# Discussion
# " Linking Households and Banks to Model Financial Stability Stress Testing Financial Stability"

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Based on:

Solheim H. and Vatne B. H. (2013), "Measures of household credit risk", Economic commentaries, Norges Bank, n°8.

Lindquist K., Riiser M., Solheim H. and Vatne B. (2014), "Ten years of household micro data. What have we learned?", Staff memo, Norges Bank.

- **Aims of both papers**
  - ❑ describing the household financial situation in Norway in terms of assets and debt

  - ❑ Providing some stress-testing of household credit risks: increase in the loan interest, fall in house prices

➤ **Data : huge dataset, covering a long time-period (1987-2012)**

- 1987-2003: Survey data (representative sample « *based on tax return data* »)

- 2004-2012: administrative register data (household's composition, « *registered* » income, transfers, debt, wealth and tax payments).

➤ **Very interesting birth-cohort analysis:**

- distribution of assets and debt by age over time

- Main point: change in debt holding over time, more of the debt being held by older households

# Clarification questions on the data and the institutional context

❖ **Wealth variables**

- Value of assets registered: tax value (which may differ from market value)

- Is the dataset combining information on income (asset returns) and wealth taxes?

- What about wealth tax in Norway? Have all assets a « tax value »?

- Are there some financial/real assets that are tax free? Are they included in your dataset?

# Clarification questions on the data and the institutional context

❖**Debt variables**

- Do you observe only the household total debt?

- Or do you also have information on the loan characteristics such as : the initial amount borrowed, the interest rate, the amount of payment made on the loan, the collateral (i.e. whether it is a mortgage), the purpose of the loan (acquire a property, consumption needs, education debt?)

- Do you observe in your dataset household debt default/bankruptcy?

# Empirical analysis

1. **Three *a priori* criteria for credit risk are used to identify vulnerable households:**

**D:** debt > 5 x disposable income  *[Loan repayment ability]*

**M:** Income-(tax + interest expenses+ standard living expenses)<monthly wages *[Financial margins]*
*(**Question:** only wages or also revenues from financial and real assets?)*

**F:** (debt-bank deposits)>  dwelling market value *[collateral value]*

## 2. Computation of the share of total debt held by these vulnerable households

| Criteria | D | M | F | D+M | D+F | M+F | D+M+F |
|---|---|---|---|---|---|---|---|
| **Share of total debt (2011)** | 34.0% | 8.2% | 30.8% | 5.2% | 15.4% | 4.1% | 2.4% |
| **Share of total debt (2012)** | 35% | 8% | 30% | 5% | 16% | 4% | 2% |
| % of vulnerable households (2012) | 12% | 16% | 24% | 3% | 5% | 7% | 1% |

**Empirical analysis**

# Questions on the sub-population of "vulnerable households"

More detailed descriptive analysis would be interesting.

- Do you observe some «**state dependence**», i.e. are the same households classify as « vulnerable » over time?

- **Who are the households changing from one category to the other one** (vulnerable or not) over time? Changes in household composition, wealth composition, employment status, income, etc.?

- Rich dataset, panel: why not a dynamic probit model?

**Probability to be classified as « vulnerable »** depending on the household current and past characteristics (including a dummy variable for being classified as "vulnerable" at time t-1).

# Empirical analysis

## 3. Sensitivity analysis of the criteria to interest rate increases and declines in house prices

| Criteria | M+F | D+M+F |
|---|---|---|
| **Share of total debt (observed)** | 4.1% | 2.4% |
| **Sensitivity analysis :if** | | |
| Increase in interest rate (+3 p.p.) | 6.7% | 4.3% |
| Decreasing in dwelling value (-31%) | 5.6% | 3.6% |
| Both | 10% | 6.8% |

Source: Solheim H. and Vatne B. H. (2013), "Measures of household credit risk", Economic commentaries, Norges Bank, n°8.

**Empirical analysis**

# Questions and comments

➢ Analysis based on a **limited number of criteria**, defined « a priori »

➢ Given the rich available dataset, one could imagine a more
« **agnostic** » **approach** (principal components analysis) to identify
the main components of « household debt risk »

     - **construct a « debt risk score » for a given year** based on
various indicators

     - **study the stability/evolutions over time** of the score and of
its main components

➢ Have you tried such an approach? Any projects?

**Empirical analysis**

# Further comments

❑ Sensitivity analysis : **simple changes in the « threshold » of the criteria** within the population, i.e. both increasing interest rates and/or decreasing wealth increases the percentage of « vulnerable » households, and « mechanically » increases the share of total debt held by vulnerable households…

❑ But it **does not account for changes in household behaviours (saving, debt contracting, homeownership, etc.)** that such new macroeconomic conditions would imply.

❑  Such an analysis would require first **modelling and estimating some household behaviours** equations (maybe consumption/saving; debt; and homeownership) **before simulating the effect of a change in the asset prices.**

# Conclusion

❑ **Very promising ways and data sources** to study household debt risks

❑ **Register data : pros and cons**

- Impressive and very useful long time period coverage : allows to analyze debt risk evolutions over time

- Only the recorded information, not collected with the original goal to analyze debt risk and financial stability issues

❑ **Other sources  (household surveys) may be also useful,** in particular to provide more detailed analysis on households behaviours (determinants of debt contracting, housing acquisitions, portfolio choices, etc.)