I FUND BENCHMARK EVALUATION

Independent
advice for
the institutional
investor

FINAL

I Fund Benchmark
Evaluation for the
Federal Thrift
Savings Plan

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Executive Summary

The Federal Retirement Thrift Investment Board (FRTIB) requested that Ennis Knupp & Associates (EnnisKnupp) evaluate the appropriateness of changing the benchmark of the International Stock Index Investment Fund (I Fund) offered within the Thrift Savings Plan (TSP). The I Fund's existing benchmark is the MSCI EAFE Index, which provides exposure to 21 developed non-U.S. equity markets across Europe, Australasia, and the Far East. In this report, we review the appropriateness of changing the I Fund's benchmark to the MSCI All-Country World (ACW) ex-U.S. Index. The MSCI ACW ex-U.S. Index provides broader and more diversified coverage of the non-U.S. equity markets as it includes exposure to the emerging markets and Canada, in addition to the countries that are in the MSCI EAFE Index.

In evaluating the appropriateness of making a change to the I Fund's mandate, we took into consideration:

- The criteria set forth in the Federal Employees' Retirement System Act of 1986 (FERSA) that govern the selection of a benchmark for the I Fund and the investment of assets of the Fund.
- The merits and challenges associated with moving to the more diversified benchmark and the appropriateness of the MSCI ACW ex-U.S. Index as a benchmark for the I Fund that is in line with the intent specified in FERSA.
- BGI's ability to manage a daily-valued fund benchmarked to the MSCI ACW ex-U.S. Index at a reasonable level of tracking error consistent with the guidelines provided in FERSA – i.e., to have a fund whose exposures are closely in line with that of the benchmark index.

In Section 1 of this report, we compare the characteristics of the MSCI EAFE Index to that of the MSCI ACW ex-U.S. Index and the MSCI ACW ex-U.S. IMI. We conclude that the MSCI ACW ex-U.S. Index provides broader coverage of the international equity markets and better diversification of the I Fund's international equity exposure. In addition to the investment merits, the MSCI ACW ex-U.S. Index also meets the criteria set forth in FERSA relating to the selection of a benchmark index for the I Fund. As such, we favor considering a move to a broader benchmark to the extent that BGI is able to manage a daily-valued fund at a reasonable level of tracking error and maintain exposures that are closely in line with the index.

In Section 2 of this report, we evaluate the construction methodology proposed by BGI to implement a daily-valued fund benchmarked to the MSCI ACW ex-U.S. Index. While BGI is able to create and manage a daily-valued fund at a reasonable level of tracking error, the proposed construction methodology will result in rebalancing of portions of the fund on a weekly or bi-monthly basis. As a result, in between rebalancing periods, the Fund could have exposures that are different from that of the benchmark index, even though these differences may be small. This appears to be in conflict with the intent of FERSA, which requires the proportion of each security in the I Fund to closely match that of the benchmark index. As such, we recommend that the TSP defer a move to a broader benchmark for the I Fund until such time that BGI is able to manage a daily-valued fund at a reasonable level of tracking error, which is also rebalanced on a daily basis.

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Section 1: Non-U.S. Equity Benchmark Review

This section of the report compares the characteristics and composition of the I Fund's current benchmark, the MSCI EAFE Index, to that of the MSCI ACW ex-U.S. Index. We also provide a brief overview of the benefits and challenges associated with the TSP moving to a broader benchmark.

For comparison purposes, we have also included the characteristics of the MSCI All-Country World ex-U.S. Investable Market Index (MSCI ACW ex-U.S.IMI). This index, recently launched by MSCI, is broader than the MSCI All-Country World ex-U.S. benchmark and seeks to cover 99% of the investable international market including small cap securities. We are not, however, recommending a change to the MSCI ACW ex-U.S. IMI at this time given that it is not yet the mainstream benchmark for institutional investors or asset managers, the lack of significant index fund assets currently managed to this index, and the illiquidity that exists within the small cap segment of the benchmark.

Characteristic Comparison

Table 1 shows a comparison of the various characteristics of the three benchmarks.

As of 12/31/2008

	MSCI EAFE Index	MSCI ACWI ex-U.S. Index	MSCI ACWI ex-U.S. Investable Market Index
Number of Countries	21	47	47
Market Capitalization ($ Float)	$7.76 trillion	$10.16 trillion	$11.29 trillion
Country Market Coverage (%)	85	85	99
Turnover (%)	0.86	0.95	0.76
Largest Company (Market Cap)	Nestle ($149.7 billion)	Nestle ($149.7 billion)	Nestle ($149.7 billion)
Smallest Company (Market Cap)	Anglo Irish Bank Corp PLC ($180.7 million)	PIK Group GDR ($95.2 million)	New Star Asset Mgmt. ($4.7 million)

As shown above, the MSCI ACW ex-U.S. Index is a broader benchmark that includes Canada and the emerging markets (26 additional countries). In addition, the market capitalization of the MSCI ACW ex-U.S. Index is $10.2 trillion versus MSCI EAFE's market capitalization of $7.8 trillion. As previously mentioned, the MSCI ACW ex-U.S. IMI is a broader index than the other two international benchmarks and targets 99% versus 85% market capitalization coverage at the country level. The main reason for this is the MSCI ACW ex-U.S. IMI's coverage of the small cap segment of the international market. This is evident when comparing the market capitalization for the smallest company in the MSCI ACW ex-U.S. IMI at $4.1million to that of the MSCI ACW ex-U.S. Index at $95.2 million.

As shown in Table 2 on the following page, Canada is the fifth largest country in terms of market capitalization in the broad non-U.S. equity markets and has continued to grow as a percentage of the overall international market over the past few years. Further, the emerging market countries in aggregate make up approximately 17.2% of both the MSCI ACW ex-U.S. and 17.4% of the MSCI ACW ex-U.S. IMI indices. There are several emerging market countries (i.e. Brazil, China, Korea) that have higher market capitalizations than a few of the developed countries (i.e. New Zealand, Portugal, Ireland).

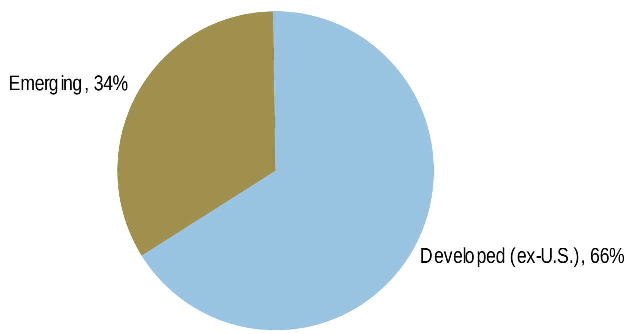
Table 2

	MSCI EAFE	MSCI ACWI ex-U.S.	MSCI ACWI ex-U.S. IMI
Developed Markets			
Australia	6.0%	4.6%	4.5%
Austria	0.3	0.2	0.3
Belgium	0.8	0.6	0.6
Canada	0.8	6.4	6.4
Denmark	1.4	0.6	0.7
Finland	10.9	1.1	1.1
France	8.7	8.3	7.8
Germany	0.5	6.7	6.5
Greece	2.0	0.4	0.4
Hong Kong	0.3	1.5	1.5
Ireland	3.7	0.2	0.3
Italy	25.3	2.8	2.8
Japan	2.4	19.3	20.1
Netherlands	0.1	1.9	1.8
New Zealand	0.6	0.1	0.1
Norway	0.3	0.5	0.6
Portugal	1.1	0.3	0.3
Singapore	4.5	0.8	0.9
Spain	2.0	3.5	3.3
Sweden	8.4	1.5	1.6
Switzerland	19.9	6.4	6.1
United Kingdom	6.0	15.2	14.9
Emerging Markets			
Argentina	--	0.0%	0.0%
Brazil	--	2.2	2.1
Chile	--	0.2	0.2
China	--	3.1	3.1
Colombia	--	0.1	0.1
Czech Republic	--	0.2	0.1
Egypt	--	0.1	0.1
Hungary	--	0.1	0.1
India	--	1.1	1.2
Indonesia	--	0.3	0.3
Israel	--	0.6	0.6
Jordan	--	0.0	0.0
Korea	--	2.3	2.4
Malaysia	--	0.5	0.6
Mexico	--	0.9	0.9
Morocco	--	0.1	0.1
Pakistan	--	0.0	0.0
Peru	--	0.1	0.1
Philippines	--	0.1	0.1
Poland	--	0.3	0.3
Russia	--	1.0	0.9
South Africa	--	1.4	1.5
Taiwan	--	1.9	2.1
Thailand	--	0.2	0.3
Turkey	--	0.3	0.3
Total Developed	100.0%	82.8%	82.6%
Total Emerging	0.0%	17.2%	17.4%

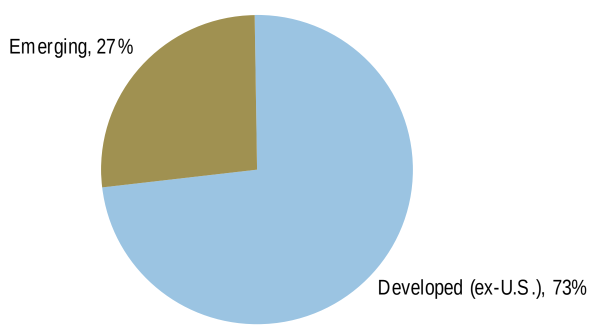
Chart 1 below shows the contribution of developed and emerging market countries to international Gross Domestic Product (GDP) for both 1997 and 2007. As shown, emerging markets make up a significant and growing portion of the world's GDP. Over the last ten years, the contribution of emerging markets to international GDP has grown by 7%.

Chart 1

International Gross Domestic Product
As of 12/31/2007



International Gross Domestic Product
As of 12/31/1997



Performance

In Table 3, we show annual and trailing year performance for all three benchmarks.

Table 3
As of 12/31/2008

	MSCI EAFE Index	MSCI ACWI ex-U.S. Index	MSCI ACWI ex-U.S. Investable Market Index
1988	28.3%	27.6%	--
1989	10.4	11.8	--
1990	-23.6	-23.0	--
1991	12.2	13.6	--
1992	-12.2	-11.3	--
1993	32.7	34.5	--
1994	7.8	6.4	0.3%
1995	11.3	9.6	7.5
1996	6.1	6.4	5.0
1997	1.6	1.8	-3.4
1998	20.1	14.1	11.9
1999	26.7	30.6	37.7
2000	-14.2	-15.3	-19.5
2001	-21.4	-19.7	-19.8
2002	-15.9	-15.0	-12.9
2003	38.6	40.8	42.1
2004	20.3	20.9	21.9
2005	13.5	16.6	17.7
2006	26.3	26.7	26.4
2007	11.2	16.7	16.1
2008	-43.4	-45.5	-46.0
Trailing Periods			
3-Year	-7.4%	-7.0%	-7.4%
5-Year	1.7	2.6	2.6
10-Year	0.8	1.9	2.3
15-Year	3.5	3.8	--

The MSCI ACW ex-U.S. Index and MSCI ACW ex-U.S. IMI have earned higher returns relative to the MSCI EAFE Index over all trailing time periods shown above, with the exception of the MSCI ACW ex-U.S. IMI's return over the trailing three-year period. Please note that the historical returns prior to June 2007 for the MSCI ACW ex-U.S. IMI are simulated returns. The positive returns relative to the MSCI EAFE over recent time periods can be mainly attributed to the strong returns of the emerging markets over the past several years.

Table 4 shows the correlations of the various indices, which indicates that the three indices are highly correlated with each other.

Table 4 – Correlations
As of 12/31/08

	MSCI EAFE Index	MSCI ACWI ex-U.S. Index	MSCI ACWI ex-U.S. Investable Market Index
MSCI EAFE	1.000		
MSCI ACWI ex-U.S.	0.995	1.000	
MSCI ACWI ex-U.S. IMI	0.995	1.000	1.000

The annualized standard deviations of the three benchmarks over several trailing time periods are shown in Table 5 below. The volatility of the MSCI ACW ex-U.S. Index and the MSCI ACW ex-U.S. IMI are marginally higher than that of the MSCI EAFE Index over the trailing time periods shown in the table below.

Table 5 – Standard Deviation
As of 12/31/08

	MSCI EAFE Index	MSCI ACW ex-U.S. Index	MSCI ACW ex-U.S. IMI
5 Years	16.5%	17.9%	18.1%
10 Years	16.4	17.2	17.4
15 Years	15.6	16.3	N/A

Table 6 shows the Sharpe Ratios for each of the indexes. Both the MSCI ACW ex-U.S. Index and the MSCI ACW ex-U.S. IMI exhibited higher Sharpe Ratios relative to the MSCI EAFE Index over the trailing time periods shown below.

Table 6 – Sharpe Ratios
As of 9/30/2008

	MSCI EAFE Index	MSCI ACW ex-U.S. Index	MSCI ACW ex-U.S. IMI
5 Years	0.04	0.10	0.10
10 Years	-0.04	0.03	0.06
15 Years	0.09	0.10	N/A

Table 7 shows the average transaction costs that have been compiled based on a survey of leading transition managers. Transaction costs are higher for the MSCI ACW ex-U.S. Index, but only marginally higher.

Table 7 – Transaction Costs

Trade Size	MSCI EAFE Index (bps)	MSCI ACW ex-U.S. Index (bps)
$25 mm	13	19
$50 mm	14	21
$100 mm	15	23
$200 mm	16	26

Analysis

The MSCI ACW ex-U.S. IMI provides broadest coverage of the international opportunity set in that it also includes smaller capitalization stocks across the non-U.S. equity markets that are not in the MSCI ACW ex-U.S. Index. The MSCI ACW ex-U.S. IMI Index was launched in 2007 and it is not yet a commonly used benchmark across large institutional investment programs. Since it is a new index, it has yet to gain significant traction across the institutional investment community and the level of assets benchmarked to this index is low – especially passively managed assets. As such, given that the MSCI ACW ex-U.S. IMI is not as widely used in the institutional space and the lack of assets benchmarked to it, we limit our analysis to the MSCI ACW ex-U.S. Index.

There are both positive and negative aspects to moving to the broader MSCI ACW ex-U.S. Index within the TSP investment plan. We summarize the benefits to changing benchmarks as well as the challenges while the following section of this report provides additional detail.

The primary benefit of changing the I Fund benchmark to the MSCI ACW ex-U.S. Index from the MSCI EAFE Index is that investors in the I Fund will gain broader coverage of the international market with exposure to both Canada and the emerging markets. This will provide participants that choose to invest internationally with additional diversification within their investment portfolio. Fully diversified investment portfolios should closely reflect the market opportunity set. Both Canada and the emerging market countries comprise a significant portion of the international market. Further, emerging markets represent a significant and growing portion of international GDP and offer a higher return potential than developed markets alone.

The challenges to moving to the broader benchmark include higher transaction costs and illiquidity within the emerging markets. It becomes more difficult within a defined contribution framework to manage tracking error and transaction costs given the high volume of daily cash flows from participants. In addition, the amount of defined contribution assets that are indexed to the MSCI ACW ex-U.S. Index as compared to the MSCI EAFE Index are low and therefore, the experience of index fund managers in managing this type of product is limited.

We believe that the higher return potential, added diversification, and broader coverage of the international opportunity set more than outweigh the higher transaction costs associated with a broader benchmark that includes the emerging markets and Canada.

The Federal Employees' Retirement System Act of 1986 (FERSA), which governs the investment of the TSP's assets, references the following requirements with reference to the benchmark index for the I Fund.

Requirements relating to the benchmark index for the I Fund
Title 5 U.S.C. Sect. 8438 (b)(4)(A). The Board shall select an index which is a commonly recognized index comprised of stock the aggregate market value of which is a reasonably complete representation of the international equity markets excluding the United States equity markets.

We believe that the MSCI ACW ex-U.S. Index meets the criteria specified in the statute – namely:

- The Index is a commonly recognized index
- Provides a reasonably complete representation of the international equity markets

Given the investment merits from broadening the mandate of the I Fund from the MSCI EAFE Index to the MSCI ACW ex-U.S. Index, and the fact that the MSCI ACW ex-U.S. Index meets the criteria set forth in FERSA, we favor a move to the broader mandate if the TSP's index fund manager, BGI, is able to manage a daily-valued fund benchmarked to the MSCI ACW ex-U.S. Index.

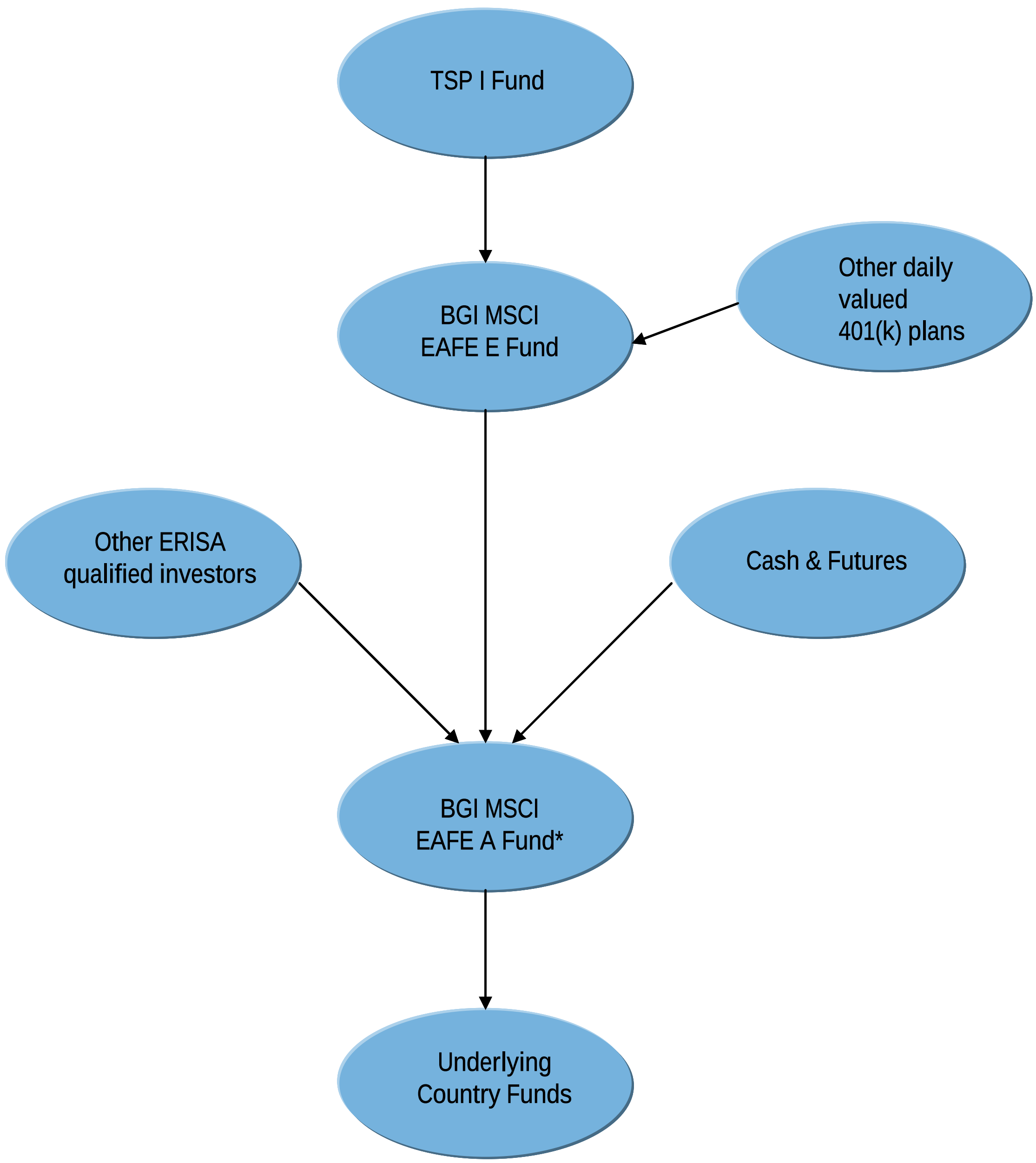
Section 2: Implementation of a Daily-Valued MSCI ACW ex-U.S. Index Fund

In this section of the report, we review BGI's proposed implementation of a daily-valued fund benchmarked to the MSCI All-Country World ex-U.S. Index (ACW ex-U.S.) for the I Fund. As of December 31, 2008, the I Fund had approximately $14.6 billion in assets.

I Fund – Existing Structure

In order to review BGI's proposed implementation, it is useful to understand the structure of the MSCI EAFE Index Fund, which is currently used by the I Fund. Chart 2 below graphically depicts the structure of the I Fund's investment.

Chart 2



The I Fund's assets are invested in BGI's MSCI EAFE E Fund. The E Fund is a daily valued fund, meaning that it is available for transaction activity on a daily basis. Further, through the methodology described in the following paragraphs, BGI rebalances the Fund on a daily basis to ensure that weights of underlying securities in the Fund are closely in line with that of the benchmark index.

The E Fund comprises, in addition to the TSP's assets, investment of other defined contribution plans. The E Fund holds units (shares) of another commingled trust fund referred to as the A Fund. In addition to the units of the A Fund, the E Fund will also hold cash and futures positions to meet redemptions and to maintain appropriate exposure to the relevant market.

The A Fund comprises investments from the E Funds, investments from other collective trust funds managed by BGI for retirement plans (defined benefit and defined contribution), and direct plan sponsor investments (defined benefit and defined contribution). The A Fund is managed in a modular basis and owns units in 21 underlying country funds in the proportion that these countries comprise the MSCI EAFE Index.

Net transaction resulting from TSP participants' daily buy and sell orders are aggregated at the I Fund level. The net transaction at the I Fund level results in a purchase / sale of units of the E Fund. This transaction is available to be unit crossed with transactions of other investors in the E Fund to the extent that there are such crossing opportunities. As depicted in the chart shown in the previous page, the E Fund holds cash, which is equitized using futures contracts, and units of the A Fund, which in turn owns underlying securities comprising the MSCI EAFE Index.

Depending on the value of the net daily transaction activity resulting from all investors at the E Fund level, BGI may determine to initiate a transaction with the A Fund. Transactions initiated by the E Fund at the A Fund level are also available for unit crossing at the A Fund level with the net transaction activity of all other investors in the A Fund.

At the E Fund level, BGI may decide to transact with the A Fund primarily on account of one or both of the following reasons:

- Level of cash at the E Fund level is higher than the threshold required to maintain a tight tracking error to the benchmark
- Natural unit level crossing opportunity at the A Fund level exists based on the net transaction flow of all other investors in the A Fund

Finally, the net transactions at the A Fund level, i.e., a purchase or sale of underlying securities, are eligible for an internal security-level cross with corresponding order flow within BGI.

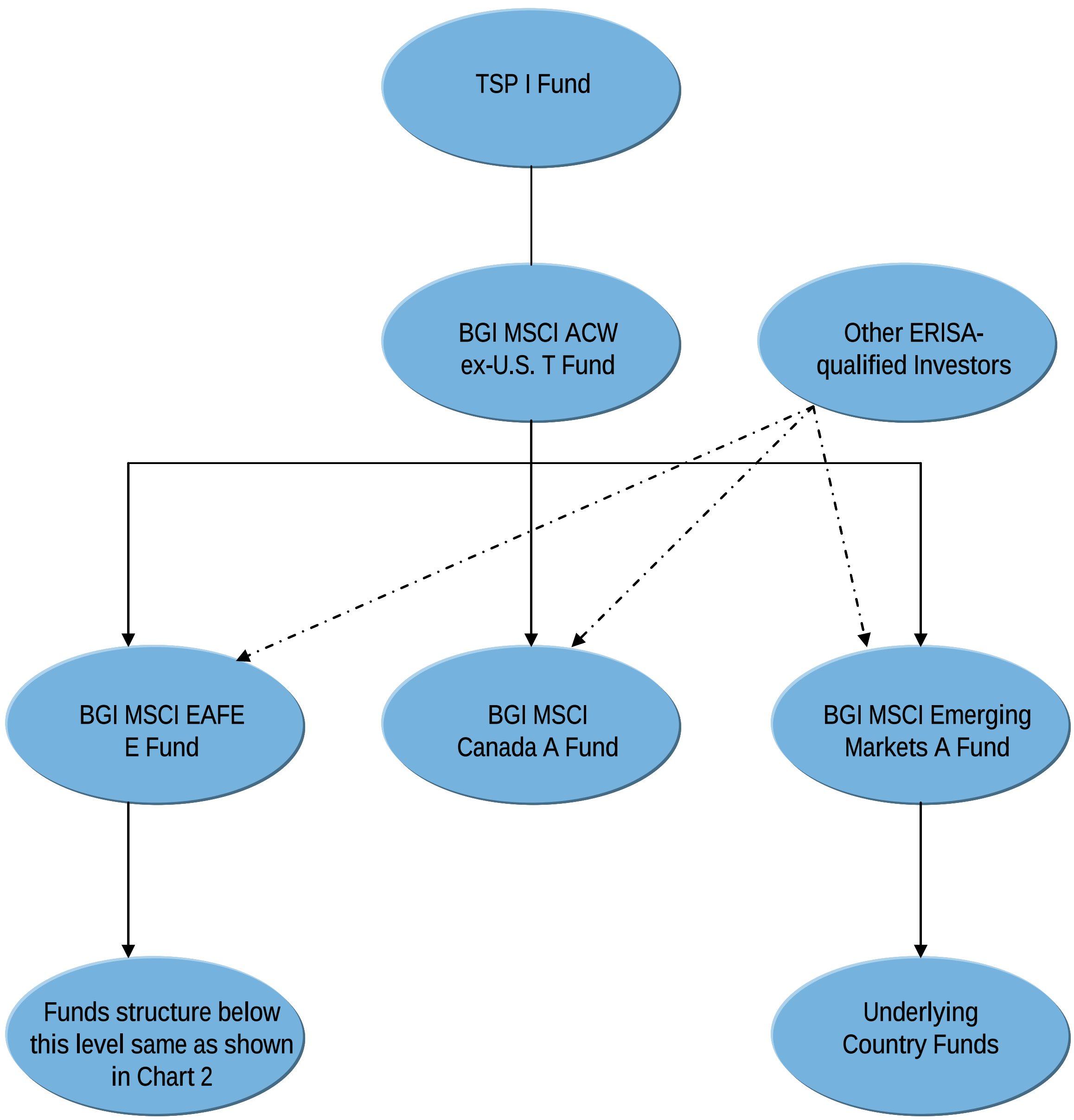
Crossing results in significant savings in transaction costs to investors since buys or sells of investors are offset by corresponding sells or buys of other investors without necessitating an underlying securities trade in the open market.

In 2008, the average monthly crossing rate, including unit and security level crosses, averaged 5%. The crossing rate achieved in 2008 was higher than the average of the previous two years. The average monthly crossing rates were approximately 4% and 3% in 2007 and 2006, respectively.

I Fund – Proposed Structure

The chart below provides a schematic description of the vehicle structure proposed by BGI were the TSP to change the benchmark of the I Fund from the MSCI EAFE Index to the MSCI ACW ex-U.S. Index.

Chart 3



BGI currently offers a daily-valued fund benchmarked to the MSCI ACW ex-U.S. Index. As of November 30, 2008, this fund had one investor (a defined contribution plan) and total assets of approximately $72 million. BGI has proposed the creation of a separate custom fund for the TSP. Under the proposed structure, the I Fund's assets would be invested in a custom fund created by BGI, which would be benchmarked to the MSCI ACW ex-U.S. Index. We refer to this custom fund as the ACW ex-U.S. T Fund (note that we use this fund reference for discussion purposes in this report and does not represent the official fund name that BGI has proposed). The ACW ex-U.S. T Fund would hold units of the following funds in the proportion that they make up the MSCI ACW ex-U.S. Index.

Table 8

Fund	Benchmark	Approximate Allocation*
BGI MSCI EAFE E	MSCI EAFE Index	74.1%
BGI MSCI Canada A	MSCI Canada Index	7.4
BGI MSCI Emerging Markets A	MSCI Emerging Markets Index	18.5

**based on September 30, 2008 weights of the MSCI ACW ex-U.S. Index*

The I Fund is currently invested in the MSCI EAFE E Fund. This fund would account for approximately 75% of the I Fund should its mandate change. The MSCI EAFE E Fund is a daily-valued fund – meaning that the fund's net asset value (NAV) is struck daily and investors are allowed to transact in the fund on a daily basis. The MSCI Canada A Fund is a weekly valued fund and the MSCI Emerging Markets A fund is a bi-monthly valued fund. The MSCI Canada A Fund and the MSCI Emerging Markets A Fund had approximately $1.2 billion and $3.0 billion in assets, respectively. The MSCI Emerging Markets A Fund is managed in a modular basis. The fund holds units in 25 country funds in the proportion that these countries comprise the MSCI Emerging Markets Index. BGI manages approximately $7.0 billion in aggregate across these underlying country funds.

Since the TSP's I Fund is a daily-valued fund, BGI has proposed sourcing daily liquidity from the MSCI EAFE E Fund to meet TSP participants' daily transaction activity – meaning that the ACW ex-U.S. T Fund will transact units of the MSCI EAFE E Fund in order to meet daily liquidity. As such, all daily transaction activity at the MSCI EAFE E Fund level will have access to the same liquidity sources and crossing opportunities as described earlier in this report (under current structure).

At the ACW ex-U.S. T Fund level, BGI will buy and sell units in the MSCI Canada A Fund at its weekly opening date and the MSCI Emerging Markets A Fund at its bi-monthly opening date in a manner such that the allocation between the three components shown in the table above are consistent with benchmark weights. Transactions in both these funds will be eligible to unit and security level crossing opportunities as described earlier with respect to the MSCI EAFE E Fund. Over the two year period ending November 30, 2008, the unit crossing rate at the MSCI Emerging Markets A Fund was approximately 43% and at the MSCI Canada A Fund was approximately 55%.

Since BGI will transact only the MSCI EAFE component of the MSCI ACW ex-U.S. Index on a daily basis to provide liquidity, the allocations between the three components of the ACW ex-U.S. T Fund can vary relative to the weights of these components in the benchmark index. BGI has indicated that they would seek to maintain any misweights within 5% of the benchmark weights between rebalancing periods (weekly for the Canada component and bi-monthly for the Emerging Markets component).

At a 5% maximum misweight, BGI expects that the incremental predicted tracking error of the I Fund on an annualized basis will be 0.17 percentage points – i.e., the fund benchmarked to the MSCI ACW ex-U.S. Index is expected to experience an additional 0.17 percentage points of tracking error as compared to the fund benchmarked to the MSCI EAFE Index.

Further, BGI has indicated that if the misweights between the components exceed 5% of the benchmark weights, they will seek to rebalance the ACW ex-U.S. T Fund prior to the official liquidity date of the MSCI Canada A Fund or the MSCI Emerging Markets A Fund. This will be achieved through a special opening / liquidity date at these fund levels – meaning that the these funds will accept transactions from the ACW ex-U.S. T Fund outside of their official liquidity dates. Such transactions should ensure that weights between components of the ACW ex-U.S. T Fund remain closely in line with benchmark weights; however, between rebalancing dates, the actual allocations between the components in the ACW ex-U.S. T Fund will vary relative to the weight of the three components in the MSCI ACW ex-U.S. Index.

The Federal Employees' Retirement System Act of 1986 (FERSA), which governs the investment of the TSP's assets, references the following requirements with reference to the investment of the I Fund's assets.

Requirements relating to the investment of I Fund assets
Title 5 U.S.C. Sect. 8438 (b)(4)(B). The International Stock Index Investment Fund shall be invested in a portfolio designed to replicate the performance of the index in subparagraph (A). The portfolio shall be designed such that to the extent practicable, the percentage of the International Stock Index Investment Fund that is invested in each stock is the same as the percentage determined by dividing the aggregate market value of all shares of that stock by the aggregate market value of all stocks included in such index.

The language in the statute, specifically, the requirement that the percentage of the I Fund be invested in each stock in the same percentage that the stock comprises the index (to the extent practicable), appears to indicate that the intent is to maintain a fund that is replicated to the extent possible.

We believe that the construction methodology and the manner in which BGI will implement the I Fund will provide appropriate exposure to the MSCI ACW ex-U.S. Index over time at a reasonable level of tracking error. However, between rebalancing dates, we believe that the weight of the components of the I Fund will deviate from the weight of these components in the benchmark. This appears to be at odds with the intent of the statute.

Therefore, while we believe that there are merits to considering a move to a broader mandate for the I Fund, we do not recommend the move at this time. Our recommendation stems from the fact that construction methodology proposed by BGI will result in a fund that is not managed in accordance with the intent of the statute.

Further, we believe it remains appropriate for the TSP to continue to consider a move to a broader benchmark, if and when BGI is able to manage a daily-valued fund that is rebalanced on a daily basis to maintain benchmark-like exposure at all times at a reasonable level of tracking error.