

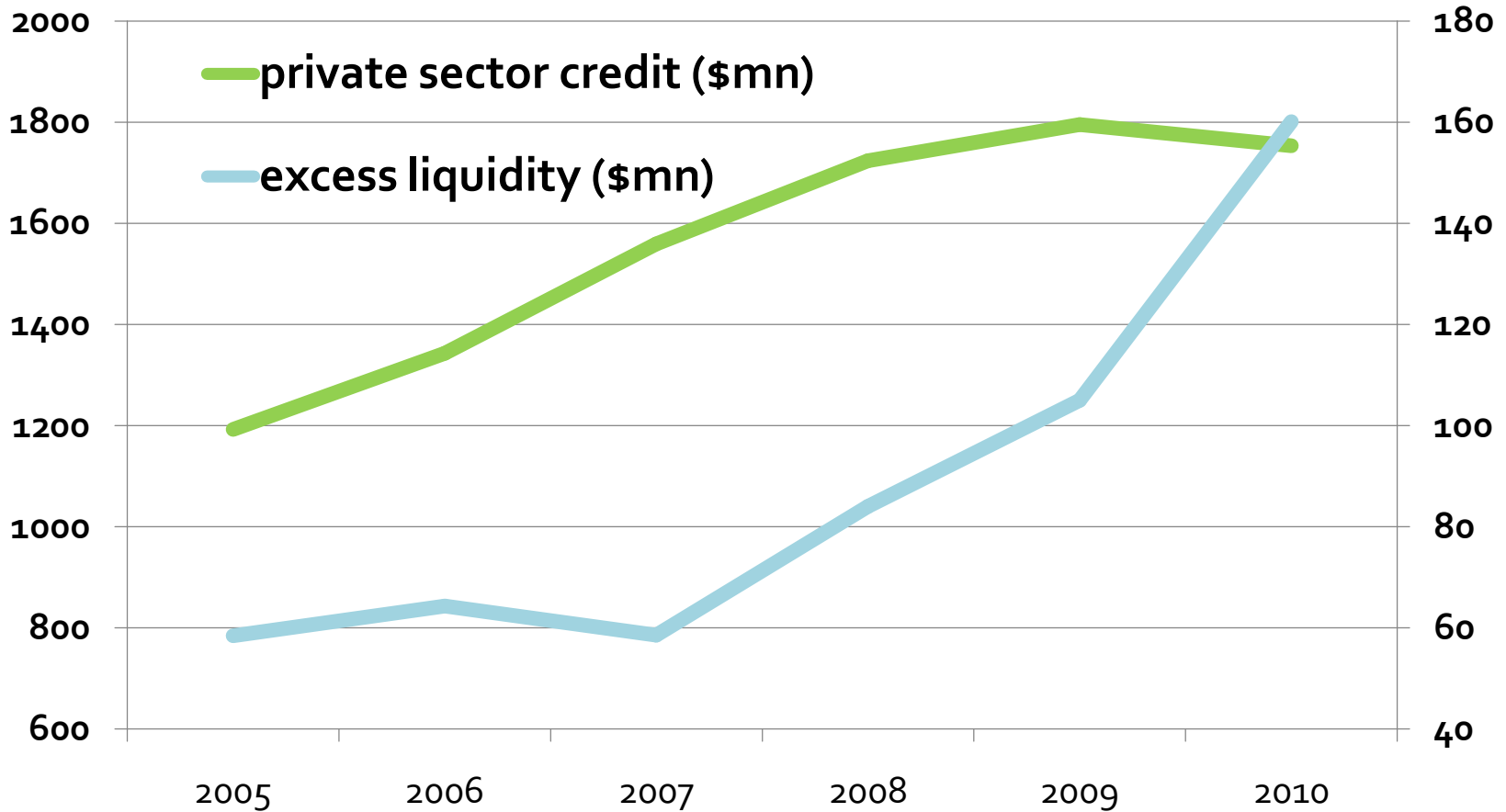
Determinants of Interest Rate Spreads in Belize

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Rationale



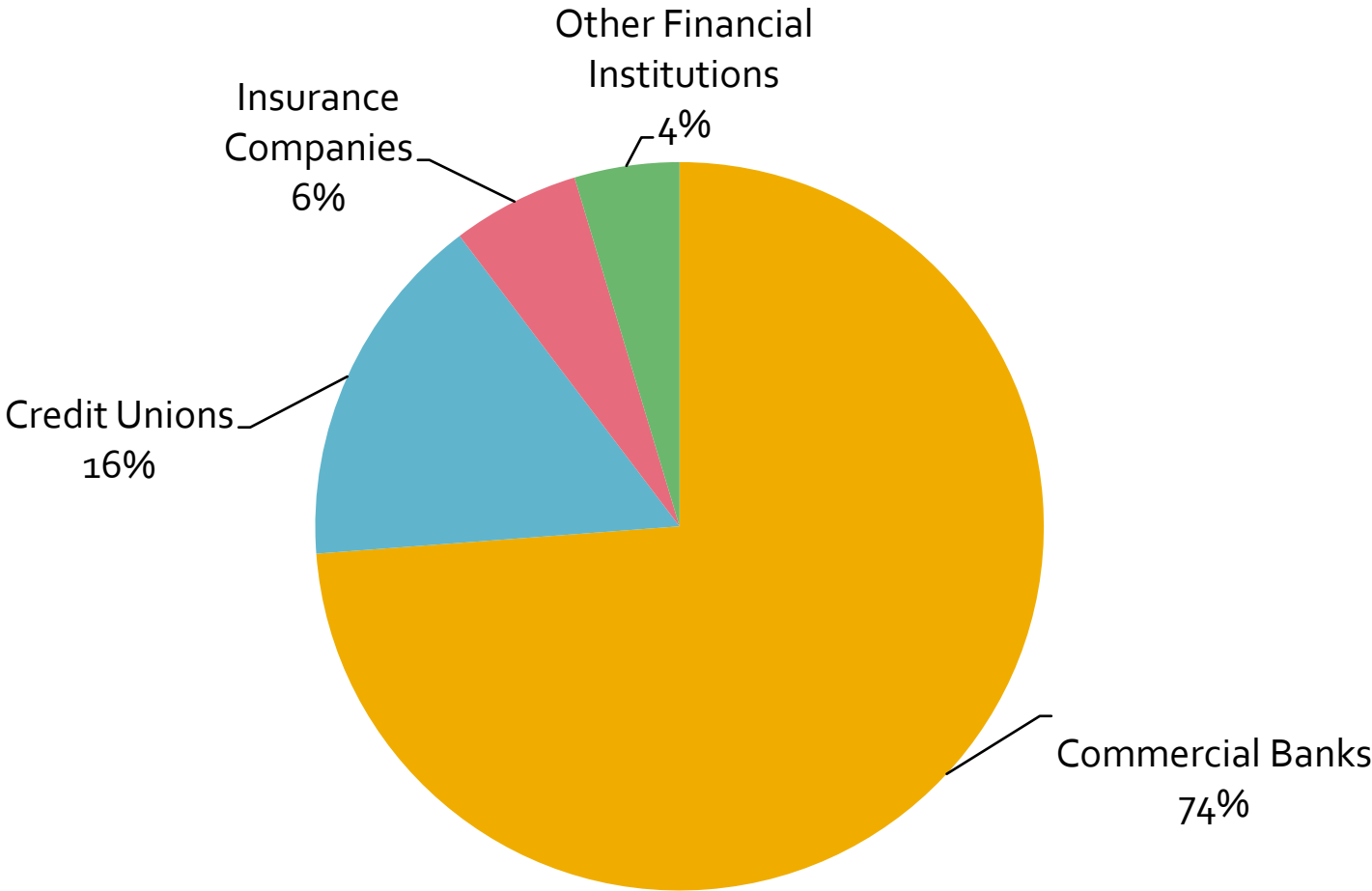
Rationale



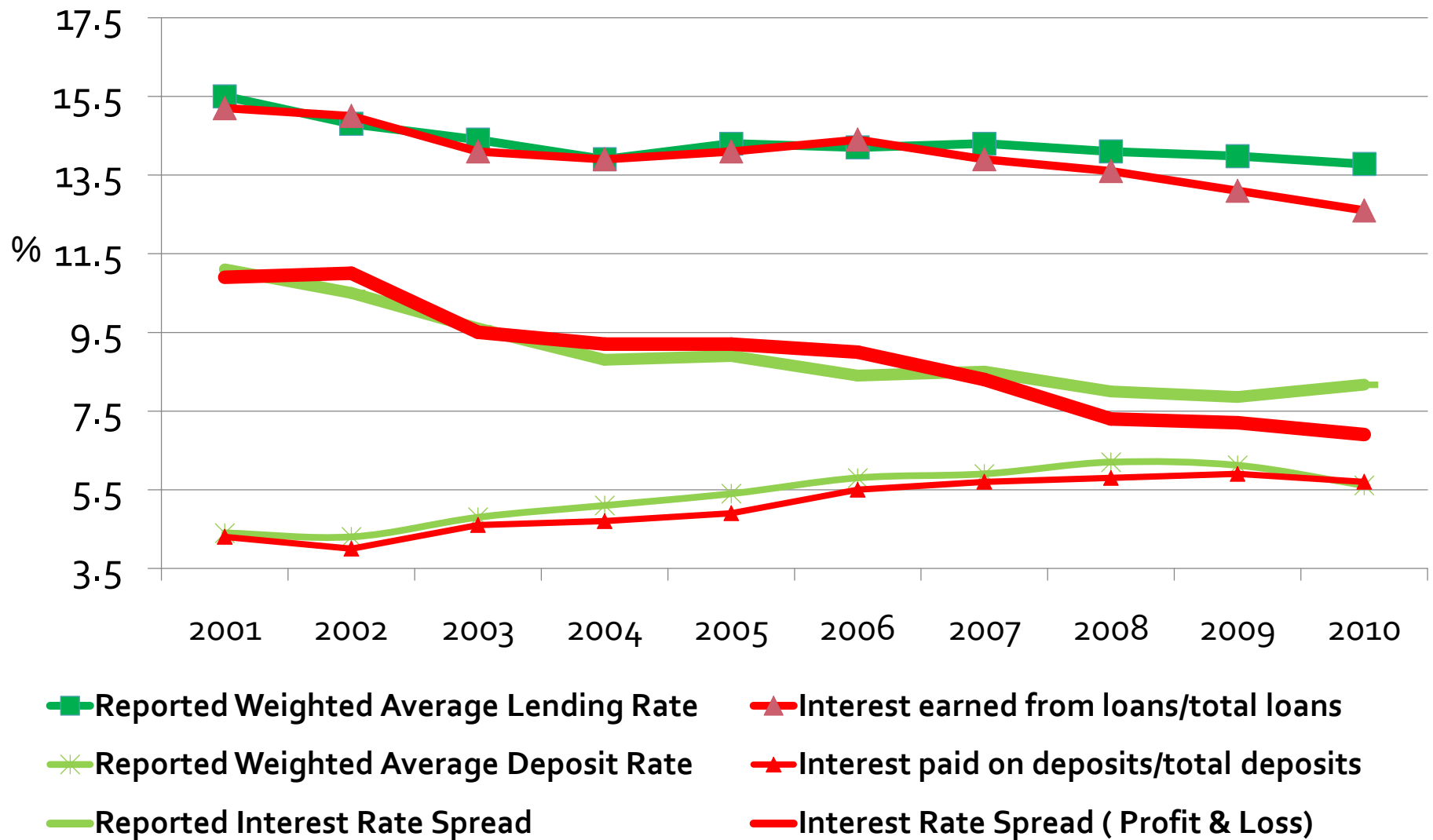
Stylised Facts

- Characteristics of the Belizean Economy
- Belize's financial industry
 - Asset size of \$3.4bn
 - Dominated by Commercial Banks
 - High concentration of market share held by two of five commercial banks

Composition of Belize's Financial Industry



Definitions



Methodology

	ACCOUNTING APPROACH	ECONOMETRIC METHOD
PURPOSE	Identify the contribution of specific accounting factors on the IRS.	Examine non-accounting and accounting factors which sustain the spread.
DATA REQUIREMENTS	Consolidate Profit & Loss and Balance Sheet Information.	Accounting and non-accounting measures, on a disaggregated level.
BENEFITS	Method is easy to calculate and intuitive; Offers preliminary insight on how accounting factors augment or reduce interest rate spread.	Analysis examines: -the size of the impact that various factors have on spread; - takes into account individual bank behavior and characteristics
DRAWBACKS	Unable to provide an explanation for causation or behavioral patterns; Does not take into account non-accounting factors;	Issues of serial correlation and endogeneity were issues when dealing with banking data.

Accounting Method

$$II + NII \equiv IP + OC + Prov + P + T \quad \dots\dots\dots(1)$$

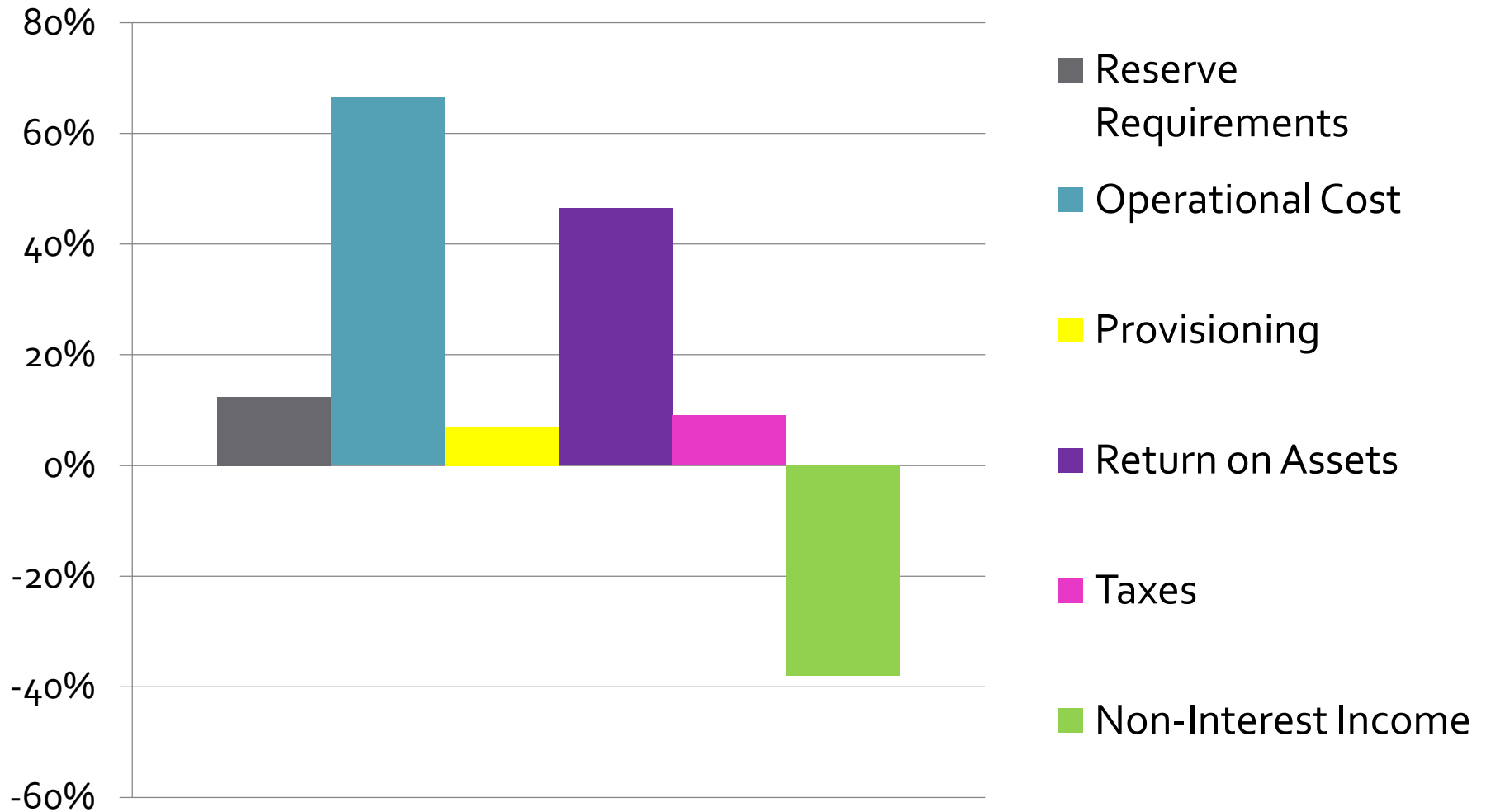
- II is interest income
- NII is non-interest income
- *IP is interest expenses*
- *OC is operating costs*
- *Prov is provisioning*
- *P is profits*
- *T is taxes*

Accounting Method

$$i_L - i_D \equiv \rho i_L + \text{OC}/D + \text{Prov}/D + \text{T}/D + \text{ROA} * \text{A}/D - \text{NII}/D + \varepsilon \dots(2)$$

- $i_L - i_D$ rep. *Wide Interest Margin*
- i_L rep. *Interest income divided by loans*
- i_D rep. *Interest expenses divided by deposits*
- ρ rep. *cash reserve requirements*
- D rep. *Deposits*
- ε rep. *residual*

Accounting Method- Findings



Econometric Model

$$WIM_{it} = \varphi_0 + \varphi_1 B_{it} + \varphi_2 Z_t + \varphi_3 M_t + \varepsilon_{it}$$

BANK SPECIFIC VARIABLES

- Adversely classified loans
- Operating cost
- Excess liquidity
- Non-interest income
- Ratio of actual to required liquid asset holdings

INDUSTRY SPECIFIC, TIME VARYING DETERMINANTS

- Cash reserve requirements
- Market Share
- Concentration of Deposits

MACROECONOMIC VARIABLES

- GDP growth
- CPI

Econometric Model

- Correlation Matrix
- Unit Root Tests
- Panel Cointegration Test
- Panel DOLS Estimation

$$y_{it} = \alpha_{it} + X'_{it} \beta_i + \sum_{j=-k}^k \lambda'''_{ij} \Delta X'_{it-j} + \xi_{it}$$

Variables	Levels							
	L,L & C	Prob.	I,P & S	Prob.	ADF-F Chi-Sq	Prob.	PP-F Chi Sq.	Prob.
Wide Interest Margin	-1.479	0.126	-1.264	0.103	14.698	0.144	35.759	0.000
Adversely Classified Loans	1.635	0.949	1.187	0.882	9.247	0.509	9.377	0.497
Cash Reserve Requirements	-2.433	0.008	-0.428	0.335	10.663	0.384	17.023	0.074
Concentration of Deposits	0.212	0.584	0.948	0.828	5.911	0.823	5.541	0.852
Market Share	3.119	0.999	2.927	0.998	8.160	0.613	7.125	0.714
Non-Interest Income	-0.908	0.182	1.330	0.092	15.566	0.113	35.271	0.000
Liquidity holdings above Required Levles	-1.323	0.093	-2.563	0.005	29.236	0.001	39.792	0.000
GDP Growth	0.899	0.816	3.887	0.000	33.035	0.000	58.647	0.000
Inflation	-8.480	0.000	6.504	0.000	58.921	0.000	67.516	0.000
	First Difference							
	L,L & C	Prob.	I,P & S	Prob.	ADF-F Chi-Sq	Prob.	PP-F Chi Sq.	Prob.
Wide Interest Margin	-4.701	0.000	10.496	0.000	100.542	0.000	140.459	0.000
Adversely Classified Loans	-7.320	0.000	-6.369	0.000	58.235	0.000	100.560	0.000
Cash Reserve Requirements	-0.355	0.361	-4.715	0.000	41.604	0.000	91.257	0.000
Concentration of Deposits	-6.294	0.000	-6.207	0.000	55.973	0.000	112.148	0.000
Market Share	-1.497	0.067	-4.638	0.000	40.822	0.000	117.935	0.000
Non-Interest Income	-5.866	0.000	-9.713	0.000	93.486	0.000	142.789	0.000

Panel Cointegration Results

Pedroni (1999)	Panel cointegration statistics		Group-mean panel cointegration statistics
	Unweighted	Weighted	
Variance ratio	0.9961	-1.8569*	
PP rho-statistics	-2.5294***	-1.4852**	-1.2139
PP t-statistics	-5.1317***	-5.6461***	-6.8301***
ADF statistics	-2.2554***	-4.7523***	-3.4167***
Kao Test			
ADF	-1.6713**		

***, ** and * indicates significance at the 1%, 5% and 10% levels, respectively.

Dynamic OLS Estimation

	LONG RUN MULTIPLIERS	
Variable	Co-efficient	t-statistics (prob)
log_acl	0.0189	2.6935***
log_dep_concen	-0.028	-7.3408***
log_mkt_share	0.0143	8.7064***
log_non_int_yoi	-0.0184	-4.6347***
log_holdings_req	0.0071	5.3741***
R-squared	0.9602	
Adjusted R-squared	0.9473	
S.E. of regression	0.0014	

Accounting vs. Economic Model

	ACCOUNTING	ECONOMETRIC MODEL
Operating Cost	Significant component that adds to the spread.	Not included in the model. High and positive correlation between market share and operating cost.
Adversely Classified Loans	Not specifically measured	Cost of ACLs is passed onto borrowers via increased margins
Non-Interest Income	Significant component that reduces the spread.	Negatively correlated to interest rate spread.
Cash Reserve Requirements	Represents one-tenth of interest rate spread.	Insignificant long run factor and was not retained in the model.

Policy Implications

- Market power, efficiency and competition
 - Market structure limits incentives to reduce cost
 - Increases in fee-based activities have been used to offset increases in inefficiency
- Reduction in Non-Performing Loans
 - Improvements in credit adjudication process
- Large Institutional Deposits & Liquidity Management Issues