NATIONAL BANK OF ROMANIA

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Implementing Loan-to-value and Debt service-to-income measures: A decade of Romanian experience

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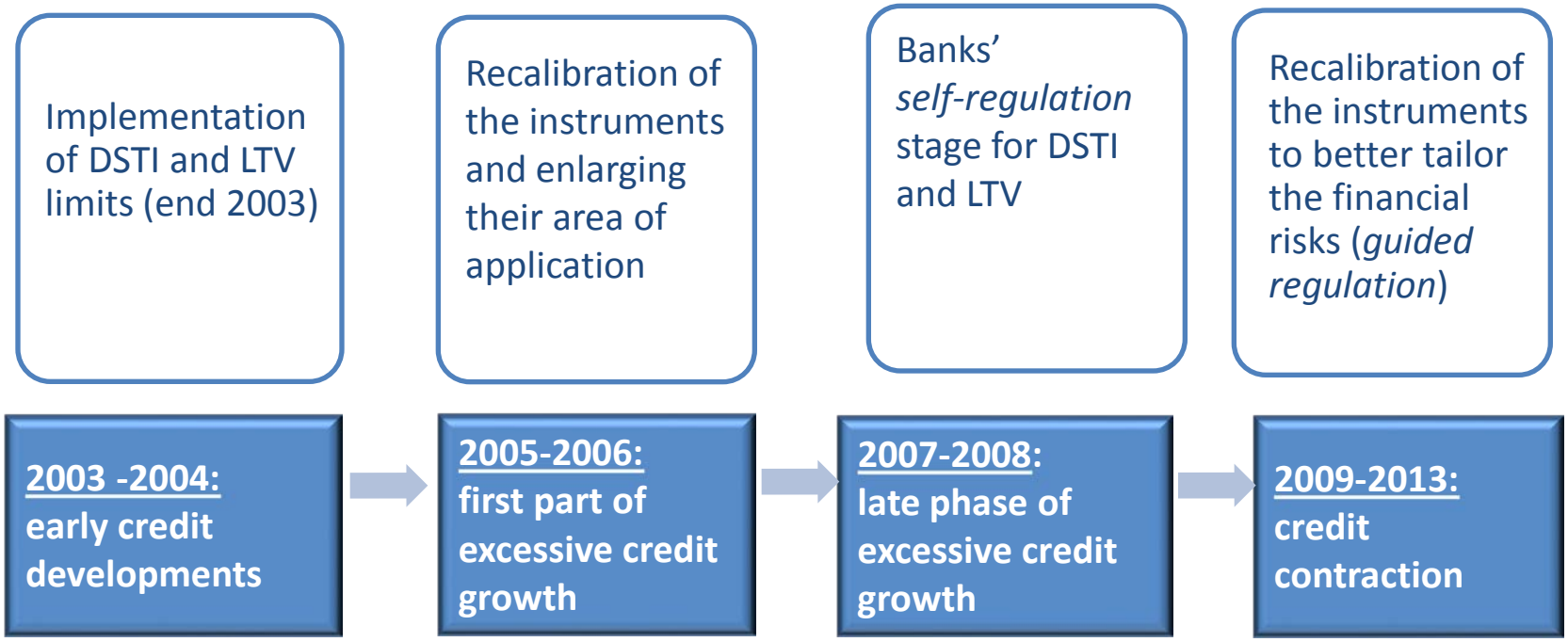
Summary:

I. NBR's macroprudential policy:
    1. Monitoring systemic risk
    2. Implementation and calibration

II. Evaluating effectiveness:
    1. Credit dynamics
    2. NPL ratio dynamics
    3. House price dynamics

III. Conclusions

I. NBR's macroprudential policy through the credit cycle



I.1. Systemic risk

Systemic risks that could trigger the activation of DSTI/LTV limits:

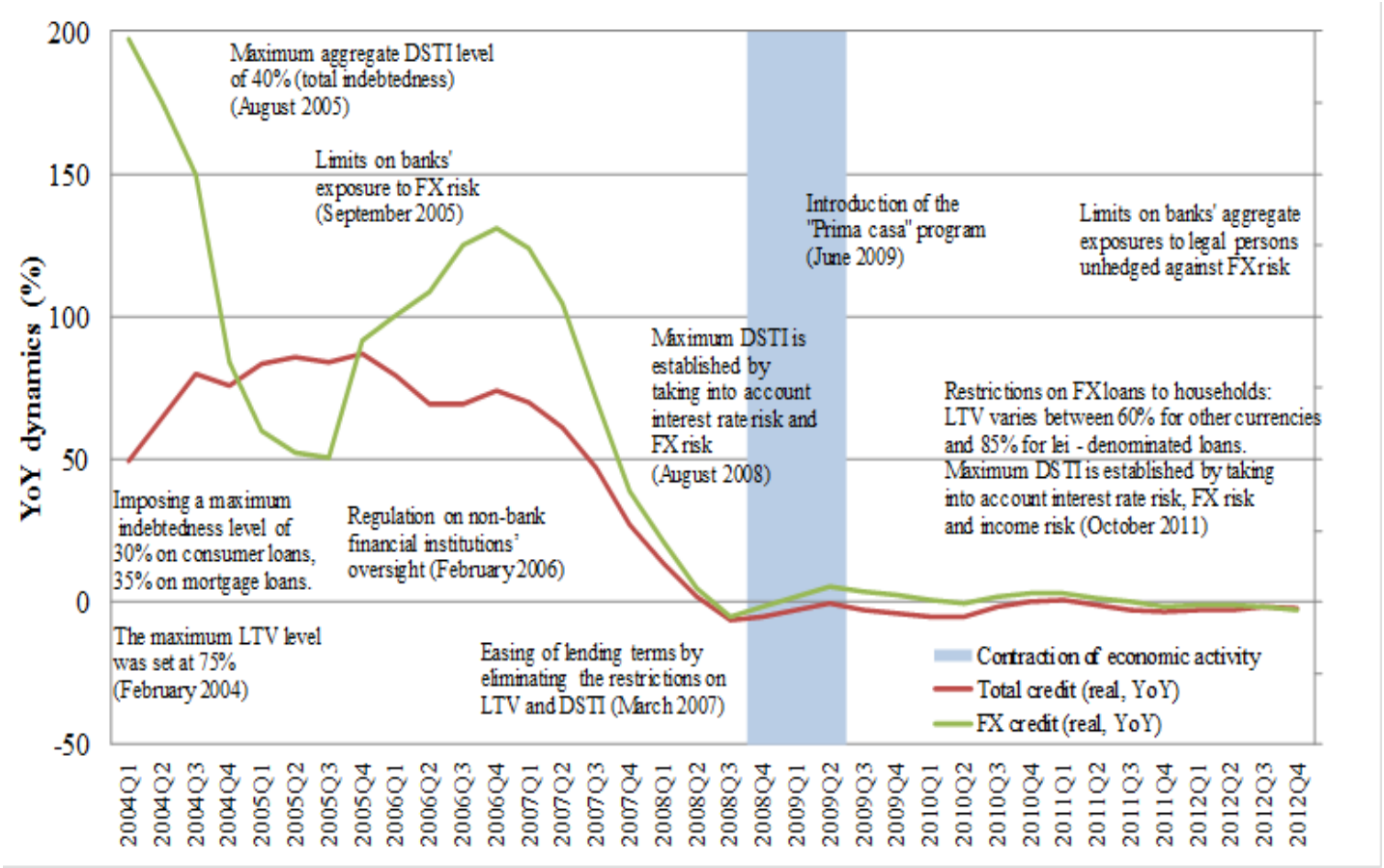
- High level of indebtedness
- Sectorial concentration in real estate assets
- Macroeconomic imbalances

I.1. Monitoring systemic risk

Household sector		Corporate sector		
(i) Indebtedness	**(ii) The ability to service debt**	**(i) Indebtedness**	**(ii) Trends in risks**	**(iii) Financial stance**
Debt service-to-disposable income, debt-to-assets, debt-to-net wealth and debt-to-GDP.	The NPL ratio (total, by currency, destination, etc.)	Overall indebtedness: the leverage ratio (debt/capital) (whole economy and main economic sectors).	The NPL ratio (total, by currency, destination, size, sectors, etc.).	ROE, EBIT/interest expenses, etc.
In level and structure (by currency, destination, disposable income and tenure).	NPL sensitivity analyses to interest rates or exchange rates shocks.	Financial indebtedness: level, dynamics and structure (by main creditors, currencies, destinations, dimension of the borrowers, economic sectors, etc.)	One-year PD and stress-test exercises.	

Other indicators monitored: banking sector and DSTI/ LTV indicators

I. 2. Implementation and calibration of instruments

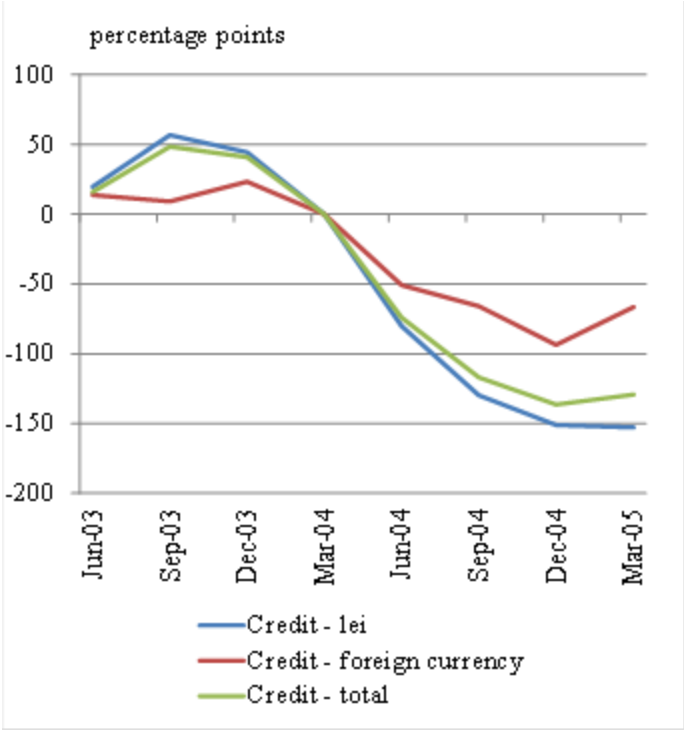


Source: NBR, own calculations

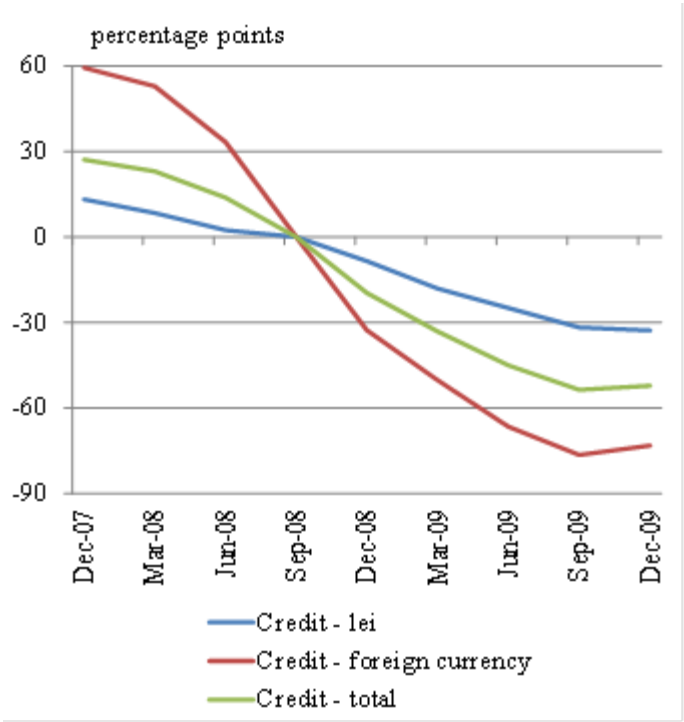
II.1. Evaluating the effectiveness on credit dynamics (1)

The change in household loan dynamics (real annual growth rate) before and after

(a) 2004 prudential regulations



(b) 2008 prudential regulations



II.1 Evaluating the effectiveness on credit dynamics (2)

- Assessing the impact of regulatory measures on tempering credit growth in lending channel approach

$$\Delta \ln L_{i,t} = \alpha\, \Delta ln\, L_{i,t-1} + \beta_{MP} \sum_{k=1}^{4} \Delta\, r_{MP,t-k} + \beta_{MRR}\, \Delta\, r_{MRR,t-1} + \beta_y\, y_{t-1} + \beta_{infl}\, \pi_{t-1} + \delta\, X_{i,t-1} * r_{MP,t-1} + \mu\, D_{t-1} + \varepsilon_{i,t}$$

D = the regulation dummy variable (takes the value 1 when measures are introduced/modified and 0 otherwise)

HH credit growth rate ($\Delta \ln L$) was corrected for externalized credits where necessary.

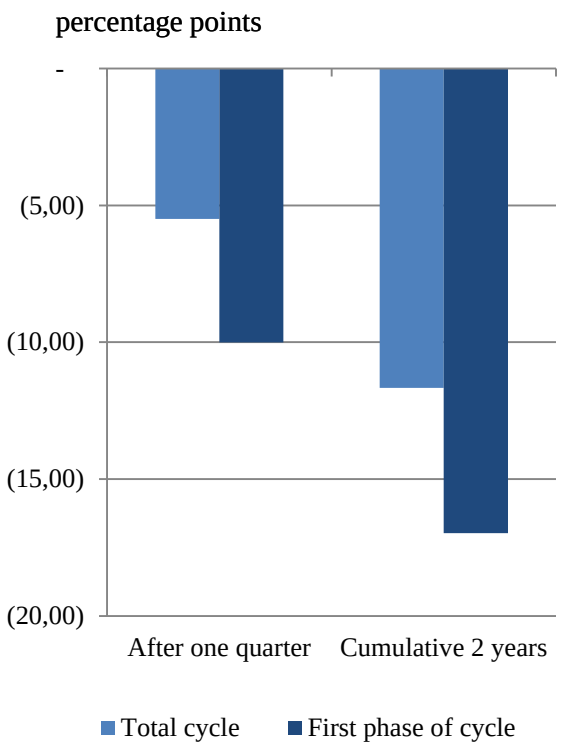
II.1. Evaluating the effectiveness on credit dynamics (3)

	Total loans	Mortgage loans	Consumer loans
Growth rate of credit, total (t-1)	0.519*** (0.00)	0.351*** (0.00)	0.488*** (0.00)
Real GDP growth rate (t-1)	0.619*** (0.01)	0.944** (0.01)	1.035*** (0.00)
Change in monetary policy rate (t-3)	-3.793*** (0.00)	-2.864*** (0.00)	-5.754*** (0.00)
Regulation Dummy (t-1)	-4.867* (0.06)		7.510** (0.03)
Regulation Dummy (t-2)		-5.123** (0.04)	
LTD (t-1) * Change in monetary policy rate (t-1)	0.007 (0.44)		
Solvency ratio (t-1)* Change in monetary policy rate (t-1)	-0.183 (0.19)		
Growth rate of real estate price (t-1)		3.490 (0.16)	
Change in bank external debt (t-2)	19.704* (0.09)	9.167 (0.21)	21.842 (0.13)
Hansen p-val	0.132	0.117	0.162
AR(2)	0.955	0.870	0.739

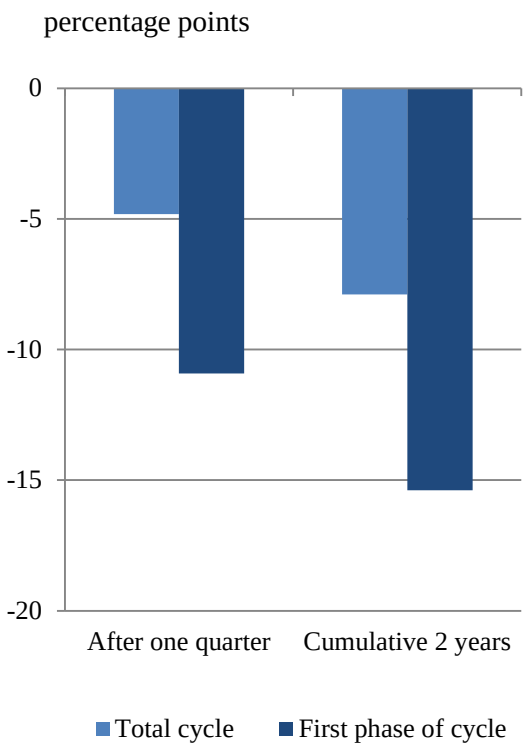
II.1. Evaluating the effectiveness on credit dynamics (4)

The impact of DSTI/LTV regulation on credit growth rate (marginal effects)

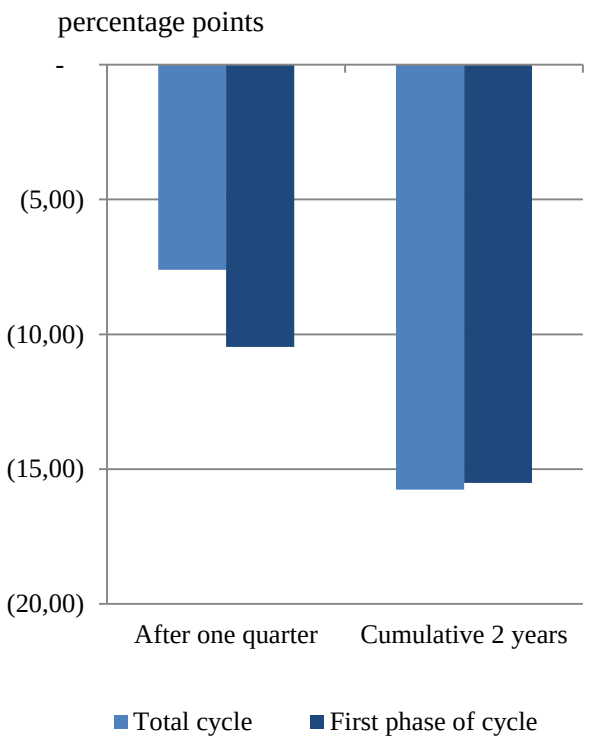
(a) Total household credit



(b) Mortgage credit



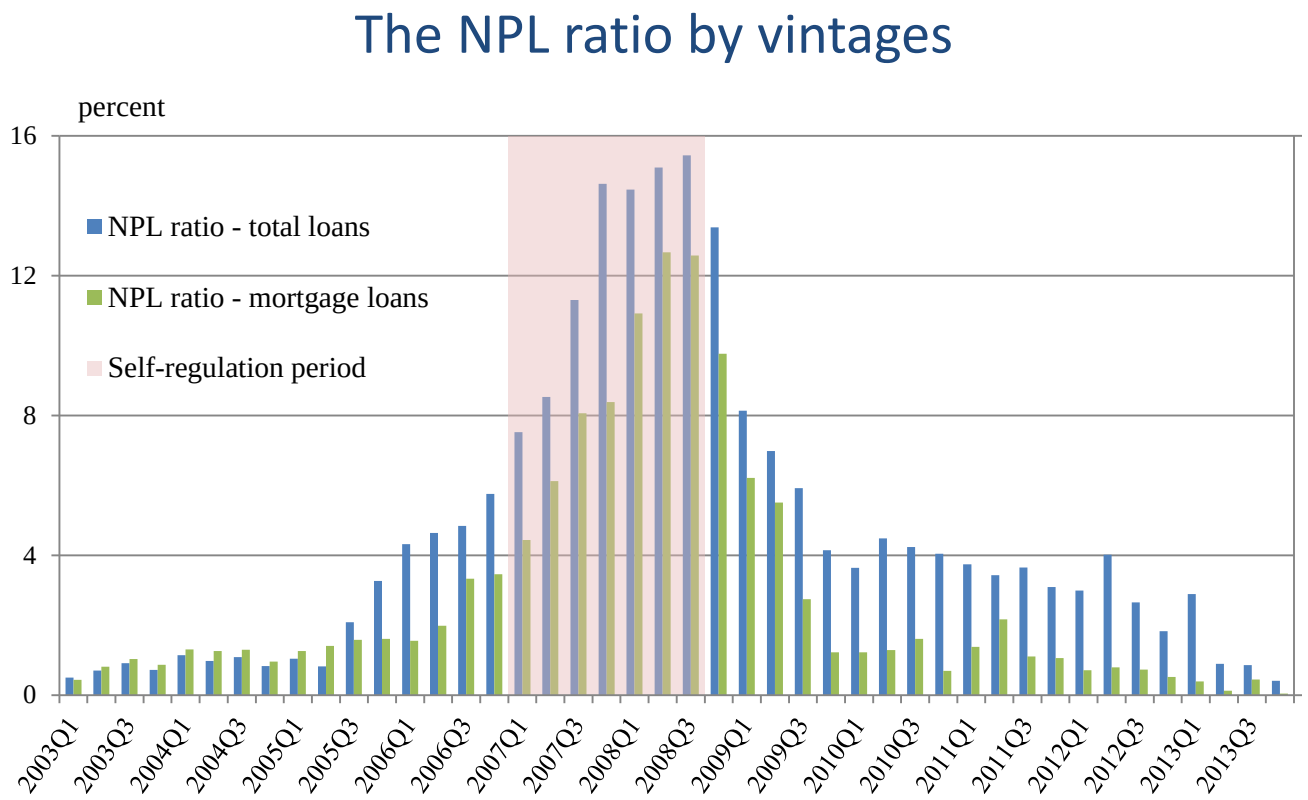
(c) Consumer credit



II.1. Evaluating the effectiveness on credit dynamics (5)

- DSTI/LTV regulation played an important anti-cyclical role
- The funding channel is a major factor for credit dynamics
- Housing prices contribute to the amplification of mortgage credit cycle
- Other policy measures, like MRR have a much lower impact on credit growth

II.2. Evaluating the effectiveness on the quality of HH portfolio (1)



Note: The NPL ratio is the share of non-performing loans to total loans, by quarterly vintages. A loan is considered non-performing if the borrower defaulted in a 3-year period since the origination of the loan. Starting June 2011 the evaluation interval decreases, with the NPL ratio reflecting the developments until June 2014 (the cut-off point).

Source: Central Credit Register, own calculations

II.2. Evaluating the effectiveness on the quality of HH portfolio (2)

Testing the capacity of DSTI/LTV regulations in maintaining the quality of banks' portfolio, with an application for the HH portfolio:

$$NPL_{i,t} = \alpha\, NPL_{i,t-1} + \beta_1\, \Delta X_{t-l} + \beta_2\, \Delta\, Y_{t-l} + \mu\, D_t + \varepsilon_{i,t}$$

The NPL ratio represents the share of non-performing loans in the total outstanding amounts, by vintages. A loan is considered non-performing (in default), if it is more than 90 days overdue, at least once since its origination.

D= *self-regulation* dummy variable

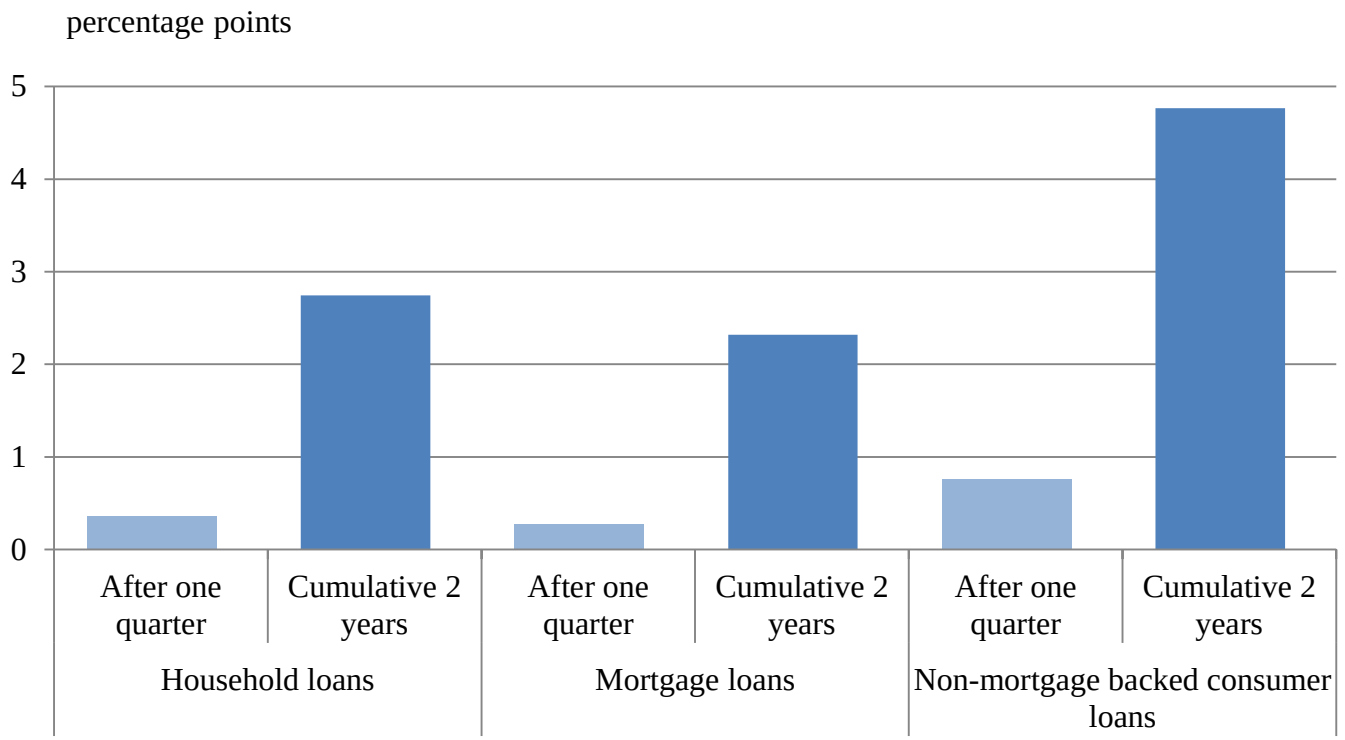
*Rescheduled or refinanced loans are excluded from the analysis.

II.2. Evaluating the effectiveness on the quality of HH portfolio (3)

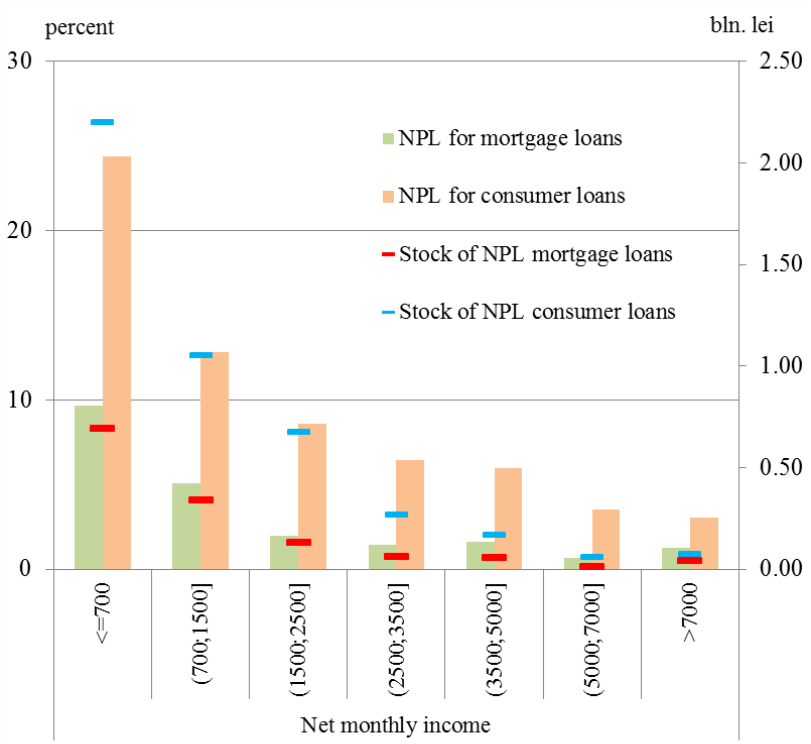
NPL ratio	Total Portfolio	Mortgage loans	Non-mortgage backed consumer loans
NPL ratio (t-1)	0.990***	1.011***	0.928***
	(0.00)	(0.00)	(0.00)
Interaction between unemployment rate and lack of self-regulation in 2007 (t-2)	1.187***	0.535**	7.672***
	(0.00)	(0.01)	(0.00)
Interaction between unemployment rate and self-regulation in 2007 (t-2)	2.786***	0.846***	9.910***
	(0.00)	(0.01)	(0.00)
Growth rate of real estate index (t-2)	-1.894***	-0.871**	
	(0.00)	(0.02)	
Change in local currency interest rate (t-2)#	0.524***		5.076***
	(0.00)		(0.00)
Change in FX interest rate (t-2)	0.059	0.077	
	(0.72)	(0.75)	
Financial expectations over the next year (t-4)	-0.008***		-0.049***
	(0.00)		(0.00)
Leverage ratio (t-4)	0.045***	0.029***	0.140***
	(0.00)	(0.00)	(0.00)
Self-regulation dummy	0.338***	0.276***	0.744***
	(0.01)	(0.00)	(0.00)
Dummy for “Prima Casă” loans		-0.081***	
		(0.01)	
Hansen p-val	0.948	0.942	0.892
AR(2)	0.968	0.092	0.054

II.2. Evaluating the effectiveness on the quality of HH portfolio (4)

The impact of self-regulation (of DSTI/LTV) on the NPL ratio (marginal effects)



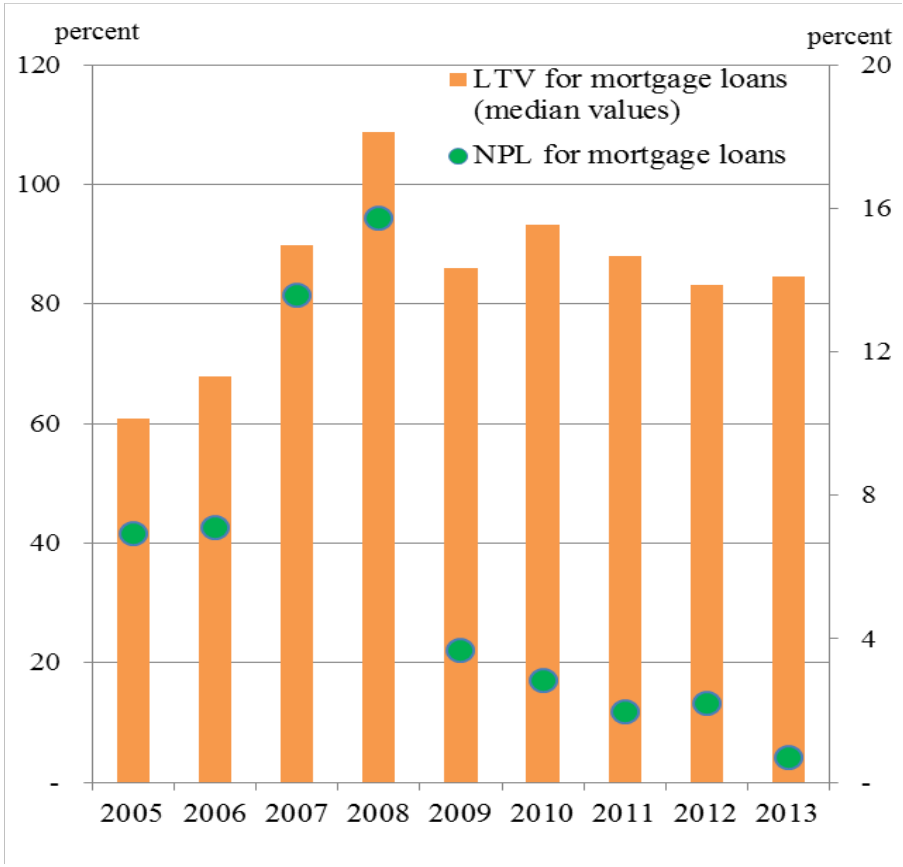
II.2. Evaluating the effectiveness on the quality of HH portfolio (5)



Credit risk decreases proportionally with the level of income and indebtedness (DSTI ratio)

Note: The NPL ratio represents the share of non-performing loans (more than 90 days past due) to total stock of loans. DSTI is calculated for all debtors with income, based on the constant annuities hypothesis (December 2013).
Source: Central Credit Register, Credit Bureau, MPF, own calculations

II.2. Evaluating the effectiveness on the quality of HH portfolio (6)



A relatively strong link between the LTV level and debtors' capacity to repay their debt

Note: The LTV values reflect the current values of collateral (December 2013)

Source: Central Credit Register, NBR calculations

II.2. Evaluating effectiveness on the quality of HH portfolio (7)

- The easing of prudential regulation leads to an increase in NPL ratio
- Loans granted in the *self-regulation period* exhibit a higher sensitivity to macroeconomic developments
- Real estate prices affect all debtors unconditionally
- *Prima Casă* loans contributes in reducing the NPL ratio for real estate loans

II.3. Evaluating the effectiveness on house price dynamics

- No clear cut view on *regulation – house price dynamics* relationship (Jacome et Mitra, 2015)
- No significant impact from the prudential regulation on house price dynamics. Nevertheless, this was not the purpose of the macroprudential instruments
- Some evidences regarding house prices impact on mortgage lending

III. Main findings

- DSTI and LTV have a good efficiency in: (i) curbing high credit growth and (ii) ensuring that both debtors and creditors are able to cope with possible adverse shocks
- Main systemic risks for the recalibration of DSTI/LTV caps: high level of indebtedness, sectorial concentration in the real estate assets and macroeconomic imbalances
- Banks' self-regulation would deliver sub-optimal results
- Tailoring DSTI and LTV caps to the specific patterns of risks might increase their efficiency

III. Main lessons

- The need for a stronger cooperation across the domestic and foreign authorities
- The need for a change in the macroprudential authorities' perspective: from the lender to the debtor side
- The need for higher transparency from the authorities' side regarding their macroprudential intermediate objectives