

Breeding One's Own Subprime Crisis

Labour Market Effects on Financial System Stability

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Motivation

- 1 Mechanism of propagation - how strong?
- 2 Different scenarios of labour market evolutions - projections
- 3 A methodological attempt - is it possible at all with the data we have?
- 4 Test empirically the effects of a **fiscally neutral** instrument for fostering the stability of the financial systems.

Basic question

How do **negative labour market shocks** transmit to the stability of the financial systems *via* the **channel of mortgage**.

Outline

- 1 Why such a study?
- 2 Data
 - Ability to service mortgages - status quo
- 3 Foundation of the analysis
 - Issues to deal with
 - Labour market - three scenarios
- 4 The simulation setup
- 5 Results
- 6 Conclusions

Data

- **Basic data set:** households' budgets survey 2007
 - the subpopulation of mortgage owners
 - separate the revenues of household to particular household members (types of revenue and form of l.m. activity of a member)
- **Additional data set:** labour force survey 1q1999-4q2007

Data shortcomings

- Only data about **monthly installments** ("implied" household debt burden)
- No. of households with mortgages only halves what we find in macro data ...
- ... but statistics are the same (size and distribution)
- Underdeclaring revenues in HBS typical, higher income people refuse participation
- No data concerning labour market history of individuals (only current status)

Ability to service mortgages - status quo

- The share of endangered credits according to Financial Sector Regulator - 3.6%
- *RESIDUAL* = revenues - mortgage monthly installment - social minimum
- How adequate is social minimum to define the situation of a household?
- Based on these guidelines: 19% households have a negative *RESIDUAL* ("delinquent" households)

Assumptions

- We take 19% as benchmark
- The implications of imposing the social minimum

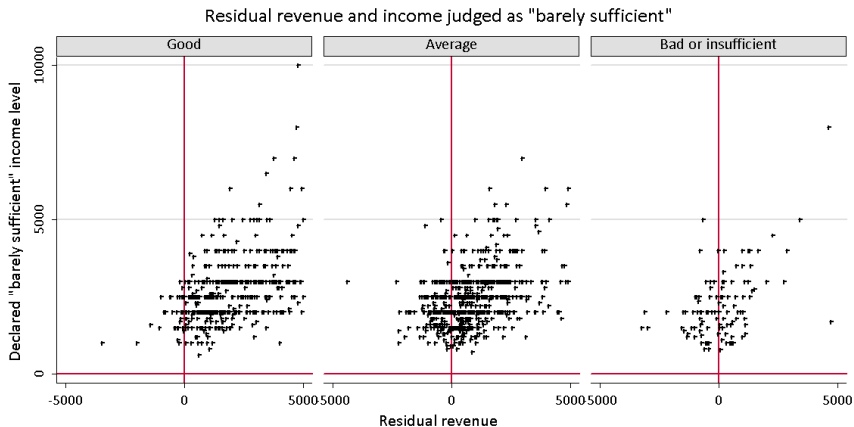
Testing the reliability of these data

Table: Delinquency and self-evaluation

| | How does your household fare? | | | | | | Total |
|----------------|-------------------------------|-------|------------|-------------|-------|-----------|-------|
| | Very bad | Bad | Struggling | Rather easy | Easy | Very easy | |
| "Liquid" | 39 | 97 | 372 | 373 | 137 | 41 | 1,059 |
| "Delinquent" | 28 | 54 | 142 | 33 | 5 | 0 | 262 |
| Total | 67 | 151 | 514 | 406 | 142 | 41 | 1,321 |
| % "Liquid" | 58,2% | 64,2% | 72,4% | 91,9% | 96,5% | 100,0% | 80,2% |
| % "Delinquent" | 41,8% | 35,8% | 27,6% | 8,1% | 3,5% | 0,0% | 19,8% |

Source: HBS 2007, own computations

Ability to service mortgages - status quo



Graphs by declared financial situation of the household

Figure: Declared preferred income and current liquidity of the household, HBS 2007

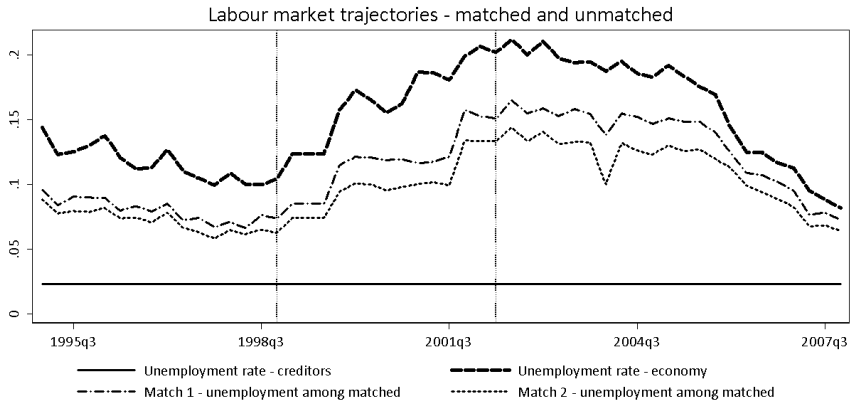
Creditors vs. population: basic differences

- Creditors' households:
 - have higher activity rates
 - report higher average revenues
 - are younger
 - comprise less members (\Rightarrow relatively more one-member households)
 - live in agglomerations

Key question

What happened at the labour market (unemployment/activity) to people, who are similar to current creditors? \Rightarrow **propensity score matching** ("statistical twins").

Creditors vs. population: labour market



Labour market for creditors - three scenarios

1 Basic scenario

- creditors still "different" from the "statistical twins"
- general unemployment rate grows to 12% (October forecast of NBP),
- creditors change **proportionately**
- unemployment changes from 2% to 2.4%

2 Individually pessimistic scenario

- creditors become "the same" as their "statistical twins", but **no change in general labour market outlook**
- unemployment changes from 2% to 7.2%

3 Generally pessimistic scenario

- labour market moves to worst levels so far (noted over 2003-2005)
- **BUT** creditors are still different than "statistical twins" (only proportionate changes)
- unemployment changes from 2% to 4%

How this translates to individual data?

We find "steady state" probabilities and subsequently impose changes in individually observed probabilities (*gender* × *education*) of losing/finding a job to match the endpoint on aggregate.

Scenarios

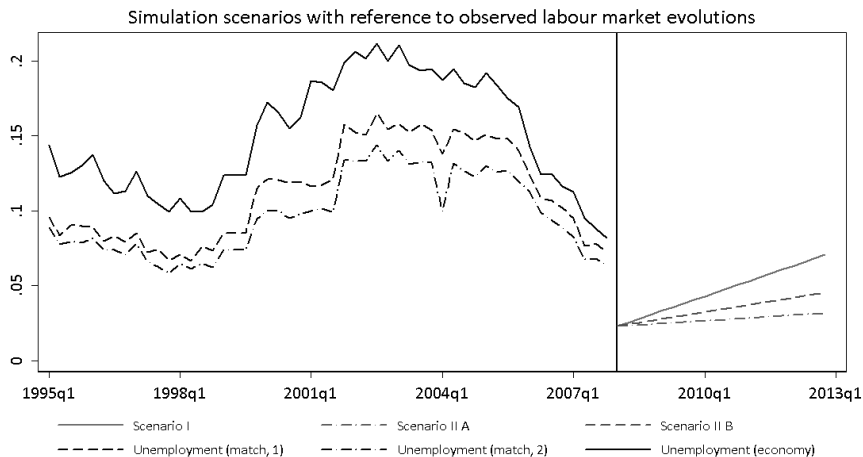


Figure: Simulation scenarios

Simulation setup

Each person, based on probabilities computed from LFS finds/looses/keeps employment or remains unemployed

- if looses job, household looses this revenue (in Scenarios B household obtains an unemployment benefit of 500 zł);
- if stays without job, household has no revenues from this member (in Scenarios B, unemployment benefit is given for four consecutive quarters);
- if finds a job, household obtains income (remuneration is randomly assigned from a distribution centered at last reported revenue, for those unemployed in the beginning of the sample, distribution is centered at national average).

Simulation setup

- Run this for 20 periods (if you take it literally, 5 years)
- At each step labour market status is independently and randomly assigned
- Household revenues are a sum of incomes by each member (for non-working household members these are treated as "autonomous" and not simulated);
- At each point in time we evaluate *RESIDUAL*, i.e. whatever is left at disposal of the household after monthly mortgage installment
 - we excluded any other liabilities for the financial sector (easy to add)
 - we include social minimum for each household member (ML&SA annual announcement, took most recent, 2008)
- Repeat the simulation 500 times to avoid vulnerability (statistical reliability)

Who loses most and when?

Table: Results

| Senario | Mean percentile | Standard deviation | Max | 75% | Median | 25% | Minimum |
|--------------------------|-----------------|--------------------|------|------|--------|------|---------|
| "Steady state" | 0.18 | - | - | - | - | - | - |
| A: No instrument | | | | | | | |
| Individually pessimistic | 0.25 | 0.001 | 0.28 | 0.26 | 0.25 | 0.24 | 0.23 |
| Basic | 0.21 | 0.01 | 0.24 | 0.21 | 0.21 | 0.21 | 0.19 |
| Generally pessimistic | 0.23 | 0.01 | 0.25 | 0.23 | 0.23 | 0.22 | 0.21 |
| B: With instrument | | | | | | | |
| Individually pessimistic | 0.24 | 0.01 | 0.27 | 0.24 | 0.24 | 0.23 | 0.21 |
| Basic | 0.20 | 0.01 | 0.22 | 0.21 | 0.21 | 0.20 | 0.18 |
| Generally pessimistic | 0.22 | 0.01 | 0.24 | 0.22 | 0.22 | 0.21 | 0.20 |

Source: Own calculation based on HBS (2007)

Distribution effects

Table: The share of *RESIDUAL* in household monthly expenses (only "delinquent" households)

| Percentile | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% |
|--------------------------|---|--------|--------|--------|--------|--------|--------|--------|--------|
| Initial situation | -0.459 | -0.348 | -0.290 | -0.246 | -0.204 | -0.155 | -0.122 | -0.082 | -0.039 |
| | With instrument | | | | | | | | |
| Individually pessimistic | -0.851 | -0.637 | -0.493 | -0.386 | -0.307 | -0.241 | -0.178 | -0.120 | -0.065 |
| Basic | -0.818 | -0.578 | -0.448 | -0.347 | -0.277 | -0.221 | -0.161 | -0.110 | -0.059 |
| Generally pessimistic | -0.843 | -0.607 | -0.468 | -0.363 | -0.289 | -0.229 | -0.168 | -0.114 | -0.061 |
| | No instrument | | | | | | | | |
| Individually pessimistic | -0.974 | -0.743 | -0.546 | -0.424 | -0.329 | -0.260 | -0.196 | -0.128 | -0.068 |
| Basic | -0.909 | -0.608 | -0.463 | -0.362 | -0.291 | -0.232 | -0.172 | -0.117 | -0.064 |
| Generally pessimistic | -0.938 | -0.643 | -0.486 | -0.381 | -0.305 | -0.243 | -0.181 | -0.121 | -0.066 |
| | <i>RESIDUAL</i> reduction due to the instrument | | | | | | | | |
| Individually pessimistic | 0.122 | 0.106 | 0.053 | 0.038 | 0.022 | 0.019 | 0.018 | 0.007 | 0.004 |
| Basic | 0.091 | 0.030 | 0.015 | 0.015 | 0.013 | 0.011 | 0.010 | 0.006 | 0.005 |
| Generally pessimistic | 0.095 | 0.036 | 0.019 | 0.018 | 0.016 | 0.014 | 0.014 | 0.007 | 0.005 |

Source: HBS 2007, own computation

Financial system stability

Table: Simulation results

| | With instrument | | | No instrument | | |
|--------------------------------|--|--------|--------------------------|-----------------------------|--------|--------------------------|
| Sum (PLN bln) | Individually pessimistic | Basic | Generally pessimistic | Individually pessimistic | Basic | Generally pessimistic |
| Credits | 128.7 | 128.7 | 128.7 | 128.7 | 128.7 | 128.7 |
| Endangered at t=0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| Endangered at t=20 | 28.1 | 24.4 | 25.8 | 29.6 | 25.4 | 27.0 |
| Increase in endangered credits | 8.2 | 4.4 | 5.9 | 9.6 | 5.5 | 7.0 |
| | Share of endangered credit | | | | | |
| at t=0 | 21.9% | 19.0% | 20.1% | 23.0% | 19.8% | 21.0% |
| at t=20 | 15.5% | 15.5% | 15.5% | 15.5% | 15.5% | 15.5% |
| | The share of <i>RESIDUAL</i> in monthly household expenses (average) | | | | | |
| w t=0 | -0,246 | -0,246 | -0,246 | -0,246 | -0,246 | -0,246 |
| w t=20 | -0,392 | -0,360 | -0,372 | -0,424 | -0,386 | -0,400 |
| Change | -0,146 | -0,114 | -0,126 | -0,178 | -0,140 | -0,155 |

Source: HBS 2007, own computation

Conclusions

Bottom line

Risk to the financial system: **large**.

Fiscally neutral instrument: **works**.

- What we did not look at:
 - ① Currency depreciation (over 70% of loans denominated in CHF, EUR and USD)
 - ② Other liabilities of the households vis-a-vis financial system
 - ③ Possibilities of selling real estate without loss
 - ④ Changes in household situations for other reasons (e.g. inheritances, becoming handicapped, changes in activity patterns, changes in household composition, etc.)