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ASSET MANAGEMENT

Next Generation EM Equities: Harnessing the Power of Thematic Drivers of Return

By

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Executive Summary

As the developed world continues to struggle with massive debt burdens and sluggish recovery, emerging markets (EM) have become more important than ever as the growth locomotive for the global economy and a core source of return for investors. Secular trends suggest that the role of EM in investment portfolios across all asset classes will only increase in significance as these economies continue to grow and mature. However, we argue that the traditional benchmark-centric approach to EM equity investing does not do justice to the high degree of differentiation that already exists across developing economies in terms of their stages of development and the macro drivers of stock market returns. Instead we think a new framework is required for next-generation EM equity investing that no longer treats EM as a monolithic bloc and allows investors to more precisely reflect their secular views in an efficient way. We suggest reconfiguring the opportunity set within the MSCI EM Index according to long-term macroeconomic themes that are likely to drive equity performance, and we demonstrate how these thematic portfolios can outperform the standard capitalization-weighted market benchmark.

We focused on four broad themes that are key to growth in the emerging world: Consumption, Commodities, Manufacturing and Investment. Constructing portfolios consisting of industries likely to benefit from those themes, we showed how each of the thematic portfolios would have outperformed the MSCI EM Index at different times over the past 10 years and demonstrated, based on our valuation analysis, how the Commodities and Investment portfolios have the potential to outperform the index over the rest of this decade. We also examined how the portfolios behaved across different market and macroeconomic conditions and incorporated relative valuation measures to refine our understanding of their risk and return profiles. We established that the Commodities and Manufacturing portfolios behave in a procyclical fashion while the Investment portfolio, which is often linked to government spending, is comparatively countercyclical. Focusing on themes also helped us think more intelligently about valuations. For example, while the Consumption theme has always traded at a valuation premium to the index, current valuations are high even relative to that elevated average. As such, we believe investors in consumption-related stocks should proceed cautiously as they are part of a crowded field.

1 The BNY Mellon Investment Strategy and Solutions Group ("ISSG") is part of The Bank of New York Mellon ("Bank"). In the U.S. ISSG offers products and services through the Bank, including investment strategies that are developed by affiliated BNY Mellon Asset Management investment advisory firms and managed by officers of such affiliated firms acting in their capacities as dual officers of the Bank.

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We developed this thematic approach as a means to more precisely express macroeconomic views about EM without diluting them through an index, country or regional strategy.

In addition to demonstrating better performance potential, our thematic analysis debunked some preconceived notions about investing in EM. For example, relatively little of China's stock market is represented in the Manufacturing portfolio, despite the country's long-held reputation as factory to the world. That is because much of China's manufacturing capacity is in the hands of the government or is privately owned, a reminder that public equity investors invest in stocks, not countries.

We developed this thematic approach as a means to more precisely express macroeconomic views about EM without diluting them through an index, country or regional strategy. In the same way developed world equities have been subdivided into specialty categories, we believe a focused approach can help EM equity investors better capture investment opportunities created by secular trends now and in the future. As emerging markets continue to evolve and ultimately converge with developed markets, we think it will become increasingly important for investors to be more attuned to specific drivers of risk and return across this highly differentiated investment universe. Relative to regional, country, or even security-specific allocations, we believe our thematic approach provides investors with greater flexibility and precision to capture those opportunities without unnecessary complexity. A thematic framework can not only help investors understand the biases they already have in their current allocations, but also guide them in how to think on a longer-term basis about a more complex and multi-dimensional asset class.

Not Your Father's EM

Emerging markets have come a long way since the days when they were regarded as an exotic "niche" asset class, in both their contribution to world gross domestic product (GDP) and global stock market capitalization. Today the BRICs constitute four out of the ten largest economies in the world and are forecast to constitute half of the world's GDP by 2020.[2] As of December 2011, EM equities comprise 29% of global stock market capitalization, compared with only 11% in 1996.[3]

But within those aggregate numbers, there is a high degree of differentiation in how individual countries have evolved and in the macro forces central to their growth. The composition of their economies varies because they are at different stages of development with varying degrees of economic and political risks, different demographic profiles and diverse endowments of resources. As a result, the sector compositions of their stock markets as well as the drivers of their stock market returns are different. Allocations solely to a broad EM index mask this differentiation, and make it difficult for investors to target their capital to specific investment hypotheses.

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2 Goldman Sachs forecast in "The New BRICS on the Block: Which Emerging Markets Are Up and Coming?" Knowledge @ Wharton, January 19, 2011.

3 World Federation of Exchanges, as of December 31, 2011. Burton G. Malkiel and J.P. Mei, *Global Bargain Hunting: The Investors' Guide to Profits in Emerging Markets* (New York: Simon & Schuster, 1998), p. 23.

We believe these four themes offer sufficient breadth for investors to express their views on the drivers of emerging market returns, but not a level of complexity that would be required to have a view on individual countries, industries or sectors.

As part of a broader shift towards better appreciation of the macro forces driving capital market returns, we think it makes sense for investors to better harness the power of this growing EM differentiation by allocating to thematic portfolios consisting of companies in industries that are most likely to benefit from those themes. For students of emerging markets, it is not difficult to identify the major long-term themes tied to economic growth and equity performance:

- Consumption: Producers of products and services primarily targeting domestic consumers. Includes industries such as: Hotels, Media, Household Products, Pharmaceuticals and Tobacco, likely to benefit from growth in the size and income of the middle class in the emerging markets.
- Investment: Providers of non-consumer products and services for the domestic economy. Includes industries such as: Banks, Electric Utilities, Airlines and Infrastructure, likely to benefit from increasing emerging market urbanization and industrialization.
- Commodities: Producers and exporters of commodities. Includes industries such as: Oil & Gas, Chemicals and Metals & Mining, likely benefit from the rising demand for commodities.
- Manufacturing: Producers of goods and services for the world market. Includes industries such as: Machinery, Computer & Peripherals, Office Electronics, Semiconductors and Leisure Equipment, likely to benefit as manufacturing continues to shift to developing markets, and as global demand for manufactured goods and services continues to grow.

We believe these four themes offer sufficient breadth for investors to express their views on the drivers of emerging market returns, but not a level of complexity that would be required to have a view on individual countries, industries or sectors. When investors purchase Brazilian or Russian stocks, their primary objective is not exposure to Brazil or Russia *per se,* but rather to stock markets that will benefit from the world's hunger for commodities. Similarly, investments in Korean and Taiwanese stocks are often tied to the countries' strong manufacturing bases. By contrast, most investors' views are not sufficiently granular to require investing at the sector or industry level. For example, they may have a view on the growth of consumer spending in emerging markets, but they are unlikely to have a view on clothing versus food retailers. Investors bullish on commodities may not have differentiated views on energy versus mining stocks.

Same Universe, New Lens: Constructing Thematic Portfolios

To construct the thematic portfolios, we reconfigured the MSCI EM universe by mapping the Global Industry Classification Standard (GICS) industry groupings to our four themes.[4] For example the Commodities thematic portfolio consists of seven industries: Energy Equipment and Services,

4 The industries and sectors are defined by the Global Industry Classification Standard (GICS) developed by MSCI and Standard & Poor's. It is a widely accepted industry analysis framework for investment research, portfolio management and asset allocation. The GICS structure includes 64 industries mapped into 10 sectors.

After refining the mapping of sectors and industries to themes, we constructed the portfolios by weighting their constituent industries according to their market capitalizations.

Oil and Gas, Chemicals, Containers and Packaging, Metals in Mining, Paper and Forest Products, and Food Products (see the appendix for the other industry mappings). We used the stocks' industry classifications rather than assigning countries to themes based on the composition of their GDP, because the structure of a country's stock market can be very different from the composition of its economy. For example, a major portion of China's GDP comes from exporting manufactured goods, but most of its manufacturing capacity is state-owned or otherwise unlisted. As a result, China's stock market has a relatively small representation in the Manufacturing portfolio. After refining the mapping of sectors and industries to themes, we constructed the portfolios by weighting their constituent industries according to their market capitalizations.[5]

To appreciate how the EM universe looks through our thematic lens, we summarize the country weights in Exhibit 1. This overview reveals a number of counterintuitive compositions that reinforce the notion of investing in public stock markets rather than countries' economies. For example, we can see the relatively large weighting of the Chinese stock market in the Investment and Commodities portfolios as well as its surprisingly small representation in the Manufacturing portfolio. While China's substantial representation in the Commodities portfolio may seem high considering it is a major importer of commodities, some of China's largest listed companies are related to commodities: PetroChina Company, China Petroleum and Chemical Corporation (Sinopec Group), and China National Offshore Oil Corporation (CNOOC).

The summary table also highlights the high exposure of most of the countries and regions to the Investment portfolio. Digging deeper, we find that Banks, Utilities and Construction companies are often among the largest publicly traded stocks. This disproportionately large representation in developing stock markets is not surprising, since those industries require large amounts of capital and exhibit significant economies of scale. In fact, the stock markets of the Czech Republic, Egypt and Morocco are 100% exposed to the Investment theme. All three have relatively few publicly traded stocks mostly confined to industries such as banking, telecoms, utilities, and construction and engineering.

5 It is important to highlight that the GICS sectors did not always map neatly into a single theme. For example, the Industrials sector was split between the Manufacturing and Investment portfolios, with the more internally focused industries such as Construction and Engineering assigned to the Investment portfolio. The Construction Materials industry was assigned to the Investment portfolio, while all of the other industries in the Materials sector were assigned to Commodities. While the returns of commodity companies' stocks are determined in large part by global commodity prices, demand for construction materials is primarily driven by local investment. We also assigned the Food Products industry to the Commodities portfolio rather than the Consumption portfolio, because the correlation of the Food Products industry was much higher with other industries in the Commodities theme. This made intuitive sense because food prices, and by extension the investment returns of food product companies, are more affected by global rather than local demand.

Looking at the country composition of the Manufacturing portfolio, we can see the heavy country concentration of Korea (42%) and Taiwan (33%), which highlights the necessity of monitoring country risk in some of the more concentrated thematic portfolios. Overall 94% of the Manufacturing portfolio consists of Asian stocks. The Consumption and Commodities portfolios are far less concentrated.

Exhibit 1 – Thematic Exposures by Country

(The values for the three countries with the largest exposures in each category are highlighted)

	Thematic Exposure of Country				Country Weight in Thematic Portfolio				
	Commodities	Manufacturing	Consumption	Investment	MSCI EM Index	Commodities	Manufacturing	Consumption	Investment
China	25%	11%	7%	57%	*18%*	*16%*	*10%*	10%	*25%*
Korea	16%	*54%*	8%	22%	*15%*	9%	*42%*	10%	*8%*
Taiwan	16%	*58%*	2%	25%	11%	6%	*33%*	2%	7%
India	19%	9%	*33%*	39%	6%	4%	3%	*17%*	6%
Malaysia	17%	9%	13%	62%	4%	2%	2%	4%	5%
Indonesia	17%	*22%*	9%	52%	3%	2%	3%	2%	4%
Thailand	44%	0%	8%	48%	2%	3%	0%	1%	2%
Philippines	4%	22%	9%	66%	1%	0%	1%	1%	1%
Total: Asia	**20%**	**31%**	**9%**	**40%**	**60%**	**42%**	**94%**	**47%**	**59%**
Brazil	*45%*	3%	14%	38%	*15%*	*24%*	2%	*18%*	*14%*
Mexico	16%	3%	*40%*	41%	5%	3%	1%	*16%*	5%
Chile	21%	11%	18%	51%	2%	1%	1%	3%	2%
Colombia	28%	0%	8%	63%	1%	1%	0%	1%	2%
Peru	*66%*	0%	0%	34%	0%	2%	0%	0%	0%
Total: Lat Am	**36%**	**3%**	**19%**	**41%**	**23%**	**30%**	**4%**	**37%**	**23%**
South Africa	36%	5%	19%	40%	8%	10%	2%	13%	8%
Russia	*72%*	0%	2%	26%	6%	*16%*	0%	1%	5%
Poland	29%	0%	5%	66%	1%	1%	0%	1%	2%
Turkey	10%	11%	14%	65%	1%	0%	1%	1%	2%
Czech Republic	0%	0%	0%	*100%*	0%	0%	0%	0%	1%
Egypt	0%	0%	0%	*100%*	0%	0%	0%	0%	1%
Hungary	33%	0%	*22%*	46%	0%	0%	0%	1%	0%
Morocco	0%	0%	0%	*100%*	0%	0%	0%	0%	0%
Total: EMEA	**43%**	**3%**	**11%**	**42%**	**17%**	**28%**	**3%**	**17%**	**19%**
Total: EM	**28%**	**20%**	**12%**	**40%**	**100%**	**100%**	**100%**	**100%**	**100%**
Asian Tigers & Cubs	17%	44%	7%	32%	36%	22%	80%	19%	27%
Cap Wt BRICs	38%	7%	9%	46%	41%	57%	16%	31%	48%
Eq Wt BRICs	40%	6%	14%	40%					
S&P 500	18%	21%	37%	24%					

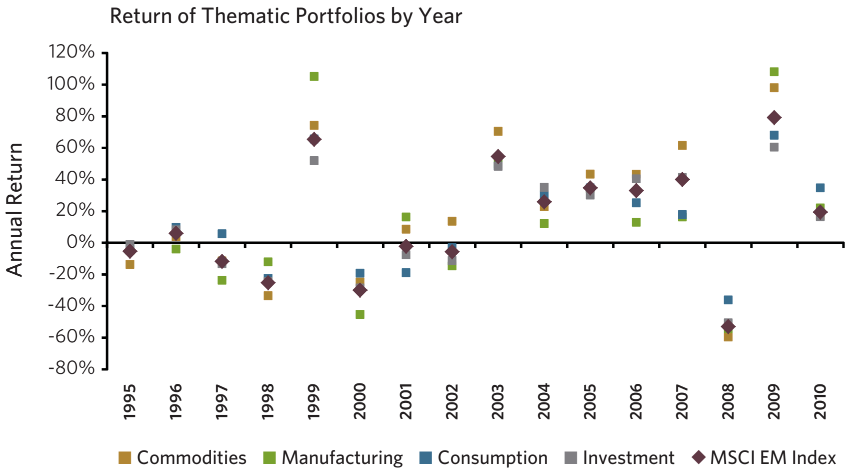
Source: MSCI, Datastream, ISSG, as of December 2011. Due to rounding, not all country weights sum to 100 and some rankings are based on levels of precision not shown in the rounded numbers. The Asian Tigers & Cubs include Indonesia South Korea, Malaysia, Philippines, Taiwan and Thailand.

Themes Matter: Outperformance and Cycles of Returns

The wide dispersion of returns across the thematic portfolios provides vivid evidence that themes matter.

The wide dispersion of returns across the thematic portfolios provides vivid evidence that themes matter (Exhibit 2). The dispersion of annual returns for the years 1995 to 2010 demonstrates that the thematic portfolios tended to be driven by different factors. Dispersion was highest in 1999, during the global bull market, as emerging markets were recovering from the Asian and Russian crises, while developed countries were experiencing the "irrational exuberance" of the Internet boom. That year the Manufacturing portfolio was up by 105% because it had the highest beta (or volatility vis a vis the index, see Exhibit 5) and high growth expectations. On the other hand, the Investment portfolio was not as affected by those drivers and was up only 52%. The lowest dispersion between the thematic portfolios' annual returns occurred in 2005, when it was only 13%. While it was a good year to own emerging market stocks, the underlying environment did not result in much divergence across themes. Between 1995 and 2010, the average annual dispersion was 28%.

Exhibit 2 – Dispersion of Thematic Portfolio Returns vs MSCI EM Index



Dispersion is defined as the difference between highest and lowest thematic portfolio returns. There are always five data points for each year. The issue is that in some years, the returns of some of the portfolios were so close that some of the points overlap or are obscured.

Source: Datastream, MSCI, ISSG. Data are from December 31, 1994 to December 31, 2011.

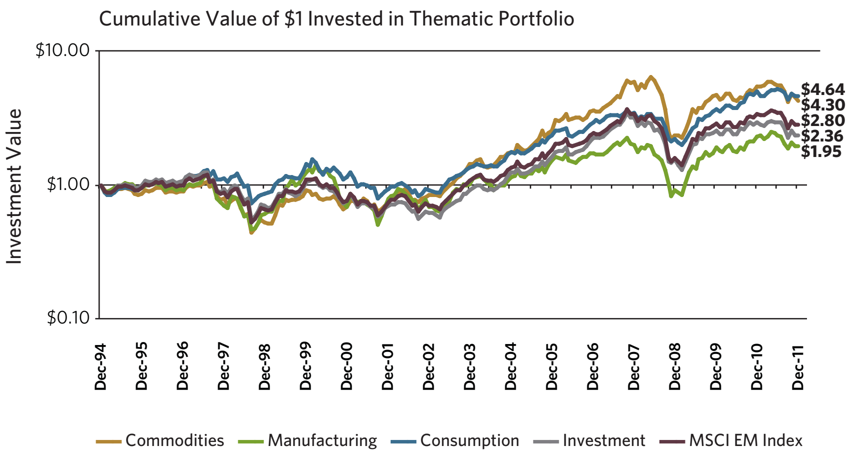
We also looked at the cumulative performance of the thematic portfolios and the MSCI EM Index during the same time period and found that the thematic portfolios outperformed the index at different times. Exhibit 3 shows cumulative returns, and Exhibit 4 shows the cumulative return of each thematic portfolio relative to the MSCI EM Index. Over the full period, the Commodities and Consumption portfolios had much higher cumulative returns than the other two themes. However, we believe it is more important to understand the differences in performance over shorter cycles and to tease out the market and macro drivers of those differences. From October 1998 to

The Consumption portfolio outperformed between November 2007 and the end of 2011 as investors sought exposure to companies aligned with the long-term potential of growing consumption among the developing world's burgeoning middle classes, especially as consumption in the developed world was plummeting.

March 2000, Manufacturing outperformed, as stocks of Asian manufacturers rallied from depressed levels caused by the Asian crisis of 1998. During the 19-month period, the cumulative return of Manufacturing was 201%, exceeding the returns of the other three thematic portfolios by around 100%.[6]

Commodities outperformed from October 2001 to May 2008. A dollar invested in the Commodities portfolio on October 1, 2001, would have grown to $10.19 by the end of May 2008, compared with $5.68 for the EM index; $4.93 for Investment; $4.33 for Consumption; and only $3.89 for Manufacturing. This dramatic outperformance by the Commodities portfolio was caused by both earnings growth and expansion of the P/E multiple. A major driver was China's massive appetite for commodities during this period, both to support its internal growth, and to build infrastructure in preparation for hosting the 2008 Olympic Games. During this period, the UBS Dow Jones Commodity Index increased by 169%: its energy section by 182%, and industrial metals section by a spectacular 329%.[7] The Consumption portfolio outperformed between November 2007 and the end of 2011 as investors sought exposure to companies aligned with the long-term potential of growing consumption among the developing world's burgeoning middle classes, especially as consumption in the developed world was plummeting.

Exhibit 3 – Cumulative Growth of $1 in Thematic Portfolios and the MSCI EM Index



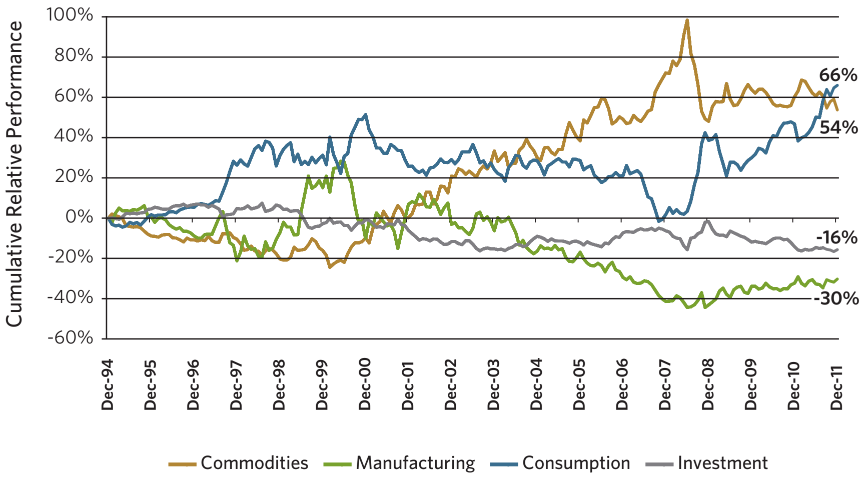
Source: Datastream, MSCI, ISSG. Data are from December 31, 1994 to December 31, 2011.

6 Cumulative returns of the MSCI EM Index were 113%; Consumption 103%; Investment 101%; and Commodities 97%.

7 Datastream, MSCI. Data are for October 1, 2001 to May 31, 2008.

Not surprisingly, because it is the theme that is most closely tied to global growth, Manufacturing had the highest beta.

Exhibit 4 – Cumulative Relative Return of the Thematic Portfolios relative to the MSCI EM Index



Source: Datastream, MSCI, ISSG. Data are from December 31, 1994 to December 31, 2011.

Analyzing Risks and Correlations in the Thematic Portfolios

We also analyzed the thematic portfolios' risk characteristics (Exhibit 5) and correlations (Exhibit 6). Not surprisingly, because it is the theme that is most closely tied to global growth, Manufacturing had the highest beta. It also had the highest tracking error, since just two countries, Taiwan and Korea, account for 75% of its capitalization. Despite high growth expectations and trading at higher-than-market multiples, Consumption had the lowest beta. Investment had the lowest tracking error, since the portfolio tends to be well diversified and the performance of banks, utilities and transportation companies are more linked to the overall economy than most other industries.

Exhibit 5 – Ex-Post Risk Characteristics of Thematic Portfolios

Themes	Risk	Beta vs. MSCI EM Index	Tracking Error
Commodities	27.3%	1.04	9.6%
Manufacturing	29.4%	1.05	14.0%
Consumption	21.5%	0.80	9.8%
Investment	25.0%	0.99	4.9%
MSCI EM Index	24.7%	1.00	0.0%

Source: Datastream, MSCI, MSCI Barra. Data are from December 31, 1994 to December 31, 2011.

The correlations of total returns are relatively high across the portfolios and the index, because most of the portfolios' risk comes from their common exposure to the broad stock market (Exhibit 6). By way of comparison, the correlation between the S&P 500 and MSCI EAFE for the same period was 0.83.[8] On the other hand, the correlations of market-adjusted returns are low or negative, which confirms that the non-market drivers of the portfolios' performance are different. Once we adjust for their common correlation with the market, the Consumption portfolio tended to be uncorrelated with the other themes. On the other hand, the excess return correlations among the Commodities, Manufacturing and Investment portfolios tended to be negative, reflecting the effect of the market rotating through the various themes.

Exhibit 6 – Historical Correlations of Thematic Portfolios' Return

	Total Returns				
	Commodities	Manufacturing	Consumption	Investment	MSCI EM
Commodities	1.00				
Manufacturing	0.76	1.00			
Consumption	0.81	0.76	1.00		
Investment	0.89	0.82	0.92	1.00	
MSCI EM Index	0.94	0.88	0.92	0.98	1.00
	Excess Returns				
	Commodities	Manufacturing	Consumption	Investment	
Commodities	1.00				
Manufacturing	-0.40	1.00			
Consumption	-0.38	-0.25	1.00		
Investment	-0.48	-0.45	0.22	1.00	

Source: Datastream, Matlab, MSCI, MSCI Barra. Data are from December 31, 1994 to December 31, 2011.

Understanding the Macroeconomic and Market Drivers of Thematic Portfolio Returns

To analyze the major drivers of the portfolios' returns, we looked at their sensitivity to macroeconomic and market variables (Exhibit 7). The first pair of columns in Exhibit 7 shows the relationship between the thematic portfolio returns in one year and EM GDP growth for the following year. The analysis relates stock market performance in one year to the state of the economy the following year. Not surprisingly, higher EM GDP growth was associated with higher returns for all four thematic portfolios. However, high growth benefited the Commodities portfolio most and the Consumption portfolio least. These results are consistent with the market betas of the portfolios: the Commodities portfolio had the highest beta and was the most sensitive to growth surprises; while the Consumption portfolio had the lowest beta, and was least sensitive to GDP growth. The sensitivities to EM export growth tell a similar story. All of the

8 ISSG calculation based on return data obtained from Datastream.

portfolios rose when exports were expected to grow (in excess of the growth that would be expected from concurrent GDP growth). Since manufacturing is export-driven, it should not be surprising that the Manufacturing portfolio performed best. The Investment portfolio showed the smallest benefit, partly because investment is internally oriented and therefore does not benefit directly from increased exports. A second and more subtle explanation is that much of investment is government-driven, and countercyclical government spending is lowest during periods of strong growth when exports are highest. Extending that argument to the sensitivities of the thematic portfolio returns to EM government spending growth, it is not surprising that all are negative, and that the relative sensitivities are the reverse of the sensitivities to EM export growth.

Exhibit 7 – Macroeconomic Effects on Thematic Portfolio Returns

Historical sensitivity of the portfolios to a 1% increase in the macro variable:

	EM GDP Growth		EM Inflation		EM Household Consumption Growth		EM Exports Growth		EM Government Spending	
	Total Return	Difference from Index	Total Return	Difference from Index	Total Return	Difference from Index	Total Return	Difference from Index	Total Return	Difference from Index
MSCI EM Index	14.4%		-2.7%		1.7%		3.9%		-7.5%	
Commodities	16.7%	2.2%	-3.9%	-1.3%	-1.4%	-3.1%	4.2%	0.3%	-10.0%	-2.5%
Manufacturing	15.8%	1.4%	-2.7%	-0.1%	4.7%	3.0%	5.3%	1.4%	-10.1%	-2.6%
Consumption	11.0%	-3.4%	-2.0%	0.7%	1.2%	-0.5%	3.7%	-0.2%	-6.5%	1.0%
Investment	13.8%	-0.7%	-2.3%	0.4%	2.8%	1.1%	3.1%	-0.8%	-5.3%	2.2%

Color Key: Highest | 2nd Highest | 3rd Highest | Lowest

Source: Bloomberg, Datastream, MSCI, World Bank. Annual data are from 1995 to 2010. See Appendix for specific sources for each variable. The analysis relates stock market performance in one year to the state of the economy the following year. Sensitivities of EM Household Consumption Growth, EM Exports Growth and EM Government Spending Growth, three components of GDP, are adjusted for next year's GDP growth..

We also looked at the relationship between the thematic portfolio returns and market variables (Exhibit 8). The statistics for their sensitivity to S&P 500 returns are similar to the betas estimated in the risk analysis section. Since EM currencies are also viewed as a "risk-on" trade, it's not surprising that the four themes also benefitted when EM currencies rose against the U.S. dollar. The coefficient of 4.2% for the index demonstrates that there are multiple forces that influence the aggregate effect of currency appreciation on stock prices. First, the appreciation of foreign currencies translates directly into higher stock prices when measured in U.S. dollars (expected coefficient of 1.0). Second, the capital flows that cause EM currencies to appreciate will likely also flow into EM stocks causing their prices to rise. Lastly, corporate earnings, and hence stock returns, can be negatively affected if the currency appreciation makes the companies' products less competitive. The Commodities portfolio benefited most from rising EM currencies, which makes sense because currency appreciation would not affect their competitive position. We also think of commodities as a "risk-on" trade, and EM stocks are linked to commodity prices, so it was expected that rising commodity prices were associated with rising EM stock prices for all themes. Not surprisingly, the Commodities portfolio had the highest sensitivity, returning 1.2% for every 1% increase in commodity prices. Not all market environments are favorable for EM stocks. Higher interest rates, both on sovereign debt and lending, were associated with poor stock market performance. Manufacturing was least sensitive to high rates. Because it is primarily externally oriented, it should be less sensitive to local interest rates.

Exhibit 8 – Market-Related Drivers of Return for Thematic Portfolios

Historical sensitivity of the portfolios to a 1% increase in the macro variable:

	S&P 500 Index Price		EM Currency Basket Appreciation vs. USD		Price of Commodities		Bond Yields		EM Lending Rates	
	Total Return	Difference from Index	Total Return	Difference from Index	Total Return	Difference from Index	Total Return	Difference from Index	Total Return	Difference from Index
MSCI EM Index	0.8%		4.2%		1.0%		-6.2%		-2.2%	
Commodities	0.7%	-0.1%	4.9%	0.7%	1.2%	0.2%	-7.1%	-0.9%	-2.9%	-0.7%
Manufacturing	1.0%	0.1%	4.5%	0.3%	0.9%	-0.1%	-3.3%	2.9%	-1.2%	1.0%
Consumption	0.8%	0.0%	3.0%	-1.2%	0.9%	-0.1%	-5.4%	0.8%	-1.7%	0.5%
Investment	0.8%	0.0%	4.1%	-0.1%	0.9%	-0.1%	-6.5%	-0.4%	-2.2%	0.0%
	Color Key:	Highest		2nd Highest		3rd Highest		Lowest		

Source: Bloomberg, Datastream, Dow Jones UBS, J.P. Morgan, MSCI, Standard & Poor's, The Federal Reserve Board, World Bank. Annual data is from 1995 to 2010. See Appendix for specific sources for each variable.

Bringing It Together: Relative Valuations and Future Outperformance

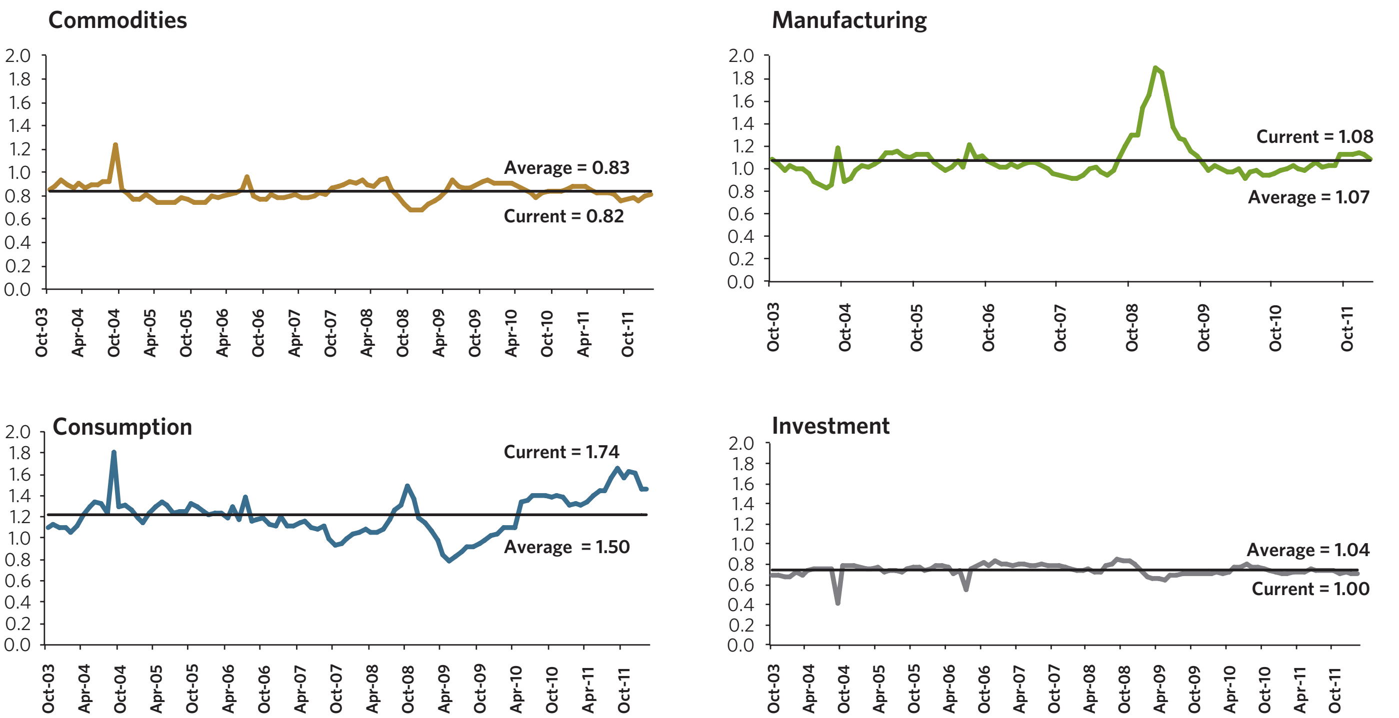
In order to develop a view on which themes are most attractively priced, we examined a traditional relative price-to-earnings ratio measure, as well as a richer model of fair earnings yields.[9] Looking at the series of relative price-to-earnings (P/E) ratios for each of the thematic portfolios,[10] we see that over the long term the Consumption portfolio has consistently traded at a premium P/E (Exhibit 9). That is consistent with investors expecting Consumption-related stocks to have higher growth rates. Conversely, the Commodities portfolio consistently traded at a discount. Despite the Consumption portfolio historically trading at a premium, its current P/E still looks expensive from a relative P/E perspective. Historically its P/E has averaged 1.5 times that of the EM index, but it is currently trading at 1.74 times. We think there are two explanations for that. The Consumption portfolio is expensive because investors have been bidding

9 See the appendix for the discussion of the panel regression analysis used to estimate the fair earnings yields.

10 Relative P/E equals the price earnings ratio of the thematic portfolio divided by that of the MSCI EM Index. They were calculated using forecasts of 12-month ahead earnings.

up the price of Consumption-related stocks beyond fair value, as they chase the relatively small number of stocks that participate in the theme. Alternatively, the Consumption portfolio is fairly priced, because the EM middle class will grow fast enough, resulting in the stocks' relative growth prospects being high enough to justify an even higher-than-usual relative P/E. The other three themes are trading close to their long-term average relative P/E ratios. We should note that the spike in the relative P/E of the Manufacturing portfolio during the global financial crisis was due more to depressed earnings rather than high prices.[11]

Exhibit 9 – Relative Forward 12-Month Price-to-Earnings Ratios for Thematic Portfolios



Source: Datastream, MSCI. Data are from October 30, 2003 to February 29, 2012. P/E valuations are relative to MSCI EM Index.

Using historical averages to determine fair relative P/E ratios implicitly assumes that the ratios should revert back to their long-term averages. However, there are valid reasons for the ratios to differ through time and across countries. For example, stocks with higher expected growth rates should trade at higher P/E ratios than other stocks. As a result, valuation "mispricing" on a relative P/E basis can persist for extended periods. To compensate, we used a panel regression to model fair earnings yields (the panel regression analysis is described in detail

11 Our analysis using relative price-to-book ratios produced results similar to the relative P/E analysis for all four thematic portfolios.

in the appendix). We used output from the panel regression to identify which thematic portfolios are cheap or expensive from an earnings yield point of view (Exhibit 10). The numbers in the first row of the table are the percentage difference between the earnings yields on 12/31/2011 and their fair value.[12] The results suggest that relative to the sample in the panel regression, the Commodities portfolio is 9.5% undervalued. Importantly, the analysis also suggests that the MSCI EM Index is 4.6% undervalued. Because we are more concerned with the relative valuations of the thematic portfolios than their absolute valuations, the bottom row in the table adjusts the mispricings for the average mispricing of the index. Relative to the broad EM market, the Commodities portfolio is undervalued by 5%, and the Consumption portfolio is overvalued by 5.8%. The Consumption portfolio overvaluation is consistent with the relative P/E-based analysis.

Exhibit 10 – Mispricing of Theme Valuations — Fair Earnings Yield Versus Current Earnings Yield

	Commodities	Manufacturing	Consumption	Investment	MSCI EM Index
Mispricing (Negative implies overvalued)	**9.5%**	**-1.2%**	**-1.3%**	**5.7%**	**4.6%**
Relative to MSCI EM Index	**5.0%**	**-5.7%**	**-5.8%**	**1.2%**	**0%**

Source: MSCI, ISSG, as of December 31, 2011.

Since the relative P/E and fair earnings yield analyses are relatively short term, we thought it would be of interest to calculate long-term (2012 – 2020) expected returns. Our model states that expected returns can be estimated as the sum of the dividend yield plus earnings growth. Because our earlier analysis suggested that some of the thematic portfolios are mispriced, we added a repricing term to the formula.[13] The impact of repricing was derived by assuming that earnings yields would revert to their fair value by 2020 (Exhibit 11 shows the model output). The model identified the Commodities and Investment portfolios as having higher-than-average expected returns. When we subtract the expected return of the MSCI EM Index, we see that the Commodities portfolio is expected to outperform the index by 1.08% per annum. That is a result of higher dividend yield, faster growth, and being positively mispriced. Conversely, the Consumption portfolio's expected return is 1.4% below that of the index. It is a result of lower dividend yield, slightly slower growth, and being negatively mispriced. What is interesting is that while investors seem to be favoring Consumption-related stocks because of an

12 Fair values are based on each country's characteristics and the coefficients from the panel regression. The thematic portfolio values are equal to the country earnings yields times the weight of the country in the thematic portfolio.

13 See the appendix for more details on how we used a supply model to estimate expected returns for the thematic portfolios to 2020.

expectation of higher growth potential, the growth rates are not apparent through our analysis. As a result, the Consumption portfolio looks to be expensive. According to this model, the growth of the Consumption portfolio would need to rise by 1.5% relative to the other themes for it to be fairly priced.

Exhibit 11 – 2012 — 2020 Expected Annualized Holding Period Returns

	Expected Equity Returns				
	Commodities	Manufacturing	Consumption	Investment	MSCI EM Index
Current Dividend Yield	3.1%	2.8%	2.5%	3.1%	3.0%
Forecast Earnings Growth Rate	10.1%	9.3%	9.6%	9.9%	9.8%
Repricing	0.8%	-0.7%	-0.5%	0.5%	0.2%
Total Return	14.0%	11.5%	11.6%	13.5%	13.0%
Alpha	1.0%	-1.5%	-1.4%	0.5%	0%

Source: Bloomberg, Consensus Economics, Datastream, MSCI, World Bank. Data is from December 31, 1994 to February 29, 2012.

Harnessing the Power of Thematic Drivers of Return

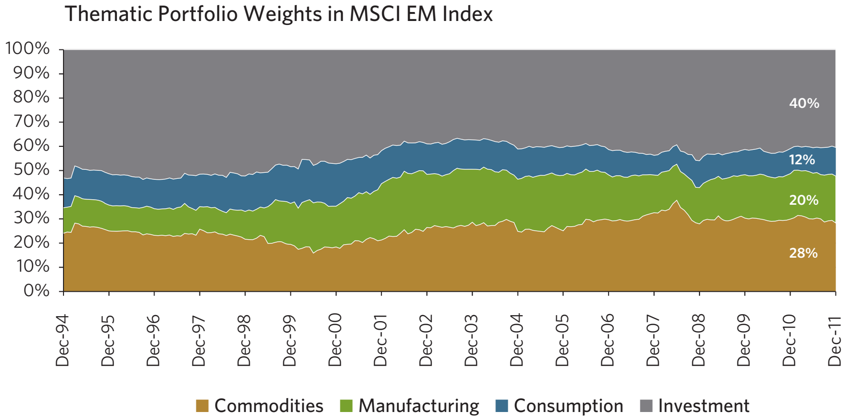
We think there are a number of advantages to a thematic portfolio approach to investing in EM equities. First, we have demonstrated that macroeconomic themes matter when it comes to equity returns; the dispersion of returns between the thematic portfolios offers potent evidence of the potential to outperform the benchmark by taking a thoughtful approach to thematic investing. Most importantly, the approach provides investors with the ability to focus their exposure on the themes they believe will drive EM equity returns in the future without the dilution that comes with an index, country-specific or region-specific strategy. We believe that as investors' allocations to EM grow, it will become increasingly important for them to align their portfolios with more granular macro views.

We believe that as investors' allocations to EM grow, it will become increasingly important for them to align their portfolios with more granular macro views.

Exhibit 12 shows the weights of the thematic portfolios in the MSCI EM Index through time. At the end of 2011, for every dollar invested in the index, 40 cents went to companies exposed to the Investment theme; 28 cents to Commodities; 20 cents to Manufacturing; and 12 cents to companies exposed to Consumption. While investing in the index might be sufficient for investors without macro views, and for investors that are moderately bullish on Investment and Commodities themes relative to the other themes, it would be an inefficient use of capital for investors wanting exposure to EM consumers. Moreover, even if your current thematic views align with the current thematic weights of the Index, the relative weights of the thematic portfolios are not static. They will vary with relative stock market performance, as well as due to new issuance. As a result, even if you are comfortable with the current weights of the thematic portfolios in the EM Index, those could drift away from your desired allocation.

None of the regions provides concentrated exposure to a single macroeconomic theme.

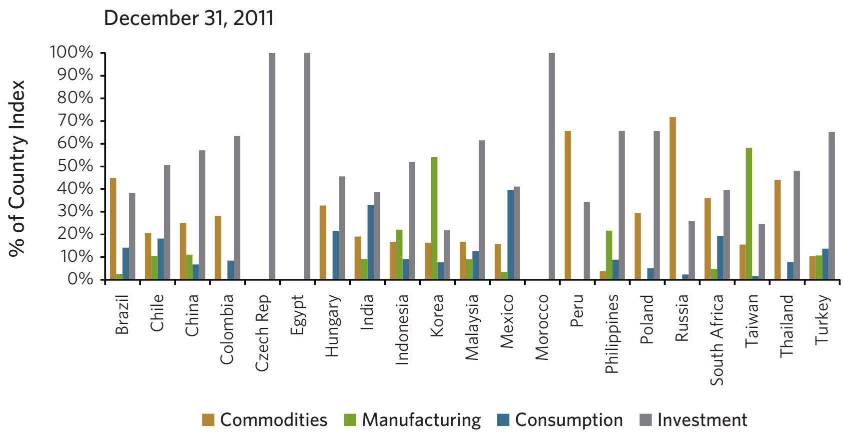
Exhibit 12 – Thematic Portfolio Weights in MSCI EM Index



Source: Datastream, MSCI. Data is from December 31, 1994 to December 30, 2011. Weights on the chart are as of December 30, 2011.

Similar dilution would be caused by country-specific or region-specific strategies. Country-based strategies would provide only partial exposure to macroeconomic themes (Exhibit 13). In addition, an investor would need to develop views on more than 20 countries as opposed to 4 thematic portfolios. Looking at Exhibit 14, we also see that regional blocs do not provide focused exposure to our themes. For example, the stock markets of the BRIC, EMEA and Latin American blocs have high exposures to both the Commodity and Investment themes, while the stock markets of Asian Tigers/Cubs are heavily tilted towards both Manufacturing and Investment. None of the regions provides concentrated exposure to a single macroeconomic theme. While there are fewer regions than countries, when using popular groupings such as the BRICs there can be overlapping classifications, and in some cases not all countries will be represented. Lastly, we should remember that sectors do not necessarily map into themes. In many cases, industries in the same GICS sectors belonged to different themes.

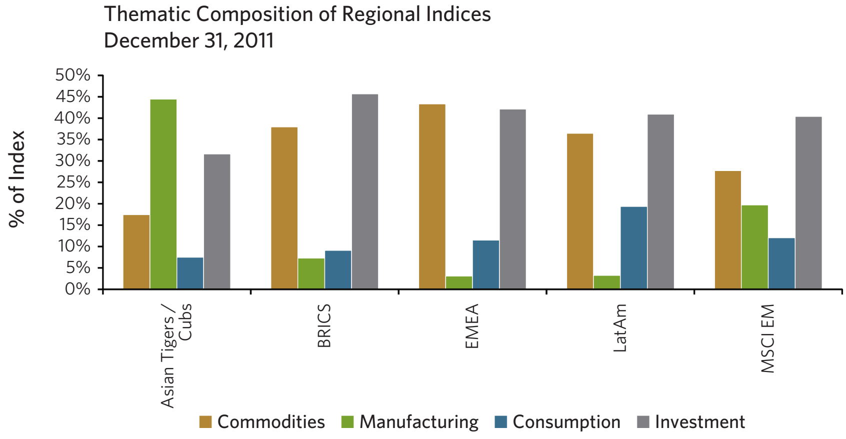
Exhibit 13 – Thematic Composition of Country Stock Markets



Source: MSCI Barra as of December 31, 2011.

A potential advantage of thematic investing is that investors would not have to reduce the weight of emerging market equities in their overall portfolio if they are bearish on only one or two themes.

Exhibit 14 – Thematic Exposure of Popular Regional Blocs and MSCI EM Index



Source: MSCI Barra. Data is as of December 31, 2011.

BRICs stand for Brazil, Russia, India and China. EMEA is an abbreviation for "Europe, Middle East and Africa." It includes Czech Republic, Egypt, Hungary, Morocco, Poland, Russia, South Africa, and Turkey. LatAm (Latin America) includes Brazil, Chile, Colombia, Mexico, and Peru. Asian Tigers / Cubs group includes Indonesia, South Korea, Malaysia, Philippines, Taiwan and Thailand.

While we believe the thematic portfolios are effective tools for achieving concentrated exposure to a macroeconomic view, avoiding exposure can be just as important. A potential advantage of thematic investing is that investors would not have to reduce the weight of emerging market equities in their overall portfolio if they are bearish on only one or two themes. For example, investors that are bearish on the growth of exports of manufactured goods could underweight the Manufacturing portfolio, and reallocate that capital to the other three themes. Without the thematic building blocks, investors would find it difficult to reduce exposure to just one theme. In order to express their investment view, they would be forced to reduce their allocation to all emerging market equities, potentially missing attractive investment opportunities. At the extreme, if investors are bullish on only one thematic portfolio, they can invest in just that portfolio.

It is important to note that from a valuation perspective, the one theme that currently stands out is Consumption. It looks expensive using all of our metrics. The stocks may be expensive due to their current popularity and high growth forecasts. Or they could turn out to be cheap if the middle class in the emerging markets continues to grow, and delivers as the bulls on Consumption expect. The thematic investing approach to emerging markets will let investors choose a side.

All of the secular signposts point to emerging markets acquiring greater significance in investors' portfolios. It's not just that advanced economies are still in a post-crisis economic funk; it's that emerging economies are on a trajectory of accelerated growth and development. That growth will not only transform the economic and financial map of the world, it will fundamentally change how we think about "core" investing. We think next-generation EM solutions need to be more thoughtful and targeted at connecting the secular drivers of that growth to the alpha potential that this rapidly evolving and multi-dimensional asset class can provide. We believe a thematic approach can not only help investors understand the exposures they have in their EM portfolios today, but also guide them in navigating the new topography of emerging and converging investment opportunities. We think the thematic approach to investing in emerging markets strikes an appropriate balance. It permits investors to flexibly and efficiently implement their macroeconomic views, without the unnecessary complexity that would accompany regional, country, and security-specific approaches.

Appendix 1. Mapping Sectors & Industries to Themes

#	GICS Industries (64)	GICS Sectors (10)
	Commodities Theme	
1	Energy Equipment & Services	Energy
2	Oil, Gas & Consumable Fuels	Energy
3	Chemicals	Materials
4	Containers & Packaging	Materials
5	Metals & Mining	Materials
6	Paper & Forest Products	Materials
7	Food Products	Consumer Staples
	Manufacturing Theme	
1	Aerospace & Defense	Industrials
2	Industrial Conglomerates	Industrials
3	Machinery	Industrials
4	Trading Companies & Distributors	Industrials
5	Internet Software & Services	Information Technology
6	Communications Equipment	Information Technology
7	Computer & Peripherals	Information Technology
8	Electronic Equipment, Instruments & Components	Information Technology
9	Office Electronics	Information Technology
10	Semiconductors & Semiconductor Equipment	Information Technology
11	Auto Components	Consumer Discretionary
12	Automobiles	Consumer Discretionary
13	Household Durables	Consumer Discretionary
14	Leisure Equipment & Products	Consumer Discretionary
15	Textiles, Apparel & Luxury Goods	Consumer Discretionary
	Consumption Theme	
1	Hotels, Restaurants & Leisure	Consumer Discretionary
2	Diversified Consumer Services	Consumer Discretionary
3	Media	Consumer Discretionary
4	Distributors	Consumer Discretionary
5	Internet & Catalog Retail	Consumer Discretionary
6	Multiline Retail	Consumer Discretionary
7	Specialty Retail	Consumer Discretionary
8	Food & Staples Retailing	Consumer Staples
9	Beverages	Consumer Staples
10	Tobacco	Consumer Staples
11	Household Products	Consumer Staples
12	Personal Products	Consumer Staples
13	Health Care Equipment & Supplies	Health Care
14	Health Care Providers & Services	Health Care
15	Biotechnology	Health Care
16	Pharmaceuticals	Health Care
17	IT Services	Information Technology
18	Software	Information Technology

#	GICS Industries (64)	GICS Sectors (10)
	Investment Theme	
1	Commercial Banks	Financials
2	Thrifts & Mortgage Finance	Financials
3	Diversified Financial Services	Financials
4	Consumer Finance	Financials
5	Capital Markets	Financials
6	Insurance	Financials
7	Real Estate	Financials
8	Diversified Telecommunication Services	Telecommunication Services
9	Wireless Telecommunication Services	Telecommunication Services
10	Electric Utilities	Utilities
11	Gas Utilities	Utilities
12	Multi-Utilities	Utilities
13	Water Utilities	Utilities
14	Independent Power Producers & Energy Traders	Utilities
15	Building Products	Industrials
16	Construction & Engineering	Industrials
17	Electrical Equipment	Industrials
18	Commercial, Professional Services & Supplies	Industrials
19	Air Freight & Logistics	Industrials
20	Airlines	Industrials
21	Marine	Industrials
22	Road & Rail	Industrials
23	Transportation Infrastructure	Industrials
24	Construction Materials	Materials

Source: MSCI, as of December 31, 2011.

Appendix 2. Estimating Fair Earnings Yield using Panel Regression

There are valid reasons for P/E ratios to differ through time and across countries. For example, stocks with higher expected growth rates should trade at higher P/E ratios than other stocks. As a result, valuation "mispricing" on a relative P/E basis can persist for extended periods.

To account for that, we used a panel regression to model fair earnings yields.[14]

Dependent variable: 18-month Forward Earnings Yield from IBES.[15]

5 independent variables: Forecast Inflation Rate, Forecast GDP Growth Rate, Household Consumption Growth Rate, Export to Import Ratio, and Urbanization Growth Rate[16]

Data set: 20 countries in MSCI Emerging Markets Index[17]

Time period: 1999 to 2010
Fixed time effects[18]

The following table shows the output from the regression. The signs of four out of five coefficients are as expected, and are statistically significant. As expected, higher inflation was associated with higher earnings yields (lower P/Es). Equity valuations are usually negatively affected by rising inflation. The coefficient of 0.45 for inflation suggests that 1% higher inflation was associated with a 0.45% higher earnings yield. Conversely, higher GDP growth was associated with lower earnings yields (higher P/Es). The coefficient of -0.38 suggests that 1% higher growth was associated with 0.38% lower earnings yield. The other variable with a large impact was the change in the urbanization growth rate. Increasing urbanization was associated with lower earnings yields (higher P/Es). Increasing consumption growth rate was associated with a small negative impact on earnings yields. Surprisingly, increase in ratio of exports to imports was associated with higher earnings yields (lower P/Es). However, we see that the impact of the ratio of exports to imports on earnings yield was weak.

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14 We used a panel regression because we had a relatively short history to work with. Had we used traditional ordinary least squares regressions, the estimated relationships would have been based on just 12 observations, and are unlikely to have been statistically significant. Panel data analysis pools data across countries and over time, and thereby delivers much more statistical power. Rather than relying on 12 observations per country, using a panel increased the number of observations to 240 (12 annual observations per country × 20 countries = 240 observations). In aggregate, the panel explained 43.7% of the total variability in Forward Earnings Yields.

15 Earnings yields are calculated as forward 18-month earnings divided by stock prices. While P/E ratios are more frequently quoted, we believe that it is more appropriate to estimate valuation models based on earnings yields (inverse of P/E).

16 We evaluated 12 variables, but only used the 5 mentioned variables because they provide the most explanatory power. Sources for the data are IBES for IBES 18-month Forward Earnings Yield; Consensus Economics for Next Year Forecast Inflation and Next Year Forecast GDP Rates; World Bank for Household Consumption Growth Rates, New Exports Ratios, and Urbanization Growth Rates.

17 Taiwan was excluded from the 21-country MSCI EM Index universe as the World Bank does not provide data for Taiwan.

18 Included because we are interested in explaining cross sectional differences rather than time series variation.

Panel Regression Output

Variables	Beta	Std. Error	t-Statistic
Forecast Inflation	0.45	0.07	6.15
Forecast GDP	-0.38	0.12	-3.11
Consumption Growth Rate	-0.05	0.04	-1.39
Ratio of Exports to Imports	0.03	0.01	3.76
Urbanization Growth Rate	-0.39	0.20	-1.91

Source: IBES for IBES 18-month Forward Earnings Yield; Consensus Economics for Next Year Forecast Inflation and Next Year Forecast GDP Rates; World Bank for Household Consumption Growth Rates, Net Exports Ratios, and Urbanization Growth Rates.

Appendix 3. Estimating Expected Returns from 2012 to 2020

A "supply model" was used to estimate expected returns for the thematic portfolios for the nine-year period from December 31, 2011 to December 31, 2020.[19] (Exhibit 11)

Supply model of expected return:

Expected Return = Current Dividend Yield + Forecast Nominal Earnings Growth + Repricing

- Current Dividend Yield captures portion of expected return that will come from dividend income.
- Forecast Nominal Earnings Growth captures appreciation from growth. (Assumes P/Es will not change)
  - Forecast Nominal Earnings Growth Rate modeled as expected real earnings growth plus expected U.S. long-term inflation (2.25%)[20, 21]
  - Real earnings growth calculated as average of expected long-term earnings growth and real GDP growth. (Reflects economic convergence)[22]
- Repricing captures price change required to move from current earnings yield to the 2020 fair earnings yield
  - Repricing calculated as (Current Forward Earnings Yield / Forecast Forward Earnings Yield) ˆ (1/9) – 1
  - 2020 fair earnings yield calculated using regression coefficients from panel regression and expected 2020 values of independent variables in 2020 calculated using autoregressive model

19 Supply model is described in "A Supply Model of the Equity Premium," Richard C. Grinold, Kenneth F. Kroner, and Laurence B. Siegel, The Research Foundation of CFA Institute, 2011.

20 We calculated 2020 real GDP growth rates by applying autoregressive techniques to 2012 values that we pulled from Consensus Economics. We calculated long-term country earnings growth rates using the period from 1995 to 2012. Source of country growth rates is MSCI via Datastream.

21 Source for inflation estimate: ISSG.

22 The assumption of earnings growth being equal to GDP growth is based on "A Supply Model of the Equity Premium," Richard C. Grinold, Kenneth F. Kroner, and Laurence B. Siegel, The Research Foundation of CFA Institute, 2011. Indeed, the earnings growth rate cannot be higher or lower than that of GDP in the long term. If earnings grow faster than GDP, companies will take over the economy, leaving nothing for labor, government and other claimants. If they grow slower than GDP, they will eventually disappear.

Appendix 4. Indexes Used

- The **MSCI Emerging Markets Index** is a free float-adjusted market capitalization index that is designed to measure equity market performance of emerging markets. The **MSCI Emerging Markets Index** consists of the following 21 emerging market country indices: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Morocco, Peru, Philippines, Poland, Russia, South Africa, Taiwan, Thailand, and Turkey. The index includes 825 large and mid-cap securities.

- The **MSCI Emerging Markets Universe** covers over 2,700 securities in 21 markets that are currently classified as EM countries. The EM equity universe spans large, mid and small cap securities and can be segmented across styles and sectors.

- The **MSCI EAFE Index** (Europe, Australasia, Far East) is a free float-adjusted market capitalization index that is designed to measure the equity market performance of developed markets, excluding the US & Canada. The **MSCI EAFE Index** consists of the following 22 developed market country indices: Australia, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the United Kingdom.

- The **Global Industry Classification Standard (GICS®)** was developed by MSCI, an independent provider of global indices and benchmark-related products and services, and Standard & Poor's (S&P), an independent international financial data and investment services company and a provider of global equity indices. The **GICS** structure consists of 10 sectors, 24 industry groups, 68 industries and 154 sub-industries.

- The **S&P 500 Index** has been widely regarded as the best single gauge of the large cap US equities market since the index was first published in 1957. The index has over US$ 5.58 trillion benchmarked, with index assets comprising approximately US$ 1.31 trillion of this total. The index includes 500 leading companies in leading industries of the U.S. economy, capturing 75% coverage of U.S. equities.

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Appendix 5. Macroeconomic / Market Variable Sources

Variables	Sources	Comments
EM GDP Growth	World Bank via Datastream	GDP values are measured in constant 2000 USD for 20 out of the 21 countries in the MSCI Emerging Markets Index.
EM Household Consumption Growth	World Bank via Datastream	Values are measured in constant 2000 USD for 20 out of the 21 countries in the MSCI Emerging Markets Index. Data for Taiwan are not included as the World Bank does not provide them. Values for the entire group are calculated on the GDP weighted basis.
EM Exports Growth	World Bank via Datastream	**Same as above**
EM Government Spending	World Bank via Datastream	**Same as above**
EM Inflation	World Bank via Datastream	**Same as above**
S&P 500 Index	Standard & Poor's via Bloomberg	The S&P 500® has been widely regarded as the best single gauge of the large cap U.S. equities market since the index was first published in 1957. The index has over US$ 5.58 trillion benchmarked, with index assets comprising approximately US$ 1.31 trillion of this total. The index includes 500 leading companies in leading industries of the U.S. economy, capturing 75% coverage of U.S. equities.
EM Basket of Currencies Appreciation vs. Dollar	The Federal Reserve Board via Datastream	The OITP (Other Important Trading Partner) index is a weighted average of the foreign exchange values of the U.S. dollar against a subset of currencies in the broad index that do not circulate widely outside the country of issue. The weights are derived from those in the broad index.
Price of Commodities (DJ UBS Commodity Index)	Dow Jones UBS via Bloomberg	The Dow Jones-UBS Commodity Index℠ (DJ-UBSCI℠) is a broadly diversified index that allows investors to track commodity futures through a single, simple measure. The DJ-UBSCI℠ is composed of commodities traded on U.S. exchanges, with the exception of aluminum, nickel and zinc, which trade on the London Metal Exchange (LME). The DJ-UBSCI℠ is calculated on an excess return basis.
Bond Yields (JPM EMBI Plus Index Yield to Maturity)	JP Morgan via Datastream	The J.P. Morgan Emerging Markets Bond Index Plus (EMBI+) tracks total returns for traded external debt (foreign currency denominates) instruments in the emerging markets
EM Lending Rates	World Bank via Datastream	Lending rates (prime rates) for 20 out of the 21 countries. Data for Taiwan are not included as the World Bank does not provide them. GDP Weighted.

All data is as of December 2011.

HYPOTHETICAL OR SIMULATED PERFORMANCE RESULTS HAVE CERTAIN INHERENT LIMITATIONS. UNLIKE AN ACTUAL PERFORMANCE RECORD, SIMULATED RESULTS DO NOT REPRESENT ACTUAL TRADING. SIMULATED TRADING PROGRAMS IN GENERAL ARE ALSO SUBJECT TO THE FACT THAT THEY ARE DESIGNED WITH THE BENEFIT OF HINDSIGHT. SINCE THE TRADES HAVE NOT ACTUALLY BEEN EXECUTED, THE RESULTS MAY HAVE UNDER OR OVER COMPENSATED FOR THE IMPACT OF CERTAIN MARKET FACTORS. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK. NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF THE TRADING LOSSES ARE MATERIAL FACTORS WHICH CAN ADVERSELY AFFECT THE ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE ECONOMY OR MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS, ALL OF WHICH CAN ADVERSELY AFFECT TRADING RESULTS.

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Special risks associated with investments in foreign companies include exposure to currency fluctuations and controls, less liquidity, less developed or less efficient trading markets, less governmental supervision and regulation, lack of comprehensive company information, political instability, greater market volatility, and differing auditing and legal standards. Further, investments in foreign markets can be affected by a host of factors, including political or social conditions, diplomatic relations, limitations on removal of funds or assets or imposition of (or change in) exchange control or tax regulations in such markets. Additionally, investments denominated in a foreign currency will be subject to changes in exchange rates that may have an adverse effect on the value, price or income of the investment. These risks are magnified in emerging markets and countries since they generally have less diverse and less mature economic structures and less stable political systems than those of developed countries.

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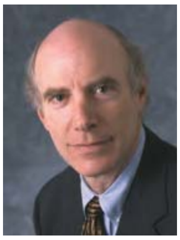

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