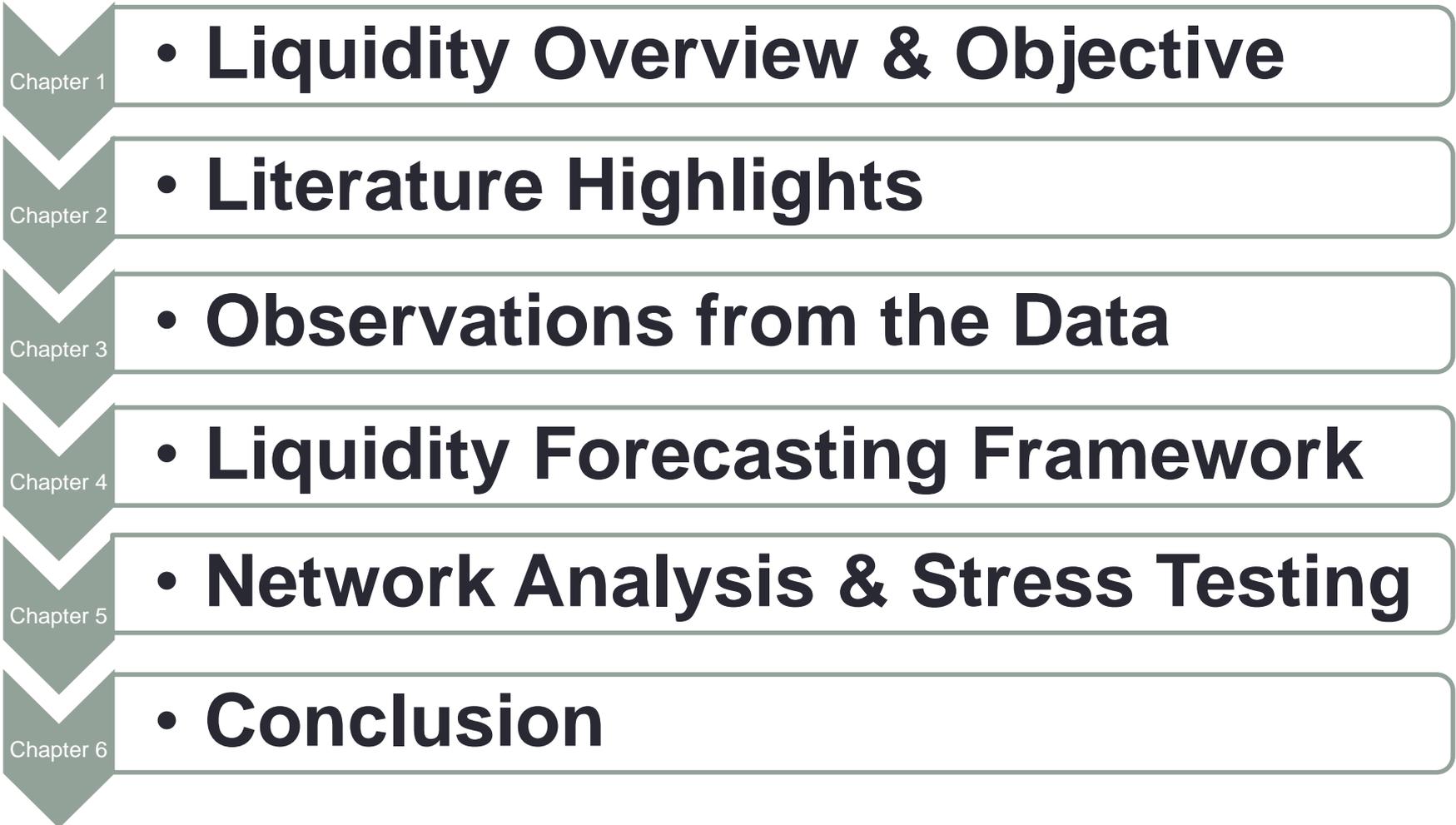# BANK LIQUIDITY & STABILITY IMPLICATIONS IN BARBADOS

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43rd Annual Monetary Studies Conference
Hilton Barbados

Structure

Chapter 1	• **Liquidity Overview & Objective**
Chapter 2	• **Literature Highlights**
Chapter 3	• **Observations from the Data**
Chapter 4	• **Liquidity Forecasting Framework**
Chapter 5	• **Network Analysis & Stress Testing**
Chapter 6	• **Conclusion**

Liquidity Overview & Objective

Overview

❑Liquidity definition

❑Institutions tend to hold excess liquidity

❑The liquidity puzzle

❑The role of bank liquidity in financing gov't (or crowding-out effects)

Objectives

Determine Factors that drive bank liquidity and establish a forecasting framework

Bank Network Analysis and exposure

Stress Test Analysis and Contagion Effects

Literature Highlights

Liquidity

➢ **Voluntary v/s involuntary**

➢ **Liquidity preference and determinants in LDC**

➢ **Empirical Approaches:** SVAR; ARDL; Pool; OLS

➢ **Common factors when modeling excess liquidity:** volatility of deposits and credit; rr ratio; net currency flows; output gap; AR term
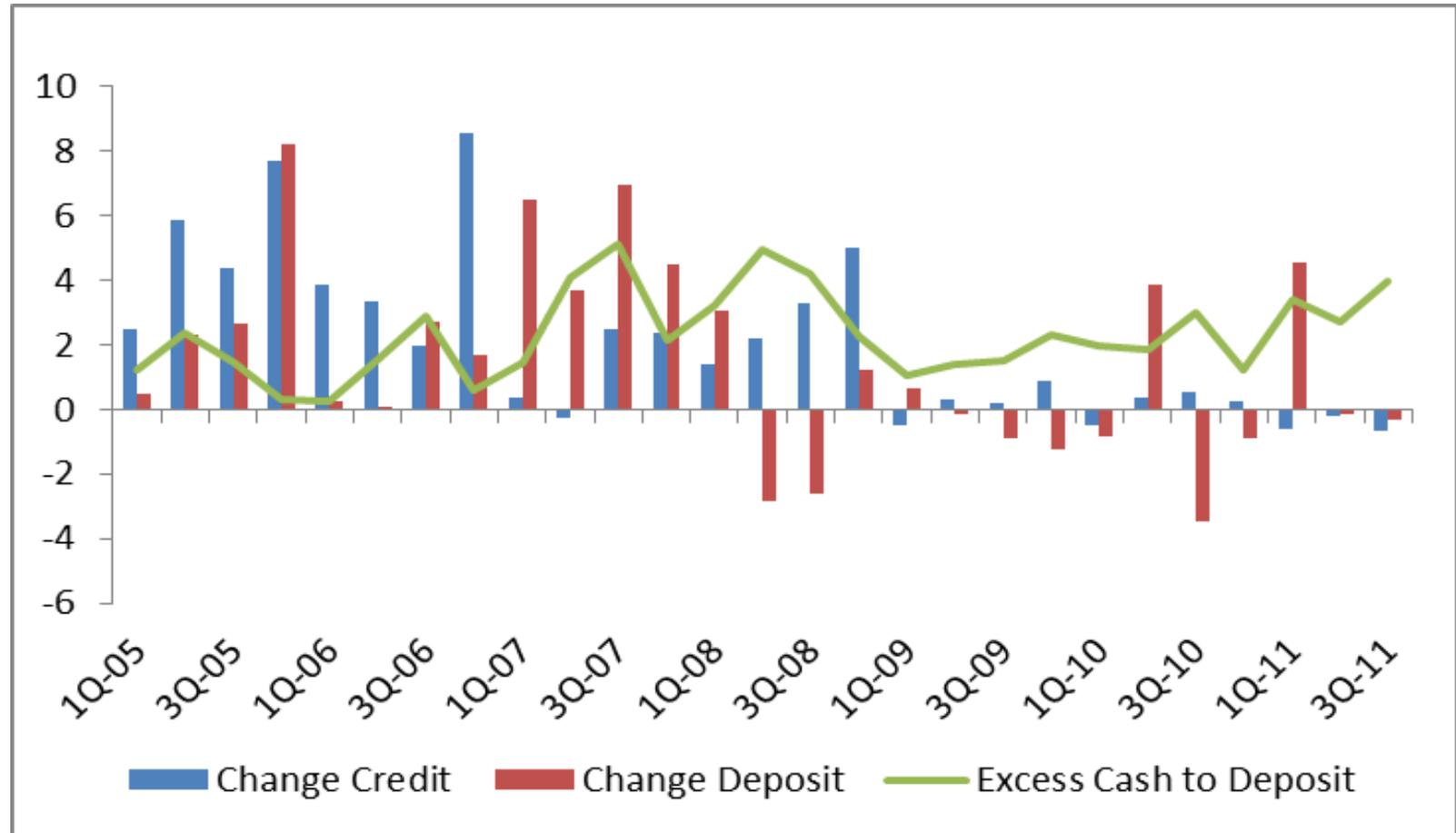
Network Analysis

➢ **Contagion Risks**

➢ **Nier et al. (2008) Framework** network of banks (connected through interbank linkages) where parameters vary to assess the contagion impact.
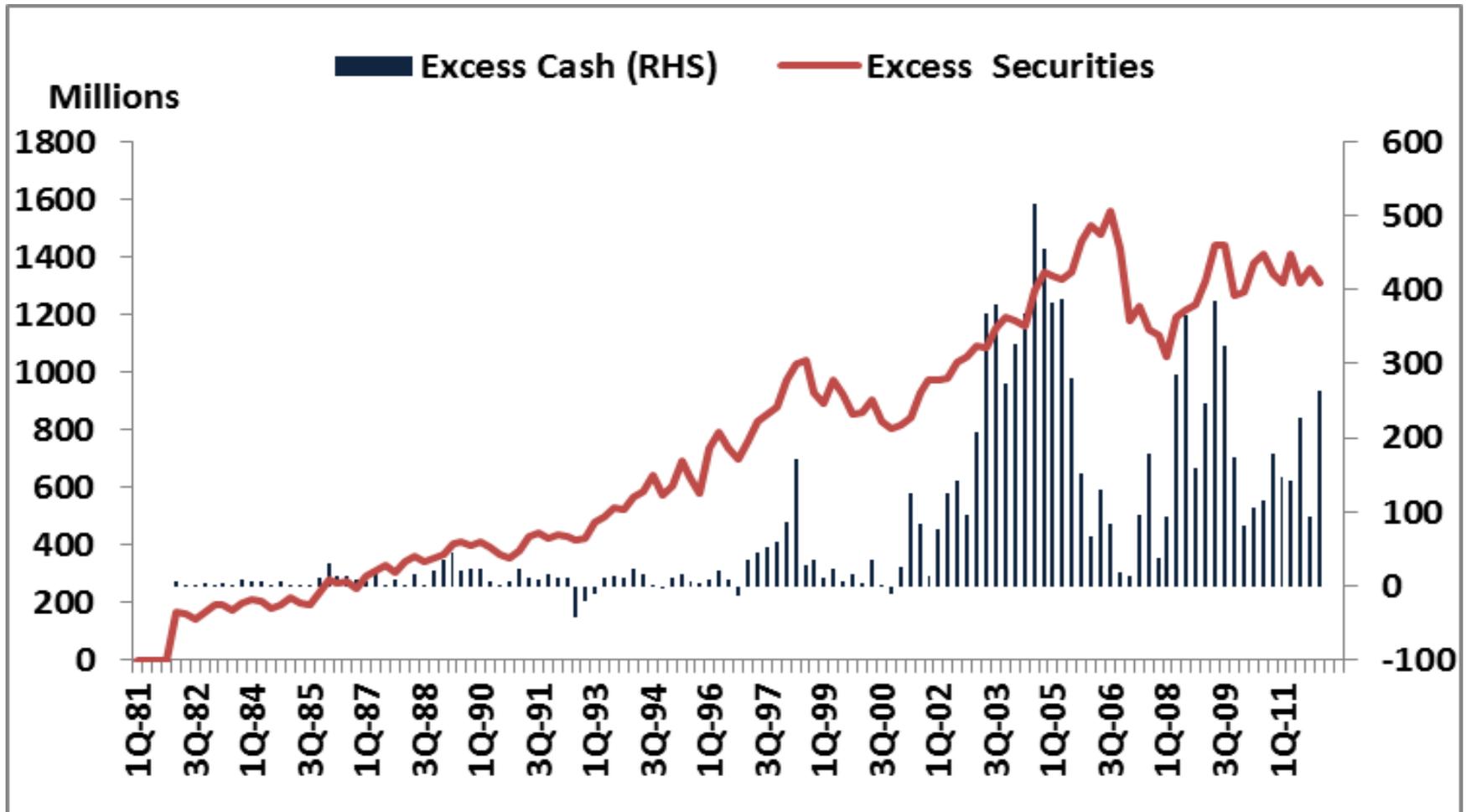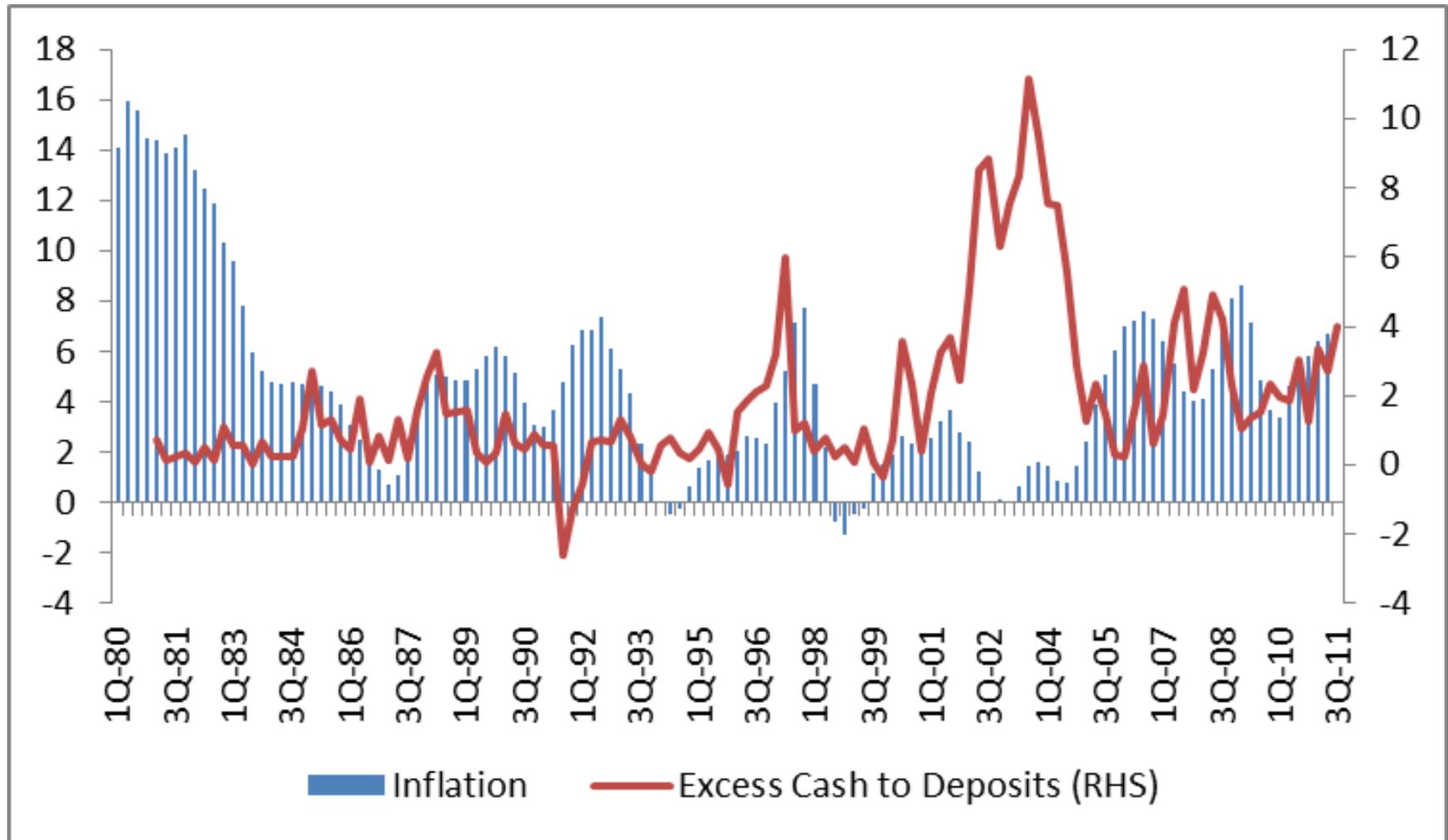
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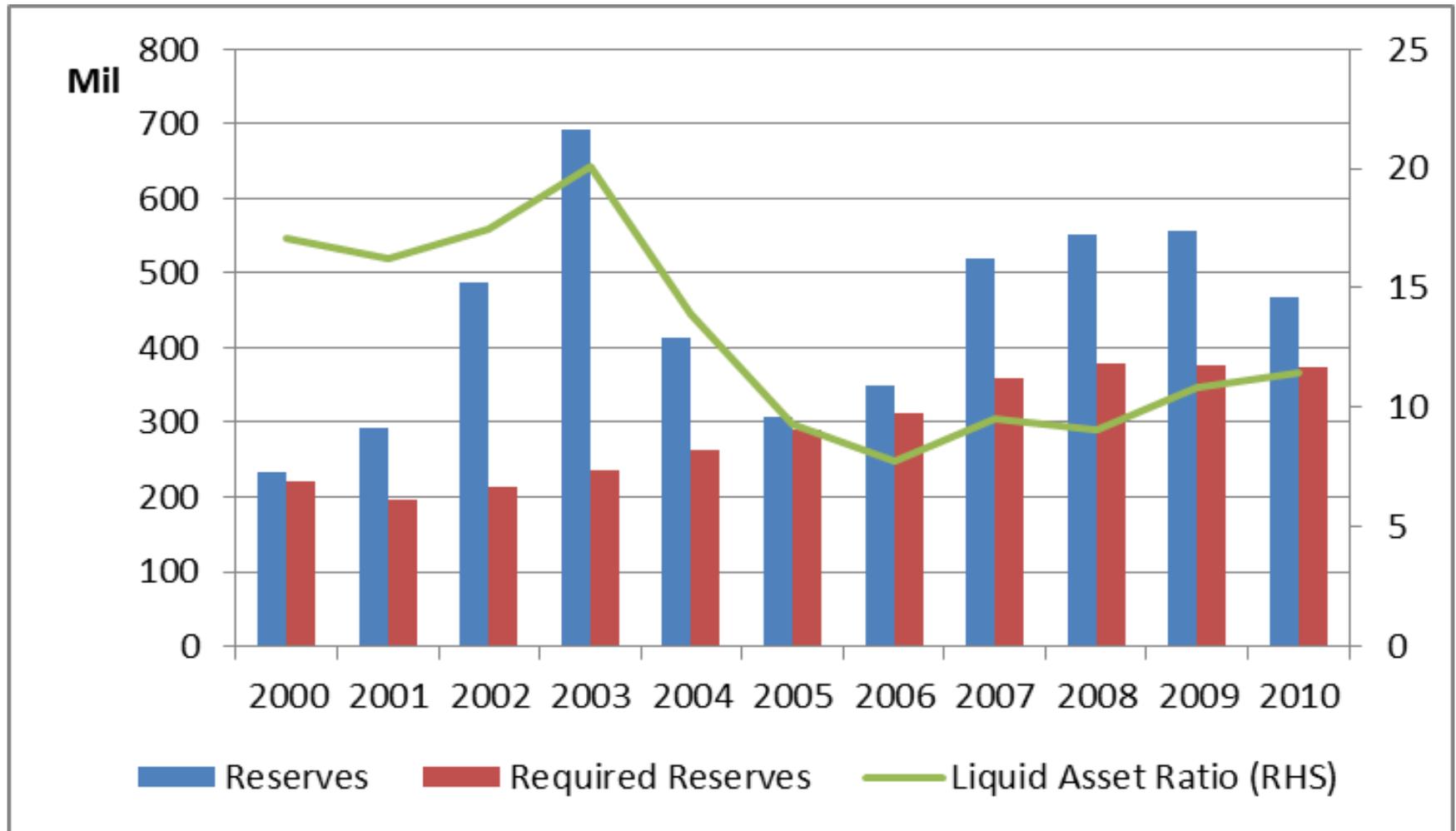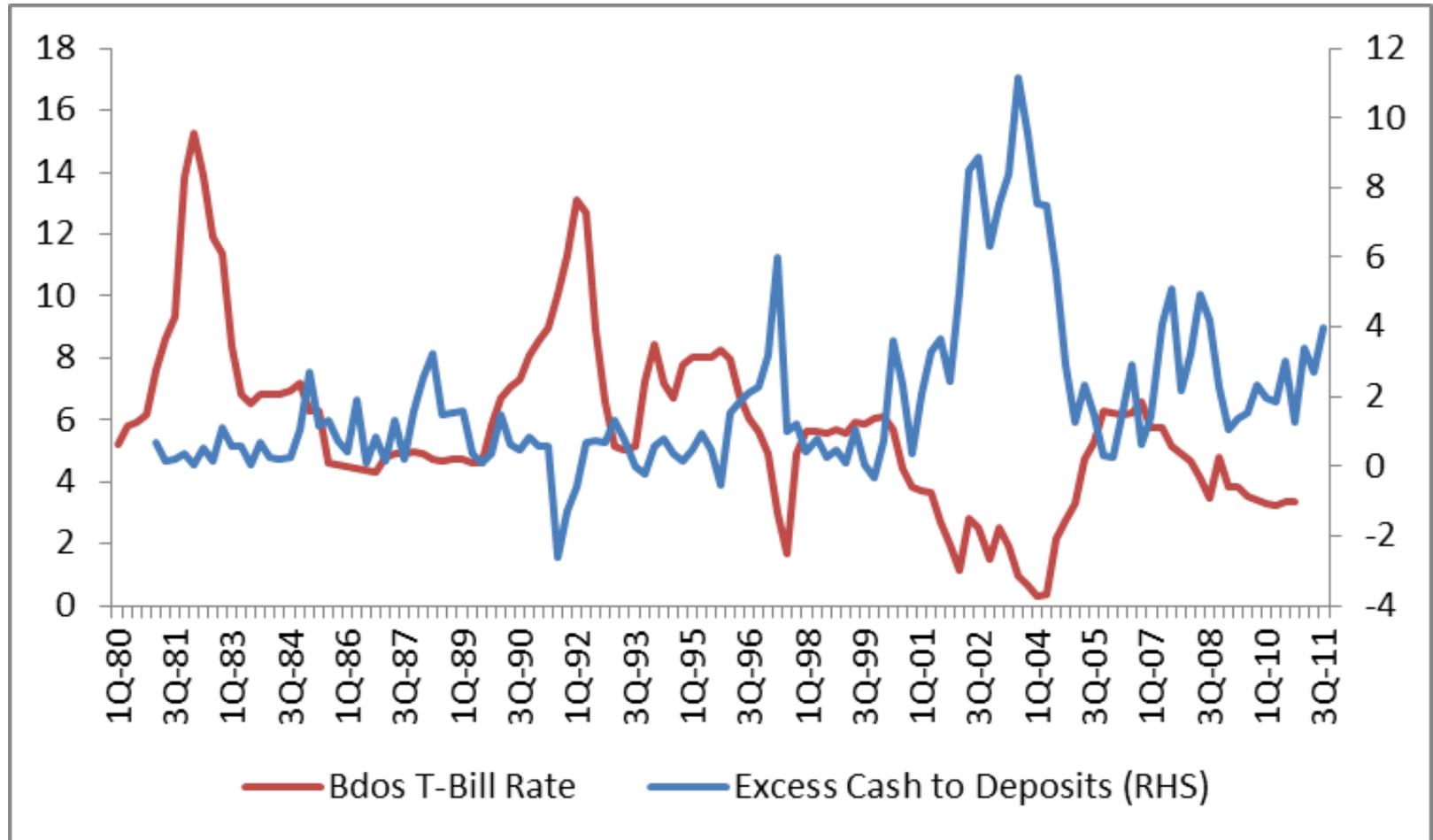
Observations from the Data

Observations from the Data

Observations from the Data

Observations from the Data

Liquidity Forecasting Framework

- Augmented approach:

Agernor et al. (2004), Maynard and Moore (2006) and Khemraj (2009)

$$exl = f(AR\ process, rr, volX, tbr, ncg, nda)$$

… testing both homogenous and heterogeneous coefficients

… where volx is a vector of volatility variables: cash to deposit; private sector credit; and output gap.
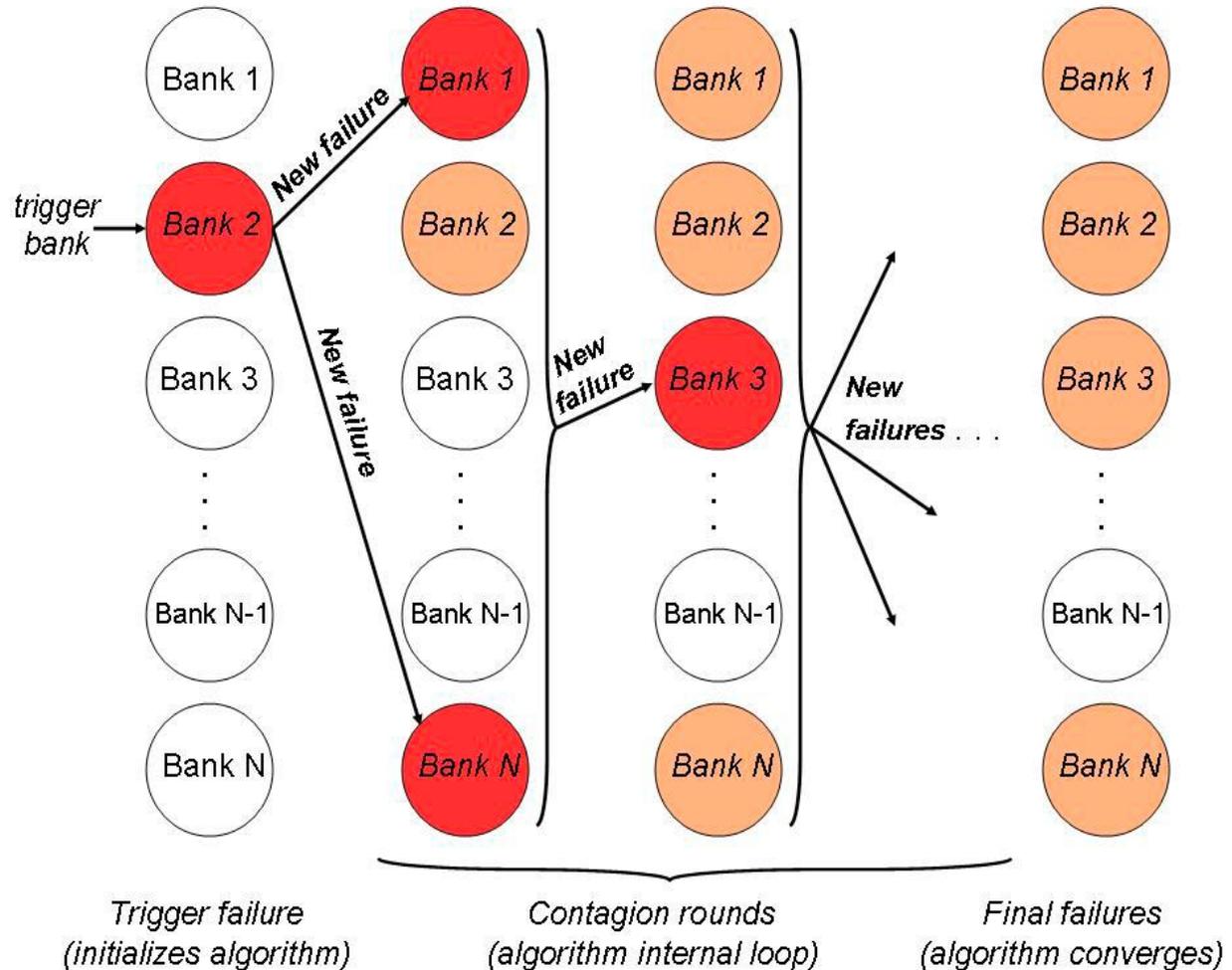
…vol variables measured by a 3 month rolling std. dev.

Liquid Assets		Excess Cash	
Variable	**Coefficient**	**Variable**	**Coefficient**
Constant	9.432**	Constant	13.024**
Liquidity(-1)	0.730**	Liquidity(-1)	0.362**
Liquidity(-2)	0.132**	Liquidity(-4)	0.137**
Dummy#	9.715**	VolCD	0.811**
VolCD(-3)	-0.076*	NDA(-1)	-0.007**
VolCD	0.245**	NDA	0.006**
VolYYT(-3)	51.489**	Liquidity(-2)	0.145**
VolPSC	-10.924**	VolCD(-1)	-0.582**
Liquidity(-3)	0.072**	YYT(-6)	-13.252**
YYT(-6)	-8.994**	VolYYT(-3)	72.990**
VolPSC(-5)	6.394**	Liquidity(-3)	0.129**
VolCD(-1)	-0.135**		
VolCD(-5)	-0.139**		
D(TB(-5))	0.255**		
Liquidity(-6)	0.040**		

Network Models:
a simulation tool
e.g. Nier et al. (2008)

Default dynamics related to contagion through interbank links can similarly be related to the physics of flow networks

Nodes (banks) are connected to a source where an initial shock is generated and every node is assigned a 'sink' where the losses are directed to – the bank's net worth or capital

Trigger failure (initializes algorithm) — Contagion rounds (algorithm internal loop) — Final failures (algorithm converges)

Network Models:
credit & liquidity shocks

$$\sum_j x_{ji} + a_i = k_i + b_i + d_i + \sum_j x_{ij}$$

Where x_{ji} stands for bank i loans to bank j, a_i stands for bank i's other assets, k_i for bank i's capital, b_i are long $-$ term and short $-$ term borrowing (excl. interbank loans) d_i - deposits and x_{ij} stands for bank i's borrowing form bank j

Network Models:
credit & liquidity shocks

Pre-Shock Balance Sheet

Post-Shock Balance Sheet

Network Models: Matrix of Bank Exposure

	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 6
Holding Banks:						
Bank 1	-	-	-	-	-	-
Bank 2	831	-	15	209	781	-
Bank 3	-	-	-	-	-	-
Bank 4	-	-	-	-	-	-
Bank 5	-	-	-	-	-	-
Bank 6	-	-	-	2,184	-	-
Canadian	28,164	1,148	118,696	39,807	331,092	72
US	39,472	16,190	55	72,457	66,509	2,542
European	871	857	3,358	8,324	2,332	1,814
Caribbean affiliates	7,483	1,112	215	233,102	1,483	1,209
Caribbean non-affiliates	1,938	178	-	648	-	-

Network Models: Simulation

Shocks	Minimum CAR % of Remaining Banks	Maximum CAR %	Sector CAR %	Number of Banks with CAR < 8%
Baseline	15.35	23.42	18.33	0
Europe	15.04	23.27	18.12	0
Canada	13.64	20.76	16.07	1
USA	9.07	23.42	15.84	0
Caribbean affiliates	10.82	23.41	18.45	1
Caribbean non-affiliates	15.35	23.42	18.30	0
Europe (+5%)	15.04	23.27	18.12	0
Canada (+5%)	11.04	20.76	14.66	1
USA (+5%)	9.07	23.42	15.84	0
Caribbean affiliates (+5%)	10.03	17.66	14.39	2
Caribbean non-affiliates (+5%)	15.35	23.42	18.30	0
Europe (+10%)	15.04	23.27	18.12	0
Canada (+10%)	-	7.39	-	6
USA (+10%)	9.07	23.42	15.84	0
Caribbean affiliates (+10%)	-	7.98	-	6
Caribbean non-affiliates (+10%)	15.35	23.42	18.30	0

Conclusion

Objectives

Determine Factors that drive bank liquidity and establish a forecasting framework

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Finding

❑A framework for forecasting individual bank liquidity was established

❑The data shows our banking system is most vulnerable to Canadian banks

❑Shocks to Canadian banks as well as the dominant bank in Barbados can trigger runs, which if persistent can lead to systemic failures.

THANK YOU

Questions & Comments Please…