MSCI

Research Insight

Capturing the Value Premium

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Many shall be restored that are now fallen and many shall fall that now are in honor.
– Horace, Ars Poetica

Section 1: Introduction

The investment world has traditionally viewed beta as return associated with broad asset class exposure, and alpha as added value from active portfolio management. In this context, capitalization weighted indices serve as efficient tools to capture the broad equity market beta through an objective representation of the entire opportunity set, macro consistency, automatic rebalancing, low transaction costs, high trading liquidity, and maximum investment capacity.

While capitalization weighted indices are efficient tools to gain exposure to market beta, there is increasing recognition among investors that many sources of return traditionally considered as added value (alpha) actually represent systematic risk premia (Bender, Briand, Nielsen and Stefek, 2009). There is a growing view that systematic risk factors need to be recognized and integrated into the investment process as they account for a significant percentage of long-term portfolio return (Ang, Goetzmann and Schaffer, 2009). In this context, we are witnessing a proliferation of alternatively weighted indices that aim to reflect various sources of systematic return. Indices reflecting the systematic elements of specific investment styles or strategies are often referred to as ***Systematic Indices***[1]***.*** Systematic Indices can be further classified into two broad categories, namely ***Risk Based Systematic Indices*** and ***Return Based Systematic Indices*** (Melas and Kang, 2010).

Risk based systematic indices rely on volatility and correlation estimates to modify the risk profile of a benchmark. Examples of risk based indices include minimum volatility indices, maximum diversification indices, equal risk contribution indices, risk weighted indices, and equally weighted indices (Demey, Maillard and Roncalli, 2010). Return based systematic indices proxy expected returns through a common factor and typically tilt the index weight towards the targeted factor. Value weighted indices typically use accounting measures such as earnings, sales, book value etc to re-weight stocks. Hence these indices are also commonly referred to as "fundamental" indices.

In this paper, we focus on the key aspects of portfolio construction and the performance characteristics of value weighted portfolios based on the recently launched MSCI Value Weighted Indices. The rest of the paper is organized as follows. Section 2 introduces the theoretical foundations of value weighted indices and then delves into the various aspects of portfolio construction. We present several empirical results that serve as the basis for the design of the MSCI Value Weighted Indices. Section 3 presents a detailed analysis of the historical performance characteristics of MSCI Value Weighted Indices. Section 4 discusses alternative approaches to capture the value premium by contrasting the MSCI Value Weighted Indices with the MSCI Value Indices and MSCI Barra Value Factor Indices. Section 5 reviews alternative theories that offer possible explanations for the historical outperformance of value weighted indices. Section 6 concludes and highlights the relevance of value weighted indices in the investment process.

[1] Systematic Indices refer to indices that capture systematic risk factors or passively replicate styles and strategies.

Section 2: Constructing Value Weighted Indices

The objective of a value weighted index is to tilt an underlying standard equity index towards stocks with lower valuations. This tilt is achieved by multiplying the market capitalization weight of each stock in the parent benchmark index with the stock's relative valuation ratio (for example, earnings to price, sales to price, book value to price, etc). We can show that this approach of tilting an equity index towards value stocks by multiplying market capitalization weights with relative valuation ratios is equivalent to weighting the constituents of the index according to the respective fundamental accounting variable (for example, earnings, sales, book value, etc). See Appendix A for details. As a result, value weighted indices are often described as "fundamental" indices (Arnott, Hsu and Moore, 2005, Wood and Evans, 2003).

Value weighted indices could also be viewed as special cases of mean-variance portfolio construction (Melas and Kang, 2010). Under this framework, "fundamental" portfolios are simple factor portfolios that assume constant volatilities and correlations and with expected returns being proportional to accounting measures of company size (e.g. earnings or sales). A general framework for systematic risk and return based indices is described in more detail in Appendix D.

In this section we examine the key aspects of index construction that play a central role in the design of MSCI Value Weighted Indices[2]. To arrive at an objective and transparent methodology, we conduct several back-tests and perform empirical analysis and highlight the different inter-related aspects that guide index construction. We focus on the following key facets of index construction:

- Fundamental Accounting Variables
- Input Data Smoothing
- Rebalancing Frequency
- Security Selection and Weighting

Fundamental Accounting Variables:

The choice of fundamental accounting variables is determined by the typical valuation ratios used to describe the relative valuations of stocks. We considered five common accounting measures: book value, sales, earnings, cash earnings and dividends and evaluate their suitability for the construction of value weighted indices. We conducted several back-tests to understand the properties and historical performance characteristics of the value weighted indices derived from the MSCI World Index using the individual accounting variables. Exhibit 1 summarizes the results from these back-tests. The summary statistics presented in this table highlight the similarities and differences across the different value weighted indices. The annualized performance of the value weighted portfolio using book value weighting (Exhibit1, Case 3) was considerably lower with slightly higher realized risk as compared to the value weighted portfolios created using other variables (Exhibit 1, Case 4,5,6 and 7). The realized one-way semi-annual turnover was higher for the book value weighted and the earnings weighted indices. All the value weighted indices have lower corresponding index level ratios compared to the valuation ratios of the MSCI World Index.

[2] For details of the methodology of MSCI Value Weighted Index, see:
http://www.msci.com/products/indices/strategy/alternatively_weighted/value_weighted/MSCI_Value_Weighted_index_methodology_book_Nov2010.pdf

Exhibit 1: Comparison of Value Weighted Indices Using Different Fundamental Variables

Statistics over 11/95 - 11/10	MSCI World Index	MSCI World Value Weighted	MSCI World BV Value Weighted	MSCI World Earnings Weighted	MSCI World Cash Earnings Weighted	MSCI World Sales Weighted	MSCI World Dividend Weighted
Case Number	1	2	3	4	5	6	7
Return (%)	5.69	7.04	5.69	7.70	7.22	7.75	7.73
Risk (%)	16.1	16.8	17.3	16.5	16.1	16.7	16.1
Return/Risk	0.35	0.42	0.33	0.47	0.45	0.46	0.48
Tracking error (%)	0.00	3.54	3.76	3.52	2.82	3.73	4.60
t-stat		5.19	0.66	7.38	6.78	7.25	5.56
Turnover (%)*	2.01	9.30	10.29	10.32	8.81	8.87	8.87
Div. Yield (%)	2.10	2.49	2.36	2.60	2.48	2.25	3.19
P/B	2.63	1.98	1.73	2.29	2.16	2.21	2.23
P/E	20.44	19.56	23.02	16.07	18.51	23.95	18.28
P/S	1.26	0.78	0.90	1.03	0.86	0.71	1.05
P/CE	10.79	8.31	8.90	8.87	7.57	8.42	8.93
Beta	1.00	1.02	1.05	1.00	0.98	1.01	0.96

* Average semi-annual one-way index turnover over 2000-2010

The differences in performance across the different value weighted indices could be attributed to the different weights assigned to the constituents in accordance with the individual weighting schemes. Hence to have a comparable fundamental measure of size across different securities, we consider a composite approach by assigning the average weight derived from the individual variable weights as the fundamental weight.

While the result from the back-tests for the dividends weighted portfolio is encouraging, dividends are typically not paid by all companies in the applicable universe. In addition, dividends are subject to tax policies and these policies vary across countries. The inclusion of dividends as a fundamental variable to compute value weight may systematically underweight those securities that do not pay dividends for reasons such as extremely low payout policies or prevailing regulations. Hence, we include reported book value, sales, earnings and cash earnings as the fundamental variables that are used to compute the composite value weight of a security. Taken together, these four variables enable the derivation of comparable fundamental weights of securities across different sectors and at various stages in their lifecycle.

Input Data Smoothing of Fundamental Accounting Variables:

The choice of estimates for the fundamental data is another important consideration in the design of value weighted indices. Using only current values of accounting variables makes them susceptible to cyclical biases and could impact the estimation of fundamental weights. Another deficiency of using current values of fundamental data is it could also result in huge variations in security level weights over time and adversely impact index turnover. Hence it is preferable to use historical averages of fundamental data to derive the value weights. We back-tested different approaches to understand the impact of input data smoothing over different time periods.

Exhibit 2 shows that the value weighted index created using input data smoothing over a three year period (Exhibit 2, case 2) had similar index characteristics to the index created without applying input data smoothing (i.e., using only current values, Exhibit-2, Case 3) with substantially lower index turnover. Input data smoothing over a five year period (Exhibit 2, Case 4) only resulted in a marginal reduction in index turnover over (Exhibit 2, Case 2). However, using fundamental data over a five year period increases the risk of the fundamental estimates being stale and not being responsive to changes

in fundamental size due to the impact of corporate events such as mergers, acquisitions and spin offs. In summary, the choice of input data smoothing over a three year period strikes a good balance and is a reasonable approach to derive historical estimates of fundamental data.

Exhibit 2: Comparison of Value Weighted Portfolios Using Different Methodology Parameters[3]

Statistics over 11/95 - 11/10	MSCI World Index	MSCI World Value Weighted**	MSCI World Unsmoothed Value Weighted	MSCI World 5 yr. smoothing Value Weighted	MSCI World Annual Rebal 3 yr. smoothing Value Weighted	MSCI World Quarterly rebal 3 yr. smoothing Value Weighted	MSCI World Screening Value Weighted
Case Number	1	2	3	4	5	6	7
Return (%)	5.69	7.04	7.01	6.92	7.22	7.29	6.77
Risk (%)	16.1	16.8	16.7	16.8	16.6	17.3	17.0
Return/Risk	0.35	0.42	0.42	0.41	0.43	0.42	0.40
Tracking error (%)	0.00	3.54	3.36	3.63	3.48	3.99	3.66
t-stat		5.19	5.29	4.66	5.84	5.67	4.20
Turnover (%)*	2.01	9.30	10.29	9.17	6.34	13.97	10.40
Div. Yield (%)	2.10	2.49	2.47	2.50	2.46	2.51	2.60
P/B	2.63	1.98	2.00	1.97	2.00	1.97	2.07
P/E	20.44	19.56	18.47	20.27	20.27	19.86	18.75
P/S	1.26	0.78	0.80	0.78	0.79	0.78	0.76
P/CE	10.79	8.31	8.22	8.35	8.42	8.26	8.03
Beta	1.00	1.02	1.01	1.02	1.01	1.04	1.03

* Average semi-annual one-way index turnover over 2000-2010

**Uses 3 year smoothing

Rebalancing Frequency:

We evaluated three options: quarterly, semi-annual and annual rebalancing, to determine a suitable rebalancing frequency for the construction of the value weighted indices. The quarterly rebalanced index (Exhibit-2, Case 6) had similar performance characteristics as the semi-annually rebalanced index (Exhibit 2, Case 2). However, the turnover was significantly higher in the case of quarterly rebalancing. While annual rebalancing (Exhibit-1, Case 5) had comparable characteristics to semi-annual rebalancing with relatively lower turnover, the results could vary widely depending on the month of rebalancing. Exhibit 3 summarizes the results from annual rebalancing performed across different calendar months. We see that annual rebalancing performed in February results in much higher annualized performance (nearly 1% per annum) compared to the performance from annual rebalancing done in the other months(Exhibit 3, Case 1 versus Exhibit 3, Case 2,3,4 and 5).

The performance differentials could be exaggerated in certain periods as experienced during the financial crisis between 2007 and 2009. Exhibit 4 shows that the performance of the MSCI World Value Weighted portfolio rebalanced annually in February had a return 44.5% during the period November 2008 – November 2009, which is far higher than the performance of the other MSCI World Value weighted portfolios rebalanced across other months of the year over the same period. Similarly, the performance of the portfolio rebalanced annually in February returned 4.5% during the period November 2009 – November 2010, which is lower compared to results obtained from rebalancing across other months. This phenomenon introduces timing effects based on the month of rebalancing that could adversely impact the ability of the index to reasonably reflect the performance of the strategy in

[3] All Value Weighted Portfolios in Exhibit 2 are created using the average weights derived from the four fundamental variables: book value, sales, earnings and cash earnings.

the case of annual rebalancing. Similar observations highlighting the timing effects associated with the month chosen for annual rebalancing have been well documented in recent research (Blitz et al, 2010). In light of these limitations posed by annual rebalancing, the MSCI Value Weighted Index methodology adopts a semi-annual rebalancing frequency.

Exhibit 3: MSCI World Value Weighted Index rebalanced annually across different months of the year

	MSCI World Value Weighted Index (Annual Rebalancing)				
Statistics over 11/96 - 11/10	February	May	August	November	March
Case Number	1	2	3	4	5
Return (%)	7.05	6.00	6.00	6.21	6.69
Risk (%)	17.5	16.9	17.1	17.1	17.3
Return/Risk	0.40	0.35	0.35	0.36	0.39
Tracking error (%)	4.33	3.22	3.28	3.60	3.94
t-stat for Active Return	7.00	5.08	5.12	5.37	6.47
Turnover (%)*	7.19	6.70	6.61	6.34	7.14
Beta	1.02	1.00	1.01	1.01	1.01

* Average semi-annual one-way index turnover over 2000-2010

Exhibit 4: Performance of MSCI World Value Weighted Index rebalanced annually across different months of the year

Annual Gross Total Return of MSCI World Value Weighted Index (%)

	MSCI World Value Weighted Index (Annual Rebalancing)				
Time period	February	May	August	November	March
	1	2	3	4	5
Nov 07 - Nov 08	-45.57	-45.33	-45.97	-45.26	-45.66
Nov 08 - Nov 09	44.5	31.5	32.7	37.5	38.3
Nov 09 - Nov 10	4.53	5.15	4.96	5.09	5.35

Selection and Weighting:

We also considered the impact of security selection and weighting as an approach to construct value weighted portfolios. Results from Exhibit 2 show that the selection approach (Exhibit-2, Case 7) did not show markedly different performance characteristics as compared to the approach that included the full opportunity set (Exhibit-2, Case 2). However, the security selection approach resulted in much higher index turnover. In addition, security selection and weighting resulted in portfolios with higher concentration and higher tracking error and thus would impact the representativeness of the methodology.

In summary, to create an objective and transparent methodology for the MSCI Value Weighted Indices, we use the full opportunity set; four fundamental accounting measures (namely -- book value, earnings, sales and cash earnings), with 3 year input data smoothing and semi-annual rebalancing frequency (Exhibit-2, Case 2).

Section 3: Historical Performance Characteristics

In this section, we discuss the historical performance characteristics of MSCI Value Weighted Indices. We also discuss the impact that active sector and country exposures have on the realized performance of value weighted indices.

Historical Performance of MSCI World Value Weighted Index:

Exhibit 5 shows the relative performance of the MSCI World Value Weighted Index. During the period from November 1976 – November 2010, the MSCI World Value Weighted Index outperformed the MSCI World Index by 156 basis points, reflecting the value premium. The MSCI World Value Weighted Index had a low tracking error of 3.48% over this period and a realized turnover of 8.7%. The average valuation ratio of the MSCI Value Weighted Index was lower than the MSCI World Index.

Exhibit 5: Performance of MSCI World Value Weighted Index relative to parent index

Gross Total Returns, USD 30/11/1976 - 30/11/2010	MSCI World Standard Index	MSCI World Value Weighted Index
Annualised Return (%)	10.51	12.06
Annualised Risk (%)	15.01	15.03
Return to Risk Ratio	0.70	0.80
Tracking Error (%)	0.00	3.48
Semi-annual Turnover (%)	2.01	8.75
Dividend Yield (%)*	2.05	2.45
Price to Book Ratio*	2.66	2.03
Price to Earnings Ratio*	21.0	19.8
Historical Beta*	1.00	0.99

*Average valuation ratios calculated over period 30/06/92-30/11/2010

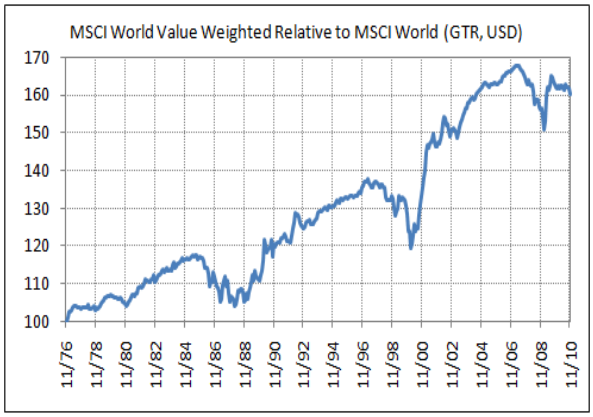
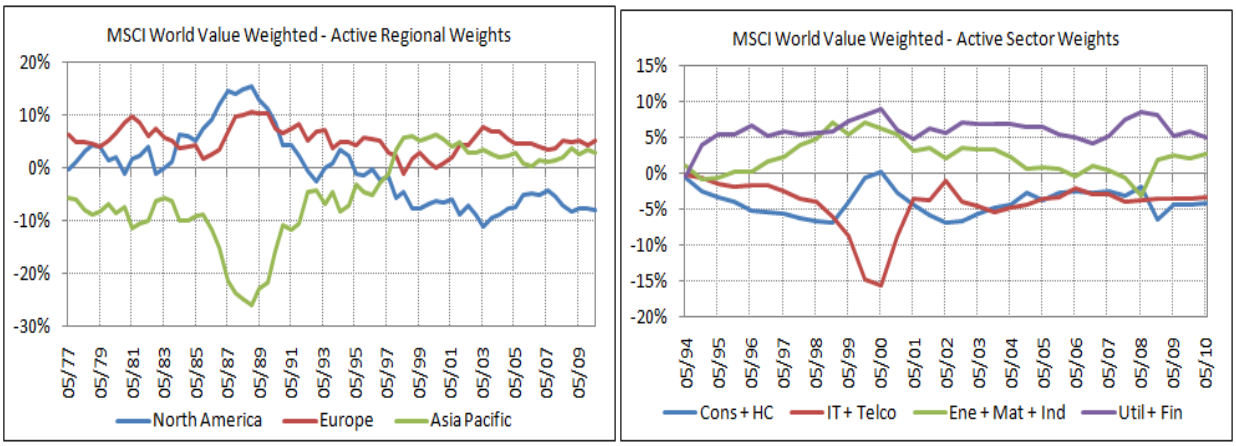


Exhibit 6 shows that the MSCI World Value Weighted Index overweighted Financials and Utilities and underweighted Information Technology, Telecommunications, Healthcare and Consumer Staples on average during the period November 1994 – December 2010. Energy, Materials and Industrials were over-weighted in most periods. Exhibit 6 also shows that the MSCI World Value Weighted Index overweighted Japan and Europe by nearly 4% on average and underweighted USA by nearly 8% on average during the period November 1998 – December 2010.

The sector and style exposures of the MSCI World Value Weighted Index have been significant drivers of its historical performance. The differences in performance are most evident during three critical periods over the last 35 years: during the Japan Bubble in 1990, during the Technology Bubble in 2001 and most recently, during the Financial Crisis in 2008. From the chart on relative performance in Exhibit 5 we can infer that the MSCI World Value Weighted Index underperformed during the period 1986-1988 when Japanese stocks were rising. A few years later, when the Japanese Bubble burst in 1990, the MSCI World Value Weighted Index outperformed due to its underweight in Japan. Similarly, the MSCI World Value Weighted Index underperformed during the run up to the Technology bubble in 2001 and then outperformed in 2002 due to its underweight of the highly valued Information Technology and Telecommunications sectors. Finally, during the financial crisis in 2008, the MSCI World Value Weighted Index underperformed during the crisis and subsequently outperformed due to its overweight in Financials and positive exposure to Leverage.

Next we examine the results from performance attribution of the MSCI World Value Weighted Index (Appendix C, Exhibit 12). We see that a significant component of the active return was attributable to the Barra risk factors. Within the Barra risk factors, the contribution of the Barra Value factor to active return is statistically significant.

Exhibit 6: Active Region Weights and Active Sector Weights of the MSCI World Value Weighted Index



Historical Performance of MSCI Value Weighted Indices across Regions:

This section discusses the relative performance of the MSCI Value Weighted Indices across Developed and Emerging Markets. Exhibit 8 shows the relative performance of the MSCI Value Weighted Indices for MSCI World, MSCI EM and MSCI ACWI. The three MSCI Value Weighted Indices have outperformed their respective benchmarks over the period November 1995 – December 2010. Exhibit 9 summarizes the performance of MSCI Value Weighted Indices across the three regions. The MSCI EM Value Weighted Index shows a much higher outperformance with higher risk. Across the three regions, the contribution to active returns from the Barra Value factor is statistically significant as seen in Appendix C. Appendix B shows the active sector, country and factor exposures across the two regions. The MSCI EM Value Weighted Index had slightly different active sector exposures with underweighting of Financials and overweighting of Industrials and Materials. The MSCI EM Value Weighted Index overweighted Korea and Brazil and underweighted China and India.

Exhibit 8: Relative Performance of MSCI Value Weighted Indices Across Regions

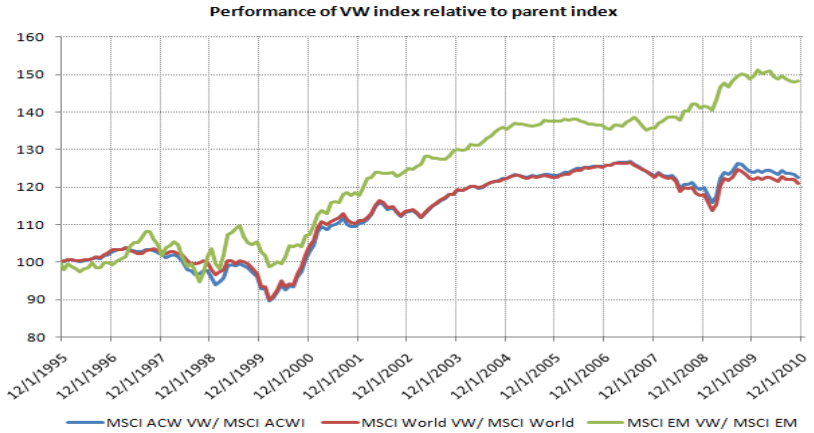


Exhibit 9: *Performance of MSCI Value Weighted Indices Across Regions*

Statistics over 11/95 - 12/10	MSCI ACWI Index	MSCI ACWI Value Weighted	MSCI World Index	MSCI World Value Weighted	MSCI EM Index	MSCI EM Value Weighted
Return (%)	6.48	7.96	6.16	7.54	9.15	12.10
Risk (%)	16.6	17.3	16.2	16.8	25.2	26.5
Return/Risk	0.39	0.46	0.38	0.45	0.36	0.46
Tracking error (%)	0.00	3.51	0.00	3.53	0.00	4.43
Turnover (%)*	2.25	9.68	2.01	9.30	5.90	14.09
Div. Yield (%)	2.11	2.52	2.10	2.49	2.37	2.91
P/B	2.55	1.86	2.63	1.98	1.85	1.29
P/E	20.03	18.92	20.44	19.56	15.19	13.69
P/S	1.26	0.73	1.26	0.78	1.30	0.77
P/CE	10.63	8.13	10.79	8.31	8.51	6.61
Beta	1.00	0.99	1.00	0.99	1.00	1.01

* Average semi-annual one-way index turnover over 2000-2010

Section 4: Contrasting the MSCI Value Weighted Index with MSCI Value Indices and MSCI Value Factor Indices

In this section, we discuss the similarities and differences across the various alternative approaches to capture the value factor. Value weighted indices offer an alternative to traditional value benchmarks. We contrast the MSCI Value Weighted Indices with the MSCI Value Indices and the MSCI Barra Value Factor Indices.

The MSCI Value Indices are constructed using security selection. MSCI Value/Growth Indices divide the universe of stocks into two separate value and growth categories based on value and growth attributes. Once stocks are classified as value/growth, they are cap-weighted to create MSCI Value/Growth benchmarks. The MSCI Value/Growth Indices, in aggregate, sum to the respective MSCI cap-weighted index.

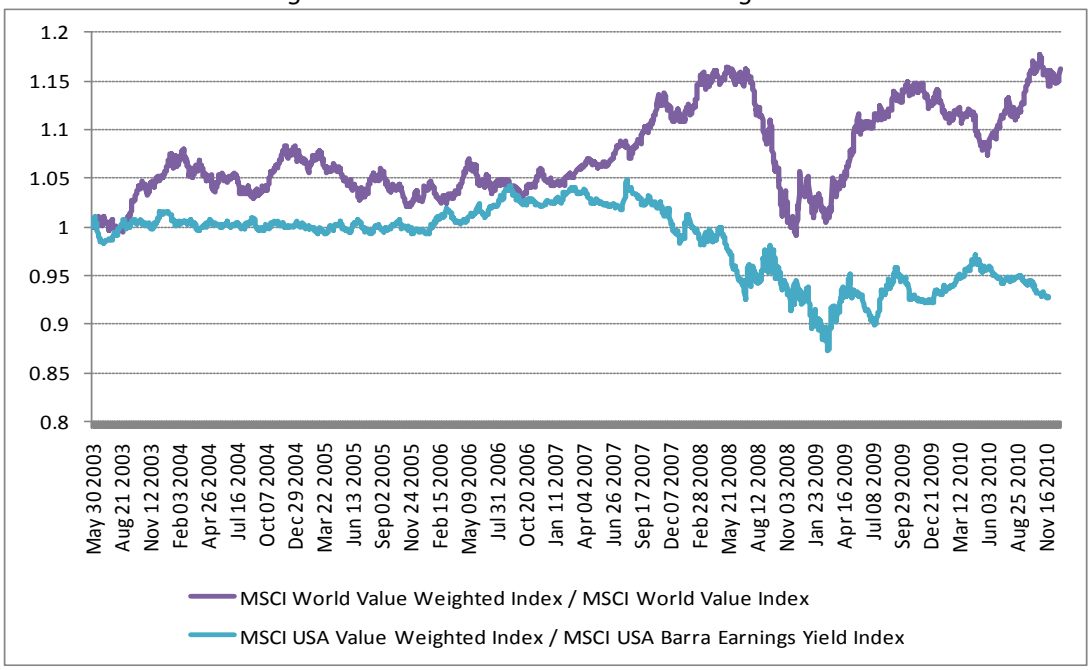
The use of capitalization weighting with MSCI Value Indices contrasts with the MSCI Value Weighted Indices. MSCI Value Weighted Indices include all stocks in the universe and security weights are a direct function of the relative valuation of stocks and the weights respond to changes in valuation dispersion. The MSCI Value Weighted Indices are complementary to existing capitalization weighted indices and could serve as tools for strategic asset allocation and enable investors to systematically gain exposure to market beta with a value tilt. In contrast, the MSCI Value Indices represent the opportunity set and serve as benchmarks for value managers.

MSCI Barra Value Factor Indices are constructed using optimization to capture the returns of the pure Barra Value factor. These indices are long/short portfolios designed to be style, industry and country neutral. The different approaches to portfolio construction across the different MSCI indices that track

the Value factor result in different sector and factor exposures and these exposures have in turn influenced the historical performance of these indices.

Exhibit 10 shows the relative performance of the MSCI World Value Weighted Index with the MSCI World Value Index. We see that the MSCI World Value Weighted Index outperformed the MSCI World Value Index over the period May 2003 – November 2010. However during the financial crisis in 2008, the MSCI World Value Weighted Index underperformed the MSCI World Value Index due to its overweight in Financials and positive exposure to Leverage. In Exhibit 10, we also observe that the MSCI USA Value Weighted Index underperformed the MSCI Barra USA Earnings Yield Factor Index[4] during the financial crisis in 2008 due to its overweight in Financials and a positive exposure to Leverage. In contrast, the MSCI USA Barra Earnings Yield Index had a positive exposure to the Barra Earnings Yield factor alone and is style and industry neutral. The MSCI Barra Value Factor Indices could provide a helpful tool to investors who seek to capture the pure Value factor without active exposure to countries and industries. The MSCI Value Factor indices are typically relevant for tactical allocation and hedging purposes.

Exhibit 10: *Comparison of the MSCI World Value Weighted Index with the MSCI World Value Index, and the MSCI USA Value Weighted Index with the MSCI USA Earnings Yield Index*



Section 5: Alternative Theories to Explain the Performance of Value Weighted Indices

From the historical performance characteristics discussed in Section 4, we can infer that the MSCI Value Weighted Indices (as shown in Exhibits 8 and 9) reflect the value premium. In this context, the pertinent question that arises is whether these excess returns could persist into the future?

[4] MSCI Barra USA Earnings Yield Factor Index captures the return of Barra USA Earnings Yield Factor

The performance of value weighted portfolios is closely related to the persistence of the "value" premium. A large body of literature in empirical finance has isolated a "value" effect in asset pricing. Several studies have reported that portfolios that overweight value stocks have historically outperformed capitalization weighted portfolios. Theories explaining the historical performance of portfolios that emphasize a particular attribute, risk factor, or characteristic such as "low valuations" or "low volatility" could be broadly placed in three categories. The first category, known as the data mining group, argues that such historical performance patterns are period specific and therefore not likely to persist out-of-sample (Lo and Mackinlay, 1990). The second category, often described as the normative finance group, argues that certain fundamental or trading characteristics such as size, value, momentum, volatility, etc, are proxies for unobservable risk factors (Fama and French, 1992). Therefore portfolios tilted towards these characteristics bear higher systematic risk and earn a premium in compensation for this risk. The third group, from the field of behavioral finance, argues that behavioral reasons influence the investment decision making process, leading to imprecision and bias in the pricing of securities that can be exploited systematically through disciplined investment strategies (Lakonishok, Schleifer and Vishny, 1994).

More recently, a few proponents of Fundamental Indexation have advanced another theory referred to as the "Noisy Market Hypothesis" (Arnott, Hsu and Moore, 2005, Siegel, 2006 and Treynor, 2005) to explain the historical outperformance of fundamental indices. According to this theory, due to buying and selling activities of "liquidity" or "noise" traders (often motivated by different reasons such as taxes, fiduciary responsibilities, portfolio rebalancing or personal reasons) stock prices are impacted by factors unrelated to the value of the firm. The proponents of the "Noisy Market Hypothesis" argue that fundamental weights are unbiased estimators of fair value weights that are statistically independent of market values. Thus under this theory stock prices are often mis-priced due to noise factors and do not reflect the fundamentals of the firm and deviate from fair value. This causes overpriced stocks to have larger capitalization than their fair equity value and underpriced stocks to be lower than their fair equity value. Accordingly, under this theory cap weighted portfolios tend to overweight high priced stocks and underweight low priced stocks causing a performance drag. In contrast, fundamental indexation uses fundamental weights and is considered by proponents of the Noisy Market Hypothesis to be a better representation of fair market value than capitalization weighted indices. A key point to highlight is that the "Noisy Market Hypothesis" assumes that price movements caused by liquidity traders are not immediately reversed by those trading on fundamental information. This assumption is a deviation from the efficient market hypothesis that claims that the price of a security is the unbiased estimate of firm value at all times.

The "Noisy Market Hypothesis" has triggered much debate and it has been criticized in recent research (Asness, 2006, Perold, 2007 and Kaplan, 2009). Perold (2007) criticizes the theory on which fundamental indexing is based, that is, that an investor can beat the market without knowing fair value simply by avoiding the capitalization weighting scheme. If one does not know fair value, then even though prices can move towards fair value, the direction of that movement is random. He argues that if markets are inefficient, but one does not know whether a given stock is over- or undervalued, then there is no performance drag from capitalization weighting. Another way to state the preceding view is in terms of the correlation of the pricing error with fair value and with market value. If a fundamentally weighted portfolio is to outperform a capitalization-weighted portfolio of the same stocks, then the fundamental variables used to construct the weights should contain more information about the fair values of the stocks than the market values of the stocks. Kaplan (2008) therefore determines a boundary condition that needs to be satisfied in order for a non-capitalization weighting scheme to add value. If the correlation between the fundamental values and the fair values exceeds the correlation between the market values and the fair values, then he argues fundamental indexing is the a priori superior

approach. If the reverse is true, then he argues capitalization weighting is superior. Since fair values in these inequalities are not observable, one can only evaluate the historical performance to see whether fundamental weighting or capitalization weighting is the better way of investing. In summary, these research studies corroborate that fundamental indexation is just a variant of value investing that employs an alternative weighting scheme to introduce a value tilt (Jun and Malkiel, 2008).

Empirical return regularities associated with attributes such as value, size, momentum, volatility, etc, were identified and chronicled in investment research as early as the 1980s; however, these return patterns persisted over the next two decades as well. This observation brings into question the view that all such empirical return regularities should be seen as being period specific and outcomes of data mining. The long-run results from value-style investing suggest considerable mean reversion in investment style rather than consistent excess returns (Owyong, 2011). For investors who believe that the historical performance patterns were driven by systematic risk premia or due to behavioral biases and therefore may persist in the future, value weighting offers a simple and transparent approach to capture the well documented value premium effect.

Section 6: Conclusion

Value weighted indices are systematic indices that aim to reflect the value premium by employing an alternative weighting scheme that tilts the index towards stocks with lower valuation ratios. In this paper, we reviewed the theoretical aspects of value weighted indices. Through empirical studies, we then discussed the important facets of index construction that underpin the design of MSCI Value Weighted Indices. The MSCI Value Weighted Indices are based on an objective and transparent methodology by which all the constituents of a standard MSCI parent index are re-weighted using four common accounting measures: book value, sales, earnings and cash earnings -- thereby adding a value tilt to the parent MSCI index towards stocks with relatively lower valuation ratios. The MSCI Value Weighted Indices have historically outperformed their respective parent MSCI indices across different regions, reflecting the value premium, with slightly higher risk, low tracking error and modest turnover. Our empirical finding on the long term outperformance of MSCI Value Weighted indices is consistent with the long history of published research on the value premium.

Value weighted indices offer many of the benefits of capitalization weighting such as broad diversification, transparency, modest turnover and lower costs. Use of value weighted indices in the investment process can potentially offer advantages over other traditional passive approaches to value investing by incorporating all stocks, differentiating security weights across the valuation spectrum and responding to changes in valuation dispersion. The long term outperformance of value weighted indices relies on the persistence of the value premium. The persistence of the value premium has been the subject of much research and debate. For investors who believe the value premium will persist in the future, value weighting potentially offers a passive and low cost approach to reflect that strategic view in asset allocation. MSCI Value Weighted Indices are complementary to capitalization weighted indices and could serve as tools in strategic asset allocation to enable investors to gain exposure to market beta with a value tilt.

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Appendix A – Analytical Derivation of Value Weights

Starting with the same universe of stocks in a value weighted index as in the cap weighted index, it can be shown that any overweight or underweight a security i in a value weighted portfolio is exactly proportional to the relative yield of the security i with the yield of the cap weighted index (Asness, 2006). Stocks with a higher yield are overweighted and stocks with a lower yield are underweighted in the value weighted index. Stocks with a yield equal to the yield of the cap weighted index have the same weights in the value weighted and the cap weighted indices. The mathematical derivation is presented below.

For example, if we use earnings as the fundamental measure, and E_i is the security's earnings and M_i is the market capitalization of the security, the ratio E_i / M_i represents the security's earnings yield.

1. Start with the market cap weight of stock i

$$\frac{M_i}{\sum_{i=1}^{n} M_i}$$ } Market cap weight of stock i

2. Apply the value tilt by multiplying the market cap weight of stock i with its relative yield

$$\frac{M_i}{\sum_{i=1}^{n} M_i} * \frac{\frac{E_i}{M_i}}{\frac{\sum_{i=1}^{n} E_i}{\sum_{i=1}^{n} M_i}}$$

$\frac{E_i}{M_i}$ } Earnings Yield of stock i

$\frac{\sum_{i=1}^{n} E_i}{\sum_{i=1}^{n} M_i}$ } Earnings Yield of the cap weighted index

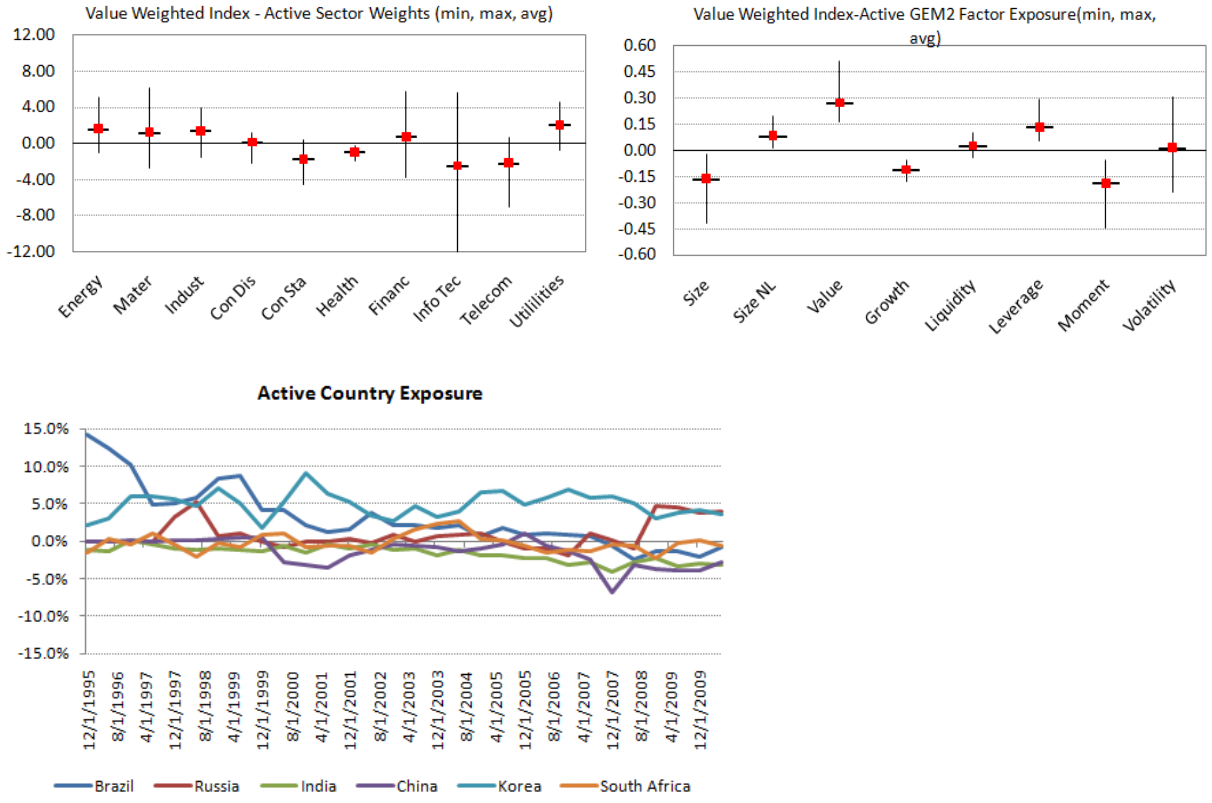
3. Derive the resultant Value Weight from Step 2

$$\frac{E_i}{\sum_{i=1}^{n} E_i}$$ } Value weight of stock i

Appendix B – Active Exposures of MSCI ACWI & MSCI Emerging Markets Value Weighted Indices

Exhibit 10: Average Active Exposures of MSCI ACWI Value Weighted Index

Exhibit 11: Average Active Exposures of MSCI Emerging Markets Value Weighted Index



Appendix C – Performance Attribution of Value Weighted Indices[5]

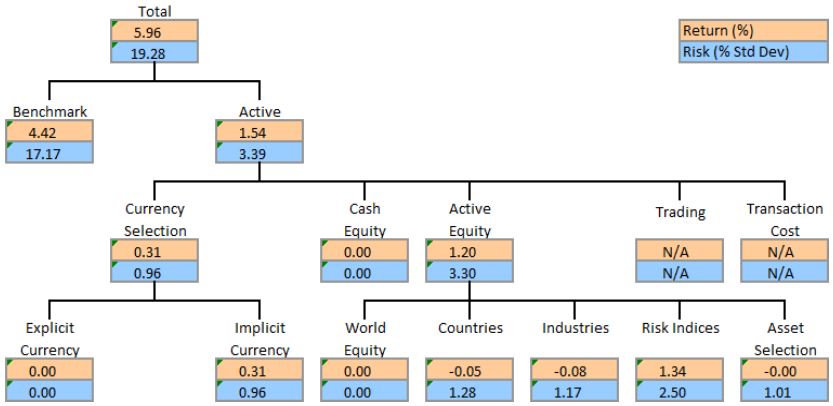
Exhibit 12: Performance Attribution of MSCI World Value Weighted Index

Portfolio Name: VWIWLD
Benchmark: MSWLD_A
Numeraire: USA

Total Annualized Attribution Chart

GL Monthly
Jan-2002 to Nov-2010 (107 Months)
21-Jan-2011 (Fri)

Attribution Chart
Annualized Contributions To Total Return



Annualized Contributions To Risk Index Return

Source of Return	Average Active Exposure	Contribution (% Return) Average [1]	Variation [2]	Total [1+2]	Risk (% Std Dev)	Total Info Ratio	T-Stat
Momentum	-0.13	-0.28	0.58	0.3	1.01	0.37	1.12
Volatility	0.07	-0.14	0.18	0.04	1.58	0.14	0.43
Value	0.25	1.04	-0.06	0.98	0.71	1.35	4.03
Size	-0.07	0.06	0.11	0.16	0.34	0.46	1.37
Size Nonlinearity	0.05	0.03	-0.02	0.01	0.16	0.05	0.14
Growth	-0.12	-0.04	0.02	-0.02	0.22	-0.15	-0.44
Liquidity	0.01	0.01	0.04	0.05	0.11	0.48	1.42
Financial Leverage	0.21	-0.13	-0.06	-0.19	0.45	-0.31	-0.92
Total				1.34	2.5	0.64	1.92

[5] Results based on performance attribution done using Barra GEM2L model in Aegis Performance Analyst

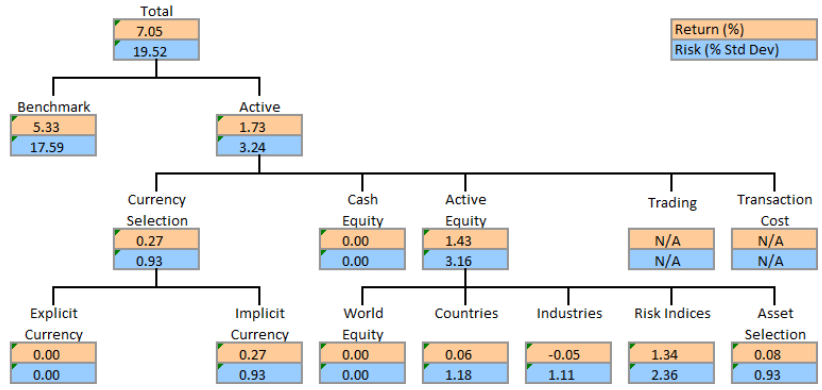
Exhibit 13:Performance Attribution of MSCI ACWI Value Weighted Index

Portfolio Name: VWIACWI
Benchmark: MSAWIF_A
Numeraire: USA

Total Annualized Attribution Chart

GL Monthly
Jan-2002 to Nov-2010 (107 Months)
28-Jan-2011 (Fri)

Attribution Chart
Annualized Contributions To Total Return



Annualized Contributions To Risk Index Return

Source of Return	Average Active Exposure	Contribution (% Return) Average [1]	Variation [2]	Total [1+2]	Risk (% Std Dev)	Total Info Ratio	T-Stat
Momentum	-0.13	-0.29	0.55	0.26	1.00	0.34	1.00
Volatility	0.06	-0.12	0.19	0.07	1.43	0.17	0.50
Value	0.25	1.05	-0.06	0.99	0.70	1.37	4.10
Size	-0.07	0.06	0.11	0.17	0.35	0.46	1.38
Size Nonlinearity	0.05	0.03	-0.02	0.01	0.16	0.04	0.11
Growth	-0.12	-0.04	0.02	-0.03	0.21	-0.16	-0.48
Liquidity	0.01	0.01	0.04	0.05	0.10	0.53	1.57
Financial Leverage	0.20	-0.13	-0.06	-0.18	0.43	-0.31	-0.92
Total				1.34	2.36	0.67	2.01

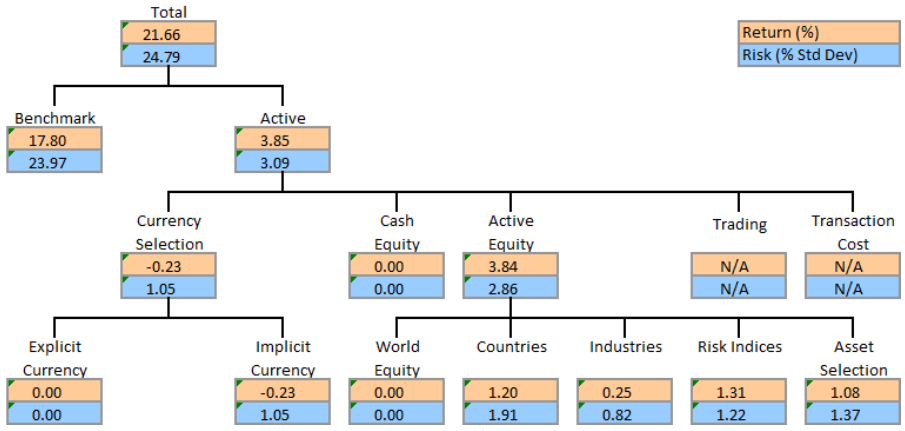
Exhibit 14 : Performance Attribution of MSCI Emerging Markets Value Weighted Index

Portfolio Name: VWIEM
Benchmark: MSEMMF_A
Numeraire: USA

Total Annualized Attribution Chart

GL Monthly
Jan-2002 to Nov-2010 (107 Months)
28-Jan-2011 (Fri)

Attribution Chart
Annualized Contributions To Total Return



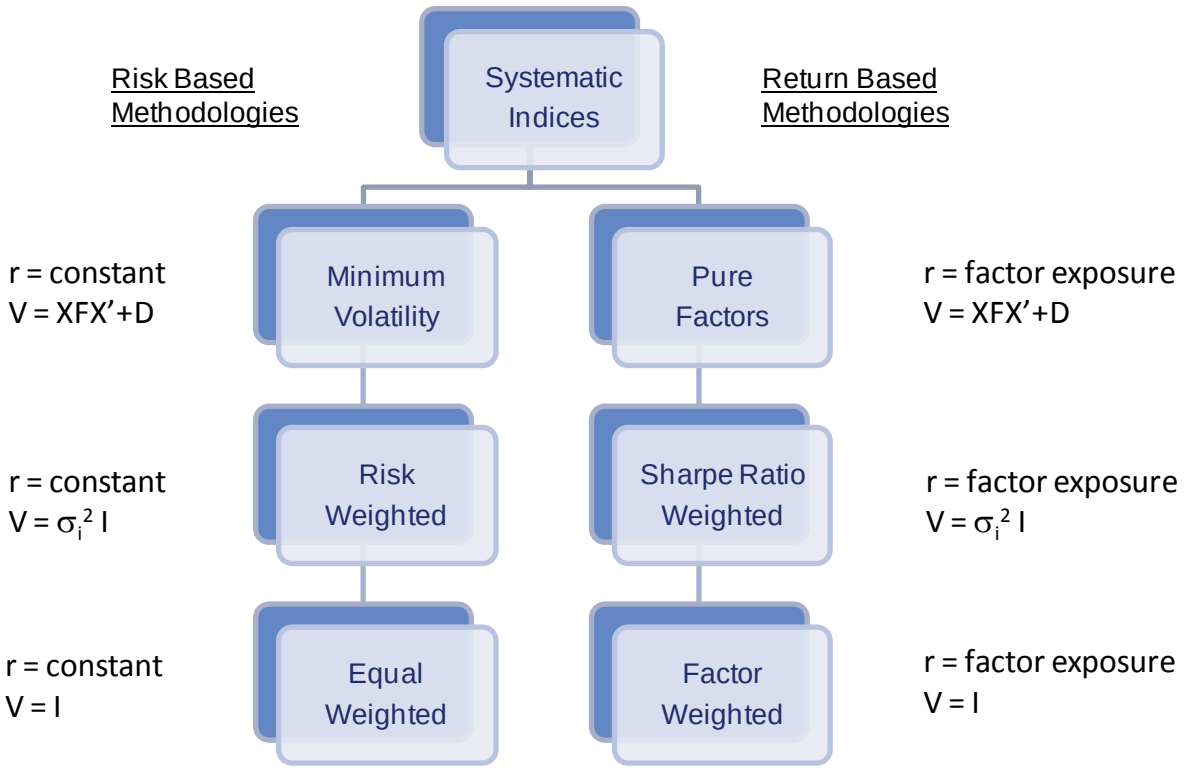
Annualized Contributions To Risk Index Return

Source of Return	Average Active Exposure	Contribution (% Return) Average [1]	Variation [2]	Total [1+2]	Risk (% Std Dev)	Total Info Ratio	T-Stat
Momentum	-0.17	-0.40	0.04	-0.36	0.69	-0.35	-1.04
Volatility	-0.02	0.06	0.40	0.46	0.51	0.77	2.30
Value	0.24	1.09	-0.01	1.08	0.49	1.91	5.69
Size	-0.12	0.11	0.17	0.28	0.40	0.59	1.76
Size Nonlinearity	0.07	0.04	-0.05	-0.01	0.14	-0.04	-0.13
Growth	-0.11	-0.04	-0.02	-0.05	0.13	-0.44	-1.30
Liquidity	0.01	0.01	0.04	0.05	0.05	0.86	2.56
Financial Leverage	0.13	-0.10	-0.04	-0.13	0.21	-0.37	-1.10
Total				1.31	1.22	1.00	3.00

Appendix D: General Framework for Systematic Indices

Systematic indices can be viewed as special cases of mean-variance portfolio optimization subject to various assumptions for expected returns, volatilities and correlations (r represents expected return, s is return volatility, V is the covariance matrix and I is the identity matrix). Exhibit 15 shows a general unified framework for Systematic Indices (Melas and Kang, 2010).

Exhibit 15: General Framework for Systematic Indices



It can be shown that value weighted indices are simple factor weighted indices derived using mean-variance optimization assuming that the expected returns of the securities are proportional to the fundamental accounting measure (earnings, sales, book value etc) and all securities have constant volatilities and correlations.

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