Household sector stress tests on the basis of micro data

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Data

- Stress tests are based on micro data from Household Budget Survey.The survey is performed annually by Central Statistical Office on large sample of about 35 thousands of households.

- Large number of questions in the survey: household characteristics, incomes and expenditures, questions about each household member (gender, age, education, position on labour market).

- The main subject of the survey (unfortunately) is not household finances – few questions about households' assets and liabilities.

Margin as the measure of household's ability to repay debts

- Margin is defined as „what is left" from current income after covering the basic living cost and debt repayments.

- Negative margin means that household can not finance both basic living costs (which are by definition absolutely necessary) and debt repayments from its current income.

$$M_i = DI_i - BLC_i - D\operatorname{Re}p_i$$

Where: Mi- Margin of i-th household,
DIi- its disposable income,
BLCi and DRepi – its basic living costs and debt repayments respectively.

The idea of stress tests

- We use the <u>proportion</u> of loans extended to household with negative margin (in total household loans portfolio) as a measure of the ability of household sector to repay their debts.

- <u>Increase in proportion</u> of loans extended to households with negative margin after the shock is used as the measure of household sector vulnerability to this shock.

- Three kinds of stress test: labour market, interest rate and depreciation of domestic currency stress tests were performed. Due to limited time of the only the first one is described in details.

Labour market shock - methodology

- The idea of labour market shock simulation is to draw so many „new" unemployed persons to increase the unemployment rate by a given amount.

- After the simulation margin of each household is recalculated to take into account the decrease in household's income as the result of loosing the job (as an option unemployment benefit is added to households income).

- The simulations are repeated so many times to get a sufficiently low statistical error.

- The final result of unemployment stress test is average results of these simulations.

Labour market shock: two methods of choosing the new unemployed

- Two methods of drawing new unemployed persons from the sample were applied:

  - „**random method**" - probability of becoming the new unemployed is the same for every working person

  - „**proportional method"** – probability of becoming the new unemployed is proportional to the relation of unemployment rates in cross section with a given age group, education level, gender and size of a place of residence to the unemployment rate in the whole sample (before stress test).

- The proportional method is equal to the assumption that relations between unemployment rates in different cross sections are the same before and after labour market shock.

Labour market shock: two methods of choosing new unemployed

- Historical data prove that unemployment rate increase pattern is usually similar to proportional method rather than to random one. Reason: probability of becoming the unemployed largely depends on person's characteristic (especially on education, age and place of residence).

- The results of random variant should also be taken into account as „conservative" one - it seems that similar variant may realize in some circumstances.

- The effects of proportional variant of unemployment rate increase are less severe to household sector ability to repay debts because household loans are highly concentrated among persons, which are less sensitive to labour market shock (young, highly educated and living in big cities).

The results of stress test – increase in unemployment rate by 4,7 pp.

Group of households	Unemployment benefit taken into account		Unemployment benefit not taken into account	
	Proportional method	Random method	Proportional method	Random method
All households	1,4	2,0	2,5	3,1
Households with mortgage loans	1,5	2,3	2,5	3,6
Households with other loans	1,4	1,6	2,5	2,7

The data in the table represents increase (in percentage points) in proportion of loans extended to households with negative margin after shock in 2007.

To compare…. the results of fx and interest rate shocks

To compare the impact of different shocks the same method of determining size of shock was applied (the biggest increase of a given indicator in 2 years period).

Group of households	Depreciation of domestic currency (zloty) by 33,3%	Interest rate increase by 3,9 pp.
All households	0,9	2,0
Households with mortgage loans	1,3	2,7
Households with other loans	0,4	1,4

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Stress test results - explanations

- The data in the table represents increase (in percentage points) in proportion of loans extended to households with negative margin after shock in 2007.

- The size of a shock is calculated established using historical method - the biggest increase in unemployment rate in the past (from 1993).

- It seems that the version of stress test without paying unemployment benefit should be considered as basic one in Poland due to low amount, short period of paying the unemployment benefit (basically 6-12 moths) and restrictions on granting the benefit (as the result it was paid to 13,6% unemployed in 2007).

Main results

- The impact of labour market shock on households' ability to repay debts in Poland is larger than in case of interest rate and fx shocks.
- The effect of labour market shock with proportional variant of increase in unemployment rate is by about 20-30% smaller than in case of random variant. The difference is especially visible in group of households with mortgage loans, as these loans are highly concentrated among young, well educated persons, living in big cities.
- The impact of labour market shock in Poland is much bigger than it was estimated in similar analysis performed in Sweden and Denmark. Main reasons: low amount of unemployment benefit and low percentage of working persons in Poland (large number of households with a single breadwinner).

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