Banks' Liquidity Buffers and the Role of Liquidity Regulation

Clemens Bonner
De Nederlandsche Bank

joint with Iman van Lelyveld (DNB, BIS) and Robert Zymek (University of Edinburgh)

EBA Seminar, 14/15 November 2013

Purpose

- Assess the determinants of banks' liquidity holdings

Purpose

- Assess the determinants of banks' liquidity holdings
- Highlight whether liquidity regulation substitutes or complements banks' incentives to hold liquid assets

Purpose

- Assess the determinants of banks' liquidity holdings
- Highlight whether liquidity regulation substitutes or complements banks' incentives to hold liquid assets
- Focus: Disclosure, Concentration, Business Model, DGS, Size

Motivation

- (International) efforts to establish or reform (existing) liquidity risk frameworks

Motivation

- (International) efforts to establish or reform (existing) liquidity risk frameworks
- Especially introduction of Basel 3 Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR)

Motivation

- (International) efforts to establish or reform (existing) liquidity risk frameworks
- Especially introduction of Basel 3 Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR)
- Little is known about determinants of banks' liquidity holdings

Motivation

- (International) efforts to establish or reform (existing) liquidity risk frameworks
- Especially introduction of Basel 3 Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR)
- Little is known about determinants of banks' liquidity holdings
- First global study on the role of liquidity regulation

Liquidity Risk

- Risk that a financial agent will be unable to meet obligations at a reasonable cost as they come due

Liquidity Risk

- Risk that a financial agent will be unable to meet obligations at a reasonable cost as they come due
- Banks manage their liquidity risk by maintaining a buffer of market-liquid assets anticipating their depositors' liquidity demands

Liquidity Risk

- Risk that a financial agent will be unable to meet obligations at a reasonable cost as they come due
- Banks manage their liquidity risk by maintaining a buffer of market-liquid assets anticipating their depositors' liquidity demands
- The determination of a bank's optimal liquidity buffer involves a trade off between self-insurance against liquidity risk and the returns from illiquid, higher-yielding assets

Liquidity Risk

- Risk that a financial agent will be unable to meet obligations at a reasonable cost as they come due
- Banks manage their liquidity risk by maintaining a buffer of market-liquid assets anticipating their depositors' liquidity demands
- The determination of a bank's optimal liquidity buffer involves a trade off between self-insurance against liquidity risk and the returns from illiquid, higher-yielding assets
- Any observed factor that would be expected to lower (raise) liquidity risk should reduce (increase) observed liquidity buffers.

Data

1. Data coverage

Data

1. Data coverage
   - 7000 banks

Data

1. Data coverage
    - 7000 banks
    - 1998-2007

Data

1. Data coverage
   - 7000 banks
   - 1998-2007
   - 24 OECD countries

Data

1. Data coverage
   - 7000 banks
   - 1998-2007
   - 24 OECD countries
2. Key variables

Data

1. Data coverage
   - 7000 banks
   - 1998-2007
   - 24 OECD countries
2. Key variables
   - Concentration of the banking sector

Data

1. Data coverage
   - 7000 banks
   - 1998-2007
   - 24 OECD countries
2. Key variables
   - Concentration of the banking sector
   - Deposit insurance coverage

Data

1. Data coverage
   - 7000 banks
   - 1998-2007
   - 24 OECD countries
2. Key variables
   - Concentration of the banking sector
   - Deposit insurance coverage
   - Disclosure Requirements

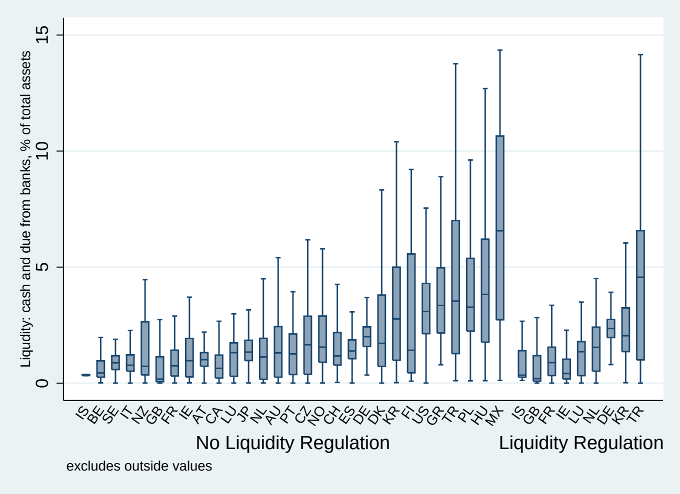
Data

1. Data coverage
   - 7000 banks
   - 1998-2007
   - 24 OECD countries
2. Key variables
   - Concentration of the banking sector
   - Deposit insurance coverage
   - Disclosure Requirements
   - Business models and size

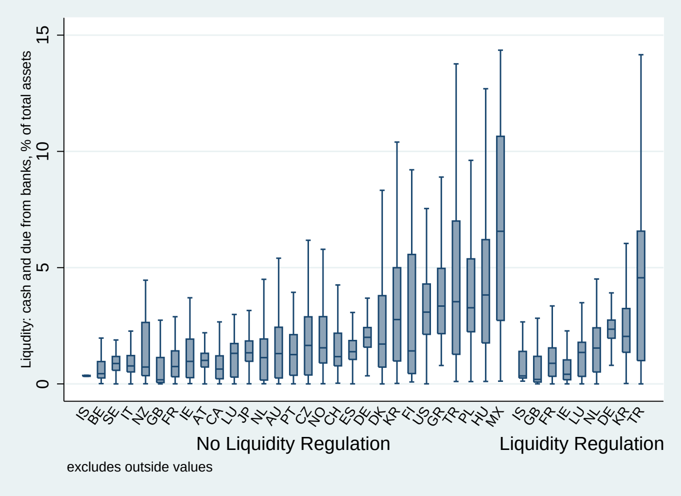
Data

1. Data coverage
   - 7000 banks
   - 1998-2007
   - 24 OECD countries
2. Key variables
   - Concentration of the banking sector
   - Deposit insurance coverage
   - Disclosure Requirements
   - Business models and size
   - Liquidity Regulation

First look at the data

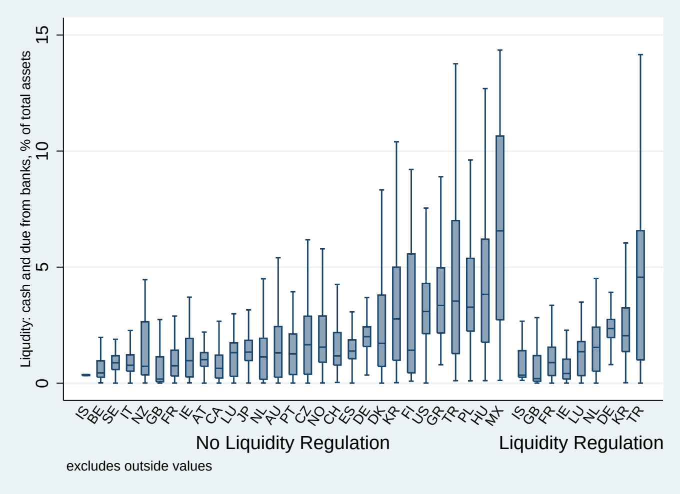


First look at the data



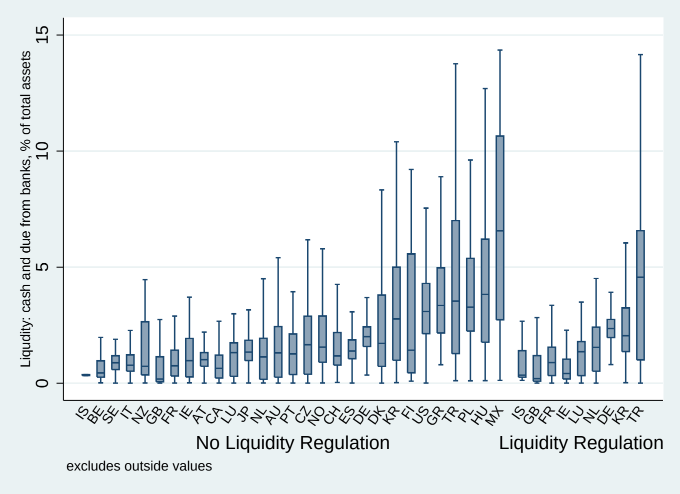
- Share of cash and due from other banks relative to total assets

First look at the data



- Share of cash and due from other banks relative to total assets
- Liquidity requirement does not imply higher liquidity buffers but lower volatility

First look at the data



- Share of cash and due from other banks relative to total assets
- Liquidity requirement does not imply higher liquidity buffers but lower volatility
- Banks in smaller countries and less used currencies have larger liquidity buffers

Empirical model

$$\Delta Liquidity_{bct} = \beta_0 + \beta_1 Bank_{bct} + \beta_2 Context_{ct} + \beta_3 Macro_{ct} + \beta_4 FinDep_{ct} + \varepsilon_{bt}$$

Empirical model

$$\Delta Liquidity_{bct} = \beta_0 + \beta_1 Bank_{bct} + \beta_2 Context_{ct} + \beta_3 Macro_{ct} + \beta_4 FinDep_{ct} + \varepsilon_{bt}$$

- Liquidity variable

De Nederlandsche Bank Eurosysteem

Empirical model

$$\Delta Liquidity_{bct} = \beta_0 + \beta_1 Bank_{bct} + \beta_2 Context_{ct} + \beta_3 Macro_{ct} + \beta_4 FinDep_{ct} + \varepsilon_{bt}$$

- Liquidity variable
- Bank: Profit, Size, Deposits, Capital

Empirical model

$$\Delta Liquidity_{bct} = \beta_0 + \beta_1 Bank_{bct} + \beta_2 Context_{ct} + \beta_3 Macro_{ct} + \beta_4 FinDep_{ct} + \varepsilon_{bt}$$

- Liquidity variable
- Bank: Profit, Size, Deposits, Capital
- Context: Concentration, Disclosure, DGS, Business Model

Empirical model

$$\Delta Liquidity_{bct} = \beta_0 + \beta_1 Bank_{bct} + \beta_2 Context_{ct} + \beta_3 Macro_{ct} + \beta_4 FinDep_{ct} + \varepsilon_{bt}$$

- Liquidity variable
- Bank: Profit, Size, Deposits, Capital
- Context: Concentration, Disclosure, DGS, Business Model
- Macro: Interest rates, GDP growth, inflation etc.

De Nederlandsche Bank Eurosysteem

Empirical model

$$\Delta Liquidity_{bct} = \beta_0 + \beta_1 Bank_{bct} + \beta_2 Context_{ct} + \beta_3 Macro_{ct} + \beta_4 FinDep_{ct} + \varepsilon_{bt}$$

- Liquidity variable
- Bank: Profit, Size, Deposits, Capital
- Context: Concentration, Disclosure, DGS, Business Model
- Macro: Interest rates, GDP growth, inflation etc.
- FinDep: financial openess, stockmarket capitalization etc.

Empirical model

$$\Delta Liquidity_{bct} = \beta_0 + \beta_1 Bank_{bct} + \beta_2 Context_{ct} + \beta_3 Macro_{ct} + \beta_4 FinDep_{ct} + \varepsilon_{bt}$$

- Liquidity variable
- Bank: Profit, Size, Deposits, Capital
- Context: Concentration, Disclosure, DGS, Business Model
- Macro: Interest rates, GDP growth, inflation etc.
- FinDep: financial openess, stockmarket capitalization etc.
- Year and country dummies

Liquidity Holdings and Size

Table 1: Banks' Liquidity Holdings under different regulatory Regimes (Part 1)

	All			No Regulation			Regulation		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cooperative Bank	-0.22***	-0.22***	-0.24***	-0.45***	-0.45***	-0.49***	0.14	0.15	0.21*
	(0.08)	(0.08)	(0.08)	(0.15)	(0.15)	(0.15)	(0.12)	(0.12)	(0.12)
Cooperative*Size		0.14	0.39		0.56	1.99		-0.03	-1.88*
		(0.38)	(0.93)		(1.30)	(2.50)		(0.28)	(1.03)
Cooperative*Size^2			-0.11			-0.96			0.71*
			(0.36)			(2.21)			(0.36)
Investment Bank	-0.42	-0.51	-0.32	-0.74**	-0.37	-0.23	0.83	0.80	1.16
	(0.35)	(0.39)	(0.45)	(0.37)	(0.50)	(0.62)	(0.79)	(0.91)	(1.03)
Investment*Size		1.03	-2.62		-7.31*	-14.30		0.18	-5.27
		(0.85)	(2.70)		(3.84)	(10.68)		(0.92)	(3.46)
Investment*Size^2			2.71*			35.65			3.37**
			(1.49)			(33.04)			(1.71)
Mortgage Bank	-1.77***	-1.79***	-1.95***	-0.88***	-0.64	-0.48	-1.36***	-1.38***	-1.46***
	(0.15)	(0.16)	(0.18)	(0.31)	(0.44)	(0.57)	(0.22)	(0.22)	(0.24)
Mortgage*Size		0.80	10.16***		-13.32	-38.73		0.70	4.63
		(1.26)	(3.09)		(13.01)	(38.24)		(0.56)	(3.17)
Mortgage*Size^2			-12.79***			427.18			-5.87
			(3.88)			(475.52)			(4.12)
Savings Bank	-0.88***	-0.89***	-0.91***	-1.07***	-1.11***	-1.18***	-0.16	-0.15	-0.02
	(0.08)	(0.08)	(0.09)	(0.11)	(0.11)	(0.12)	(0.12)	(0.13)	(0.14)
Savings*Size		0.68	0.26		4.87**	14.27***		-0.40	-9.09**
		(0.59)	(1.60)		(2.08)	(2.83)		(0.88)	(4.48)
Savings*Size^2			1.22			-27.10***			7.70**
			(1.30)			(6.29)			(3.49)
Size	0.04	-0.01	-1.18***	-0.06	-0.10	-1.30*	-0.17	-0.17	-0.03
	(0.28)	(0.33)	(0.40)	(0.45)	(0.47)	(0.71)	(0.16)	(0.19)	(0.66)
Size^2			0.50**			0.56			-0.06
			(0.21)			(0.42)			(0.22)
Observations	20160	20160	20160	10360	10360	10360	6486	6486	6486
R^2	0.256	0.257	0.260	0.286	0.288	0.291	0.263	0.263	0.270

Liquidity Holdings and Contextual Factors

Table 1: Banks' Liquidity Holdings under different regulatory Regimes (Part 2)

	All			No Regulation			Regulation		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Profit	0.26***	0.26***	0.25***	0.31***	0.30***	0.30***	0.09	0.09	0.09
	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)	(0.08)	(0.08)	(0.08)
Capital ratio (%)	0.00	0.00	-0.00	-0.00	-0.00	-0.00	-0.01	-0.01	-0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Deposits	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Disclosure	0.06***	0.06***	0.06***	-0.01	-0.01	-0.00	0.08***	0.08***	0.08***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.03)
Concentration	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.00	-0.00	-0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
DGS	-0.00	-0.00	-0.00	0.00	0.00*	0.00*	-0.00**	-0.00**	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations	20160	20160	20160	10360	10360	10360	6486	6486	6486
R^2	0.256	0.257	0.260	0.286	0.288	0.291	0.263	0.263	0.270

De Nederlandsche Bank Eurosysteem

Main Findings

1. Determinants of banks' liquidity holdings

Main Findings

1. Determinants of banks' liquidity holdings
    - Bank: Deposits (+), Profit (+), Size (x), Capital (x)

Main Findings

1. Determinants of banks' liquidity holdings
   - Bank: Deposits (+), Profit (+), Size (x), Capital (x)
   - Business Model: Savings (-), Investment (x), Corporate (-), Mortgage (-)

Main Findings

1. Determinants of banks' liquidity holdings
    - Bank: Deposits (+), Profit (+), Size (x), Capital (x)
    - Business Model: Savings (-), Investment (x), Corporate (-), Mortgage (-)
    - Contextual: Concentration (-), Disclosure (+), DGS (x)

Main Findings

1. Determinants of banks' liquidity holdings
   - Bank: Deposits (+), Profit (+), Size (x), Capital (x)
   - Business Model: Savings (-), Investment (x), Corporate (-), Mortgage (-)
   - Contextual: Concentration (-), Disclosure (+), DGS (x)
2. Effects of liquidity regulation:

Main Findings

1. Determinants of banks' liquidity holdings
   - Bank: Deposits (+), Profit (+), Size (x), Capital (x)
   - Business Model: Savings (-), Investment (x), Corporate (-), Mortgage (-)
   - Contextual: Concentration (-), Disclosure (+), DGS (x)
2. Effects of liquidity regulation:
   - Substitutes almost all bank- and country specific determinants

Main Findings

1. Determinants of banks' liquidity holdings
   - Bank: Deposits (+), Profit (+), Size (x), Capital (x)
   - Business Model: Savings (-), Investment (x), Corporate (-), Mortgage (-)
   - Contextual: Concentration (-), Disclosure (+), DGS (x)
2. Effects of liquidity regulation:
   - Substitutes almost all bank- and country specific determinants
   - Complements disclosure

Main Findings

1. Determinants of banks' liquidity holdings
   - Bank: Deposits (+), Profit (+), Size (x), Capital (x)
   - Business Model: Savings (-), Investment (x), Corporate (-), Mortgage (-)
   - Contextual: Concentration (-), Disclosure (+), DGS (x)
2. Effects of liquidity regulation:
   - Substitutes almost all bank- and country specific determinants
   - Complements disclosure
   - Causes a non-linear effect of size

Sensitivity

1. Different liquidity regulation variable

Sensitivity

1. Different liquidity regulation variable
2. Lagged variables

Sensitivity

1. Different liquidity regulation variable
2. Lagged variables
3. Fixed and random effects

Sensitivity

1. Different liquidity regulation variable
2. Lagged variables
3. Fixed and random effects
4. To do: Different liquidity variables

Conclusion

- Findings

Conclusion

- Findings
  - Determinants of banks' liquidity buffers is a combination of bank- and country-specific factors

Conclusion

- Findings
  - Determinants of banks' liquidity buffers is a combination of bank- and country-specific factors
  - Liquidity regulation substitutes most of these factors

Conclusion

- Findings
  - Determinants of banks' liquidity buffers is a combination of bank- and country-specific factors
  - Liquidity regulation substitutes most of these factors
  - Liquidity regulation makes disclosure more important: Complement

Conclusion

- Findings
  - Determinants of banks' liquidity buffers is a combination of bank- and country-specific factors
  - Liquidity regulation substitutes most of these factors
  - Liquidity regulation makes disclosure more important: Complement
- Policy Implication

Conclusion

- Findings
  - Determinants of banks’ liquidity buffers is a combination of bank- and country-specific factors
  - Liquidity regulation substitutes most of these factors
  - Liquidity regulation makes disclosure more important: Complement
- Policy Implication
  - When harmonizing liquidity regulation, disclosure requirements need to be harmonized as well

De Nederlandsche Bank Eurosysteem

Conclusion

- Findings
  - Determinants of banks' liquidity buffers is a combination of bank- and country-specific factors
  - Liquidity regulation substitutes most of these factors
  - Liquidity regulation makes disclosure more important: Complement
- Policy Implication
  - When harmonizing liquidity regulation, disclosure requirements need to be harmonized as well
  - Non-linear effect of size indicates bias towards large institutions

Thank you