



Combating Global Warming in Emerging Markets with Carbon Efficient Indices

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Abstract

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While substantial efforts are being made to combat global warming, one innovative technique enables investors to choose their investment profiles along carbon efficient lines. Standard & Poor's Indices launched the world's first carbon efficient index for emerging markets in December 2009 under the sponsorship of the International Finance Corporation (part of the World Bank Group). The idea is to allow investors to achieve market returns (as per a standard emerging market index) and yet lower their exposure to companies with large carbon footprints.

Large institutional investors use indices for passive replication as well as benchmarking and are tied to provide at a minimum market returns as per established indices. This approach can be a disincentive for investing along sustainable lines where returns can deviate frequently from established benchmarks.

This case study explores how the index is a tool to focus attention on the importance of carbon emission and its increasing importance to global investors. Widespread adoption of the index would provide an incentive for emerging market companies to improve carbon efficiency.

Combating Global Warming in Emerging Markets with Carbon Efficient Investing

With the 2012 expiration of the Kyoto Protocol on global warming looming large, emerging markets, which have begun to surpass the United States as some of the largest emitters of carbon (per the most recent available data released by U.S. Energy Department's Carbon Dioxide Information Analysis Center for 2007), are taking a central role in the debate over how to reduce emissions. As global attention turns to these countries, Standard & Poor's has designed an index that allows for reduced carbon emission exposure in investors' portfolios while it closely tracks the broad emerging-market returns.

According to the most recent numbers available, developed countries continue to lead the world in terms of per capita emissions; however, the largest emerging market countries are fast becoming the biggest carbon polluters, explaining why total global emissions have risen alarmingly in the last decade (Figure 1).

Emerging markets are polluting more for several reasons: Manufacturing services have moved increasingly to emerging markets, which has resulted in increases in carbon emissions in those locations; an increase in the worldwide demand for commodities has led to more exploitation of the natural resources in those emerging markets; and the rapid growth of emerging-market economies has led to population explosions in developing countries, along with an attendant demand for energy, materials, and infrastructure. It follows that carbon emissions have increased and the environment is an immediate casualty. While per capita emissions in these countries are still several notches below those in advanced economies, emerging markets are catching up fast, and their total emissions have already exceeded those in many developed markets.

Figure 1: Top 20 Carbon Emitting Countries in the World

Country	2007	2006	
	National emissions (thousands of tonnes of carbon)	National emissions (thousands of tonnes of carbon)	Emissions per person (tonnes of carbon)
CHINA (MAINLAND)	1,922,687	1,664,589	1.27
UNITED STATES OF AMERICA	1,547,460	1,568,806	5.18
INDIA	479,039	411,914	0.37
RUSSIAN FEDERATION	435,126	426,728	2.99
JAPAN	357,534	352,748	2.80
GERMANY	210,480	219,570	2.67
CANADA	153,659	148,549	4.55
UNITED KINGDOM	148,818	155,051	2.56
REPUBLIC OF KOREA	142,230	129,613	2.68
ISLAMIC REPUBLIC OF IRAN	133,961	127,357	1.81
ITALY (INCLUDING SAN MARINO)	125,015	129,313	2.19
MEXICO	124,450	118,950	1.13
SOUTH AFRICA	120,520	113,086	2.39
SAUDI ARABIA	119,374	104,063	4.38
BRAZIL	110,833	96,143	0.51
FRANCE (INCLUDING MONACO)	103,845	104,495	1.71
INDONESIA	99,648	90,950	0.41
AUSTRALIA	96,168	101,458	4.90
SPAIN	94,468	96,064	2.18
UKRAINE	84,448	87,043	1.86

Ranking of the world's countries by 2007 total CO² emissions from fossil fuel burning, cement production, and gas flaring. Emissions are expressed in thousand metric tons of carbon (not CO²).

Source: Tom Boden, Gregg Marland, and Bob Andres, Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory http://cdiac.ornl.gov/trends/emis/overview_2007.html

In our view, governments alone can't fight the battle against carbon emissions. The task is too large and the scope too wide. Thus we think that a public-private partnership is a must to make carbon reduction a reality. A process by which stock market mechanisms reward companies that are more carbon efficient can be an effective way to deliver the eco-conscious message to the private sector.

One popular approach so far has been to create equity indices and investment tools that focus on companies whose primary interest has been in producing clean technology and clean energy. This approach has its uses: It highlights the specific companies that are leading the charge in the green space and betting that consumers will reward them with increased revenues and earnings, which the market will reflect.

However, it is an inescapable fact that the need to achieve market returns dictates the flow of a large amount of institutional money. Niche investment strategies that cater to an audience of socially responsible investors haven't crossed over into the mainstream market, mostly because the relatively smaller size and liquidity of the 'clean' companies hampers huge investments. What is required, in our view, is a broad market strategy that can meet the dual objectives of replicating a broad market and rewarding carbon efficiency at the same time. Pension funds, sovereign funds, and other government bodies with large assets can make a difference if they support an agenda that promotes carbon efficiency and yet allows them to satisfy their responsibilities to achieve market returns at the same time.

S&P/IFCI Carbon Efficient Index Replicates the Risk Return Profile of the S&P/IFCI LargeMidCap

On the heels of the launch of the S&P U.S. Carbon Efficient Index in March 2009, Standard & Poor's, with the financial support of the International Finance Corporation (IFC), the private sector arm of the World Bank Group, began work in the area of emerging markets. The idea was to replicate the risk-return profile of the S&P/IFCI LargeMidCap Index for emerging markets, but with an emphasis on carbon emissions. The resulting S&P/IFCI Carbon Efficient Index, which launched on December 10, 2009, in Copenhagen, Denmark, closely tracks the investment performance of the parent index while the index constituents provide a 28% reduced exposure to carbon emissions.

Challenges in Working with Emerging Markets' Carbon Footprint Data

The S&P/IFCI Carbon Efficient Index, like its parent, includes 20 emerging markets and more than 800 stocks. Market weights within the index range from nearly 20% for countries like China and Brazil to less than 1% for Hungary and the Philippines. Frequently, smaller markets lack sectoral diversity, and a limited number of companies contribute nearly 100% of their emissions. Carbon footprints, as calculated by Trucost PLC, a company that provides comprehensive data on corporate environmental impacts, are naturally highest for companies in the utilities, energy, and materials sectors. A simple exclusion of these companies from an index provides a vast sector bias toward investing in financials and technology companies, an approach unacceptable to most investors. Carbon footprints differ greatly between emerging markets, and between sectors within the same emerging market (Figure 2). Such varying differences further increase the complexity of designing an emerging-market carbon efficiency index.

Figure 2: S&P/IFCI LargeMidCap Carbon Scores

Country	Average Carbon Score
Brazil	428.23
Chile	923.33
China	1,528.14
Czech Republic	1,089.82
Egypt	545.25
Hungary	372.64
India	1,768.75
Indonesia	1,308.13
Korea	353.75
Malaysia	921.79
Mexico	383.11
Morocco	39.05
Peru	367.71
Philippines	616.13
Poland	513.45
Russia	826.21
South Africa	683.23
Taiwan	361.70
Thailand	1,154.48
Turkey	424.56
Total	853.36

Sector	Min	Max	Range	Average
Consumer Discretionary	10.36	2,105.84	2,095.47	153.13
Consumer Staples	44.66	2,613.67	2,569.01	368.81
Energy	21.97	6,469.98	6,448.01	1,060.45
Financials	3.79	1,018.82	1,015.04	37.24
Health Care	55.78	715.56	659.79	162.92
Industrials	20.08	7,283.31	7,263.24	602.99
Information Technology	12.55	747.76	735.22	133.41
Materials	144.81	19,045.07	18,900.26	2,207.91
Telecommunication Services	10.59	827.42	816.83	46.10
Utilities	19.48	29,184.21	29,164.73	5,199.01
				853.36

Sources: S&P Indices and Trucost PLC.

How Reweighting Yields Reduce Carbon Exposure

Some market sector combinations are naturally conducive to applying some reweighting within the combination, while market sector combinations that have only few stocks or stocks that are all high polluters are difficult to reweight. To reweight within a sector, we rank stocks in terms of their carbon footprint using the same sectors as in the parent index.

Reweightings are possible if a market sector includes both high polluters and low polluters, where the market sector combination is responsible for a significant amount of carbon emissions and reweighting will result in real emission savings. As of the September 2010 rebalance, we have reweighted 21 market sectors out of the 136 in the S&P/IFCI LargeMidCap Index to yield a 28% saving in carbon emission exposure in the new portfolio (using Trucost PLC estimates). At all times, we kept the sector and country weights of the index at exactly the same proportions as the parent index. The reweighting is done annually to coincide with the annual rebalancing of the parent index. Based on a back-tested history of three years and nearly a year of actual performance, this methodology ensures a small tracking error with the parent index.

Statistical Results

More than three years of back-tested history and nearly a year of actual performance history since the launch give us some interesting results.

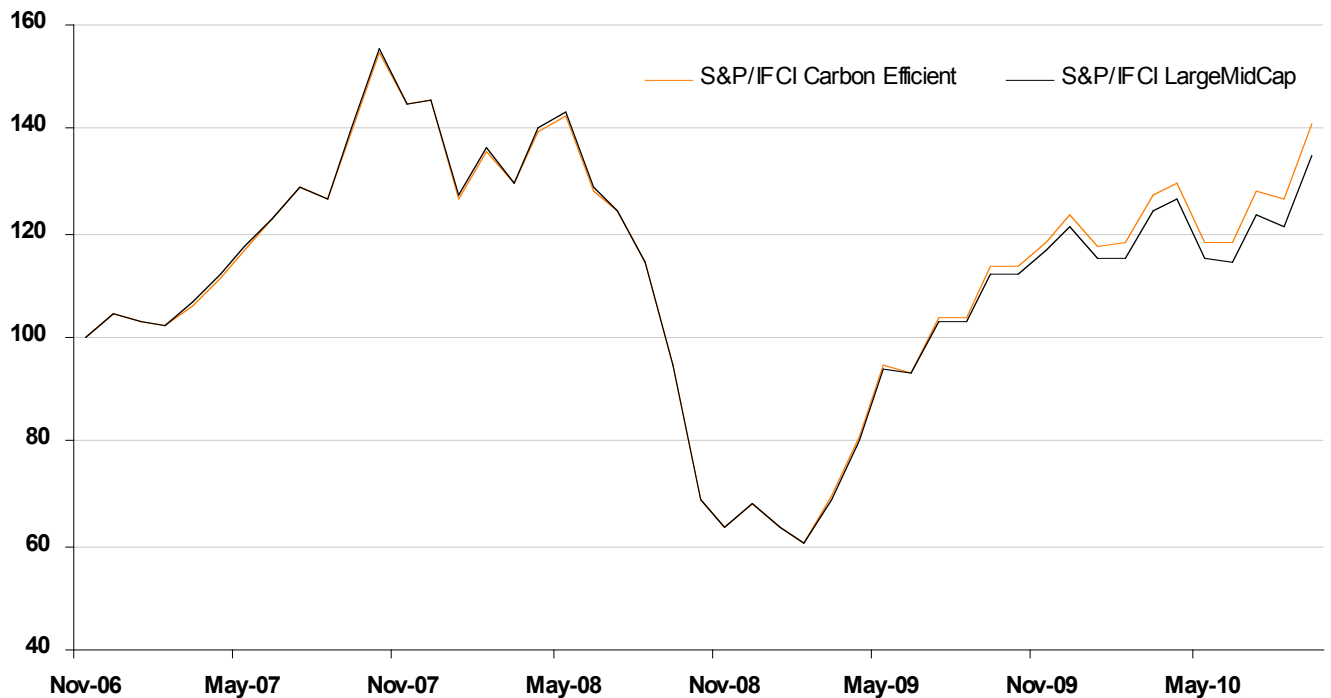
1. **A close tracking error.** The annualized tracking error of the S&P/IFCI Carbon Efficient Index to the S&P/IFCI LargeMidCap over nearly four years was a manageable 1.40% in the period from November 2006 to September 2010 (Figures 3 and 4). In each of the four calendar-year periods, the tracking error ranged from .99% in 2007 to 2.11% in 2008. In short, investing in the S&P/IFCI Carbon Efficient Index seems likely to ensure competitive emerging-market returns using a “greener” portfolio.

Figure 3: Annualized Tracking Error from Nov 2006 – Sep 2010

S&P/IFCI Carbon Efficient vs S&P/IFCI LargeMidCap	
Nov 2006 - Sep 2010	1.40%
2007	0.99%
2008	2.11%
2009	1.08%
2010 YTD	1.08%

Source: S&P Indices.

Figure 4: Index Performance Comparison (Nov. 2006 – Sep 2010)



Source: S&P Indices.

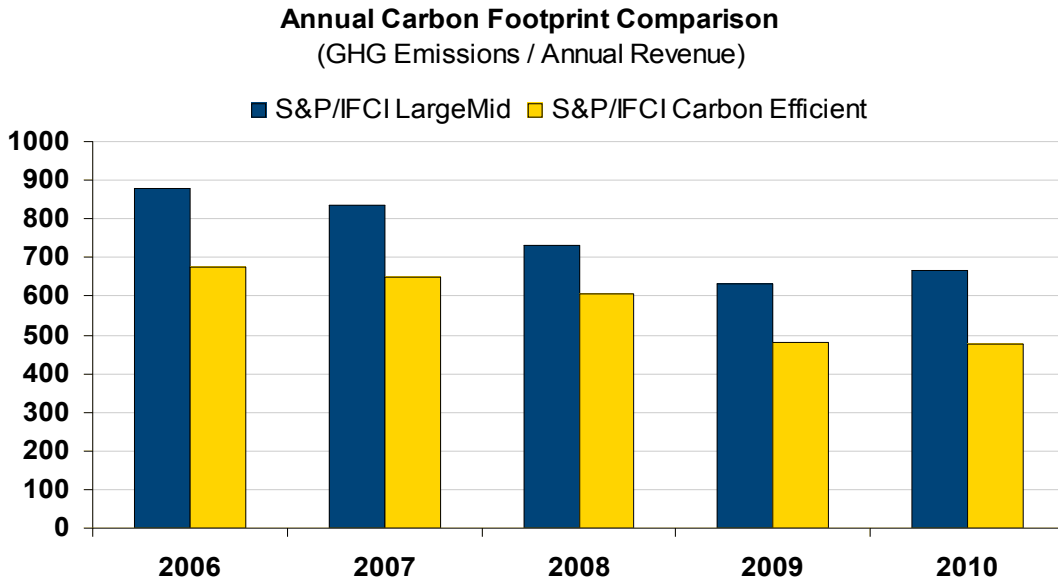
- 2. Reduced carbon emission exposure.** Over the five time periods – 2006, 2007, 2008, 2009 and 2010 – the average reduction in a portfolio’s exposure to carbon emissions using our new index was nearly 23% (using Trucost PLC estimates). In 2010, it was more than 28% (Figures 5 and 6).

Figure 5: Carbon Footprint of the Indices

Year	Carbon Footprint of the S&P/IFCI LargeMidCap	Carbon Footprint of the S&P/IFCI Carbon Efficient
2006	880.80	676.28
2007	833.57	651.00
2008	730.90	605.46
2009	633.87	480.44
2010	664.86	475.79

Source: S&P Indices.

Figure 6: Carbon Content



Source: S&P Indices.

- 3. Analysis of an index with deletions.** As an exercise to see what would happen if we designed an index without high carbon emitters, we created a pro forma index that deleted all stocks of companies we identified as high polluters but that had been included in the new S&P/IFCI Carbon Efficient Index with a lower weighting. We tested the performance of this hypothetical ‘clean’ version against the S&P/IFCI LargeMidCap Index. The investment performance tracking error in this case grew noticeably to 2.6% over three years (Figure 7). This is important because a large tracking error introduces uncertainty over time on expected returns and can be an issue for investors that make large commitments, such as pension funds and sovereign wealth funds.

Figure 7: Annualized Tracking Error from Nov 2006 – Dec 2009)

S&P/IFCI Clean* vs S&P/IFCI LargeMidCap	
Nov 2006 - Dec 2009	2.63%
2007	1.43%
2008	3.80%
2009	2.04%

* S&P/IFCI Clean is the name of the pro forma index, where we have actually deleted companies from the index that had very high carbon footprints. Source: S&P Indices.

Indices Can Drive Investor Attention to Carbon Efficiency

The S&P/IFCI Carbon Efficient Index is a benchmark that allows investors to track the performance of stocks in a broad-based emerging-market portfolio while reducing carbon emission exposure. The index has the same risk-return profile as the parent S&P/IFCI LargeMidCap Index. Eventually, we expect more investors will seek to reduce the carbon emission exposure of their portfolio while maintaining their risk- return profile. They should find that replicating one of the first such indices as a guide for greener investment strategies, which is what the S&P/IFCI Carbon Efficient Index attempts to do, is a useful investment strategy.

In order to have an impact on global warming, companies need to be motivated to perform better on the carbon efficiency scale. Indices bring attention to a specific theme, in this case, that of reducing the carbon footprint by investing in a low-carbon emission exposure portfolio, and thus giving investors the opportunity to achieve their goal of balancing environmental and financial factors. By highlighting this important issue and giving investors an option for selecting companies that recognize the importance of improving their carbon efficiency, indices provide an important role for the financial markets to play in the fight against global warming.

Biography

Alka Banerjee is vice president, global equities, at S&P Indices. Alka is responsible for the design and methodology governing Standard & Poor's global indices, focusing on creating new benchmarks for international equity markets and promoting their use amongst global clients.

Alka was closely involved with the transition of the premier IFC's Emerging Market Indices to Standard & Poor's in 2000, and the integration of the S&P/Citigroup Indices into the S&P Indices family in 2004. Alka's special areas of interest are global benchmarks, emerging markets, Islamic finance and environmental investing.

Prior to joining Standard & Poor's in 2000, Alka worked for The Bank of New York where she was responsible for the creation, maintenance, and marketing of The Bank of New York ADR Index. Before coming to the U.S., she worked in India for the State Bank of India for ten years.

Alka holds a master's degree in economics from Lucknow University in India and an MBA in finance from Pace University in New York