The Optimal foreign reserves: Case of Croatia

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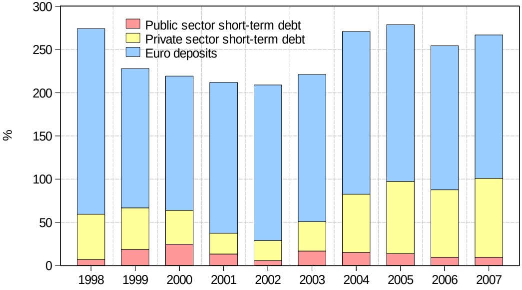
THE MAIN QUESTIONS

- What is the optimal level of foreign reserves the CNB should hold?
- Are CNB foreign reserves sufficient to mitigate negative effects of potential sudden stop and banking crisis?
- Is there a rationale for recent hoarding of foreign reserves in Croatia?
  - Since 1998 CNB foreign reserves have increased by four times
- Do we have too much of a good thing?
- How do optimal reserves compare to "standard" indicators of reserves adequacy?

Motivation

- Optimal reserves take into account benefits and costs from holding reserves
- Benefits: precautionary motives or self-insurance against double drain risk in dollarized economies (future sudden stops accompanied with banking crises)
  - foreign reserves act as an insurance against negative effects of a sudden stop and a key tool for managing domestic financial sector stability



MOTIVATION

- Costs: opportunity costs from holding reserves (investing into high yield assets, repaying external debt)
- Inadequate "standard" indicators of reserves adequacy

THE MODEL

- A simple dynamic stochastic general equilibrium model with 3 sectors (households/firms, private banks, government/central bank)
- The only source of uncertainty comes from probability of sudden stop that occurs in tandem with banking crisis
- During crisis
  - short-term foreign loans of every sector are not rolled over,
  - GDP falls by some fraction,
  - kuna/euro exchange rate depreciates,
  - a part of kuna deposits (both household and corporate) is exchanged for euro deposits,
  - a bank run occurs - a fraction of overall deposits of non-financial sector is withdrawn from banks,
  - banks and households withdraw their foreign liquid assets from abroad to use them as a buffer against a sudden stop

Government/Central bank as a Social Planner

- Maximizing the welfare of the economy by choosing optimal level of foreign reserves
- Precautionary motives of demand for foreign reserves
- Balancing between
    - Benefits of holding reserves
        - substituting lost access to market for short term foreign debt
        - easing credit crunch by providing foreign liquidity during bank run

AND

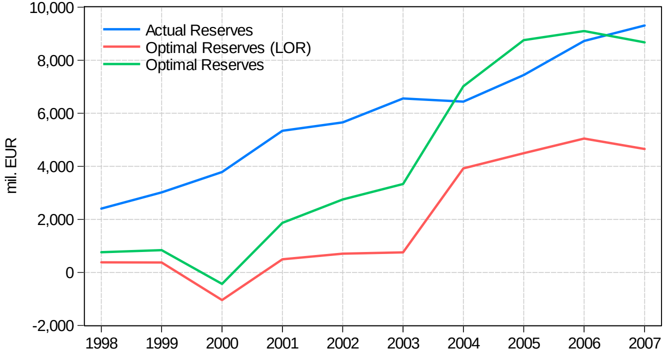
- Costs of holding reserves
    - reserves earn low return

Optimal reserves

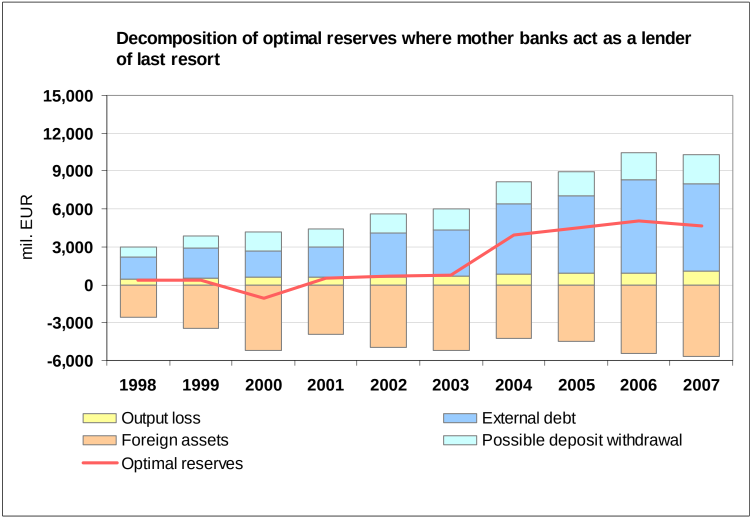
- Optimal reserves will increase with
  - short-term external debt
  - possible foreign deposits withdrawal
  - output loss, probability of sudden stop, and exchange rate depreciation
- Optimal reserves will decrease with
  - their costs
  - high alternative buffer (foreign liquid assets of private sector)
- Relation with Greenspan-Guidotti rule?

Optimal and Actual reserves

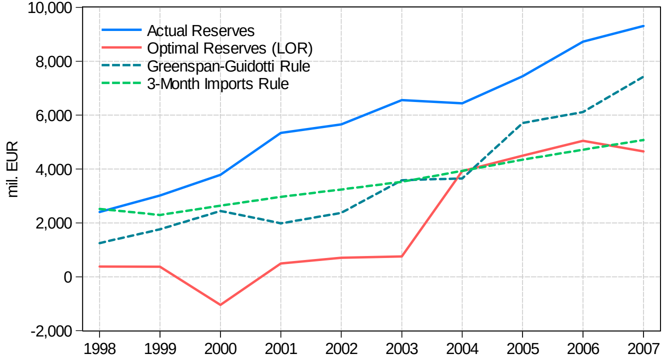
- The model was calibrated on 1998/1999 sudden stop with banking crisis



Structure of Optimal Reserves



Comparison of Standard Indicators and Optimal reserves



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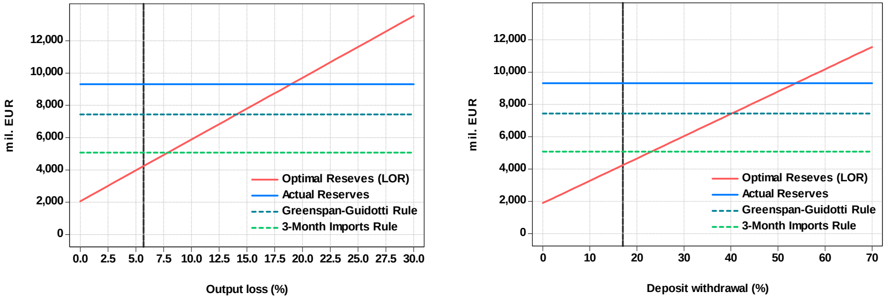

Conclusion

- Precautionary demand for foreign reserves might explain recent increase in CNB reserves
- The difference between actual and optimal reserves depends crucially
  - on the expected reaction of the mother banks during the crisis
- The CNB is holding enough foreign reserves to fight the possible crisis of the 1998/1999 magnitude regardless of the mother banks' reaction
- Using the two standard indicators of foreign reserves adequacy might be misleading in assessing foreign reserves optimality