CENTRAL BANK OF TRINIDAD AND TOBAGO

AN ANALYSIS OF THE MUTUAL FUNDS INDUSTRY IN TRINIDAD AND TOBAGO: WITH REFERENCE TO THE TTUTC AND COMMERCIAL BANKS FUNDS

By: Avinash Ramlogan, Alon Dhanessar and Charissa Mooteeram

Abstract

This paper analyses potential risks to financial stability in the local mutual funds industry and the actions that may be required by sponsors and the regulator. The study makes use of stress-testing techniques (usually employed for banks and insurance companies) which offer one possibility of gauging mutual funds' vulnerabilities to shocks. The stress-tests focused on a sample of funds that are sponsored by the Trinidad and Tobago Unit Trust Corporation (TTUTC) and commercial banks (and their affiliates). Based on the results of the tests, the industry appears to be resilient but the funds of individual institutions appear to be heavily exposed to certain shocks that could result in losses. The study recommends that sponsors adopt policies to desensitize investors particularly to run-risk (e.g. consider implementing a floating NAV regime where workable) and address the huge asset/liability mismatch (e.g. withdrawal restriction policies). These measures can help mutual funds become more resilient to adverse shocks that could impact on financial stability. Most importantly, the study recommends that sponsors should always be adequately capitalized to address problems in mutual funds under stressful conditions.

JEL Classification: C63, G21, G23

Key words: Mutual Funds, Stress Testing, Banking Crisis, Regulation

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An Analysis of the Mutual Funds Industry in Trinidad and Tobago:
With Reference to the TTUTC and Commercial Banks Funds

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1. Introduction

Mutual funds began in Trinidad and Tobago with the establishment of the Trinidad and Tobago Unit Trust Corporation (TTUTC) in 1982[2]. Since then, mutual funds have seen a remarkable growth both in terms of the value of assets under management and number of funds in operation. The industry has therefore become much more important today to the local financial landscape and the domestic economy than it had been during the 1980s.

The TTUTC, which was originally established to provide investment opportunities to small unsophisticated investors (or households), held a monopoly position in the industry throughout the 1980s. Since the 1990s, financial liberalization has encouraged other financial institutions such as commercial banks (and their affiliates) to participate in mutual funds business. Although as a single entity, the TTUTC is the largest sponsor of local mutual funds (in terms of assets under management), bank-sponsored mutual funds now account for a substantial share of total industry assets.

Mutual funds are designed and operated as off-balance-sheet financial structures of sponsors but these financial intermediaries conduct similar activities to regulated commercial banks[3]. Unlike banks, these financial structures hold no capital for the risk-taking activities they undertake[4,5]. The absence of capital or lack thereof, enables mutual funds to generate better returns than bank deposits by even accepting low-margin business.

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[1] The authors are economists in the Central Bank of Trinidad and Tobago. Any views expressed in this paper are those of the authors and not necessarily those of the Central Bank of Trinidad and Tobago.
[2] This institution was established under the Trinidad and Tobago Unit Trust Corporation, Act 1981.
[3] The assets and liabilities of mutual funds are not placed on the balance-sheets of their sponsors.
[4] Mutual funds basically obtain short-term funding from investors and frequently invest in longer-term assets. For instance, investors that place cash in local mutual funds have easy access to liquidity via debit cards. Access to fund accounts via debit cards enable investors to conduct economic transactions (i.e. pay for goods and services), thus making mutual funds akin to traditional bank deposits.
[5] Financial institutions that are supervised under Basel Accord rules (i.e. rules established by the Basel Committee for Bank Supervision) are required to hold capital in relation to their risk-taking activities.

Mutual funds however, are vulnerable to risks which can have destabilizing effects on the financial system and the wider domestic economy. At times when the activities of a mutual fund results in losses, the sponsor usually provides support by absorbing the losses. Providing support is common practice and may take various forms such as a cash infusion or the purchase of an impaired asset by the sponsor - both of which is a charge on the capital of the sponsoring entity. While the sponsor may be able to support its funds in good times, in periods of crisis the sponsor may also be facing other pressures on its capital reserves. This situation can be problematic if the sponsor is forced to absorb losses of funds to avoid a major panic by investors that decide to flee which in turn, depletes capital reserves and puts the sponsor and the mutual fund in financial distress.

A stark example of this situation occurred during the global financial crisis of 2008. Here Lehman Brothers, a major international bank in the United States experienced severe financial stress which triggered a crisis of confidence and heavy redemptions by investors[6] on its prime reserve fund - one of the largest money market funds in operation in the United States. This crisis of confidence snowballed as problems developed in other money market funds and other types of funds. The cost of such a problem occurring in the financial system has proven to be enormous both in terms of real output foregone, as well as taxpayers resources accessed from fiscal support.

In light of the destabilizing influence that mutual funds can have on the financial system and the wider economy, assessing mutual funds susceptibility to shocks seems to be a worthwhile venture since it may help sponsoring organizations (like commercial banks and the TTUTC) determine if they are well-capitalized to support their funds during stressful times[7].

[6] A heavy redemption in a mutual fund occurs when a large number of investors try to withdraw their money from a fund because they believe they will lose money.

[7] Rosengren (2012) argues that banking organizations sponsoring mutual funds should conduct stress tests that include a focus on whether these structures will require support during periods of severe market or idiosyncratic stress, and what the impact would be on the organization at that time. This might lead financial institutions to be more attentive to their capital structures, consistent with institutions seeking to hold capital to survive stressful times – rather than the capital needed strictly to satisfy regulatory requirements. Using stress tests to identify the possible capital and liquidity demands from these structures during a crisis, the institution's management, directors, and even regulators can better determine the appropriateness of these structures and the associated capital and liquidity – and whether these structures are likely to be beneficial to banking organizations at all times, or only during good times.

In this paper, we apply some stress-testing techniques which offer one possibility of gauging the vulnerability of mutual funds to large and plausible shocks. Stress-testing is commonly utilized to assess the vulnerabilities of banks and insurance companies to shocks. This paper however, takes a macro-approach to analyzing the local mutual fund industry and therefore does not delve into the internal risk management practices in-place by individual mutual funds. The paper begins with some stylized facts on the local mutual funds industry, highlighting areas of systemic significance in section 2. In section 3, we provide details of the stress-testing methodologies and parameters that we believe are relevant to the local mutual funds industry. It then goes on to present the stress-testing results and determine the potential vulnerabilities and risks, and the implications for financial stability (section 4). The final section concludes with a recommendation in terms of broad policy options available to sponsors and the regulator.

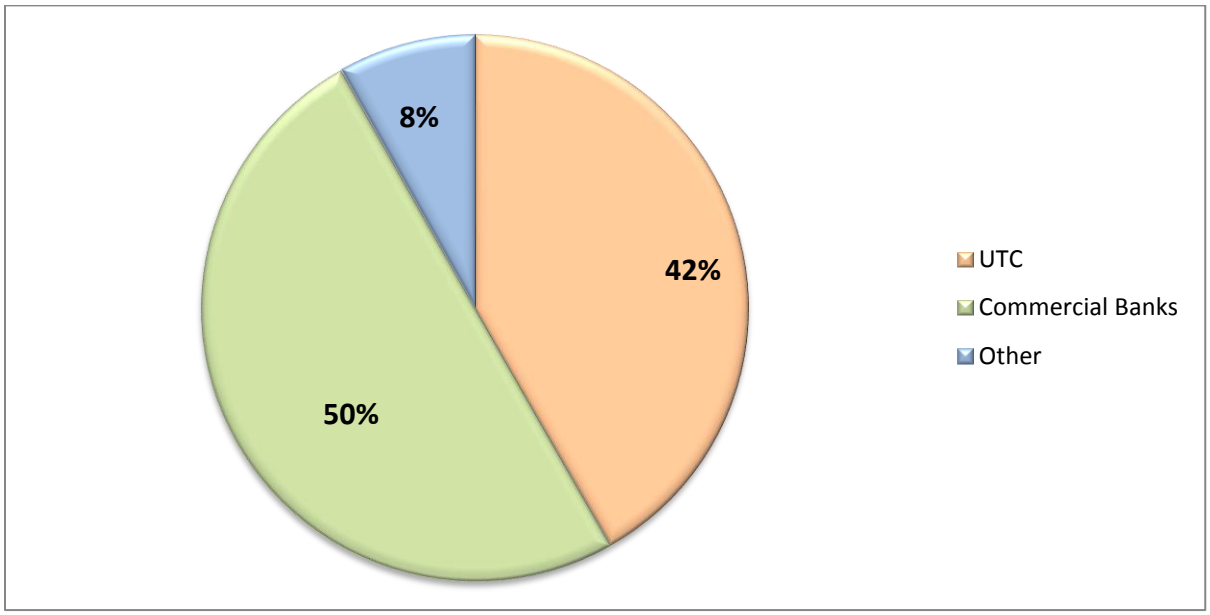
2. Stylized Facts on the Local Mutual Funds Industry

With assets under management totaling roughly TT$46.3 billion at the end of 2014, mutual funds accounted for 16 per cent of the financial system's assets and 25.8 per cent of the economy's Gross Domestic Product (GDP)[8]. Available data show that at the end of 2014 there were sixty-one (61) registered mutual funds which were issued through twelve (12) sponsors. This compared to around TT$500 million in assets under management at the end of the 1980s[9]. This significant growth in assets is reflective of the increasing importance of mutual funds in the local financial system.

[8] At the end of 2014, financial system assets and nominal GDP totaled $289.8 billion, and $179.8 billion, respectively. Also noteworthy, is that total mutual funds' assets as a proportion of total non-energy GDP at end-2014 was 45.1 per cent.

[9] Local mutual funds are required to be registered with the Trinidad and Tobago Securities and Exchange Commission (TTSEC), the regulator for the domestic capital market.

Chart 2.1
Market Share of Major Mutual Fund Sponsors as measured by FUM (%)
As at end 2014



Source: The chart is based on data collected from the TTSEC.

An analysis of data in Chart 2.1 reveals evidence of the systemic importance of some sponsors of local mutual funds. At the end of 2014, four (4) of the twelve (12) sponsors were commercial banks (and their affiliates), which in aggregate, accounted for 50.1 per cent of the total assets held by this industry. In addition, a single asset management firm, the TTUTC, accounted for about 41.7 per cent of total mutual funds' assets[10]. These five (5) entities, in aggregate, accounted for 91.8 per cent of total mutual funds' assets.

Mutual funds invest in a broad range of assets, both domestically and abroad, and through diverse fund types (Table 2.1). The mutual funds industry is governed under various pieces of legislation[11] but mutual funds' are particularly required to follow broad investment rules

[10] In light of the staggering size of assets under management by the Trinidad and Tobago Unit Trust Corporation (TTUTC), this entity was included in a list of big financial intermediaries called systemically important financial institutions (also known as SIFIs). As a result, the TTUTC is now subject to tighter regulatory supervision by the Central Bank of Trinidad and Tobago. Also see Note to Cabinet No. 3100 dated October 2013 entitled "Supervision of Systemically Important Financial Institutions by the Central Bank of Trinidad and Tobago".
[11] The local mutual funds industry is governed by the Unit Trust Corporation Act, 1981, Securities Industries Act, 2012, and Financial Institutions Act, 2008.

stipulated under the Collective Investment Schemes Guideline of 2008[12](See Appendix Table 1 for details on the rules). These rules are geared towards (and have helped in) preventing mutual funds from becoming over-exposed to particular areas such as to a single issuer of securities, or to a related financial entity.

Table 2.1
Trinidad and Tobago: Types of Mutual Funds
End of period

Type of Fund	Number of Funds	Value of AUM $Mns (Gross)	Percentage of Total AUM
Income Funds	***24***	***38,711.5***	***83.6%***
Fixed Income Funds	20	37,352.3	80.7%
Money Market Funds	4	1,359.2	2.9%
Equity Funds	***30***	***7,114.1***	***15.4%***
Income and Growth Funds	23	1,196.8	2.6%
Balanced Funds	7	5,917.3	12.8%
Other	***7***	***485.6***	***1.0%***
Total	***61***	***46,311.3***	***100.0%***

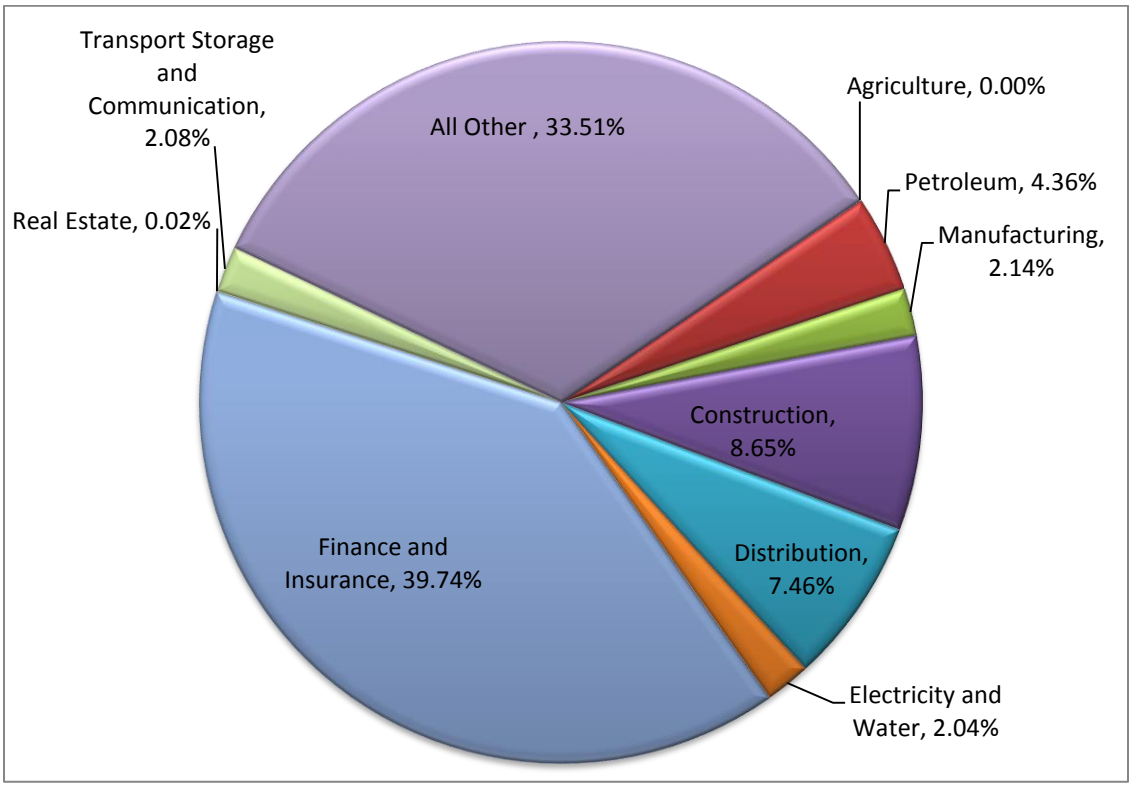
Source: TTSEC

Despite these rules, there is evidence of a high degree of concentration by this industry in a number of areas which is mainly reflective of the pattern of development of the domestic capital market. For instance, data at the end of 2014 on a sample of 19 mutual funds (which comprises 88.4 per cent of total industry assets) show that debt instruments accounted for 76.1 per cent of portfolios' investments while equities accounted for 9.7 per cent and mutual funds an insignificant amount of less than 0.8 per cent[13]. Also, the top three leading fund sponsors accounted for about 77.1 per cent of the assets of the industry at end-2014. Further, 68 per cent of the total funds under management are invested in TT dollars, while 32 percent are invested in foreign currency funds, the majority of which was in US dollars. In terms of economic sectors, 39.7 per cent of the investments by TT dollar mutual funds were made in the local finance and insurance sector while 8.7 per cent and 7.5 per cent were invested in the local construction and

[12] This guideline was issued by the regulator of the domestic capital market, the Trinidad and Tobago Securities and Exchange Commission (TTSEC).
[13] Local debt instruments as a proportion of total debt instruments was 66.9 per cent while local equities comprised 61.6 per cent of total quoted equities held by mutual funds as at December 2014.

distribution sectors, respectively. A mere 2.1 per cent of funds were invested in the domestic manufacturing sector (Chart 2.2).

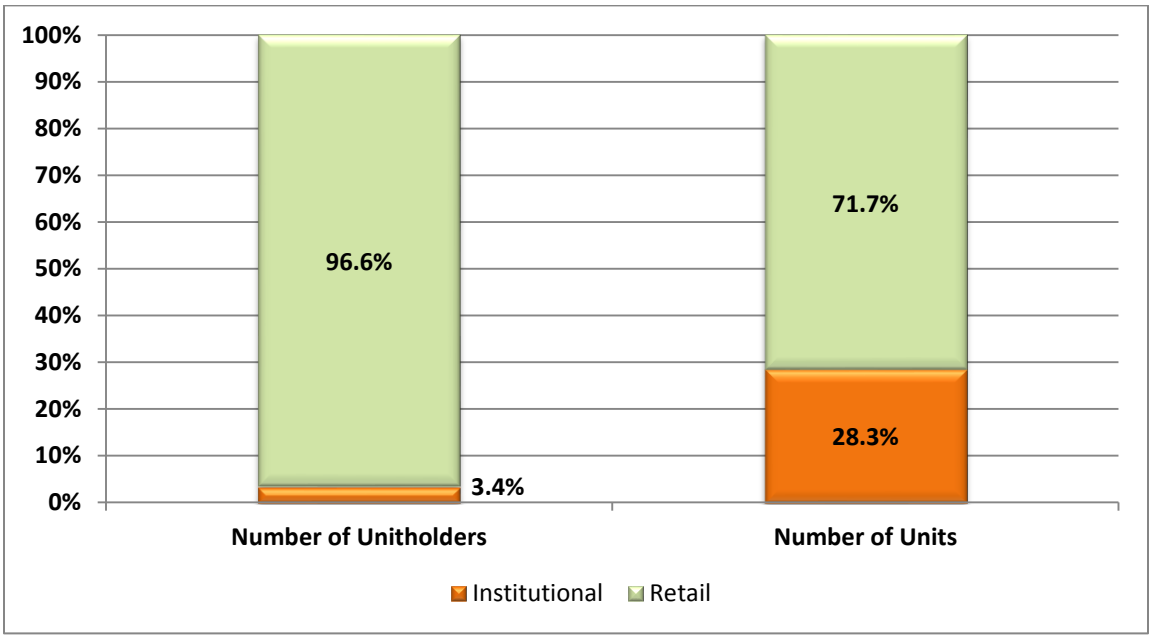
Chart 2.2
Sectoral Composition of TT Currency Investments
Data as at end-2014



Source: CBTT Survey

Regarding the funding base for mutual funds, data at the end of 2014 show that institutional unitholders formed a fair proportion (28.3 per cent) of units in mutual funds, but the majority (71.7 per cent) of units was held by retail investors (or households) (Chart 2.3).

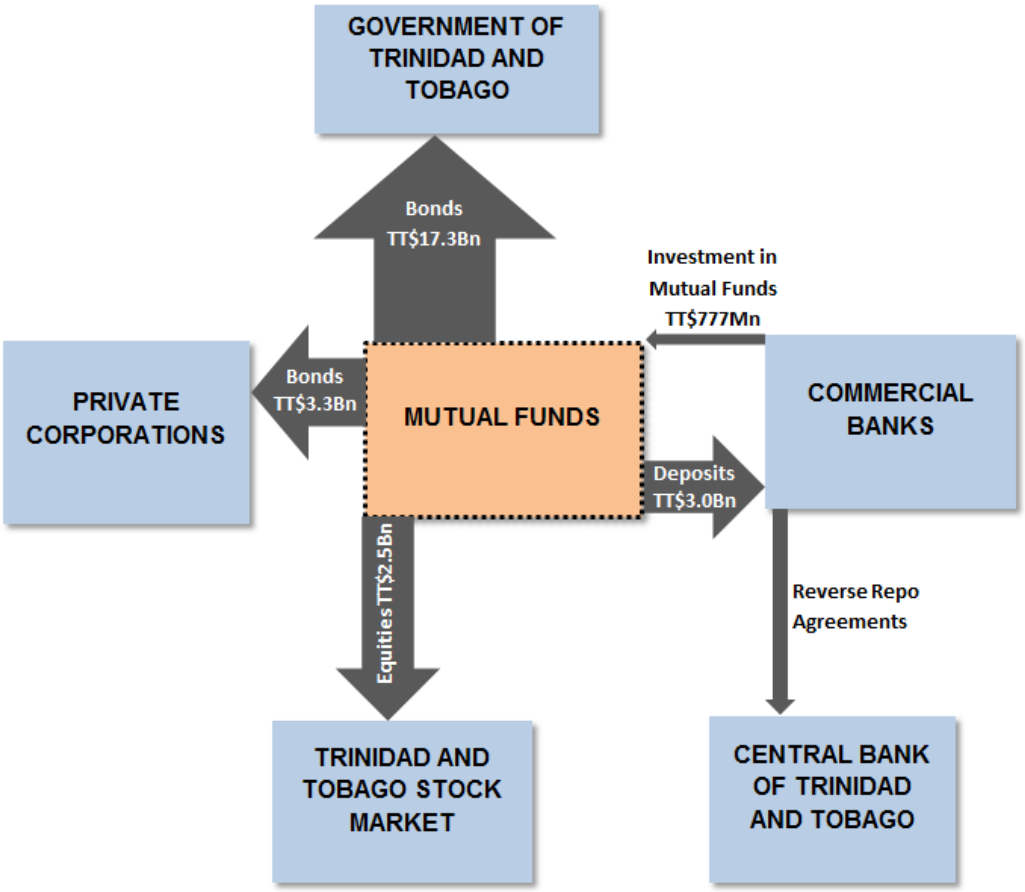
Chart 2.3
Institutional vs. Retail Investors of Mutual Funds
/Per cent/



Source: CBTT Survey
Note: Based on a sample of 11 funds.

Investments made by mutual funds have led to some loose inter-connections between this industry and other institutional sectors of the local economy. Mutual funds and the Government of Trinidad and Tobago are highly inter-connected through funds' investments in central government and public sector enterprise bonds. As at end-2014, mutual funds' investment in public sector bonds accounted for 62.9 per cent of mutual funds' total local assets. Mutual funds and banks appear to be moderately inter-connected through funds' investments in bank deposits and repo transactions. At the end of 2014, mutual funds' deposit and repo holdings with banks accounted for about 9.3 per cent of mutual funds' total local asset portfolios.

Chart 2.4
Mutual Funds Inter-connectedness with Other Sectors of the Economy



Source: Authors'
Notes: The thickness of the arrows reflects the size of the exposures.
The values in the diagram represent the size of the exposure as at December 2014.

Mutual funds are also inter-connected with the private corporate sector. At the end of 2014, corporate bonds accounted for around 12.1 per cent of mutual funds' total asset portfolios. Mutual funds exposure to the local stock market appears to be low given that assets held in quoted equities only account for 8.8 per cent of their portfolios (Chart 2.4).

Data from the Trinidad and Tobago Securities and Exchange Commission reveals the systemic significance of fixed NAV[14] funds in the local mutual fund industry. Out of the 61 mutual funds,

[14] The Net Asset Value (NAV) is usually used in mutual or unit trust funds to describe the value of assets less the value of liabilities.

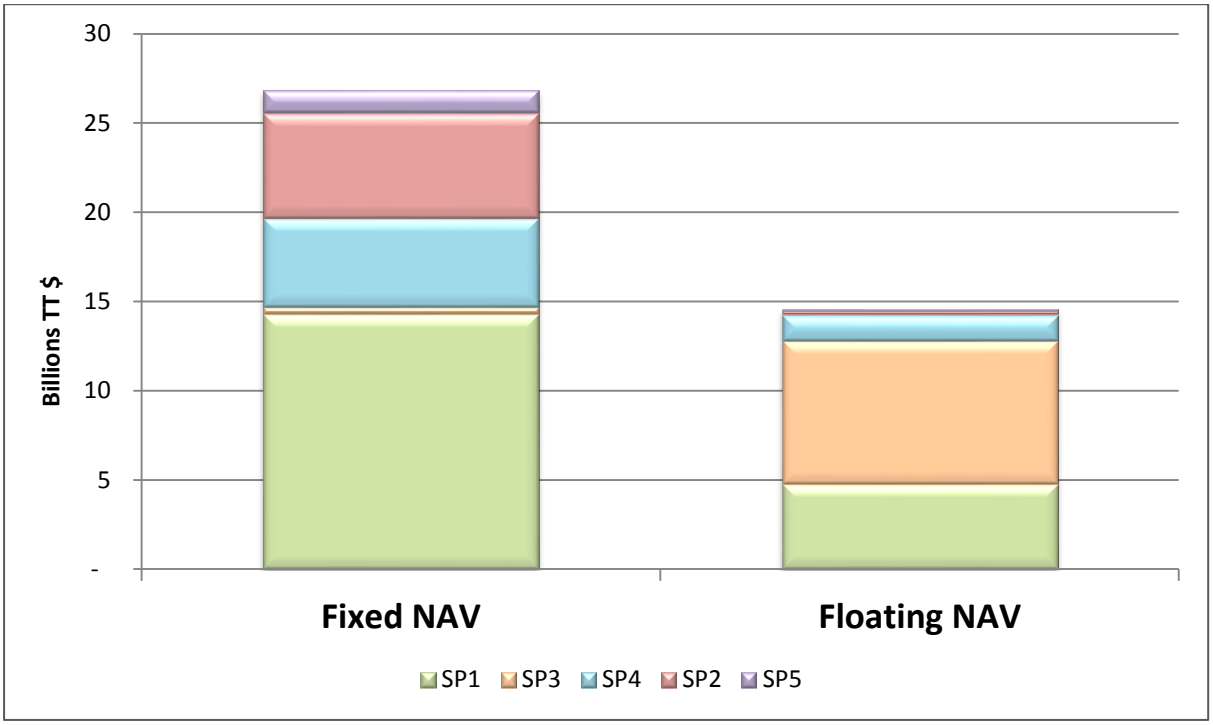
14 of these funds are classified as having a fixed NAV, while the remaining 47 possess a floating NAV. Table 2.2 provides a breakdown of the number of funds offered by NAV structure and sponsor. The 13 funds classified as having a fixed NAV account for roughly 62.4 per cent of total industry funds under management (or TT$28.9 billion) while the 47 floating NAV funds represent roughly 37.6 per cent (or TT$17.4 billion).

Table 2.2
TTSEC Registered Mutual Funds (As at end 2014)

FUND SPONSOR	Number of Funds	Fixed NAV	Floating NAV
ANSA Merchant Bank Limited	5	1	4
Bourse Securities Limited	8	1	7
First Citizens Bank Limited	4	1	3
Fortress Fund Management Limited	1	0	1
Guardian Asset Management Limited	13	2	11
RBC Royal Bank Limited	8	2	6
Republic Bank Limited	3	1	2
Sagicor Funds Inc., and Sagicor Merchant Limited	3	1	2
Schroder International	1	0	1
Scotia Bank Limited	8	1	7
Trinidad and Tobago Home Mortgage Bank	1	1	0
TT Unit Trust Corporation	6	3	3
TOTAL	**61**	**14**	**47**

Source: Trinidad and Tobago Securities and Exchange Commission.

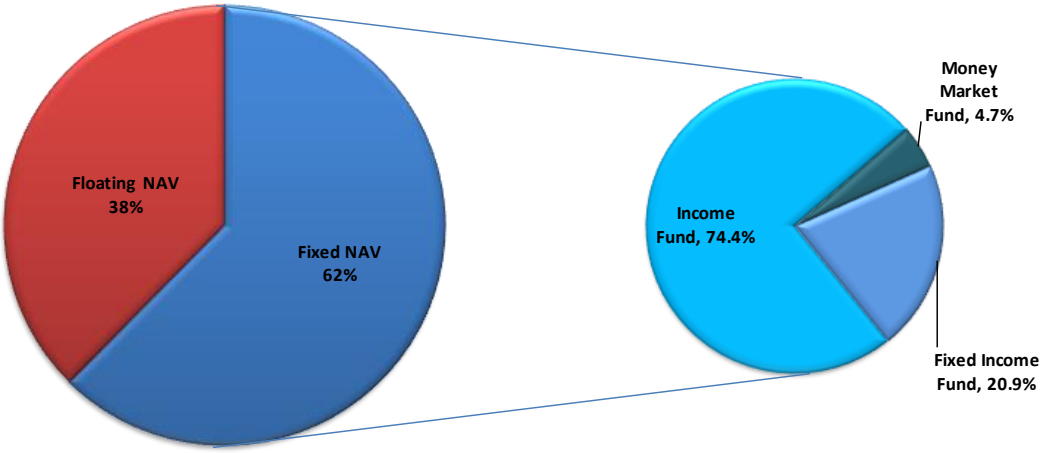
Chart 2.5
Major Financial Institutions: Fund under Management
Fixed NAV vs. Floating NAV at end 2014
/$TT Billions/



Source: TTSEC, CBTT
Note: These 6 institutions held 96.9 per cent of the Fixed NAV funds and 91.2 per cent of the Floating NAV funds.

In terms of industry distribution, the 14 fixed NAV funds registered are classified into three (3) fund types. Income funds represent 74.4 per cent of all fixed NAV funds while fixed income funds and money market funds constitute 20.9 per cent and 4.7 per cent respectively (Chart 2.6). It should be noted that income funds also make up 42.3 per cent of all floating NAV funds while fixed income funds account for 14.1 per cent of the same. All Money Market funds however are of the fixed NAV classification.

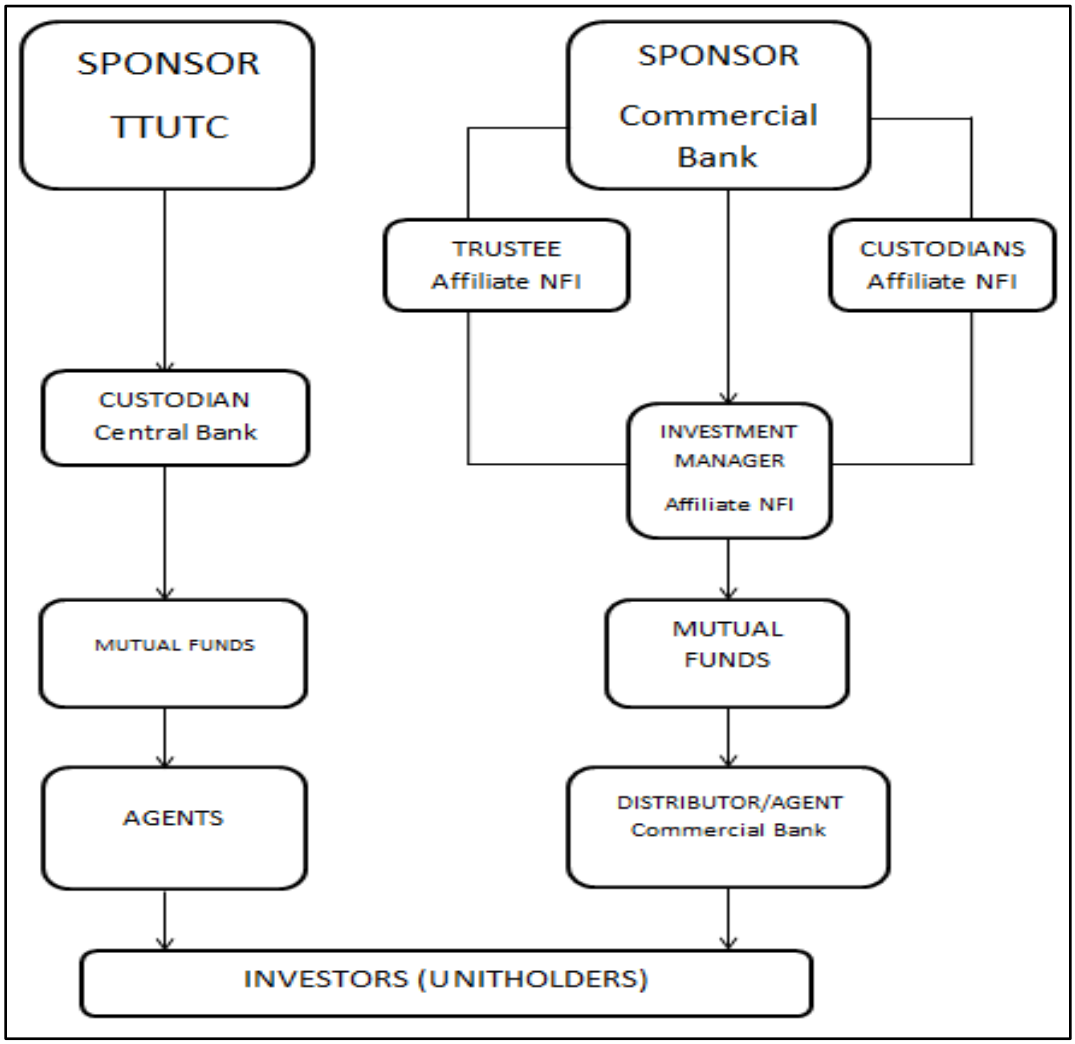
Chart 2.6
Distribution of Total Industry Funds under Management
Fixed and Floating NAV Funds (end-2014)



Source: CBTT Survey.

A review of prospectuses reveals some important information about the organizational structure of sponsors. The diagram (Chart 2.7 and Appendix Table 2) below shows the respective structure of a typical depository institution (i.e. commercial bank) that sponsors mutual funds and the TTUTC since these organizations account for the bulk of the assets in the local mutual funds industry. In the case of the bank-based mutual fund, the sponsor is the commercial bank and the advisor and manager of the funds are affiliated non-bank financial institutions (NFIs). In the case of the TTUTC, the sponsor of the First Unit Scheme comprises a number of institutions, including the Central Bank of Trinidad and Tobago, the National Insurance Board, some commercial banks and several other non-bank financial institutions and insurance companies. While the subsidiaries of the commercial banks perform many of the functions required administering bank-sponsored funds, these functions are carried out by a variety of separate and independent institutions in the case of the TTUTC. This independency among institutions in the TTUTC is more in line with international best practices. Another distinguishing feature between the TTUTC and the commercial banks structures is that the former carries a Guaranteed Reserve Fund. Finally, similar to the commercial banks, the TTUTC is not required under Basel Accord rules to hold capital to support its funds in the event of financial distress.

Chart 2.7
Mutual Funds: Organizational Structure of the TTUTC and Commercial Banks



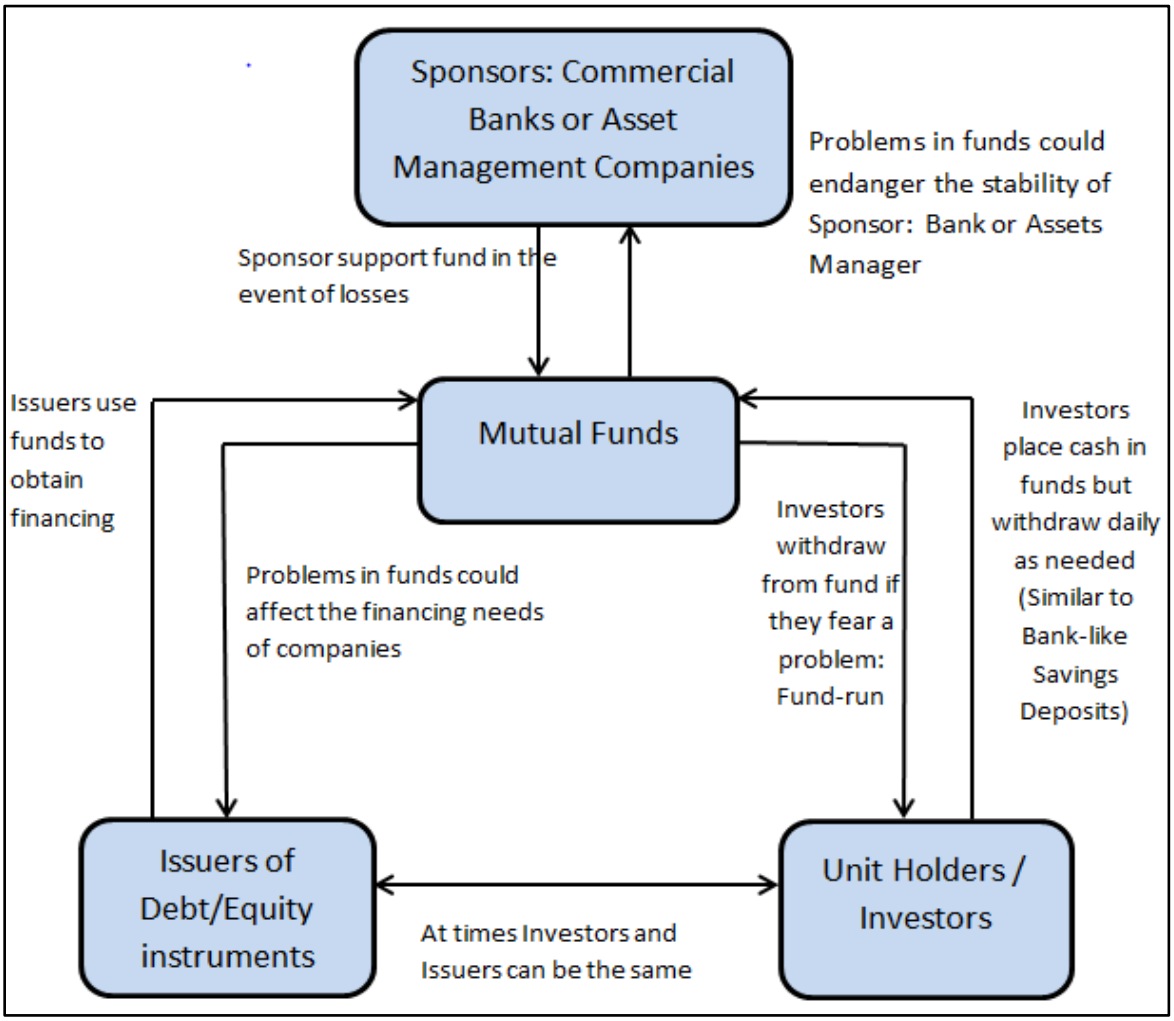
Source: Authors'

Our analysis reveals that the biggest potential risk in the mutual fund industry is not through mutual funds' investments in assets but the "implicit or explicit" guarantees that large sponsors in the local industry provide to the unitholders of mutual funds. It is an important contagion channel whereby risks emanating from either the sponsor or the mutual fund can inflict harm on each other, destabilizing the financial system and the wider domestic economy. We recognize that local sponsors may have had to support their funds in the past in various ways and this is a common practice in the industry. In Trinidad and Tobago, data availability is a problem. There is substantial evidence in the United States and in Europe that sponsors support their funds when

they are in difficulty either in terms of liquidity or to support their NAV[15], either of which results in a charge on the capital reserves of the sponsor. We recognize that unprepared sponsors could be caught *"off-guard"* and may not hold adequate capital to support this guarantee in their funds. While some sponsors such as commercial banks, may be able to support their funds under normal conditions, they may not be in a position to address problems in their funds under stressful times. This is because, under stressful conditions, capital reserves of sponsors could become scarce and sponsors themselves may be facing capital pressures due to problems arising out of on-balance-sheet exposures. These problems can have wider systemic implications (Chart 2.8).

[15] Money market funds (MMFs) in the United States, for instance, have historically relied on support in terms of capital to avoid "breaking the buck". Sponsors may, at times be forced to support their funds out of fear that their funds may "break the buck" and the reputational risk could trigger a major panic which could even affect the sponsor's retail client base.

Chart 2.8
Potential Contagion Channels between Mutual Funds and their Sponsors



Source: Authors'

3. Methodology and Assumptions - Stress Testing Local Mutual Funds

Stress-testing analysis is employed to assess the resilience of local mutual funds sponsored by the TTUTC and banking organizations to various shocks. This technique of analysis is particularly utilized by regulators to gauge the resilience of banks and insurance companies to possible macro-financial shocks that could impact the stability of financial systems. The stress-testing exercise carried out for this paper covered a sample of 19 mutual funds out of a total of 61 funds in operation as at December 2014. These 19 mutual funds however, account for some

90.1 per cent of the assets under administration by the local mutual funds industry. The 19 funds are also sponsored through three large local commercial banks and the TTUTC.

The sample spanned a variety of mutual funds including, money market funds, income funds, equity funds as well as funds denominated in both local and foreign currencies sponsored by these institutions. The majority of assets of the industry are held in fixed NAV funds. Data show that out of the sample of 19 mutual funds in operation, 13 of them are under a floating NAV regime, while 6 of them rely on a fixed NAV regime. The picture is somewhat different when we analyze the value of assets under the two different regimes. At end-2014, funds relying on a floating NAV regime accounted for $17.4 billion (or 37.6 per cent) while those operating under a fixed NAV regime accounted for $28.9 billion (or 62.4 per cent of total assets under management).

The stress testing exercise utilized detailed balance sheet data as at end-2014 for individual mutual funds. A total of five single factor tests and three scenarios tests were conducted. As discussed in more details below, the stress tests simulated the impact of various shocks that were considered relevant to the Trinidad and Tobago mutual fund industry. Single factor shocks assessed the repercussions arising out of changes in interest rates, exchanges rates, equity price declines, as well as a sharp increase in redemptions. Scenario shocks were also imposed taking into account the possibility of an energy price collapse or a local natural disaster.[16] The magnitude of the shocks was determined on the basis of what could be considered as "extreme but plausible". In all tests, the impacts of the shocks on the marked-to-market or shadow net asset value of the shares were calibrated. The impacts on the net asset value per share are considered important since the unitholders in the fund primarily sustain or absorb any losses suffered by the fund.

Liquidity risk test – This type of risk could occur when a fund is unable to sell or liquidate its holdings easily and quickly. A fund could slip into a downward spiral if its holdings are so illiquid that losses spur redemptions and redemptions create further losses if the fund has to

[16] Note that in most instances the shocks and methodologies applied are similar to those utilized by the Central Bank of Trinidad and Tobago when conducting stress test on the on-balance sheet assets of domestic commercial banks.

liquidate assets through fire-sales, which could generate a crisis for the fund. The liquidity test that was applied examined whether mutual funds held sufficient liquid assets to sustain a redemption run over a 30-day period. The test assumed a 1 per cent daily withdrawal of funds by unitholders, and also that mutual funds have access to all liquid funds and 50 per cent of marketable securities.

Interest rate risk test – Sudden changes in interest rates can have a significant impact on mutual funds' investment portfolios. In particular, interest rates impact the earnings of investments such as on time deposits but may also impact the value of bonds held in mutual funds' portfolios. Another important factor is the time it takes for interest rates to affect earnings or the value of holdings on a fund's portfolio – the more flexible the interest contract and the shorter the maturity of the investment the faster the changes in interest rates would be reflected in the fund's portfolios. Depending on the structure of the fund's portfolio, changes in interest rates can have a significant adverse effect on the value as well as earnings potential of a fund. The interest rate single factor or sensitivity tests involved a parallel upward shock to the yield curve of 700 basis points.

Foreign exchange rate risk test – Foreign exchange risk is associated with potential losses incurred by mutual fund holdings of foreign currency denominated instruments due to adverse movements in the exchange rate. Broadly speaking, foreign currency risk is larger the greater the funds' holdings in foreign currency denominated instruments. Sudden and large depreciations (or appreciations) in the local currency can have important impacts on fund's portfolios. The foreign exchange sensitivity test applied an assumed depreciation of 40 per cent in the exchange rate to the foreign exchange position of mutual funds.

Equity price risk test – This is the risk that changes in stock prices affect the valuation of equities held by a mutual fund. The stress test for equity price risk assumed a 30 per cent decline in the local stock price index that results in an equivalent write-down on all quoted equity holdings held by a mutual fund.

Credit risk test – Deterioration in borrowers' ability to service their obligations could impact mutual funds cash flows. This stress test examined the impact of a worsening of the credit quality of issuers of debt securities. In particular, the test assumed that borrowers probability of default increased by 50 per cent. The test also assumed that losses in the event of default are 100 per cent.

Energy Price Shock – Trinidad and Tobago's heavy dependence on the local energy sector as a source of foreign earnings makes the economy susceptible to shocks to international energy prices. Sharp declines in the price of energy could impact government revenues which in turn influences its ability to stimulate the domestic economy via fiscal policy. The energy price shock examined the impact of a 50 per cent decline in the price of energy over a one year period. There are two versions of this test. One of the versions assumed that no policy action was undertaken by the monetary authority in response to the oil price shock. The other test assumed an immediate action by the Central Bank of Trinidad and Tobago to lower interest rates in order to stimulate the domestic economy in the face of depressed energy prices.

Local Natural Disaster Shock – A local natural disaster could severely impact the economy and by extension the financial system including the local mutual funds industry. Natural disasters in the form of a hurricane (given our island's close proximity to the hurricane belt) could devastate Trinidad and Tobago's economy which could impact the ability of economic agents to conduct their activities which could leave the financial system and funds industry prone to financial distress. The local natural disaster test assumed a combination of 40 per cent depreciation in the external value of the TT dollar, a 100 reduction in the interest rate, and a 20 per cent fall-off in the value of all investments.

Table 3.1
Stress Tests: Methodology and Magnitude[17]

Test	Methodology	Magnitude of Shock Parameter
Sensitivity Tests		
Liquidity	Redemption-run over a 30-day period. Assumed that 1 per cent of unitholders (value) withdraw daily and banks have access to all liquid assets and 50 per cent of marketable securities.	Redemption runs over a 30 day period.
Interest rate[18]	Duration of Equity: All assets in the fund's portfolio.	700 bps ↑ in interest rates.
Foreign exchange	Applied to fund's position in foreign currency	20 per cent ↓ of exchange rate.
Equity price	Applied to fund's position in equity.	30 per cent decline in local stock price index.
Credit risk	Applied to fund's debt exposures.	50 per cent increase in the probability of default. Loss given default (LGD) is 100%
Scenarios		
Energy Price Shock: No Policy Intervention	Same as single factor tests	500 bps ↑ in interest rates 20 % depreciation of foreign exchange Rate 30 % increase in PDs 30 % write-down on all other investment
Energy Price Shock: Policy Intervention	Same as single factor tests	100 bps ↓ in interest rates 40 % depreciation of Foreign Exchange Rate 50 % increase in PDs 5 % write-down on all other investments
Local Natural Disaster	Same as single factor tests	40% ↓ of local exchange rate 100 ↓ in interest rates 20 % write-down on all investments.

[17] In order to determine the capital adequacy of the sponsor banking organizations the stress test methodologies and parameters applied were very similar to that utilized by the Central Bank of Trinidad and Tobago when conducting stress test on the domestic commercial banks.

[18] The interest rate shock is extremely large but could be justified in terms of the prolonged period of ultra-low interest rates in the domestic economy.

4. Vulnerabilities and Risks: Analysis of Stress - Test Results

Tables 4.1 and 4.2 below show the stress test results according to the sponsor and the industry. The results provide some information about potential risks in mutual funds and the losses that funds could encounter if these risks materialize under stressful conditions.

The results indicate that sponsors passed most of the tests, both sensitivity and scenarios. According to the tests conducted, mutual funds can withstand various types of severe shocks including shocks to liquidity, the exchange rate, and credit. Unsurprisingly, institutions are highly exposed to interest rate risk arising from a sudden increase in interest rates. If this risk materializes, sponsors may have to support the NAV value of their funds, in particular, the fixed NAV funds.

Table 4.3 shows the estimated impact of losses arising from mutual funds on the capital adequacy ratios (CARs) of sponsoring commercial banks in the local financial system. The results indicate that shocks to interest rates could also have significant impact on the CARs of sponsoring banks. The table shows that out of the three banking institutions, two of them experienced a fall in their CARs below the regulatory requirements (i.e. 8 per cent). The tables show the impact on CARs if sponsoring banks are faced with shocks which simultaneously impact both on-balance-sheet and off-balance-sheet exposures. Similarly, the results indicated an interest rate shock is likely to have a major effect across also sponsors. In the case of a rise in credit losses, one fund sponsor (SP3) is likely to witness a decline in its CAR below the regulatory minimum. According to the results of the scenarios, a decline in the price of energy (without any accompanying monetary policy support) is also likely to lead to a huge fall-off in banks' CARs. The results also show that in the case of the energy price stress-test, most of the losses are as a result of the sudden increase in the interest rate.

Table 4.1
Comparison of Sensitivity Stress - Test Results by Sponsor

Sponsor Institutions			SP1	SP2	SP3	SP4	SUB-TOTAL
AUM as a Proportion of Total Industry AUM (%)			41.7%	13.1%	19.8%	15.5%	90.1%
Type of Stress Test	**Measure**	**Parameter**					
Liquidity Risk	Number of days to illiquid	1% run	38	55	48	74	84
			Per cent Change in AUM of Fund				
Foreign Exchange Risk	Depreciation in TT Dollar	20% decline	6.9%	2.0%	11.6%	4.3%	6.7%
Interest Rate Risk	Parallel shift of yield curve	700 bps increase	-9.7%	-17.2%	-19.8%	-22.7%	-21.1%
Stock Price Risk	Decline in the Local CPI, ATI	30 % decrease	-3.0%	-0.7%	-0.8%	-0.8%	-1.8%
Credit Default Risk	Stressed PDs	50 % increase in PDs	-0.68%	-0.3%	-0.39%	-0.10%	-0.38%

Source: Central Bank
Note: Pass or fail for each test was set at a maximum of 30-days (liquidity tests) and loss in fund value of -5 per cent (for all other tests).

Table 4.2
Comparison of Scenario Stress - Test Results by Sponsor

Scenario 1: Energy Price Shock without Policy Intervention			**SP1**	**SP2**	**SP3**	**SP4**	**SUB-TOTAL**
Asset Under Management as a Proportion of Total Industry AUM (Per cent)			41.7%	13.1%	19.8%	15.5%	90.1%
Type of Stress Test	**Measure**	**Parameter**					
Foreign Exchange Risk	Depreciation in TT Dollar	40% decline	13.6%	4.0%	23.0%	8.6%	12.7%
Interest Rate Risk	Parallel shift of yield curve	500 bps increase	-9.6%	-17.2%	-19.7%	-22.5%	-15.0%
Stock Price Risk	Decline in the Local CPI, ATI	30 % decrease	-2.9%	-0.7%	-0.8%	-0.8%	-1.8%
Credit Default Risk	Stressed PDs	50 % increase in PDs	-0.4%	0.0%	-0.3%	-0.1%	-0.3%
Total Shock Gain / (Loss)			132.1	(896.6)	152.3	(1,147.6)	(1,759.9)
Post Shock AUM (TT$)			19,887.5	5,568.6	7,193.4	6,563.1	39,212.6
Percentage Change in AUM			0.7%	-13.9%	2.2%	-14.9%	-4.3%
Scenario 2: Energy Price Shock with Policy Intervention			**SP1**	**SP2**	**SP3**	**SP4**	**TOTAL**
Foreign Exchange Risk	Depreciation in TT Dollar	20% decline	6.8%	2.0%	11.5%	4.3%	6.4%
Interest Rate Risk	Parallel shift of yield curve	100 bps decrease	1.9%	3.4%	3.9%	4.5%	3.0%
Stock Price Risk	Decline in the Local CPI, ATI	5 % decrease	-0.5%	-0.1%	-0.1%	-0.1%	-0.3%
Credit Default Risk	Stressed PDs	30 % increase in PDs	-0.3%	0.0%	-0.2%	-0.1%	-0.2%
Total Shock Gain / (Loss)			1,570.2	344.1	1,062.9	663.5	3,640.7
Post Shock AUM (TT$)			21,325.6	6,809.2	8,104.1	8,374.3	44,613.2
Percentage Change in AUM			7.9%	5.3%	15.1%	8.6%	8.9%
Scenario 3: Local Natural Disaster			**SP1**	**SP2**	**SP3**	**SP4**	**TOTAL**
Foreign Exchange Risk	Depreciation in TT Dollar	40% decline	13.6%	4.0%	23.0%	8.6%	12.7%
Interest Rate Risk	Parallel shift of yield curve	100 bps decrease	1.9%	3.4%	3.9%	4.5%	3.0%
Stock Price Risk	Decline in the Local CPI, ATI	50 % decrease	-4.8%	-1.1%	-1.3%	-1.4%	-3.0%
Credit Default Risk	Stressed PDs	50 % increase in PDs	-0.4%	0.0%	-0.3%	-0.1%	-0.3%
Total Shock Gain / (Loss)			2,015.1	409.5	1,780.1	897.0	5,101.7
Post Shock AUM (TT$)			21,770.6	6,874.7	8,821.3	8,607.7	46,074.2
Percentage Change in AUM			10.2%	6.3%	25.3%	11.6%	12.5%

Table 4.3

Estimated Effect of Stressed Losses on the CARs of Sponsor

End-December 2014

		SP2	SP3	SP4	Sub-System
Total Assets ($TT Mn)		43,837.7	26,349.3	29,362.5	99,549.5
Share of Banking System		33%	20%	22%	75%
Value of Mutual Funds AUM (TT$ (Mns)		6,465.2	7,041.1	7,710.8	21,217.1
CAPITAL ADEQUACY OF SPONSORS					
Total Adjusted Qualifying Capital		5,442.2	1,167.0	3,111.1	9,720.3
Risk-Weighted Assets (RWA)		25,998.7	12,898.5	11,153.4	50,050.6
Pre-Shock CAR (Adjusted)		20.9%	9.0%	27.9%	19.4%
MUTUAL FUNDS: POST-SHOCK IMPACT ON COMMERCIAL BANKS' C.A.R					
Sensitivity					
Interest Rate Risk	Interest Rate ↑ 700 BP	14.9%	-6.0%	6.1%	7.6%
Foreign Exchange Risk	TT Dollar Depreciation 40 %	21.9%	21.6%	33.8%	24.5%
Stock Market Shock	Major Stock Indices ↓ 30%	20.8%	8.6%	27.3%	19.1%
Credit Default Risk		20.9%	8.5%	27.7%	19.2%
Scenario Tests					
Energy Price Shock - 50 % ↓ in Energy Price	No Monetary Policy Response	17.5%	10.2%	17.6%	15.6%
	Monetary Policy Response	22.3%	17.3%	33.8%	23.6%
Local Disaster Scenario		22.5%	22.8%	35.9%	25.6%
BANK AND MUTUAL FUNDS: POST-SHOCK IMPACT ON COMMERCIAL BANKS' C.A.R					
Sensitivity					
Interest Rate Risk	Interest Rate ↑ 700 BP	-1.0%	-6.9%	-14.4%	-5.5%
Foreign Exchange Risk	TT Dollar Depreciation 40 %	21.8%	21.5%	36.9%	25.1%
Credit Default Risk		19.3%	5.7%	25.8%	17.2%
Scenario Tests					
Energy Price Shock - 50 % ↓ in Energy Price	No Monetary Policy Response	4.6%	6.8%	3.1%	4.8%
	Monetary Policy Response	22.5%	14.5%	37.7%	23.9%
Local Disaster Scenario		20.9%	18.6%	35.0%	23.4%

Source: Stress-Test Analysis

A. Sensitivity Tests

Liquidity Risks

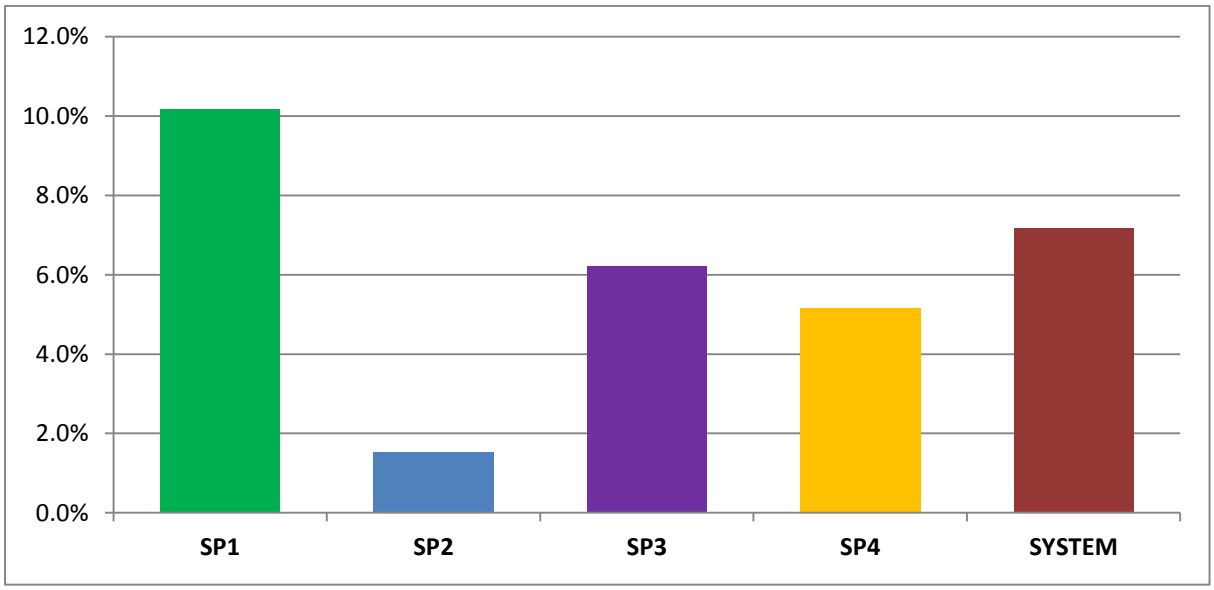
Mutual funds appear to be holding ample cash and other assets it could liquidate in the event of heavy redemptions by retail investors. Chart 4.1 shows institutions held a liquidity ratio of less than 10 per cent as at end 2014. Table 4.4 below shows that 68.4 per cent of all funds would remain liquid following a possible heavy daily run-off by investors over a thirty-day period. The results are not too surprising given the low interest rate environment that has been persuading investors to channel excess liquidity in to mutual funds in search for higher yields. The results of the stress-test by sponsor also indicate the high liquidity position of funds held by the various sponsors (Table 4.1). This test however does not consider the possibility of a single large investor withdrawing from any fund. Also, data from the survey show a clear mismatch in the assets/liability maturity structure of mutual funds (Table 4.5).

Table 4.4
Liquidity Stress Test Results by Individual Fund

Survival Period	0 days up to 7 days	Greater than 8 days up to 14 days	Greater than 14 days up to 21days	Greater than 21days up to 28 days	Greater than 29 days up to 36 days	Greater than 37 days up to 43 days
# of Funds that become illiquid	1	1	1	3	7	6

Source: Stress Test Results
Note: Total number of funds included in the test is 19

Chart 4.1
Major Mutual Fund Sponsors: Liquid Assets to Total Assets Ratio
Per cent



Source: CBTT Survey

Table 4.5
Maturity Structure of Mutual Funds Assets under Management
/TT$Mns/

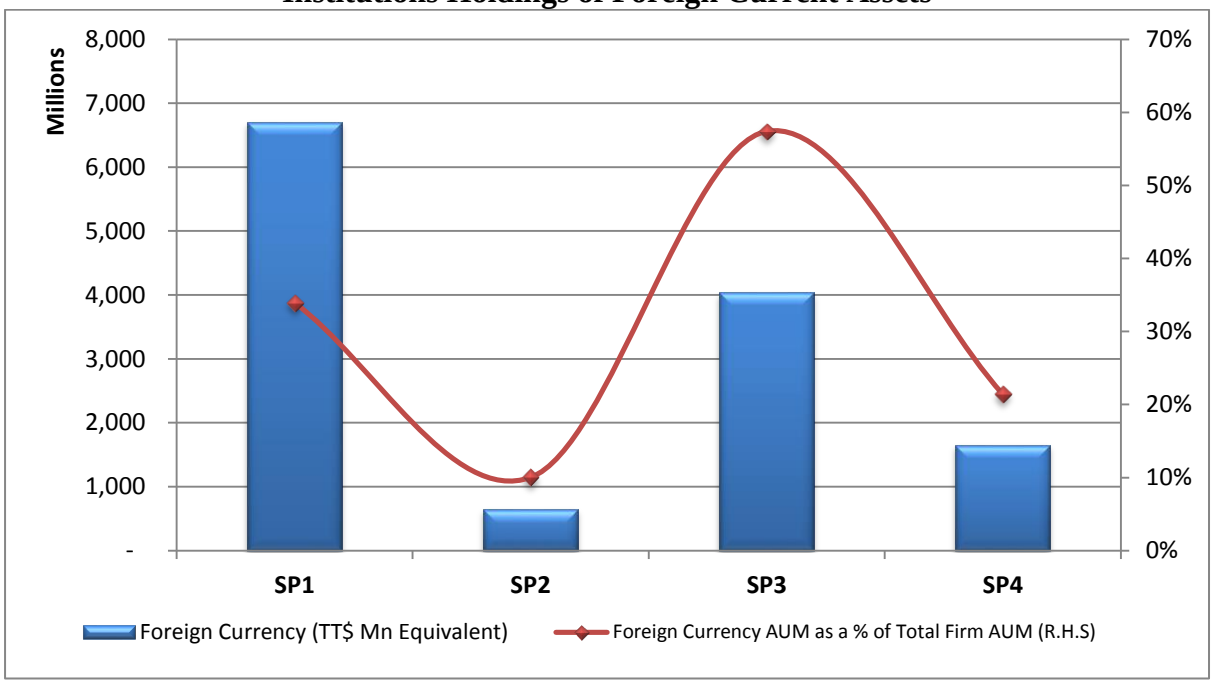
Maturity Bucket	System	
	Assets	**Liabilities**
0 - 1 mth	8,953.34	40,972.51
>1 mth - 3 mths	2,241.68	-
> 3 mths – 6 mths	2,042.36	-
> 6 mths -12 mths	4,284.74	-
>1yr – 3yrs	4,358.22	-
>3yrs – 5yrs	5,322.51	-
>5yrs – 10yrs	8,757.34	-
>10yrs – 15yrs	4,172.39	-
>15 yrs – 20yrs	837.30	-
>20yrs	2.63	-
Total	**40,972.51**	**40,972.51**

Source: CBTT Survey

Exchange Rate Risk

All institutions fared well under this particular stress-test. The results indicate that a sharp and sudden depreciation in the local currency relative to currencies of foreign economies could result in the assets under management by the industry increasing by 6.7 per cent. Since funds sponsored by fund sponsor SP3 accounted for the highest proportion of investments in foreign currency denominated assets, this institution stands to gain the most (11.6 per cent) in the event that this shock materializes. The shock to the local exchange rate therefore, does not appear to be a vulnerability to the stability of the funds currently.

Chart 4.2
Institutions Holdings of Foreign Current Assets



Source: Stress-test results

Interest Rate Risk

A sudden rise in interest rates represents the biggest potential risk for local mutual funds currently. The results of the interest rate stress tests are presented in Table 4.1. In comparing the institutions, SP1 was the least exposed to interest rate risk. Further, among the remaining sponsors, SP4 appeared to be most exposed to interest rate risk, followed by SP3 and then SP2. The mutual funds of all institutions are however faced with a high degree of interest rate risk in their portfolios due to investments in longer-term assets.

Table 4.6
Re-pricing/Maturity Structure of Mutual Funds
/TT$Mns/

Re-pricing/Maturity Bucket	System	
	Assets	Liabilities
0 - 1 mth	9,130.4	40,972.5
>1 mth - 3 mths	2,080.6	-
> 3 mths – 6 mths	3,656.4	-
> 6 mths -12 mths	4,170.0	-
>1yr – 3yrs	3,884.4	-
>3yrs – 5yrs	5,442.7	-
>5yrs – 10yrs	8,299.0	-
>10yrs – 15yrs	3,570.9	-
>15 yrs – 20yrs	735.5	-
>20yrs	2.6	-
Total	**40,972.5**	**40,972.5**

Source: Central Bank of Trinidad and Tobago

As at December 2014, data indicated that local mutual funds had 53.5 per cent of their assets that were re-pricing or maturing in one year or more, indicating a high level of interest rate sensitivity. In particular, a significant portion of assets (TT$8.3 billion) was invested in instruments that were either re-pricing or maturing in the 5yr – 10yr band (Table 4.6). In an effort to maximize yields in the current ultra-low interest rate environment, mutual funds have invested in longer-term assets. Table 4.1 above shows the results of the interest rate stress-test among the different institutions.

The results of the interest rate test have important implications for mutual funds that operate under a fixed NAV regime. Under severe market stress, fixed NAV funds can be vulnerable to heavy redemptions. This is because as interest rates rise and bond values fall, it may be difficult for funds to offer investors the option to redeem units at the stated value since the actual value of shares may be relatively lower. Funds may be able to handle limited redemptions in the near term but this may not be sustainable. The problem could be further aggravated if savvy investors decide to redeem if they believe that the fund is in distress.

Stock Price Risk

The bursting of a local stock market bubble is likely to have a marginal impact on the local mutual funds industry. Stress test results indicate that the industry is likely to suffer a 1.8 per cent decline in its investment portfolio in the event of a 30 per cent decline in the local stock index. The results however, overshadowed stock market exposures of individual funds within the industry. For instance, one institution (SP1) is likely to see a decline in its asset portfolios of about 3 per cent. Specifically, two funds administered by this institution are exposed to losses of 11.4 per cent and 11.2 per cent in their asset portfolios, respectively. While these are potentially significant losses, the possibility of investors withdrawing funds is limited. One explanation for this is that these funds operate under a floating NAV and losses are partially reflected in the share prices of the funds, thus desensitizing investors to possible withdrawals in the event of reductions in unit prices. Drawing from research on mutual funds operating in international jurisdictions, the fact that a fund operates under a floating NAV does not completely eliminate run-risk. In fact, run-risk can still be triggered via a variety of factors such as uncertainty about sponsor support or guarantee, also known as sponsor-fund risk[19].

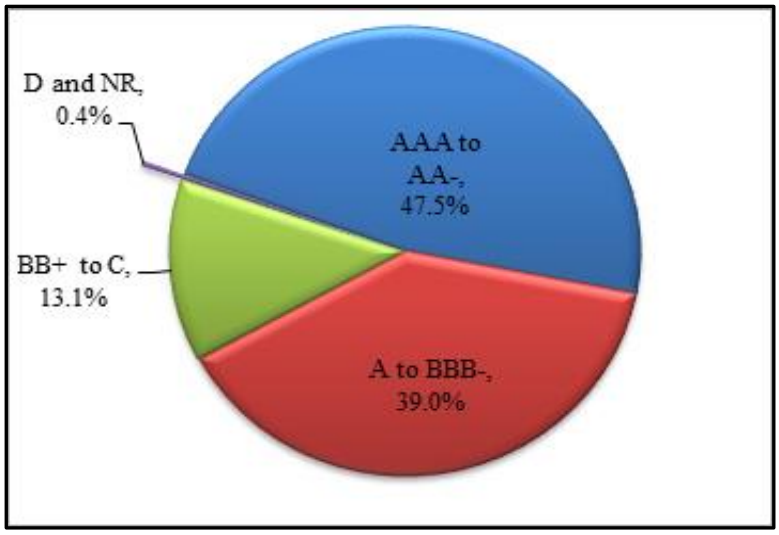
[19] See paper by McCabe (2010)

All other institutions are likely to suffer losses amounting to, on average, 0.8 per cent in their asset portfolios.

Credit Default Risk

As at end-2014, the local mutual funds industry appeared to be minimally exposed to credit default risk. This is commendable, as mutual funds are generally invested in high quality assets of issuers. Chart 4.3 shows the value of assets by credit rating held by mutual funds that were stress tested. The data indicate that approximately 13.5 per cent of assets held by mutual funds carried a rating of BB+ or lower. The results of the stress test as seen in Table 4.1 indicate that in the event of a stress scenario which increases the default risk of bonds, the industry is likely to witness a loss in the value of assets of about 0.4 per cent. The picture is somewhat different when we analyzed the average fund rating of the various institutions.

Chart 4.3
Market Value of Mutual Funds Assets by Credit Rating
/Per cent/



Source: Based on CBTT Survey.

Table 4.7 below shows that two sponsors held an average credit rating of AA- each, while one sponsor held a credit rating of BBB. SP1 had an average institution rating of AA-. Among the various institutions that were tested, SP1 is most exposed to credit risk (0.68 per cent), while SP4 was the least, with a potential loss of 0.1 per cent in its asset portfolio.

Table 4.7
Average Fund Portfolio Credit Rating by Sponsor – As December 2014

Institution /Sponsor	Amt. of Bonds in Portfolios /TT$Bns/	Avg. Portfolio Credit Rating by Sponsor
SP4	6.90	AA-
SP2	5.60	AA
SP3	5.80	BBB
SP1	12.80	AA-
Overall Rating	**31.20**	**A**

Source: Calculations based on CBTT Survey.
Note: The average credit rating of the institution was first determined by assigning numbers 1 to 22, 1 being equivalent to a AAA rated bond and 22 being NR rated bond. This was done for each bond held in the portfolios of each sponsor. The weighted average rating was calculated using the value of each bond in the portfolios. After arriving at a number we reassigned a credit rating letter for the institutions (S&P rating).

B. Scenario-Stress Tests

Energy-Price Shock: No Policy Intervention

Based on the results of the scenario tests, the mutual fund industry is likely to see a fall in assets under management of 4.3 per cent, which is slightly lower than the benchmark of 5 per cent. The results for the industry however overshadowed significant losses in two sponsors (SP4 and SP2) which experienced losses of 14.9 per cent and 13.9 per cent respectively in assets under management. These losses were mainly due to the interest rate shock reducing the assets under management of various institutions. The stock price and credit default risk shocks only resulted in marginal declines in funds under management.

Energy-Price Shock: With Policy Intervention

In a similar shock scenario however with policy intervention, the industry will be able to withstand any negative or adverse effects. In fact, the results for the system indicate an improvement in assets under management of 8.9 per cent. In this scenario, an expansionary monetary policy intervention by the Central Bank, may positively impact asset values held in funds' portfolios.

Local Natural Disaster Shock: With Policy Intervention

In a natural disaster scenario with subsequent central bank policy intervention, the mutual fund system is able to withstand any negative declines in asset under management. The only stresses that negatively affect such a scenario are stock price and credit default risk shocks;

however the resulting declines are outweighed by the positive effects of policy intervention and depreciation of the domestic currency which appreciates all foreign currency assets held by the funds.

In all scenarios, interest rate risks pose the greatest threat to the system. However, with proper central bank policy intervention, these risks are mitigated. In addition, these shock scenarios result in a depreciation of the domestic currency. The net effect of this is an increase in the domestic market value of all foreign currency assets held by the system (32 per cent or TT$13.1 billion). Considering that only 6 per cent of the assets under management are local equity assets, stock price shocks do not considerably affect the system. Furthermore, credit default risk through an increase in the probability of default also does not significantly affect assets under management as the overall average credit rating of the system is A-.

5. Evaluation of Data Limitations

In order to conduct the stress testing exercise, mutual funds were asked to submit detailed balance-sheet data for individual mutual funds as follows:

(i) Investment Distribution of Assets (including liabilities and shareholders' equities) – The data collected was broken-down by institutional sector, marketable vs. non-marketable, TTD value equivalent of all investments and liquid fund holdings;

(ii) Maturity/Re-pricing Schedule of All Assets/Liabilities – Mutual funds were asked to provide a break-down of all balance sheet assets and liabilities according to time to next re-pricing and/or time remaining to maturity depending on whether the instruments were floating or fixed.

(iii) Foreign Currency Investments – The data collected relates to mutual funds' asset holdings by currency type e.g. USD, CAN, BDS;

(iv) Regional Distribution of Assets – The type of data collected pertained to the distribution of assets held in the portfolios of mutual funds by country.

(v) Distribution of Assets by Economic Sector – The definition of economic sectors followed that Trinidad and Tobago System of

National Accounts (TTSNA) e.g. manufacturing, distribution, financial.

(vi) Investment Details – Mutual funds were asked to submit details of the bond holdings in their respective portfolios according to latest market value, credit rate, date of issue, date of maturity, current yield etc.

In researching and conducting the various stress tests on the domestic mutual fund industry, we encountered some data limitations. The first major limitation is that data was only collected for 19 funds from four institutions where as the industry currently contains 61 TTSEC registered funds from 12 institutions. Although the 19 funds' data represent roughly 88 per cent of the industry, the remaining 12 per cent would have provided a more accurate picture of the industry and resulting stress tests. In addition, the data collected from the institutions were based on a unique or one-off data request and therefore was not able to provide a time series analysis of the susceptibility of the industry during different time periods. Considering that the data sets requested were unique with a newly developed data entry template, some of the funds were not specific with the various asset classes and internal assumptions had to be made with respect to the category some assets fell into and also the credit rating of some assets that do not possess an assigned rating from an international or regional credit rating agency.

6. Conclusion and Recommendations

We have performed a preliminary assessment of the local mutual funds industry in Trinidad and Tobago with a view to determining potential systemic risks to the stability of the wider financial system and the domestic economy. This assessment included the use of stress-testing techniques typically used to assess the vulnerabilities of banks and insurance companies to shocks. The stress tests used a sample of 19 mutual funds sponsored by banking organization in Trinidad and Tobago including the TTUTC.

The results of the stress tests indicate that mutual funds performed well under a number of severe adverse shocks including both sensitivity and scenarios. The results of the overall study however, point to some risks which warrant attention in a number of areas. There appears to be a huge asset/liability mismatch in the mutual funds industry. This is because mutual funds locally provide daily redemptions but invest in very long-term assets. In

addition, a huge portion of this industry's assets are administered under fixed NAV funds, which provides an implicit expectation to investors that their funds will not lose value.

As regards to preliminary recommendations, we propose two options: (i) the implementation of redemption/withdrawal restriction policies and (ii) switching to a floating NAV where workable. Withdrawal restrictions will improve the huge mismatch between assets and liabilities currently existing in mutual funds. The switch to a floating NAV will desensitize investors to run-risk by making them more aware about losses in mutual funds.

We further propose that sponsors monitor and evaluate their mutual funds' vulnerability to shocks and ensure that they hold adequate capital (not only to meet on-balance-sheet exposures) but to also lend support to funds during stressful conditions. In terms of the size of the capital needed to buffer losses, this could be determined on the basis of the degree of risks undertaken by the funds at all times.

Finally, regulators, especially the Central Bank of Trinidad and Tobago, should frequently conduct stress-testing of major mutual funds in order to determine the impact of potential losses on their sponsors. As a first step, the regulator may consider implementing a stress-testing data survey similar to that used in this study. This will enable the Bank to acquire the data needed to conduct stress-testing exercises on major mutual fund sponsors.

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8. Appendices

Appendix Table 1
Investment Rules
Under the Collective Investment Schemes Guideline 2008

Restriction	Description
Concentration restrictions	Prohibits a CIS from investing more than ten (10) percent of its net assets in any one issuer but excludes certain types of indebtedness such that money market and bond funds could acquire indebtedness of an issuer above the ten per cent limit.
Control restrictions	Limits a CIS to holding ten percent or less of the outstanding securities of an issuer and therefore not holding more than ten percent of the votes attached to the outstanding voting securities of that issuer. In addition, a CIS should not purchase a security for the purpose of exercising control or direction over the issuer of a security.
Liquidity restrictions	A CIS shall not purchase equity securities that cannot be readily disposed of through a securities exchange.
Borrowing restrictions	A CIS shall not borrow cash or provide a security interest over any of its portfolio assets unless the transaction is temporary and is for the purpose of accommodating requests for the redemption of securities of the collective investment scheme. The outstanding amount of all borrowings of the CIS must not exceed five percent of the portfolio assets of the collective investment scheme taken at market value at the time of the borrowing and a transaction shall be deemed to be temporary if the borrowing is repaid within six months from the date of borrowing.

Appendix Table 2
Organizational Structure of Mutual Funds

Sponsor	TT Unit Trust Corporation (UTC)	First Citizens Bank Limited	Royal Bank Trinidad and Tobago Limited	Republic Bank Limited	Scotia Bank Trinidad and Tobago
Fund Promoter	TT Unit Trust Corporation	First Citizens Asset Management Limited	Royal Bank Trinidad and Tobago Limited	Republic Bank Limited	Scotia Trust and Merchant Bank (TT)
Fund Custodian	Central Bank of Trinidad and Tobago (CBTT)	First Citizens Trustee Services Limited	RBTT Trust and Asset Management Limited	Republic Finance & Merchant Bank Limited	State Street Bank & Trust Company
Fund Trustee	TT Unit Trust Corporation	First Citizens Trustee Services Limited	RBTT Trust and Asset Management Limited	Republic Finance & Merchant Bank Limited	State Street Bank & Trust Company
Fund Manager	TT Unit Trust Corporation	First Citizens Asset Management Limited	RBC Investment Management Caribbean Ltd	Republic Bank Limited	Scotia Investments Trinidad and Tobago Limited
Fund Distributor	TT Unit Trust Corporation	First Citizens Bank Limited	Royal Bank Trinidad and Tobago Limited	Republic Bank Limited	Scotia Asset Management (St. Lucia) Limited