



The impact of Quantitative Easing in the Netherlands: a SFC approach

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- Aim of the model is to explain the lack of impact of QE on the Dutch economy
 - using data on the Dutch economy
- Develop a stock-flow consistent (SFC) model
 - explains wealth accumulation
 - impact of wealth effects on the economy
 - natural role for the financial sector
- We are more than halfway: we have
 - a working prototype model
 - a consistent set of Dutch data
 - but have still to match both



Structure presentation

- Brief survey empirical SFC models
- Stylised facts Dutch economy
- Impact of QE
- The model
- Simulations
 - impact of QE
 - helicopter money



Empirical SFC models (1)

- Papadimitriou et al. (2013): LIMG model
 - estimated for the Greek economy
- Gudgin et al. (2015): UKMOD model
 - estimated for the UK economy
- Miess and Schmeltzer (2016): Austria
 - not really estimated
- Burgess et al. (2016): “Bank of England model”
 - estimated for the UK economy



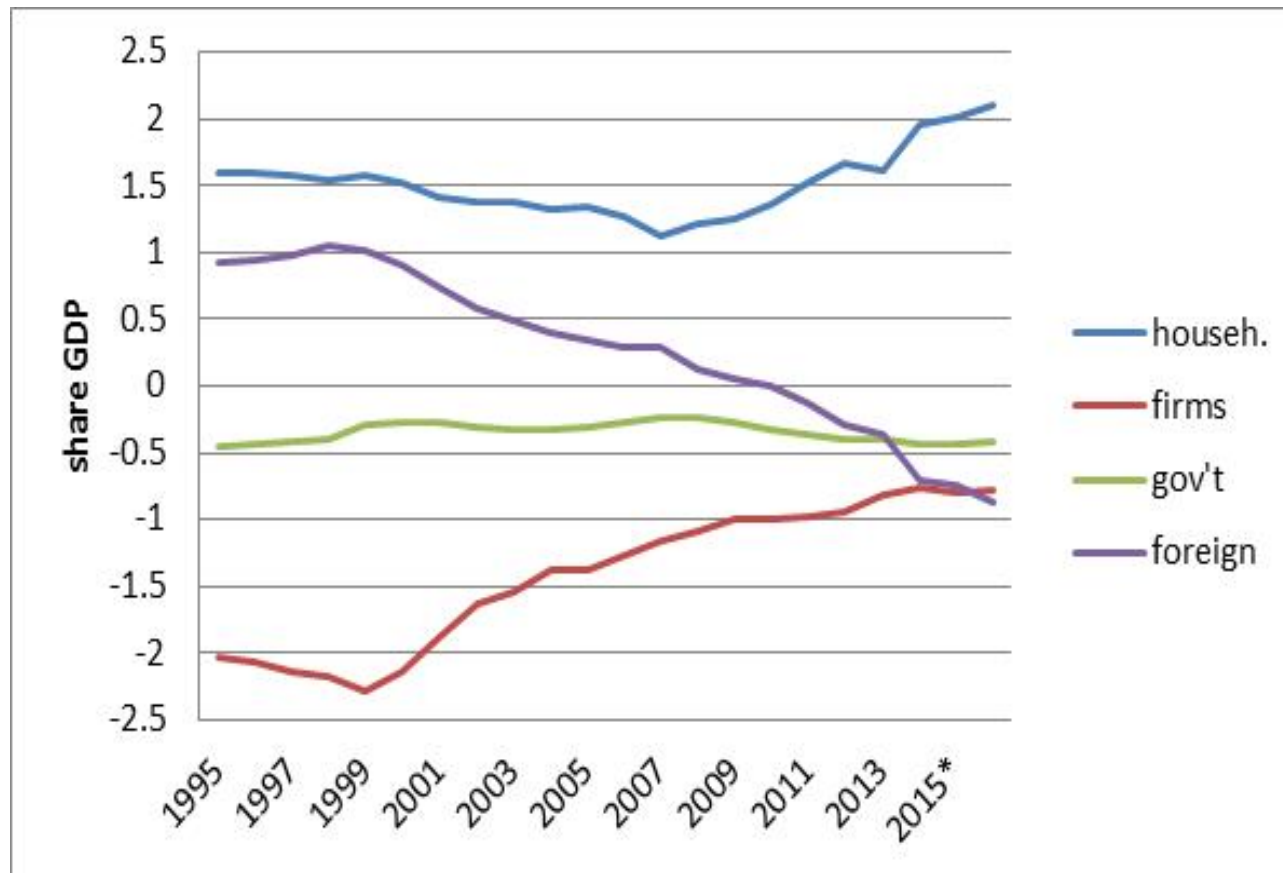
Empirical SFC models (2)

- All models distinguish between private sector, government and foreign sector
 - emphasise imbalances between these sectors
 - stress importance of wealth effects
- LIMG and UKMOD ignore financial sector
 - do not distinguish between various types of assets
- Austrian model has no behavioural equations
- “Bank of England model” is full SFC model



Dutch Economy: Sector Imbalances

Net financial assets (CBS)





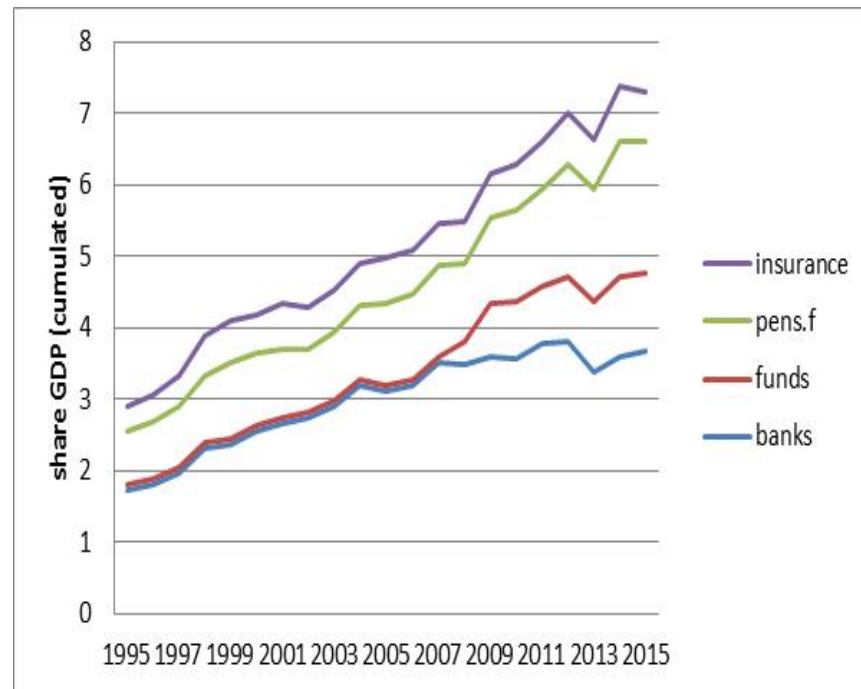
Dutch Economy: Stylised Facts

- Open economy:
 - strongly dependent on exports (87% GDP)
 - large current account surplus (4 – 11 % GDP)
 - considerable foreign exposure of banks and PFs
- Large financial sector
 - banks assets (500% GDP), PF assets (200% GDP)
 - fragilities (dep. fund. gap banks, low reserves PF)
- Strongly indebted households
- Firms investing in financial assets

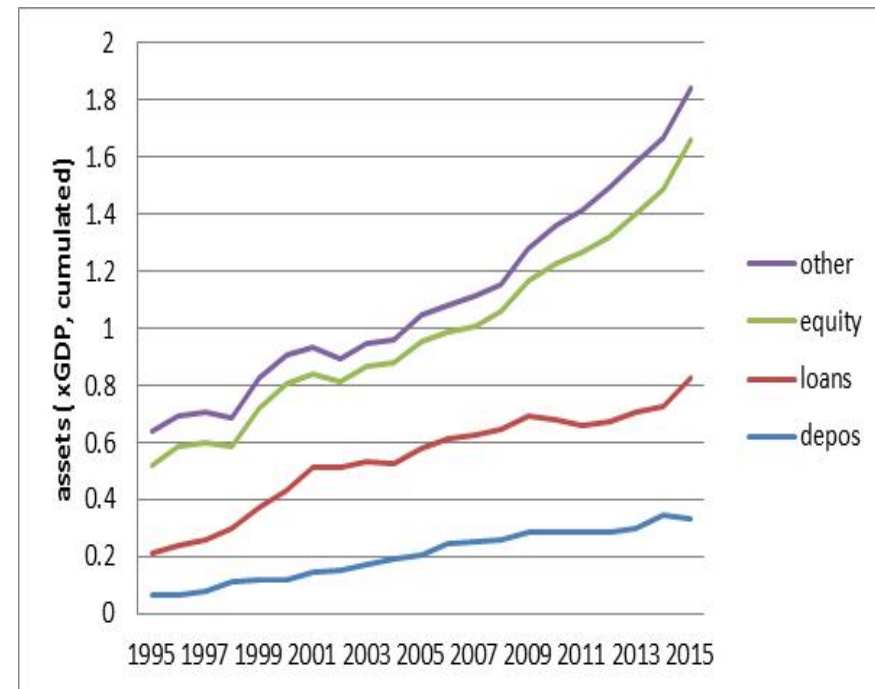


Dutch Economy: Large Financial Sector

Financial Sector



Large firm savings

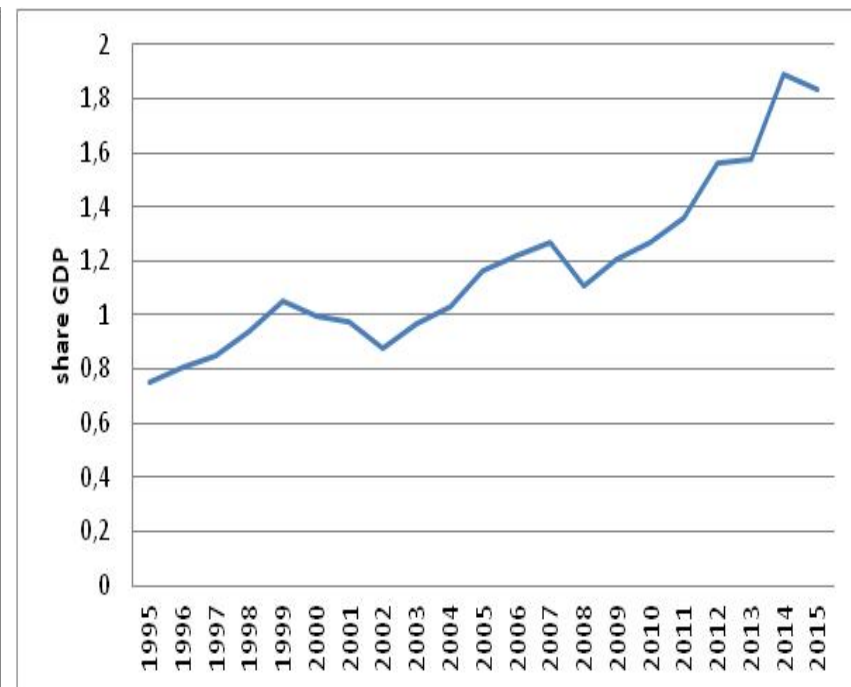
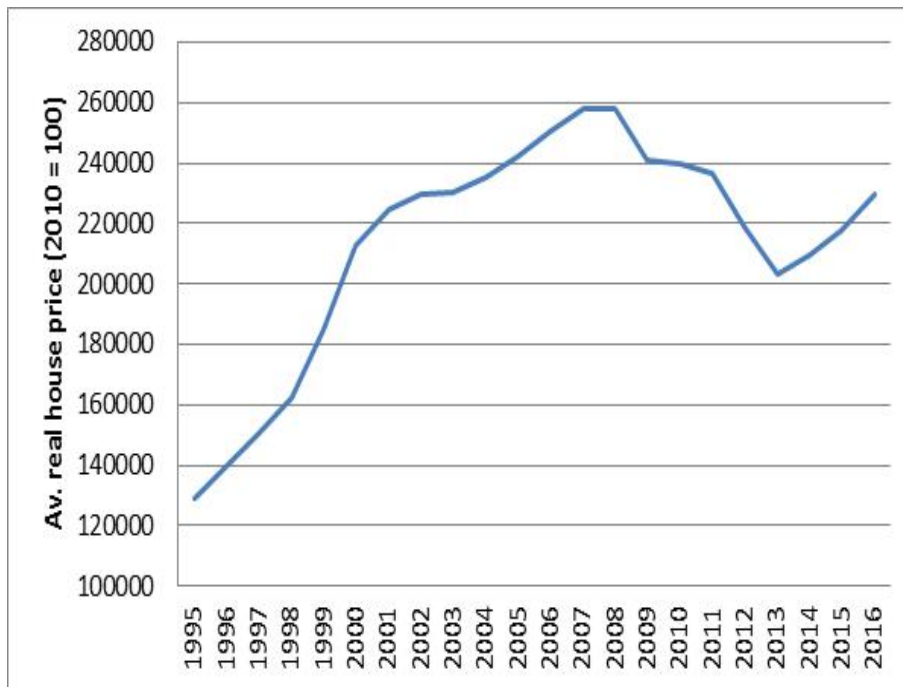




The role of low interest rates (and QE)

- Housing bubble

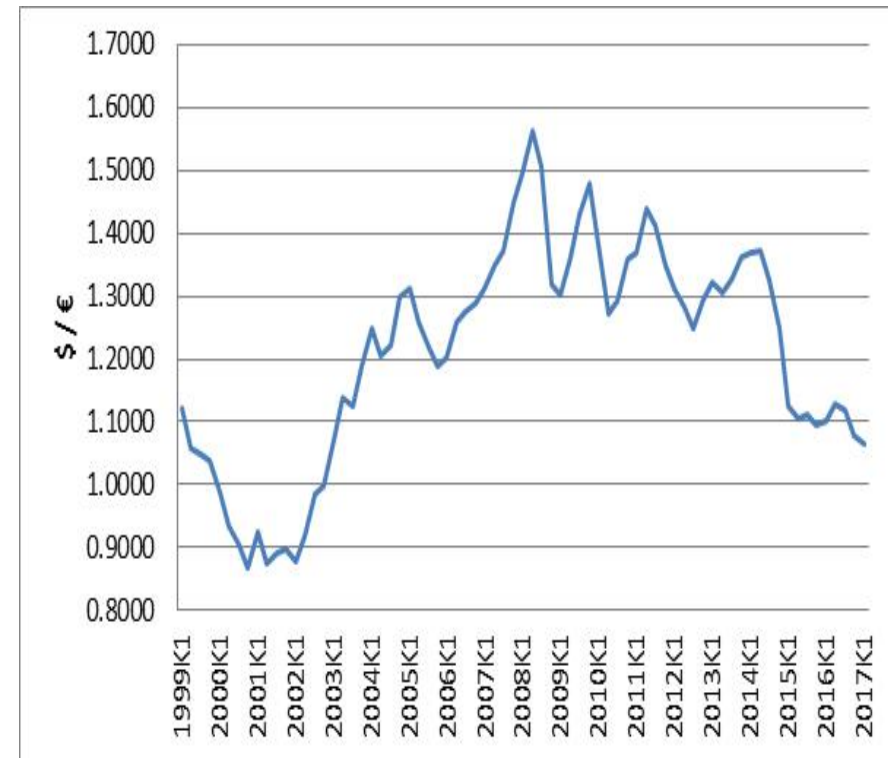
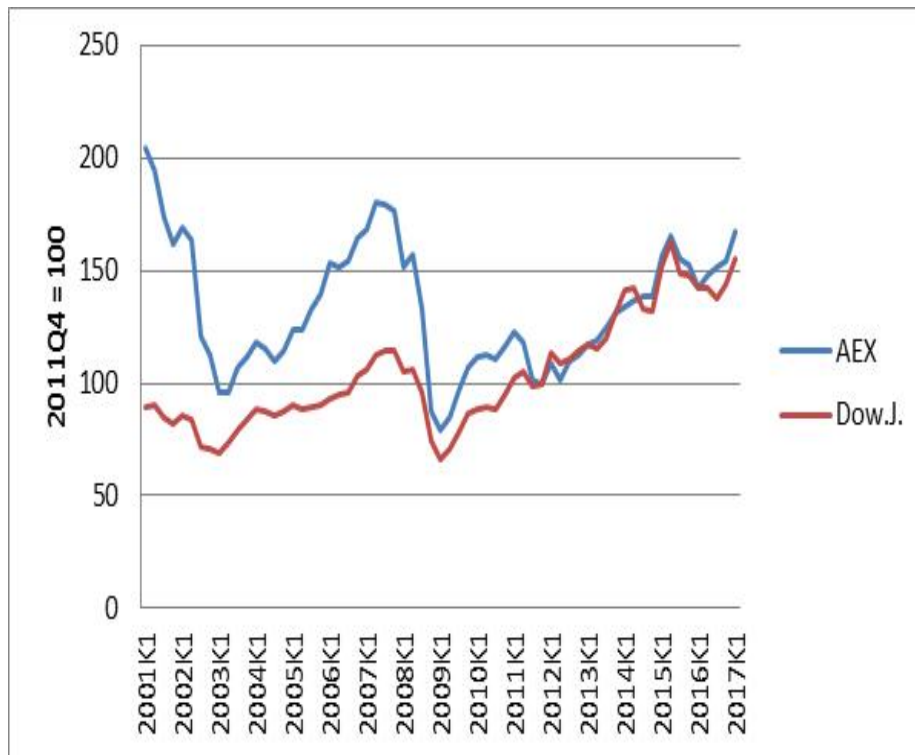
Soaring liabilities
pension funds





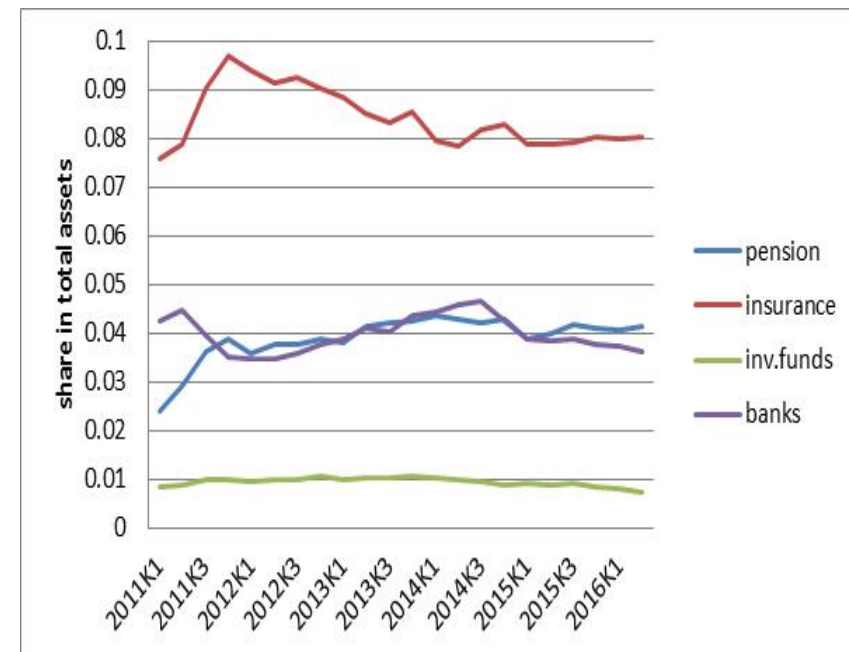
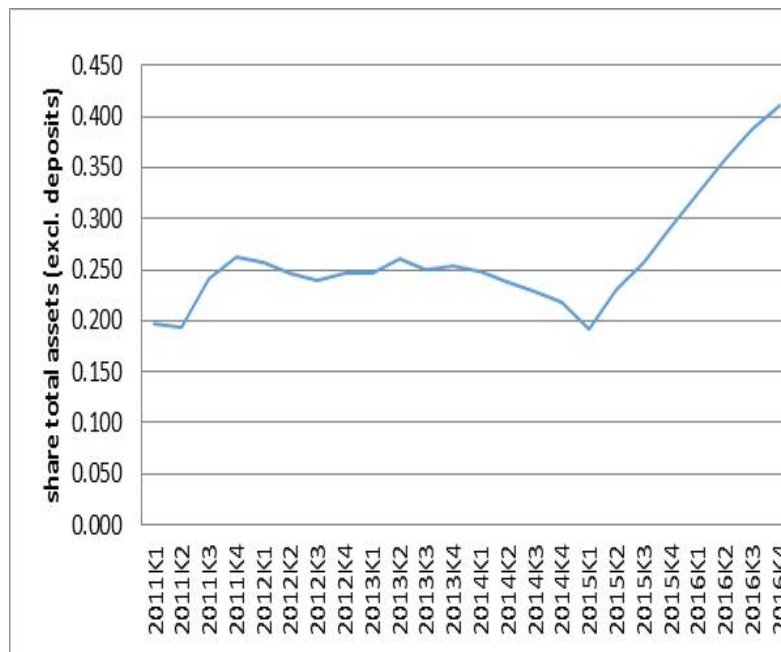
The role of low interest rates (and QE)

- Increasing stock prices
- Depreciation of €



What happened with QE (1)?

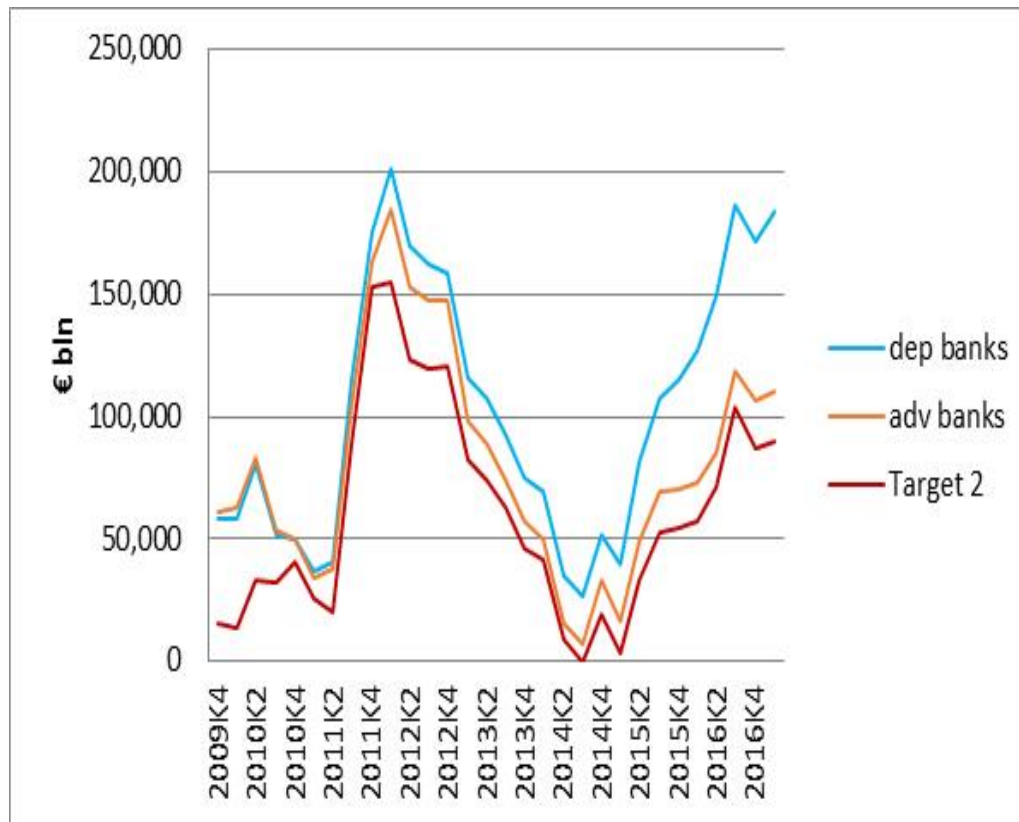
- DNB buys bonds
- Fin Inst don't sell





What happened with QE (2)?

- DNB balance sheet



- Till 2015 deposits held by domestic banks at DNB follow Target 2: **capital flight South**
- After 2015 domestic banks increase deposits: **QE (capital flight?)**



SFC Model

- Households – Firms – Banks – Pension funds – Central bank – Government – Foreign sector
- Main Behavioural equations:
 - Households:
 - Consumption
 - Portfolio distribution of HH wealth
 - Endogenous housing prices, and mortgages



SFC Model (II)

– Firms

- Investment
- dividends paid to HH -> rate of return on equity,
- Firms invest in capital and in equity abroad

– Pension funds

- hold bonds (government and foreign) in fixed ratio to equity abroad

– Foreign sector

- holds bonds (banks and government) in fixed ratio to net equity



Long Run Properties

- Our model runs to a steady state
- Positive growth rate GDP
- Balance sheet items as ratio to GDP are constant
- Approximates Dutch balance sheet (2015)



Simulations

- QE -> buying government bonds through financial system
- Reducing interest rate
- Helicopter Money -> by reducing direct taxes

Simulation starts in 1800, shock in 2000, reverse shock in 2040.

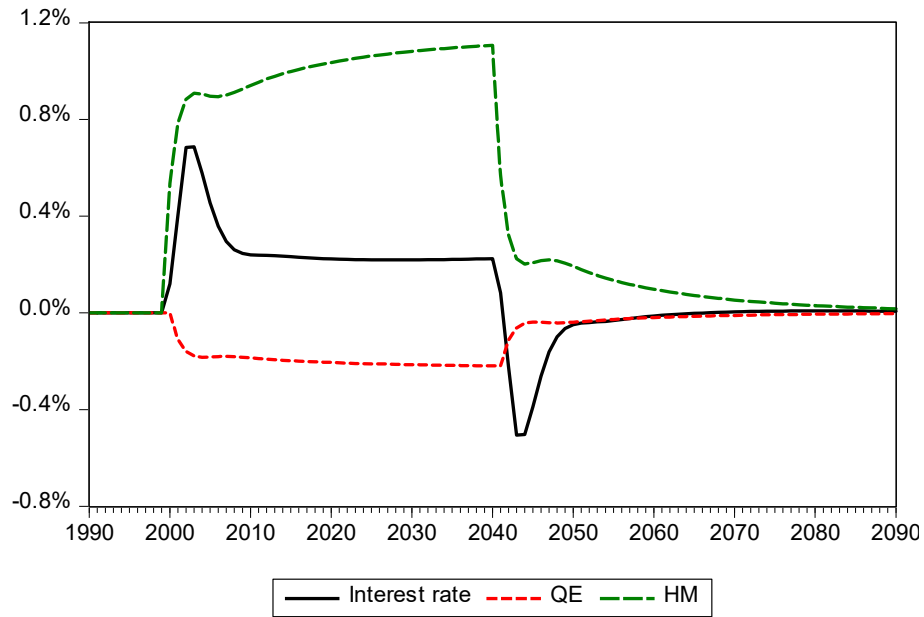


QE : Reducing Advances

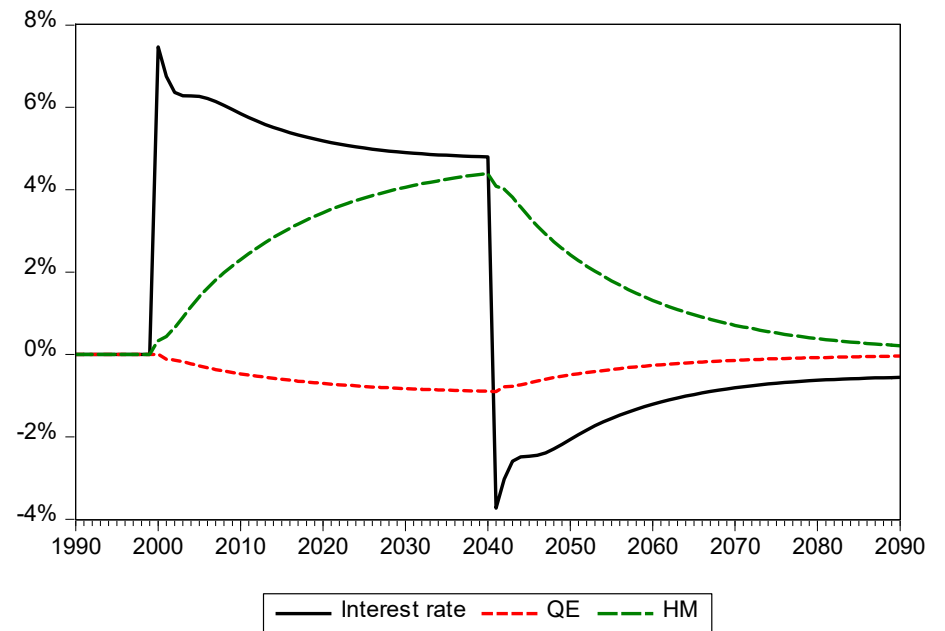
Balance sheet, Simulated/GDP – Base run/GDP

| | House holds | Firms | Banks | Pension funds | Central bank | Government | Foreign | Total |
|--------------------|-------------|-------|--------|---------------|--------------|------------|---------|--------|
| Central bank adv. | | | 7.15% | | -7.15% | | | |
| Bank deposits | -0.35% | | 0.35% | | | | | |
| Loans | | 0.01% | -0.01% | | | | | |
| Bills | -0.02% | | | 0.00% | 6.97% | 0.35% | -7.30% | |
| Capital | | 0.01% | | | | | | 0.01% |
| Bonds | | | -7.32% | | | | 7.32% | |
| Equities | -0.11% | 0.01% | 0.02% | 0.00% | | | 0.09% | |
| Mortgages | 0.18% | | -0.18% | | | | | |
| Houses | -0.23% | | | | | | | -0.23% |
| Claims/Liabilities | 0.00% | | | 0.00% | | | | |
| Foreign Reserves | | | | | 0.18% | | -0.18% | |
| Total net worth | -0.53% | 0.03% | 0.00% | 0.00% | 0.00% | 0.35% | -0.07% | -0.22% |

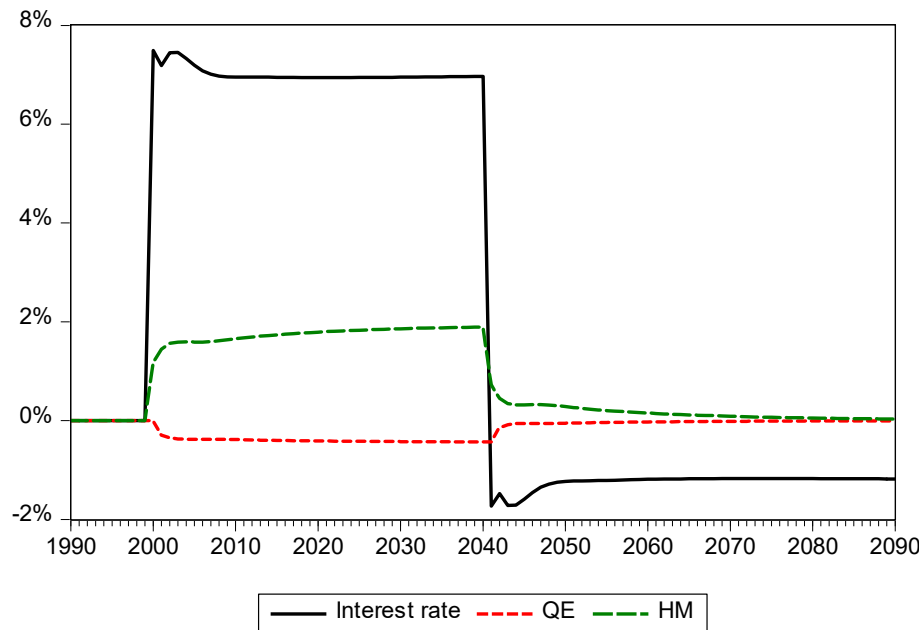
Real GDP
(%deviation from baseline)



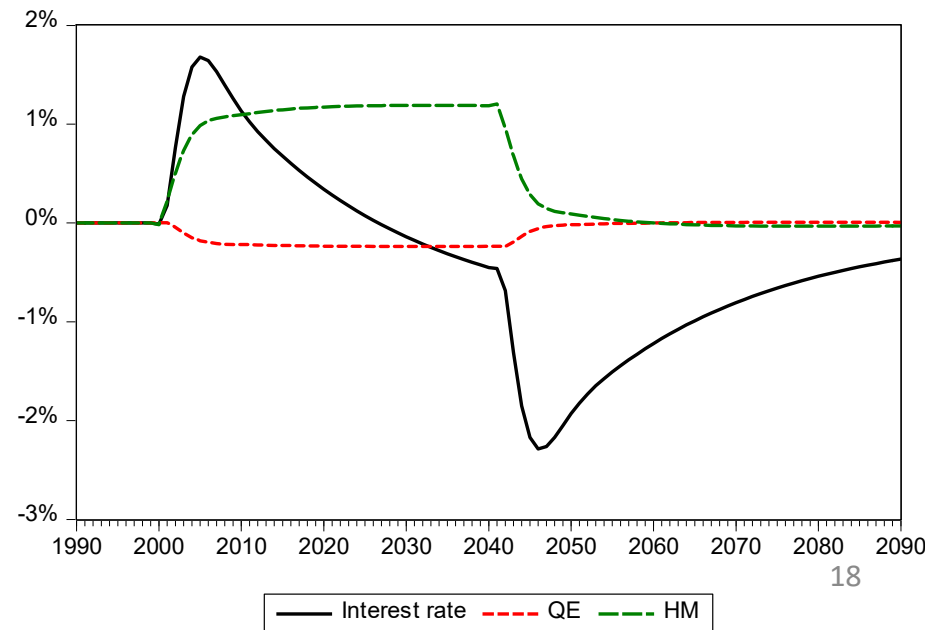
Equity Households
(%deviation from baseline)



Mortgages



Loans





Conclusions

- SFC data are hard to find
 - Stock data
 - Who transfers to whom is often not clear
- Model should have focus
 - Limit complexity (extensive financial sector, limited real sector)
 - Dynamics are important
- Long run properties are important
 - Exploding/imploding
 - Stabilizes after a shock



Thank you

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Balance sheet

(% of GDP, after 500 periods)

| | House holds | Firms | Banks | Pension funds | Central bank | Government | Foreign | Total |
|--------------------|-------------|-------|-------|---------------|--------------|------------|---------|-------|
| Central bank adv. | | | -11% | | 11% | | | |
| Bank deposits | 38% | | -38% | | | | | |
| Loans | | -42% | 42% | | | | | |
| Bills | 2% | | | 56% | -34% | -24% | 0% | |
| Capital | | 113% | | | | | | 113% |
| Bonds | | | -70% | | | | 70% | |
| Equities | 12% | -32% | -15% | 130% | | | -94% | |
| Mortgages | -89% | | 89% | | | | | |
| Houses | 111% | | | | | | | 111% |
| Claims/Liabilities | 180% | | | -180% | | | | |
| Foreign Reserves | | | | | 22% | | -22% | |
| Total net worth | 254% | 38% | -3% | 5% | 0% | -24% | -46% | 224% |