EUROJÄRJESTELMÄ
EUROSYSTEMET

DOES BANK LIQUIDITY CREATION CONTRIBUTE TO ECONOMIC GROWTH?

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INTRODUCTION

- finance-growth nexus literature
  - financial sector development is positively associated with economic growth
  - banking sector development (credit/GDP, M3/GDP) as well as stock market development play a role
- financial crisis has shown that the liquidity creation function of banks is critical for the economy
- bank liquidity creation
  - comprehensive measure of bank output
  - has not been used in finance-growth studies so far

BANK LIQUIDITY CREATION

- banks perform two central roles in the economy
  - risk transformation and liquidity creation
- financial intermediation literature - banks create liquidity
  - **on** the balance sheet by financing relatively illiquid assets (e.g. long-term loans) with relatively liquid liabilities (e.g. demand deposits), (Bryant 1980, Diamond & Dybvig 1983)
  - **off** the balance sheet through loan commitments and similar claims to liquid funds (Kashyap, Rajan & Stein, 2002)

=> liquidity is created if a bank holds illiquid items and grants liquid items to the economy

- liquidity creation is important for macroeconomy as a whole
  - lending,loan commitments and liquid deposits support economic activity

CONTRIBUTION

- we investigate the impact of bank liquidity creation on economic growth
- uncover a critical channel through which finance might influence growth
- contribute to the literature on bank liquidity creation
  - recent studies provide evidence on the volume of bank liquidity creation as well as the determinants of liquidity creation (Berger et al., 2010; Fungáčová and Weill, 2012; Horvath, Seidler and Weill, 2013)
  - empirical evidence confirming macroeconomic impact of bank liquidity creation is still missing

CONTRIBUTION

- better understanding of the relation between financial development and economic growth in Russia
  - Berkowitz and DeJong (2010), Berkowitz, Hoekstra and Schoors (2012)
- large emerging economy provides opportunity to investigate whether bank liquidity creation is growth enhancing
  - "finance-growth nexus" issues are important for emerging countries playing a role in restoring global output following the recent crisis
  - detailed data necessary for calculation of liquidity creation is available
  - analysis benefits from regional level data

DATA

- unique dataset constructed from different sources covering period from 2004 – 2011
- macroeconomic data on Russian regions from the Russian Federation Federal State Statistics Service, Rosstat and CEIC Russia Premium Database
- aggregate banking data at regional level from the Central Bank of the Russia (CBR)
- hand-collected data on location of banks and their branches (CBR)

DATA

- bank-level financial statement data from information agency Interfax that collects and organizes data from the CBR
  - data on all banks in Russia
  - detailed financial information necessary for the calculation of liquidity creation measures
  - over 27,000 bank-quarter observations for more than 1,100 banks
- we use the data on banks' branches to allocate the liquidity created we calculated for individual banks to regions
- final dataset contains 512 observations for 64 regions

LIQUIDITY CREATION MEASURES

- we calculate two measures of liquidity creation
  - category-based liquidity creation measure
  - maturity-based liquidity creation measure
- three-step procedure to construct these measures (Berger and Bouwman, 2009)
  1. classify balance sheet items as liquid,semiliquid or illiquid
  2. assign weights to these items
  3. calculate the measures

CLASSIFICATION OF ASSETS AND LIABILITIES

Illiquid liabilities and equity (-1/2)		**Semiliquid liabilities (0)**		**Liquid liabilities (1/2)**	
(category)	(maturity)	(category)	(maturity)	(category)	(maturity)
equity (statutory and surplus capital, retained earnings)		securities issued - CDs and CSs		accounts of other entities	
other liabilities		term and other deposits	term deposits (< 1 year)	securities issued - bonds	
	term (> 1 year) and other deposits			securities issued - promisory notes	
				demand deposits	
Illiquid assets (1/2)		**Semiliquid assets (0)**		**Liquid assets (-1/2)**	
(category)	(maturity)	(category)	(maturity)	(category)	(maturity)
loans to firms	loans (> 1Y)	loans to CBR	loans (< 1Y)	cash	
other loans and lease financing receivables		interbank loans		accounts with banks	
loans in precious metals		loans to government		investments in promissory notes	
intangible assets		loans to foreign government		investments in debt securities	
fixed assets		loans to households		investments in stocks	
other assets					

METHODOLOGY

- fixed effect model with benchmark regression equation

$$\dot{y}_{it} = \alpha_i + \beta lc_{it} + \sum_{k=1}^{K} \gamma_k X_{kit} + \varepsilon_{it}$$

where y_{it} is annual growth rate of GRP

lc_{it} is a measure of bank liquidity creation (proportion of GRP)

X_{kit} is matrix of control variables

- control variables in line with the finance-growth literature
  - education, openess to trade, government expenditures, inflation, oil price
- time dummy variables included

METHODOLOGY

- control for dynamic properties of the data and for possible reverse causality and endogeneity problems
- apply one-step system GMM estimator according to Arellano and Bover (1995) and Blundell and Bond (1998)

$$\dot{y}_{it} = \alpha_i + \rho \dot{y}_{it-1} + \beta lc_{it} + \sum_{k=1}^{K} \gamma_k X_{kit} + \varepsilon_{it}$$

- use one lag of dependent variable and instrument all regressors
  - as internal instruments we use one lag of each of the endogenous variables
  - time effects are included as exogenous instruments
- control variables as before

MAIN ESTIMATIONS

	(1) FE	(2) FE	(3) GMM	(4) GMM
liquidity creation (maturity)	**11.829**** **(4.981)**		**16.885**** **(7.698)**	
liquidity creation (category)		**2.651** **(4.007)**		**2.514** **(2.782)**
education	-0.133 (0.148)	-0.131 (0.147)	-0.124 (0.249)	-0.134 (0.372)
government size (log)	2.632 (2.908)	3.298 (2.911)	0.516 (0.842)	0.777 (0.825)
inflation	-67.260** (31.677)	-66.945** (31.629)	38.898 (49.581)	56.664 (55.084)
openness to trade	6.307* (3.218)	6.155* (3.259)	0.315 (2.821)	1.126 (2.737)
oil price	-0.110** (0.051)	-0.117** (0.056)	0.156** (0.065)	0.184*** (0.065)
lagged growth			0.026 (0.047)	0.031 (0.048)
Constant	0.307 (28.603)	-7.555 (28.850)	-10.843 (11.410)	-18.841 (18.845)
No. of observations	512	512	512	512
R^2	0.519	0.515		
No. of regions	64	64	64	64
Hansen test			47.390 [0.618]	44.732 [0.719]
1st order autocorr. test			-4.332 [0.000]	-4.356 [0.000]
2nd order autocorr. test			-1.792 [0.073]	-1.880 [0.060]

RESULTS

- positive coefficient for liquidity creation measure
  - significant for maturity-based liquidity creation measure
  - maturity-based measure more objective than category-based one

  => liquidity creation of banks is positive for economic growth
- the same results with both methodologies
- control variables mostly insignificant
  - might result from low variation in variables
  - in line with previous works on Russia – growth in Russia seems to follow different pattern than in other countries

ROBUSTNESS CHECKS

- economic cycle might influence the relation between liquidity creation and growth
  - financial development can improve growth performance in calm times but amplify drops in recession
  - add an interaction between liquidity creation and dummy variable for crisis
- account for specific position of Moscow and St.Petersburg which enjoy higher financial development
  - estimations excluding these regions

ROBUSTNESS CHECK I

	(1) FE	(2) FE	(3) GMM	(4) GMM
liquidity creation (maturity)	**16.036*** **		**19.785** **	
	(5.187)		**(8.058)**	
liquidity * financial crisis	-14.378		-17.175	
	(9.384)		(15.469)	
liquidity creation (category)		**4.621**		**4.470**
		(3.868)		**(2.900)**
liquidity * financial crisis		-2.914		-3.258
		(2.357)		(2.598)
education	-0.125	-0.134	-0.209	-0.105
	(0.149)	(0.147)	(0.296)	(0.372)
government size (log)	2.808	3.565	0.314	0.853
	(2.930)	(2.966)	(0.799)	(0.824)
inflation	-72.359**	-69.906**	27.752	51.294
	(31.432)	(31.490)	(54.714)	(56.326)
openness	5.904*	6.120*	-0.036	0.830
	(3.174)	(3.192)	(2.921)	(2.611)
oil price	-0.123**	-0.134**	-0.015	-0.008
	(0.053)	(0.056)	(0.053)	(0.052)
lagged growth			0.033	0.043
			(0.050)	(0.048)
Constant	-0.322	-10.041	12.749	-0.682
	(28.722)	(29.385)	(11.647)	(14.105)
No. of observations	512	512	512	512
R^2	0.521	0.517		
No. of regions	64	64	64	64
Hansen test			47.851	44.386
			0.560	0.697
1st order autocorr. test			-4.391	-4.407
			0.000	0.000
2nd order autocorr. test			-1.925	-1.847
			0.054	0.065

ROBUSTNESS CHECK II

	(1) FE	(2) FE	(3) GMM	(4) GMM
liquidity creation (maturity)	**10.818****		**19.012****	
	(5.191)		**(8.299)**	
liquidity creation (category)		**1.266**		**2.912**
		(4.410)		**(2.096)**
education	-0.132	-0.122	0.111	0.301
	(0.157)	(0.156)	(0.322)	(0.421)
government size (log)	3.238	3.779	0.692	1.312
	(3.119)	(3.140)	(1.156)	(1.124)
inflation	-62.857*	-62.498*	8.816	26.673
	(32.026)	(32.269)	(54.979)	(60.391)
openness	8.015***	7.785**	-0.761	-0.065
	(2.995)	(3.052)	(3.406)	(3.452)
oil price	-0.109**	-0.109*	0.111	0.132*
	(0.053)	(0.060)	(0.075)	(0.078)
lagged growth			0.033	0.045
			(0.055)	(0.058)
Constant	-6.636	-13.044	-12.229	-28.770
	(30.708)	(30.930)	(18.337)	(22.440)
No. of observations	480	480	480	480
R^2	0.510	0.507		
No. of regions	60	60	60	60
Hansen test			47.520	42.648
			0.613	0.791
1st order autocorr. test			-3.749	-3.668
			0.000	0.000
2nd order autocorr. test			-1.284	-1.167
			0.199	0.243

CONCLUSION

- we investigate the impact of bank liquidity creation on economic growth in Russia
  - compute two measures of bank liquidity creation
  - link liquidity creation to growth at the regional level
- provide some evidence that liquidity creation role of banks is beneficial for economic growth
- positive influence confirmed for maturity-based measure
- results robust to several robustness checks