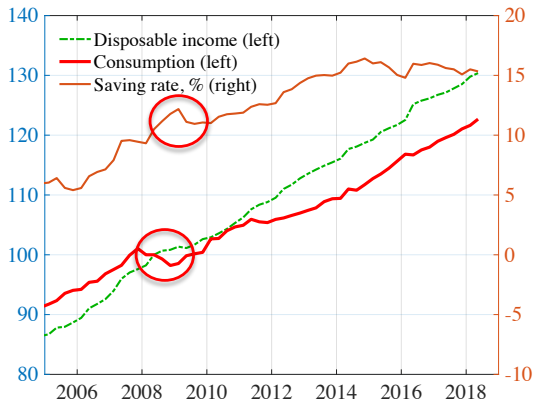


Microdata evidence on HEW in Sweden

- Li & Zhang: Some HEW, used to pay off high-interest-rate unsecured consumer debt, not for new consumption. Thus to improve debt composition. Also to finance startup businesses.
- Sodini et al.: Random conversion of public to tenant-owned housing; substantial capital gains. HEW used to smooth consumption when negative income shocks. Movers realized capital gains and consumed more, stayers did not.
- HEW used to increase resilience and reduce income-sensitivity of consumption:
  More efficient debt composition, consumption smoothing
- No evidence of unsustainable overconsumption

Real-time stress test 2008-2009:
How did household consumption adjust?





- 2008–2009 crisis: Housing prices fell 13%, unemployment rose 3.5 pp
- Export and investment collapsed
- Consumption fell only by 2%
- Saving rate rose only 1.5 pp
- Disposable income did not fall (cash-flow channel)
- Real-time stress test does not support elevated macroeconomic risk

International organizations

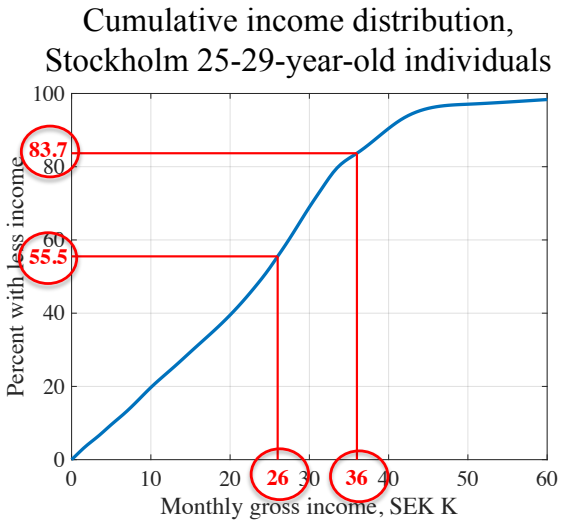
- FI has often referred to the European Commission, the ESRB, the IMF, and the OECD as providing independent support of their view and policy actions
- The international organizations have supported the amortization requirements
- The European Commission, the ESRB, and the OECD considers Swedish housing overvalued, ESRB by 24% or more
- This judgment seems based not on any detailed and thorough analysis but on the development of PTI and PTRent ratios relative to historical averages, which are quite misleading indicators.
- The organizations' missions often subject to domestic pressure, making their reports less independent

Conclusions 1

- There is no evidence that Swedish housing prices and household debt are too high relative to their fundamental determinants
- There is no evidence that Swedish household indebtedness poses an "elevated macroeconomic risk"
- The correlation in several countries between pre-crisis household indebtedness and consumption falls during the crisis is best explained by HEW-financed overconsumption that stopped when the crisis came
- There is no evidence of HEW-financed overconsumption in Sweden
- Microdata studies of HEW in Sweden indicate that HEW increases resilience by allowing a more efficient debt composition and some consumption smoothing for negative income shocks

Conclusions 2

- No evidence that Swedish household indebtedness poses an "elevated macroeconomic risk" means no rationale for FI's tightening of lending standards
- Few or no benefits of tightening, but substantial welfare costs



- Share of 25-29-year-olds with less than the income required to get a loan and buy an average Stockholm studio
- Before tightening, 55.5%
- After tightening, 83.7%
- Share of individuals qualified before but excluded after
  (44.5 – 16.3)/44 = 63%
- More about consequences in companion paper

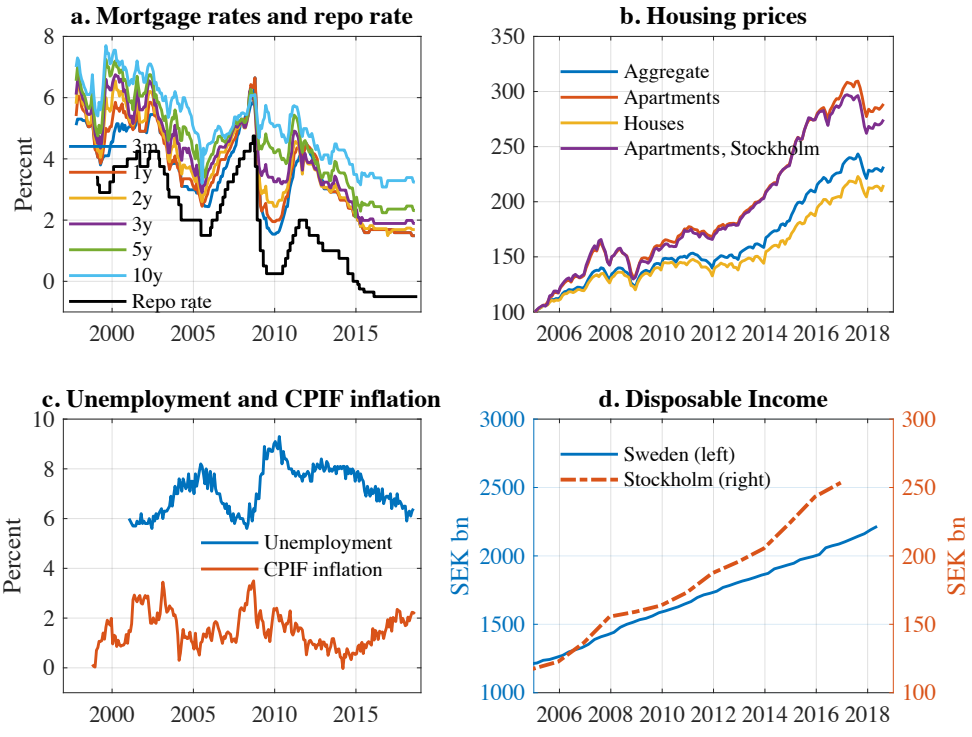
PTI and DTI: Payment out of income?

- FI: “Natural” to repay debt in full, “sound” standard of amortization (“sund amorteringskultur”)
- Repayment in full out of income OK for unsecured loans for consumption purposes
- Not optimal for secured loans for investment (including housing)
- Repay remaining principal when collateral sold
- Owner-occupied housing: Both tenant and landlord
- Residential rental housing financed by mortgages
- Optimal portfolio: Diversification into liquid and illiquid assets (deposits, bonds, stocks, housing, …) financed by debt
- Optimal life-cycle consumption and bequest: Not die with zero debt
- Optimal mortgage contract (Piskorski and Tchistyi 2010, Cocco 2013): Interest-only with equity line of credit (!)
- Automatic amortization: 2% inflation + 2% real growth = 4% automatic amortization; LTV and LTI for interest-only loan halved in 18 years
- Why is 4% not enough?

Back

Consequences of FI:s policy

- Large difference between housing payment and user cost, the difference being a large involuntary saving
- Debt-service-to-income ratio extremely frontloaded
- Tighter lending standards means that 84% of 25-29-year-olds excluded from borrowing to buy an average Stockholm studio
- Those excluded may have to go the secondary rental market with very high rents and short leases
- Households' resilience lower with amortization requirements (fixed payments higher share of income)
- Households have to save in the form of more housing equity instead of in a portfolio of financial liquid assets that facilitates consumption-smoothing and increases resilience



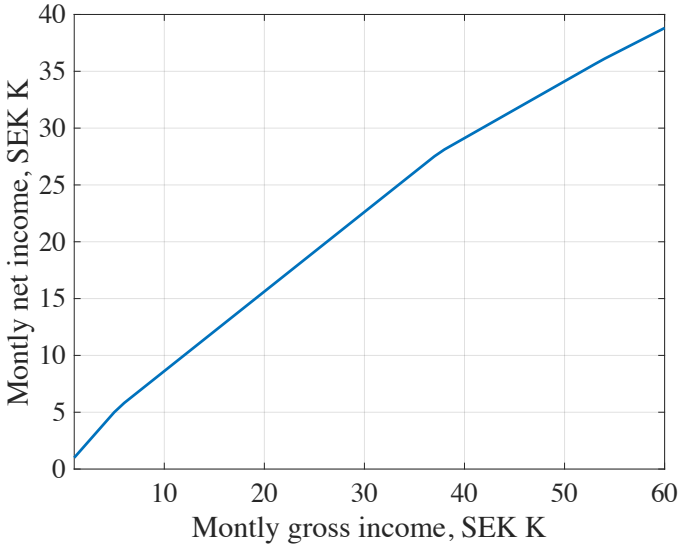
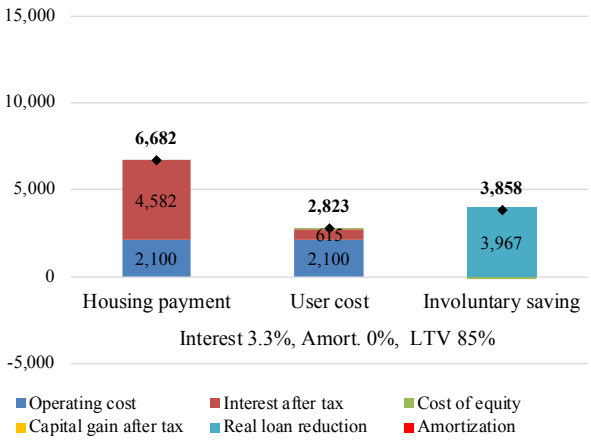


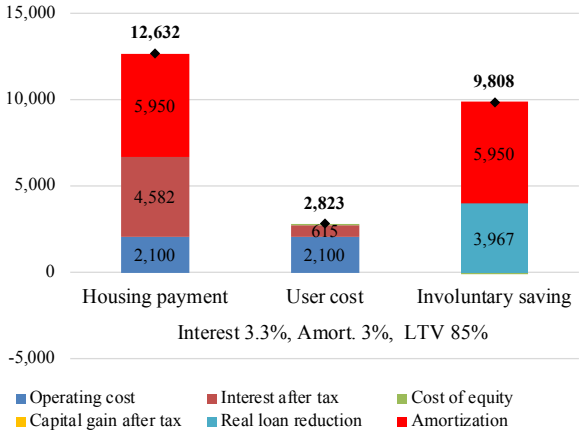
Table B.1: Benchmark assumptions for an average studio in Stockholm Municipality 2017.

Price	SEK 2.8 mn (EUR 280,000)
Size	31 m^2
Price/m^2	SEK 90,323 (EUR 9,032)
Monthly operating and maintenance cost	SEK 2,100 (EUR 210)
Monthly benchmark living costs	SEK 9,300 (EUR 9,300)
Down payment, 15%	SEK 0.42 mn (EUR 42,000)
Mortgage, LTV ratio 85%	SEK 2.38 mn (EUR 238,000)
Interest rate	3.3%
Capital-income tax rate	30%
Capital-gain tax rate	22%
Expected inflation rate	2%
Real capital gain after tax	0%

Source and note: Source for price, size, and monthly fee to the tenant-owner association is Svensk Mäklarstatistik. They refer to the mean of the studio transactions during 2017. The operating and maintenance cost is approximated by the monthly fee of SEK 1,900 (EUR 190) plus an additional monthly operating costs of SEK 200 (EUR 20). The benchmark living costs for single adult are from FI (2017d, appendix 1) and exceed by SEK 2,950 (EUR 295) the estimates of the costs of a reasonable consumption standard of the Swedish Consumer agency .

Housing payment, user cost, and involuntary saving





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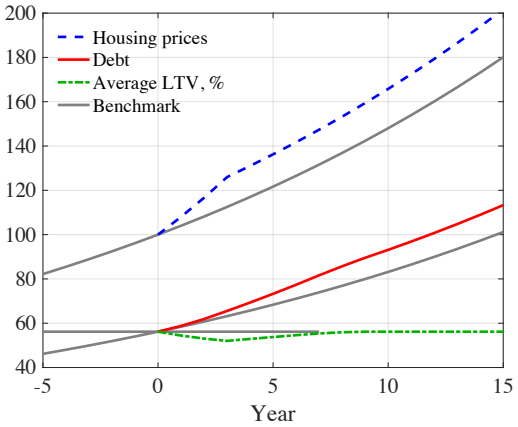
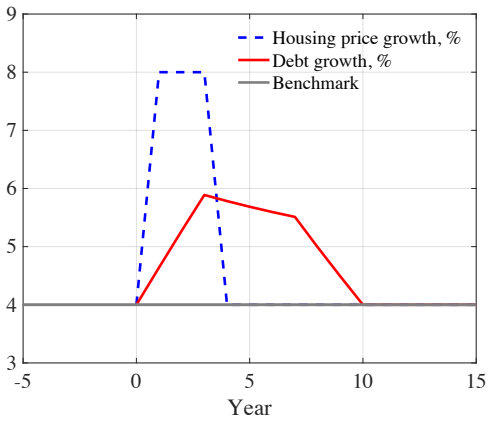
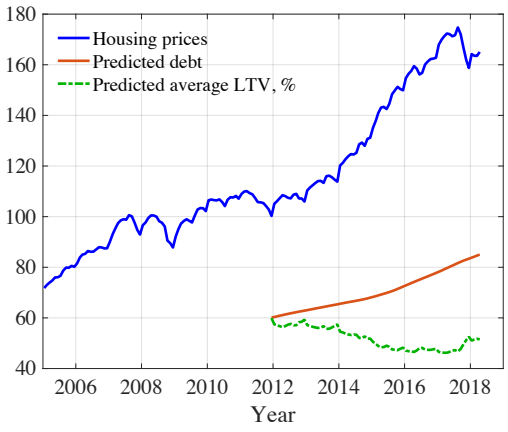
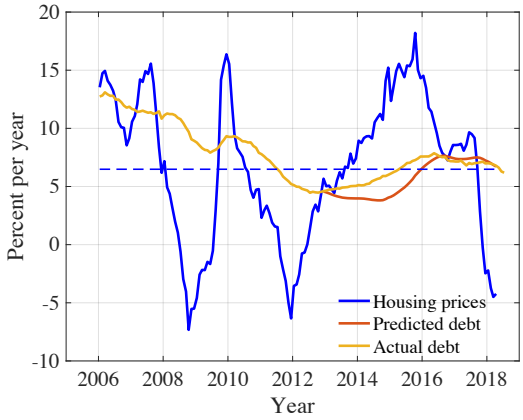
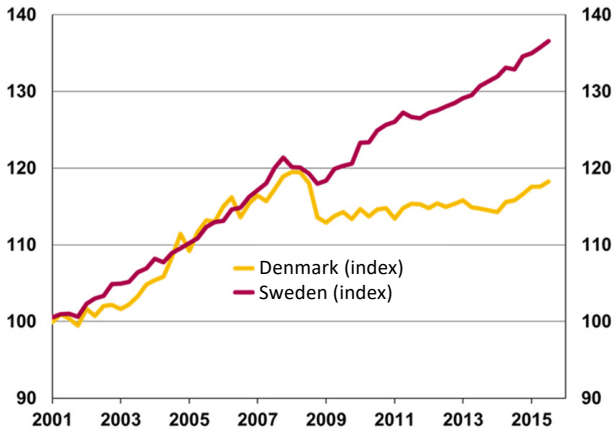





Housing prices
Predicted debt
Predicted average LTV, %
180
160
140
120
100
80
60
40
2006
2008
2010
2012
2014
2016
2018
Year


Housing prices
Predicted debt
Actual debt
Percent per year
20
15
10
5
0
-5
-10
2006
2008
2010
2012
2014
2016
2018
Year


Denmark (index)
Sweden (index)
140
130
120
110
100
90
2001
2003
2005
2007
2009
2011
2013
2015

But household debt grows rapidly