MBTA – A Pension Fund At Risk

Investigative Report - June 26, 2015

Investigation Team - Background

- The forensic investigation commenced in November 2013 with Certified Fraud Examiner Harry Markopolos CFA
- By December 2014, Boston University finance professor and risk management expert Mark Williams was contacted and he assembled a team of two Mathematical Finance Graduate students to help deconstruct pension fund financials and closely scrutinize stated asset mix
- On the accounting side, Boston-based Certified Fraud Examiner and Forensic Accountant Van Khang CPA, CFE of Khang Advisory LLC assessed MBTA accounting practices, standards applied by KPMG, and the level and quality of financial reporting

Investigation Team - Background

- Steve Gaudette CFA from Boston-based Northfield Information Services also provided analysis and insights relating to pension fund assumptions applied
- Several other individuals with math, finance and actuarial backgrounds also contributed to this investigation but requested to remain anonymous
- Each of the above individuals freely volunteered their time to analyze the MBTA Pension Plan

Summary Findings – MBTA Pension Fund At Risk

1. Even with limited and opaque financials, this investigation uncovered 12 Red Flags
2. Potential size of discrepancies are in **excess** of $470 million or 29% of total pension fund value
3. Individually, each of these findings were concerning and when combined, they pointed to **a pension fund at risk** and significant danger to plan beneficiaries
4. The dollar size of potential risk may be even larger as limited reporting in the $320 million alternative investments/hedge funds segment (20 percent of pension assets) has made it difficult to analyze what could be **hidden** in this higher-risk and harder to value asset category

Summary Findings – MBTA Pension Fund At Risk

Examples of Red Flag areas include the following:

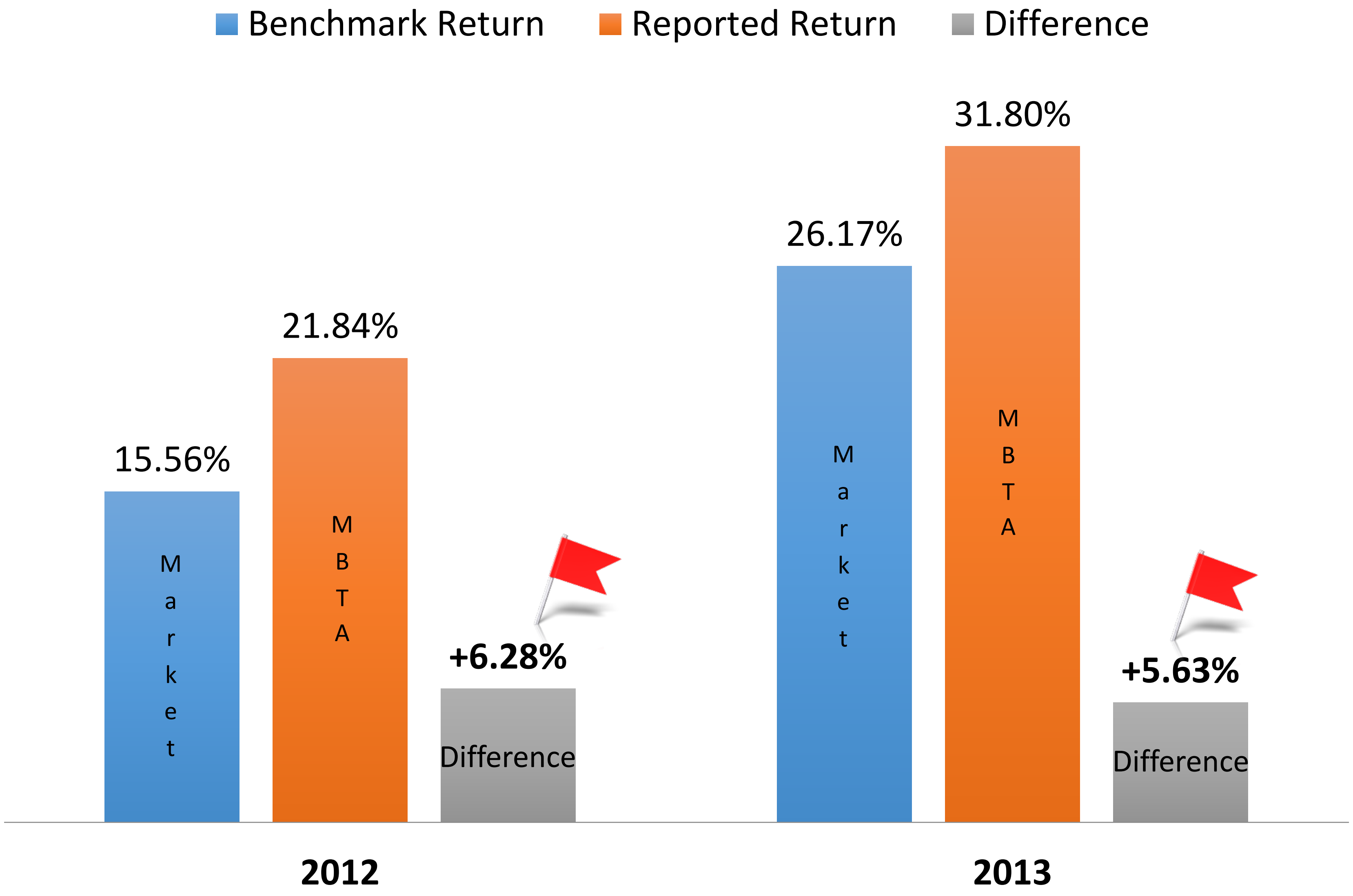
1. Reported investment returns appeared overstated by up to $123 million
2. Pension portfolio assets appeared overstated by $139.5 million
   A. Liberal asset smoothing assumptions used - $96 million
   B. Bonds discrepancy (book versus market value) - $43.5 million
3. Pension liabilities appeared understated by up to $211 million
   A. Use of outdated mortality table - $105 million
   B. Liberal increase in expected return assumption - $106 million
4. Size of pension underfunded ratio appeared understated by 5 to 6 percent
5. Excessive staffing fees paid out ($4 million annually) and in violation with the governing trust
6. Lack of board sophistication, investment experience and a pronounced unwillingness to provide reporting transparency even after significant multi-million dollar losses associated with Ponzi Scheme operators Fletcher Asset Management and Weston Capital Management

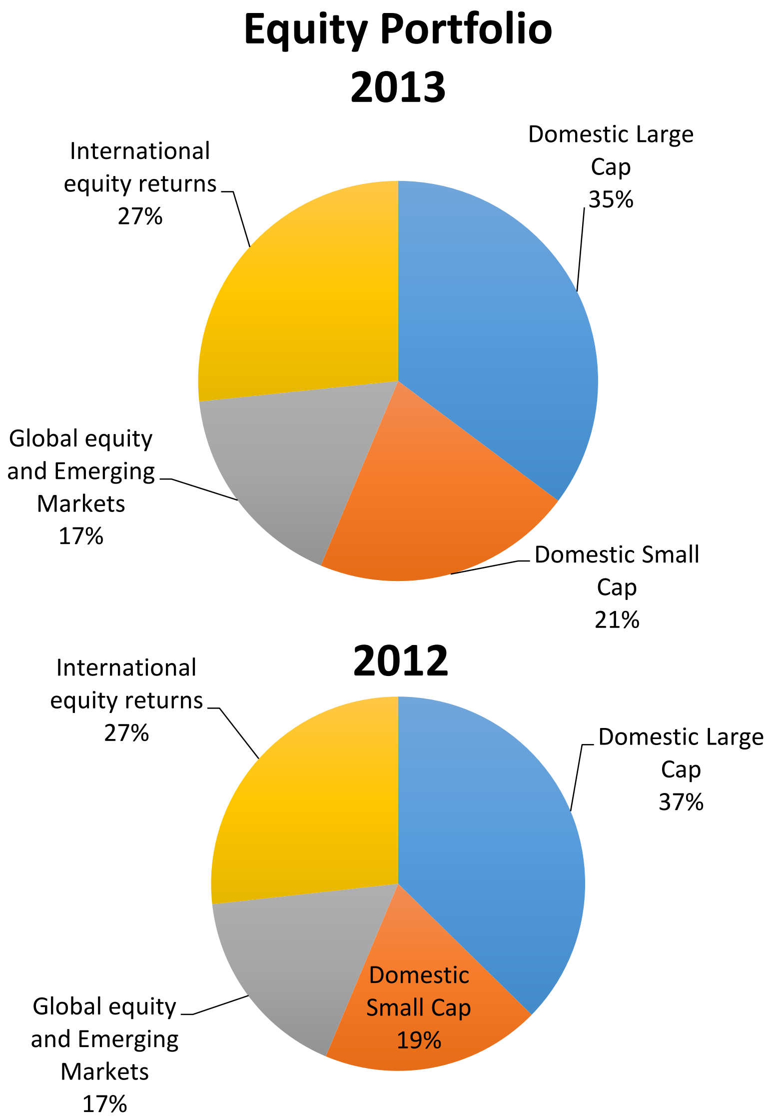
Highly Unusual - Size and Frequency of Reported Market Beating Performance

Pension Asset Class	MBTA 2012 Reported Returns Beat Market (Y/N)	Percentage Beat Market in 2012 (%)	MBTA 2013 Reported Returns Beat Market (Y/N)	Percentage Beat Market in 2013 (%)
1) Equity Portfolio	Yes	**6.28**	Yes	**5.63**
Categories				
Large Cap Equities	Yes	**4.10**	No	(.31)
Small Cap Equities	Yes	**4.24**	No	(1.05)
Emerging Markets	Yes	**12.19**	Yes	**31.77**
International	Yes	**7.02**	Yes	**2.05**
2) Fixed Income	Yes	**7.60/1.67***	Yes	**2.86/.28***
3) Real Estate	Yes	**1.47**	Yes	**4.23**
4) Private Equity		(17.94)		(9.20)
5) Hedge Fund	No	(9.61)	No	(14.48)
6) Diversified Beta		(13.77)		(11.31)

Source: Annual Report 2012, 2013
*applied two separate benchmarks

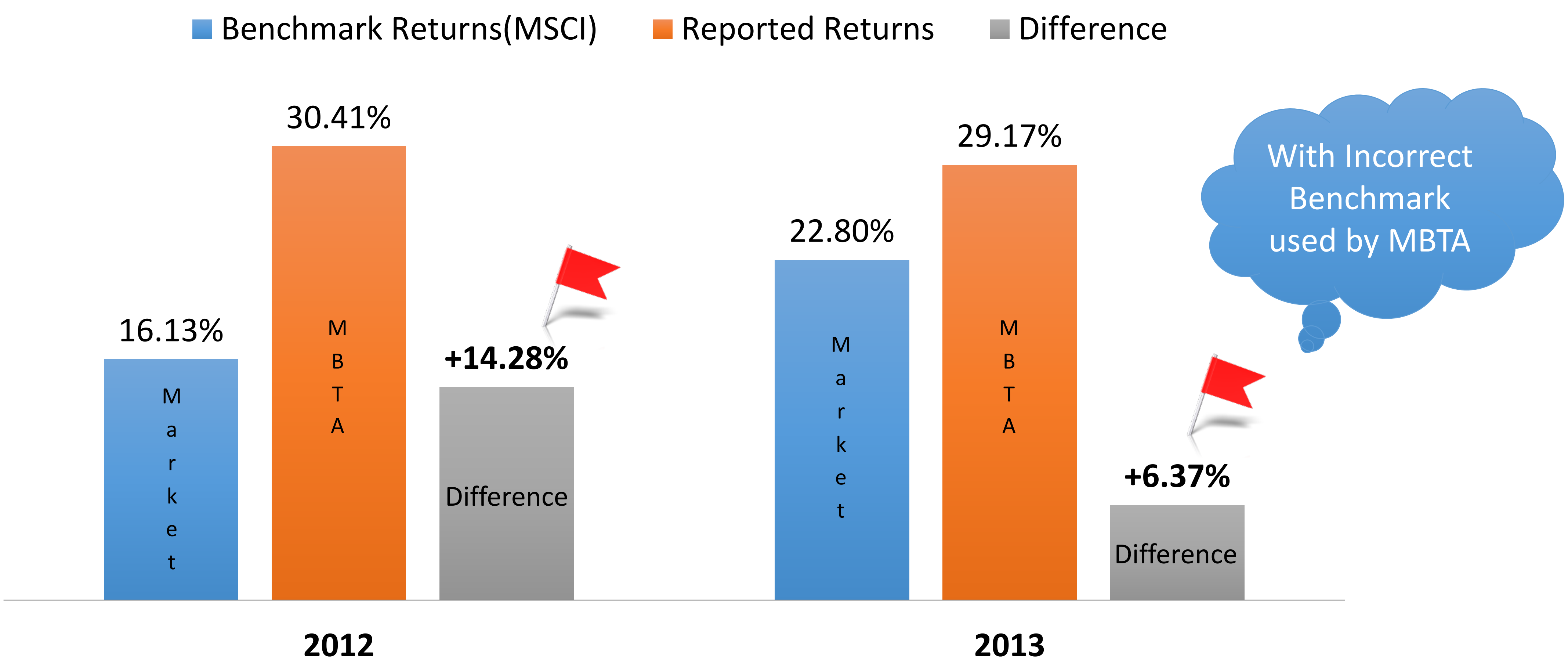
1) - Equity Portfolio Expected Returns vs. Reported Returns





Source: Annual Report 2012, 2013

1. c) - Returns on Emerging Markets vs. MSCI (All Country World Index)



Source: Annual Report 2012 and 2013

Red Flag #2 – MBTA Reported Consistently Higher Returns Than Larger and More Sophisticated MASSPRIM

- In five out of six years, the MBTA, a much smaller and less sophisticated organization with less internal investment expertise was able to beat or tie MASSPRIM returns 5 out of 6 years (2008-2013).
- MASSPRIM state-wide pension fund ($61 billion) is more than 38 times the size of MBTA's ($1.6 billion) fund
- All returns are reported gross of fees

What are the odds that MBTA could meet or beat the more sophisticated MASSPRIM in 5 out of 6 years?

Year	MBTA	PRIT	Difference
2008	-27.20%	-29.40%	2.20%
2009	**17.70%**	**17.70%**	**(0.00)%**
2010	13.42%	13.61%	(0.19)%
2011	0.75%	0.14%	0.61%
2012	14.93%	13.88%	1.05%
2013	17.08%	15.24%	1.84%

Source: Annual Reports of MBTA, MASSPRIM (http://www.mapension.com/publications/)
PRIT: Pensions Reserves Investment Trust managed by PRIM
Returns for PRIT (TOTAL CORE) are gross of fees and as of periods ending December 31

MBTA and MASSPRIM Portfolios in 2009 Were Different – Making Obtaining the Exact Same Return More Improbable

Portfolio Mix 2009	MBTA	MASSPRIM	Difference
Bonds	23.02%	18.70%	4.32%
Short-Term Investments	2.78%	0%	2.78%
Equities Domestic + International	44.06%	47.70%	-3.64%
Real Estate	7.01%	9.50%	-2.49%
Alt Investments & Hedge Funds	23.14%	24.10%	-0.96%
Total	**100.00%**	**100.00%**	

Source: MBTA 2009 Annual Report, http://www.mapension.com/files/2513/1656/3580/20091231-Performance.pdf

Suspicious Activities Diagram - Inconsistencies in Actuarial Methods & Assumptions Used

Suspicious Activities	Flags	Dollar Effects
Manipulation of liabilities	Use of outdated mortality table (1994) & substituting with RP 2000 adjusted to 2013	~ $105 million
	Unexplained changes in expected rate of return	~ $106 million
Manipulation of actuarial assets	Changes in asset smoothing methods in 2013	~ $96.34 million
	Changes in asset smoothing methods in 2012	Not estimated due to insufficient data
		= $307 million - $400 million

MBTA's use of an <u>outdated</u> mortality table

As shown in the table below, with regards to mortality tables, MBTA was the only transit authority among the eight major transit authorities in the US that used an outdated mortality table.

Transit Authority	UP 1994	RP 2000	Others
Massachusetts Bay Transportation Authority (MBTA)	✔	✖	✖
Chicago Transit Authority (CTA)	✖	✔	✖
Metropolitan Atlanta Rapid Transit Authority (MARTA)	✖	✔	✖
Miami-Dade Transit (MDT)	✖	✔	✖
Washington Metropolitan Area Transit Authority (WMATA)	✖	✔	✖
Los Angeles County Metropolitan Transportation Authority (LACMTA)	✖	✔	✖
San Francisco Bay Area Rapid Transit (BART) – Pension handled by CALPERS (California Public Employees' Retirement System)	✖	✖	CALPERS own table*
New York City Transit Authority - Pension handled by NYCERS (New York City Employment Retirement System)	✖	✖	NYCERS own table*

*CALPERS table is closer to the RP 2000 table as stated by them while NCERS is a GAM 94 table updated to 2014 mortality rates as per their latest actuarial report.

Source: Annual reports (Actuarial Reports wherever applicable) MBTA, CTA, MARTA, MDT, WMATA, LACMTA, BART(CALPERS), NYCT(NYCERS)

Asset Smoothing – 3 Different & Unsubstantiated Accounting Methods Used

2008		2009	2010	2011	2012	2013
Initial point of analysis	**5 yr smoothing**	✔	✔	✔	✖	✖
5 year smoothing method	**5 yr moving average**	✖	✖	✖	Method #2 ✔	✖
	5 yr phase-in	✖	✖	✖	✖	Method #3 ✔
	Reason for change	NA	NA	NA	None provided	None provided
	Dollar value of change	Use of the 5 year smoothing method overstates actuarial asset value during earlier years of market underperformance			Use of 5 year moving average method overstates actuarial asset value during later years of market underperformance	**+$96,359,000**

Overall effect on asset smoothing is in excess of **+$96 million** over the last 5 years due to the utilization of *3 methods* during this period

Source: Annual reports MBTARF 2012, 2013