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Comparison of RBC 250 Hedge Index Using Investible and Non-Investible Hedge Fund Indices: A Statistical Analysis

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Abstract

In recent years, a number of investible hedge fund indices have been introduced. Many of these investible indices are based on either managed account platforms or direct investment into fund-based products. While the various hedge fund indices differ on a number of characteristics (strategy, availability, construction, etc), one significant difference is the number of managers/funds within the representative index ( ). One concern often expressed over the use of investible hedge fund indices is that the number of managers/funds within any one index is too small to adequately represent the performance of the overall universe or strategy. This concern is reflective of that in the traditional asset market to the degree that one may have concerns over the ability of the Dow Jones Industrial index or S&P 500 to adequately represent the performance of the larger universe of equity securities.

In this article, we compare the risk and return characteristics of the RBC 250 index and its constituent strategy-based sub-indices relative to comparable investible and non-investible indices. Our findings suggest that for many hedge fund strategies, the RBC indices perform either markedly superior or inferior to other comparable index providers. We also find that the RBC generally has higher volatility at the sub-index level and higher equity betas; however, this is of course strategy specific. In addition, we show that the initial out performance of the RBC does not reflect its current performance relative to other investible hedge fund indices. Thus, while the RBC 250 and many of its sub-indices initially showed significant return differentials in early months, such differentials declined in later months.

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Introduction

In recent years, a number of investible hedge fund indices have been introduced. Many of these investible indices are based on either managed account platforms or direct investment into fund-based products. While the various hedge fund indices differ on a number of characteristics (strategy, availability, construction, etc), one significant difference is the number of managers/funds within the representative index ( ). One concern often expressed over the use of investible hedge fund indices is that the number of managers/funds within any one index is too small to adequately represent the performance of the overall universe or strategy. This concern is reflective of that in the traditional asset market to the degree that one may have concerns over the ability of the Dow Jones Industrial index or S&P 500 to adequately represent the performance of the larger universe of equity securities.

In response to the concern over the size of many investible hedge fund indices, the Royal Bank of Canada (RBC) introduced the RBC 250 Hedge Index; a structured finance product that attempts to create an index that represents the performance of a larger hedge fund universe. While previous research has indicated that between four to ten managers/funds are adequate to fully represent the performance of a larger universe of similar hedge fund managers, the question as to the relative performance characteristics of a larger 'investible' index to investible indices based on a smaller set of managers/funds is an empirical question**.**

In this article, we compare the risk and return characteristics of the RBC 250 index and its constituent strategy-based sub-indices relative to comparable investible and non-investible indices. Our findings suggest that for many hedge fund strategies, the RBC indices perform either markedly superior or inferior to other comparable index providers. Results also suggest that the RBC generally has higher volatility at the sub index level and higher equity betas. However, it is important to note that the limited short period from which we base our analysis may not be representative of the longer-run results obtained over time.

Data and Methodology

The RBC Hedge 250 index is a broad-based investible hedge fund index incepted on July 1, 2005 that is comprised of approximately 250 funds. The index is designed to be representative of a much larger hedge fund universe. The index is comprised of 4 sectors and 9 strategies as noted in Exhibit 1 below. To ensure that no particular strategy dominates the overall index, RBC has also established target weight limitations for each strategy.

Exhibit 1: Hedge Fund Strategies Represented in RBC 250 Hedge Index

RBC 250 Hedge Index							
Relative Value Sector		Tactical Sector		Event-Driven Sector		Mult-Strategy Sector	
Strategy	Target Weight Limits	Strategy	Target Weight Limits	Strategy	Target Weight Limits	Strategy	Target Weight Limits
Convertible Arbitrage	40%	Equity Long/Short	40%	Mergers & Special Situations	20%	Multi-Strategy	20%
Equity Market Neutral	20%	Macro	10%	Credit	15%		
Fixed Income Arbitrage	10%	Managed Futures	10%				

Each month, RBC discloses the weights that it applies to each of the hedge fund strategies that comprise its investible hedge fund index as well as the performance incurred within each strategy. Exhibit 2 below depicts the range and average weightings for each hedge fund strategy within the index for the period July 2005 through

October 2006. Equity long/short, multi-strategy and credit strategies to account for the majority of the index as expected given these strategies account for the majority of assets under management in the overall hedge fund universe.

Exhibit 2: Hedge Fund Strategy Weighting in RBC 250 Hedge Index (July/05 – Oct/06)

Strategy	Average Weighting	Range High	Range Low
Relative Value:			
Convertible Arbitrage	3.80%	4.54%	2.96%
Equity Market Neutral	2.80%	3.04%	2.48%
Fixed Income Arbitrage	5.90%	6.22%	5.55%
Total	12.49%		
Tactical:			
Equity Long/Short	34.75%	36.85%	32.96%
Macro	8.80%	9.06%	8.56%
Managed Futures	6.25%	6.72%	5.90%
Total	49.79%		
Event-Driven:			
Credit	12.23%	12.57%	11.93%
Mergers & Special Situations	10.37%	10.87%	10.01%
Total	22.60%		
Multi-Strategy:			
Multi-Strategy:	15.12%	15.95%	14.06%

For our comparison analysis, we obtained monthly returns for composite and strategy based investible hedge fund indices from Dow Jones (DJ), Credit Suisse/Tremont (CS/Tremont), Morgan Stanley Capital International (MSCI), and Hedge Fund Research (HFR) from July 1, 2005 through October 31, 2006 from Bloomberg. We also obtained non-investible composite and strategy-based hedge fund indices from the Center for International Securities and Derivatives Markets (CISDM), HFR, and the Barclay Group over the same period. Using the returns of these alternative index providers, we construct equally weighted hedge fund composite investible and non-investible indices and compare the risk and return performance for each of these indices relative to the RBC indices. Additionally, we also compare the performance of the RBC indices to the S&P 500 and Lehman U.S. Aggregate and Government Credit indices over the period.

Lastly, our analysis consists of an analysis of the differential in returns obtained when comparing the RBC indices relative to our strategy based investible composite indices. For the purposes of comparison, we divide our sample of returns into three subgroups: July 1, 2005 to December 31, 2006; January 1, 2006 to June 30, 2006; and, July 1, 2006 to October 31, 2006. We then compute the compound rate of returns for both the RBC and strategy-based investible composite indices in each of the subgroup periods and determine the differential in returns for each of the strategies over each of the subgroup periods.

Empirical Results

1. Global Market Index

Index	Annualized Return	Standard Deviation	Information Ratio	Maximum Drawdown	Skewness	Kurtosis
	Descriptive Statistics					
DJ BPI	7.83%	2.69%	2.91	-1.09%	-0.13	0.74
MSCI Hedge Invest	7.23%	3.18%	2.28	-1.83%	-0.27	-0.66
CS/Tremont Investable Index	7.43%	2.82%	2.63	-0.89%	-0.10	-0.53
HFRX Global Hedge Fund Index	7.96%	4.18%	1.90	-2.36%	-0.65	-0.20
HFRX Equal Weighted Strategies Index	7.01%	2.91%	2.41	-1.45%	-0.75	0.93
Average	7.49%	3.16%	2.43	-1.52%	-0.38	0.05
RBC 250 INDEX RETURN	10.13%	4.14%	2.45	-1.87%	-0.50	-0.38
Investible Hedge Fund Composite Index	7.50%	3.03%	2.48	-1.18%	-0.46	-0.13
HFR FOF Composite (Non-investible)	9.93%	4.62%	2.15	-2.71%	-0.67	-0.26
Non-Investible Composite Index	12.43%	4.67%	2.66	-1.84%	-0.49	-0.13
S&P 500	13.59%	6.67%	2.04	-2.88%	-0.39	-0.38
Lehman Gov't Credit	2.23%	3.29%	0.68	-2.15%	-0.23	-1.02
Lehman High Yield	7.82%	2.90%	2.70	-1.69%	-0.50	-0.58

Bullet Points:

- **RBC 250 has higher return than average of investible indices, FOF Composite, and Index of investible Hedge fund composite indices.**
- **RBC 250 has higher standard deviation than average of investible indices and Index of investible Hedge fund composite indices.**
- **RBC 250 has similar maximum drawdown, skewness and kurtosis to other investible and non-investible indices**

	Beta 7/2005-10/2006			Correlation 7/2005-10/2006			
Index	S&P 500	Lehman Gov't Credit	Lehman High Yield	S&P 500	Lehman Gov't Credit	Lehman High Yield	Non-Investible Composite Index
DJ BPI	0.30	-0.06	0.63	0.75	-0.07	0.68	0.89
MSCI Hedge Invest	0.35	-0.14	0.50	0.73	-0.14	0.45	0.96
CS/Tremont Investable Index	0.25	-0.23	0.32	0.59	-0.27	0.33	0.92
HFRX Global Hedge Fund Index	0.50	-0.05	0.81	0.79	-0.04	0.56	0.96
HFRX Equal Weighted Strategies Index	0.32	0.01	0.59	0.73	0.01	0.59	0.92
Average	0.34	-0.09	0.57	0.72	-0.10	0.52	0.93
RBC 250 INDEX RETURN	0.43	-0.19	0.67	0.68	-0.15	0.47	1.00
Investible Hedge Fund Composite Index	0.34	-0.09	0.57	0.76	-0.10	0.55	0.97
HFR FOF Composite (Non-investible)	0.48	-0.15	0.74	0.70	-0.11	0.46	0.99
Non-Investible Composite Index	0.49	-0.22	0.74	0.70	-0.15	0.46	1.00
S&P 500	1.00	0.05	1.55	1.00	0.02	0.67	0.70
Lehman Gov't Credit	0.01	1.00	0.42	0.02	1.00	0.37	-0.15
Lehman High Yield	0.29	0.33	1.00	0.67	0.37	1.00	0.46

Bullet Points:

- **RBC 250 has higher S&P 500 and Lehman High Yield betas than average of investible indices and Investible Hedge fund composite indices.**
- **RBC 250 has similar market factor correlations to average of investible indices and index of investible hedge fund composite indices.**
- **RBC 250 has greater market sensitivity to other investible indices due primarily to its greater standard deviation than a higher correlation.**
- **RBC 250 has high correlation to non-investible composite index similar to that of the average of investible indices, HFR Fund of Fund, and Investible Hedge fund composite indices.**

2. Convertible Arbitrage

Index	Annualized Return	Standard Deviation	Information Ratio	Maximum Drawdown	Skewness	Kurtosis
	Descriptive Statistics 7/2005-10/2006					
DJ Convertible Arbitrage Index	8.77%	2.35%	3.74	-0.84%	-0.35	0.62
MSCI Hedge Invest Convert & Equity Arb Index	7.31%	2.68%	2.73	-1.77%	-1.62	6.09
CS/Tremont INVX Convertible Arbitrage Index	9.07%	2.50%	3.63	-0.80%	0.58	1.25
HFRX Convertible Arbitrage Index	7.84%	1.96%	3.99	-0.43%	-0.21	-1.28
Average	8.25%	2.37%	3.52	-0.96%	-0.40	1.67
RBC Convertible Arbitrage Index	13.25%	3.93%	3.37	-1.35%	0.82	2.54
Investible Convertible Arbitrage Composite Index	8.25%	2.09%	3.94	-0.87%	-0.49	2.63
Non-Investible Convertible Arbitrage Composite Index	10.72%	2.18%	4.92	-0.24%	0.72	2.01
S&P 500	13.59%	6.67%	2.04	-2.88%	-0.39	-0.38
Lehman Gov't Credit	2.23%	3.29%	0.68	-2.15%	-0.15	-1.15
Lehman High Yield	7.82%	2.90%	2.70	-1.69%	-0.50	-0.58

Bullet Points:

- **RBC Convertible Arbitrage index has higher return than all investible indices, the non-investible composite index, and Lehman bond indices.**
- **RBC Convertible Arbitrage index has higher standard deviation than all investible and non-investible convertible arbitrage indices as well as Lehman bond indices, but lower than that of the S&P 500.**
- **Risk adjusted returns for the RBC convertible arbitrage index are inferior to almost all other investible and non-investible hedge fund indices, but better than traditional stock and bond indices.**
- **RBC Convertible Arbitrage index has similar maximum drawdown, skewness and kurtosis to other investible and non-investible indices.**

Index	Beta 7/2005-10/2006 S&P 500	Beta Lehman Gov't Credit	Beta Lehman High Yield	Correlation 7/2005-10/2006 S&P 500	Correlation Lehman Gov't Credit	Correlation Lehman High Yield	Correlation Non-Investible Covertible Arbitrage Composite Index
DJ Convertible Arbitrage Index	0.05	-0.11	0.30	0.14	-0.16	0.37	0.81
MSCI Hedge Invest Convert & Equity Arb Index	-0.08	-0.10	0.14	-0.20	-0.12	0.16	0.67
CS/Tremont INVX Convertible Arbitrage Index	0.15	-0.12	0.53	0.40	-0.15	0.62	0.90
HFRX Convertible Arbitrage Index	0.09	-0.05	0.31	0.30	-0.09	0.46	0.81
Average	0.05	-0.09	0.32	0.16	-0.13	0.40	0.80
RBC Convertible Arbitrage Index	0.15	-0.19	0.61	0.26	-0.16	0.45	0.97
Investible Convertible Arbitrage Composite Index	0.05	-0.09	0.32	0.16	-0.15	0.45	0.90
Non-Investible Convertible Arbitrage Composite Index	0.08	-0.14	0.34	0.23	-0.21	0.46	1.00
S&P 500	1.00	0.05	1.55	1.00	0.02	0.67	0.23
Lehman Gov't Credit	0.01	1.00	0.42	0.02	1.00	0.37	-0.21
Lehman High Yield	0.29	0.33	1.00	0.67	0.37	1.00	0.46

Bullet Points:

- **RBC Convertible Arbitrage index has higher S&P and Lehman High Yield betas relative to the average of investible indices and the non-investible composite index. RBC has a lower Lehman Government Credit beta than all other investible indices and the non-investible composite index.**
- **RBC Convertible Arbitrage index has similar market factor correlations to average of investible indices and the investible and non-investible convertible arbitrage composite indices.**
- **RBC has greater market sensitivities than other investible indices due primarily to its greater standard deviation rather than higher correlations.**
- **RBC has a higher correlation to the non-investible convertible arbitrage composite index than all other investible hedge fund indices.**

3. Equity Market Neutral

Index	Annualized Return	Standard Deviation	Information Ratio	Maximum Drawdown	Skewness	Kurtosis
	Descriptive Statistics 7/2005-10/2006					
DJ Equity Market Neutral Index	5.40%	1.25%	4.33	-0.25%	0.10	-0.19
MSCI Hedge Invest Equity Non Directional Index	5.59%	2.94%	1.90	-1.81%	0.51	1.61
CS/Tremont INVX Equity Market Neutral Index	6.96%	1.60%	4.35	-0.16%	0.26	-0.46
HFRX Equity Market Neutral Index	2.90%	2.58%	1.12	-2.00%	-0.01	-1.02
Average	5.21%	2.09%	2.93	-1.05%	0.22	-0.02
RBC Equity Market Neutral Index	3.39%	2.81%	1.20	-1.43%	0.25	-1.13
Investible Equity Market Neutral Composite Index	5.22%	1.28%	4.08	-0.15%	0.07	-1.17
Non-Investible Equity Market Neutral Composite Index	10.14%	2.56%	3.96	-0.59%	-0.23	-0.41
S&P 500	13.59%	6.67%	2.04	-2.88%	-0.39	-0.38
Lehman Gov't Credit	2.23%	3.29%	0.68	-2.15%	-0.15	-1.15
Lehman High Yield	7.82%	2.90%	2.70	-1.69%	-0.50	-0.58

Bullet Points:

- **RBC Equity Market Neutral index has a lower return than almost all investible indices, the investible and non-investible composite indices, the S&P 500 and the Lehman High Yield Index.**
- **RBC Equity Market Neutral index has a higher standard deviation than almost all investible indices as well as the investible and non-investible strategy indices. However, the RBC index has a lower standard deviation than traditional stock and bond indices.**
- **Risk adjusted returns for the RBC Equity Market Neutral index are inferior to all hedge fund and traditional stock and bond indices except for the HFRX Equity Market Neutral and Lehman Government Credit indices.**
- **RBC Equity Market Neutral index has similar maximum drawdown and skewness to other investible and non-investible indices. RBC has kurtosis similar to all other indices except for the MSCI Hedge Invest Equity Non Directional index, which exhibits higher positive kurtosis.**

Index	Beta 7/2005-10/2006: S&P 500	Beta: Lehman Gov't Credit	Beta: Lehman High Yield	Correlation 7/2005-10/2006: S&P 500	Correlation: Lehman Gov't Credit	Correlation: Lehman High Yield	Correlation: Non-Investible Equity Market Neutral Composite Index
DJ Equity Market Neutral Index	0.06	0.04	0.12	0.31	0.10	0.28	0.28
MSCI Hedge Invest Equity Non Directional Index	0.22	-0.08	0.36	0.49	-0.09	0.36	0.86
CS/Tremont INVX Equity Market Neutral Index	-0.05	-0.15	-0.08	-0.22	-0.30	-0.14	0.26
HFRX Equity Market Neutral Index	0.14	-0.04	0.15	0.37	-0.05	0.17	0.13
Average	0.09	-0.06	0.14	0.24	-0.08	0.17	0.38
RBC Equity Market Neutral Index	0.04	-0.12	0.07	0.08	-0.14	0.07	0.57
Investible Equity Market Neutral Composite Index	0.09	-0.06	0.14	0.47	-0.14	0.31	0.71
Non-Investible Equity Market Neutral Composite Index	0.24	-0.18	0.36	0.64	-0.24	0.41	1.00
S&P 500	1.00	0.05	1.55	1.00	0.02	0.67	0.64
Lehman Gov't Credit	0.01	1.00	0.42	0.02	1.00	0.37	-0.24
Lehman High Yield	0.29	0.33	1.00	0.67	0.37	1.00	0.41

Bullet Points:

- **RBC Equity Market Neutral index has lower S&P and Lehman bond index betas relative to almost all other investible indices (except CS/Tremont) as well as investible and non-investible composite indices.**
- **RBC Equity Market Neutral index has lower market factor correlations than the average of investible indices as well as lower correlations with the S&P 500 and Lehman High Yield indices.**
- **RBC has less market sensitivity than other investible indices due primarily to its lower correlations rather than higher standard deviations.**
- **RBC has a higher correlation to the non-investible equity market neutral composite index than the average of investible hedge fund indices, but lower correlation than the investible composite index.**

4. Fixed Income Arbitrage

Index	Annualized Return	Standard Deviation	Information Ratio	Maximum Drawdown	Skewness	Kurtosis
	Descriptive Statistics 7/2005-10/2006					
MSCI Hedge Invest Fixed Income Index	4.96%	3.04%	1.63	-1.58%	0.32	-0.86
CS/Tremont INVX Fixed Income Arbitrage Index	3.56%	2.20%	1.62	-1.55%	-0.02	-0.39
Average	4.26%	2.62%	1.63	-1.56%	0.15	-0.62
RBC Fixed Income Arbitrage Index	6.16%	1.21%	5.07	-0.11%	0.05	0.19
Investible Fixed Income Arbitrage Composite Index	4.27%	2.13%	2.01	-0.91%	0.59	-0.62
Non-Investible Fixed Income Arbitrage Composite Index	6.77%	1.03%	6.60	0.00%	0.37	0.36
S&P 500	13.59%	6.67%	2.04	-2.88%	-0.39	-0.38
Lehman Gov't Credit	2.23%	3.29%	0.68	-2.15%	-0.15	-1.15
Lehman High Yield	7.82%	2.90%	2.70	-1.69%	-0.50	-0.58

Bullet Points:

- **RBC Fixed Income Arbitrage index has a higher return than all investible arbitrage indices, but lower returns than the non-investible fixed income composite, S&P 500, and Lehman High Yield indices.**
- **RBC Fixed Income index has a lower standard deviation than all investible indices and traditional stock and bond indices. However, the RBC index has a slightly higher standard deviation than the non-investible fixed income arbitrage index.**
- **Risk adjusted returns for the RBC Fixed Income Arbitrage index are superior to all hedge fund and traditional stock and bond indices except for the non-investible fixed income arbitrage index.**
- **RBC Fixed Income Arbitrage index has a lower maximum drawdown than most all other hedge fund and traditional stock and bond indices while exhibiting similar skewness and kurtosis**

Index	S&P 500	Lehman Gov't Credit	Lehman High Yield	S&P 500	Lehman Gov't Credit	Lehman High Yield	Non-Investible Fixed Income Arbitrage Composite Index
	Beta 7/2005-10/2006			Correlation 7/2005-10/2006			
MSCI Hedge Invest Fixed Income Index	0.23	-0.16	0.35	0.51	-0.18	0.33	0.55
CS/Tremont INVX Fixed Income Arbitrage Index	-0.04	-0.34	-0.16	-0.12	-0.51	-0.21	0.79
Average	0.10	-0.25	0.09	0.20	-0.35	0.06	0.67
RBC Fixed Income Arbitrage Index	-0.02	-0.16	0.05	-0.10	-0.43	0.12	0.88
Investible Fixed Income Arbitrage Composite Index	0.10	-0.25	0.09	0.31	-0.39	0.13	0.80
Non-Investible Fixed Income Arbitrage Composite Index	0.00	-0.16	0.05	0.01	-0.51	0.13	1.00
S&P 500	1.00	0.05	1.55	1.00	0.02	0.67	0.01
Lehman Gov't Credit	0.01	1.00	0.42	0.02	1.00	0.37	-0.51
Lehman High Yield	0.29	0.33	1.00	0.67	0.37	1.00	0.13

Bullet Points:

- **RBC Fixed Income Arbitrage index has lower S&P and Lehman High Yield index betas relative to almost all other investible indices (except CS/Tremont) and investible and non-investible composite indices.**
- **RBC Fixed Income Arbitrage index has similar market factor correlations to the both investible and non-investible indices.**
- **RBC has lower market sensitivities than other investible indices due to both its lower standard deviation and lower correlation than other indices.**
- **RBC has a higher correlation to the non-investible fixed income arbitrage composite index than all investible hedge fund indices as well as traditional stock and bond indices.**

5. Equity Long/Short

Index	Annualized Return	Standard Deviation	Information Ratio	Maximum Drawdown	Skewness	Kurtosis
	Descriptive Statistics 7/2005-10/2006					
DJ Equity Long/Short Index	7.70%	7.75%	0.99	-6.80%	-0.17	-0.56
MSCI Hedge Invest Variable Bias Index	11.24%	6.84%	1.64	-4.68%	-1.10	1.06
CS/Tremont INVX Long/Short Index	5.64%	5.19%	1.09	-3.93%	-0.99	0.43
HFRX Equity Hedge Index	8.45%	6.17%	1.37	-4.51%	-0.61	-0.51
Average	8.26%	6.49%	1.27	-4.98%	-0.72	0.11
RBC Equity Long/Short Index	13.86%	6.14%	2.26	-3.04%	-0.82	-0.02
Investible Equity Long/Short Composite Index	8.26%	6.18%	1.34	-4.86%	-0.84	0.08
Non-Investible Equity Long/Short Composite Index	12.30%	5.74%	2.14	-3.31%	-0.58	-0.22
S&P 500	13.59%	6.67%	2.04	-2.88%	-0.39	-0.38
Lehman Gov't Credit	2.23%	3.29%	0.68	-2.15%	-0.15	-1.15
Lehman High Yield	7.82%	2.90%	2.70	-1.69%	-0.50	-0.58

Bullet Points:

- **RBC Equity Long/Short index has a higher return than all investible and non-investible long/short indices as well as traditional stock and bond indices.**
- **RBC Equity Long/Short index has a lower standard deviation than almost all investible long/short indices as well as the S&P 500. However, its standard deviation is higher than that of the non-investible equity long/short composite and Lehman bond indices.**
- **Risk adjusted returns for the RBC Equity Long/Short index are superior to all hedge fund and traditional stock and bond indices.**
- **RBC Equity Long/Short index has lower maximum drawdown compared to other investible indices and similar maximum drawdowns to the non-investible composite index and traditional stock and bond indices. RBC's skewness and kurtosis is similar to that of other investible and non-investible long/short indices.**

Index	Beta 7/2005-10/2006			Correlation 7/2005-10/2006			
	S&P 500	Lehman Gov't Credit	Lehman High Yield	S&P 500	Lehman Gov't Credit	Lehman High Yield	Non-Investible Equity Long/Short Composite Index
DJ Equity Long/Short Index	0.93	-0.35	1.36	0.80	-0.15	0.51	0.94
MSCI Hedge Invest Variable Bias Index	0.74	-0.11	1.01	0.72	-0.05	0.43	0.97
CS/Tremont INVX Long/Short Index	0.52	0.34	1.00	0.67	0.22	0.56	0.85
HFRX Equity Hedge Index	0.78	-0.10	1.25	0.85	-0.05	0.59	0.94
Average	0.74	-0.05	1.15	0.76	-0.01	0.52	0.92
RBC Equity Long/Short Index	0.65	-0.06	1.11	0.71	-0.03	0.52	0.99
Investible Equity Long/Short Composite Index	0.74	-0.05	1.15	0.80	-0.03	0.54	0.97
Non-Investible Equity Long/Short Composite Index	0.62	-0.25	0.93	0.72	-0.14	0.47	1.00
S&P 500	1.00	0.05	1.55	1.00	0.02	0.67	0.72
Lehman Gov't Credit	0.01	1.00	0.42	0.02	1.00	0.37	-0.14
Lehman High Yield	0.29	0.33	1.00	0.67	0.37	1.00	0.47

Bullet Points:

- **RBC Equity Long/Short index has comparable S&P and Lehman bond index betas relative to almost all other investible indices and investible and non-investible composite indices.**
- **Market factor correlations of the RBC Equity Long/Short index are similar to that of the comparable investible and non-investible equity long/short indices.**
- **RBC has a high correlation to the non-investible equity long/short composite index as do other equity long/short indices.**

6. Global Macro

Index	Annualized Return	Standard Deviation	Information Ratio	Maximum Drawdown	Skewness	Kurtosis
	Descriptive Statistics 7/2005-10/2006					
CS/Tremont INVX Global Macro Index	-1.69%	4.01%	-0.42	-5.78%	0.31	-0.48
HFRX Macro Index	8.15%	7.29%	1.12	-5.74%	-0.01	-1.14
Average	3.23%	5.65%	0.35	-5.76%	0.15	-0.81
RBC Global Macro Index	5.19%	5.43%	0.96	-5.88%	-0.03	-0.27
Investible Global Macro Composite Index	3.16%	5.15%	0.61	-5.34%	0.38	-1.09
Non-Investible Global Macro Composite Index	9.01%	4.47%	2.02	-2.30%	0.07	-0.82
S&P 500	13.59%	6.67%	2.04	-2.88%	-0.39	-0.38
Lehman Gov't Credit	2.23%	3.29%	0.68	-2.15%	-0.15	-1.15
Lehman High Yield	7.82%	2.90%	2.70	-1.69%	-0.50	-0.58

Bullet Points:

- **RBC Global Macro index has a higher return than the average of investible indices, but lower returns than the non-investible global macro, S&P 500, and Lehman High Yield indices.**
- **RBC Global Macro index has a higher standard deviation than the investible and non-investible composite as well as Lehman bond indices, but lower standard deviation that the S&P 500.**
- **Risk adjusted returns for the RBC Global Macro index are superior to the investible global macro composite index, but inferior to the non-investible composite index.**
- **RBC Global Macro index higher maximum drawdown, but similar skewness and kurtosis compared to other investible and non-investible global macro indices.**

	Beta 7/2005-10/2006			Correlation 7/2005-10/2006			
Index	S&P 500	Lehman Gov't Credit	Lehman High Yield	S&P 500	Lehman Gov't Credit	Lehman High Yield	Non-Investible Global Macro Composite Index
CS/Tremont INVX Global Macro Index	0.04	-0.56	-0.20	0.07	-0.46	-0.15	0.77
HFRX Macro Index	0.53	-0.05	0.30	0.48	-0.02	0.12	0.91
Average	0.28	-0.31	0.05	0.28	-0.24	-0.01	0.84
RBC Global Macro Index	0.39	-0.58	0.02	0.48	-0.35	0.01	0.94
Investible Global Macro Composite Index	0.28	-0.31	0.05	0.37	-0.20	0.03	0.94
Non-Investible Global Macro Composite Index	0.32	-0.34	0.20	0.47	-0.25	0.13	1.00
S&P 500	1.00	0.05	1.55	1.00	0.02	0.67	0.47
Lehman Gov't Credit	0.01	1.00	0.42	0.02	1.00	0.37	-0.25
Lehman High Yield	0.29	0.33	1.00	0.67	0.37	1.00	0.13

Bullet Points:

- **RBC Global Macro index similar S&P 500 and Lehman bond index betas relative to investible and non-investible global macro composite indices.**
- **RBC Global Macro index has similar market factor correlations to investible and non-investible global macro indices.**
- **RBC has greater market sensitivity than other investible indices due primarily to its higher correlations rather than higher standard deviations.**
- **RBC has a high correlation to the non-investible convertible arbitrage composite index as do other global macro indices.**

7. Managed Futures

Index	Annualized Return	Standard Deviation	Information Ratio	Maximum Drawdown	Skewness	Kurtosis
			Descriptive Statistics 7/2005-10-2006			
MSCI Hedge Invest Systematic Trading Index	6.51%	6.20%	1.05	-3.88%	0.94	0.25
CS/Tremont INVX Managed Futures Index	1.46%	8.73%	0.17	-6.61%	0.04	-0.92
Average	3.98%	7.47%	0.61	-5.24%	0.49	-0.33
RBC Managed Futures Index	9.61%	6.03%	1.59	-3.11%	0.43	-0.67
Investible CTA/Managed Futures Composite Index	4.00%	6.96%	0.57	-5.03%	0.35	-0.78
Non-Investible CTA/Managed Futures Composite Index	2.69%	6.40%	0.42	-5.26%	0.42	-0.96
S&P 500	13.59%	6.67%	2.04	-2.88%	-0.39	-0.38
Lehman Gov't Credit	2.23%	3.29%	0.68	-2.15%	-0.15	-1.15
Lehman High Yield	7.82%	2.90%	2.70	-1.69%	-0.50	-0.58

Bullet Points:

- **RBC Managed Futures index has a higher return than investible indices, investible and non-investible managed futures indices, and the Lehman Government Credit index, but lower returns than the S&P 500 and Lehman High Yield indices.**
- **RBC Managed Futures index has a lower standard deviation than the investible and non-investible composite and S&P 500 indices, but higher standard deviation that the Lehman Bond indices.**
- **Risk adjusted returns for the RBC Managed Futures index are superior to the investible and non-investible managed futures composite indices, but inferior to the S&P 500 and Lehman High Yield indices.**
- **RBC Managed Futures index has lower maximum drawdown, but comparable skewness and kurtosis to other investible and non-investible global macro indices and traditional stock and bond indices.**

	Beta 7/2005-10/2006			Correlation 7/2005-10/2006			
Index	S&P 500	Lehman Gov't Credit	Lehman High Yield	S&P 500	Lehman Gov't Credit	Lehman High Yield	Non-Investible CTA/Managed Futures Composite Index
MSCI Hedge Invest Systematic Trading index	0.44	-0.41	-0.03	0.47	-0.22	-0.02	0.92
CS/Tremont INVX Managed Futures Index	0.51	-1.19	-0.05	0.39	-0.45	-0.02	0.87
Average	0.48	-0.80	-0.04	0.43	-0.33	-0.02	0.90
RBC Managed Futures Index	0.46	-0.83	0.03	0.51	-0.45	0.01	0.95
Investible CTA/Managed Futures Composite Index	0.48	-0.80	-0.04	0.46	-0.38	-0.02	0.96
Non-Investible CTA/Managed Futures Composite Index	0.56	-0.54	0.31	0.58	-0.28	0.14	1.00
S&P 500	1.00	0.05	1.55	1.00	0.02	0.67	0.58
Lehman Gov't Credit	0.01	1.00	0.42	0.02	1.00	0.37	-0.28
Lehman High Yield	0.29	0.33	1.00	0.67	0.37	1.00	0.14

Bullet Points:

- **RBC Managed Futures index has similar S&P 500 and Lehman bond index betas as other investible composite index, but lower correlations than the non-investible composite index.**
- **RBC Managed Futures index has similar market factor correlations to the average of investible indices and slightly lower correlations relative to the non-investible composite index.**
- **RBC has a high correlation to the non-investible managed futures composite index as does the investible indices and the investible managed futures composite index.**

8. Distressed Securities

Index	Annualized Return	Standard Deviation	Information Ratio	Maximum Drawdown	Skewness	Kurtosis
	Descriptive Statistics 7/2005-10/2006					
DJ Distressed Securities Index	12.11%	2.61%	4.64	-0.81%	-0.60	0.85
HFRX Distressed Securities Index	6.84%	2.96%	2.31	-1.16%	-0.36	-0.59
Average	9.48%	2.79%	3.47	-0.98%	-0.48	0.13
RBC Distressed Securities Index	10.97%	3.10%	3.54	-1.16%	-0.28	0.53
Investible Distressed Securities Composite Index	9.45%	2.67%	3.54	-0.97%	-0.44	0.12
Non-Investible Distressed Securities Composite Index	13.55%	2.83%	4.79	-0.46%	-0.02	-0.62
S&P 500	13.59%	6.67%	2.04	-2.88%	-0.39	-0.38
Lehman Gov't Credit	2.23%	3.29%	0.68	-2.15%	-0.15	-1.15
Lehman High Yield	7.82%	2.90%	2.70	-1.69%	-0.50	-0.58

Bullet Points:

- **RBC Distressed Securities index has a higher return than the average of investible indices and the Lehman bond indices, but lower returns than the non-investible distressed securities composite and S&P 500 indices.**
- **RBC Distressed Securities index has a higher standard deviation than the investible and non-investible composite indices, but lower standard deviation that the S&P 500 and Lehman Government Credit index.**
- **Risk adjusted returns for the RBC Distressed Securities index are superior to traditional stock and bond indices, similar to the investible composite index, and inferior to the non-investible composite index.**
- **RBC Distressed Securities index has similar maximum drawdown, skewness, and kurtosis as other investible and non-investible global macro indices.**

Index	S&P 500	Lehman Gov't Credit	Lehman High Yield	S&P 500	Lehman Gov't Credit	Lehman High Yield	Non-Investible Distressed Securities Composite Index
	Beta 7/2005-10/2006			Correlation 7/2005-10/2006			
DJ Distressed Securities Index	0.07	-0.07	0.42	0.19	-0.09	0.47	0.72
HFRX Distressed Securities Index	0.06	0.02	0.36	0.14	0.02	0.35	0.70
Average	0.07	-0.03	0.39	0.16	-0.04	0.41	0.71
RBC Distressed Securities Index	0.25	-0.19	0.60	0.54	-0.20	0.56	0.87
Investible Distressed Securities Composite Index	0.07	-0.03	0.39	0.17	-0.03	0.42	0.74
Non-Investible Distressed Securities Composite Index	0.22	-0.22	0.47	0.53	-0.26	0.48	1.00
S&P 500	1.00	0.05	1.55	1.00	0.02	0.67	0.53
Lehman Gov't Credit	0.01	1.00	0.42	0.02	1.00	0.37	-0.26
Lehman High Yield	0.29	0.33	1.00	0.67	0.37	1.00	0.48

Bullet Points:

- **RBC Distressed Securities index has higher S&P and Lehman High Yield index betas relative to all other investible indices, but lower Lehman Government Credit beta.**
- **RBC Distressed Securities index has higher S&P 500 and Lehman High Yield market factor correlations and lower Lehman Government Credit correlations than other investible indices. RBC correlations are similar to that of the non-investible distressed securities composite index.**
- **RBC has higher market sensitivities than other investible indices due primarily to its larger positive or negative correlations rather than higher standard deviations.**
- **RBC has a higher correlation to the non-investible distressed securities composite index than all investible hedge fund indices as well as traditional stock and bond indices.**

9. Merger Arbitrage

	Descriptive Statistics 7/2005-10/2006					
Index	Annualized Return	Standard Deviation	Information Ratio	Maximum Drawdown	Skewness	Kurtosis
DJ Merger Arbitrage Index	6.33%	2.50%	2.53	-1.55%	-1.19	1.15
HFRX Merger Arbitrage Index	7.31%	3.66%	2.00	-2.92%	-2.27	8.35
Average	6.82%	3.08%	2.27	-2.24%	-1.73	4.75
RBC Merger Arbitrage Index	10.32%	4.98%	2.07	-2.96%	-1.21	2.37
Investible Merger Arbitrage Composite Index	6.83%	2.94%	2.32	-2.24%	-1.98	6.07
Non-Investible Merger Arbitrage Composite Index	9.32%	2.74%	3.41	-1.24%	-0.34	3.03
S&P 500	13.59%	6.67%	2.04	-2.88%	-0.39	-0.38
Lehman Gov't Credit	2.23%	3.29%	0.68	-2.15%	-0.15	-1.15
Lehman High Yield	7.82%	2.90%	2.70	-1.69%	-0.50	-0.58

Bullet Points:

- **RBC Merger Arbitrage index has a higher return than investible and non-investible arbitrage composite and Lehman bond indices, but lower returns S&P 500 index.**
- **RBC Merger Arbitrage index has a higher standard deviation than investible and non-investible arbitrage composite and Lehman bond indices, but lower standard deviation than the S&P 500 index.**
- **Risk adjusted returns for the RBC Merger Arbitrage index are inferior to the investible and non-investible arbitrage indices while similar to that of the S&P 500 index.**
- **RBC Merger Arbitrage index has comparable maximum drawdown and skewness as other investible indices. The RBC index exhibits lower kurtosis than the average of the investible indices; however, the average is influenced by the high kurtosis of the HFRX Merger Arbitrage index.**

	Beta 7/2005-10/2006			Correlation 7/2005-10/2006			
Index	S&P 500	Lehman Gov't Credit	Lehman High Yield	S&P 500	Lehman Gov't Credit	Lehman High Yield	Non-Investible Merger Arbitrage Composite Index
DJ Merger Arbitrage Index	0.20	0.10	0.50	0.54	0.13	0.58	0.85
HFRX Merger Arbitrage Index	0.27	0.27	0.80	0.49	0.25	0.64	0.91
Average	0.24	0.19	0.65	0.52	0.19	0.61	0.88
RBC Merger Arbitrage Index	0.53	0.01	0.95	0.70	0.00	0.55	0.94
Investible Merger Arbitrage Composite Index	0.24	0.19	0.65	0.54	0.21	0.64	0.93
Non-Investible Merger Arbitrage Composite Index	0.23	0.02	0.57	0.57	0.02	0.60	1.00
S&P 500	1.00	0.05	1.55	1.00	0.02	0.67	0.57
Lehman Gov't Credit	0.01	1.00	0.42	0.02	1.00	0.37	0.02
Lehman High Yield	0.29	0.33	1.00	0.67	0.37	1.00	0.60

Bullet Points:

- **RBC Merger Arbitrage index has higher S&P 500 and Lehman High Yield index betas relative to all other investible indices and investible and non-investible composite indices.**
- **RBC Merger Arbitrage index has similar market factor correlations to the average of investible indices. The RBC index suggest no correlation with the Lehman Government credit index as does the non-investible merger arbitrage composite index.**
- **RBC has greater market sensitivities than other investible indices due primarily to its greater standard deviation rather than higher correlations.**
- **RBC has a high correlation to the non-investible merger arbitrage composite index as does the investible indices and the investible merger arbitrage composite index.**

10. Event Driven

Index	Annualized Return	Standard Deviation	Information Ratio	Maximum Drawdown	Skewness	Kurtosis
	Descriptive Statistics 7/2005-10/2006					
DJ Event Driven Index	10.75%	3.98%	2.70	-1.92%	-0.62	0.97
MSCI Hedge Invest Event Driven & Merger Arb Index	7.06%	2.82%	2.51	-1.49%	-1.01	1.75
CSFB/Tremont INVX Event Driven	12.79%	3.18%	4.03	-1.35%	-0.77	2.24
HFRX Event Driven Index	8.15%	4.59%	1.78	-2.05%	-0.37	-0.53
Average	9.69%	3.64%	2.75	-1.70%	-0.69	1.11
RBC Event Driven Index	13.44%	3.31%	4.05	-0.64%	-0.08	-0.25
Investible Event Driven Composite Index	9.68%	3.53%	2.74	-1.70%	-0.71	1.06
Non-Investible Event Driven Composite Index	12.72%	4.25%	2.99	-1.75%	-0.41	0.52
S&P 500	13.59%	6.67%	2.04	-2.88%	-0.39	-0.38
Lehman Gov't Credit	2.23%	3.29%	0.68	-2.15%	-0.15	-1.15
Lehman High Yield	7.82%	2.90%	2.70	-1.69%	-0.50	-0.58

Bullet Points:

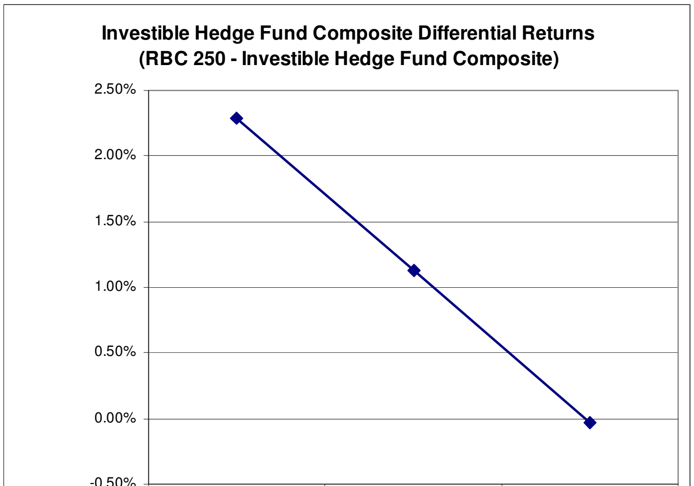
- **RBC Event Driven index has a higher return than all investible and non-investible indices as well traditional bond indices.**
- **RBC Event Driven index has a lower standard deviation than the investible and non-investible composite index as well as the S&P 500 index, but higher standard deviation that the Lehman bond indices.**
- **Risk adjusted returns for the RBC Event Driven index are superior to all investible and non-investible event driven indices as well as traditional stock and bond indices.**
- **RBC Event Driven index has lower maximum drawdown, skewness, and kurtosis relative to all other investible and non-investible event driven indices as well as traditional stock and bond indices.**

Index	S&P 500	Lehman Gov't Credit	Lehman High Yield	S&P 500	Lehman Gov't Credit	Lehman High Yield	Non-Investible Event Driven Composite Index
	Beta 7/2005-10/2006			Correlation 7/2005-10/2006			
DJ Event Driven Index	0.45	-0.02	0.97	0.76	-0.02	0.70	0.95
MSCI Hedge Invest Event Driven & Merger Arb Index	0.32	0.04	0.58	0.76	0.05	0.60	0.91
CSFB/Tremont INVX Event Driven Index	0.31	0.08	0.68	0.65	0.08	0.62	0.91
HFRX Event Driven Index	0.50	-0.09	1.01	0.73	-0.06	0.64	0.95
Average	0.40	0.00	0.81	0.72	0.01	0.64	0.93
RBC Event Driven Index	0.29	-0.18	0.53	0.57	-0.17	0.47	0.93
Investible Event Driven Composite Index	0.40	0.00	0.81	0.75	0.00	0.66	0.96
Non-Investible Event Driven Composite Index	0.45	-0.16	0.87	0.70	-0.12	0.60	1.00
S&P 500	1.00	0.05	1.55	1.00	0.02	0.67	0.70
Lehman Gov't Credit	0.01	1.00	0.42	0.02	1.00	0.37	-0.12
Lehman High Yield	0.29	0.33	1.00	0.67	0.37	1.00	0.60

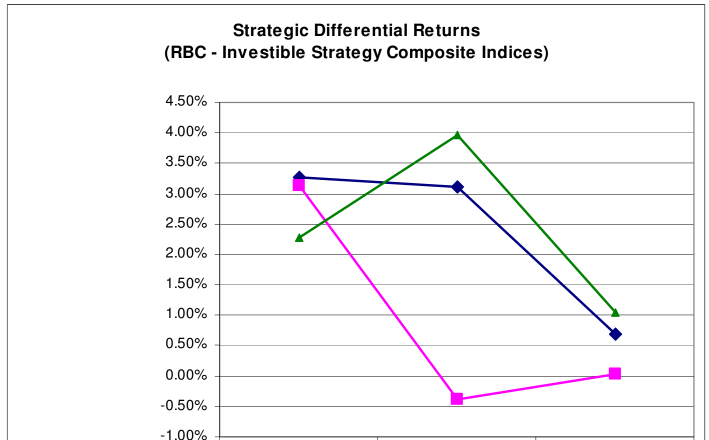
Bullet Points:

- **RBC Event Driven index has lower S&P 500 and Lehman bond index betas relative to all other investible indices, investible and non-investible composite indices.**
- **RBC Event Driven index has lower market factor correlations than investible and non-investible event driven indices.**
- **RBC has lower market sensitivities than other investible indices due to both its lower standard deviation and lower correlation than other indices.**
- **RBC has a similar correlation to the non-investible event driven composite index as does other investible hedge fund indices, which is considerably higher than that incurred by traditional stock and bond indices.**

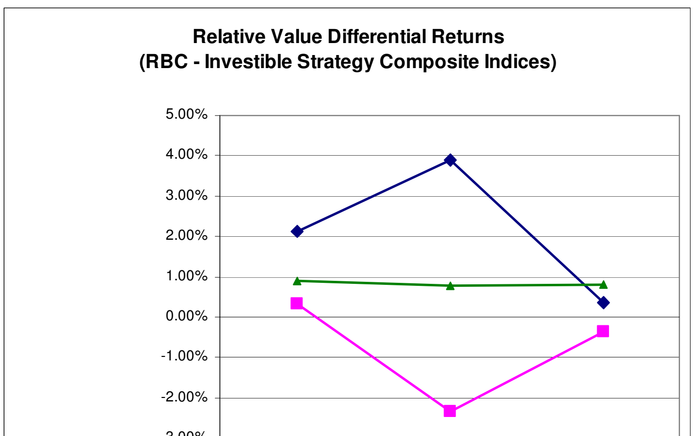
Recent Performance



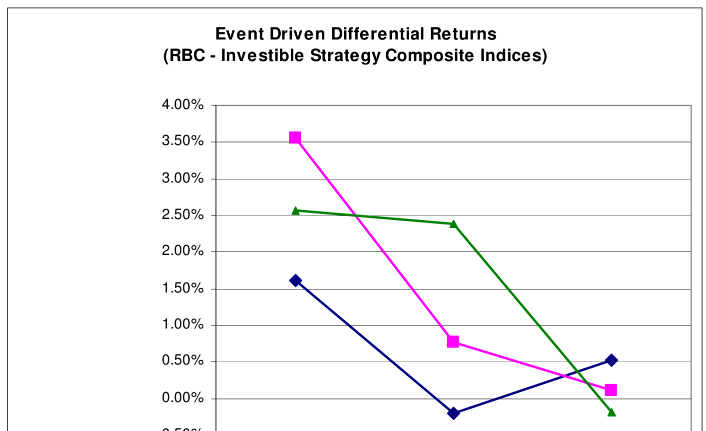
	7/05-12/05	1/06-6/06	7/06-10/06
Global Index	2.29%	1.13%	-0.03%



	7/05-12/05	1/06-6/06	7/06-10/06
Equity Long Short	3.27%	3.10%	0.70%
Global Macro	3.12%	-0.39%	0.03%
CTA/Managed Futures	2.27%	3.96%	1.04%



	7/05-12/05	1/06-6/06	7/06-10/06
Convertible Arbitrage	2.12%	3.88%	0.34%
Equity Market Neutral	0.32%	-2.33%	-0.38%
Fixed Income Arbitrage	0.89%	0.77%	0.79%



	7/05-12/05	1/06-6/06	7/06-10/06
Distressed Securities	1.60%	-0.21%	0.52%
Merger Arbitrage	3.56%	0.77%	0.11%
Event Driven	2.56%	2.38%	-0.18%

Bullet Points:

- **RBC 250 Hedge Index differential declines by approximately 2.3% between the first subperiod and last subperiod. While not examined in this paper, this is consistent with previous academic research in which new funds and smaller fund returns may decline as they mature.**
- **RBC Relative Value Strategies (Equity Market Neutral, Convertible Arbitrage, and Fixed Income Arbitrage) index differentials declines between 0.1% (Fixed Income Arbitrage) and 1.8% (Convertible Arbitrage) between the first subperiod and last subperiod. While this decline is less than other strategy areas, the level from which the decline is reported is also lower.**
- **RBC Strategic index differentials (Equity Long/Short, Global Macro, and CTA) declines between 1.2% (CTA) and 3% (Global Macro) between the first subperiod and the last subperiod.**
- **RBC Event Driven Strategies (Event Driven, Merger Arbitrage, and Distressed) index differentials declines between 0.8% (Event Driven) and 3.4% (Merger Arbitrage) between the first subperiod and the last subperiod.**

Conclusions

In recent years, a number of investible hedge fund indices have been introduced. Many of these investible indices are based on either managed account platforms or direct investment into fund-based products. While the various hedge fund indices differ on a number of characteristics, one significant difference is the number of managers/funds within the representative index. The RBC 250 Hedge Index offers an additional investible index product that primarily differs from other similar products in that its composite index is composed of over 200 representative funds. In contrast, many of the other investible products have less than 100 funds and/or managed accounts in their composite and even less in their sub index products.

In this article, we compare the risk and return characteristics of the RBC 250 index and its constituent strategy-based sub-indices relative to comparable investible and non-investible indices. Our findings suggest that for many hedge fund strategies, the RBC indices perform either markedly superior or inferior to other comparable index providers. We also find that the RBC generally has higher volatility at the sub-index level and higher equity betas; however, this is of course strategy specific. In addition, we show that the initial out performance of the RBC does not reflect its current performance relative to other investible hedge fund indices. Thus, while the RBC 250 and many of its sub-indices initially showed significant return differentials in early months, such differentials declined in later months. However, it is important to note that the limited period from which we base our analysis may not be representative of the longer-run results obtained over time.

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