Household Debt and Macroeconomic Stability: An Empirical Stock-flow consistent (SFC) model for the Danish Economy

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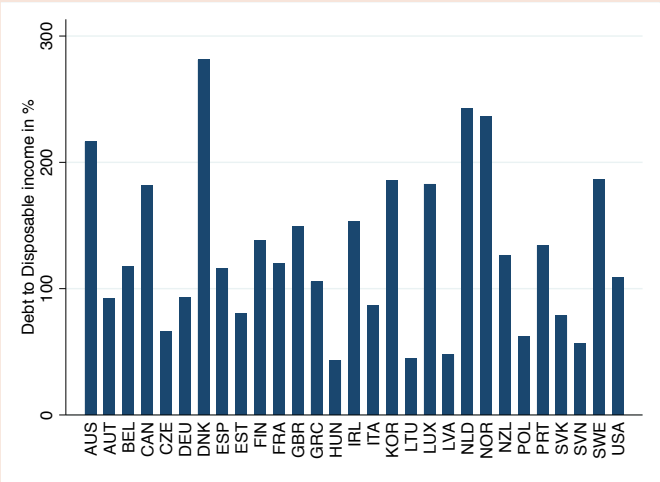
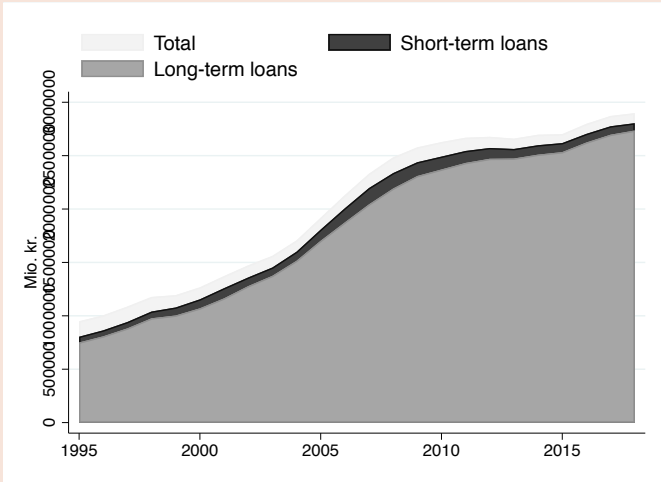
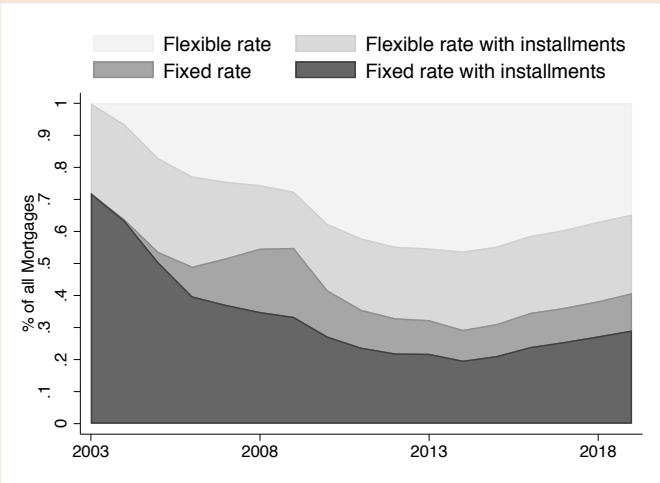
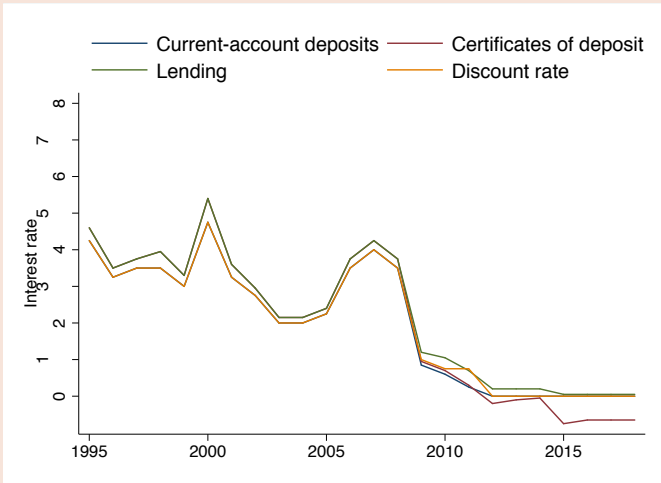
Empirics

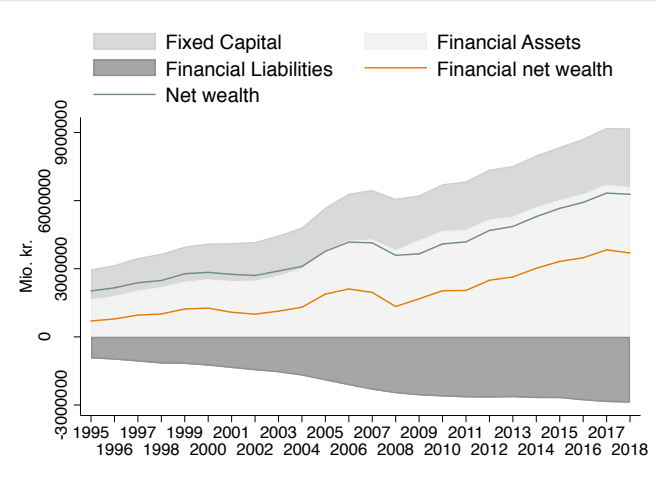

Debt to Disposable income in %
0
100
200
300
AUS
AUT
BEL
CAN
CZE
DEU
DNK
ESP
EST
FIN
FRA
GBR
GRC
HUN
IRL
ITA
KOR
LTU
LUX
LVA
NLD
NOR
NZL
POL
PRT
SVK
SVN
SWE
USA


Total
Short-term loans
Long-term loans
Mio. kr.
0
1995
2000
2005
2010
2015


Flexible rate
Flexible rate with installments
Fixed rate
Fixed rate with installments
% of all Mortgages
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
1
2003
2008
2013
2018


Current-account deposits
Certificates of deposit
Lending
Discount rate
Interest rate
0
1
2
3
4
5
6
7
8
1995
2000
2005
2010
2015

Empirics


Fixed Capital
Financial Assets
Financial Liabilities
Financial net wealth
Net wealth
Mio. kr.
-3000000
0
3000000
6000000
9000000
1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018


Houses
Flats
Prices (2006=index 100)
20
40
60
80
100
120
1995
2000
2005
2010
2015
2020
year

OECD 2016

"Danish households have large balance sheets and high levels of gross debt. Even though the high debt levels are matched by large assets, notably in form of pension savings, ***there are feedback loops with the housing market and households' balance sheets contributing to macroeconomic volatility.***"

Nationalbanken 2018

"As a result of the high level of debt, of which a large share is at a variable rate of interest, changes in interest rates will have a stronger impact on disposable income than they did 10-20 years ago. Changes in income are of major significance to consumption, so ***private consumption has also become more sensitive to interest rates, which may reduce macroeconomic stability in certain situations.***"

IMF 2017

"Household debt and access to credit can help boost demand and build personal wealth, but high indebtedness can also be a source of financial vulnerability. Nonetheless, even if positive in the long term, ***high household indebtedness can cause significant debt overhang problems when a country unexpectedly faces extreme negative shocks.*** *"*

Aim

The aim of this paper is to investigate the macroeconomic risks associated with high household debt in a situation with:

1. an increase in the interest rate
2. a fall in house prices

Inspiration

- Godley & Zezza (DK)
- Levy-institute(US and Greece)
- Model for Italy and England

Data sources

Annual data from 1995-2016, mainly from EUROSTAT

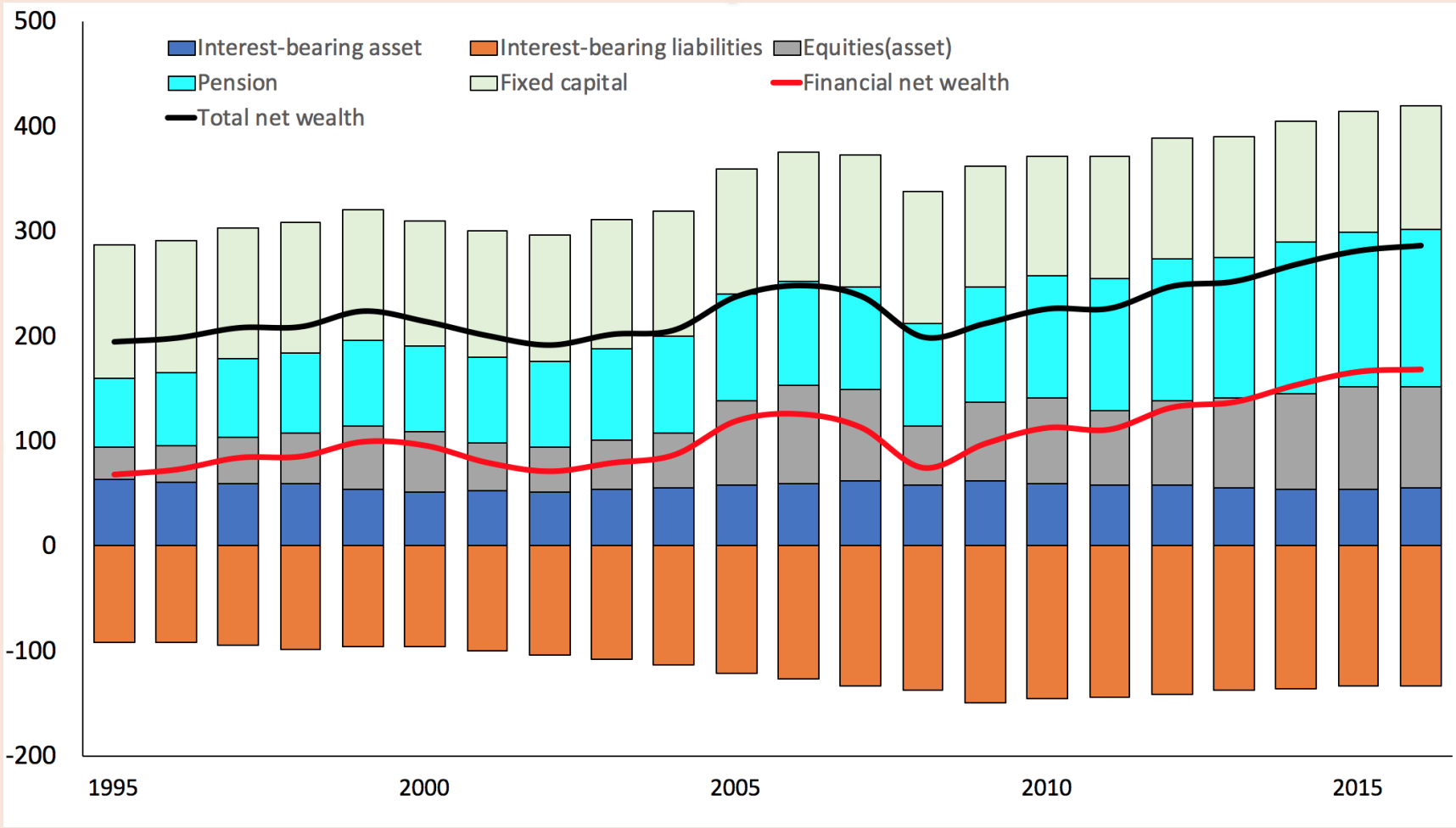
Econometric

ARDL and OLS

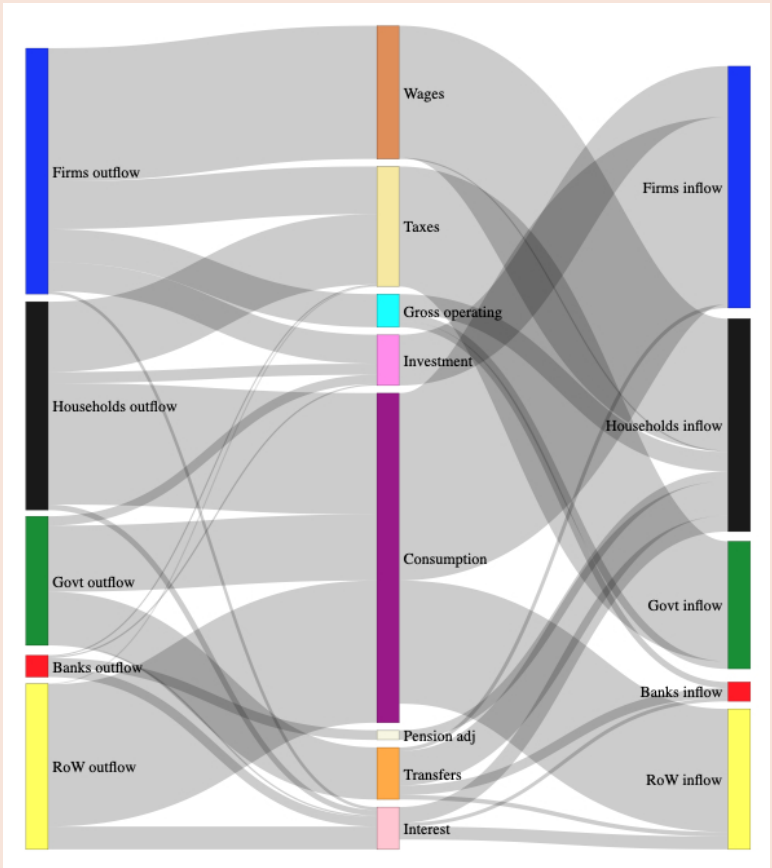
Assumptions

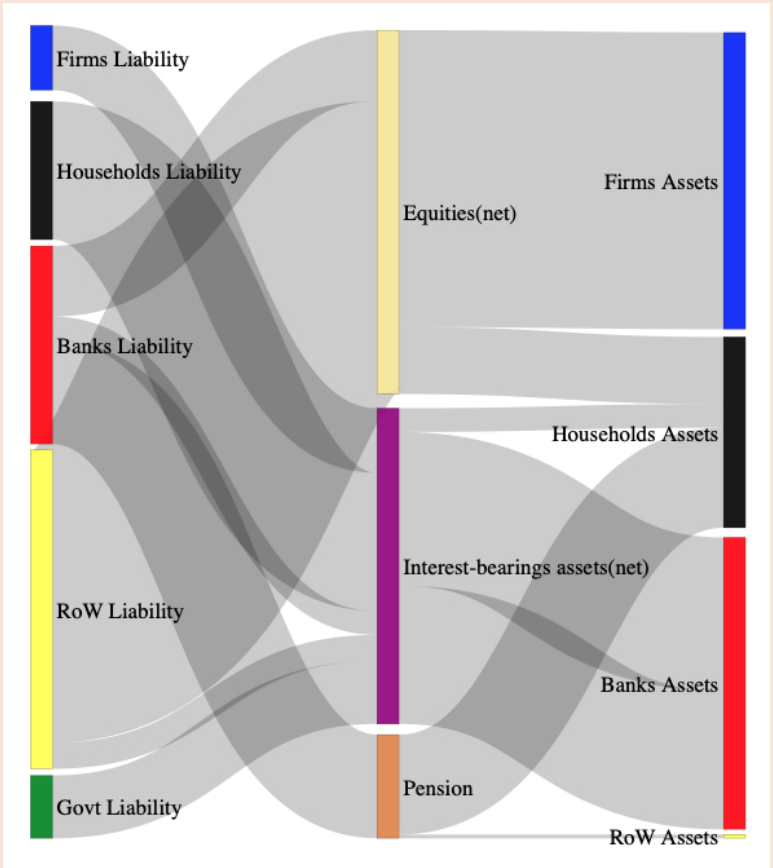
- Small open economy with fixed exchange rate
- Small economy doesn't affect the situation in Rest of the World
- 5 sectors: Households, Non-financial corporations, Financial corporations, Government and Rest of the World
- Only three financial assets (IBA, Equities and Pension)
- Fixed capital (including stock of housing and stock of capital)
- Only three interest rates

Balance sheet



Transactions 2015





Real side - Household

Income:

$$Y_t^H = WB_t^H + B_{2_t}^H + r_{A_{t-1}}^H(IBA_{t-1}^H) - r_{L_{t-1}}^H(IBL_{t-1}^H) + \chi_t(EQA_{t-1}^H) + \psi_t(PENA_{t-1}^H) + STR_t^H + \epsilon^H$$

Consumption:

$$ln(c_t) = \beta_8 + \beta_9 ln(c_{t-1}) + \beta_{10} ln(yd_t^H) + \beta_{11} ln(nw_{t-1}^H)$$

Investment:

$$ln(i_t^H) = \beta_i + \beta_i ln(i_{t-i}^H) + \beta_i ln\left(\frac{P_{t-i}^H}{P_{t-i}^i}\right) + \beta_i ln(yd_{t-i}^H)$$

Net lending:

$$NL_t^H = S_t^H - I_t^H - NP_t^H + KTR_t^H$$

Financial side - Household

Accumulation of Equities:

$$EQAHTR_t = \beta_{20} + \beta_{21}(\chi_t) + \beta_{22}(r^H_{L_{t-1}}) + \beta_{23} IBLTR^H_t$$

Accumulation of Pension:

$$ln(PENATR^H_t) = \beta_{24} + \beta_{25}(\psi_t) + \beta_{26} ln(yd^H_t)$$

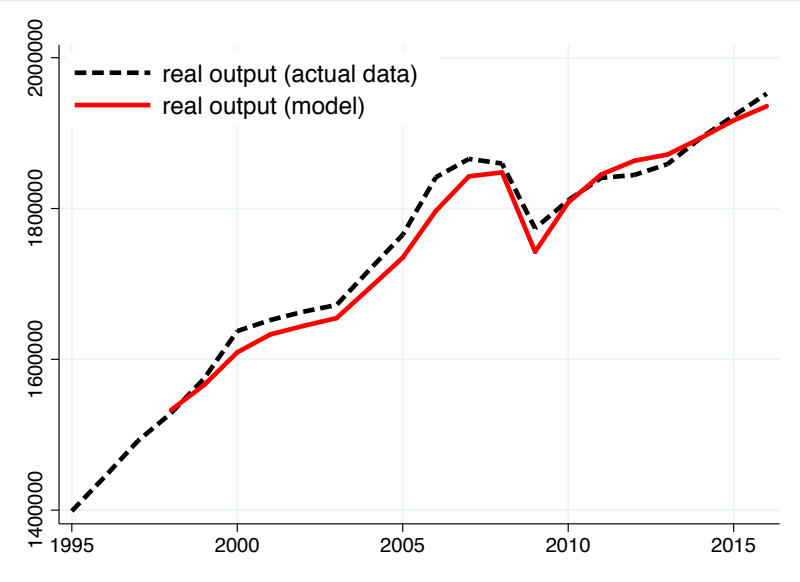
Accumulation of Loans:

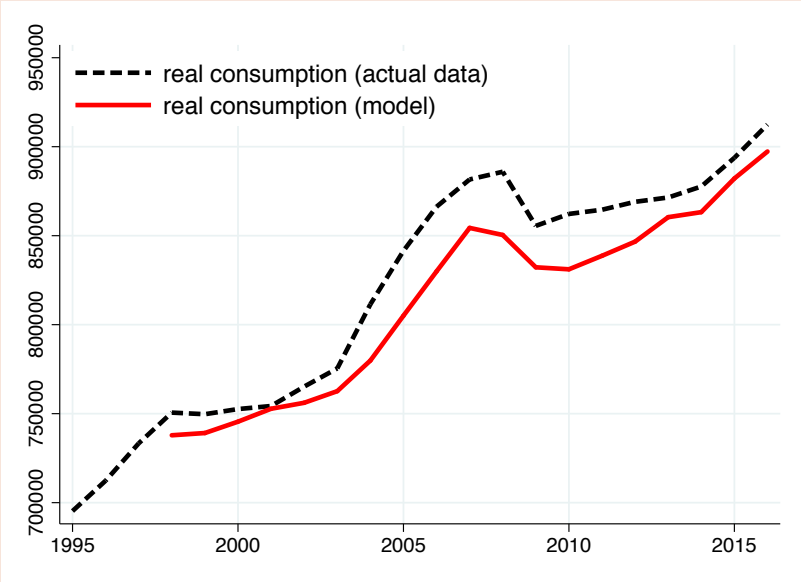
$$IBLTR^H_t = \beta_{28}(I^H_t) + \beta_{29}(IBL^H_{t-i}) + \beta_{30}(FATR^H_t) + \beta_{31}(r^H_{L_{t-1}})$$

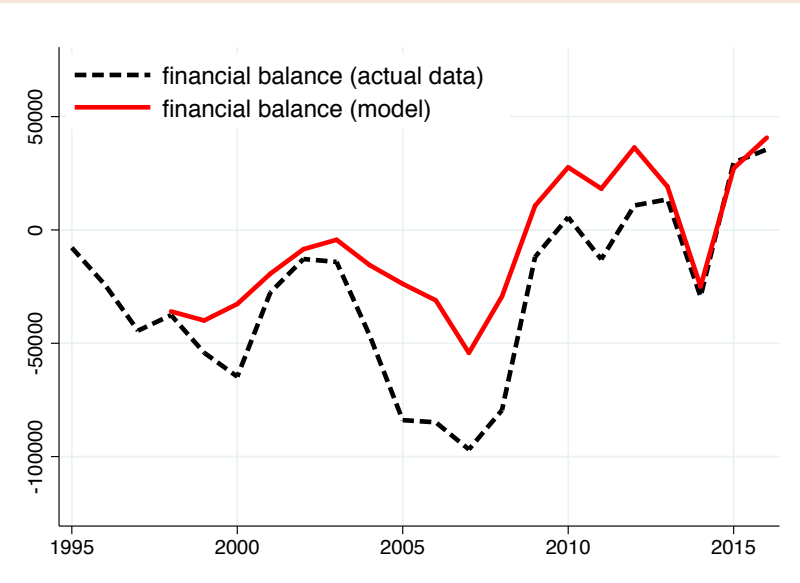
Accumulation of Interest bearing assets:

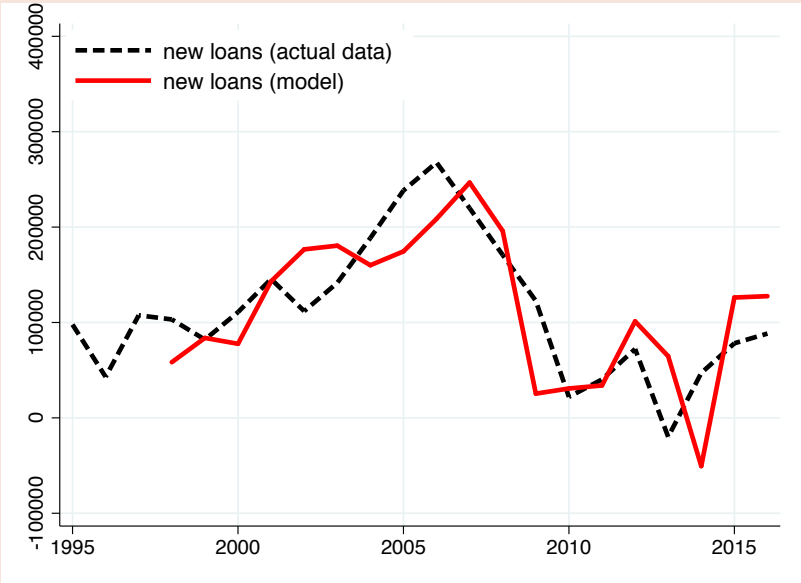
$$IBATR^H_t = NL^H + IBLTR^H_t - EQATR^H_t - PENATR^H_t$$

DATA vs. Model







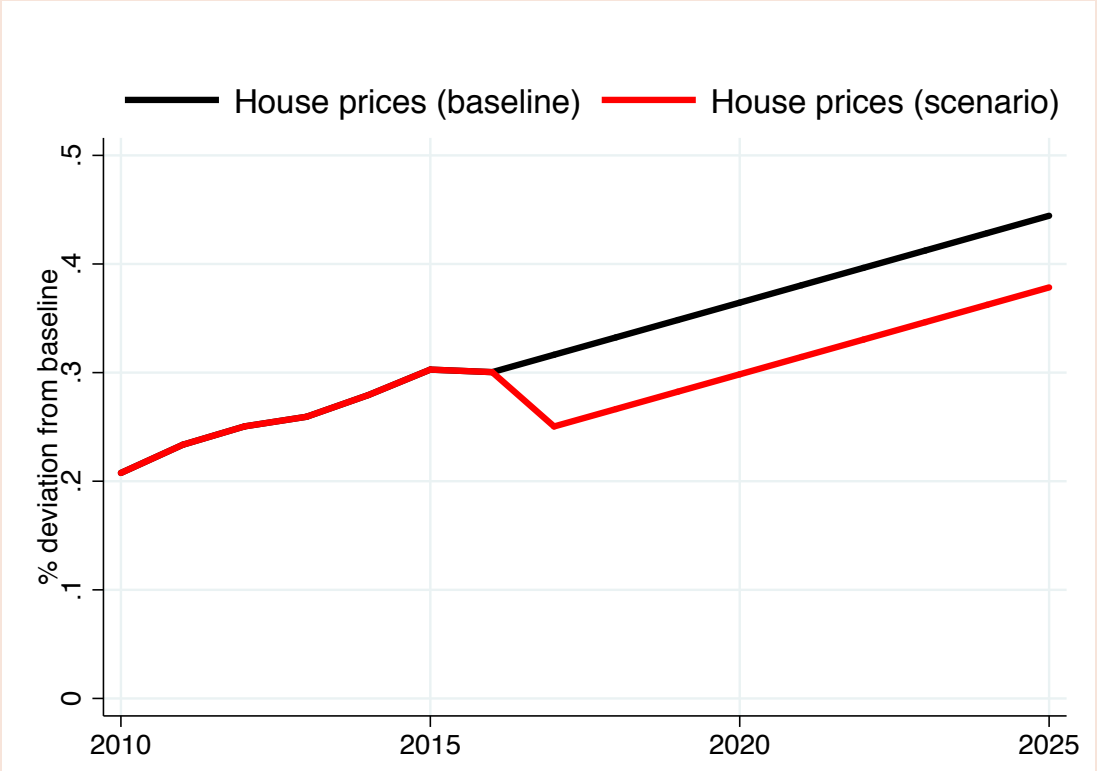


Baseline

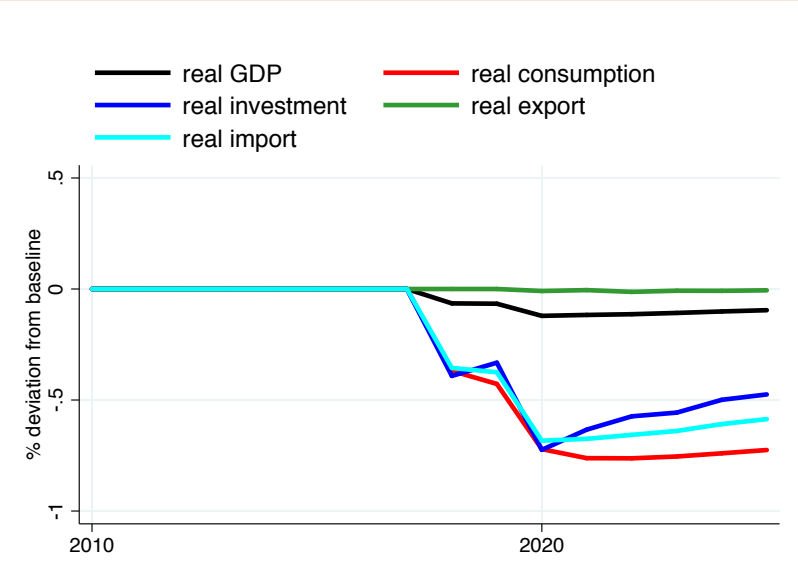
- Simple forecast until 2025
- no capital gains - low real growth rates in baseline

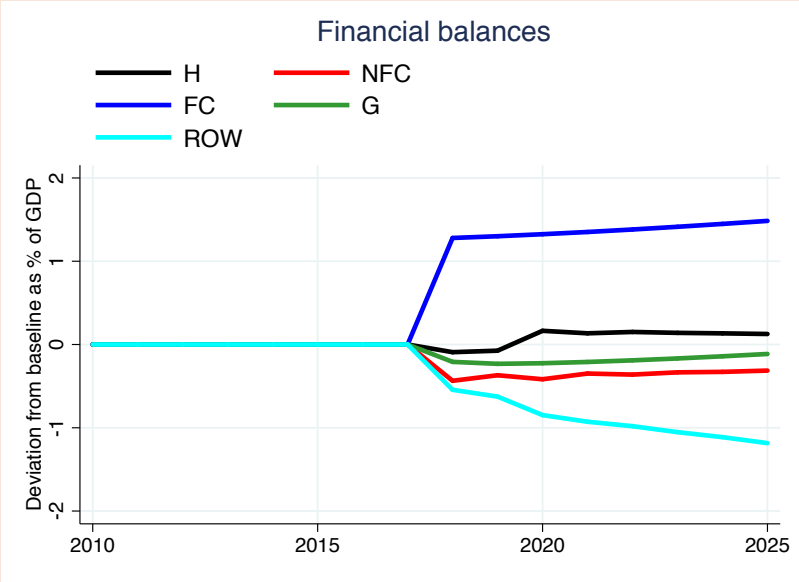
Shocks

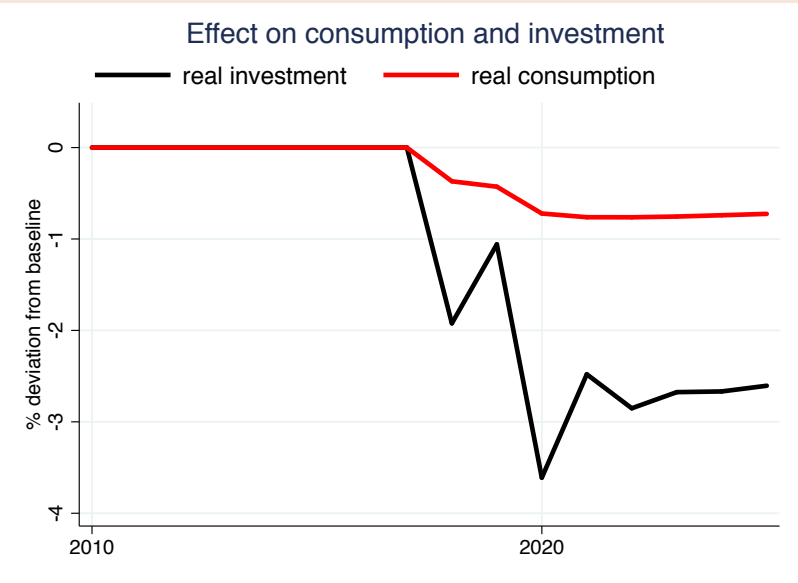
- Increase in the level of interest rate (1%-point 2017-2025)
- Fall in the house prices (-5% 2017)

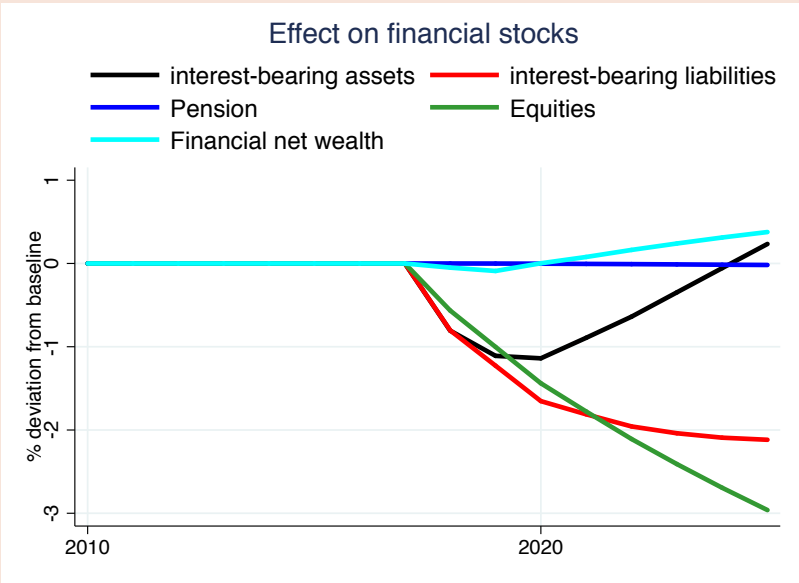


Increase in interest rate

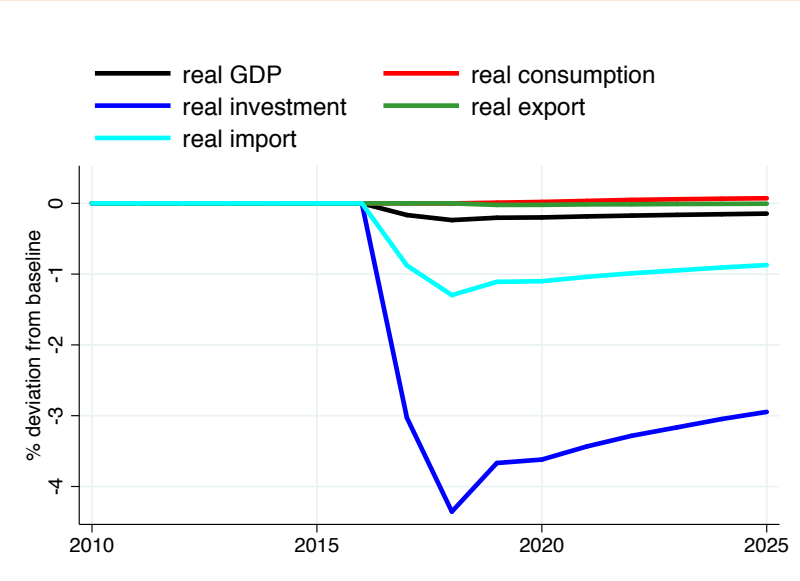


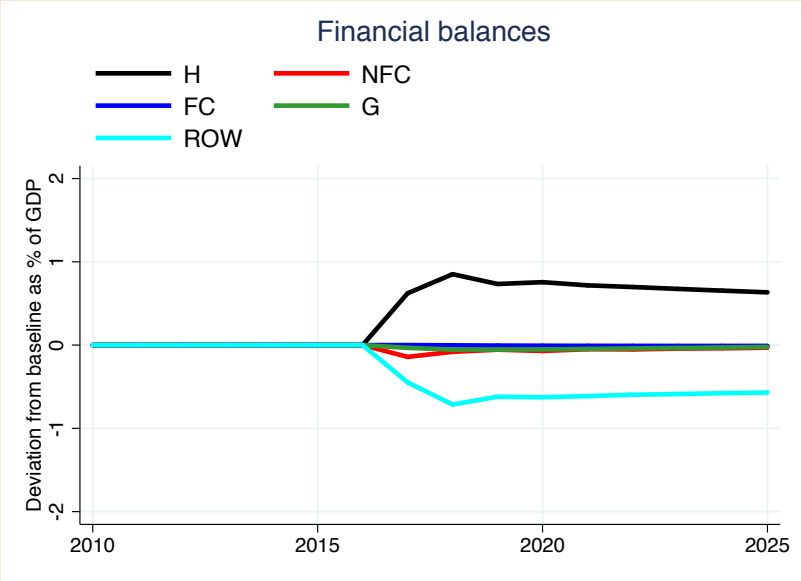


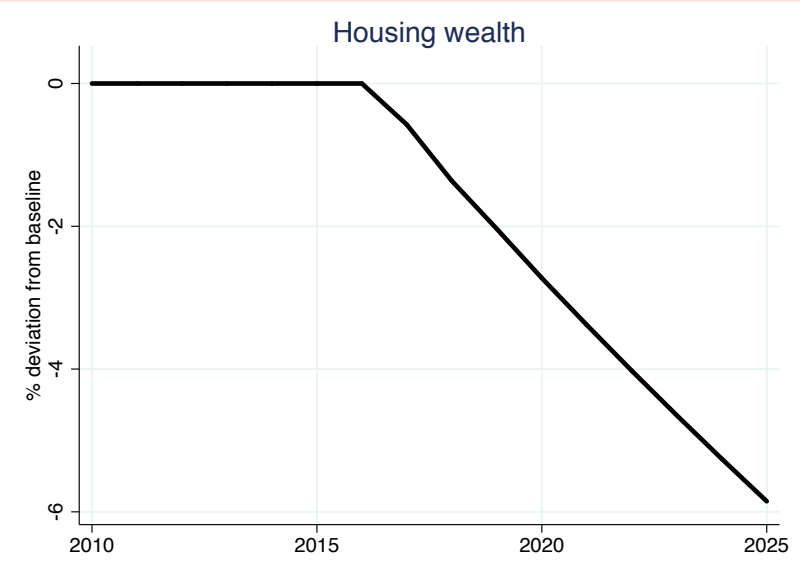


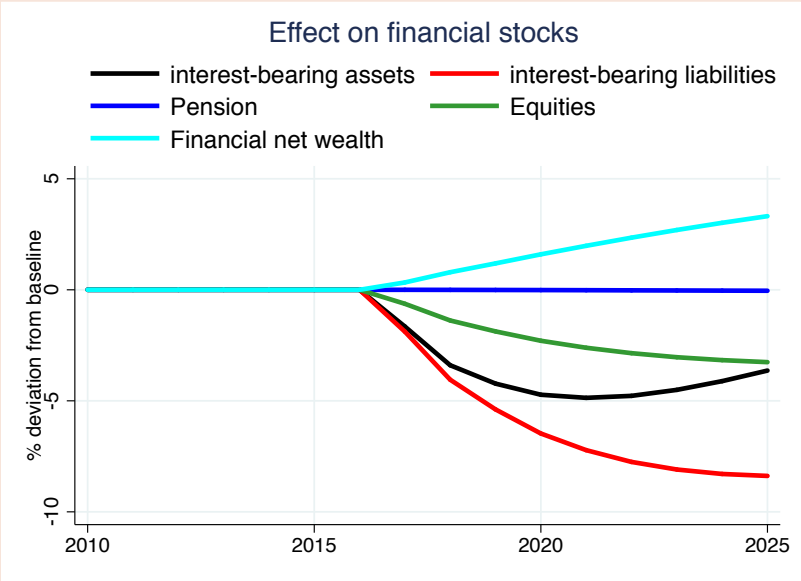


Fall in house prices









Is household debt a risk to the macroeconomic stability?

- The overall results of our model indicate that higher household debt can magnify the effects of negative shocks
- Economic growth in response to these shocks will slightly slow down but will not turn negative.
- Domestic shocks to the economy may not pose a serious risk to macroeconomic stability

Why is this time different?

- A reduction in global output in combination with a rise in interest rate and a fall in house prices leads to a serious recession in the Danish economy mimicking the situation in 2009.
- Being a small open economy, the Danish economy is highly affected by global shocks.

Conclusion

- The two shocks to the economy affect the macroeconomic output negatively (but through different channels)
- In the absence of global shocks, domestic shocks to the economy may not pose a serious risk to macroeconomic stability
- Is household debt a risk to the financial stability?