▷ Dimensional

Embracing Multifactor in Emerging Markets

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Dec 11, 2023

KEY TAKEAWAYS

- The equity, size, value, and profitability premiums have been positive in emerging markets over the most recent 10, 20, and 30 years.

- Dimensional has three decades of experience designing and managing systematic active multifactor solutions in emerging markets.

- The track record of our emerging markets strategies shows their ability to capture the premiums and outperform their benchmarks net of fees.

Emerging markets are increasingly difficult to ignore. Equities in emerging countries currently account for 11% of the world's market capitalization, up from 3% in 1993.[1] Naturally, many investors see emerging markets as a way to expand the opportunity set and broaden diversification.

Still, some remain on the fence—or are having second thoughts—when it comes to emerging markets, perhaps because of geopolitical tensions, government crackdowns in certain sectors, or the added complexity of investing in less developed markets.

This paper attempts to alleviate these concerns. I first show that the equity, size, value, and profitability premiums have on average been positive in emerging markets, both over the longest sample period and during more recent decades. I then discuss how Dimensional's emerging markets strategies adopt a multifactor approach and a daily process that seek to capture premiums while managing risks and controlling costs. Lastly, I demonstrate that Dimensional's emerging markets strategies have delivered the size, value, and profitability premiums and added value over their benchmarks.

EMERGING MARKETS PREMIUMS

Exhibit 1 shows average annual returns to the Fama/French research factors by region (emerging, developed-ex US, and US) over the most recent 10, 20, and 30 years.

Emerging markets have on average seen positive equity, size, value, and profitability premiums over the most recent one, two, and three decades. The equity premium in emerging markets trailed its developed markets counterparts over the most recent 10 years but outperformed them over both 20 and 30 years. The value premium has been higher in emerging markets compared to developed markets over all three periods, but

the opposite has been true for the profitability premium. The size premium has generally been highest outside the US. All premiums have on average been positive in all three regions over the most recent 30 years.

In sum, the premiums are alive and well in emerging markets, and a global opportunity set can mitigate disappointing spells for a given premium or region.

Exhibit 1

Average Annual Premiums (%) by Region over the 10, 20, and 30 Years Ending with 2022

	Emerging			Developed-ex US			US		
	10 Years	20 Years	30 Years	10 Years	20 Years	30 Years	10 Years	20 Years	30 Years
Equity	3.38	13.18	9.67	5.68	8.48	6.12	12.88	10.45	9.02
Size	0.56	0.92	2.55	0.97	2.38	1.98	−1.29	1.50	1.01
Value	3.72	8.34	9.48	−0.23	2.16	3.78	−1.46	−0.51	2.30
Profitability	2.49	1.73	1.09	3.88	3.38	4.14	3.81	3.03	4.14

Past performance, including hypothetical performance, is no guarantee of future results. For research and educational purposes only.

The Fama/French research indices and factors represent academic concepts and are not available for direct investment. They are not representative of actual portfolios and do not reflect costs and fees associated with an actual investment.

In USD. This table shows arithmetic averages of annual returns to the Fama/French factors by region over the most recent 10, 20, and 30 years. The equity premium is the return to the Fama/French Total Market Index minus the US one-month Treasury bill rate (from Ibbotson Associates). The size premium is the return to the small-minus-big (SMB) factor; the value premium is the return to the high-minus-low book-to-market (HML) factor; and the profitability premium is the return to the robust-minus-weak profitability (RMW) factor. Each annual premium is the difference in compound returns to the corresponding factor's long and short sides. Portfolio returns are weighted by market cap, and portfolios are rebalanced annually at the end of June. See Appendix A: Premium Definitions in Exhibit 1 for additional details. Data are annual and cover 1993–2022. Source: Dimensional calculations using data from Ken French's website.

EMERGING MARKETS MULTIFACTOR

Dimensional has three decades of experience designing and managing systematic active strategies in emerging equities. A key feature of our equity strategies, in emerging markets and beyond, is that we design them to be multifactor solutions that carefully integrate the size, value, and profitability premiums. Integrating multiple premiums into a strategy's design can increase expected returns while potentially lowering volatility. This is true for both core ("total market") and component ("asset class") strategies. Our value strategies, for instance, emphasize smaller and more profitable value stocks. This can increase their expected returns while mitigating the risk of "value traps" (low relative prices due to low expected cash flows, not high discount rates). **Exhibit 2** illustrates the security selection, exclusions, and weighting schemes of representative strategies in our emerging markets range.

Benefitting from a multifactor approach requires a careful portfolio design that provides a sufficient tilt on each premium without negating the tilts on others or sacrificing diversification. But it also requires a continuous implementation process that seeks to avoid style drift and allows for a flexible, low-cost approach to trading. All Dimensional
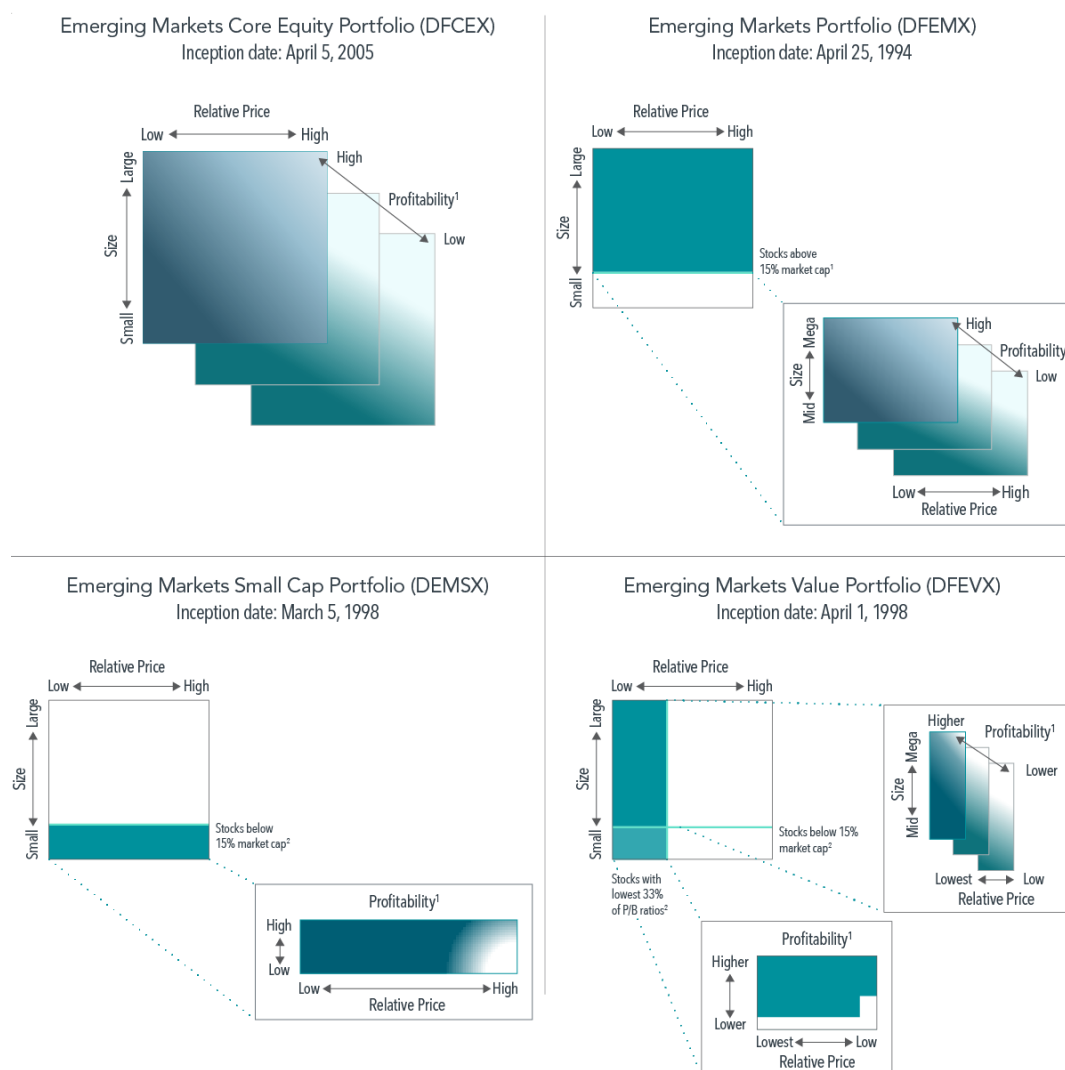
strategies may be rebalanced incrementally on a daily basis as prices and company characteristics change. A daily process also allows us to dynamically monitor and react to materializing risks. This is particularly relevant in emerging markets, where geopolitical events can quickly change the investment landscape.

Exhibit 2
Design Schematics for Representative Dimensional Emerging Markets Strategies
As of September 30, 2023

Emerging Markets Core Equity Portfolio (DFCEX)
Inception date: April 5, 2005

Emerging Markets Portfolio (DFEMX)
Inception date: April 25, 1994

Emerging Markets Small Cap Portfolio (DEMSX)
Inception date: March 5, 1998

Emerging Markets Value Portfolio (DFEVX)
Inception date: April 1, 1998

1. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book.

2. Actual size and relative price breaks are determined at the country or region level.

For illustrative purposes only. Not comprehensive. Portfolios are governed by the prospectus. The criteria the advisor uses for assessing securities on company size, relative price, and profitability are subject to change from time to time.

Illustrations of security selection, exclusions, and weighting scheme as of September 2023. The Emerging Markets Core Equity Portfolio (DFCEX) invests in stocks of all market capitalizations, down to $50 million; it overweights smaller, lower relative price, and higher profitability stocks; among small caps, it excludes those with higher relative price and lower profitability. The Emerging Markets Portfolio (DFEMX) invests in large and mid caps; it overweights mid caps and stocks with lower relative price and higher profitability. The Emerging Markets Small Cap Portfolio (DEMSX) invests in the smallest 15% of stocks by market cap, down to $50 million; it excludes higher relative price and lower profitability stocks. The Emerging Markets Value Portfolio (DFEVX) invests in all-cap value stocks, down to $50 million; among small-cap value stocks, it excludes those with higher relative price and lower profitability; among large-cap value stocks, it overweights smaller, lower relative price, and higher profitability stocks. Includes Dimensional's core and component emerging markets equity mutual funds with track records longer than 10 years. Excludes social and sustainable mutual funds.

EMERGING MARKETS PREMIUM CAPTURE

A carefully designed and well-managed multifactor strategy should capture the premiums it pursues when they materialize. This means that such a strategy should on average outperform its benchmark, net of fees, when the premiums are positive.
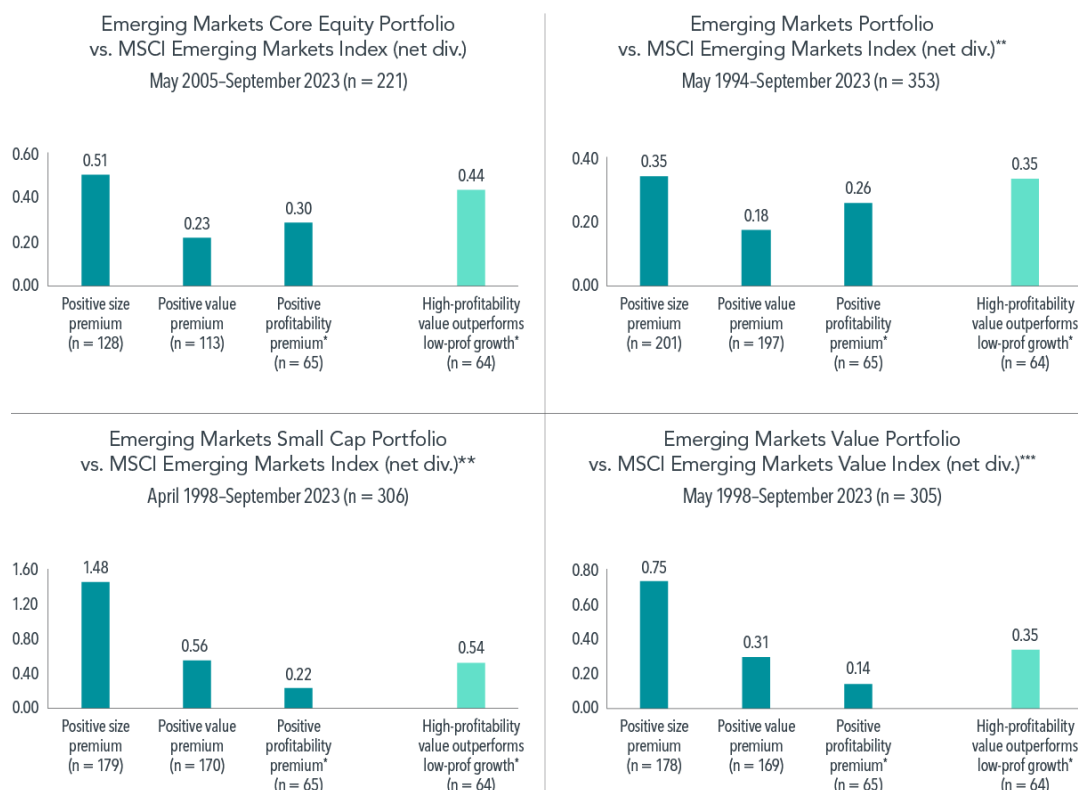
Exhibit 3 demonstrates premium capture for the strategies considered above. It shows each strategy's average monthly returns, net of fees, in excess of the returns to its benchmark during months with positive premiums.

Exhibit 3

Premium Capture for Representative Dimensional Emerging Markets Strategies

Average monthly excess returns (%) to Dimensional emerging markets strategies vs. prospectus benchmarks as of September 30, 2023

Emerging Markets Core Equity Portfolio vs. MSCI Emerging Markets Index (net div.)
May 2005–September 2023 (n = 221)

	Value
Positive size premium (n = 128)	0.51
Positive value premium (n = 113)	0.23
Positive profitability premium* (n = 65)	0.30
High-profitability value outperforms low-prof growth* (n = 64)	0.44

Emerging Markets Portfolio vs. MSCI Emerging Markets Index (net div.)**
May 1994–September 2023 (n = 353)

	Value
Positive size premium (n = 201)	0.35
Positive value premium (n = 197)	0.18
Positive profitability premium* (n = 65)	0.26
High-profitability value outperforms low-prof growth* (n = 64)	0.35

Emerging Markets Small Cap Portfolio vs. MSCI Emerging Markets Index (net div.)**
April 1998–September 2023 (n = 306)

	Value
Positive size premium (n = 179)	1.48
Positive value premium (n = 170)	0.56
Positive profitability premium* (n = 65)	0.22
High-profitability value outperforms low-prof growth* (n = 64)	0.54

Emerging Markets Value Portfolio vs. MSCI Emerging Markets Value Index (net div.)***
May 1998–September 2023 (n = 305)

	Value
Positive size premium (n = 178)	0.75
Positive value premium (n = 169)	0.31
Positive profitability premium* (n = 65)	0.14
High-profitability value outperforms low-prof growth* (n = 64)	0.35

*Performance data shown represents past performance and is no guarantee of future results. Current performance may be higher or lower than the performance shown. The investment return and principal value of an investment will fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original cost. To obtain performance data current to the most recent month-end, visit **dimensional.com**.*

Performance includes reinvestment of dividends and other earnings. Index returns are not representative of actual portfolios and do not reflect costs and fees associated with an actual investment. MSCI data © MSCI 2023, all rights reserved.

Conditional performance given a positive profitability premium or a positive return spread between high-profitability value and low-profitability growth (indicated with *) is since January 2014, which coincides with Dimensional's implementation of profitability across its strategies. Before the availability of the MSCI Emerging Markets Index (net div.) in January 1999, we use the MSCI Emerging Markets (gross div) (indicated with **). Before the availability of the MSCI Emerging Markets Value Index (net div) in January 1999, we use the MSCI Emerging Markets Value Index (gross div) (indicated with ***).

In USD. This figure shows average monthly excess returns (in % per month) to representative Dimensional emerging markets strategies, net of fees, vs. benchmarks during months with positive premiums. The size premium is the return difference between the Dimensional Emerging Markets Small Index and the MSCI Emerging Markets Large Cap Index (gross div.). The value premium, the profitability premium, and the return spread between high-profitability value stocks and low-profitability growth stocks are from the Fama/French emerging markets 2x2 sorts on book-to-market and profitability. See Appendix B: Premium Definitions for Exhibit 3. Data are monthly and cover each strategy's first full month through September 2023.

We identify these months using research proxies for the premiums that control for

important interactions among them. This is crucial for isolating each premium and is in line with the strategies' designs. Specifically, the size premium is the difference between the Dimensional Emerging Markets Small Cap Research Index and the MSCI Emerging Markets Large Cap Index (gross div.), where the former excludes small caps with high relative prices and low profitability because their tilts against the value and profitability premiums obscure the true size premium.[2] Similarly, the value and profitability premiums are constructed from the Fama/French 2x2 sorts on book-to-market equity and profitability for emerging markets. This prevents the proxies for the value and profitability premiums from having mechanical tilts against each other because value stocks tend to have relatively low profitability, while high-profitability stocks tend to have relatively high valuations.[3] These 2x2 sorts also allow us to check the strategies' ability to benefit from the interaction between value and profitability—that is, to check whether the strategies on average outperformed their benchmarks during months with a positive return spread between high-profitability value stocks and low-profitability growth stocks.

The exhibit shows that the four strategies on average outperformed their benchmarks by 14 to 148 basis points per month, net of fees, when at least one of the size, value, and profitability premiums were positive. This shows how each strategy benefited from emphasizing the individual premiums. The strategies also on average outperformed by 35 to 54 basis points per month when high-profitability value outperformed low-profitability growth, demonstrating their ability to benefit from the value-profitability interaction.[4]

Positive average premiums (Exhibit 1), designs that integrate multiple premiums (Exhibit 2), and consistent premium capture (Exhibit 3) can help a strategy achieve its long-term goal of adding value above its benchmark. **Exhibit 4** shows that the Dimensional strategies considered above have outperformed their benchmarks, net of fees, by 0.97% to 4.06% annualized since their first full month and through September 2023.

Exhibit 4
Periodic Performance of Representative Dimensional Emerging Markets Strategies
As of September 30, 2023

Portfolio vs. Benchmark	Symbol	Portfolio's First Full Month	Periodic Returns (%), Annualized					
			1 Year	3 Years	5 Years	10 Years	20 Years	Since Portfolio's First Full Month
Emerging Markets Core Equity Portfolio	DFCEX	May 2005	18.30	4.72	3.21	3.39	—	6.71
MSCI Emerging Markets Index (net div.)			11.70	−1.73	0.55	2.07	—	5.74
Difference			*6.60*	*6.44*	*2.66*	*1.32*	*—*	*0.97*
Emerging Markets Portfolio	DFEMX	May 1994	15.49	2.45	2.00	2.79	7.90	6.03
MSCI Emerging Markets Index (net div.)			11.70	−1.73	0.55	2.07	7.30	4.76*
Difference			*3.79*	*4.17*	*1.45*	*0.72*	*0.60*	*1.26*
Emerging Markets Small Cap Portfolio	DEMSX	April 1998	19.48	7.92	5.35	4.97	9.99	9.66
MSCI Emerging Markets Index (net div.)			11.70	−1.73	0.55	2.07	7.30	5.59*
Difference			*7.78*	*9.65*	*4.80*	*2.90*	*2.69*	*4.06*
MSCI Emerging Markets Small Cap Index (net div.)			23.06	10.61	6.45	4.57	9.07	6.64
Difference			*−3.59*	*−2.69*	*−1.10*	*0.40*	*0.92*	*3.02*
Emerging Markets Value Portfolio	DFEVX	May 1998	19.85	9.68	2.66	3.12	9.02	8.79
MSCI Emerging Markets Value Index (net div.)			16.03	4.40	0.38	1.21	7.45	5.74**
Difference			*3.82*	*5.28*	*2.29*	*1.92*	*1.57*	*3.05*

Performance data shown represents past performance and is no guarantee of future results.

*Current performance may be higher or lower than the performance shown. The investment return and principal value of an investment will fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original cost. To obtain performance data current to the most recent month-end, visit **dimensional.com**. Standardized performance and complete information on investment objectives, risks, advisory fees, and expenses of Dimensional's funds are available here: **https://www.dimensional.com/us-en/funds?ft=mutualFund&ac=equity&f=emerging**.*

Performance includes reinvestment of dividends and other earnings. Index returns are not representative of actual portfolios and do not reflect costs and fees associated with an actual investment. MSCI data © MSCI 2023, all rights reserved.

*The MSCI Emerging Markets Index (net div.) is available from January 1999. Prior to that date, we use the MSCI Emerging Markets Index (gross div.).

**The MSCI Emerging Markets Value Index (net div.) is available from January 1999. Prior to that date, we use the MSCI Emerging Markets Index (gross div.).

In USD. The table shows annualized compound returns by period as of September 30, 2023 to representative Dimensional emerging markets portfolios, their benchmarks, and related indices. Portfolio returns are net of fees. The prospectus benchmark of the Dimensional Emerging Markets Small Cap Portfolio is the MSCI Emerging Markets Index (net div.).

EMERGING MARKETS EMBRACE

Whether an allocation to emerging markets is appropriate for a given investor ultimately depends on the investor's goals and preferences, including risk tolerance. For investors considering such an allocation, the results presented here quantify the potential benefits of embracing emerging markets as a viable part of a global investment opportunity set.

Notably, the size, value, and profitability premiums have on average been positive in

emerging markets, both over the longest sample and in more recent decades. Further, the track record of Dimensional's strategies shows that it is possible to capture the premiums in emerging markets and add material value above indexing through systematic active multifactor solutions.

APPENDIX A: PREMIUM DEFINITIONS IN EXHIBIT 1

Source: Dimensional calculations using Fama/French data.

All Fama/French data is from Ken French's website: https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. See "Appendix C: Definitions of Dimensional and Fama/French Research Indices and Factors" for detailed definitions. The Fama/French indices and factors represent academic concepts that may be used in portfolio construction and are not available for direct investment or for use as a benchmark. Index returns are not representative of actual portfolios and do not reflect costs and fees associated with an actual investment.

Emerging markets
Equity premium: Fama/French Emerging Markets Total Market Research Index minus US one-month Treasury bill rate.

Size premium: Fama/French emerging markets small-minus-big (SMB) size factor from the five-factor model.

Value premium: Fama/French emerging markets high-minus-low (HML) book-to-market factor from 2x3 sorts on market cap and book-to-market.

Profitability premium: Fama/French emerging markets robust-minus-weak (RMW) profitability factor from 2x3 sorts on market cap and operating profitability.

Countries included in Fama/French emerging markets research indices and factors as of September 2023: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Qatar, Saudi Arabia, South Africa, South Korea, Taiwan, Thailand, Turkey, and United Arab Emirates.

Developed-ex US markets
Equity premium: Fama/French Developed-ex US Total Market Research Index minus US one-month Treasury bill rate.

Size premium: Fama/French developed-ex US small-minus-big (SMB) size factor from the five-factor model.

Value premium: Fama/French developed-ex US high-minus-low (HML) book-to-market factor from 2x3 sorts on market cap and book-to-market.

Profitability premium: Fama/French developed-ex US robust-minus-weak (RMW) profitability factor from 2x3 sorts on market cap and operating profitability.

Countries included in Fama/French Developed-ex US research indices and factors as of September 2023: Australia, Austria, Belgium, Canada, Denmark, Switzerland, Germany, Finland, France, Great Britain, Greece, Hong Kong, Ireland, Italy, Japan, Netherlands,

Norway, New Zealand, Portugal, Singapore, Spain, Sweden, and Switzerland.

US market
Equity premium: Fama/French Total US Market Research Index minus one-month Treasury bill rate.

Size premium: Fama/French US small-minus-big (SMB) size factor from the five-factor model.

Value premium: Fama/French US high-minus-low (HML) book-to-market factor from 2x3 sorts on market cap and book-to-market.

Profitability premium: Fama/French US robust-minus-weak (RMW) profitability factor from 2x3 sorts on market cap and operating profitability.

APPENDIX B: PREMIUM DEFINITIONS IN EXHIBIT 3

Source: Dimensional calculations using Fama/French, Dimensional, and MSCI data.

All Fama/French data is from Ken French's website https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. See "Appendix C: Definitions of Dimensional and Fama/French Research Indices and Factors" for detailed definitions. The Dimensional and Fama/French indices and factors represent academic concepts that may be used in portfolio construction and are not available for direct investment or for use as a benchmark. Index returns are not representative of actual portfolios and do not reflect costs and fees associated with an actual investment. MSCI data © MSCI 2023, all rights reserved.

Size premium: Dimensional Emerging Markets Small Index minus MSCI Emerging Markets Large Cap Index (gross div.).

Value premium: Based on the Fama/French 2x2 sorts on book-to-market and profitability for emerging markets. The value premium is, month-by-month, the simple average return difference between value stocks and growth stocks within profitability groups.

Profitability premium: Based on the Fama/French 2x2 sorts on book-to-market and profitability for emerging markets. The profitability premium is, month-by-month, the simple average return difference between high-profitability stocks and low-profitability stocks within book-to-market groups.

High-profitability value minus low-profitability growth: The return difference along the diagonal of the Fama/French 2x2 sorts on book-to-market and profitability for emerging markets.

Countries included in Dimensional emerging markets indices as of September 2023: Brazil, Chile, China, Colombia, Czech Republic, Hungary, India, Indonesia, Malaysia, Mexico, Peru, Philippines, Poland, South Africa, South Korea, Taiwan, Thailand, and Turkey.

Countries included in MSCI emerging markets indices as of September 2023: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Kuwait, Malaysia, Mexico, Peru, Philippines, Poland, Qatar, Saudi Arabia, South

Africa, Taiwan, Thailand, Turkey, and United Arab Emirates.

APPENDIX C: DEFINITIONS OF DIMENSIONAL AND FAMA/FRENCH RESEARCH INDICES AND FACTORS

All Dimensional index data compiled by Dimensional. All Fama/French data is from Ken French's website: https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

Dimensional Emerging Markets Small Index: January 1989–December 1989: Fama/French Emerging Markets Small Cap Index. January 1990–Present: Dimensional Emerging Markets Small Index: Market-capitalization-weighted index of small company securities in the eligible markets, excluding those with the lowest profitability and highest relative price within their country's small cap universe. The index also excludes those companies with the highest asset growth within their country's small cap universe. Profitability is defined as operating income before depreciation and amortization minus interest expense divided by book equity. Asset growth is defined as change in total assets from the prior fiscal year to current fiscal year. The index monthly returns are computed as the simple average of the monthly returns of four subindices, each one reconstituted once a year at the end of each quarter of the year. Maximum index weight of any one company is capped at 5%. Countries currently included are Brazil, Chile, China, Colombia, Czech Republic, Hungary, India, Indonesia, Malaysia, Mexico, Peru, Philippines, Poland, South Africa, South Korea, Taiwan, Thailand, and Turkey. Exclusions: REITs and Investment Companies. Source: Bloomberg. The Dimensional Emerging Markets Small Index has been retrospectively calculated by Dimensional Fund Advisors and did not exist prior to April 2008. Accordingly, the results shown during the periods prior to April 2008 do not represent actual returns of the Index. Backtested index performance is hypothetical and is provided for informational purposes only to indicate historical performance had the index been calculated over the relevant time periods. Backtested performance results assume the reinvestment of dividends and capital gains. The Index is unmanaged and is not subject to fees and expenses typically associated with managed accounts or investment funds. Investments cannot be made directly in an index. Past performance is no guarantee of future results. The calculation methodology for the Dimensional Emerging Markets Small Index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology for the Dimensional Emerging Markets Small Index was amended in November 2019 to include asset growth as a factor in selecting securities for inclusion in the index.

Fama/French US Research Factors

Fama/French US Mkt-Rf Research Factor: The excess return on the market, value-weight return of all CRSP firms incorporated in the US and listed on the NYSE, AMEX, or NASDAQ that have a CRSP share code of 10 or 11 at the beginning of month t, good shares and price data at the beginning of t, and good return data for t minus the one-month Treasury bill rate (from Ibbotson Associates).

Fama/French US SMB Research Factor: Constructed from six size/book-to-market research portfolios, six size/profitability research portfolios, and six size/investment research portfolios. SMB (small minus big) for July of year t to June t + 1 includes all NYSE, AMEX, and NASDAQ stocks for which we have market equity for December t − 1 and June of t, (positive) book-to-market equity data for fiscal year ending in t − 1, non-

missing revenues and at least one of the following: cost of goods sold, selling, general and administrative expenses, or interest expense for t − 1, and total assets data for t − 2 and t − 1. Exclusions: ADRs, investment companies, tracking stocks, non-US incorporated companies, closed-end funds, certificates, shares of beneficial interests, and negative book values.

Fama/French US HML Research Factor: Constructed from four size/book-to-market research portfolios. HML for July of year t to June t + 1 includes all NYSE, AMEX, and NASDAQ stocks for which we have market equity for December t − 1 and June of t, and (positive) book-to-market equity data for fiscal year ending in t − 1. HML (high minus low) is the average return on two value research portfolios minus the average return on two growth research portfolios: 1/2 (small value + big value) − 1/2 (small growth + big growth). Exclusions: ADRs, investment companies, tracking stocks, non-US incorporated companies, closed-end funds, certificates, shares of beneficial interests, and negative book values.

Fama/French US RMW Research Factor: Constructed from four size/profitability research portfolios. RMW for July of year t to June t + 1 includes all NYSE, AMEX, and NASDAQ stocks for which we have market equity data for June of t, (positive) book equity data for t − 1, non-missing revenues data for t − 1, and non-missing data for at least one of the following: cost of goods sold, selling, general and administrative expenses, or interest expense for t − 1. RMW (robust minus weak) is the average return on the two robust operating profitability portfolios minus the average return on the two weak operating profitability portfolios: 1/2 (small robust + big robust) − 1/2 (small weak + big weak). Exclusions: ADRs, investment companies, tracking stocks, non-US incorporated companies, closed-end funds, certificates, and shares of beneficial interests.

Fama/French US CMA Research Factor: Constructed from six size/investment research portfolios that do not include hold ranges. CMA for July of year t to June t + 1 includes all NYSE, AMEX, and NASDAQ stocks for which we have market equity data for June of t, total assets data for t − 2 and t − 1. CMA (conservative minus aggressive) is the average return on the two conservative investment portfolios minus the average return on the two aggressive investment portfolios: 1/2 (small conservative + big conservative) − 1/2 (small aggressive + big aggressive). Exclusions: ADRs, investment companies, tracking stocks, non-US incorporated companies, closed-end funds, certificates, and shares of beneficial interests.

Fama/French Developed-ex US Research Factors

Countries included in Fama/French Developed-ex US Research Factors as of September 2023: Australia, Austria, Belgium, Canada, Switzerland, Germany, Denmark, Spain, Finland, France, Great Britain, Greece, Hong Kong, Ireland, Italy, Japan, Netherlands, Norway, New Zealand, Portugal, Sweden, and Singapore.

Fama/French Developed-ex US Mkt-Rf Research Factor: The excess return on the market, value-weight return of all firms at the beginning of month t, good shares and price data at the beginning of t, and good return data for t minus the one-month Treasury bill rate (from Ibbotson Associates).

Fama/French Developed-ex US SMB Research Factor: Constructed from six size/book-

to-market research portfolios, six size/profitability research portfolios, and six size/ investment research portfolios. SMB (small minus big) for July of year t to June t + 1 includes all stocks for which we have market equity for December t − 1 and June of t, (positive) book-to-market equity data for fiscal year ending in t − 1, non-missing revenues and at least one of the following: cost of goods sold, selling, general and administrative expenses, or interest expense for t − 1, and total assets data for t − 2 and t − 1.

Fama/French Developed-ex US HML Research Factor: Constructed from four size/ book-to-market research portfolios. HML for July of year t to June t + 1 includes all stocks for which we have market equity for December t − 1 and June of t, and (positive) book-to-market equity data for fiscal year ending in t − 1. HML (high minus low) is the average return on two value research portfolios minus the average return on two growth research portfolios: 1/2 (small value + big value) − 1/2 (small growth + big growth).

Fama/French Developed-ex US RMW Research Factor: Constructed from four size/ profitability research portfolios. RMW for July of year t to June t + 1 includes all stocks for which we have market equity data for June of t, (positive) book equity data for t − 1, non-missing revenues data for t − 1, and non-missing data for at least one of the following: cost of goods sold, selling, general and administrative expenses, or interest expense for t − 1. RMW (robust minus weak) is the average return on the two robust operating profitability portfolios minus the average return on the two weak operating profitability portfolios: 1/2 (small robust + big robust) − 1/2 (small weak + big weak).

Fama/French Developed-ex US CMA Research Factor: Constructed from six size/ investment research portfolios that do not include hold ranges. CMA for July of year t to June t + 1 includes all stocks for which we have market equity data for June of t, total assets data for t − 2 and t − 1. CMA (conservative minus aggressive) is the average return on the two conservative investment portfolios minus the average return on the two aggressive investment portfolios: 1/2 (small conservative + big conservative) − 1/2 (small aggressive + big aggressive).

Fama/French Emerging Markets Research Factors

Countries included in Fama/French Emerging Markets Research Factors as of September 2023: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Qatar, Saudi Arabia, South Africa, South Korea, Taiwan, Thailand, Turkey, and United Arab Emirates.

Fama/French Emerging Markets Mkt-Rf Research Factor: The excess return on the market, value-weight return of all firms at the beginning of month t, good shares and price data at the beginning of t, and good return data for t minus the one-month Treasury bill rate (from Ibbotson Associates).

Fama/French Emerging Markets SMB Research Factor: Constructed from six size/ book-to-market research portfolios, six size/profitability research portfolios, and six size/ investment research portfolios. SMB (small minus big) for July of year t to June t + 1 includes all stocks for which we have market equity for December t − 1 and June of t, (positive) book-to-market equity data for fiscal year ending in t − 1, non-missing revenues and at least one of the following: cost of goods sold, selling, general and administrative expenses, or interest expense for t − 1, and total assets data for t − 2 and t − 1.

Fama/French Emerging Markets HML Research Factor: Constructed from four size/book-to-market research portfolios. HML for July of year t to June t + 1 includes all stocks for which we have market equity for December t − 1 and June of t, and (positive) book-to-market equity data for fiscal year ending in t − 1. HML (high minus low) is the average return on two value research portfolios minus the average return on two growth research portfolios: 1/2 (small value + big value) − 1/2 (small growth + big growth).

Fama/French Emerging Markets RMW Research Factor: Constructed from four size/profitability research portfolios. RMW for July of year t to June t + 1 includes all stocks for which we have market equity data for June of t, (positive) book equity data for t − 1, non-missing revenues data for t − 1, and non-missing data for at least one of the following: cost of goods sold, selling, general and administrative expenses, or interest expense for t − 1. RMW (robust minus weak) is the average return on the two robust operating profitability portfolios minus the average return on the two weak operating profitability portfolios: 1/2 (small robust + big robust) − 1/2 (small weak + big weak).

Fama/French Emerging Markets CMA Research Factor: Constructed from six size/investment research portfolios that do not include hold ranges. CMA for July of year t to June t + 1 includes all stocks for which we have market equity data for June of t, total assets data for t − 2 and t − 1. CMA (conservative minus aggressive) is the average return on the two conservative investment portfolios minus the average return on the two aggressive investment portfolios: 1/2 (small conservative + big conservative) − 1/2 (small aggressive + big aggressive).

The Dimensional and Fama/French indices and factors represent academic concepts that may be used in portfolio construction and are not available for direct investment or for use as a benchmark. Index returns are not representative of actual portfolios and do not reflect costs and fees associated with an actual investment. The Dimensional indices have been retrospectively calculated by Dimensional Fund Advisors LP and did not exist prior to their index inception dates. Accordingly, results shown during the periods prior to each index's inception date do not represent actual returns of the index. Other periods selected may have different results, including losses. Backtested index performance is hypothetical and is provided for informational purposes only to indicate historical performance had the index been calculated over the relevant time periods. Backtested performance results assume the reinvestment of dividends and capital gains.

1. Source: Dimensional calculations using data on market capitalization through September 2023 for developed and emerging markets from Ken French's website, free-float adjusted in non-US markets.
2. See, for example, Stanley Black and Eric Geffroy, "Understanding the Performance of Small Cap Stocks" (white paper, Dimensional Fund Advisors, June 2018).
3. See Robert Novy-Marx, "The Other Side of Value: The Gross Profitability Premium," *Journal of Financial Economics* 108, no. 1 (April 2013): 1–28; and Eugene F. Fama and Kenneth R. French, "A Five-Factor Asset Pricing Model," *Journal of Financial Economics* 116, no. 1 (April 2015): 1–22.
4. In Exhibit 3, the conditional performance of the Dimensional Emerging Markets Small Cap Portfolio is relative to the MSCI Emerging Markets Index (net div.) because the latter is the fund's prospectus benchmark. However, the fund also outperformed the MSCI Emerging Markets Small Cap Index (net div.) when either of the premiums were positive: average outperformance net of fees of 0.20% per month when the size premium was positive, 0.20% per month when the value premium was positive, 0.16% per month when the profitability premium was positive, and 0.19% per month when high-profitability value stocks outperformed low-profitability growth stocks.

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