

# Assessing the Main Determinants Of Bank Profitability In Trinidad And Tobago

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## Acknowledgements

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# Outline

- ▶ Motivation
- ▶ Research questions
- ▶ Overview: TT Economy and Financial System
- ▶ Literature review
- ▶ Data and methodology
- ▶ Results
- ▶ Limitations
- ▶ Extensions

# Motivation

## **Republic records \$946 million profit\***

Published on Nov 4, 2016, 10:44 pm AST

## **Scotia profits up 17%**

Published on Mar 8, 2016, 4:59 pm AST

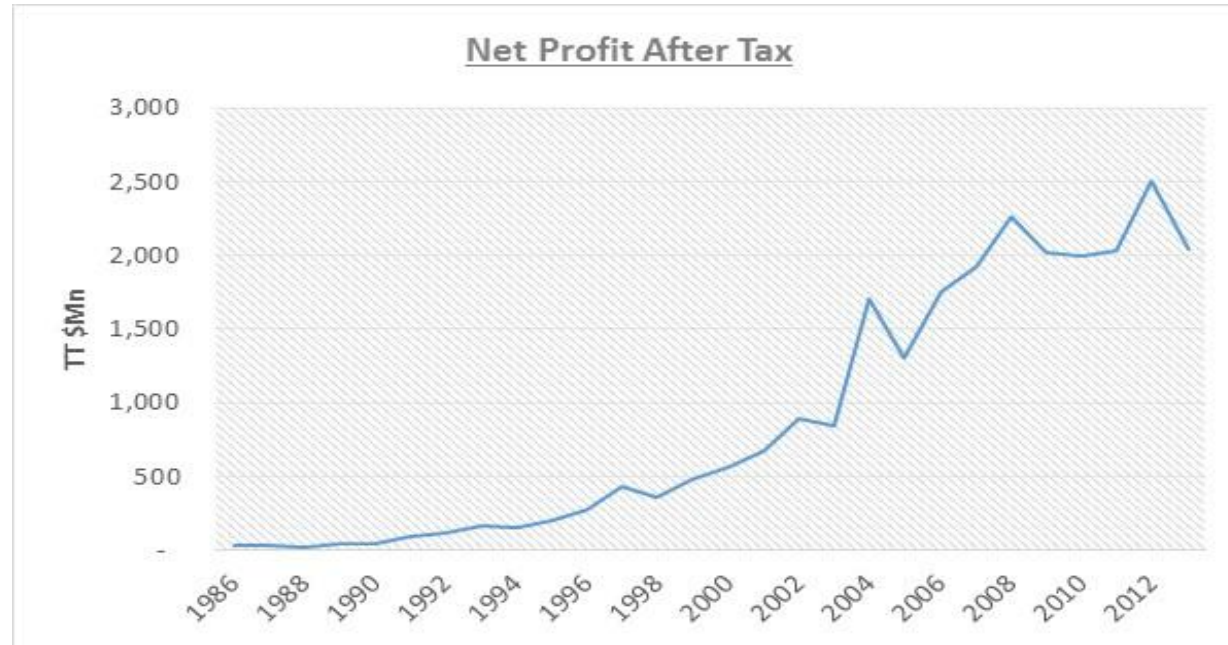
## **First Citizens records \$159.5 million profit**

Published on Aug 4, 2016, 11:00 pm AST

# Motivation (continued)

- ▶ Since “financial liberalization” in 1993, there have been no bank failures and instead the commercial banks have been very profitable.
- ▶ Last empirical study on the TT banking sector: Seepersad (1995)
- ▶ No “determinants” study on TT neither on the CARICOM\* Region specifically.

# T&T Economy and Financial System



Source: CBTT Operating Results of the Financial System,  
Various Years

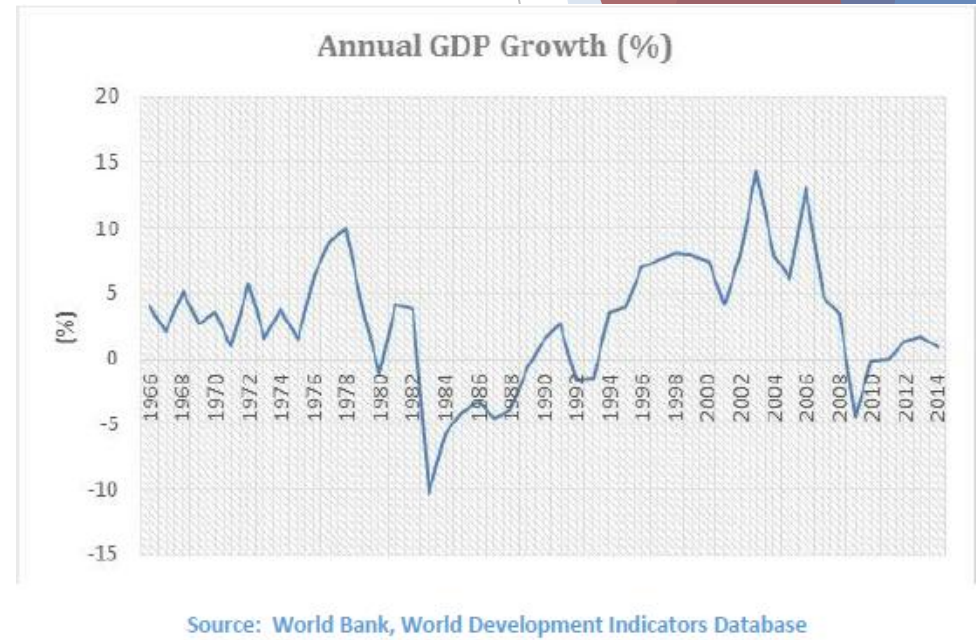
- ▶ In terms of performance, net profits after taxes has grown exponentially since the 1990s.
- ▶ Coincidentally after “liberalization” of the financial sector.

# Research question

- ▶ What were the main determinants of bank profits in T&T over the past two decades?
- ▶ To what extent are commercial bank profits due to variations in internal factors under the control of bank mgmt. and to what extent does external factors, especially macroeconomic variables impact the financial performance of these banks?

# T&T Economy and Financial System

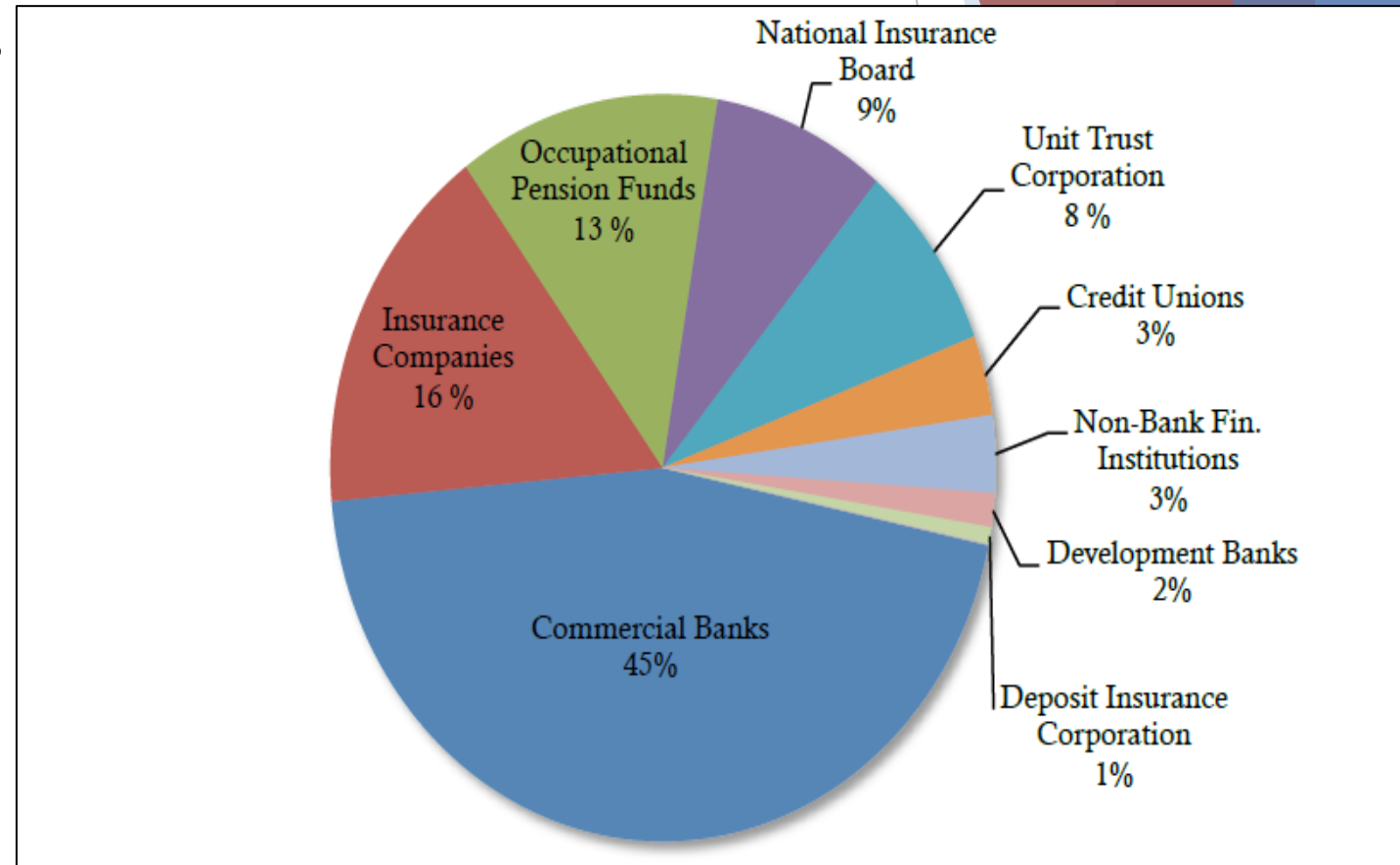
- ▶ TT is a small-open middle to high income, energy-producing country.
  - ▶ Real GDP per capita of US \$20,444 in 2015.
- ▶ Robust, positive growth 15 years post-liberalization.
- ▶ Strong macroeconomic environment.
  - ▶ Falling unemployment rate, low inflation, stable exchange rate, positive trade balance and a healthy foreign exchange reserves position.
- ▶ TT has become a major source of regional financing;
  - ▶ In particular, domestic financial institutions have expanded their presence through the CARICOM region and beyond.





# T&T Economy and Financial System

- ▶ TT Financial system accounts for 12% of GDP
- ▶ The commercial banking sector accounts for almost half of the assets of the financial system.
- ▶ Oligopolistic banking structure.
- ▶ 8 banks: 6 foreign, 2 local,
  - ▶ 3 Canadian banks
  - ▶ 1 state bank
- ▶ The banking sector throughout the years has been relatively stable + Capital base is quite strong



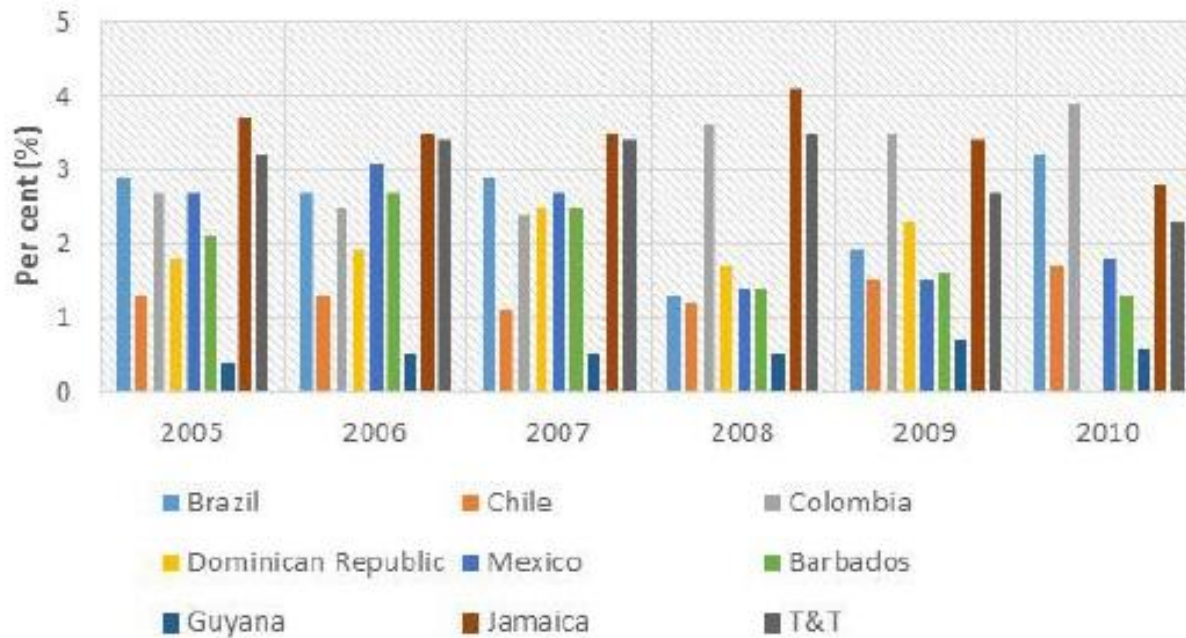
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Composition of Assets in T&T Financial System, 2013

Source: CBTT Financial Stability Report 2014

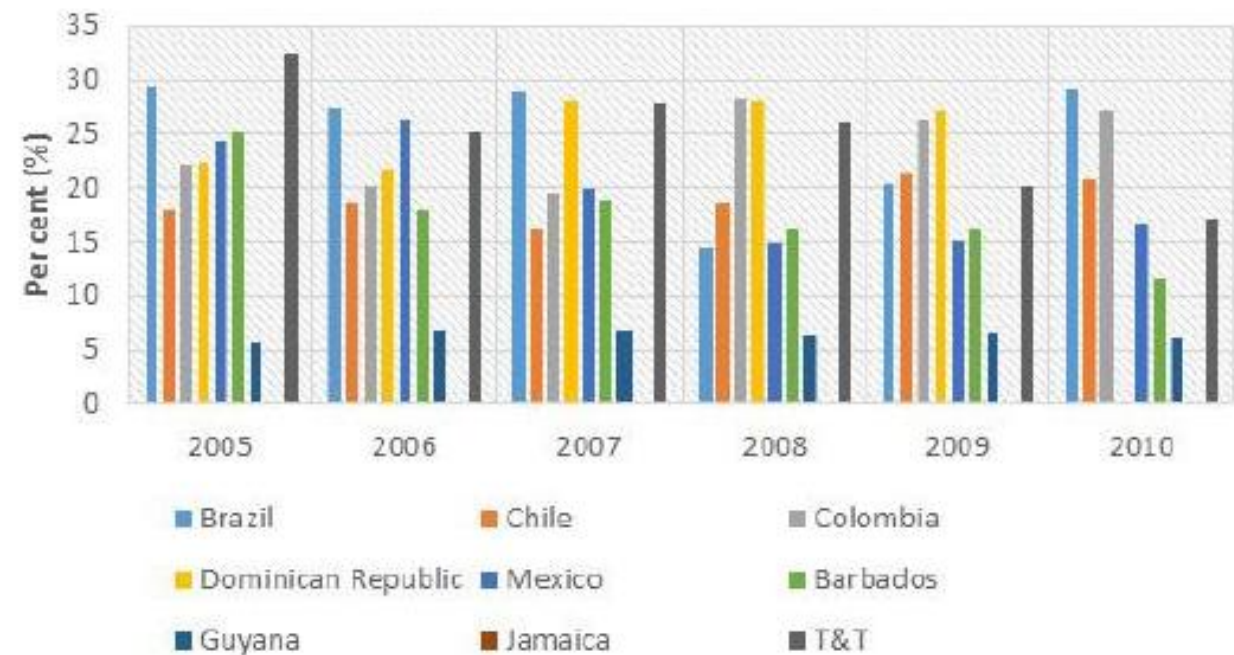
# ROA and ROE in the LAC Region

Comparative Return on Assets and Return on Equity (%) for Selected Caribbean and Latin American Countries.

Return on Assets



Return on Equity



# Literature review

- ▶ Developed / Developing countries
- ▶ Groups of countries / individual countries
- ▶ Canada and USA; Short (1979), Smirlock (1985), Berger (1995), Hoffman (2011)
- ▶ European countries; Bourke (1989), Goddard et al (2004), Kosmidou et al (2005)
- ▶ Latin America and the Caribbean (LAC); Peria et al (2004), Gelos (2006)
- ▶ African countries; Flamini et al (2009), Soyemi et al (2013), Qin and Pastory (2012)
- ▶ Middle-Eastern countries; Naceur (2003), Poghosyan and Hesse (2009)
- ▶ Demirguc and Huizinga (1998), Sufian (2008), Sufian and Habibullah (2009)

# The model

$$\pi_{it} = \alpha_i + \beta_1 \text{SIZE}_{it} + \beta_2 \text{CAP}_{it} + \beta_3 \text{CREDIT}_{it} + \beta_4 \text{LEND}_{it} + \beta_5 \text{NIETA}_{it} + \beta_6 \text{NIITA}_{it} \\ + \beta_7 \text{GROWTH}_{it} + \beta_8 \text{INFL}_{it} + \beta_9 \text{FOREIGN}_{it} + \beta_{10} \text{PRIVATE}_{it} + \varepsilon_{it}$$

- ▶ where  $\pi_{it}$  is the measure of performance (ROAA or ROAE) of bank  $i$  at time  $t$ .
- ▶  $\beta_1$  to  $\beta_{10}$  are the coefficients of the explanatory variables and  $\alpha_i$  is the bank-effect.
- ▶  $N$  banks, denoted  $i = 1, 2, \dots, 5$
- ▶  $T$  time periods, denoted  $t = 1, 2, \dots, 22$ .
- ▶ Unbalanced panel

	<u>Variables</u>	<u>Notation</u>	<u>Description</u>	<u>Expected sign</u>
Dependent Variables	Return on Average Assets (%)	ROAA	Net income/Total Assets	N/A
	Return on Average Equity (%)	ROAE	Profit before tax/Shareholders' Funds	N/A
Independent Variables	Bank size	SIZE	Log of total assets	(+)
	Bank capital	CAP	Shareholders' Funds/Total Assets	(+)
	Credit risk	CREDIT	Loan Loss Provisions/Total Loans	(-)
	Lending intensity	LEND	Total Loans/Total Assets	(+)
	Cost efficiency	NIETA	Non-interest Expenses/Total Assets	(+/-)
	Non-interest income	NIITA	Non-interest Income/Total Assets	(+)
	Real GDP growth (%)	GROWTH	Inflation-adjusted growth rate of GDP	(+)
	Inflation (%)	INFL	Annual Inflation rate	(+)
	Ownership1	FOREIGN	Dummy variable that takes a value of 1 for foreign-owned banks and 0 for locally-owned banks.	(-)
	Ownership2	PRIVATE	Dummy variable that takes a value of 1 for private-owned banks and 0 if government-owned.	(+)

# Dependent Variables

## ROAA and ROAE

Return on Average Assets (%)	ROAA	Net income/Total Assets
Return on Average Equity (%)	ROAE	Profit before tax/Shareholders' Funds

- ▶ ROAA measures how effectively the bank utilizes assets to generate a rate of return.
- ▶ For consistency, the ROAA for each bank was calculated as Profit After Tax divided by Average Total Assets.
- ▶ ROAE measures how well the bank is using common shareholders' invested money.
- ▶ These measures were typically used by Berger (1995), Alexiou and Sofoklis (2009), Soyemi et al (2013) to name a few.
- ▶ Advantages and disadvantages in using bank operating ratios as a measure of bank efficiency are provided in Vittas (1991).
  - ▶ Sufian (2009) provides a clear distinction between the ROA and ROE measure.
  - ▶ Alexiou and Sofoklis (2009) noted that “banks with lower leverage, and hence higher equity, generally report higher ROA but lower ROE.
  - ▶ Athanassoglou, (2005) argues that an analysis based on ROE disregards the risks associated with leverage, often a consequence of regulation.
  - ▶ Goddard et al (2004) employ ROE as an appropriate profitability measure, arguing that for many European banks the off-balance-sheet business makes a significant contribution to total profit. He explains that, the earnings generated from these activities are excluded from the denominator of ROA.

# Independent Variables

## Bank size

- ▶ The effect varies throughout the literature.
- ▶ Larger banks are arguably more profitable than smaller banks (Seepersad (1995), Kaufman (1992), Alexiou and Sofoklis (2009), Flamini (2009) and Sufian (2011)).
- ▶ As a firm grows it can benefit from **economies of scale** especially in the financial services sector.
- ▶ However, the theory of **diseconomies of scale**, also suggests that large organizations lead to complex processes that may result in increases in cost of running such big organization and hence a negative impact on bank profits (Soyemi et al (2013), Naceur (2003) and Sufian (2008)).
- ▶ Nonetheless, in line with the conclusion from the previous study done on T&T (Seepersad (1995)), it is expected that bank size would have a positive impact on profits.

Bank size	SIZE	Log of total assets	(+)
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# Independent Variables

## Capital adequacy

- ▶ Capital adequacy (the ratio of equity to assets) reflects the ability of the bank to absorb unexpected losses and is also a measure of a firm's indebtedness.
- ▶ Theoretically, there should be a negative relationship but the empirical evidence shows otherwise.
  - ▶ Berger (1995), Athanasoglou, et al. (2005), Kosmidou (2008) and Ramadan et al (2011) showed that there is a positive relationship between bank profitability and capitalization.
  - ▶ Demirguc and Huizinga (1998) show that well-capitalized banks have higher net interest margins and are more profitable
- ▶ We expect that a rise in this ratio should lead to a rise in bank profits.

15

Bank capital	CAP	Shareholders' Funds/Total Assets	(+)
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# Independent Variables

## Credit risk

Credit risk	CREDIT	Loan Loss Provisions/Total Loans	(-)
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- ▶ Examines the risk of a financial loss relating to the failure of a borrower to honor their contractual obligations.
- ▶ It reveals the extent to which banks are preparing for loan losses by building up loan-loss reserves against current income.
- ▶ Credit risk is measured as loan loss provisions to total loans as in the case of Alexiou and Sofoklis (2009), Sufian (2009), Sufian and Habibullah (2009).
- ▶ It is also a measure of the quality of the bank's loan portfolio which can ultimately affect the banks' performance.
- ▶ In the literature the results are mixed.
  - ▶ Alexiou and Sofoklis (2009) found this variable to be significant and positively related to bank profits in Greece while Sufian found that credit risk had a negative relationship on profits in Malaysia, Philippines and Korea.
  - ▶ Poghosyan and Hesse (2009) found that credit risk did not significantly affect profits in MENA countries.
- ▶ **Following Sufian (2009), a negative relationship is expected - increased exposure to credit risk is usually associated with lower bank profits.**



# Independent Variables

## Lending intensity

- ▶ Ratio of total loans to total assets
- ▶ Captures the effect which the share of loans have on bank profits.
- ▶ A commercial bank is in the business of making loans; the more loans it creates, the higher the profits should be so a positive relationship between this ratio and bank profit is expected.
- ▶ However, a large loan portfolio can lead to less bank profits if it mainly comprise of poor quality loans (i.e. a quality over quantity matters argument).
- ▶ A positive, significant ratio was found by Sufian and Habibullah (2009) on the Bangladesh banking sector while a negative relationship by Sufian (2009) on the Malaysian banking sector.
- ▶ **We expect a positive relationship between lending intensity and bank profits**

17

Lending intensity	LEND	Total Loans/Total Assets	(+)
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# Independent Variables

## Non-interest Income

- ▶ Banks also generate revenue from fee income, non-lending activities such as brokerage services and off-balance sheet activities.
- ▶ Sufian and Habibullah (2009):
  - ▶ Bangladesh economy: they expected a positive relationship, but found that this variable had a significantly negative relationship with the both variables used as bank profits (ROAA and ROAE).
  - ▶ Supports Stiroh and Rumble (2006) on US banks. He explained that “diversification benefits of the U.S. financial holding companies are offset by the increased exposure to non-interest activities, which are much more volatile but not necessarily more profitable than interest generating activities”.
- ▶ Like Sufian and Habibullah (2009) this variable will be measured as the ratio of non-interest income to total assets.
- ▶ The two main sources of non-interest income in the case of T&T are fees and commissions and foreign exchange trading earnings. It is expected that this variable will have a positive impact on profits in the case of T&T.

Non-interest income		NIITA		Non-interest Income/Total Assets		(+)
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# Independent Variables

## Cost efficiency

- ▶ Some of the main non-interest expenses incurred by T&T commercial banks include salaries and staff benefits and other operating expenses (such as depreciation, advertising, directors fees and deposit insurance premium).
- ▶ Usually cost efficiency is measured by the ratio of total expenses to total income (Alexiou and Sofoklis (2009)) or non-interest expense to total assets (Sufian (2009), Sufian and Habibullah (2009)).
- ▶ In the literature, Molyneux and Thornton (1992) found a positive relationship between staff expenses and profits which may have indicated that the higher profits may be appropriated in the form of higher payroll expenditures.
- ▶ Following Sufian (2009), the model uses non-interest expenses (operating expenses) to total assets as a measure of cost efficiency.
- ▶ Empirically, the effect of this variable on profits is mixed so the expected impact of this variable on profits is not clear.

# Independent Variables

## Macro Variables

Real GDP growth (%)	GROWTH	Inflation-adjusted growth rate of GDP	(+)
Inflation (%)	INFL	Annual Inflation rate	(+)

### ▶ GDP

▶ Economic growth should enhance bank profits through increased demand for household and business loans. These loans generate positive returns to commercial banks leading to higher profits. Moreover, in a booming economy, there should be fewer loan defaults.

▶ **Positive** (Demirguc-Kunt and Huizinga (2000)), **negative** (Sufian (2009) and (2011) on Malaysian and Philippine banks) or **no relationship** (Demirguc and Huizinga (1998), Flamini et al (2009), Naceur (2003), Sufian and Habibullah (2009))

### ▶ Inflation

▶ **Positive** impact on profits - Kosmidou et al (2005), Alexiou and Sofoklis (2009), Flamini, et al (2009), Poghosyan and Hesse (2009), Sufian (2009) and Sufian (2011)

▶ **No impact:** Naceur (2003), Sufian and Habibullah (2009) on Bangladesh

▶ Considering that the T&T banking sector is oligopolistic in nature, they can pass on any higher costs to customers.

▶ We expect a positive relationship between the inflation rate and bank profits

# Independent Variables

## Ownership

Ownership1	FOREIGN	Dummy variable that takes a value of 1 for foreign-owned banks and 0 for locally-owned banks.	(-)
Ownership2	PRIVATE	Dummy variable that takes a value of 1 for private-owned banks and 0 if government-owned.	(+)

- ▶ Capture the impact of foreign ownership on bank profits
- ▶ Demirguc and Huizinga (1998) found that in developing countries foreign banks have higher margins and profits than domestic banks.
- ▶ Seepersad (1995) found that local banks had a weaker performance than the foreign banks mainly due to cost management (since they also had favorable income generation capability), disadvantages of small size and lack of experience.
- ▶ Literature: foreign banks make greater profits
- ▶ Observations and knowledge about the sector: the locally-owned banks appear to be more profitable compared to the foreign counterparts.
- ▶ Hence, a negative relationship between FOREIGN and bank performance is expected.

# Data

- ▶ Annual reports of 5 banking groups (Consolidated data)
- ▶ Macroeconomic variables were obtained from The World Bank World Development Indicators.
- ▶ 1994 – 2015 (Novelty)

## Summary Statistics

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
ROAA	90	2.002211	0.913507	-0.36955	3.933877
ROAE	92	17.45466	8.016277	-4.04131	34.09179
SIZE	93	16.298	1.13189	13.66428	18.27085
CAP	93	0.122815	0.043138	0.049237	0.243198
CREDIT	90	0.029369	0.024407	0.002053	0.098947
LEND	90	0.452655	0.114615	0.163987	0.763743
NIETA	90	0.036289	0.007621	0.02086	0.054411
NIITA	90	0.019133	0.008238	0.000474	0.037569
GDPGROWTH	89	4.870669	4.441529	-4.38975	14.44104
INFL	89	6.265047	2.536447	3.404574	12.0485

Descriptive Statistics for our sampled banks.

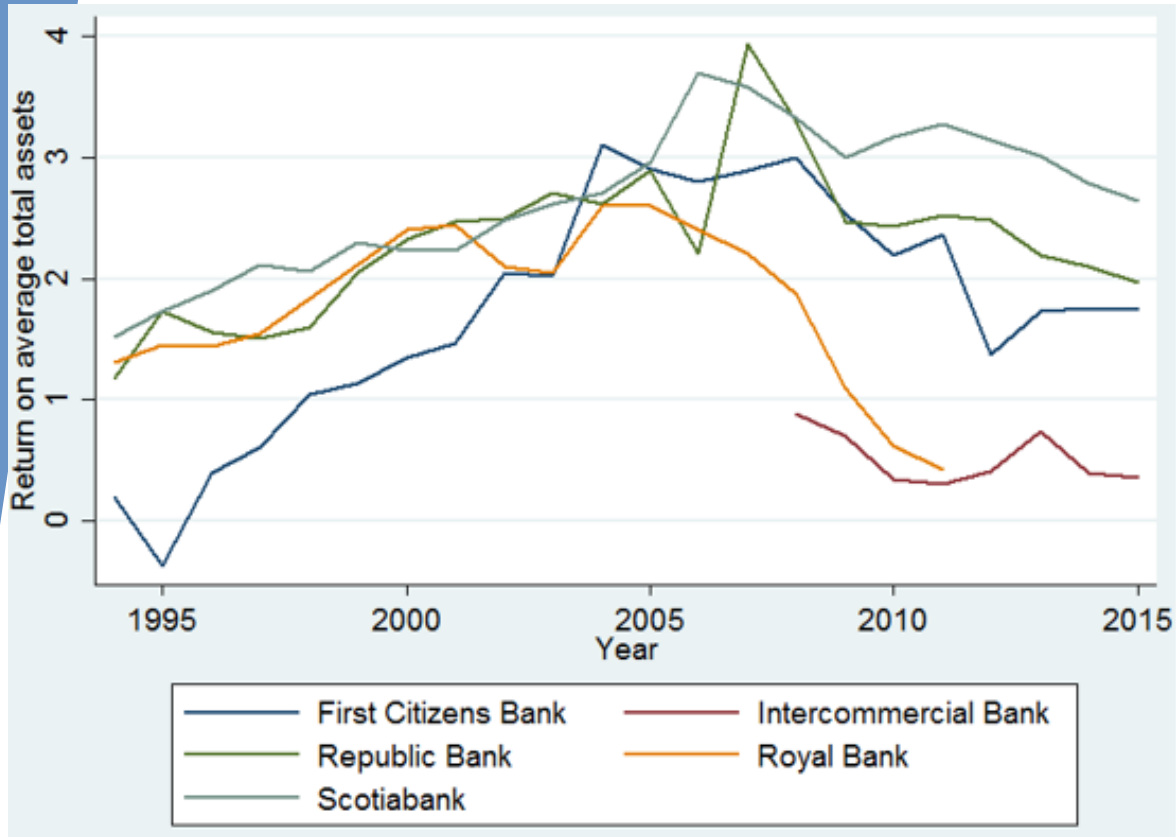
Country	Loans/Assets	Equity/Assets	Average ROE	Deposits/Loans
Argentina	0.421	0.216	-8.798	0.396
Bolivia	0.614	0.145	-0.777	0.531
Brazil	0.381	0.154	10.407	0.181
Costa Rica	0.635	0.195	12.342	0.344
Ecuador	0.481	0.220	14.170	0.124
El Salvador	0.593	0.150	0.671	0.238
Mexico	0.589	0.193	-0.631	0.228
Nicaragua	0.520	0.038	30.798	0.282
Paraguay	0.504	0.142	13.983	1.139
Peru	0.574	0.121	6.923	0.224
Uruguay	0.548	0.386	-2.391	0.000
Venezuela	0.383	0.151	38.099	1.114

Table shows the descriptive statistics for the banks in our sample.

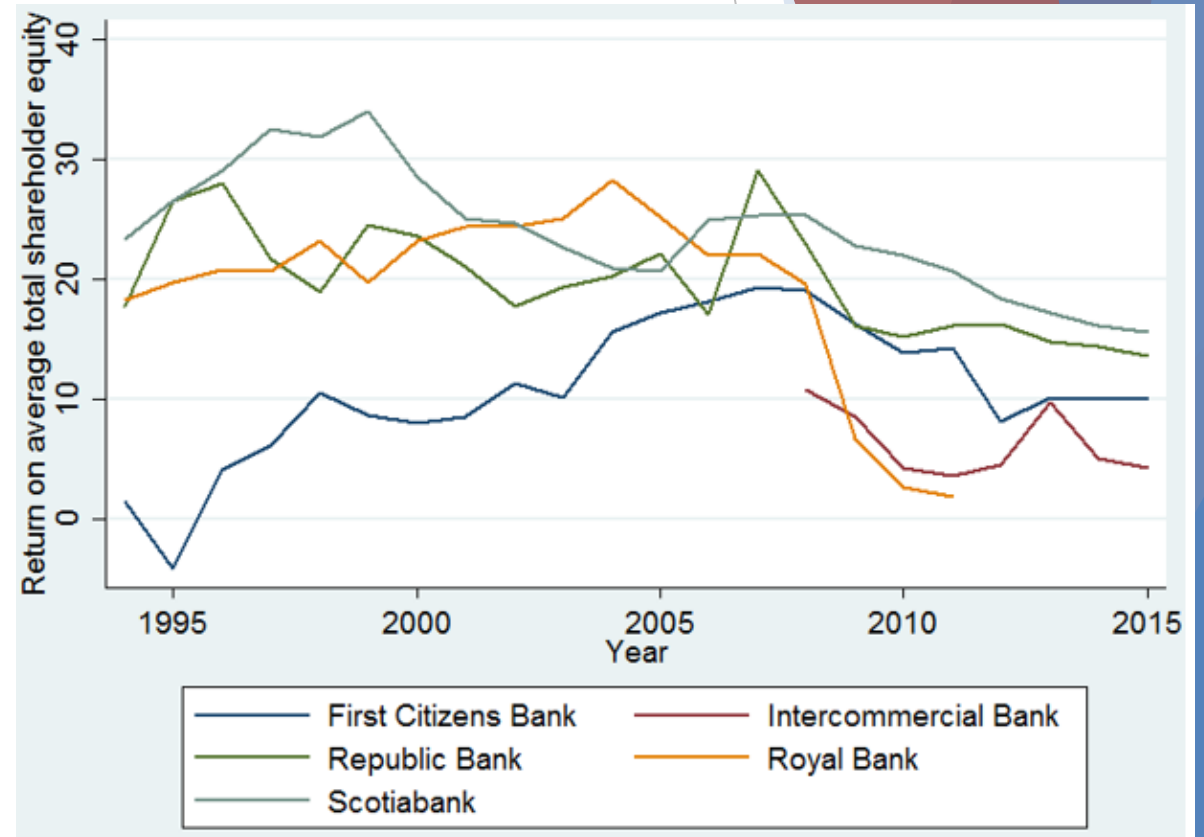
Source: Guillen, et al (2014); Means

Total Assets: 2015	TT\$ Millions	US\$ Millions
Intercommercial Bank	1,758.84	271.84
Royal Bank	86,084.93	13,305.24
Scotiabank	22,155.22	3,424.30
Republic Bank	65,992.19	10,199.72
First Citizens Bank	37,538.31	5,801.90

# Profitability Ratios of Sampled Banking Groups



Return on Assets (%)



Return on Equity (%)

# Diagnostic Tests

- ▶ Multicollinearity is not severe or non-existent.
- ▶ Heteroscedasticity present \*\*
- ▶ Cross-sectional dependence exists (Breusch-Pagan Test | Small N, large T) at the 5 and 10 per cent level of significance
  - ▶ Errors corrected for: (i) heteroscedasticity and cross-sectional dependence and (ii) heteroscedasticity only.
- ▶ Hausman Test:
  - ▶ Wooldridge's auxiliary regression for panel-robust Hausman Test
  - ▶ Hausman Test robust to general forms of spatial and temporal dependence (Hoechle(2007))
- ▶ F-test (Pooled OLS vs. Fixed Effects Model);
- ▶ Fixed effects estimation is consistent.



# Results

- ▶ Bank-specific and macroeconomic variables matter
  - ▶ Bank capital and the growth rate of GDP positively affects profits
  - ▶ Operating expenses adversely affect profits
  - ▶ Non-interest income is not significant in determining group profits
- ▶ Size does not matter.
- ▶ Domestic banks are more profitable than foreign banks. \*\*

Dependent variable:	Return on Average Assets (ROAA)		Return on Average Equity (ROAE)	
	Driscoll-Kraay Errors	White's Errors	Driscoll-Kraay Errors	White's Errors
SIZE	0.493	0.493	-0.565	-0.565
	(0.203)	(0.108)	(1.739)	(1.571)
CAP	10.925***	10.925	-31.516***	-31.516
	(1.281)	(1.469)	(11.095)	(39.303)
CREDIT	-5.278	-5.278*	-69.694	-69.694***
	(5.750)	(2.331)	(43.528)	(11.803)
LEND	0.679	0.679*	-8.813**	-8.813*
	(0.652)	(0.314)	(3.515)	(3.710)
NIETA	-38.369***	-38.369***	-122.133	-122.133
	(11.634)	(6.582)	(144.984)	(107.528)
NIITA	5.878	5.878	-198.607	-198.607
	(17.349)	(17.205)	(172.602)	(195.767)
GDPGROWTH	0.031*	0.031***	0.287*	0.287*
	(0.017)	(0.005)	(0.161)	(0.110)
INFL	0.022	0.022	0.054	0.054
	(0.018)	(0.019)	(0.151)	(0.148)
FOREIGN	-2.569***	-2.569***	-12.597***	-12.597*
	(0.321)	(0.255)	(2.856)	(4.754)
PRIVATE	0.000	0.000	0.000	0.000
	(omitted)	(omitted)	(omitted)	(omitted)
Constant	1.434	1.434	46.840	46.840
	(3.292)	(1.796)	(28.410)	(26.092)
Number of banks	5	5	5	5
Observations	85	85	85	85
R-squared (within)	0.7012	0.7012	0.5915	0.5915

Standard errors in parenthesis: \*\*\* p< 0.01, \*\*p<0.05, \*p<0.10

# Implications

- ▶ T&T banking sector is known for its stable, strong capital base – the evidence shows that this has contributed significantly to bank profits.
- ▶ High bank fees are not significant in determining banking group profits. But there is an issue.
- ▶ Individual Bank data from Bankscope data base shows a different result.
  - ▶ .

# Limitations

1. The model did not consider:

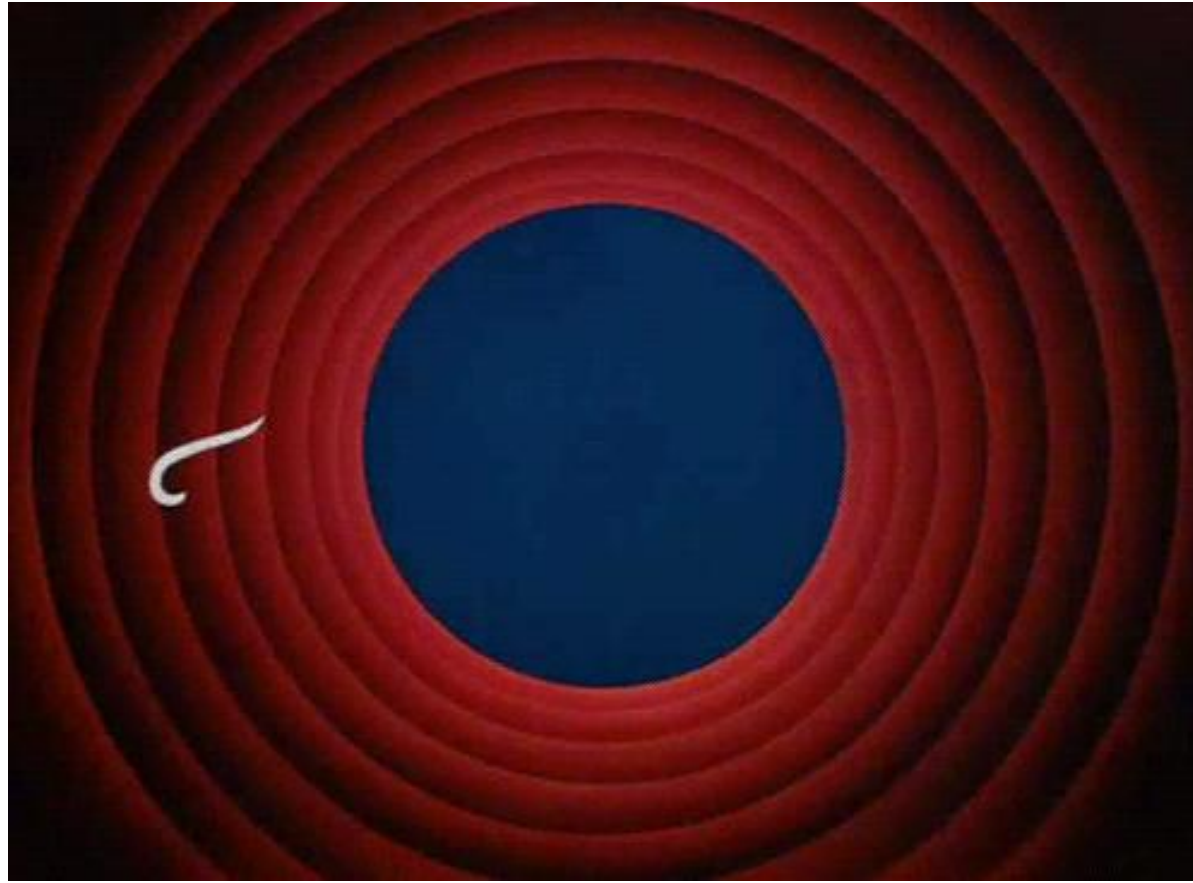
- ▶ Dynamics and persistence; Arellano–Bond GMM estimation.
- ▶ Endogeneity between the real and financial sector.

2. This study examined the banking groups (consolidated data) as a whole rather than on the commercial banks only (unconsolidated data).

- ▶ Herfindahl Hirschman Index (HHI) for industry structure cannot be computed at the national level.

# Extensions / future work

- ▶ Address the limitations
- ▶ Examine the case for the individual banks.
- ▶ Apply it specifically to all banks in the CARICOM Region.



Thank you for your attention!

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