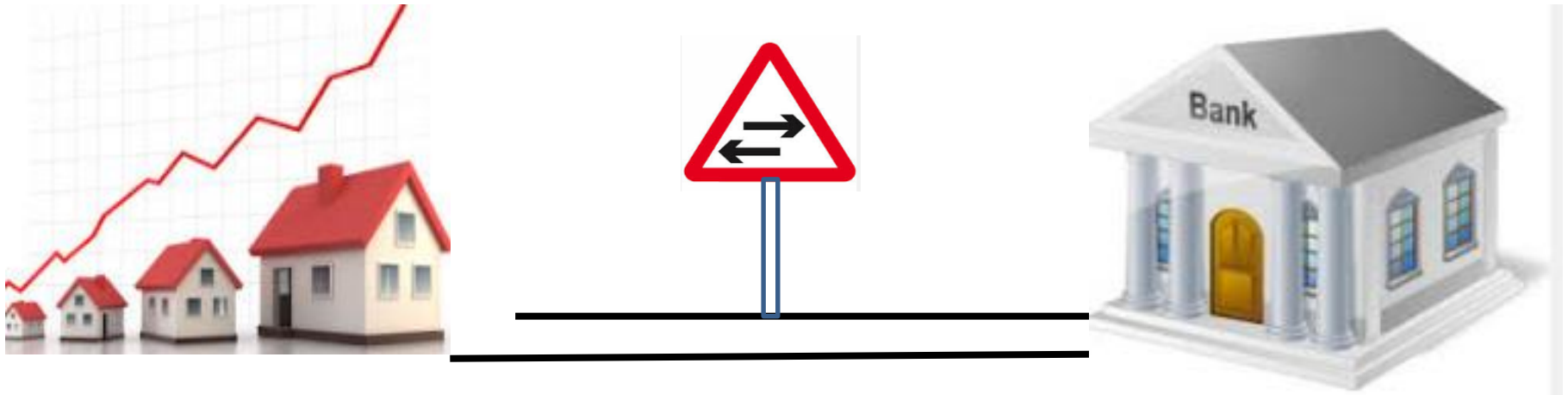**Central Bank of Trinidad and Tobago**

Examining the Trinidad and Tobago Banking Sector's Exposure to the Local Housing Market

Avinash Ramlogan and Wendy Ho Sing

Presented at CCMF Conference, 2014

19th November, 2014

1

This linkage can be seen as a two-way street

Energy-Dependent Trinidad and Tobago

- Energy accounts for about 50 per cent of total GDP and 80 per cent of total exports (Average 2003 – 2013)

- Vulnerable of shocks in international energy prices

- These shocks impact rest of economy

- Including the housing market and banking sector.

Goal of Paper

- To assess the extent to which the banking sector in Trinidad and Tobago is exposed to the local housing market.

- The analysis covers the period Q2:1995 – Q2:2014

- Macro perspective

- Is there evidence of over-exposure to the local housing market?

1. Why this Paper?

- Prolonged ultra-low interest rate environment

- Persistent growth in mortgage lending

- Recent recovery of local house prices.

- Dearth of literature on local housing market.

Outline of Paper

1. Introduction

2. Why this Study?

3. Literature Review

4. Structure: Housing Market and Related Financing System

5. Developments in the Housing Market and bank credit

6. An Assessment Exposures

7. Conclusion and Recommendation

2. Literature Review

Micro Perspective

Use of detailed data
-Models of real estate loan delinquency

E.g.
Quigley et al(2000)
Avery et al (1996)
Archer (1998)
Hilaire et al (2011)

Macro Perspective

Aggregate data
e.g. Boom-bust housing cycles

E.g.
IMF (2003)
BIS (2001)
Claessens et al (2008b)
Burnside et al (2011)
Auguste et al (2011)
Hofmann 2001
Bordo and Jeanne 2002
Reinhart and Rogoff 2009

Macro-Micro Perspective

Attempt to empirically link housing market developments to bank distress

E.g.
Igan and Pinheiro (2009)

3. Public policy and housing supply

Public Sector plays a key role in the supply of housing as well as in the financing of housing in Trinidad and Tobago
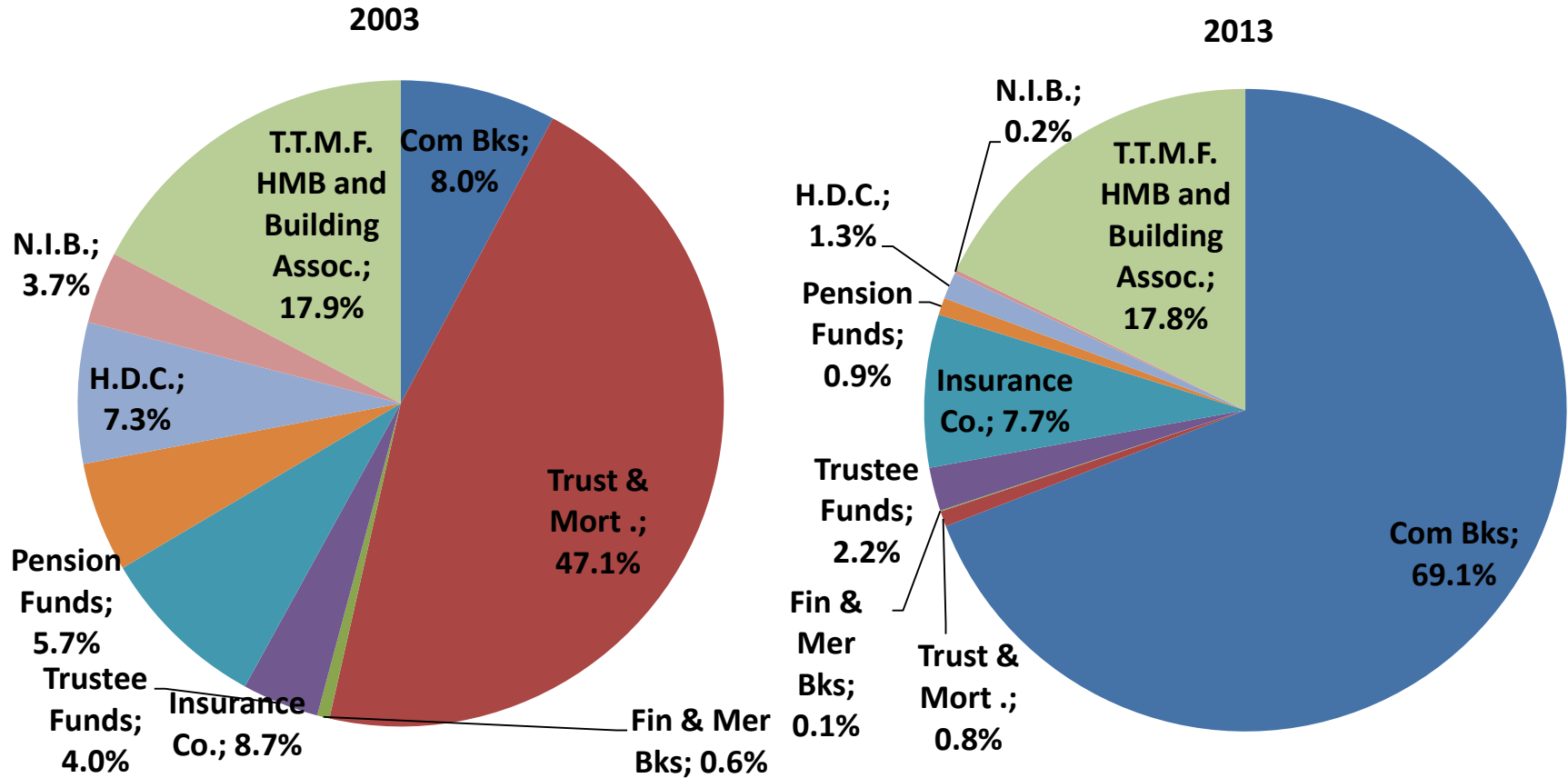
3. Robust financing supply and sources in place

Private Sector	Public Sector
Commercial Banks	Trinidad and Tobago Mortgage Finance Company
Trust and Mortgage Companies	Home Mortgage Bank
Life Insurance Companies	
Credit Unions	
Pension Plans	

3. Market Share by type of Institution

2003

- Com Bks; 8.0%
- Trust & Mort.; 47.1%
- Fin & Mer Bks; 0.6%
- Insurance Co.; 8.7%
- Trustee Funds; 4.0%
- Pension Funds; 5.7%
- H.D.C.; 7.3%
- N.I.B.; 3.7%
- T.T.M.F. HMB and Building Assoc.; 17.9%

2013

- N.I.B.; 0.2%
- H.D.C.; 1.3%
- Pension Funds; 0.9%
- Insurance Co.; 7.7%
- Trustee Funds; 2.2%
- Fin & Mer Bks; 0.1%
- Trust & Mort.; 0.8%
- Com Bks; 69.1%
- T.T.M.F. HMB and Building Assoc.; 17.8%

Source: Central Bank of Trinidad and Tobago, Annual Reports, Author's Estimates

4. Developments in the Housing Market and Related Financing Activities

4.1 Trends in House Prices

WTI Crude Oil Price vs. Median House Price
/ In terms of 2003 constant prices/
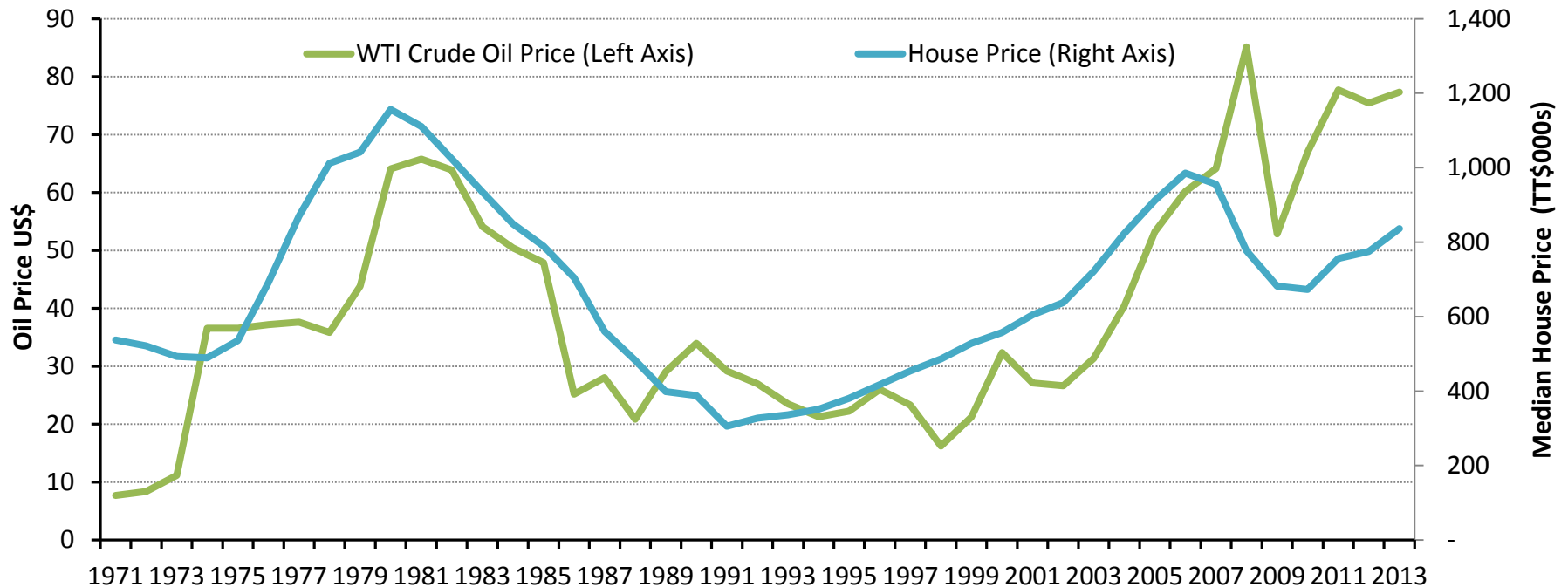
Source: Central Bank of Trinidad and Tobago's Handbook of Key Economic Statistics, AREA and authors calculations.
Note: The real crude oil price was found by deflating the nominal crude oil price using US Consumer Price Index. The real house price was calculated by deflating the nominal median estimated price by the TT Retail Price Index (core). The base year was 2003 for both indices.

4.2 Trends in Home Ownership and Housing Affordability

Country Comparison: Home Ownership Rates

Country	Home Ownership Rate (%)	Date of Information
Developed Countries		
United Kingdom	66.7	2012
Canada	69.0	2011
United States	64.7	Q2:2014
Spain	78.9	2012
Developing Countries: Caribbean		
Bahamas	57.7	2001
Jamaica	63.0	2008
Suriname	62.4	1999
Trinidad and Tobago	78.7	2011
Developing Countries: Latin America		
Argentina	72.2	2003
Brazil	74.4	2008
Chile	71.3	2003
Uruguay	67.0	2004

Housing Affordability and Compensation of Employees to GDP Ratios
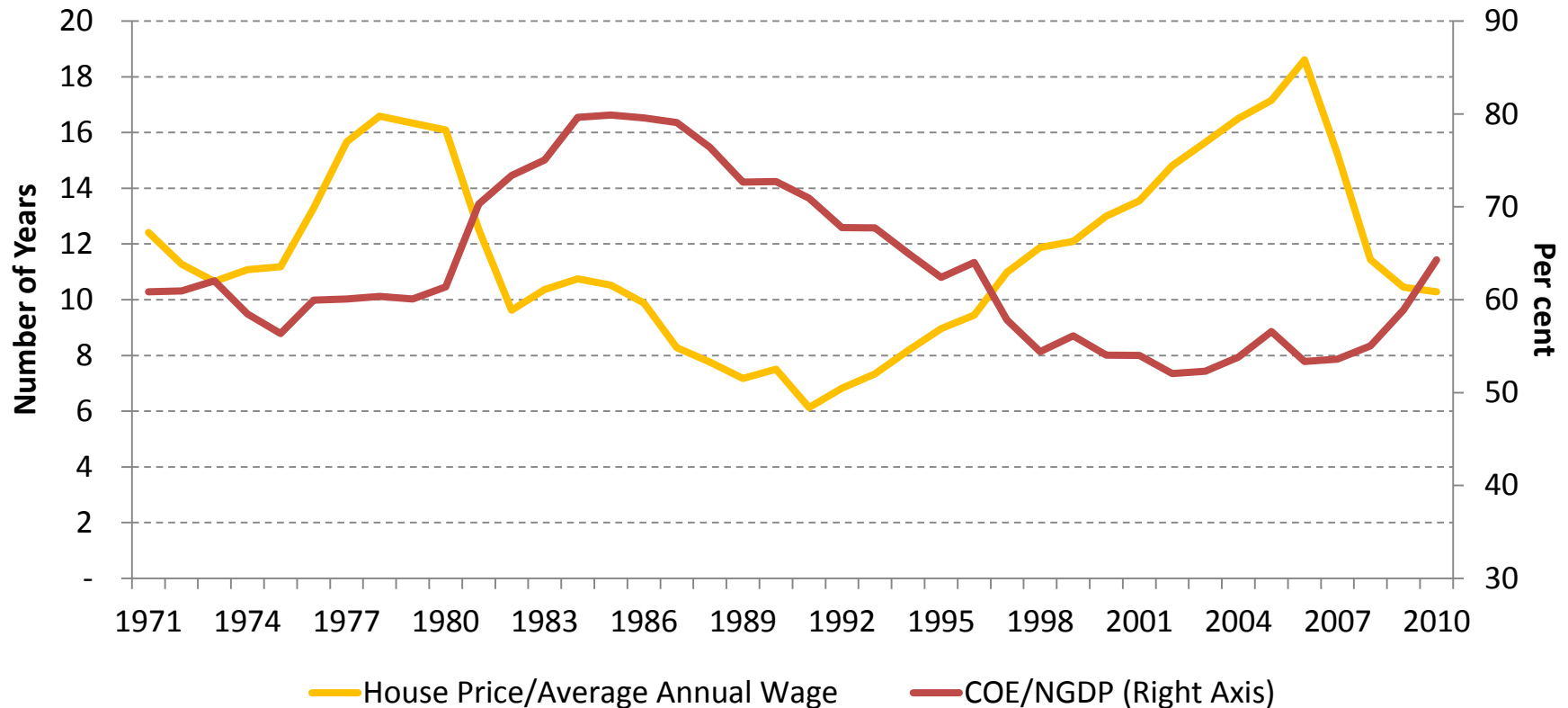
Source: Trinidad and Tobago Central Statistical Office, Handbook of Key Economic Statistics, authors' estimates.
Note: Affordability Ratio = Median House Price/Average Annual Compensation per employee (Non-energy sector).
COE/NGDP Ratio = Compensation of Employees in Non-Energy Sector/Non-energy GDP
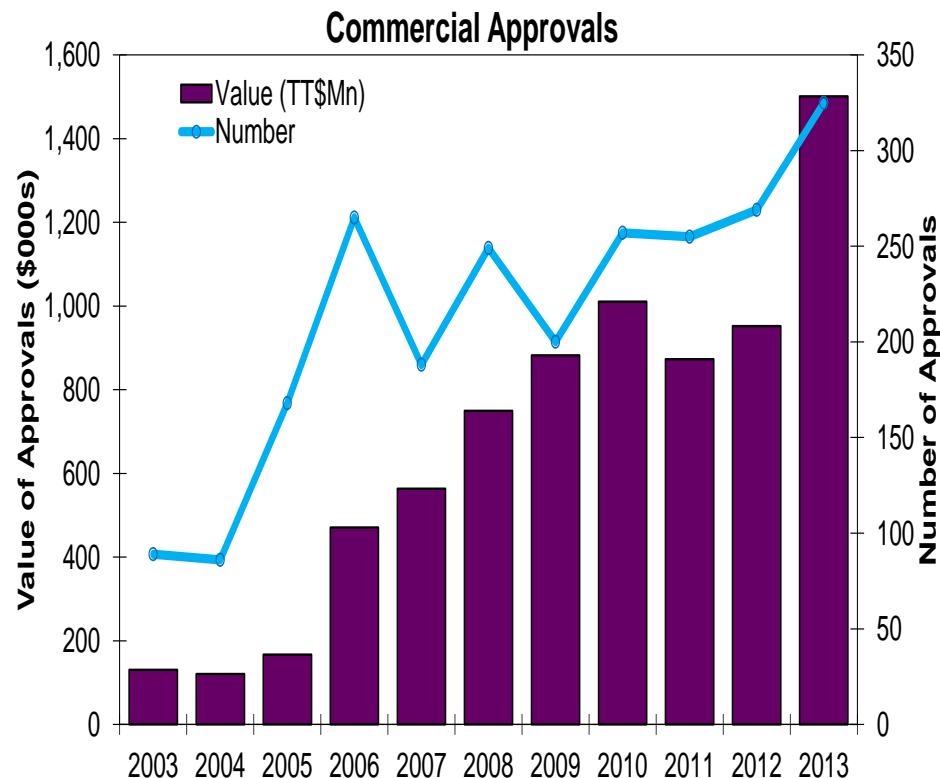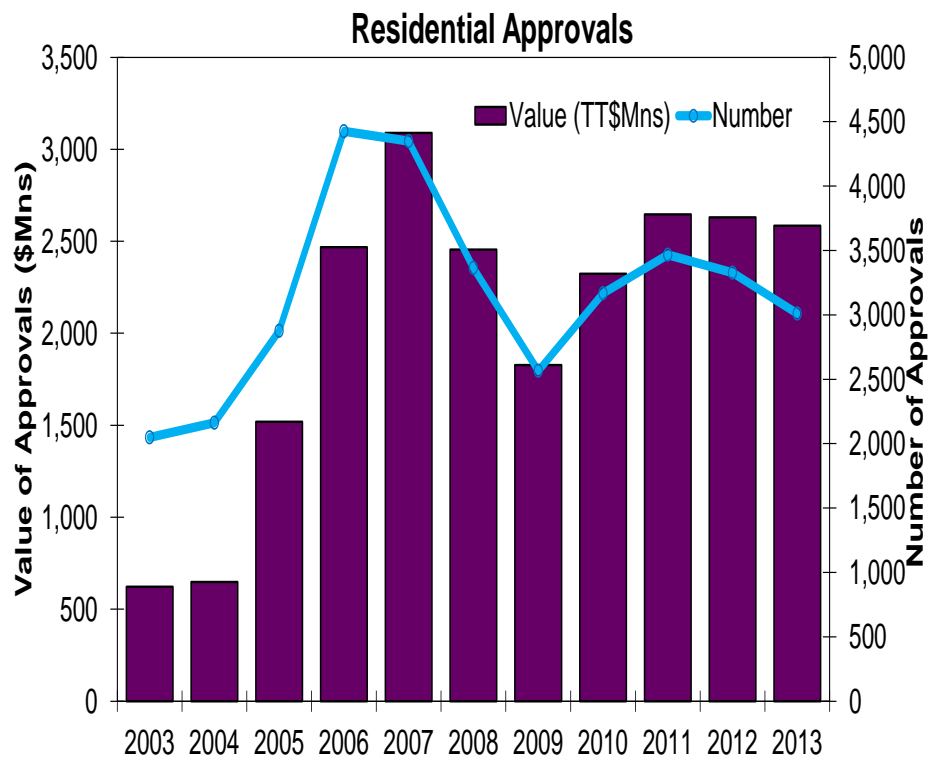
4.3 Trends in Lending

Consolidated Financial System:
Growth in Consumer, Business and Mortgage Credit
/Per Cent/
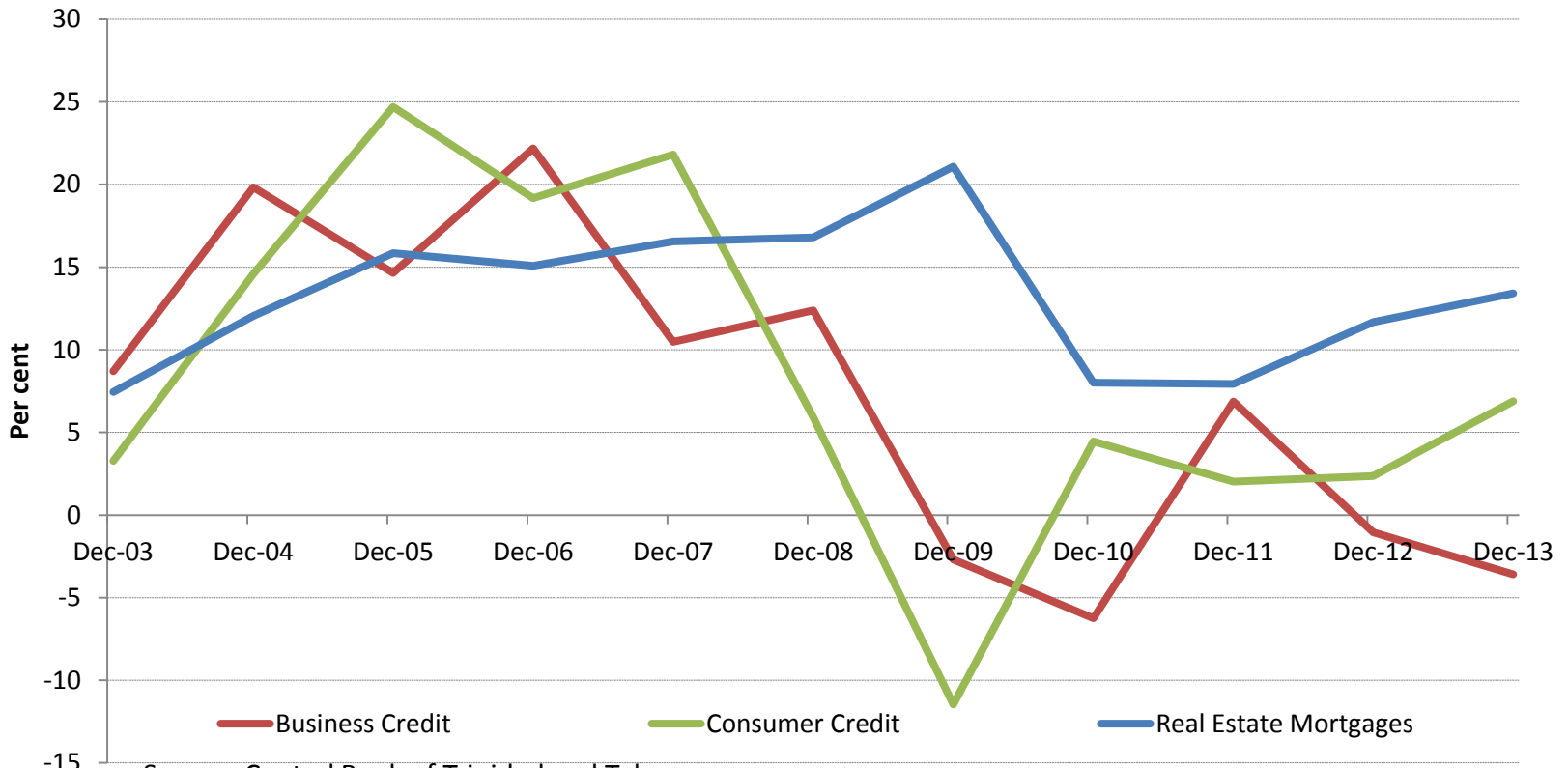
Source: Central Bank of Trinidad and Tobago

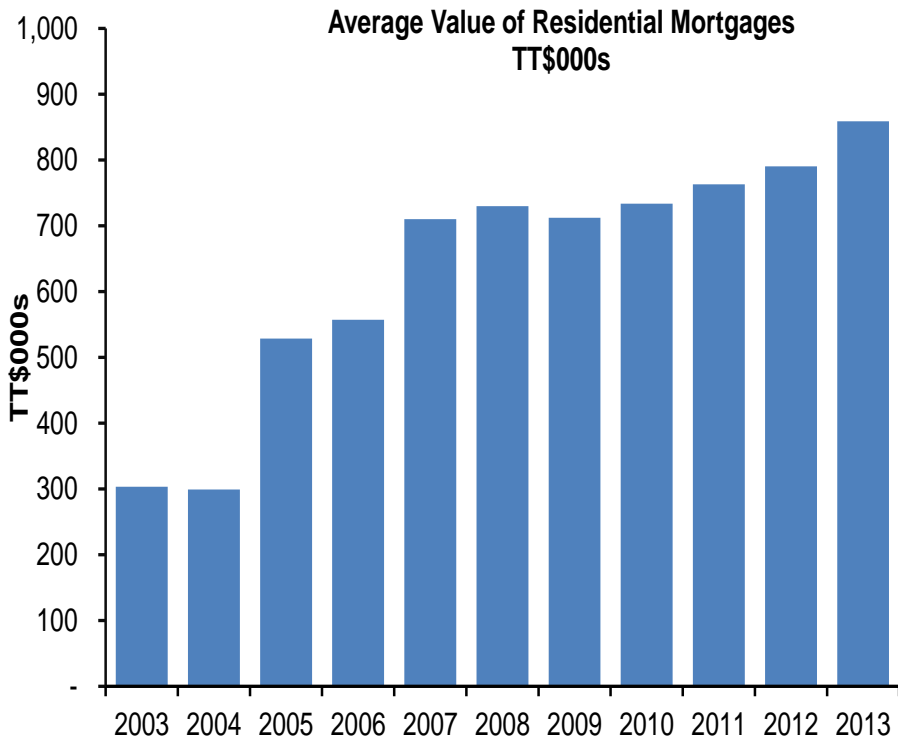Banking Sector: Residential and Commercial Mortgage Approvals

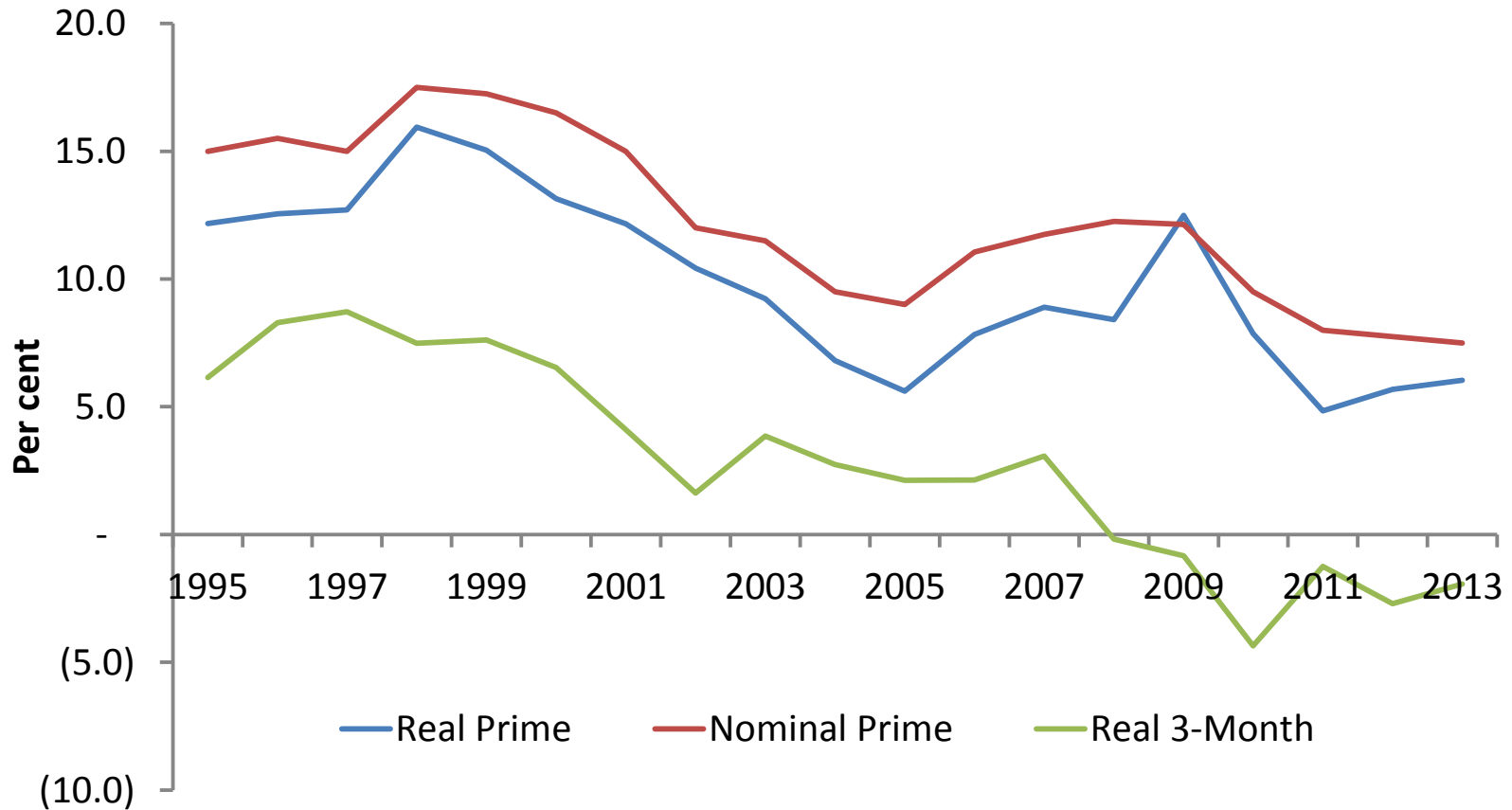Source: Central Bank of Trinidad and Tobago

4.3 Trends in Lending (Cont'd)

Consolidated Banking System: Average Mortgage Size
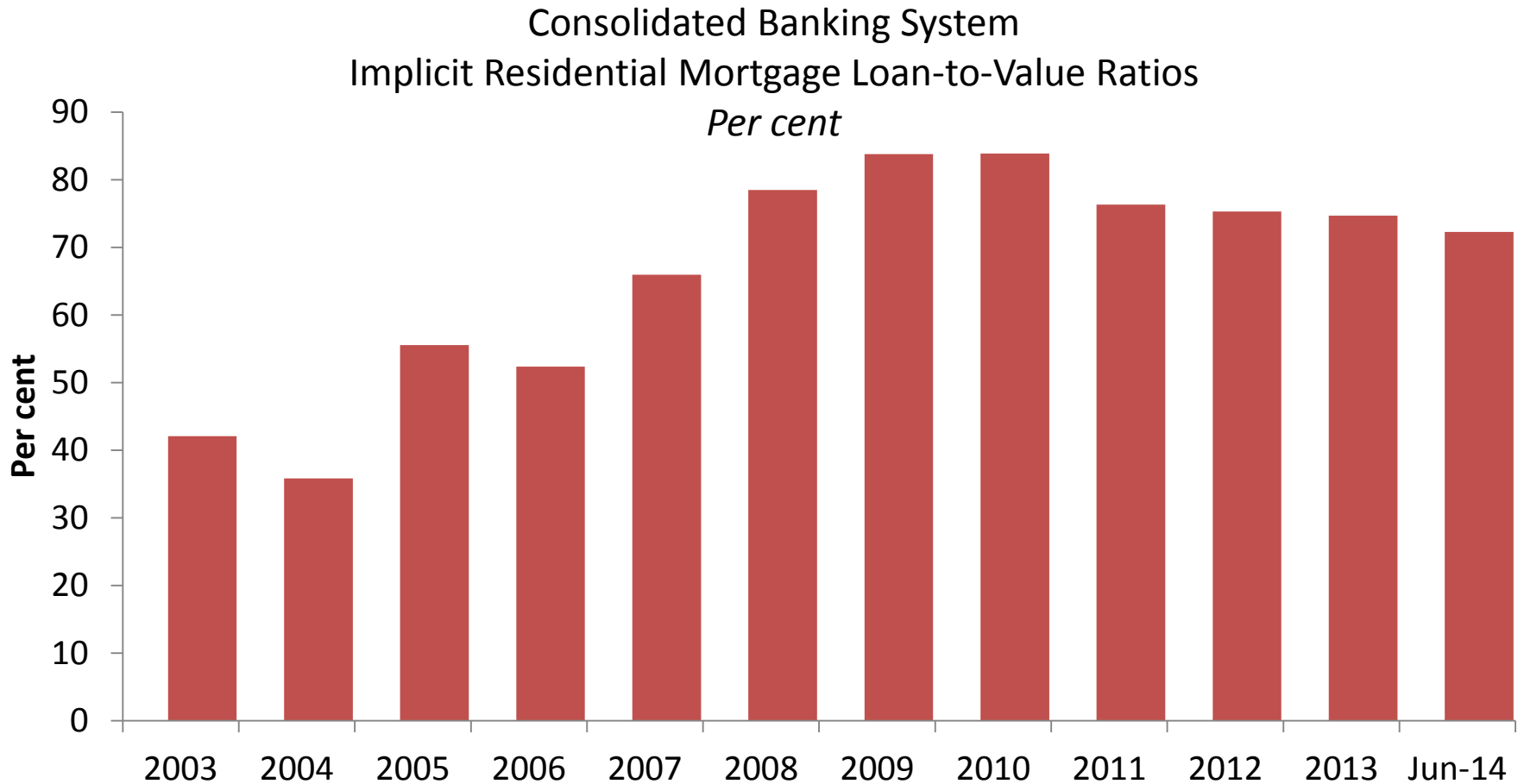

Source: Central Bank of Trinidad and Tobago

4.3 Trends in Lending (Cont'd)

Commercial Banks: Nominal and Real Prime Lending Rate
/Per cent Per Annum/

Source: Central Bank of Trinidad and Tobago

4.3 Trends in Lending (Cont'd)

Consolidated Banking System
Implicit Residential Mortgage Loan-to-Value Ratios
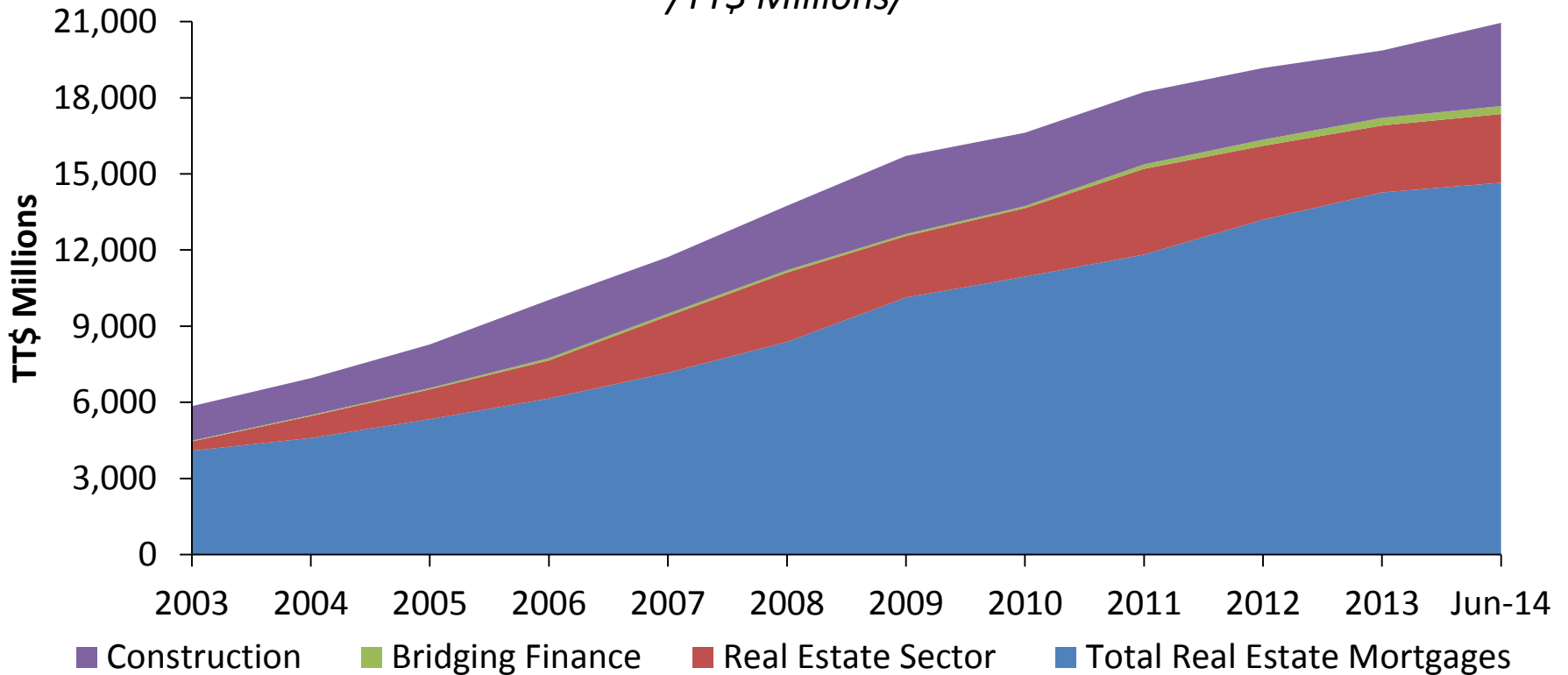*Per cent*

Source: Author's Calculations
Note: The implicit loan-to-value ratio was calculated as the average value of the mortgage divided by the estimate median house price.

5. An Assessment of Housing and Real Estate-Related Exposure

5.2 Trends in Exposure

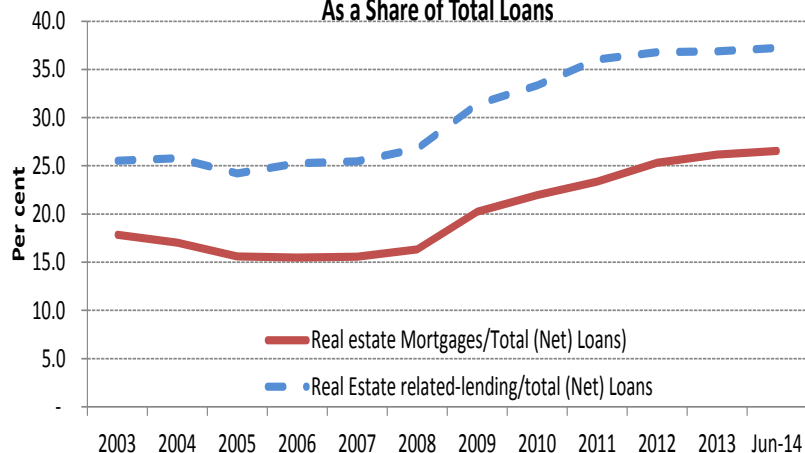**Banking Sector: Stock of Real Estate-Related loans**
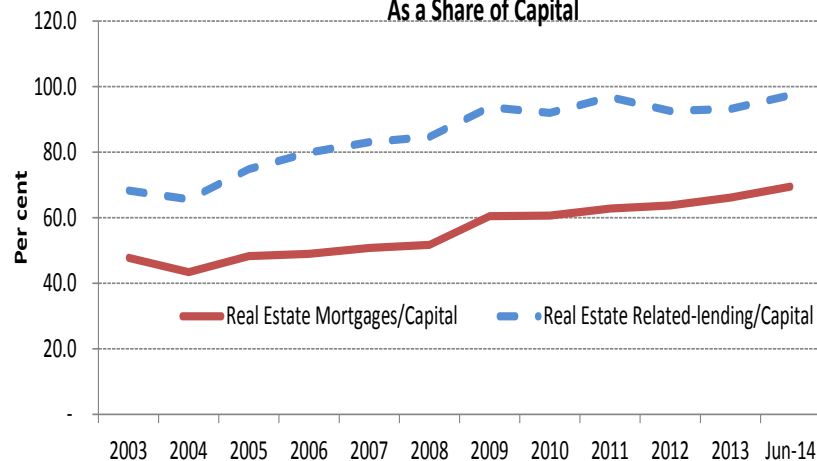*/TT$ Millions/*

Source: Central Bank of Trinidad and Tobago.

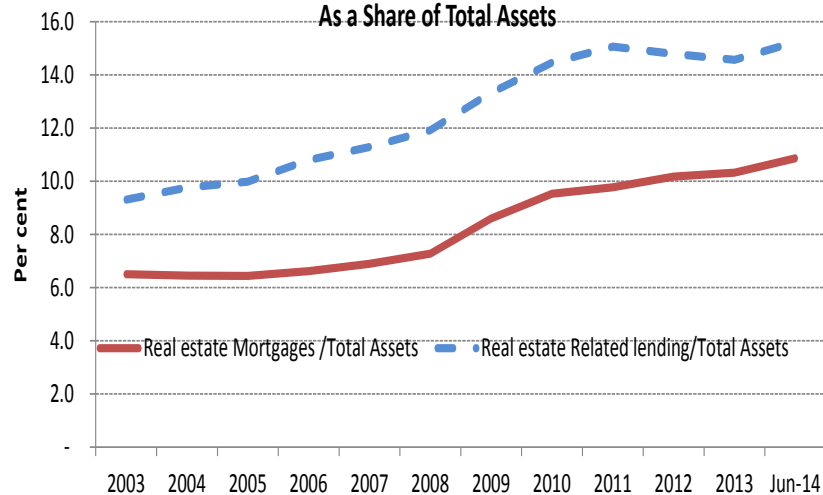# Banking Sector: Indicators of Real Estate Exposure

/Per cent/

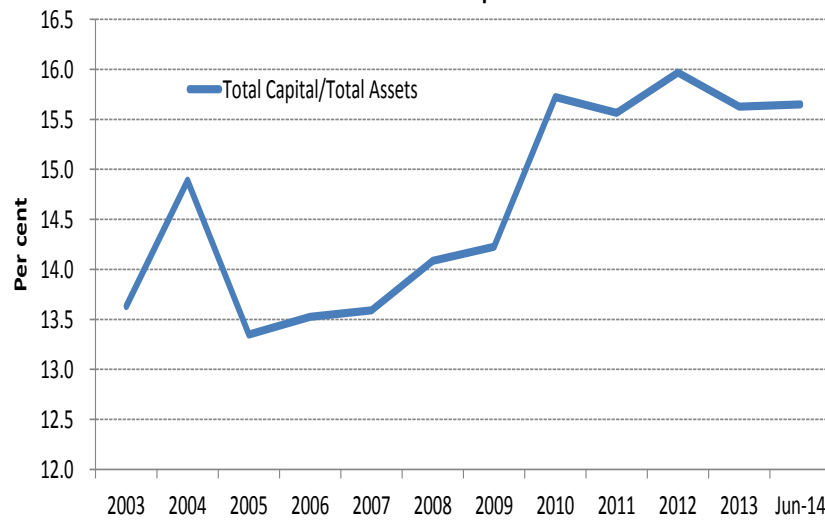Chart 5.2.2a: Stock of Mortgages and Real Estate-Related Loans As a Share of Total Loans

- Real estate Mortgages/Total (Net) Loans
- Real Estate related-lending/total (Net) Loans

Chart 5.2.2b: Stock of Mortgages and Real Estate-Related Loans As a Share of Capital

- Real Estate Mortgages/Capital
- Real Estate Related-lending/Capital

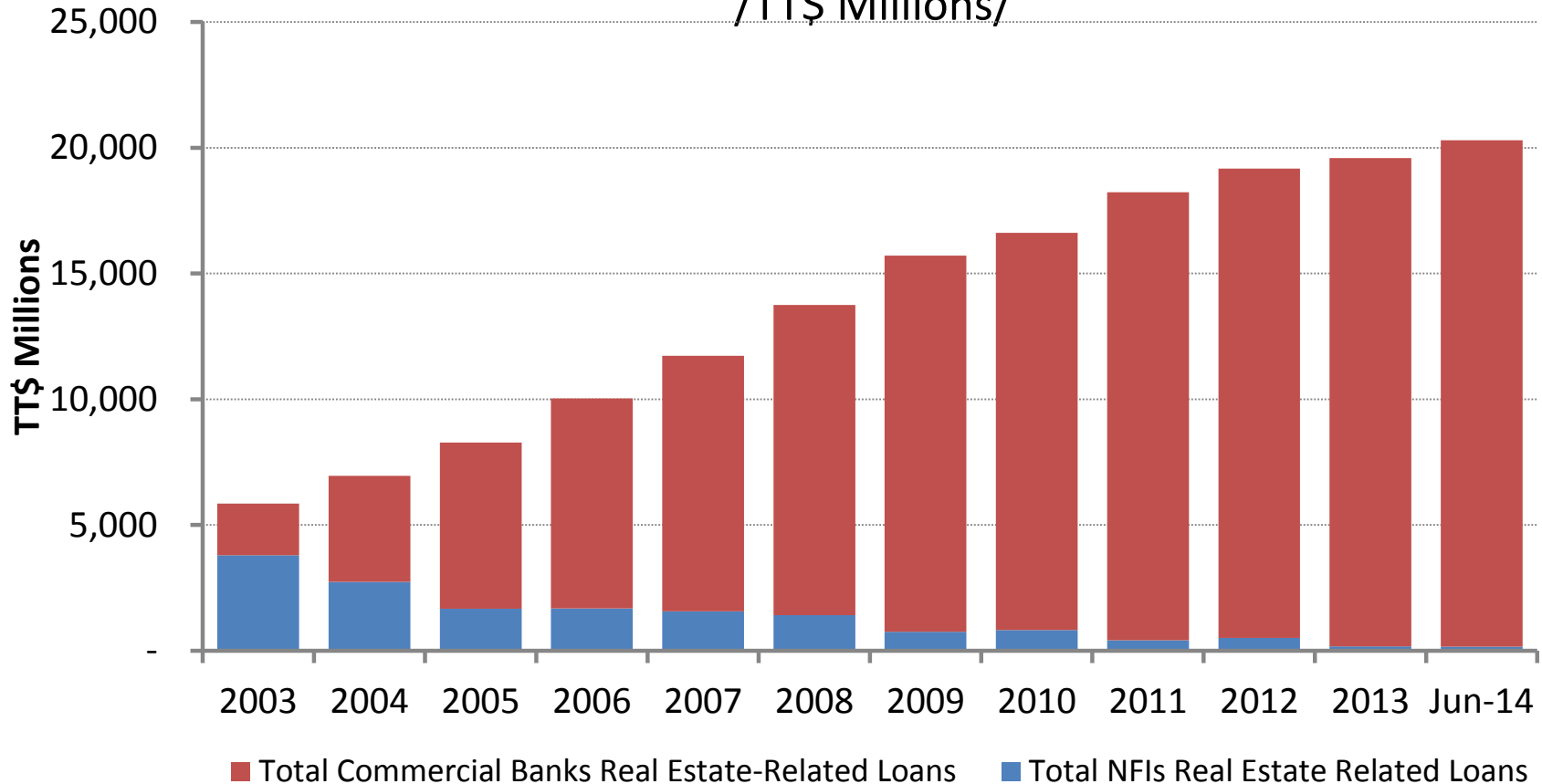Chart 5.2.2c: Stock of Mortgages and Real Estate-Related Loans As a Share of Total Assets

- Real estate Mortgages /Total Assets
- Real estate Related lending/Total Assets

Chart 5.2.2d: Ratio of Total Capital to Total Assets

- Total Capital/Total Assets

Banking Sector: Stock of Real Estate-Related loans
/TT$ Millions/

Source: Central Bank of Trinidad and Tobago

Stock of Mortgages and Real Estate-Related Loans
As a Share of Total Loans
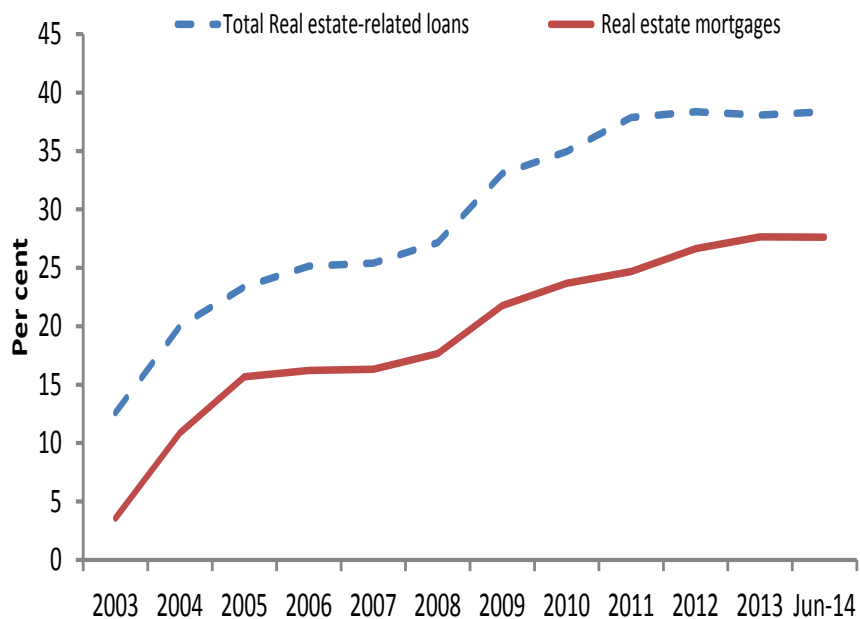*/Per cent/*

Chart 5.2.4a Commercial Banks

- - - Total Real estate-related loans   —— Real estate mortgages

Chart 5.2.4b: Non-Bank Financial Institutions

—— Real estate Mortgages/Total (Net) Loans
- - - Real Estate related-lending/total (Net) Loans

Source: Central Bank of Trinidad and Tobago

Stock of Mortgages and Real Estate Related Loans
As a Share of Total Capital
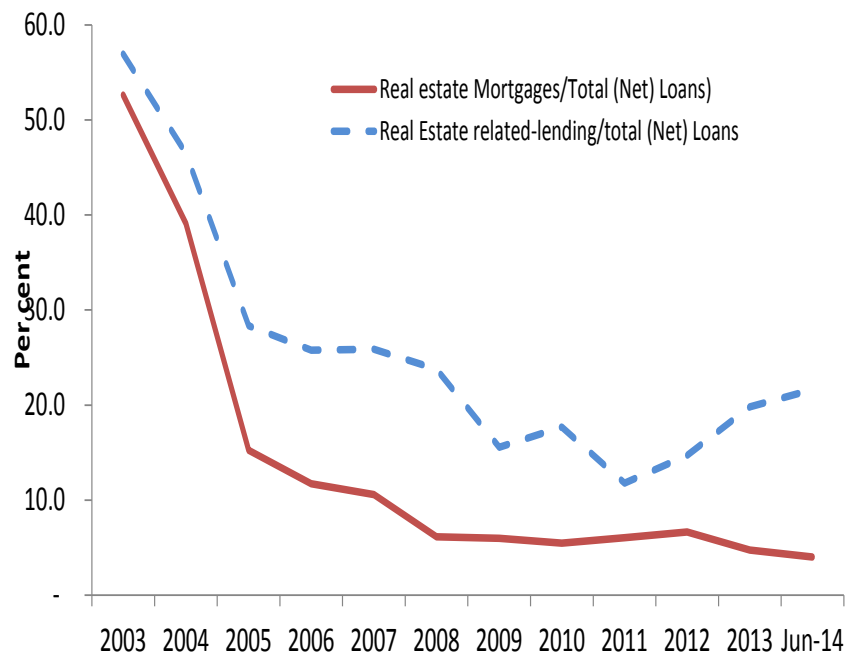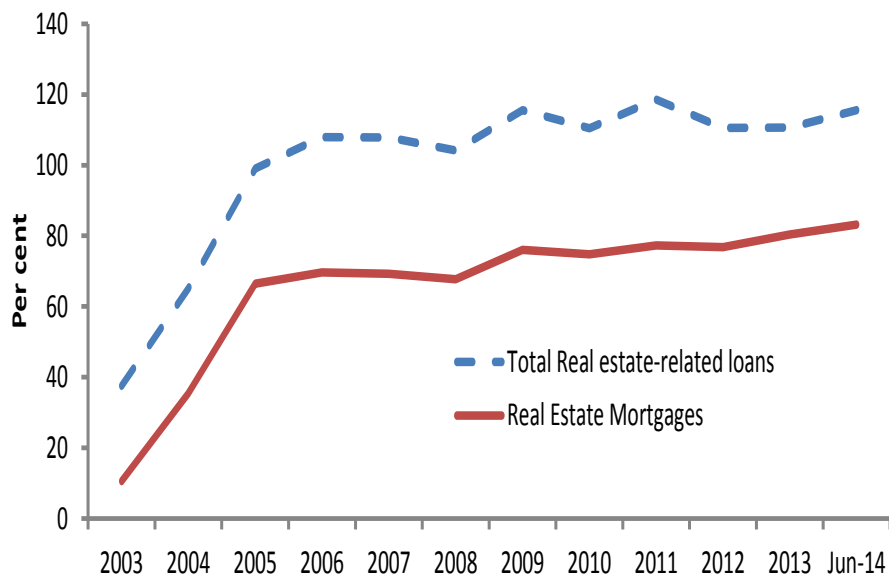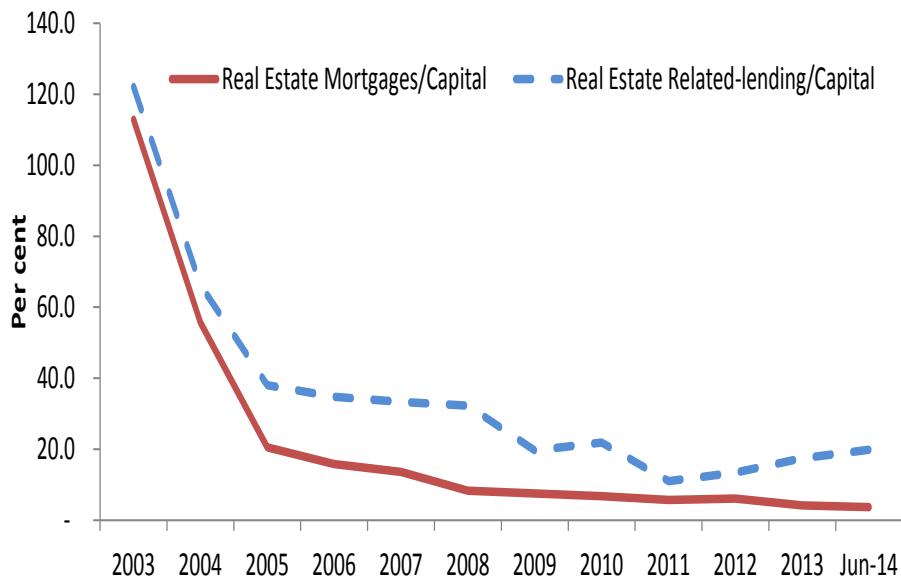*/Per cent/*

Chart 5.2.5a: Commercial Banks:

Chart 4.2.5b: Non-Bank FInancial Institutions

Source: Central Bank of Trinidad and Tobago

5.2 Trends in Exposure (Cont'd)

Stock of Mortgages and Real Estate-Related Loans
As a share of Total Assets
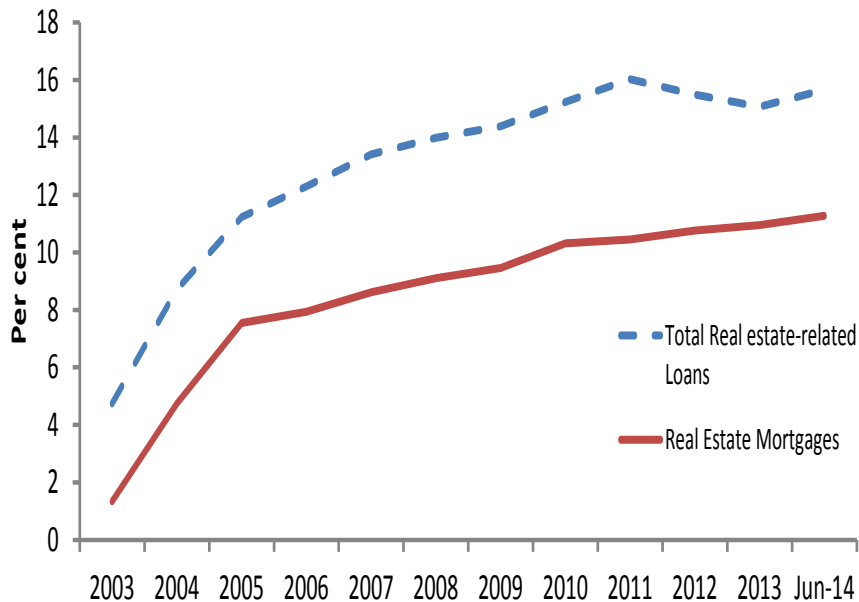*/Per cent/*
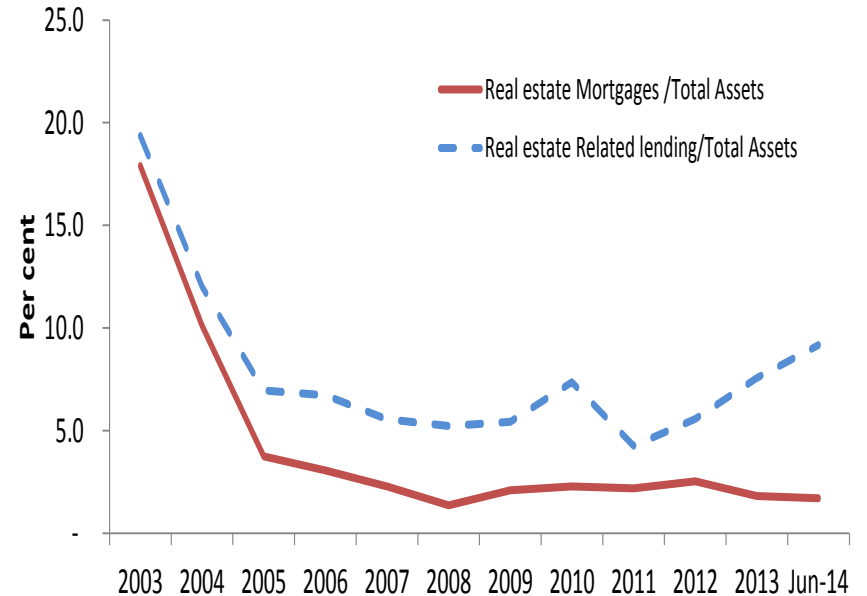

Chart 5.2.6a: Commercial Banks
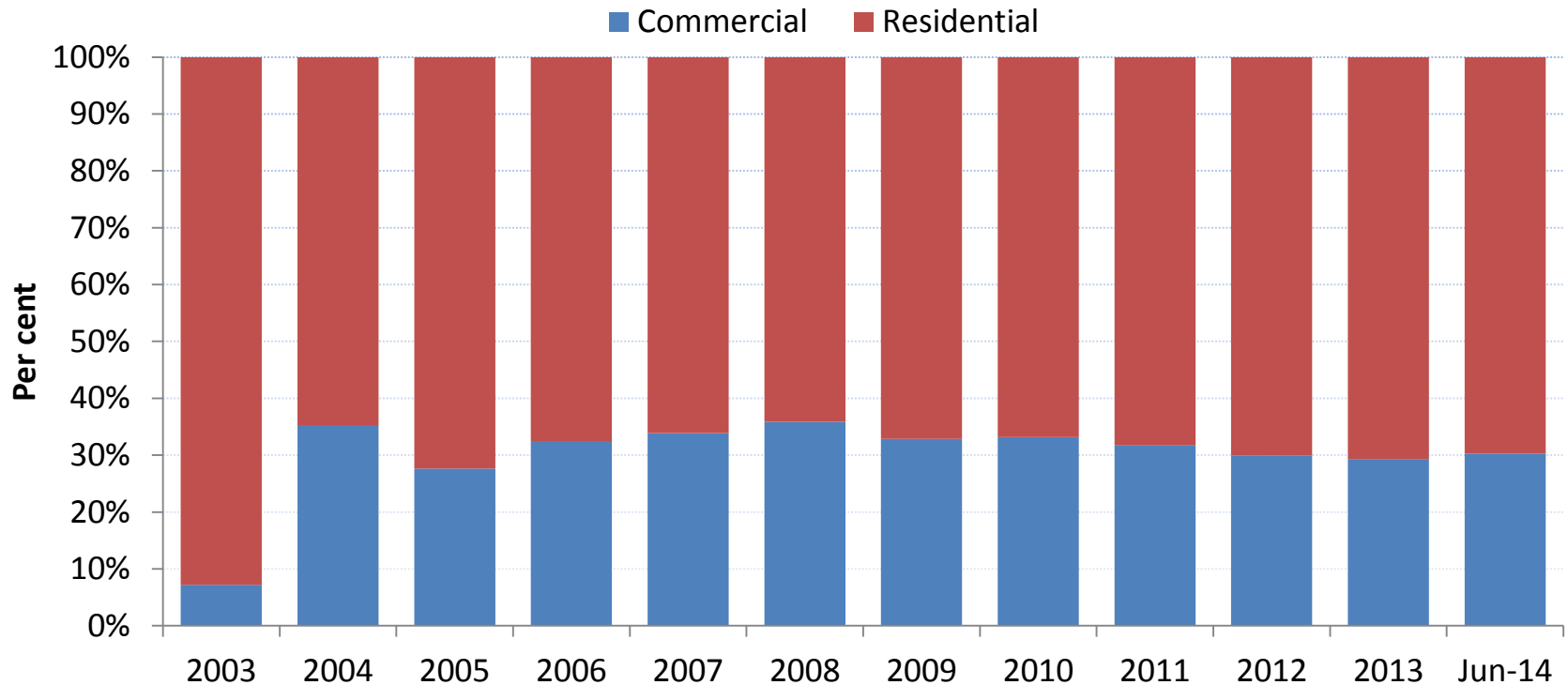
Chart 5.2.6b: Non-Bank Financial Institutions
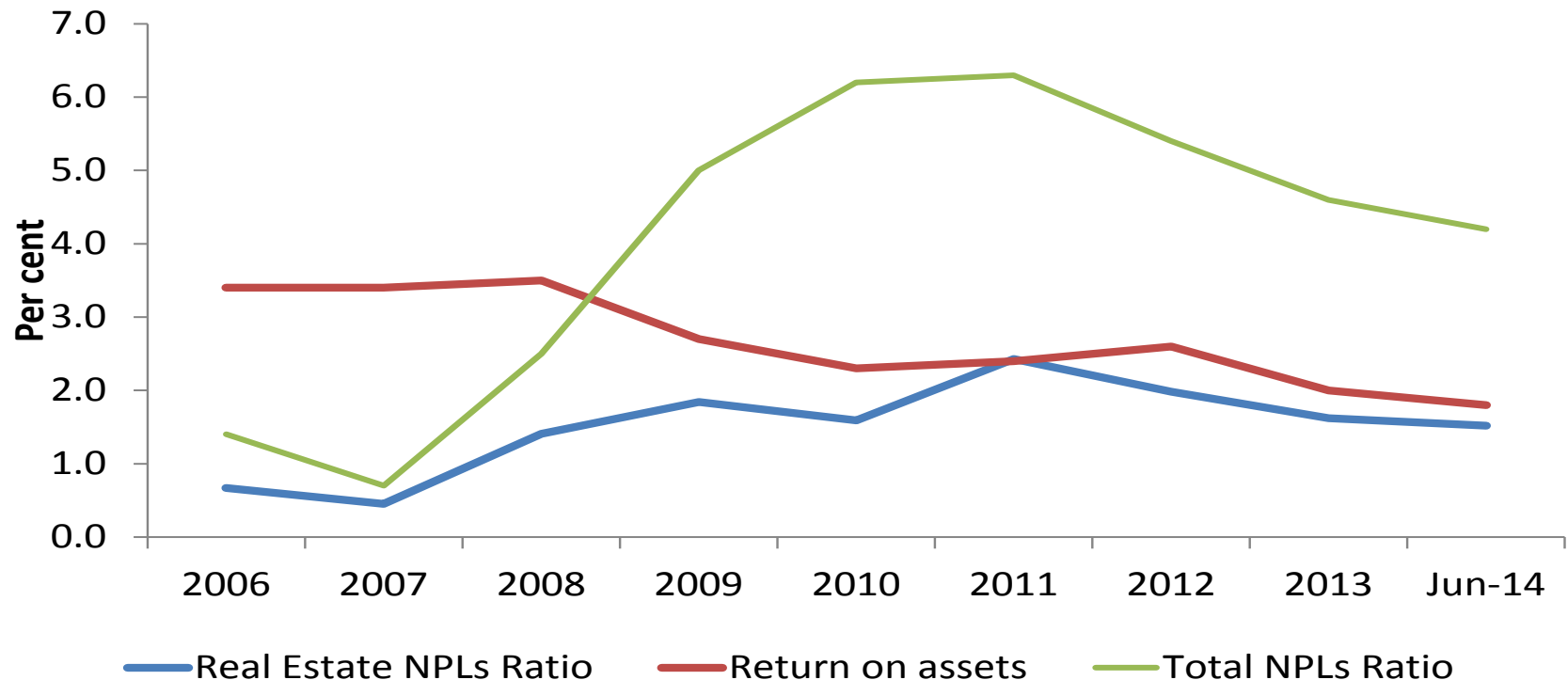
Source: Central Bank of Trinidad and Tobago

5.2 Trends in Exposure (Cont'd)

**Commercial Banks' Real Estate Mortgages Outstanding
Share of Residential vs. Commercial**
/Per cent/

5.2 Trends in Exposure (Cont'd)

Commercial Banks: Return-on-Assets and NPL Ratios
/Per cent/

Source: Central Bank of Trinidad and Tobago
Notes: 1. Real Estate NPLs Ratio = Real Estate Loans past due 90 days and over divided by Total Real Estate Loans, and 2. Profit after tax divided by Average Total Assets

5.3 Credit Risk Stress-Testing

Commercial Bank Sub-Sector
Stress-Tests Results on Mortgage and Real Estate-Related Portfolios as at June-2014
/Per cent/

Shock Parameter/Increase in Non-Performing Loans	30	40	50
Pre-Shock CAR	23	23	23
Pre-Shock CAR Adjusted for under-provisioning	21.2	21.2	21.2
Decline in the CAR	2	2.6	3.2
Post-Shock CAR	19.3	18.6	18.0

Source: Central Bank of Trinidad and Tobago

5.4 Relationship between mortgage exposure and macroeconomic variables

- The empirical model is based on the following long-run relationship:

$$XP = \alpha + \beta_1.NY + \beta_2.R + \beta_3.P + \varepsilon$$

- where XP is (log) real mortgage credit relative to total credit to the private sector, NY is (log) real output, and R is the (log) real rate of interest, and P is (log) of real property price.

5.4 Cointegration Analysis

- An Analysis of the relationship between mortgage exposure and these variables (if any) is conducted using the Johansen multivariate approach to cointegration

- Sample period Q2:1995 – Q2:2014

- All the variables we tested for unit roots and found to be I(1) at their levels but I(0) after differencing once.

5.4 Johansen Test Results

H_0 :rank = p	Trace Statistic	0.05 Critical Value	Max Eigenvalue Statistic	0.05 Critical Value
$p \leq 0$	49.44*	47.86	21.69	27.58
$p \leq 1$	27.75	29.79	18.38	21.13
$p \leq 2$	09.36	15.49	07.14	14.26
$p \leq 3$	02.23	3.84	02.23	03.84

Note: * Existence of cointegration at 5% significance level.

5.4 Long-run Relationship

Models (Lags)	Long–Run Equation	Loading Coefficient (α)
Model (2)	XP = 0.34NY − 0.91R − 1.34P + 20.85 (1.98) (3.42) (5.23)	-0.08 (-3.57)

The table displays the test statistic of the Johansen trace statistic tests for cointegration, the identified long-run relationship and the loading coefficient (α) in the VECM equation for bank asset exposure; lags () indicate the lag-order of the underlying VAR. XP represents the log of banking sector mortgage asset exposure, Y the log of index of domestic production (non-energy), R is the log of real interest rate and, P the log of the real house price. The long-run and loading coefficient is significant at least at the 5 % level.

5.4 Short-Run Dynamics
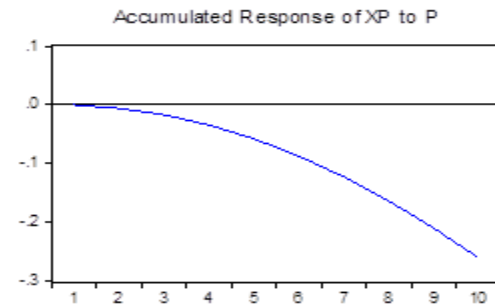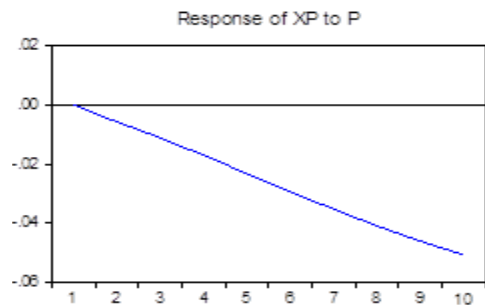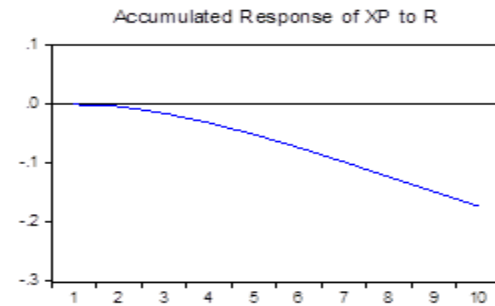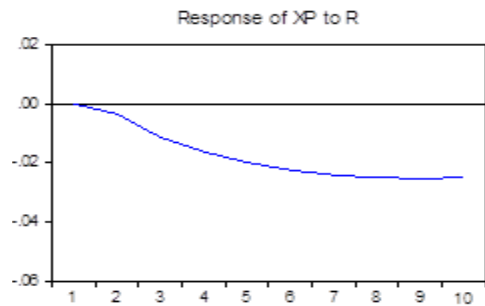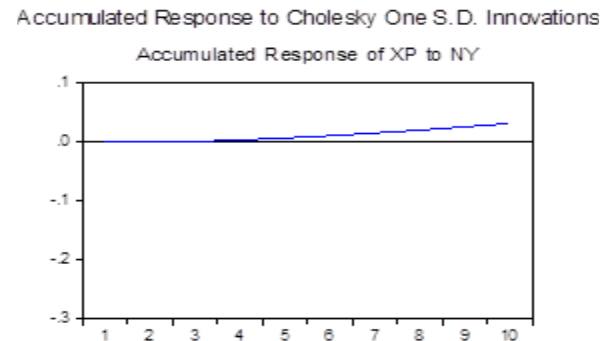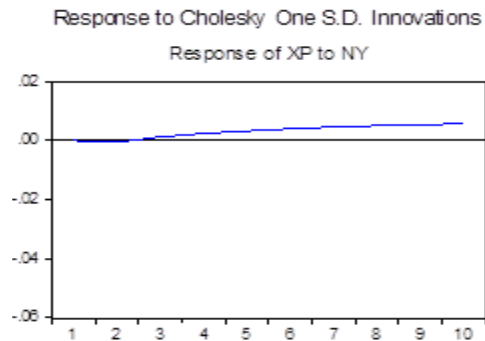
6. Conclusions

- Exposure to the local housing market in the banking sector trended upwards in recent years.

- Capital adequacy ratio (CAR) for the commercial bank sub-sector, is 23 per cent (Adjusted CAR 21.2 per cent) as at June 2014.

- Stress-tests show a fall in the CAR of 3.2 per cent to 18 per cent if house prices collapse by 50 per cent

- No major risks, at least over the short-term

6. Conclusions (Cont'd)

- House Prices (in real terms) have been appreciating in the local market. The price as at June-2014 is 10 per cent below the peak of 2006, and 22.9 per cent below the peak of 1979

- Low mortgage rates stimulating mortgage demand and exposure to the housing market rising

6. Recommendations

- Develop a comprehensive database to monitor and assess housing and real estate related activities.

- Introduce a housing and real estate stress-testing guideline.

End of Presentation