

November 15, 2018

City of Fort Pierce

International Growth

William Blair

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Overview

Photos courtesy of Casey Preyss, Ken McAtamney, Stephanie Braming and Alaina Anderson



William Blair Investment Management at a Glance

We work closely with corporations, public pension funds, retirement plans, Taft-Hartley plans, endowments, foundations, insurance and healthcare companies, and sovereign wealth funds.

Investment Management

- \$62.2 billion in AUM
- 472 clients
- PMs average 15 years at the firm
- Analysts average 8 years at the firm
- 317 employees (58 partners)
- 98 investment professionals

Core Investment Tenets

- Active Management
- Alpha-Seeking
- Long-Term Focus
- Fundamental Orientation
- Disciplined Process
- Research Intensive



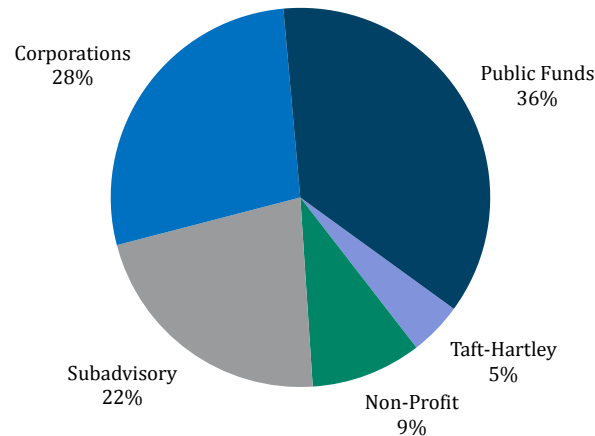
¹Wo Bai Business Consulting (Shanghai) Co., Ltd. is an affiliated company solely providing research to other William Blair affiliates on a consultative basis. As of September 30, 2018

William Blair Investment Management, LLC is headquartered in Chicago and utilizes resources and personnel of its affiliate, William Blair & Company L.L.C. and its participating affiliate, William Blair International, Ltd. William Blair International, Ltd. is an asset manager located in London. William Blair & Company, L.L.C. and certain affiliates maintain sales and client services offices in Sydney and Zurich.

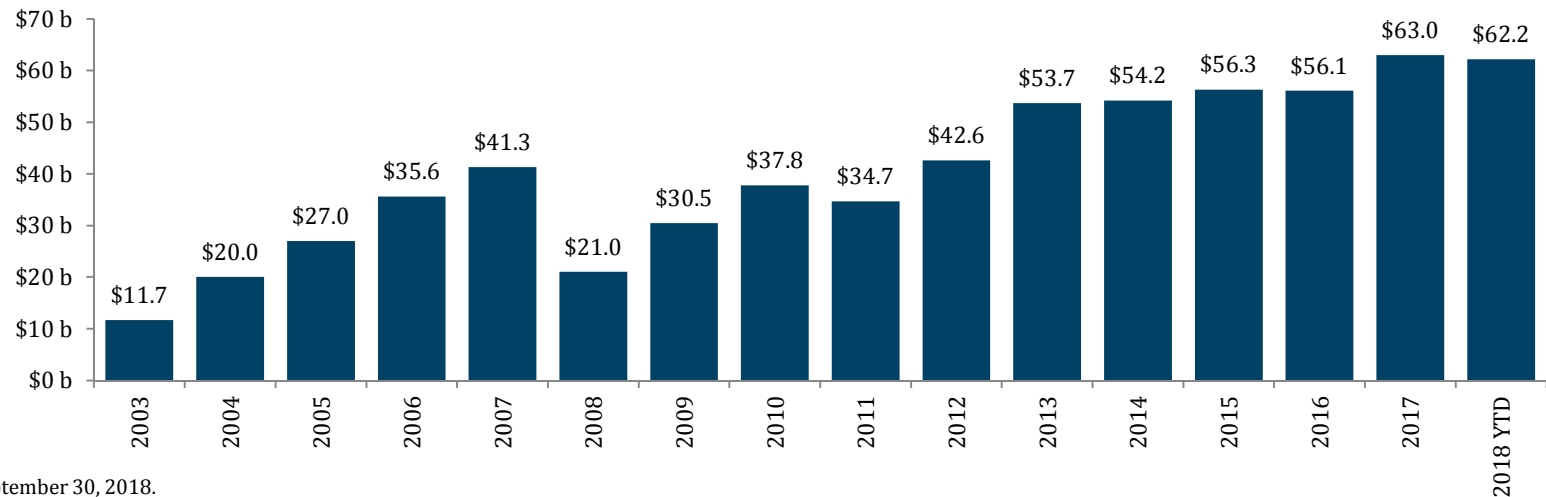
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Sophisticated Investor Base

Balanced mix of institutional clients



Assets Under Management



As of September 30, 2018.

Breakdown by client type represents separate account clients.

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Investment Strategies

Global reach and extensive line of strategies across the asset class spectrum with a wide array of separate account strategies and pooled vehicles

Teams	Strategies	Investment Professionals	AUM	Philosophy	
Global Equity	<ul style="list-style-type: none"> Global Leaders International Growth International Leaders International Developed Plus ADR Growth 	<ul style="list-style-type: none"> International Small Cap Growth Emerging Markets Growth Emerging Markets Leaders Emerging Markets Small Cap Growth China A-Shares Growth 	8 PMs, 19 analysts	\$38.3b	Believes that an integrated approach and a global perspective to identifying quality growth companies that demonstrate sustainable value creation can produce above-average excess returns.
U.S. Equity	<p>U.S. Growth</p> <ul style="list-style-type: none"> All Cap Growth Large Cap Growth Mid Cap Growth SMID Growth Small Cap Growth 	<p>U.S. Value</p> <ul style="list-style-type: none"> SMID Value Small Cap Value 	11 PMs, 18 analysts	\$20.6b	<p>U.S. Growth – Seeks to invest in durable growth businesses when they are attractively valued in the market.</p> <p>U.S. Value – Seeks to strike the right balance between valuation and fundamentals and invest in companies whose management teams are good stewards of capital and focused on creating shareholder value.</p>
Global Multi-Asset	<ul style="list-style-type: none"> Macro Allocation Global Opportunity Dynamic Diversified Allocation Global Diversified Return Absolute Return Currency 		2 PMs, 14 analysts	\$2.0b	Employs a global top-down discretionary approach that strives to exploit long and short term fundamental opportunities across equities, bonds and currencies.
Fixed Income	<ul style="list-style-type: none"> Core Intermediate Low Duration Opportunistic Credit 		4 PMs/analysts	\$1.2b	Invests in bonds with compelling yields and strong fundamental characteristics in niches of the market that tend to get overlooked by large bond market participants.
Systematic Strategies	<ul style="list-style-type: none"> Systematic International All Cap Core Systematic International Core Systematic Emerging Markets All Cap Core 		2 PMs, 5 analysts	\$18.0m	Uses a quantitative approach based on William Blair's traditional fundamental stock selection philosophy.

As of September 30, 2018.

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Active Never Rests – Ownership, Culture, and Investment Approach

Our client-focused approach underpins each of three key fundamental pillars

Ownership

- 100% active employee-owned
- Alignment of interests; no outside influences or constantly changing short-term priorities
- Stable and entrepreneurial environment helps retain top talent
- Client focus; we build client relationships that last year after year rather than quarter to quarter

Culture

- Stability and evolution; we evolve with you
- Collaborative environment where investment professionals can thrive
- Professionals incented to seek long-term success for clients
- Transparency and an unwavering commitment to active investing and strong client outcomes

Investment Approach

- Unique voices and shared values; autonomous investment teams have freedom and flexibility to deliver high-conviction active management
- Deep intellectual curiosity and conviction promotes ongoing investment process improvements while each team stays true to its investment philosophy
- Consistent, rigorous, and repeatable process enables teams to seek performance our clients expect



Global Portfolio Strategies

The global strategy suite reflects the changing opportunity set and our philosophy of constantly expanding our horizons to capitalize on new opportunities.

- The Focused Leaders strategies comprise high quality leaders across the corporate life cycle in terms of products, services, and execution
- The All Cap strategies reflect broad exposure to high quality companies across the market capitalization spectrum
- The Small Capitalization strategies are designed to capture a broader array of small and micro-cap opportunities with more limited liquidity
- Developed Plus represents our version of EAFE plus with limited emerging markets exposure
- The China A-Shares Growth strategy invests in high quality growth domestic Chinese equities across the market capitalization spectrum

	International	Emerging Markets	Global
Focused Leaders	International Leaders \$5.4 billion	Emerging Markets Leaders \$4.3 billion	Global Leaders \$2.9 billion
All Cap	International Growth (Closed 6/12) \$15.4 billion	Emerging Markets Growth \$4.4 billion	
Small Cap	International Small Cap Growth (Closed 3/11) \$3.2 billion	Emerging Markets Small Cap Growth (Closed 10/13) \$1.4 billion	
EAFE Plus	International Developed Plus \$1.0 billion		
ADR Growth and China A-Shares Growth	ADR Growth \$165 million \$577 million AUA ¹	China A-Shares Growth \$10 million	

¹Assets Under Advisement (AUA) consists of assets managed by third parties in accordance with model portfolios provided by William Blair. William Blair does not have investment discretion or trading authority over these assets.

Assets as of September 30, 2018.

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Global Investment Team

Portfolio Management Team ¹						Portfolio Specialists
Global Leaders	International Growth	International Leaders	Developed Plus	International Small Cap	Emerging Markets Strategies	
Andy Flynn, CFA, Partner 13 yrs. WB/28 yrs. Industry Ken McAtamney, Partner 13 yrs. WB/28 yrs. Industry	Simon Fennell, Partner 7 yrs. WB/26 yrs. Industry Ken McAtamney, Partner 13 yrs. WB/28 yrs. Industry	Simon Fennell, Partner 7 yrs. WB/26 yrs. Industry Ken McAtamney, Partner 13 yrs. WB/28 yrs. Industry	David Merjan, CFA, Partner 20 yrs. WB/31 yrs. Industry Jack Murphy, CFA, Partner 13 yrs. WB/22 yrs. Industry	Simon Fennell, Partner 7 yrs. WB/26 yrs. Industry Andy Flynn, CFA, Partner 13 yrs. WB/28 yrs. Industry	<u>Emerging Markets Growth</u> Todd McClone, CFA, Partner 18 yrs. WB/26 yrs. Industry Casey Preyss, CFA, Partner 18 yrs. WB/19 yrs. Industry <u>Emerging Markets Leaders</u> Todd McClone, CFA, Partner Jack Murphy, CFA, Partner <u>Emerging Small Cap Growth</u> Todd McClone, CFA, Partner Casey Preyss, CFA, Partner <u>China A-Shares Growth</u> Casey Preyss, CFA, Partner Vivian Lin Thurston, CFA, Partner 3 yrs. WB/24 yrs. Industry	Ryan Dimas, CFA, CAIA 18 yrs. WB/23 yrs. Industry Romina Graiver 6 yrs. WB/19 yrs. Industry Blake Pontius, CFA 13 yrs. WB/21 yrs. Industry
Global Fundamental Research Team ²						
Strategy Research	Global Sector Research			Systematic Research		
	Consumer	Financials	Healthcare			
Olga Bitel, Partner 9 yrs. WB/16 yrs. Industry Hugo Scott-Gall <1 yr WB/25 yrs. Industry	Kwesi Smith, CFA 3 yrs. WB/14 yrs. Industry Dan Su, CFA 5 yrs. WB/11 yrs. Industry Rita Spitz, CFA, Partner 32 yrs. WB/40 yrs. Industry	Joel Gomberg, CFA, Partner 21 yrs. WB/24 yrs. Industry D.J. Neiman, CFA, Partner ³ 16 yrs. WB/20 yrs. Industry Daniel Hill, CFA 13 yrs. WB/13 yrs. Industry	Thomas Sternberg, CFA, Partner 14 yrs. WB/16 yrs. Industry Camilla Oxhamre Cruse, Ph.D. 4 yrs. WB/12 yrs. Industry Richard Reznick, Ph.D. 8 yrs. WB/8 yrs. Industry			Spiro Voulgaris, Partner 11 yrs. WB/28 yrs. Industry Andrew Kominik, CFA 15 yrs. WB/18 yrs. Industry Jeffrey Hill 4 yrs. WB/20 yrs. Industry Andrew Wickman, CFA 3 yrs. WB/8 yrs. Industry
	Industrials	Information Technology	Real Assets			
	Andrew Siepker, CFA 12 yrs. WB/14 yrs. Industry Anil Daka, CFA 7 yrs. WB/10 yrs. Industry	William Benton, CFA, CPA, Partner 21 yrs. WB/21 yrs. Industry Drew Buckley, CFA, CPA 10 yrs. WB/12 yrs. Industry	Alaina Anderson, CFA, Partner 12 yrs. WB/17 yrs. Industry			
	Emerging Markets Small Cap Generalists		China Generalists		Technologist	
	Greg Scolaro, CFA, CPA 4 yrs. WB/4 yrs. Industry	Bryan Shea 9 yrs. WB/9 yrs. Industry	Vivian Lin Thurston, CFA, Partner 3 yrs. WB/24 yrs. Industry	Richard Reznick, Ph.D. 8 yrs. WB/8 yrs. Industry	Darragh Grogan 10 yrs. WB/12 yrs. Industry	
	Research Associates (8)					
Implementation/Trading Team ⁴						
Asia/Pacific	Europe	Americas & Fx	Portfolio and Trade Order Management	International Trade Specialists		
Nathan Fisher, CFA 3 yrs. WB/14 yrs. industry Daniel Iannessa 13 yrs. WB/15 yrs. industry Malik Nicholson 4 yrs. WB/12 yrs. Industry	Nicola Hynds 10 yrs. WB/23 yrs. industry Simon Johnstone 6 yrs. WB/18 yrs. industry	Terry O'Bryan, Partner, Head of Global Equity Trading 11 yrs. WB/20 yrs. industry	Monika Budyn 5 yrs. WB/9 yrs. industry Tim Randick 11 yrs. WB/11 yrs. industry	Kristin Gaffud 13 yrs. WB/16 yrs. Industry Michael LaDuke 8 yrs. WB/11 yrs. Industry		

¹Portfolio Management team average 13 years at William Blair and 26 years in the industry. ²Global Fundamental Research Team, excluding Technologist, average 10 years at William Blair and 17 years in the industry. ³D.J. Neiman also serves as Director of Research. ⁴Traders, excluding Portfolio and Trade Order Management and International Trade Specialists, average 8 years at William Blair and 17 years in the industry. As of October 2018.

Philosophy and Process

Photos courtesy of Tommy Sternberg, Casey Preyss, Vivian Thurston



Investment Philosophy

- We believe that strong corporate performance is the foundation of superior long-term investment returns
- The essence of corporate success lies in building intrinsic strengths in the management of human capital, financial resources, and stakeholder relationships, and delivering quality, innovation, service, and value to customers
- We believe companies that lead in these critical areas have produced better returns on capital, over a longer time horizon, with greater consistency and less risk

There is no guarantee that these investment strategies will work under all market conditions or are suitable for all investors and each investor should evaluate their ability to invest long-term, especially during periods of downturn in the market.

Investment Philosophy: Organic Value Creation

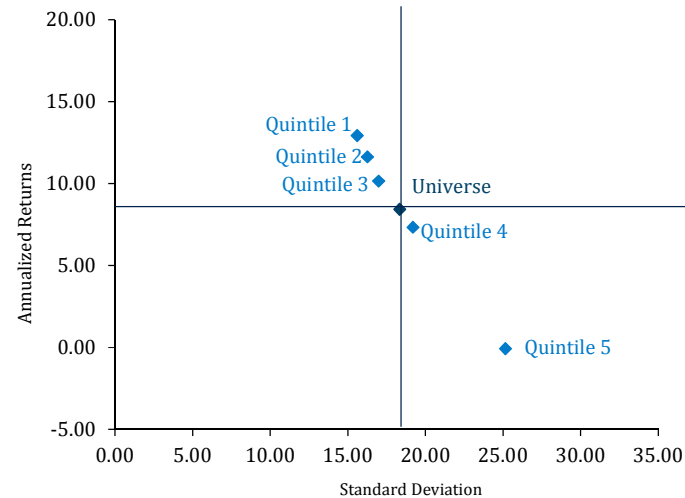
We seek:

- Organic value creation
- Peer group leadership
- Consistent earnings growth
- High return on capital and assets
- Positive earnings trends over time
- Low leverage

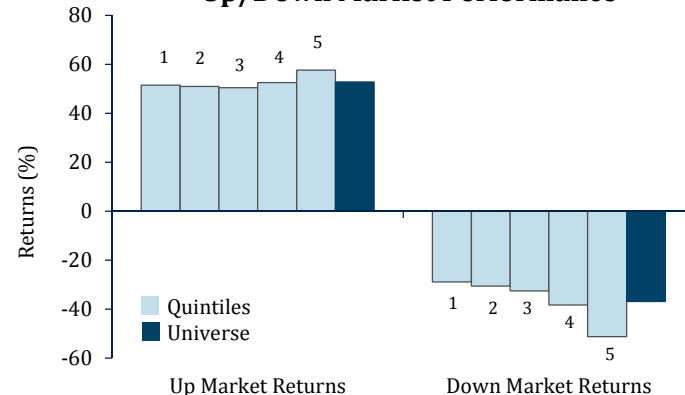
Companies with high quality and sustainable growth characteristics may:

- Perform well in up markets
- Protect in down markets
- Produce attractive, risk-adjusted returns

Global Universe by Quality Quintiles



Global Quality Universe
Up/Down Market Performance



Past performance is not indicative of future returns. The above performance information is based on William Blair's proprietary model and does not in any way relate to the return of the strategy. The strategy may or may not hold the companies included in the Quality quintiles shown. Quality is defined as those companies with good balance sheet metrics, efficiency, and higher returns. Up/down market returns based on MSCI ACWI Index, monthly annualized returns.

Data shown for period between July 31, 1997–September 30, 2018.

Data source: William Blair Global Universe.

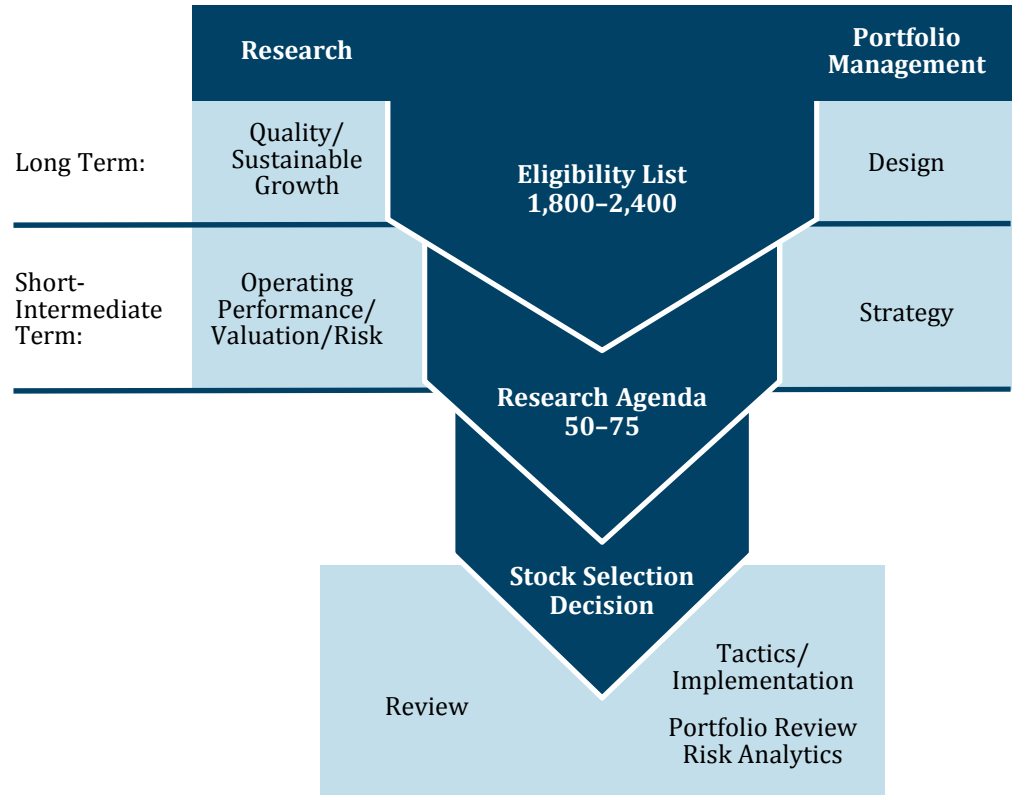
Investment Process: Integrated and Inclusive

Integrated

Each element of the process is directed toward portfolio characteristics and performance objectives

Inclusive

Members of the investment team work in concert toward research conclusions and portfolio decisions



Portfolio Design: International Growth

September 30, 2018

Benchmark:

MSCI ACWI ex-US IMI Index

Position Size:

Dependent on market cap, float, trading volume, price volatility, and fundamental risk/reward

Range:

0.15–4.00% at initial purchase

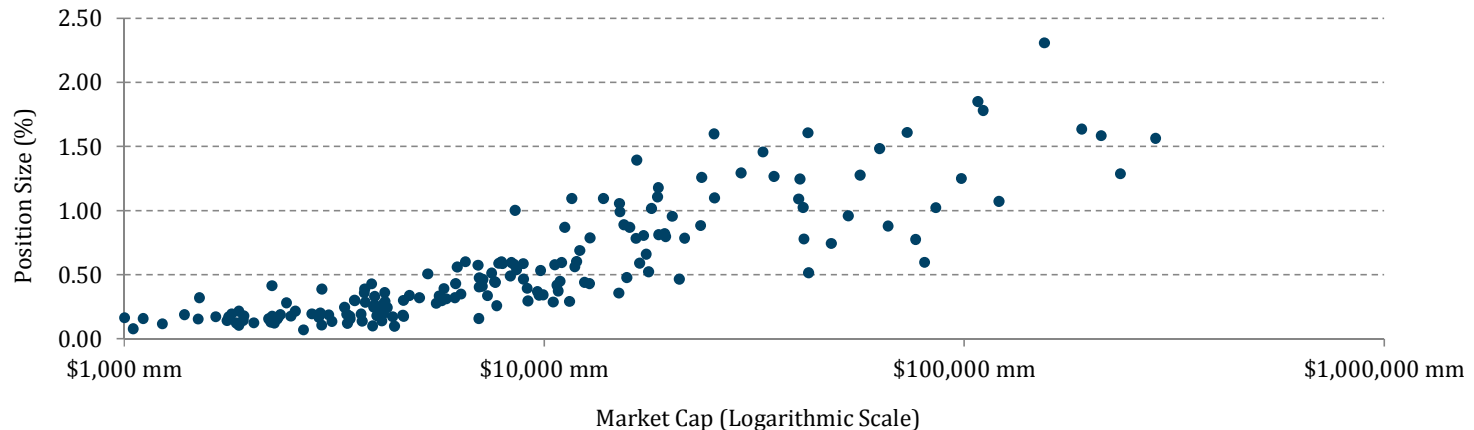
Number of holdings:

180–240

Geographic Exposure	
Region	Range
Pacific ex-Japan	0–15%
Japan	5–25%
Europe + ME ex-U.K.	20–50%
United Kingdom	10–30%
Canada	0–15%
Emerging Asia	0–20%
EMEA	0–10%
Latin America	0–15%
Note: Total Emerging Markets	10–35%

Sector Exposure	
Sector	Range
Communication Svcs.	0–20%
Discretionary	5–25%
Staples	0–20%
Energy	5–20%
Financials	5–35%
Healthcare	5–15%
Industrials	5–25%
IT	0–20%
Materials	0–15%
Real Estate	0–10%
Utilities	0–10%

Capitalization	
Market Cap	Range
Large Cap	20–70%
Mid Cap	25–55%
Small Cap	10–35%



Policy ranges subject to change at any time. Name change from Telecommunication Services to Communication Services effective after close of business on 9/28/18; industry and subindustry reclassifications effective 10/1/18.

Fund Characteristics – Institutional International Growth Fund

As of September 30, 2018

	International Growth	MSCI AC World ex-US IMI Index	Difference
Quality			
WB Quality Model (Percentile)	27	37	
Return on Equity (%)	19.8	14.6	36%
Cash Flow ROIC (%)	18.0	13.9	29%
Debt/Equity (%)	72.5	85.0	-15%
Growth			
WB Growth Model (Percentile)	49	59	
Long-Term Growth (%) ¹	15.0	11.8	27%
5-Year Historic EPS Growth (%)	18.0	12.3	46%
Reinvestment Rate (%)	14.2	10.0	42%
Earnings Trend			
WB Earnings Trend Model (Percentile)	34	46	
EPS Est Rev Breadth (%)	2.8	-1.9	4.7
Valuation			
WB Valuation Model (Percentile)	70	45	
P/E (next 12 months)	19.4	13.3	46%
Dividend Yield (%)	1.8	3.0	-40%
Other			
WB Composite Model (Percentile)	37	37	
Float-adj. weighted average market cap (\$m)	38,399	42,154	-9%
Number of Holdings	184	6,456	
Active Share	85.3	--	

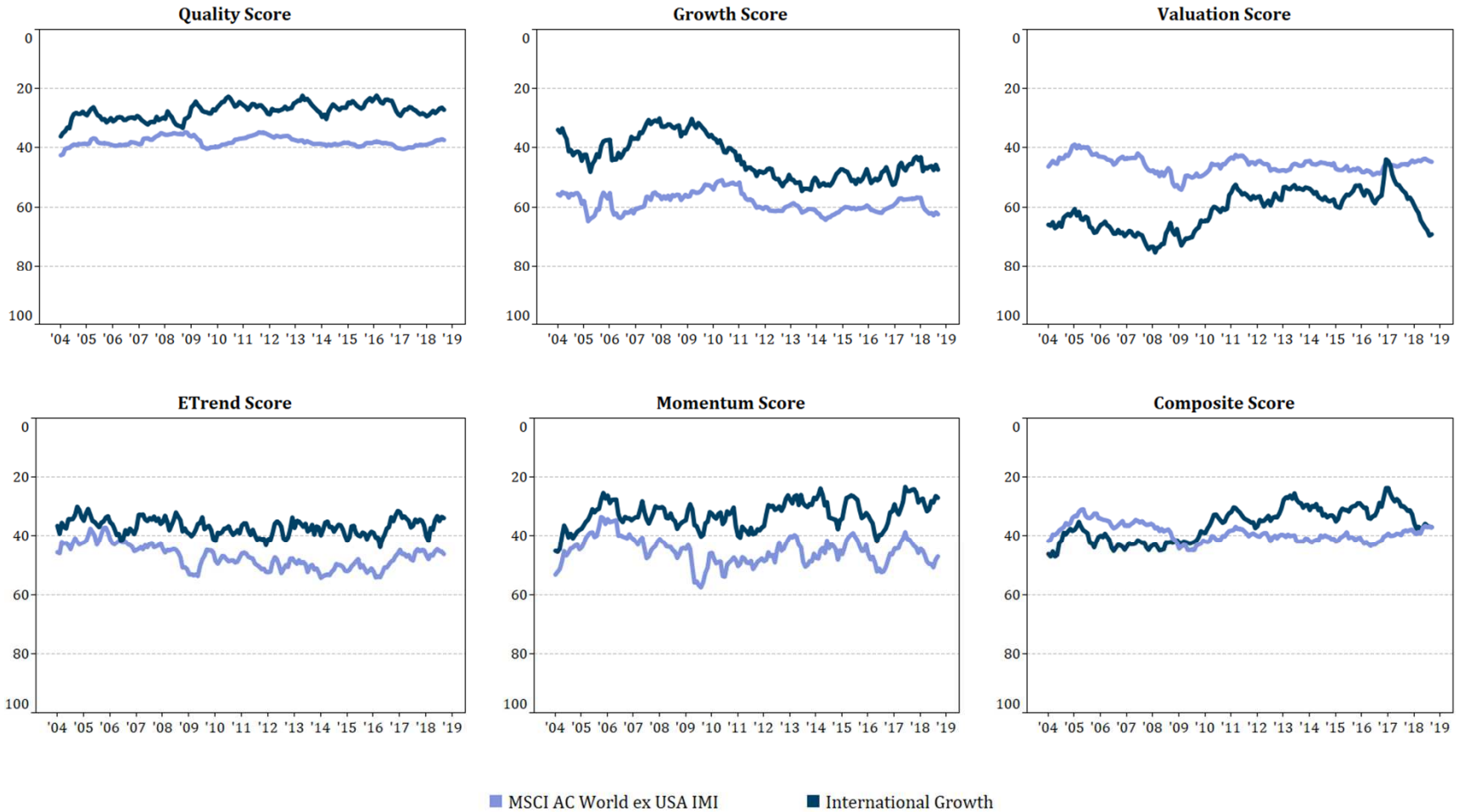
Source: William Blair; Factset; Eagle.

¹This measure represents the weighted average of forecasted growth in earnings expected to be experienced by stocks within the portfolio over the next 3-5 years. This projected earnings growth should not be considered an indication of future performance. From a portfolio perspective, the portfolio P/E ratio and EPS Growth Rate are weighted averages of the individual holdings' P/E ratios and EPS Growth Rates.

The index is comparable to the fund in terms of investment approach but contains significantly more securities. Calculated in FactSet, with the exception of market cap, which is calculated in Eagle. Aggregate scores shown above based on William Blair's quantitative model. For individual and composite ranks, 1 is best and 100 is worst. The MSCI AC World ex-US IMI Index is a free float-adjusted market capitalization index designed to measure global developed and emerging market equity performance, excluding the U.S. Not intended as investment advice.

International Growth Portfolio Characteristics

September 30, 2018



Aggregate scores shown above based on William Blair proprietary quantitative model. For individual and composite ranks, 1 is best and 100 is worst.

Portfolio Analytics and Performance

Photos courtesy of Alaina Anderson and D.J. Neiman



Barcelona



Tokyo

Market Performance – Global Markets

October 31, 2018

	QTD	YTD	2017	2016
Regions				
AC World (DM+EM)	-7.8	-4.4	23.9	8.4
Developed Markets (DM)	-7.7	-2.8	22.4	8.2
Pacific ex JP	-8.8	-11.5	25.9	7.8
Japan	-8.6	-7.7	25.3	3.2
Europe ex UK	-8.2	-10.4	28.0	-0.2
UK	-7.1	-9.7	23.7	-1.6
Canada	-7.9	-10.1	15.6	25.4
USA	-7.4	2.1	20.6	12.0
Emerging Markets (EM)	-8.9	-16.4	36.8	9.9
Asia	-11.1	-17.6	41.8	4.8
EMEA	-6.7	-19.0	24.1	20.7
Latin America	3.2	-4.7	24.8	30.3
Frontier Markets (FM)	-3.7	-16.0	29.9	5.6
Size				
Large Cap	-7.2	-3.2	23.9	8.0
Small Cap	-10.0	-7.4	23.8	11.6
Sectors				
Communication Svcs	-7.4	-11.9	8.2	4.9
Discretionary	-10.2	-5.0	25.0	2.9
Staples	-2.5	-6.2	18.0	2.1
Energy	-9.9	-2.1	5.2	28.4
Financials	-6.4	-10.0	23.1	11.2
Healthcare	-7.6	5.1	22.0	-6.7
Industrials	-10.6	-9.7	26.1	12.6
IT	-9.2	2.9	41.0	12.3
Materials	-9.9	-13.4	29.3	24.4
Real Estate	-4.4	-6.6	16.2	4.1
Utilities	-1.1	-0.6	15.2	7.4
Style				
Quality	3.5	12.7	4.3	2.5
Valuation	3.0	2.7	5.2	14.2
Etrend	0.6	9.5	7.8	-1.1
Momentum	0.9	10.5	13.2	-4.5
Growth	-2.5	-5.1	6.7	-7.5
Composite	4.0	14.4	9.6	7.2

Regional performance is based on IMI region/country indexes. Sector and style values are based on the MSCI ACWI IMI Index. Size values are based on the MSCI ACWI Index. Style values reflect the Quintile 1 minus Quintile 5 spread of William Blair's proprietary quantitative models. Sectors are based on Global Industry Classification (GICS) sectors. Large Cap and Small Cap based on MSCI Global Investable Market Index Methodology. Data in blue reflects the top 20% (highest) values by region, country, sector, and style. Data in red reflects the bottom 20% (lowest) values by region, country, sector, and style.

Past returns are no guarantee of future performance. A direct investment in an unmanaged index is not possible. The Morgan Stanley Capital International (MSCI) All Country World IMI Index is an unmanaged index that includes developed markets and emerging markets. Calculated in FactSet. All index returns are net of dividends. Name change from Telecommunication Services to Communication Services effective after close of business on 9/28/18; industry and subindustry reclassifications effective 10/1/18.

City of Fort Pierce Retirement and Benefit System Portfolio

As of October 31, 2018

Original Investment (10/2/2003)	\$10,392,820
+ Contributions	\$0
- Withdrawals	-\$14,727,816
- (Investment Management Fees & Other Expenses ¹)	-\$1,912,701
+ Dividend Income and Capital Gain Distribution	\$9,599,060
+/- Market Appreciation/(Depreciation)	\$9,604,532
Market Value	\$12,955,895

1. The investment management fee and other expenses are estimates.

Performance Summary

For periods ending October 31, 2018

The table below shows the Institutional International Growth Fund's performance in comparison to its benchmark, the MSCI AC World ex-US IMI Index (net).

Performance (%)	October	YTD	1 Year	Annualized			
				3 Years	5 Years	10 Years	Since Inception ¹
Institutional International Growth Fund	-11.19	-12.61	-10.29	2.81	2.21	8.88	6.73
MSCI AC World ex-US IMI Index (net)	-8.36	-11.35	-8.44	4.52	1.86	7.37	6.61

Calendar Year Performance (%)	2017	2016	2015	2014	2013	2012	2011
Institutional Int'l. Growth Fund	29.53	-2.40	0.09	-2.66	18.90	24.11	-13.66
MSCI AC World ex-US IMI Index (net)	27.81	4.41	-4.60	-3.89	15.82	17.04	-14.31

Calendar Year Performance (%)	2010	2009	2008	2007	2006	2005	2004	2003 ¹
Institutional Int'l. Growth Fund	20.10	42.83	-51.99	18.49	23.45	22.76	18.15	11.76
MSCI AC World ex-US IMI Index (net)	12.73	43.60	-45.99	16.13	26.51	17.68	21.93	13.43

1. City of Fort Pierce Inception Date: 10/2/2003.

Institutional International Growth Fund Expense Ratio (no expense cap in place):

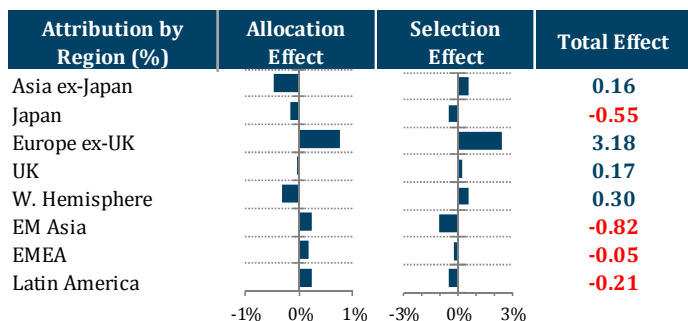
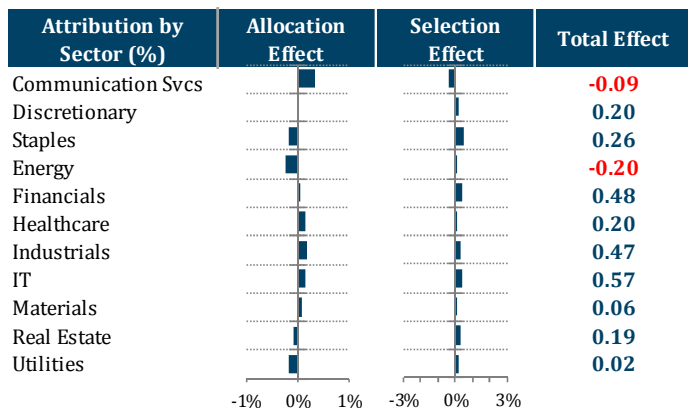
Gross
0.97%

Performance cited represents past performance. Past performance does not guarantee future results and current performance may be lower or higher than the data quoted. Returns shown assume reinvestment of dividends and capital gains. Investment returns and principal will fluctuate with market and economic conditions and you may have a gain or loss when you sell shares. For the most current month-end performance information, please call 1-800-742-7272, or visit our Web site at www.williamblairfunds.com. Institutional Class shares are available to certain institutional investors.

The Morgan Stanley Capital International (MSCI) AC World ex-U.S. IMI Index (net) is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets, excluding the United States. This series approximates the minimum possible dividend reinvestment. An index is unmanaged, does not incur fees or expenses, and cannot be invested in directly

Performance Attribution YTD – Institutional International Growth Fund

As of September 30, 2018



Top Five Contributors (%)			
Security	Sector	Country	Contribution to Relative Return
Wirecard AG	IT	Germany	0.55
Lonza Group AG	Health Care	Switzerland	0.36
TOTAL SA	Energy	France	0.33
Kering SA	Discretionary	France	0.30
Amadeus IT Group SA	IT	Spain	0.28

Top Five Detractors (%)			
Security	Sector	Country	Contribution to Relative Return
Valeo SA	Discretionary	France	-0.22
Maruti Suzuki India Ltd	Discretionary	India	-0.20
Canadian National Railway Co	Industrials	Canada	-0.19
Komatsu Ltd	Industrials	Japan	-0.19
Weibo Corp	IT	China	-0.17

Performance cited represents past performance. Past performance does not guarantee future results and current performance may be lower or higher than the data quoted. Results shown assume reinvestment of dividends and capital gains. Investment returns and principal will fluctuate with market and economic conditions and you may have a gain or loss when you sell shares. For the most current month-end performance information, please call 1-800-742-7272, or visit our Web site at www.williamblairfunds.com.

Attribution by segment is based on estimated returns of equities held within the segments listed. All stocks held during a measurement period, including purchases and sales, are included. Cash is not allocated among segments. Calculations are for attribution analysis only and are not intended to represent simulated performance history. The actual returns may be higher or lower. We calculate attribution using Opturo. Opturo runs transactions-based attribution, taking into account all trading activity. Interaction effect is reallocated into Allocation effect. Sectors based on Global Industry Classification Sectors (GICS). Individual securities listed in this report are for informational purposes only. Holdings are subject to change at any time. This information does not constitute, and should not be construed as, investment advice or recommendations with respect to the securities listed.

The MSCI AC World ex-US IMI Index is a free float-adjusted market capitalization weighted index designed to measure global developed and emerging markets equity performance, excluding the US. An index is unmanaged, does not incur fees or expenses, and cannot be invested in directly. Name change from Telecommunication Services to Communication Services effective after close of business on 9/28/18; industry and subindustry reclassifications effective 10/1/18.

International Growth Strategy Performance in Various Environments

Arithmetic Avg Quarterly Return (%)

		<u>Portfolio (Gross)</u>	<u>Benchmark</u>	
All Quarters (4Q96 - 3Q18)		2.9	1.7	
<i>Quarters in which:</i>	<i>Outperformance</i>			
Index Rose	✓	8.8	7.4	(54/88 Qs)
Index Declined	✓	-6.3	-7.2	(34/88 Qs)
MSCI Growth (Net) Outperformed	✓	3.9	1.9	(45/88 Qs)
MSCI Value(Net) Outperformed	✓	2.0	1.6	(43/88 Qs)
MSCI Small Cap (Net) Outperformed	✓	4.6	3.3	(48/88 Qs)
MSCI EAFE (Net) Outperformed	✓	-1.5	-2.0	(38/88 Qs)
MSCI EM IMI (Net) Outperformed	✓	6.3	4.8	(47/88 Qs)

Consistent outperformance in a variety of market environments. Annualized return (gross) of 9.94% vs. 5.17% for the benchmark since we began managing international equity in house (October 1, 1996).

Composite Inception is December 1, 1992. Data above reflects since inception of the strategy's current management style. At this time, changes were made to the portfolio management team and the way the philosophy was implemented. Actual composite inception precedes this date. This information is supplemental to the composite disclosure slide located in the appendix.

Past performance is not indicative of future returns. Returns for periods greater than one year are annualized. Gross performance results shown do not reflect the deduction of investment management fees, assume the reinvestment of dividends and capital gains, and are net of transaction costs. Performance results will be reduced by the fees incurred in the management of the account. For example, assuming an annual gross return of 8% and an annual management/advisory fee of .40%, the net annualized total return of the portfolio would be 7.58% over a 5-year period. Net investment performance represents the deduction of the highest possible fee. Investment management fees are described in William Blair's Form ADV Part 2A. The benchmark that best reflects the composite's investment strategy is the MSCI All Country World Ex US Investable Market Index (net), which is a free float-adjusted market capitalization index that is designed to measure equity market performance, net of withholding taxes, in the global developed and emerging markets, excluding the US. Prior to 1995, the MSCI All Country World Ex US Index preceded the current benchmark as returns are unavailable back to composite inception for the current benchmark. International investing involves special risk considerations, including currency fluctuations, lower liquidity, economic and political risk. Based on data from the William Blair International Growth Fund, which is closed to new investors. Calculations are for attribution analysis only and are not intended to represent simulated performance history. Regional attribution is based on estimated US\$ price-only returns of equities held within regions for the period Q4 1996 to Q3 2003. Beginning Q3 2003, the returns represent the estimated total equity-only returns of securities held within regions. All stocks held during a measurement period, including purchases and sales, are included. Cash is not allocated among regions and all returns are exclusive of cash. A rounding discrepancy may occur when calculating backup data. Please see composite disclosure in appendix for a complete description of the composite.

International Growth Strategy

Performance analysis by geography

Oct 1 96 to Sep 30 18	Portfolio (Gross)	Index
United Kingdom		
Cumulative	707.4%	272.5%
Annualized	10.0%	6.2%
Europe + ME ex-UK		
Cumulative	946.9%	308.1%
Annualized	11.3%	6.6%
Japan		
Cumulative	281.4%	55.2%
Annualized	6.3%	2.0%
Pacific ex-Japan		
Cumulative	512.7%	338.0%
Annualized	8.6%	6.9%
Canada		
Cumulative	1089.5%	453.2%
Annualized	11.9%	8.1%

Composite Inception is December 1, 1992. Data above reflects since inception of the strategy's current management style. At this time, changes were made to the portfolio management team and the way the philosophy was implemented. Actual composite inception precedes this date. This information is supplemental to the composite disclosure slide located in the appendix.

Past performance is not indicative of future returns. Returns for periods greater than one year are annualized. Gross performance results shown do not reflect the deduction of investment management fees, assume the reinvestment of dividends and capital gains, and are net of transaction costs. Performance results will be reduced by the fees incurred in the management of the account. For example, assuming an annual gross return of 8% and an annual management/advisory fee of .40%, the net annualized total return of the portfolio would be 7.58% over a 5-year period. Net investment performance represents the deduction of the highest possible fee. Investment management fees are described in William Blair's Form ADV Part 2A. The benchmark that best reflects the composite's investment strategy is the MSCI All Country World Ex US Investable Market Index (net), which is a free float-adjusted market capitalization index that is designed to measure equity market performance, net of withholding taxes, in the global developed and emerging markets, excluding the US. Prior to 1995, the MSCI All Country World Ex US Index preceded the current benchmark as returns are unavailable back to composite inception for the current benchmark. International investing involves special risk considerations, including currency fluctuations, lower liquidity, economic and political risk. Based on data from the William Blair International Growth Fund. Calculations are for attribution analysis only and are not intended to represent simulated performance history. All stocks held during the measurement period, including purchases and sales, are included. Cash is not allocated among regions and all returns are exclusive of cash. (1) MSCI UK IMI (net), (2) MSCI Europe ex UK IMI (net), (3) MSCI Japan IMI (net), (4) MSCI Pacific ex-Japan IMI (net), and (5) MSCI Canada IMI (net). This information may be supplied as a supplement to the International Developed Plus composite performance. A rounding discrepancy may occur when calculating backup data. Please see composite disclosure in appendix for a complete description of the composite.

International Growth Strategy

Performance analysis by subsector

Oct 1 96 to Sep 30 18	Portfolio	Index
Developed Large/Mid Cap¹		
Cumulative	662.4%	183.4%
Annualized	9.7%	4.9%
Developed Small Cap²		
Cumulative	1005.2%	283.7%
Annualized	11.5%	6.3%
Emerging Markets³		
Cumulative	943.5%	183.3%
Annualized	11.3%	4.9%

Composite Inception is December 1, 1992. Data above reflects since inception of the strategy's current management style. At this time, changes were made to the portfolio management team and the way the philosophy was implemented. Actual composite inception precedes this date. This information is supplemental to the composite disclosure slide located in the appendix.

Past performance is not indicative of future returns. Returns for periods greater than one year are annualized. Gross performance results shown do not reflect the deduction of investment management fees, assume the reinvestment of dividends and capital gains, and are net of transaction costs. Performance results will be reduced by the fees incurred in the management of the account. For example, assuming an annual gross return of 8% and an annual management/advisory fee of .40%, the net annualized total return of the portfolio would be 7.58% over a 5-year period. Net investment performance represents the deduction of the highest possible fee. Investment management fees are described in William Blair's Form ADV Part 2A. The benchmark that best reflects the composite's investment strategy is the MSCI All Country World Ex US Investable Market Index (net), which is a free float-adjusted market capitalization index that is designed to measure equity market performance, net of withholding taxes, in the global developed and emerging markets, excluding the US. Prior to 1995, the MSCI All Country World Ex US Index preceded the current benchmark as returns are unavailable back to composite inception for the current benchmark. International investing involves special risk considerations, including currency fluctuations, lower liquidity, economic and political risk. Based on data from the William Blair International Growth Fund. Calculations are for attribution analysis only and are not intended to represent simulated performance history. Prior to Q3 1998, small cap is defined as companies with a market capitalization of under \$1 billion. From Q3 1998 to Q4 2003, small cap is defined as companies with a market capitalization of under \$1.5 billion. From Q4 2003 to Q4 2007, small cap is defined as companies with a market capitalization of under \$2 billion. Beginning Q4 2007, small cap is defined as companies with a market capitalization of under \$3 billion. Beginning with Q3 2014, small cap is defined as companies with a market capitalization of under \$4 billion, mid cap is adjusted to \$4 billion to \$15 billion, and large cap to over \$15 billion. For the Large/Mid Cap and Small Cap Segments, is a price-only estimate based on the average month-end market values during the quarter prior for Q4 1998. From Q4 1998 to Q4 1999, Large/Mid Cap and Small Cap segment performance is a total-return estimate based on a monthly buy-and-hold calculation. Beginning Q1 2000, Large/Mid Cap and Small Cap segment performance is a total return estimate based on a daily buy-and-hold calculation. Developed market companies without readily available market capitalization data and cash are excluded. Emerging markets return data represents the returns of the Emerging Markets Growth composite until 1/1/2007 and then the emerging portion of international growth thereafter. Indices: (1) MSCI EAFE; (2) MSCI World ex-US Small Cap (Net); (3) MSCI EM IMI. For consistency, index returns prior to Q4 1998 are price-only except for emerging markets. Beginning with Q4 1998, index returns are total return. Source: FactSet Portfolio Analysis and SPAR. Please see composite disclosure in appendix for a complete description of the composite.

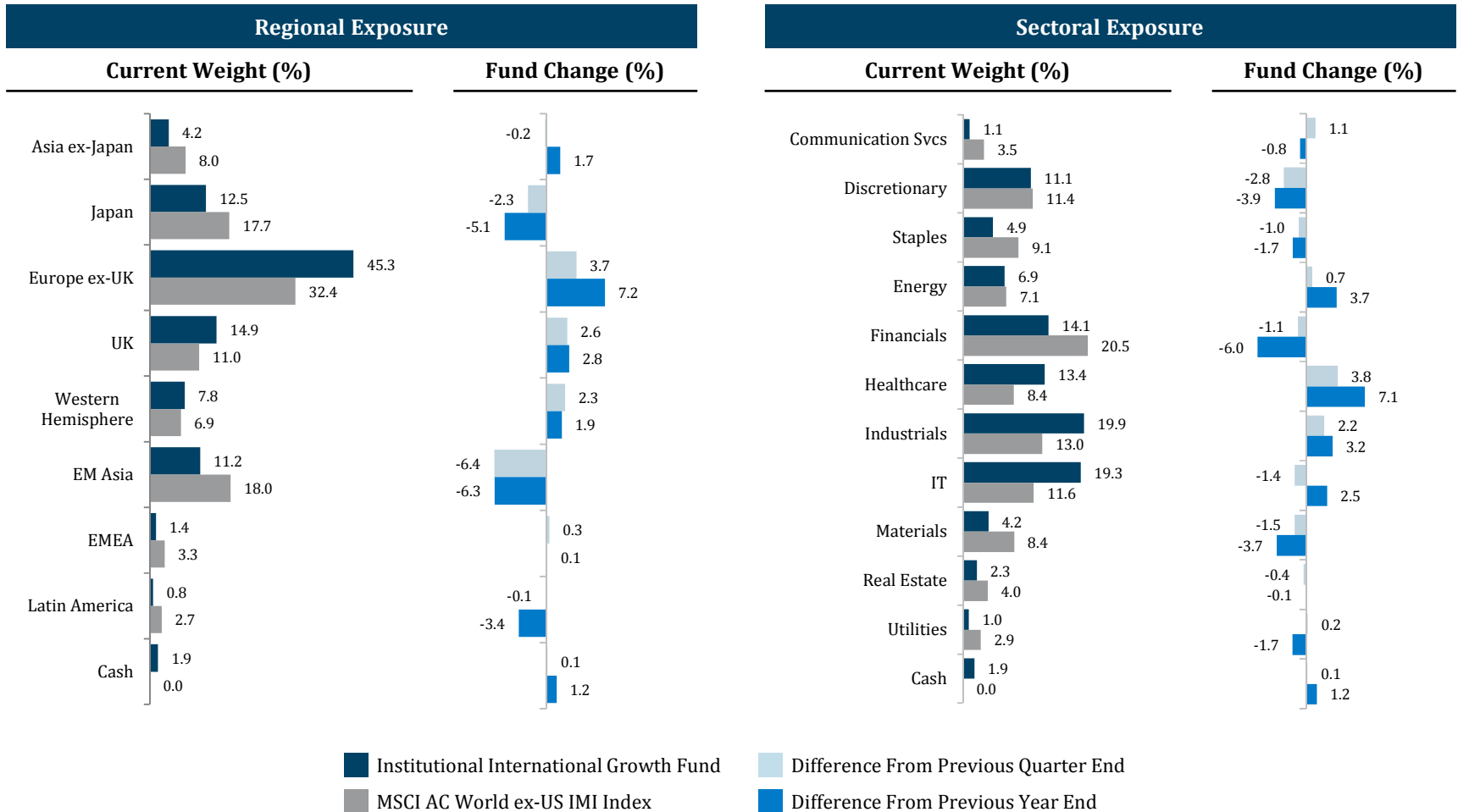
Positioning and Strategy

Photos courtesy of Ken McAtamney, Drew Buckley, Joel Gomberg, Andy Flynn and Jack Murphy



Fund Positioning – Institutional International Growth Fund

As of September 30, 2018



Cash incorporates cash equivalents and accruals. Region and sector distribution calculated in Eagle based on Global Industry Classification (GICS) Sectors. The MSCI AC World ex-US IMI Index is a free float-adjusted market capitalization weighted index designed to measure global developed and emerging markets equity performance, excluding the U.S. Not intended as investment advice. Name change from Telecommunication Services to Communication Services effective after close of business on 9/28/18; industry and subindustry reclassifications effective 10/1/18.

Holdings: Institutional International Growth Fund

September 30, 2018

	Portfolio Weight		Portfolio Weight		Portfolio Weight
Pacific Ex Japan	4.23	Japan (continued)		Europe+ME Ex UK (continued)	
Australia	2.03	Japan (continued)		France (continued)	
Csl Ltd	0.88	Nihon M&A Center Inc	0.29	Vinci SA	0.74
Bhp Billiton Limited	0.60	Pola Orbis Holdings Inc	0.24	Ubisoft Entertainment	0.58
Aristocrat Leisure Ltd	0.56	Topcon Corp	0.21	Hermes International	0.46
Hong Kong	2.20	Sankyu Inc	0.20	Teleperformance	0.45
Aia Group Ltd	1.84	Zenkoku Hosho Co Ltd	0.18	Ipsen	0.35
Galaxy Entertainment Group L	0.35	Nichias Corp	0.16	Orpea	0.31
Japan	12.54	Welcia Holdings Co Ltd	0.07	Rubis	0.17
Japan	12.54	Europe+ME Ex UK	45.26	Nexity	0.17
Daikin Industries Ltd	1.45	Belgium	1.17	Plastic Omnium	0.12
Shiseido Co Ltd	1.29	Kbc Group NV	1.17	Germany	6.25
Keyence Corp	1.27	Denmark	4.19	Vonovia Se	1.25
Nintendo Co Ltd	1.02	Dsv A/S	1.39	Wirecard AG	1.09
Terumo Corp	1.01	Novo Nordisk A/S-B	1.02	Mtu Aero Engines AG	1.09
Shimadzu Corp	0.57	Orsted A/S	0.79	Sap Se	1.07
Asahi Group Holdings Ltd	0.48	Coloplast-B	0.69	Qiagen N.V.	0.54
Technopro Holdings Inc	0.41	Royal Unibrew	0.22	Fuchs Petrolub Se -Pref	0.43
Yakult Honsha Co Ltd	0.40	Ambu A/S-B	0.10	Puma Se	0.23
Kose Corp	0.39	Finland	0.57	Carl Zeiss Meditec Ag - Br	0.19
Tis Inc	0.36	Neste Oyj	0.57	Kion Group AG	0.17
Taisei Corp	0.34	France	12.28	Norma Group Se	0.12
Hoshizaki Corp	0.33	Total SA	2.30	Washtec AG	0.07
Misumi Group Inc	0.33	Airbus Se	1.60	Ireland	1.58
Asahi Intecc Co Ltd	0.33	Kering	1.24	Icon PLC	0.59
Zozo Inc	0.32	Thales SA	1.05	Smurfit Kappa Group PLC	0.58
Monotaro Co Ltd	0.31	Arkema	1.00	Kingspan Group PLC	0.41
Nomura Research Institute Lt	0.29	Capgemini Se	0.95	Israel	0.32
Nitori Holdings Co Ltd	0.29	Dassault Systemes SA	0.79	Wix.Com Ltd	0.32

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Holdings: Institutional International Growth Fund

September 30, 2018

	Portfolio Weight		Portfolio Weight		Portfolio Weight
Europe+ME Ex UK (continued)		Europe+ME Ex UK (continued)		UK (continued)	
Italy	2.47	Sweden (continued)		United Kingdom (continued)	
Ferrari NV	0.59	Epiroc Ab-A	0.51	Hiscox Ltd	0.43
Fincobank Spa	0.50	Boliden AB	0.44	Victrex PLC	0.39
Banca Generali Spa	0.32	Swedish Orphan Biovitrum AB	0.34	Wh Smith PLC	0.39
Recordati Spa	0.29	Fabege AB	0.19	Fevertree Drinks PLC	0.30
Moncler Spa	0.26	Nolato Ab-B Shs	0.12	Intertek Group PLC	0.28
Diasorin Spa	0.19	Switzerland	3.77	Rotork PLC	0.28
Interpump Group Spa	0.17	Lonza Group Ag-Reg	1.59	Aveva Group PLC	0.28
Technogym Spa	0.16	Partners Group Holding AG	1.09	Weir Group Plc/The	0.27
Luxembourg	1.19	Straumann Holding Ag-Reg	0.59	Intermediate Capital Group	0.26
Tenaris SA	0.60	Logitech International-Reg	0.40	Beazley PLC	0.25
Eurofins Scientific	0.60	Belimo Holding Ag-Reg	0.10	Kindred Group PLC	0.21
Netherlands	4.87	UK	14.90	Electrocomponents PLC	0.19
Koninklijke Philips NV	1.60	United Kingdom	14.90	Big Yellow Group PLC	0.19
Royal Dutch Shell Plc-A Shs	1.56	Compass Group PLC	1.26	Greggs PLC	0.19
Wolters Kluwer	0.80	Astrazeneca PLC	1.25	Abcam PLC	0.18
Asml Holding NV	0.77	Ashtead Group PLC	0.89	Renishaw PLC	0.17
Euronext NV	0.14	Experian PLC	0.88	Dechra Pharmaceuticals PLC	0.17
Norway	0.36	Carnival PLC	0.87	Synthomer PLC	0.14
Tgs Nopec Geophysical Co Asa	0.36	London Stock Exchange Group	0.81	Close Brothers Group PLC	0.13
Spain	2.24	Relx PLC	0.78	Metro Bank PLC	0.12
Amadeus It Group SA	1.09	3i Group PLC	0.60	W Hemisphere	7.76
Acs Actividades Cons Y Serv	0.59	Segro PLC	0.49	Canada	7.76
Bankinter SA	0.56	Spirax-Sarco Engineering PLC	0.47	Toronto-Dominion Bank	1.77
Sweden	3.98	Croda International PLC	0.46	Suncor Energy Inc	1.48
Hexagon Ab-B Shs	0.99	Halma PLC	0.46	Rogers Communications Inc-B	1.10
Atlas Copco Ab-A Shs	0.82	Melrose Industries PLC	0.44	Lululemon Athletica Inc	0.78
Alfa Laval AB	0.58	Rentokil Initial PLC	0.44	Alimentation Couche-Tard -B	0.78

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Holdings: Institutional International Growth Fund

September 30, 2018

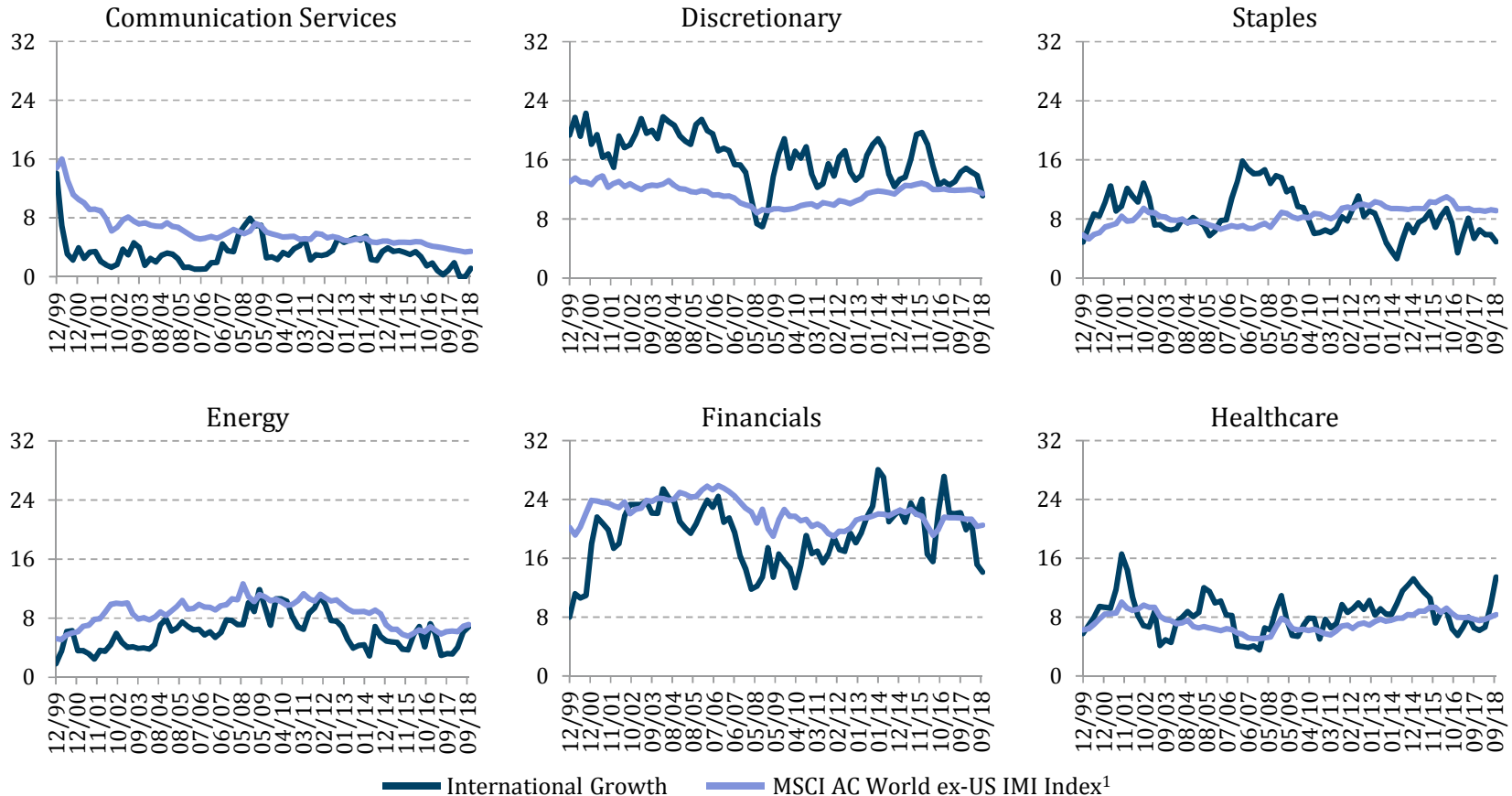
	Portfolio Weight		Portfolio Weight		Portfolio Weight
W Hemisphere (continued)		EM Asia (continued)		Latin America	0.76
Canada (continued)		Indonesia	0.87	Brazil	0.24
Shopify Inc - Class A	0.66	Bank Central Asia Tbk Pt	0.87	M Dias Branco SA	0.16
Dollarama Inc	0.53	South Korea	0.71	Via Varejo SA	0.08
Brookfield Asset Manage-Cl A	0.52	Samsung Sdi Co Ltd	0.43	Peru	0.52
Finning International Inc	0.14	Hotel Shilla Co Ltd	0.18	Credicorp Ltd	0.52
EM Asia	11.23	Hugel Inc	0.10	Cash	1.89
China	5.63	Taiwan	1.85	Total	100.00
Alibaba Group Holding-Sp Adr	1.63	Taiwan Semiconductor-Sp Adr	1.58		
Tencent Holdings Ltd	1.28	Eclat Textile Company Ltd	0.15		
Ping An Insurance Group Co-H	0.96	Hiwin Technologies Corp	0.12		
Shenzhou International Group	0.37	EMEA	1.42		
Cspc Pharmaceutical Group Lt	0.34	Russia	0.47		
China Mengniu Dairy Co	0.29	Yandex Nv-A	0.37		
Huazhu Group Ltd-Adr	0.24	Globaltra-Spons Gdr Reg S	0.10		
Weibo Corp-Spon Adr	0.18	South Africa	0.76		
Li Ning Co Ltd	0.17	Rmb Holdings Ltd	0.26		
Baozun Inc-Spn Adr	0.17	Mr Price Group Ltd	0.25		
India	2.17	Bid Corp Ltd	0.16		
Hdfc Bank Limited	0.48	Bidvest Group Ltd	0.10		
Maruti Suzuki India Ltd	0.42	United Arab Emirates	0.18		
Indusind Bank Ltd	0.28	Nmc Health PLC	0.18		
Makemytrip Ltd	0.19				
Titan Co Ltd	0.15				
Britannia Industries Ltd	0.15				
Hexaware Technologies Ltd	0.15				
Pidilite Industries Ltd	0.14				
Motherson Sumi Systems Ltd	0.13				
Interglobe Aviation Ltd	0.08				

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Historical International Growth Sector Weightings

September 30, 2018

% of Portfolio



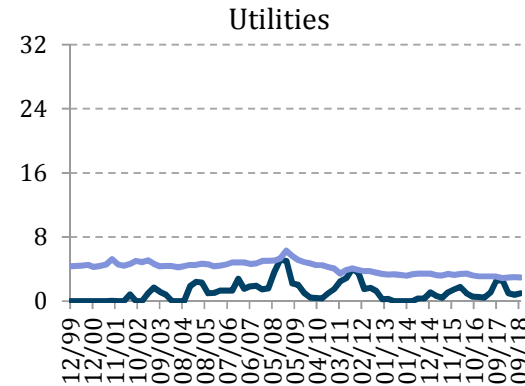
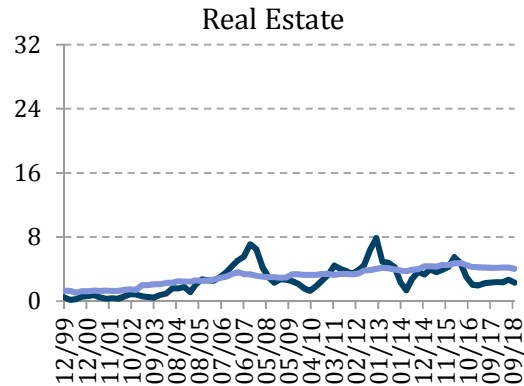
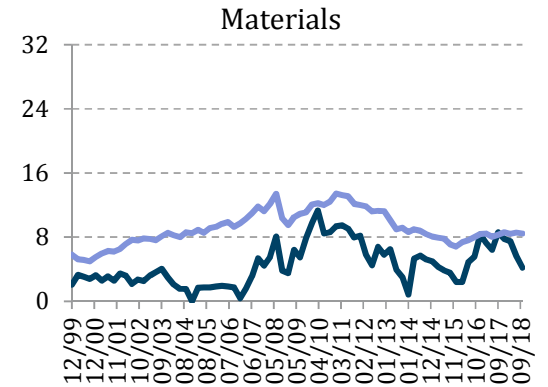
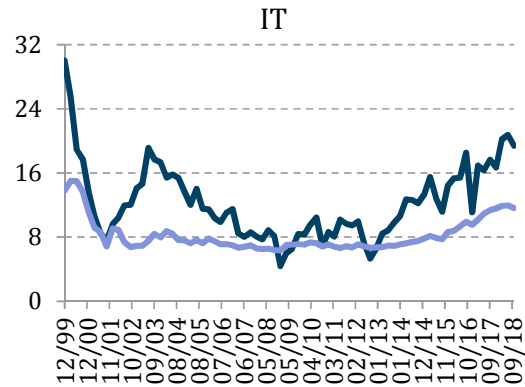
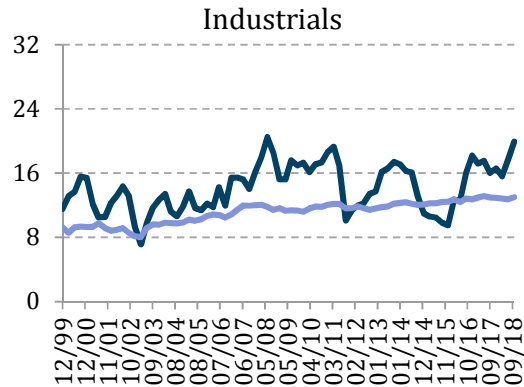
¹Prior to March 31, 2003, benchmark data is taken from the MSCI AC World ex-US Index.

The data shown above is based on the strategy's representative portfolio. Calculated in Eagle. The index is comparable to the strategy in terms of investment approach but contains significantly more securities. Cash incorporates cash equivalents and accruals. Cash is a residual of the stock selection process. Sectors based on GICS (Global Industry Classification Sectors). Name change from Telecommunication Services to Communication Services effective after close of business on 9/28/18; industry and subindustry reclassifications effective 10/1/18.

Historical International Growth Sector Weightings

September 30, 2018

% of Portfolio



█ International Growth
█ MSCI AC World ex-US IMI Index¹

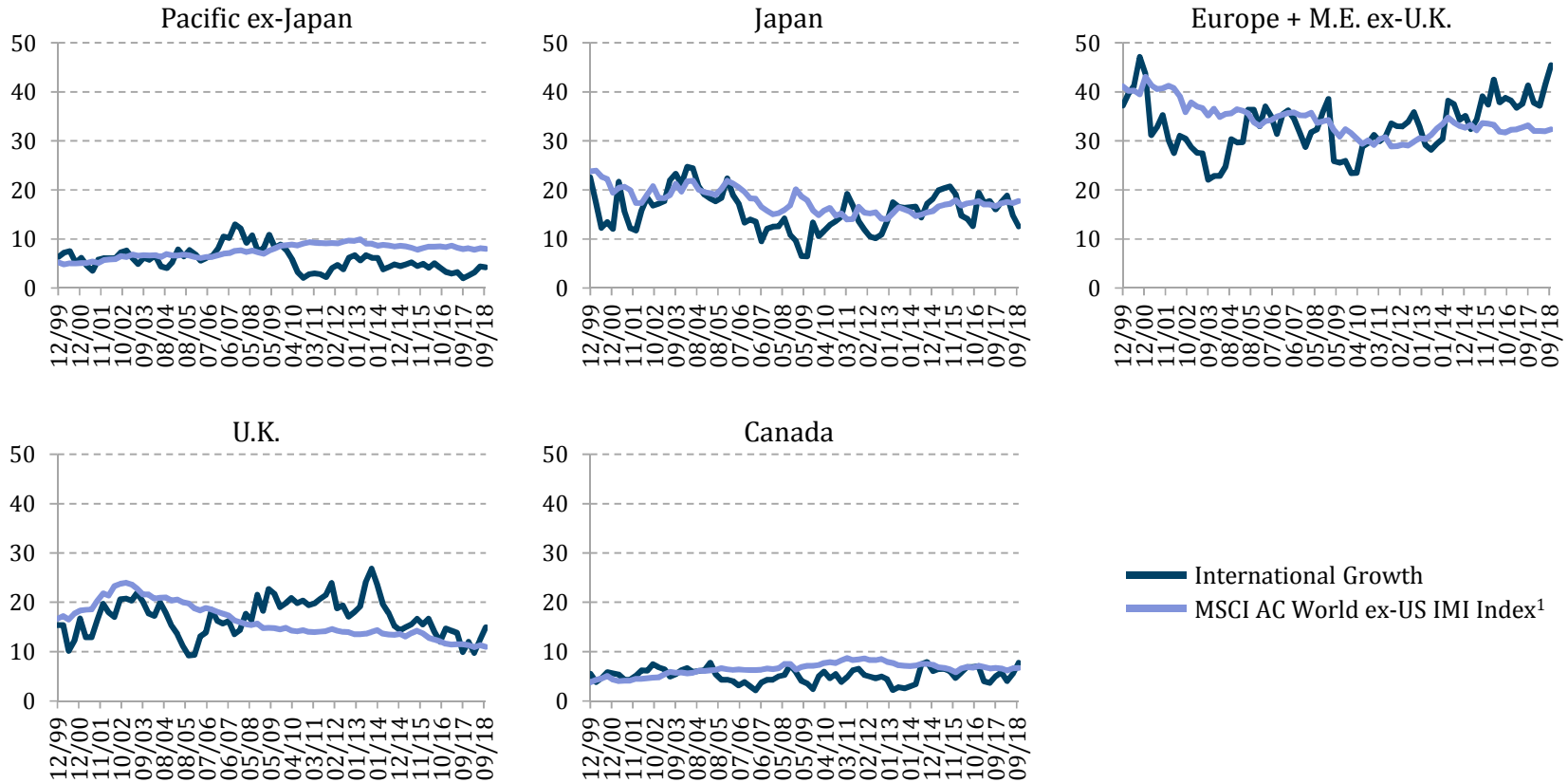
¹Prior to March 31, 2003, benchmark data is taken from the MSCI AC World ex-US Index.

The data shown above is based on the strategy's representative portfolio. Calculated in Eagle. The index is comparable to the strategy in terms of investment approach but contains significantly more securities. Cash incorporates cash equivalents and accruals. Cash is a residual of the stock selection process. Sectors based on GICS (Global Industry Classification Sectors).

Historical International Growth Regional Weightings

September 30, 2018

% of Portfolio



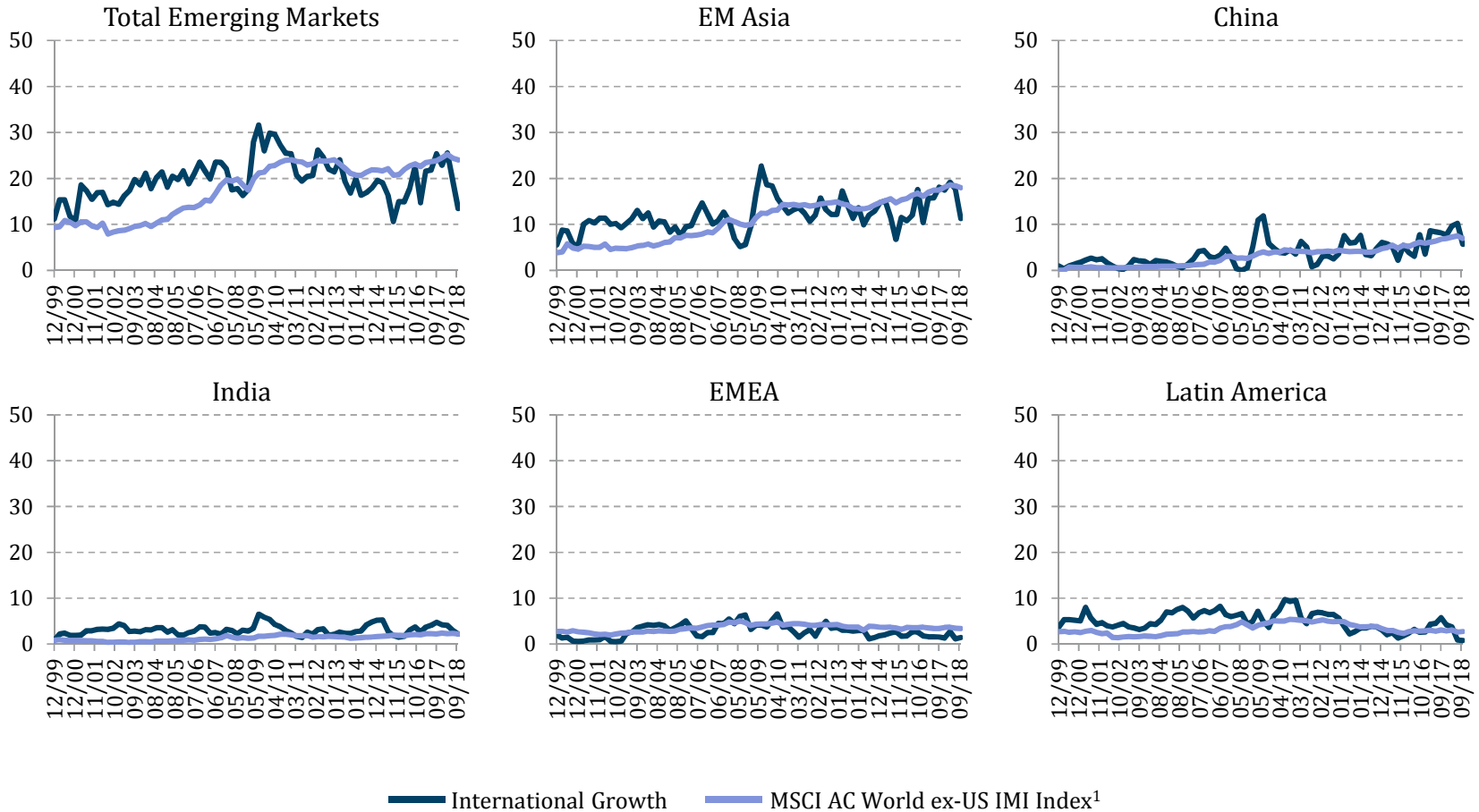
¹Prior to March 31, 2003, benchmark data is taken from the MSCI AC World ex-US Index.

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Historical International Growth Regional Weightings

September 30, 2018

% of Portfolio



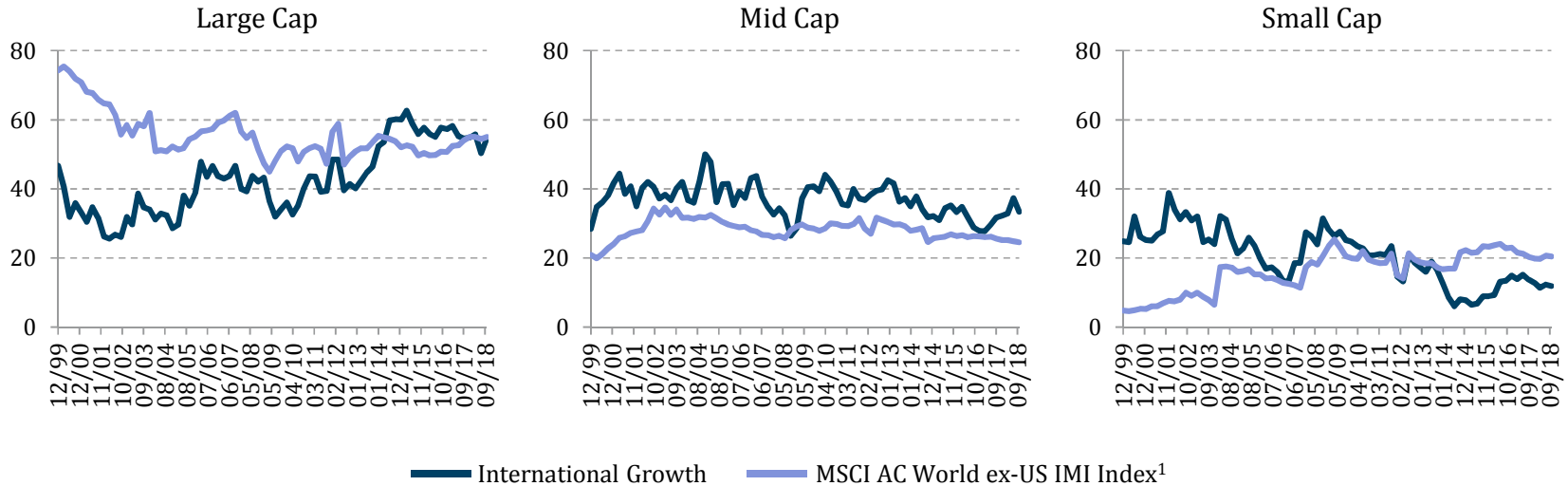
¹Prior to March 31, 2003, benchmark data is taken from the MSCI AC World ex-US Index.

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Historical International Growth Market Cap Weightings

September 30, 2018

% of Portfolio



¹Prior to March 31, 2003, benchmark data is taken from the MSCI AC World ex-US Index.

Beginning with 3Q 1998, market caps were defined by small, mid, and large caps as \$1.5 billion, \$1.5 billion to \$10 billion, and over \$10 billion, respectively. Beginning with 1Q 2004, these figures were adjusted to \$2 billion, \$2 billion to \$12 billion, and over \$12 billion. Beginning with 4Q 2007, these figures were adjusted to \$3 billion, \$3 billion to \$15 billion, and over \$15 billion. Beginning with 3Q 2014, these figures were adjusted to \$4 billion, \$4 billion to \$15 billion, and over \$15 billion. The data shown above is based on the strategy's representative portfolio. Calculated in Eagle. The index is comparable to the strategy in terms of investment approach but contains significantly more securities. Cash incorporates cash equivalents and accruals. Cash is a residual of the stock selection process.

Market Overview/Strategy

Photos courtesy of Vivian Thurston and Andrew Siepker



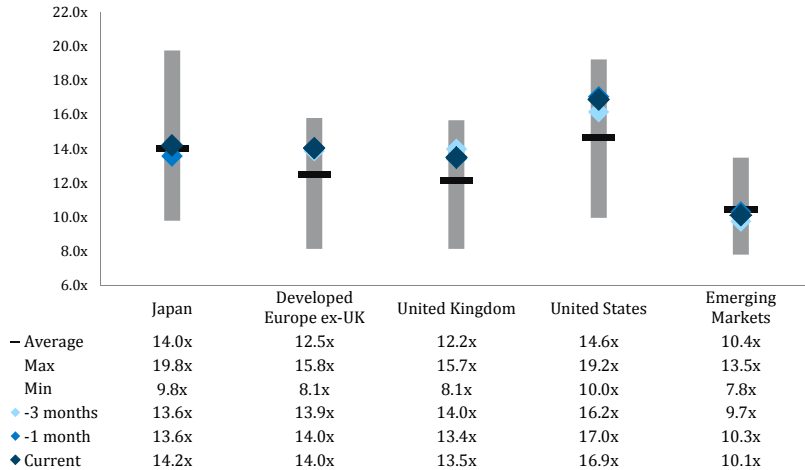
London



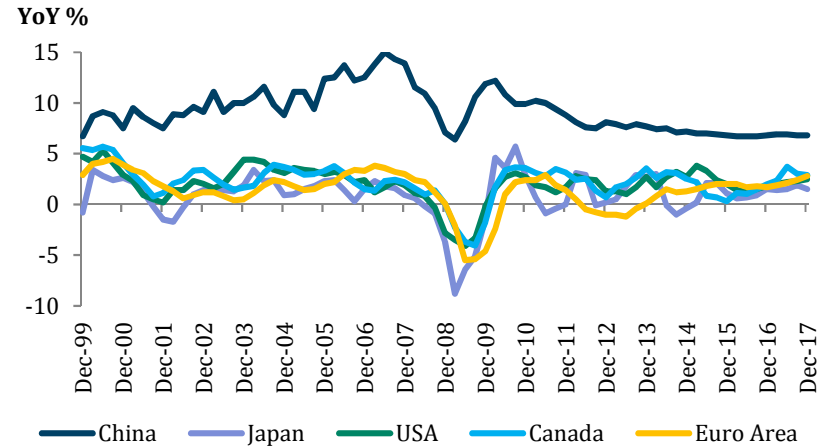
Mumbai

Global Equity Market Environment

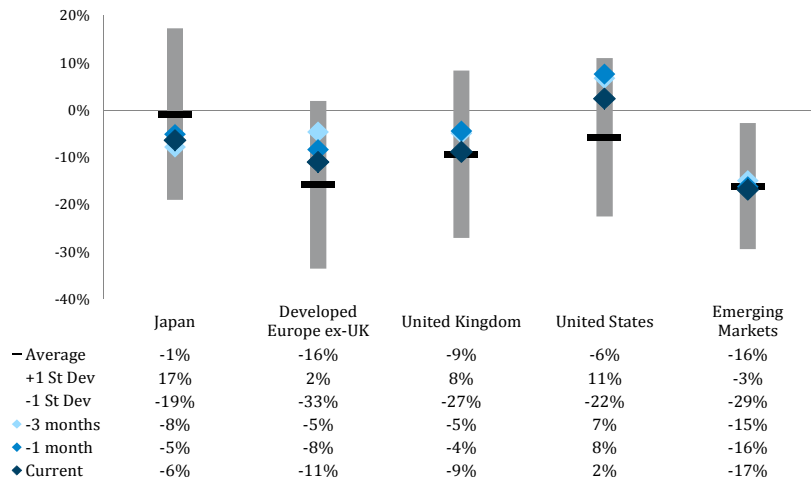
Regional Valuations FY2 P/E vs 10 Year History



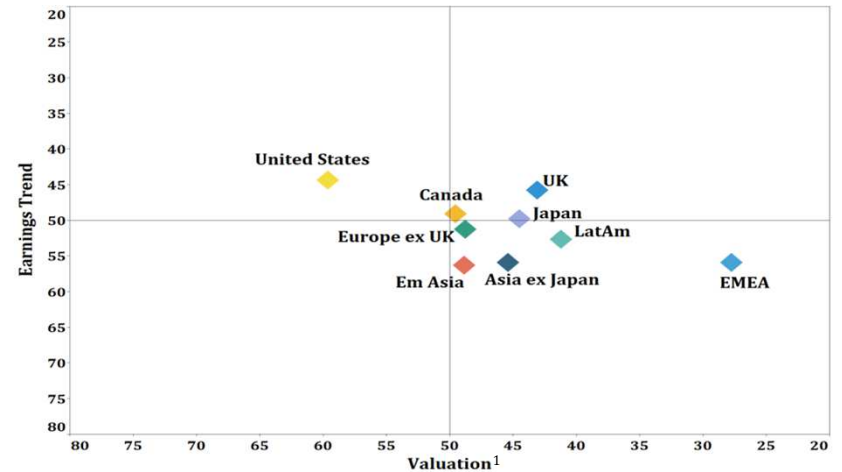
Real GDP Growth by Region - YoY (%)



Regional Earnings Revisions vs 10 Year History

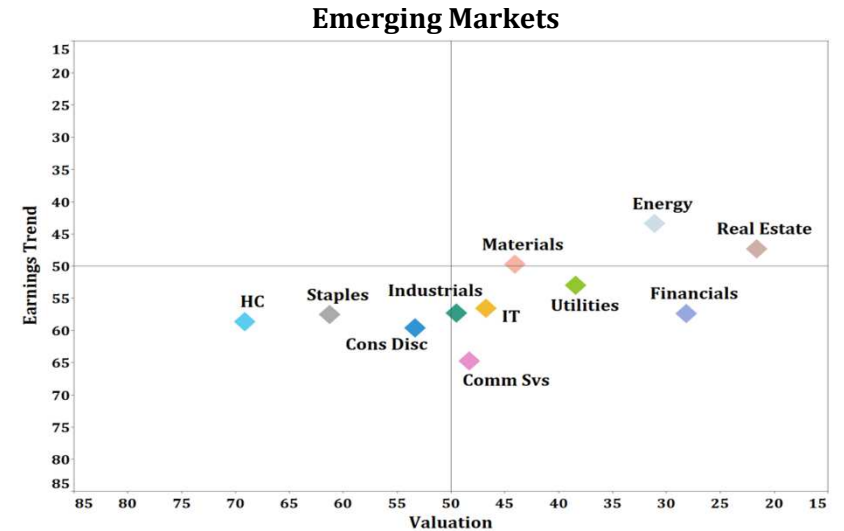
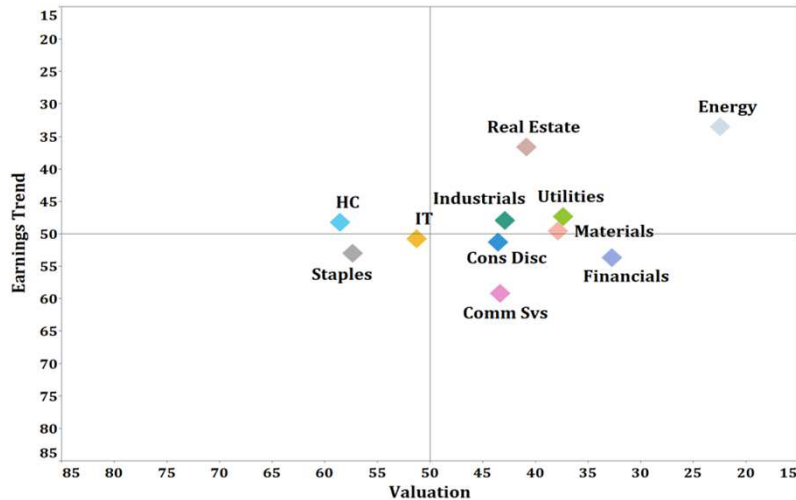
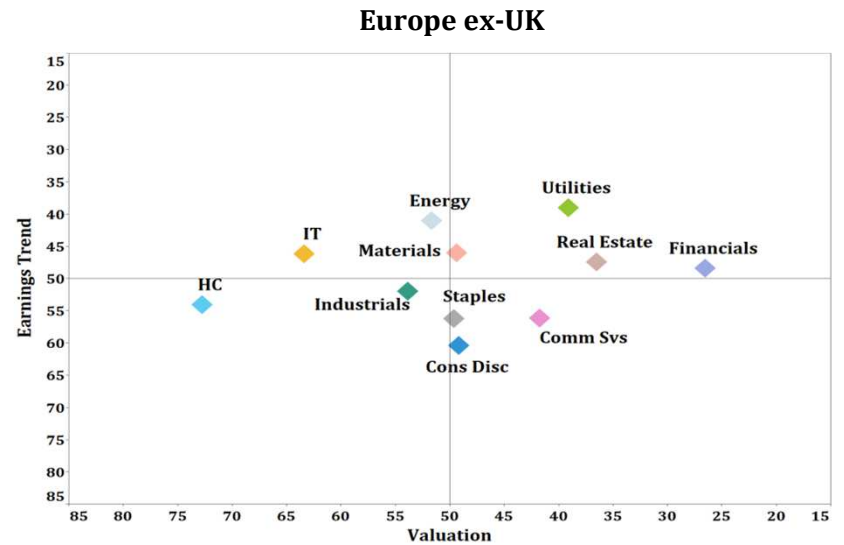
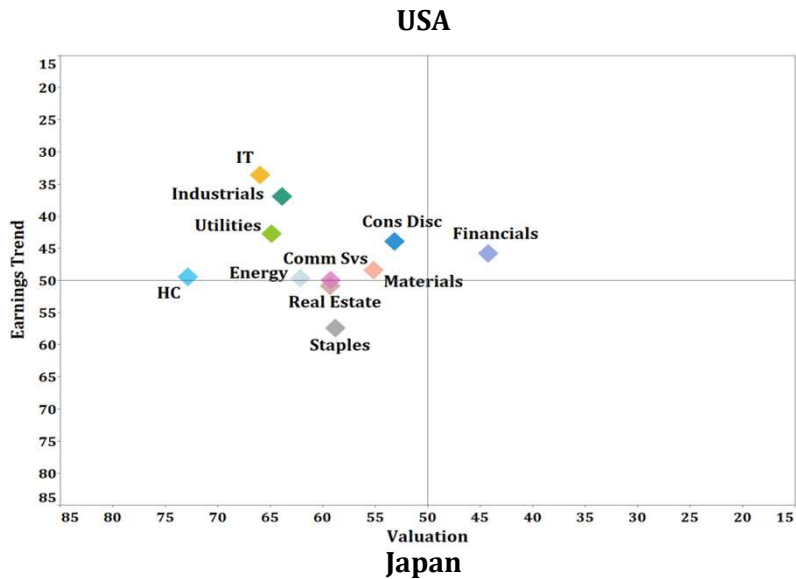


Global Earnings Trend and Valuation Score by Region



¹Scores based on William Blair Investment Management's proprietary research management & investment process platform. 1 is Best, 100 is Worst. Based on the MSCI AC World IMI. Sectors based on Global Industry Classification Sectors (GICS). Data as of September 2018. Source: Bloomberg, William Blair Quantitative Models, Datastream, FactSet.

Strong Earnings Across Developed Markets at Different Valuations



Note: Scores based on William Blair Investment Management's proprietary research management & investment process platform. 1 is Best, 100 is Worst. Based on the MSCI AC World IMI. Sectors based on Global Industry Classification Sectors (GICS). Data as of September 2018. William Blair Quantitative Models, Datastream, FactSet.

Global Macroeconomic Scorecard

- Growth has decelerated across most Developed Markets with the exception of the USA
- Ongoing deceleration in orders-inventories, a component of manufacturing PMIs
- Europe and Japan consumer spending remains relatively weak
- China retail sales have decelerated
- Growth in Emerging Markets remains firm

Countries	Supply Side Indicators									Demand Side Indicators					
	IP volume, YoY % change			manufacturing PMIs			m. PMIs: orders - inventories			retail sales volume, YoY % change			autos, mn units, YoY % change		
	latest	1-m Δ	3-m Δ	latest	1-m Δ	3-m Δ	latest	1-m Δ	3-m Δ	latest	1-m Δ	3-m Δ	latest	1-m Δ	3-m Δ
DMs	2.9	-0.3	-0.6	53.8	-0.2	-0.9	3.5	-0.3	-1.6						
US	3.7	0.1	0.0	54.7	-0.6	-1.7	4.1	-0.1	-2.6	3.5	0.4	1.0	1.3	-0.5	-0.5
Euro Area	1.5	-0.5	-1.0	54.6	-0.5	-0.9	3.2	-0.4	-1.5	1.4	-0.1	-0.2	4.3	1.8	0.1
Germany	2.3	-0.1	-0.1	55.9	-1.0	-1.0	4.0	-0.5	-2.0	0.8	-0.7	-0.6	2.5	2.6	-2.6
UK	1.1	-0.3	-1.4	52.8	-1.0	-1.4	4.1	-0.3	0.8	3.5	0.8	2.1	6.9	6.6	7.5
Japan	1.7	-0.3	-1.0	52.5	-0.3	-0.6	3.6	-0.3	-1.6	0.5	-0.1	0.2	0.3	0.9	0.4
Canada	3.6	-0.8	-0.1	56.8	-0.1	0.6	7.6	-0.2	-0.1	0.8	-0.1	-0.5	-1.2	-0.3	-4.0
Australia										0.6	0.0	-0.4			
EMs	4.2	0.0	-0.3	50.8	-0.2	-0.3	2.7	-0.1	0.3						
Brazil	-0.1	-0.5	-3.7	51.1	0.6	0.4	2.3	1.0	1.3	2.4	-1.3	-0.4	11.3	3.8	-5.1
China	6.3	-0.3	-0.5	50.6	-0.2	-0.5	2.4	0.1	0.7	1.5	-0.4	-1.2	1.6	-5.5	0.0
India	5.8	0.7	0.2	51.7	-0.6	0.5	7.2	-1.1	-0.9				18.3	-3.4	11.1
Indonesia	4.6	0.7	-0.3	51.9	1.4	0.2	2.7	0.5	-0.2	4.5	-0.4	1.8	7.1	3.9	2.9
Korea	1.3	-0.1	2.1	49.9	1.6	1.0	0.7	-0.2	1.8	4.8	0.3	-1.3	0.6	-0.3	0.6
Mexico	0.7	0.3	0.5	50.7	-1.4	-0.3	0.5	-0.1	-0.9	2.5	0.1	1.1	-2.2	-1.6	5.5
Russia	3.2	0.0	-0.1	48.9	0.8	-0.9				3.0	0.1	0.7	13.2	-2.3	-5.6
S. Africa	1.5	1.1	1.3	49.3	-1.6	-1.1				2.0	0.2	-1.9	2.1	-1.0	-1.7
Taiwan	4.5	-1.7	-2.0	53.0	-0.1	-0.4	1.3	-0.4	-0.8						
Thailand				49.9	-0.2	-1.2	-0.2	0.3	0.2						
Turkey	5.0	-1.4	-5.0	46.4	-2.6	0.0	-1.2	-0.5	1.6	8.0	-0.7	-1.6	-22.2	-7.6	-17.7

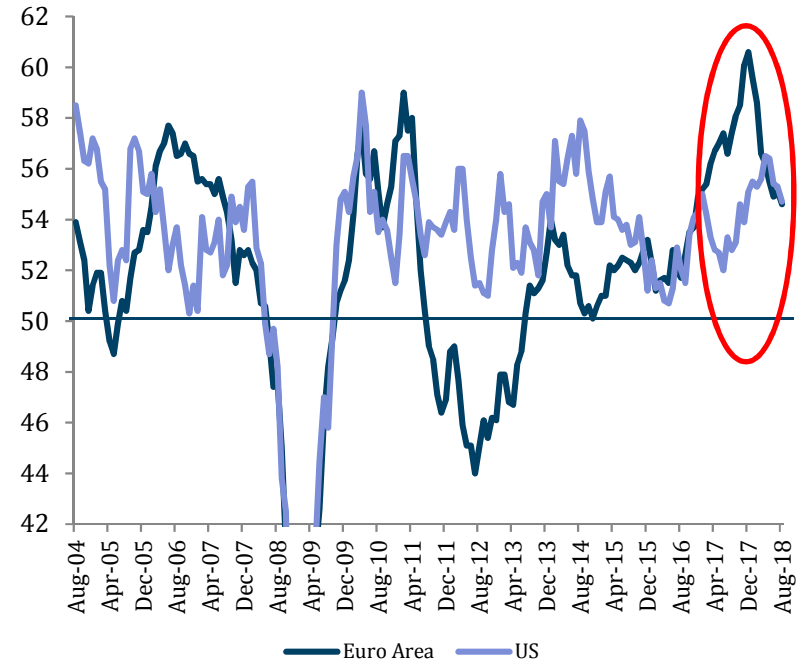
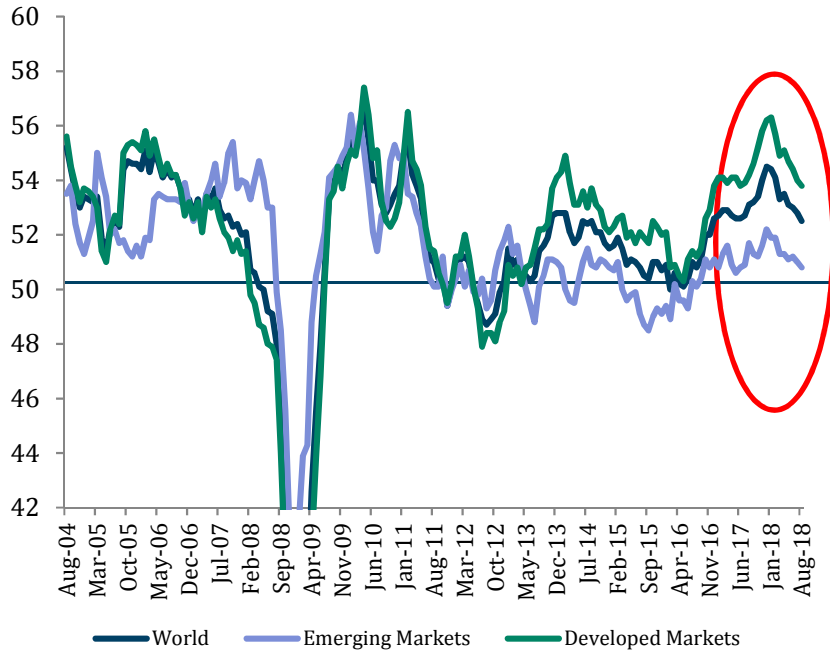
Improving Growth

Weakening Growth

Data as of September 2018.
Source: Bloomberg, Markit.

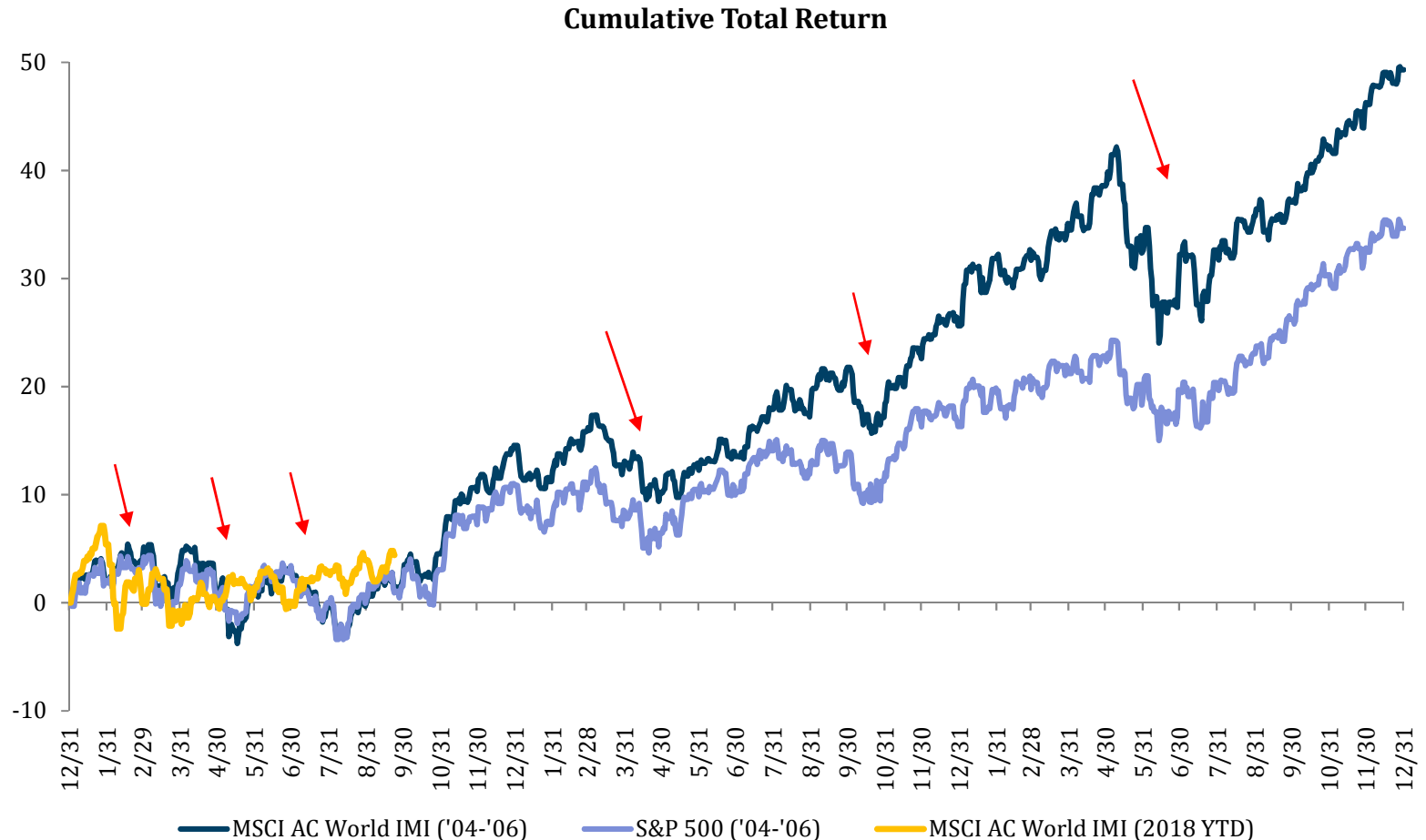
From Recovery to Expansion

Global Manufacturing PMIs



Data as of September 2018.
Source: Markit.

Equity Performance in Expansion is Volatile



Past performance is not indicative of future returns.

Data as of September 2018.

The MSCI All Country World IMI Index measures large, mid, and small cap equity market performance in the global developed and emerging markets. The S&P 500 Index measures the performance of the large capitalization segment of the U.S. equity market. A direct investment in an unmanaged index is not possible.

Appendix



Chicago



London



Zurich



Sydney

Investing in Our Communities

Deep philanthropic commitments across the globe

We are committed to serving our neighbors and being a long-term partner to the communities where we live and work.

We also support our employees' philanthropic initiatives by matching their personal financial contributions and providing support for those that serve on charitable boards.



Civic



Cultural



Music Institute of Chicago's ArtsLink program.



Education



Health



Bunker Labs



Whole Kids Foundation



Midtown Educational Foundation



Hands On London



Anne Frank Education Center in Frankfurt

Sample Research Report

Recommendation Report

ABC Corporation (ABC DC)

Outperform

Vivian Lin Thurston

Date of Recommendation: 4/13/2015

Investment Management Research		Global Quant Scores	
Rating	Outperform	Composite	22
	<i>Leader</i>	Quality	2
Symbol	ABC DC	Valuation	85
Exchange	COPENHAGEN STOCK EXCHANGE	Earnings Trend	18
Headquarters	Denmark	Price Momentum	4
Focus Country	Denmark	Volatility	29
GICS Sector	Consumer Discretionary	[Scale: 1 = Best 100 = Worst]	
GICS Industry	Textiles, Apparel & Luxury Goods	Blair LTG Estimate	15.2%

Investment Conclusion (Last Modified: 10/21/2015)

What is the mix of long term characteristics, current fundamentals and thematic considerations that make the stock attractive? What is the case for sustaining or enhancing fundamental expectations and valuation? Are you currently recommending purchase or anticipating a development that would suggest a better opportunity is likely in the foreseeable future?

Business Activities and Segment Analysis (Last Modified: 10/21/2015)

Briefly describe the company's primary business units, products or end markets. Frame in terms of clarifying the mix of revenues and profits.

Financial/Trading Data		Estimate Summary		
Price (DKK)	760.00	GAAP	Street	Author
Market Cap (\$ mm)	95,514	LTG (DKK)	21.7	25.0
Mkt Cap Float Adj (\$ mm)	80,890.6	EPS FYA(DKK)	24.70	9.32
YTD % Change	52.8	FY1	34.09	15.97
Shares Outstanding (mm)	122.3	FY2	46.91	20.53
Dividend Yield (%)	1.2	FY3	55.25	23.10
3mo ADT Value (\$ m)	378.80	P/E FYA	30.8	28.7
IM Holdings (USD)		FY1	22.3	16.8
		FY2	16.2	13.0
		FY3	13.8	11.6
		REV FYA(DKK)	11,942	6,652
		FY1	16,160	8,780
		FY2	18,909	9,936
		FY3	21,415	10,927

All report statistics are as of most recent close.

FYA Reported: 12/31/2014

Author Date: 11/25/2013

For illustrative purposes only.

Sample Research Report

Recommendation Report

ABC Corporation (ABC DC)

Outperform

Vivian Lin Thurston

Date of Recommendation: 4/13/2015

Investment Analysis

Qualitative Assessment: Management / Business Model (Last Modified: 10/21/2015)

Quality Model : 2

Evaluate the company relative to peers, competitors and general corporate standards - How strong is management and how durable is the business model? 1) Rate management on execution, control, strategy, continuity, culture and values, and stakeholder commitment. 2) Assess the strengths of the business model. Does the company have a sustainable competitive advantage? Proprietary products? Dominant or improving market share? Best-in-class cost structure? Unique asset base? 3) Review the company's financial performance - margins, returns, cash flow and balance sheet strength.

Decomposition of Long Term Growth Outlook (Last Modified: 10/21/2015)

Blair LTG Estimate (%) : 15.2

What is the likely range of earnings growth over the next 3-5 years? What is the composition of growth in terms of organic vs. acquired, price vs. volume, revenue vs. margin expansion? Are growth projections realistic or biased? Are there any issues that argue for a different growth metric other than EPS?

Current Fundamental Performance / Expectations (Last Modified: 10/21/2015)

ETrend Model : 18

Assess current growth trends in the context of valuation and long term expectations. What is the direction of forecasts? Are operating and reporting earnings in line? How predictable are near term earnings? If current and expected growth is below the long term nor, what are the prospects for improvement?

Valuation (Last Modified: 10/21/2015)

Valuation Model : 85

Assess valuation relative to market expectations considering future growth, incremental returns, historic and comparable norms. What are the valuation variables (cyclicality, risk)? What is or may be changing to drive a re-rating- growth potential, profitability, risk, competition, management?

Governance / Environmental / Social Considerations (Last Modified: 10/21/2015)

GMI Global: B GMI Home: C GMI Sector: B

MSCI IVA Rating: AA Goldman Sachs ESG Rating: -

Highlight any overall conclusions or concerns.

Governance Considerations (Last Modified: 10/21/2015)

GMI Global: B GMI Home: C GMI Sector: B

The key focus is on transparency, oversight, shareholder value creation, accounting policies. Does the company practice good governance? How are executives compensated? Is it in line with shareholder interests and executive performance? Are there concerns about alignment of interests between management and outside shareholders (particularly when the company is closely held)? Is the board focused on shareholder interests and is it accountable? Is there an independent audit function and, if so, has it found significant issues? Does it report on these issues for shareholders? How conservative/aggressive are accounting practices?

Environmental Considerations (Last Modified: 10/21/2015)

GMI Global: A GMI Home: B GMI Sector: B

The key focus is on resource management, product innovation, renewable energy/water use, reporting. Is this relevant? What is the company's environment reporting / disclosure? Does it use resources effectively and minimize impact of operations? Have there been any past environmental issues? Any areas of concern?

Social Considerations (Last Modified: 10/21/2015)

GMI Global: C GMI Home: C GMI Sector: C

For illustrative purposes only.

Sample Research Report

Recommendation Report

ABC Corporation (ABC DC)

Outperform

Vivian Lin Thurston

Date of Recommendation: 4/13/2015

The key focus is on human rights at the company and the supply chain, labor/management relations, product/workplace safety and community relations. What is the relationship between labor and management? Are there any other areas of concern here, including the company's history and policy supporting human rights, workplace safety, product safety, community relations, resource use, or specific political risks?

Accounting / Disclosure / Transparency (Last Modified: 10/21/2015)

How does the company rate on these issues? Any concerns about corporate structure, shareholder rights, compensation, hidden risks, information flow, board of directors?

Thematic Issues / Risks (Last Modified: 10/21/2015)

What market trends or sector issues are reflected in the company's risk/reward picture? What exogenous developments might affect the fundamentals or valuation?

Key Metrics / Events / Catalysts (Last Modified: 10/21/2015)

Any identifiable milestones, events or conditions that may provide feedback on the stock's prospects?

Contact With Management (Last Modified: 10/21/2015)

Highlight any recent interactions with management. How well do we know this management team?

For illustrative purposes only.

Sample Research Report

Quant Model Factors

Focus Country	Denmark	Eligibility List	Yes
GICS Sector	Consumer Discretionary	Research Agenda	No
GICS Industry	Textiles, Apparel & Luxury Goods	IM Hldgs (USD) (as of)	
GICS Industry Group	Consumer Durables & Apparel	Market Cap (USD mm)	95,514.00

ABC Corporation (ABC DC)

Outperform

Vivian Lin Thurston

4/13/2015

Composite Model	Value	Percentile	Ind Rel
COMPOSITE MODEL SCORE	-	22	-
Quality Model	Value	Percentile	Ind Rel
QUALITY MODEL SCORE	-	2	1
<i>Sustainable Value Creation</i>	-	1	1
Cash Flow ROIC	47.2	3	2
Cash Flow ROIC 3 Year Avg	44.3	3	2
ROE LTM (Financials Only)	-	-	-
Productivity Factor (ex. Financials, Ind Rel)	-	2	2
Oper ROA 5 yr Avg (%)	31.3	2	4
ROE 5yr Avg (%)	44.1	3	2
FCF Margin 3 Year Avg (ex Financials, Ind Grp Rel)	25.0	3	4
Gross Profit / Assets (ex Financials, Ind Grp Rel)	84.3	5	5
EVA Margin (Ind Grp Rel)	22.7	2	2
<i>Earnings Quality</i>	-	49	33
Balance Sheet Accruals Component	52	46	32
Cash Flow Accruals	6.9	62	42
NTM EPS Standard Error 3 Year Average	2.2	31	21
<i>Financial Strength</i>	-	21	16
Altman Z-Score (Ind Grp Rel)	6.8	4	2
Merton Distance to Default (Ind Grp Rel - Higher is better)	12.2	25	11
Net Debt / EBITDA (ex Financials, Ind Grp Rel)	.1	49	38
<i>Banks Only</i>	-	-	-
Tangible Equity to Assets	-	-	-
NPL to Loans	-	-	-
Cost Income Ratio	-	-	-
Risk Adjusted Income	-	-	-
Loans to Deposits	-	-	-
Tier 1 Factor	-	-	-
Pretax Income plus Loan Loss Reserves/Market Cap	-	-	-
1 Year Change in Loan Loss Reserves/Assets	-	-	-

Valuation	Value	Percentile	Ind Rel
VALUATION MODEL SCORE	-	85	71
<i>Earnings / Cash Flow Based Factors</i>	-	85	70
Free Cash Flow Yield (ex Financials)	3.4	50	40
Enterprise Value / EBITDA (ex Financials)	18.8	86	74
Dividend Yield	1.2	80	68
Cash Flow Yield Rel to 3 yr Avg (ex Financials)	70.2	80	63
Price / NTM Earnings	17.0	56	51
<i>Asset-Based Factors</i>	-	100	99
Enterprise Value / Sales (Ind Rel, ex Financials)	6.9	93	94
Price to Tangible Book	108.6	100	98
Enterprise Value / Invested Capital	12.8	99	97
<i>Model-Based Factors</i>	-	52	38
EVA PRVIt	60	39	30
StarMine Intrinsic Value (IV) Model	1.0	71	53
StarMine Ind Rel Valuation	-	75	74
AFG Percent to Target Current	92.1	11	5

Earnings Trend Model	Value	Percentile	Ind Rel
EARNINGS TREND MODEL SCORE	-	18	9
<i>Earnings Revisions</i>	-	15	9
StarMine ARM	80	21	13
3M EPS FY1 Revisions / Book Value per Share 3M Ago	.7	9	6
3M EPS FY2 Revisions / Book Value per Share 3M Ago	.2	17	11
EPS Est Rev Breadth 1 month (%)	.0	38	26
<i>Momentum</i>	-	47	32
EVA Momentum	7.4	9	1
Quality Momentum (6M Change in Percentile)	-1	61	44
FY0 - FY5 Growth Momentum (6M Change in Growth Rate)	2.1	19	13
3M Change in 3M Revision (FY1 and FY2 Avg)	-2.4	92	90
<i>Earnings Surprise</i>	-	42	35
Standardized Unexpected Earnings (SUE)	.3	46	38
StarMine Predicted Surprise	.5	31	14

For illustrative purposes only.

Sample Research Report

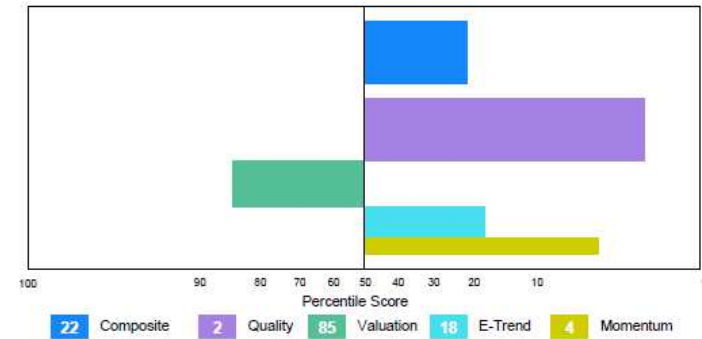
Quant Model Factors				ABC Corporation (ABC DC)	
Focus Country	Denmark	Eligibility List		Yes	Outperform Vivian Lin Thurston 4/13/2015
GICS Sector	Consumer Discretionary	Research Agenda		No	
GICS Industry	Textiles, Apparel & Luxury Goods	IM Hldgs (USD) (as of)			
GICS Industry Group	Consumer Durables & Apparel	Market Cap (USD mm)	95,514.00		

Momentum Model	Value	Percentile	Ind Rel
MOMENTUM MODEL SCORE	-	4	5
12 Month Volatility Adjusted Return	39.4	5	7
6 Month Sharpe Ratio	1.6	4	6
Industry Group Percentage of 1 Year Range	.5	34	32
6 Month Region - Sector Volatility Adjusted Return	-6.7	49	36
9 Month Sharpe Ratio	2.0	4	6

Growth Model (%)	Value	Percentile	Ind Rel
Blair LTG Estimate	15.2	-	-
Historical Growth	19.0	-	-
6 Year Avg Trend Growth (FY-2 to FY+3)	19.6	-	-
10 Year Avg Trend Growth (FY-6 to FY +3)	8.3	-	-
FY0 to FY+5 Expected Growth Trend	15.9	-	-
FY+1 to FY+5 Expected Growth Trend	12.2	-	-
<i>IBES Consensus LTG Estimate (for display only)</i>	21.7	-	-

Volatility Model	Value	Percentile	Ind Rel
VOLATILITY MODEL SCORE	-	29	-
ROE Range/Avg	-	41	-
Operating Margin Range/Avg	-	16	-
CF ROIC Range/Avg	-	35	-
EPS FY1 Coefficient of Variation	-	23	-
EPS FY2 Coefficient of Variation	-	55	-
EPS FY1 Dispersion	-	51	-
EPS FY2 Dispersion	-	26	-

Model History (GICS Industry)	Short Term	Long Term
Composite	☆☆☆☆☆☆	☆☆☆☆☆☆
Quality	☆☆	☆☆☆☆☆☆
Valuation	☆☆	☆☆
Earnings Trend	☆☆☆☆☆☆	☆☆☆☆
Momentum	☆☆☆☆	☆☆☆☆
Growth	☆☆☆☆	☆☆



For illustrative purposes only.

Biographies – Global Equity Team

Portfolio Management:

Simon Fennell, Partner

Simon Fennell is a portfolio manager for William Blair's International Growth, International Small Cap Growth, and International Leaders strategies. He joined William Blair in 2011 as a technology, media, and telecommunications research analyst focusing on idea generation and strategy more broadly. Before joining William Blair, Simon was a managing director in the equities division at Goldman Sachs in London and Boston, responsible for institutional equity research coverage for European and international stocks. Previously, Simon was in the corporate finance group at Lehman Brothers in London and Hong Kong, working in the M&A and debt capital markets groups. Simon received an M.A. from the University of Edinburgh and an M.B.A. from Cornell University's Samuel Curtis Johnson Graduate School of Management.

Andrew G. Flynn, CFA, Partner

Andy Flynn is a portfolio manager for William Blair's International Small Cap Growth and Global Leaders strategies. Since joining William Blair in 2005, Andy has served as a U.S. industrials and consumer analyst and a non-U.S. consumer, healthcare, and IT analyst. He was also a portfolio manager for the firm's Global Small Cap Growth strategy. Before joining the firm, Andy was a senior equity analyst and portfolio manager at Northern Trust, where he specialized in mid- and small-capitalization growth companies. Before that, he was a senior equity analyst at Scudder Kemper Investments and a research assistant at Fidelity Investments. Andy is a member of the CFA Institute and the CFA Society of Chicago. He received a B.A. in economics from the University of Kansas and an M.B.A. with an emphasis in finance from the University of North Carolina at Chapel Hill.

Kenneth J. McAtamney, Partner

Ken McAtamney is a portfolio manager for William Blair's International Growth, Global Leaders, and International Leaders strategies. He was previously co-director of research and a mid-large-cap industrials and healthcare analyst. Before joining William Blair in 2005, Ken was a vice president at Goldman Sachs and Co., where he was responsible for institutional equity research coverage for both international and domestic equity. Before that, he was a corporate banking officer with NBD Bank. Ken received a B.A. from Michigan State University and an M.B.A. from Indiana University.

Todd M. McClone, CFA, Partner

Todd McClone is a portfolio manager for William Blair's emerging markets strategies. Before joining the firm in 2000, he was a senior research analyst specializing in international equity for Strong Capital Management. Previously, he was a corporate finance research analyst with Piper Jaffray, where he worked with the corporate banking financials team on a variety of transactions, including initial public offerings, mergers and acquisitions, and subordinated debt offerings. He also issued fairness opinions and conducted private company valuations. Todd received a B.B.A. and B.A. from the University of Wisconsin–Madison.

David Merjan, CFA, Partner

David Merjan is a portfolio manager for William Blair's International Developed Plus and International ADR strategies. Before joining William Blair in 1998, he worked for Hughes Electronics in Los Angeles in various capacities, including in the corporate treasury department, where he focused on international mergers and acquisitions and managed corporate currency and interest-rate portfolios. He also managed an international equity fund in the pension management subsidiary of Hughes. David is a member of the CFA Institute. He received a B.A. from Dickinson College and an M.I.M. from the American Graduate School of International Management.

Jack Murphy, CFA, Partner

Jack Murphy is a portfolio manager for William Blair's Emerging Markets Leaders and International Developed Plus strategies. Previously, he was director of research for the Global Equity team and a research analyst covering mid-large-cap non-U.S. consumer stocks. He joined William Blair in 2005 as a sell-side research analyst focusing on e-commerce and hardline retailers. Previously, he was an equity research analyst covering a broad range of retail companies for Credit Suisse First Boston for nearly six years. Before that, he was an equity research analyst at Lehman Brothers and an equity research associate at Salomon Brothers. Before that, he was a financial analyst for General Electric Capital, having graduated from GE's financial management program. Jack received a B.A. in economics, magna cum laude, from Villanova University.

Casey K. Preyss, CFA, Partner

Casey Preyss is a portfolio manager for William Blair's Emerging Markets Growth, Emerging Markets Small Cap Growth, and China A-Shares Growth strategies. Since joining William Blair in 2000, he has been a research analyst covering industrials, IT, and resources stocks. Before taking on fundamental research responsibilities for William Blair's global equity team, Casey was a quantitative analyst. Before joining the firm, he was an international equity research sales associate with Thomas White International. He received a B.S.B.A. from The Ohio State University and an M.B.A. from the University of Chicago's Booth School of Business.

Biographies – Global Equity Team

Vivian Lin Thurston, CFA, Partner

Vivian Lin Thurston is a portfolio manager for William Blair's China A-Shares Growth strategy and a global research analyst covering Chinese equities. Previously, she was a global research analyst covering large-cap consumer stocks. Before joining William Blair, Vivian was vice president and consumer sector head at Calamos Investments. Before that, she was an executive director and senior investment analyst at UBS Global Asset Management/Brinson Partners, where she was responsible for stock selection and research for consumer sectors in the United States and emerging markets. Vivian also held roles at Mesirov Financial, China Agribusiness Development Trust and Investment Corporation, and Vanke. She is a member of the CFA Institute and the CFA Society of Chicago. She is also the founder and chairman of the board of the Chinese Finance Association of America, a 501(c) nonprofit organization. Vivian received a B.A. in sociology from Peking University and an M.A. in sociology and M.S. in finance from the University of Illinois Urbana-Champaign.

Ryan Dimas, CFA, CAIA

Ryan Dimas is a portfolio specialist for William Blair's global equity strategies. In this role, Ryan participates in the team's decision-making meetings, conducts portfolio analysis, and is responsible for communicating portfolio structure and outlook to clients, consultants, and prospects. Previously, for 17 years, Ryan led the investment manager research effort for William Blair Select, a team that was responsible for the selection and ongoing evaluation of third-party investment managers. In 2016, Ryan was named chief investment strategist and chair of the asset allocation investment committee for investment counseling, where he worked closely with investment counseling teams on strategic and tactical recommendations that were implemented within portfolios. He is a member of the CFA Society of Chicago and is a CFA and CAIA charterholder. Ryan received a B.A. in finance from Arizona State University.

Romina Graiver

Romina Graiver is a portfolio specialist for William Blair's global equity strategies. In this role, she participates in the team's decision-making meetings, conducts portfolio analysis, and is responsible for communicating portfolio structure and outlook to clients, consultants, and prospects. Previously at William Blair, she was a senior client relationship manager. Before joining William Blair in 2012, Romina was deputy head of the international equity investment team at BNP Paribas Investment Partners, where she was responsible for product development and investor communication. Before taking on that role, she was a product specialist for model-driven equity investments and a marketing manager. Romina received a B.Sc. in international business and an M.Sc. in economics from the University of Pantheon-Sorbonne in Paris, France.

Blake S. Pontius, CFA

Blake Pontius provides analytical support to portfolio managers and coordinates the team's integration of environmental, social, and governance (ESG) factors in the investment process. He is also responsible for communicating investment strategy and portfolio positioning to clients, consultants, and prospects. Previously at William Blair, Blake was a relationship manager responsible for institutional client accounts, including public and corporate pension funds, endowments, and foundations invested in the firm's global/international and emerging market equity strategies. Before joining William Blair in 2005, Blake worked at UBS Asset Management and Mercer. He is a member of the CFA Institute and the CFA Society of Chicago. Blake received a B.A. in economics, with honors, from Michigan State University and an M.B.A. in finance, with distinction, from DePaul University.

Biographies – Global Equity Team

Research:

D.J. Neiman, CFA, Partner

D.J. Neiman is director of research for the global equity team at William Blair Investment Management. He is also a global research analyst covering small-cap financial stocks. Before joining Investment Management in 2009, D.J. was an analyst in the firm's sell-side research group, covering the financials sector with a focus on the asset-management and advisory investment-banking industries. Previously, D.J. was a senior accountant with William Blair Funds and a fund analyst at Scudder Kemper Investments. He is a member of the CFA Institute and the CFA Society of Chicago. He received a B.S. from Miami University and an M.B.A., with high distinction, from the University of Michigan's Ross School of Business.

Alaina Anderson, CFA, Partner

Alaina Anderson is a global equity research analyst with William Blair Investment Management. She covers real estate, utilities, and construction and engineering companies. Before joining William Blair in 2006, she was a senior analyst in the investments department of the MacArthur Foundation, where she provided research support for internally managed portfolios and was involved in investment manager due diligence, selection, and monitoring for the foundation's U.S., non-U.S., and hedge-fund portfolios. Before joining the MacArthur Foundation, Alaina was an investor relations consultant with Ashton Partners and a financial advisor with UBS Painewebber. She is a Leadership Greater Chicago fellow and a member of the CFA Society of Chicago. Alaina received a B.S. from the Wharton School at the University of Pennsylvania and an M.B.A. from the University of Chicago's Booth School of Business.

William W. Benton, CFA, CPA, Partner

William Benton is a global research analyst for William Blair Investment Management. He covers mid- and large-cap technology, media, and communication services stocks. Before joining William Blair Investment Management in 2007, William was a technology research analyst with the firm's sell-side research group for 10 years. In this position, he was twice named "Best on the Street" in The Wall Street Journal's annual analyst survey. Before joining William Blair in 1997, he worked at SBC Warburg, U.S. Cellular, May Company, and Monsanto. He is a member of the CFA Society of Chicago and holds the CMA and CPA designations. William received a B.S. in finance from the University of Illinois Urbana-Champaign and an M.B.A. from Dartmouth College's Amos Tuck School of Business Administration, where he was a Tuck Scholar.

Drew Buckley, CFA, CPA

Drew Buckley is a global research analyst with William Blair Investment Management. He covers small-cap technology, media, and communication services stocks. Before joining William Blair in 2008 as a global research associate focused on technology, media, and telecommunications stocks, he spent two years as a senior associate in Ernst & Young LLP's investment management assurance practice. Drew is a member of the CFA Society of Chicago and holds the certified public accountant (CPA) designation. He received a B.S. in business from the University of Colorado–Boulder.

Anil Daka, CFA

Anil Daka is a global research analyst for William Blair Investment Management. He covers midcap industrial stocks. Before joining the firm in 2011, Anil was an equity analyst at Morningstar, where he was responsible for equity research coverage in the global industrials sector. He is a member of the CFA Institute and the CFA Society of Chicago. He received a B.Tech. in metallurgical engineering from the Indian Institute of Technology and an M.B.A. from the University of North Carolina.

Joel Gomberg, CFA, Partner

Joel Gomberg is a global research analyst at William Blair Investment Management. In this role, he covers mid- and large-cap financials stocks. Previously, he was an equity analyst following the finance industry, including commercial banks, global investment banks, exchanges, retail brokers, and commercial property service companies, and was group head of the financials sector. In this role, Joel was included in The Wall Street Journal's annual analyst survey, "Best on the Street," three times. Before joining William Blair in 1997, Joel was an equity analyst at Duff & Phelps and Howe Barnes Investments, where he covered specialty finance and bank stocks. He also worked at Northern Trust Company, primarily in commercial banking and credit policy. Joel received a B.S. from the University of Illinois at Urbana-Champaign and an M.B.A. from the University of Chicago's Booth School of Business.

Daniel Hill, CFA

Daniel Hill is a global research analyst covering the financials sector. He was previously a global generalist research analyst and an international and global research associate supporting the global financial team under the guidance of research analysts. Daniel joined William Blair in 2005 as an investment accountant. He is a member of the CFA Institute and the CFA Society of Chicago. He received a B.S. in finance from the University of Nebraska and an M.B.A. from Northwestern University's Kellogg Graduate School of Management.

Biographies – Global Equity Team

Camilla Oxhamre Cruse, Ph.D.

Camilla Oxhamre Cruse is a global research analyst at William Blair Investment Management. She covers small-cap healthcare stocks. Camilla joined William Blair in 2014. She previously spent six years at Carnegie Investment Bank, where she was a sell-side research analyst focusing on the Nordic pharma and biotech industry. She has a scientific background. Camilla received an M.B.A. in finance from Hawaii Pacific University, a Ph.D. in medicine from Karolinska Institute, and an M.Sc. in biochemistry from Lund University.

Richard Reznick, Ph.D.

Richard Reznick is a global research analyst at William Blair Investment Management. In this role, he covers Chinese equities with a focus on small-cap healthcare stocks. Before joining William Blair in 2010 as an equity research associate focused primarily on the biotechnology sector, Richard was a product specialist in Abbott Laboratories' diagnostics division. He received a B.S. in biology from the University of Illinois at Urbana-Champaign and a Ph.D. in biology from Yale University.

Greg Scolaro, CFA, CPA

Greg Scolaro is a research analyst at William Blair Investment Management. In this role, he covers emerging market small-cap stocks. Previously, he was a research associate covering global technology, media, and telecommunications stocks. Before joining the firm in 2014, Greg was an auditor in the technology sector at KPMG Chicago. He is a member of the CFA Institute and the CFA Society of Chicago. Greg received a B.S. and M.S. in accountancy from the University of Illinois Urbana-Champaign.

Bryan Shea

Bryan Shea is an emerging markets small-cap analyst for William Blair Investment Management. He joined the firm in 2009. Previously, he was an associate analyst focusing on global consumer stocks and a sell-side research associate focusing on several subsectors within the consumer sectors. Before joining William Blair, Bryan was an associate at Madison Capital Funding, where he provided a variety of cash-flow-based, leveraged-capital products to private-equity sponsors. Before that, he was an analyst at Lincoln International, where he worked on mergers and acquisitions, issued fairness opinions, and conducted private company valuations. Bryan received a B.S. in finance, with honors, from Indiana University and an M.B.A. from Northwestern University's Kellogg School of Management.

Andrew J. Siepker, CFA

Andrew Siepker is a global research analyst at William Blair Investment Management. In this role, he covers large-cap industrial stocks. Previously, he was a research analyst conducting non-U.S. consumer research and worked on William Blair's sell-side as a research associate focused on e-commerce and hardline retailers. Before joining William Blair in 2006, Andy was a financial analyst in a finance training program at First Data Corporation. He is a CFA charterholder and a member of the CFA Society of Chicago. Andy received a B.S. in finance, with highest distinction, from the University of Nebraska.

Kwesi Smith, CFA

Kwesi Smith is a global research analyst covering large-cap consumer stocks at William Blair Investment Management. Before joining the firm in 2015, Kwesi was an equity research analyst for TimesSquare Capital Management for 10 years. In this role, he supported the firm's research efforts across a variety of sectors, including healthcare, technology, media/cable, defense, and consumer, before focusing on healthcare. Before that, Kwesi worked at MetLife Investments as a technology, media/cable, and telecom fixed-income research analyst and provided credit analysis across a variety of fixed-income asset classes, including high yield, private placement, leveraged finance, and investment-grade public corporates. He is on the governing board of 3Arts and Breakthrough. He is also a member of the CFA Institute and the CFA Society of Chicago. Kwesi received a B.S. from the University of Virginia's McIntire School of Commerce.

Rita Spitz, CFA, Partner

Rita Spitz is a global research analyst covering small-cap consumer stocks at William Blair Investment Management. Previously, she was a research analyst covering U.S. large- and midcap consumer stocks, and she served as director of research from 2001 to 2008. Rita joined William Blair in 1986 as a sell-side research analyst covering advertising and marketing firms, a role she held for 13 years. She is a member of the CFA Society of Chicago, the CFA Institute, and The Economic Club of Chicago. She has also served on the advisory groups of several financial accounting standards boards since 2002, and is currently a board member of the Transition Resource Group for Revenue Recognition and a trustee of The Joffrey Ballet. Rita received a B.B.A. in finance and Spanish from the University of Wisconsin-Madison and an M.B.A. from the University of Chicago's Booth School of Business.

Biographies – Global Equity Team

Thomas A. Sternberg, CFA, Partner

Tommy Sternberg is a global research analyst at William Blair Investment Management. In this role, he covers large-cap healthcare stocks. Previously, he was a research associate focused on the healthcare industry. Before joining William Blair in 2004, Tommy spent two years as an equity analyst in Oak Brook Bank's investment management and trust department. He is a member of the CFA Institute and the CFA Society of Chicago. Tommy received a B.S. in economics from Duke University and an M.B.A. from the University of Chicago's Booth School of Business.

Dan Su, CFA

Dan Su is a global research analyst covering midcap consumer stocks for William Blair Investment Management. Before joining William Blair in 2013, Dan was a senior equity analyst at Morningstar, where she covered global apparel and internet service companies. Before joining Morningstar, she held various positions in corporate strategy for media and technology companies in China and Singapore. She is a member of the CFA Institute and the CFA Society of Chicago. Dan received a B.A. from Beijing Foreign Studies University and an M.B.A. from the University of Chicago's Booth School of Business.

Vivian Lin Thurston, CFA, Partner

Vivian Lin Thurston is a portfolio manager for William Blair's China A-Shares Growth strategy and a global research analyst covering Chinese equities. Previously, she was a global research analyst covering large-cap consumer stocks. Before joining William Blair, Vivian was vice president and consumer sector head at Calamos Investments. Before that, she was an executive director and senior investment analyst at UBS Global Asset Management/Brinson Partners, where she was responsible for stock selection and research for consumer sectors in the United States and emerging markets. Vivian also held roles at Mesirow Financial, China Agribusiness Development Trust and Investment Corporation, and Vanke. She is a member of the CFA Institute and the CFA Society of Chicago. She is also the founder and chairman of the board of the Chinese Finance Association of America, a 501(c) nonprofit organization. Vivian received a B.A. in sociology from Peking University and an M.A. in sociology and M.S. in finance from the University of Illinois Urbana-Champaign.

Technology:

Darragh Grogan

Darragh Grogan is a technologist on the global equity team at William Blair Investment Management. In this role, he works with William Blair's IT development team to implement technological improvements into the investment process. Before joining William Blair in 2008 as a software engineer supporting trading and reconciliation, Darragh was a senior software engineer at Accenture and Fidelity. He received a B.Com. and a higher diploma in applied science (software development and design) from the National University of Ireland in Galway, and an M.S. in advanced software engineering from University College Dublin.

Biographies

Systematic Research:

Spiro Voulgaris, Partner

Spiro Voulgaris is a senior quantitative analyst leading the systematic research team. He joined William Blair in 2007. Before joining the firm, Spiro was a senior quantitative analyst with Neuberger Berman for five years and subsequently worked alongside the same investment professionals for an additional three years while with Northern Trust. He was also with Lehman Brothers for six years, where he was a strategist and quantitative analyst for its global and U.S. investment strategy teams in London and New York. Before that, Spiro spent three years as a research analyst with the Center for Research in Securities Prices (CRSP). Spiro received a B.A. in economics from the University of Chicago and an M.B.A., with a concentration in statistics and international finance, from the University of Chicago's Booth School of Business.

Andrew Kominik, CFA

Andrew Kominik is William Blair Investment Management's liquidity and investment risk manager. In this role, Andrew identifies, aggregates, and monitors investment-related risks across William Blair Investment Management. He also is a senior quantitative analyst on the systematic research team. In this role, he supports equity management teams in the use of internal and external quantitative models to evaluate portfolio risk and performance. He spearheaded the development of William Blair's proprietary equity risk models and continues to maintain and enhance them. Andrew also plays a role in developing and maintaining multifactor quantitative stock-selection models used by fundamental equity analysts and portfolio managers. Previously, Andrew was a quantitative portfolio analyst, portfolio construction analyst, and marketing analyst. Before joining William Blair in 2003, he worked in institutional marketing at Columbia Management Group. Andrew is a CFA charterholder and a member of the CFA Institute and the CFA Society of Chicago. He received a B.A. in history from Brandeis University and an M.B.A. with concentrations in finance and econometrics/statistics from the University of Chicago's Booth School of Business. He is currently pursuing an M.Sc. in analytics at the University of Chicago.

Jeffrey Hill

Jeffrey Hill is a senior quantitative business analyst on the systematic research team at William Blair Investment Management. In this role, he provides the team with business and technical support, focusing on portfolio attribution. Before joining William Blair in 2014, Jeff spent 15 years on the global investment services team at UBS Global Asset Management. In this role, he managed an international development team focused on building bespoke risk-management, portfolio-rebalancing, and asset-allocation solutions. Because these solutions were used both within UBS and for external clients, Jeff also functioned as the bridge between the technical, investment, and sales teams. He received a B.S. in industrial technology from Illinois State University.

Andrew Wickman, CFA

Andrew Wickman is a quantitative research analyst on the systematic research team at William Blair Investment Management. In this role, he develops and programs multifactor quantitative models that are used by fundamental equity analysts and portfolio managers. He also produces research for the team's portfolio strategy thought leaders. Before joining William Blair in 2015, Andrew was a consultant at FactSet Research Systems for four years; in this role, he supported investment management research analysts and portfolio managers. He is a member of the CFA Institute and the CFA Society of Chicago. Andrew received a B.S. in economics from the University of Kentucky and is currently pursuing an M.B.A. at the University of Chicago's Booth School of Business.

Strategy Research:

Olga Bitel, Partner

Olga Bitel is William Blair Investment Management's global strategist. In this role, she is responsible for economic research and analysis across all regions and sectors. She distills macroeconomic and geopolitical developments into actionable insights for global, international, and emerging market equity portfolios within a multifaceted strategic framework. In addition, she provides insights about cyclical turning points and structural trends as inputs into portfolio construction in predominantly bottom-up investment approaches. Olga represents the firm with existing and prospective clients in one-on-one settings, conference calls, and written communications. With her contributions to the William Blair blog "Investing Insights," she is frequently quoted in the media. She is also a frequent speaker at major global investment conferences with influential colleagues in the industry, heads of state, and global political figures. Before joining William Blair in 2009, Olga was a senior economist at the National Institute of Economic and Social Research in London, United Kingdom, where she produced macroeconomic forecasts for most Asian economies and led thematic research projects for some of the world's best-known international organizations, including the Organization of the Petroleum Exporting Countries and the International Monetary Fund. Olga received a B.A. from the University of Chicago and an M.Sc. in economics from the London School of Economics and Political Science.

Biographies

Hugo Scott-Gall

Hugo Scott-Gall is William Blair Investment Management's thematic strategist. In this role, he is responsible for both researching and identifying the longer-term trends affecting corporate performance and developing systematic solutions for broad investment challenges. Before joining William Blair in 2018, Hugo was a managing director and head of the thematic research team at Goldman Sachs. In that role, he managed a global team of approximately 15 people who investigated thematic changes, analyzed their effects across industries, and sought to identify long-term structurally advantaged companies. He and his team produced *Fortnightly Thoughts*, a publication offering thematic insights across sectors, and *GS Sustain*, a long-term-focused publication that sought to find best-in-breed companies, with environmental, social, and governance (ESG) analysis forming an integral part of the process. He also oversaw *GS Dataworks*, a team that used alternative data to augment fundamental research. Before his move into thematic research, Hugo was an equity research analyst covering European transportation companies. Before joining Goldman Sachs, he was an equity research analyst at Fidelity Investments. He is based in London.

Biographies – Client Service Team

Douglas J. Kryscio, CFA, Partner

Doug Kryscio is head of North America client service at William Blair Investment Management. Previously at William Blair, he was a senior client relationship manager. Before joining the firm in 2011, he was at Mercer Investment Consulting for 11 years, most recently as a partner, and earlier as a business leader for the Midwest and Great Lakes markets. Before joining Mercer, Doug was a portfolio manager at First Chicago. He is a member of the CFA Institute and the CFA Society of Chicago. Doug received a B.B.A. in finance, with department honors, from the University of Kentucky and an M.B.A. in finance, with distinction, from DePaul University. He was a member of Phi Kappa Phi and Delta Mu Delta National Honor Society.

Stephen J. Weeks, Partner

Steve Weeks is a senior client relationship manager with William Blair Investment Management. Before joining William Blair in 2015, he was senior vice president of marketing, consultant relations, and client services at Columbus Circle Investors (CCI). Before joining CCI in April 2005, he was a director and senior investment specialist for Principal Global Investors and one of the founding partners of GlobeFlex Capital, where he was responsible for institutional marketing and client service. He is a current board advisor of the National Conference on Public Employee Retirement Systems (NCPERS). He received a B.S. in finance from the University of Arizona.

Julie Stevens, CFA

Julie Stevens is the head of client service for William Blair Investment Management. She has been a member of the client service team since May 2004, and was previously a member of the operations team. Before joining William Blair in 2000, Julie spent three years as a financial analyst for Bank One's asset liability management department. She is a member of the CFA Institute and the CFA Society of Chicago. Julie received a B.S. from Indiana University and an M.B.A. from the University of Chicago's Booth School of Business.

James Dominguez

James Dominguez is a client relationship manager with William Blair Investment Management. Before joining the firm in 2016, he was a vice president and relationship manager for Northern Trust Asset Management, working with public pension plans and Taft-Hartley plans. While at Northern Trust, James also served as an associate relationship manager in the institutional sales and client service group and a senior investment manager liaison with investment operations. Before joining Northern Trust, James was the managing director of a national employment and training organization, where he oversaw the service delivery of five workforce programs for the City of Chicago's Mayor's Office of Workforce Development. He received a B.A. in psychology from Roosevelt University and an M.B.A. in financial analysis from DePaul University's Kellstadt Graduate School of Business.

Cliff Kalish, CFA

Cliff Kalish is a client relationship manager with William Blair Investment Management. Before joining William Blair in 2011, Cliff was a client relationship manager at Calamos Investments for six years and a research analyst at Ellwood Associates for five years. Cliff is a member of the CFA Institute and the CFA Society of Chicago. He received a B.S. in consumer economics with an option in finance from the University of Illinois at Urbana-Champaign.

Dana Denizman

Dana Denizman is a senior client services associate, responsible for both international and domestic accounts. She joined William Blair in 1999 as a member of the small-cap growth team and has been a member of the client service team since May 2004. Previously, she spent four years at PaineWebber in various positions, including a registered sales assistant and branch office administrator, and was a member of the firm's management development program. Before that, Dana spent four years at American Century as a client service representative. Dana received a B.A. from the University of Iowa.

Biographies – Client Service Team

Matt Brady, CFA

Matt Brady is a client services associate, responsible for both international and domestic accounts, with William Blair Investment Management. He joined William Blair in May 2015. Previously, Matt was an analyst on the product development and management team for BMO Global Asset Management. He is a member of the CFA Institute and CFA Society of Chicago. He received a B.B.A. in finance and risk management from the University of Wisconsin–Madison.

Luke Hepler, CFA

Luke Hepler is a client services associate, responsible for both international and domestic accounts. He joined William Blair in 2015. Previously, Luke was a research analyst at Ellwood Associates. He is a member of the CFA Institute and the CFA Society of Chicago. He received a B.S. in finance from Northern Michigan University.

Jennifer Pinner

Jennifer Pinner is a senior client service associate, responsible for both international and domestic accounts, with William Blair Investment Management. She joined the firm in 2014. Previously, she spent eight years at Northern Trust in various positions, including senior consultant and senior account manager for the corporate and institutional services team. She received a B.S. from DePaul University and an M.B.A. from Saint Xavier University's Graham School of Management.

Thomas Riesenber

Tom Riesenber is a senior client service associate with William Blair Investment Management. In this role, he is responsible for both international and domestic accounts. Previously, Tom was an international accounting analyst for three years. Before joining the firm in November 2014, Tom was a financial reporting analyst at The Northern Trust Company for four years. He received a B.S.B.A. in finance from Creighton University.

Glossary – Terms

Active Share: A measure of the percentage of stock holdings in a manager's portfolio that differ from the benchmark index.

Alpha: A measure of a portfolio's return in excess of the market return, after both have been adjusted for risk. It is a mathematical estimate of the amount of return expected from a portfolio above and beyond the market return at any point in time. For example, an alpha of 1.25 indicates that a stock is projected to rise 1.25% in price in a year over the return of the market, or the return when the market return is zero. When an investment price is low relative to its alpha, it is undervalued, and considered a good selection.

Beta: A quantitative measure of the volatility of the portfolio relative to the overall market, represented by a comparable benchmark. A beta above 1 is more volatile than the overall market, while a beta below 1 is less volatile, and could be expected to rise and fall more slowly than the market.

Developed Markets: Using the Morgan Stanley Capital International (MSCI) geographic definition, this region includes: United Kingdom, Europe (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Spain, Sweden and Switzerland), Japan, Pacific Asia (Australia, Hong Kong, New Zealand, and Singapore) and the Western Hemisphere (Canada and other Americas).

Debt to Total Capital Ratio: This figure is the percentage of each company's invested capital that consists of debt. Companies with a high Debt to Total Capital level may be considered more risky. From a portfolio perspective, the portfolio Debt to Total Capital Ratio is a weighted average of the individual holdings' Debt to Total Capital Ratio.

Emerging Markets: Using MSCI's geographic definition, this region includes: Emerging Markets Asia (China, India, Indonesia, Malaysia, S Korea, Taiwan, and Thailand), Emerging Markets Europe, Mid-East and Africa (Czech Republic, Hungary, Poland, Russia, Turkey, Egypt, Morocco, and S Africa), and Latin America (Argentina, Brazil, Chile, Columbia, Mexico, Peru and Venezuela).

EPS (Earnings Per Share) Growth Rate (Projected): This measure represents the weighted average of forecasted growth in earnings expected to be experienced by the stocks within the portfolio over the next year. From a portfolio perspective, the portfolio EPS Growth Rate is a weighted average of the individual holdings' EPS Growth Rate.

EV/EBITDA (Enterprise Value/Earnings Before Interest, Taxes and Depreciation-Amortization): The EV/EBITDA ratio is useful for global comparisons because it ignores the distorting effects of individual countries' taxation policies. It's used to find attractive takeover candidates. Enterprise value is a better measure than market cap for takeovers because it takes into account the debt which the acquirer will have to assume. Therefore, a company with a low EV/EBITDA ratio can be viewed as a good takeover candidate.

EV/IC: (Enterprise Value/Invested Capital) Ratio: Enterprise Value (EV), which is market capitalization minus cash plus debt divided by Invested Capital (IC), which is the sum of common stock, preferred stock and long-term debt. This number will get you a simple multiple. If it is below 1.0, then it means that the company is selling below book value and theoretically below its liquidation value.

Information Ratio: A measure of risk-adjusted return. The annualized excess return of the portfolio relative to a respective benchmark, divided by the annualized tracking error relative to that same benchmark. The higher the measure, the higher the risk-adjusted return.

Integrated: Constructs a portfolio of the top 20% of stocks based on William Blair's multi-factor composite model, which uses Earnings Trend, Momentum, Quality, and Valuation factors. The portfolio is rebalanced on a monthly basis and weights stocks based on relative market capitalization.

PBVn (Price/Book Value) Ratio: The PBV Ratio measures the value of a company's common stock relative to its shareholder's equity. A price-to-book multiple above one means that the price of the company's common stock is higher than its common shareholder's equity. A price-to-book multiple below one means that the price of the company's common stock are less than its break-up value, and the shares may be undervalued.

PCF (Price/CashFlow): Some analysts favor the price/cash flow over the price-earnings (PE) ratio as a measure of a company's value. Cash flow is a measure of a company's financial health. It equals cash receipts minus cash payments over a given period of time.

P/E (Price/Earnings) Ratio: This is the most common measure of how expensive a stock is. Simply, it is the cost an investor in a given stock must pay per dollar of current annual earnings. A high P/E generally indicates that the market is paying more to obtain the stock because it has confidence in the company's ability to increase its earnings. Conversely, a low P/E often indicates that the market has less confidence that the company's earnings will increase rapidly or steadily, and therefore will not pay as much for its stock.

R-squared: A measurement of how closely the portfolio's performance correlates with the performance of its benchmark, such as the MSC AC World Free ex US Index. In other words, it is a measurement of what portion of a portfolio's performance can be explained by the performance of the overall market or index. Ranges from 0 to 1, where 0 indicates no correlation and 1 indicates perfect correlation.

Risk (Standard Deviation): A measure of the portfolio's risk. A higher standard deviation represents a greater dispersion of returns, and thus a greater amount of risk. The annualized standard deviation is calculated using monthly returns.

Silo: Constructs portfolios using the top 20% of stocks based on each of the four sub-models used to construct William Blair's composite model, then averages the returns coming from each of the four portfolios. The portfolios are rebalanced on a monthly basis and weights stocks based on relative market capitalization. (The Equal Weighted strategy equally weights the returns coming from each of the sub-portfolios; the Optimized approach weights Quality 5%, Valuation 60%, Earnings Treng 5%, and Momentum 30%. The optimization was based on a monte-carlo simulation that sought an optimal weighting of each sub-portfolios to achieve the highest return).

Sortino Ratio: A modification of the Sharpe ratio that differentiates harmful volatility from general volatility by taking into account the standard deviation of negative asset returns, called downside deviation. The Sortino ratio subtracts the risk-free rate of return from the portfolio's return, and then divides that by the downside deviation. A large Sortino ratio indicates there is a low probability of a large loss.

Sharpe-Ratio: A risk-adjusted measure calculated using standard deviation and excess return (Portfolio return – Risk Free Rate) to determine reward per unit of risk. The higher the Sharpe ratio, the better the portfolio's historic risk-adjusted performance.

Tracking Error: Tracking Error measures the extent to which a portfolio tracks its benchmark. The tracking error of an index portfolio should be lower than that of an active portfolio. The tracking error will always be greater than zero if the portfolio is anything other than a replication of the benchmark.

Trailing 1-Year Turnover: This figure reflects the portfolio's trading activity by calculating the amount of the portfolio's holdings bought or sold over the prior year, expressed as a percentage of the portfolio's average market value. Turnover figures may be related to the amount of trading costs experienced by the portfolio.

Weighted Average Market Capitalization: Market capitalization refers to the total market value of each company's outstanding shares. The Weighted Average Market Capitalization for a portfolio is calculated as the average market capitalization of the stocks within the portfolio, weighted by the amount of each stock owned.

Weighted Median Market Capitalization: This calculation represents the median market capitalization of the stocks in the portfolio, weighted by the amount of each stock owned.

Glossary – Indices

Bloomberg Barclays U.S. Aggregate Bond Index: A broad-based benchmark that measures the investment grade, U.S. dollar-denominated, fixed-rate taxable bond market, including Treasuries, government-related and corporate securities, mortgage-backed securities (agency fixed-rate and hybrid ARM pass-throughs), asset-backed securities and commercial mortgage backed securities.

Bloomberg Barclays Intermediate Govt./Credit Bond Index (formerly the Lehman Index): A fixed-rate government and corporate bonds rated investment grade or higher.

Bloomberg Barclay's Multiverse Index: Provides a broad-based measure of the global fixed-income bond market. The index represents the union of the Global Aggregate Index and the Global High-Yield Index and captures investment grade and high yield securities in all eligible currencies. Standalone indices such as the Euro Floating-Rate ABS Index and the Chinese Aggregate Index are excluded. The Multiverse Index family includes a wide range of standard and customized sub-indices by sector, quality, maturity, and country.

Bloomberg Barclays U.S. Intermediate Aggregate Bond Index: A broad-based benchmark that measures the investment grade, U.S. dollar-denominated, fixed-rate taxable bond market, including Treasuries, government-related and corporate securities, mortgage-backed securities (agency fixed-rate and hybrid ARM pass-throughs), asset-backed securities and commercial mortgage backed securities with maturities between one and 10 years.

ICE BofAML 1-Year U.S. Treasury Note Index: An unmanaged index comprised of a single U.S. Treasury Bill issued at the beginning of each month and held for a full month. Each month the index is rebalanced and the issue selected is the outstanding U.S. Treasury Note that matures closest to, but not beyond one year from the rebalancing date.

ICE BofAML 3-Month Treasury Bill Index: An unmanaged market index of U.S. Treasury securities maturing in 90 days that assumes reinvestment of all income.

J.P. Morgan Cash Index: Measures the total return of a rolling investment in a notional fixed income instrument with a maturity of three months. The deposit rates used in the calculation of the JP Morgan Cash Index are LIBOR or similar local reference rates.

Merrill Lynch 1-Year U.S. Treasury Note Index: Comprised of a single U.S. Treasury Bill issued at the beginning of each month and held for a full month. Each month the index is rebalanced and the issue selected is the outstanding U.S. Treasury Note that matures closest to, but not beyond one year from the rebalancing date.

Merrill Lynch 3-Month Treasury Bill Index: An unmanaged index market index of U.S. Treasury securities maturing in 90 days that assumes reinvestment of all income.

MSCI (Morgan Stanley Capital International): MSCI indices are the most widely used benchmarks by global portfolio managers. MSCI offers international investors performance benchmarks for 51 national stock markets as well as regional, sector, industry group, and industry aggregations.

MSCI China A Onshore Index: A free-float weighted equity index, designed to measure performance of China A share securities listed on either the Shanghai or Shenzhen Stock Exchanges.

MSCI All Country World ex-US EAFE Index: An unmanaged index that includes developed and emerging markets outside the United States.

MSCI All Country World ex-US Small Cap Index: A free float-adjusted market capitalization index designed to measure global developed and emerging market small capitalization equity performance, excluding the U.S.

MSCI EAFE Index: A free float-adjusted market capitalization index which captures large and mid cap representation across Developed Markets countries around the world, excluding the U.S. and Canada.

MSCI EAFE IMI Index: A free float-adjusted market capitalization index which captures large, mid and small cap representation across Developed Markets countries around the world, excluding the U.S. and Canada.

MSCI EAFE Growth Index: A free float-adjusted market capitalization index that is designed to measure the equity market performance of developed markets, excluding the U.S. & Canada.

MSCI All Country World ex-US Index: An unmanaged index that includes developed and emerging markets, excluding the U.S.

MSCI All Country World ex-US Growth Index: A free float-adjusted market capitalization index that is designed to provide a broad measure of equity-market performance throughout the world, excluding the U.S. It includes those MSCI All Country World ex-US securities with higher price-to-book ratios and higher forecasted growth rates.

MSCI All Country World ex-US IMI Index: A free float-adjusted market capitalization index that is designed to measure equity market performance in the global developed and emerging markets, excluding the U.S.

MSCI All Country World IMI Index: A free float-adjusted market capitalization index that is designed to measure equity market performance in the global developed and emerging markets.

MSCI All Country World ex-US IMI Growth Index: A free float-adjusted market capitalization index that is designed to measure equity market performance in the global developed and emerging markets, excluding the U.S. It includes those MSCI All Country World ex-US IMI Index securities with higher price-to-book ratios and higher forecasted growth rates.

MSCI World ex-US Growth Index: A free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets, excluding the U.S., with higher price-to-book ratios and higher forecasted growth rates.

MSCI World ex-US Index: A free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets, excluding the U.S.

MSCI Emerging Markets Index: A free float-adjusted market capitalization index that is designed to measure equity market performance in the global emerging markets.

MSCI Emerging Markets IMI Index: A free float-adjusted market capitalization index which captures large, mid and small cap equity market performance in the global emerging markets.

MSCI Emerging Markets Small Cap Index: A free float-adjusted market capitalization index that is designed to measure equity market performance of small cap companies in emerging markets.

MSCI Emerging Markets Large Cap Index: A free float-adjusted market capitalization index that is designed to measure equity market performance of large cap companies in emerging markets.

MSCI World ex-US Small Cap Index: An unmanaged index that includes non-US developed markets.

Russell 1000 Index: Measures the performance of the 1000 largest companies in the Russell 3000 Index, which represents approximately 90% of the total market capitalization of the U.S. market.

Russell 1000 Growth Index: Measures the performance of those Russell 1000 companies with higher price-to-book ratios and higher forecasted growth values.

Russell 1000 Value Index: Measures the performance of the large cap value segment of the U.S. equity universe. It includes those Russell 1000 companies with lower price-to-book ratios and lower forecasted growth values.

Russell 2000 Index: Measures the performance of the 2000 smallest companies in the Russell 3000 index, which represents approximately 8% of the total market capitalization of the Russell 3000 index.

Russell 2000 Growth Index: Measures the performance of those Russell 2000 companies with higher price to book ratios and higher forecasted growth values.

Russell 2000 Value Index: Measures the performance of those Russell 2000 companies with lower price-to-book ratios and lower forecasted growth values.

Russell 2500 Index: Measures the performance of the 2500 smallest companies in the Russell 3000 Index.

Russell 2500 Growth Index: Measures the performance of those Russell 2500 companies with higher price-to book ratios and higher forecasted growth values.

Russell 2500 Value Index: Measures the performance of those Russell 2500 companies with lower price-to book ratios and lower forecasted growth values.

Russell 3000 Index: Measures the performance of the 3000 largest U.S. companies based on total market capitalization, which represents approximately 98% of the investable U.S. equity market.

Russell 3000 Growth Index: Measures the performance of those Russell 3000 companies with higher price-to-book ratios and higher forecasted growth values.

Russell Midcap Index: Measures the performance of the 800 smallest companies in the Russell 1000 Index, which represent approximately 27% of the total market capitalization of the Russell 1000 companies.

Russell Midcap Growth Index: Measures the performance of those Russell Midcap companies with higher price-to-book ratios and higher forecasted growth values.

Russell Midcap Value Index: Measures the performance of the mid-cap value segment of the U.S. equity universe. It includes those Russell Midcap Index companies with lower price-to-book ratios and lower forecasted growth values.

S&P 500 Index: The Standard & Poor's 500 Index (S&P 500) is an index of 500 stocks chosen for market size, liquidity and industry grouping, among other factors. The S&P 500 is designed to be a leading indicator of U.S. equities and is meant to reflect the risk/return characteristics of the large cap universe. Companies included in the index are selected by the S&P Index Committee, a team of analysts and economists at Standard & Poor's. The S&P 500 is a market value weighted index—each stock's weight is proportionate to its market value.

A direct investment in an unmanaged index is not possible.

Quantitative Models – Definitions

Factor	Examples
Quality	
The William Blair Quality Model attempts to put into quantitative terms one of the cornerstones of the firm’s investment philosophy: identifying high quality companies. The score combines measurements of sustainable value creation, earnings quality, and financial strength.	Cash Flow ROIC Cash Flow Accruals Net Debt/EBITDA
Valuation	
The William Blair Valuation Model combines varying metrics used to characterize the relationship between the stock’s trading price and its intrinsic value. By going beyond using only one or two measures, the model attempts to build a more holistic version of a stock’s worth vis-a-vis the market. The score combines measurements of earnings/cash flow based, asset-based, and model-based factors.	Free Cash Flow Yield Price/NTM Earnings Enterprise Value/Sales EVA Dimensions PRVit score
Earnings Trend	
The William Blair Earnings Trend Model captures information about short- and medium-term changes in analyst estimates in an attempt to anticipate future estimate changes and stock performance. The score combines measurements of earnings revisions, momentum, and earnings surprise.	3 Month EPS Revisions EVA Momentum Standardized Unexpected Earnings (SUE)
Momentum	
The William Blair Momentum Model combines information about short- and medium-term performance trends for each stock in order to identify stocks that may be able to persist in outperformance over the near term.	12 Month Volatility Adjusted Return 6 Month Sharpe Ratio
Growth	
The William Blair Growth Model builds a long-term growth estimate based on a combination of realized and forecast growth rates. The inputs and results of this model are not limited to earnings, but instead cast a broader net to include measures of a firm’s overall growth. In addition to providing a Growth Model score, the growth rate generated by the model is used as an input into other models.	Historical & Expected Growth 6 & 10 Year Average Trend Growth
Volatility	
The William Blair Volatility Model captures the variability in short- and long-term fundamental returns which include ROE, Margins, and EPS.	ROE Range/Average Coefficient of Variation & Dispersion of EPS
Composite	
The William Blair Composite Model produces an aggregate score from the Quality, Valuation, Earnings Trend, and Momentum models using a proprietary weighting mix.	

William Blair proprietary quantitative model.

Important Disclosures

Intended for informational purposes only.

Performance cited represents past performance. Past Performance does not guarantee future results.

Investment returns and principal will fluctuate with market and economic conditions and you may have a gain or loss when you sell shares. Current performance may be lower or higher than the data quoted. International investing involves special risk considerations, including currency fluctuations, lower liquidity, economic and political risk. Investing in emerging markets can increase these risks. Investing in smaller companies involves special risks, including higher volatility and lower liquidity. Equities may decline in value due to both real and perceived general market, economic, and industry conditions. Investing in foreign denominated and/or domiciled securities may involve heightened risk due to currency fluctuations, and economic and political risks, which may be enhanced in emerging markets.

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As used in this document, "William Blair" refers to William Blair Investment Management, LLC and affiliates unless otherwise noted.

Composite Presentation Report

International Growth

Calendar Year	Composite Gross Return (%)	Composite Net Return (%)	MSCI AC ex US IMI (net) -Linked Return (%)	Composite 3-Yr Std Dev (%)	Benchmark 3-Yr Std Dev (%)	Number of Portfolios	Dispersion (%)	Composite Assets End of Period \$(mm)	Percentage of Total Firm Assets (%)
2008	-52.27	-52.73	-45.99	23.75	21.13	24	0.67	6,906.24	26.37
2009	46.32	45.01	43.60	26.53	25.52	23	0.73	9,739.15	26.58
2010	21.19	20.22	12.73	27.77	27.57	40	0.77	14,599.87	33.04
2011	-13.05	-13.74	-14.31	20.43	22.79	41	0.52	11,567.14	28.08
2012	23.94	22.95	17.04	18.02	19.29	41	0.58	14,265.48	28.75
2013	21.14	20.17	15.82	15.41	16.24	40	0.27	16,962.01	27.35
2014	-1.40	-2.18	-3.89	12.03	12.78	38	0.23	15,481.25	24.55
2015	0.46	-0.34	-4.60	10.94	11.95	36	0.29	15,242.21	23.53
2016	-1.40	-2.18	4.41	11.22	12.38	40	0.30	14,279.91	22.01
2017	30.95	29.90	27.81	11.01	11.77	38	0.34	16,350.96	22.23

Disclosures:

William Blair Investment Management claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. William Blair Investment Management has been independently verified for the periods January 1, 1993 through December 31, 2017. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. The International Growth Composite has been examined for the periods presented through December 31, 2017. The verification and performance examination reports are available upon request.

For purposes of compliance with GIPS, the Firm is defined as all portfolios managed by William Blair Investment Management ("WBIM"), a distinct operating unit within William Blair. WBIM currently operates as William Blair Investment Management, LLC, an investment adviser registered with the United States Securities and Exchange Commission ("SEC"). Registration with the SEC does not imply a certain level of skill or training. WBIM primarily manages assets for institutional investors. Through 2017, WBIM included an additional sub unit, named IM Counseling, which primarily managed assets for private wealth investors, under an affiliated registered investment adviser.

The International Growth strategy invests in a broad range of companies based in developed and emerging markets outside of the United States. Companies have had and are expected to maintain superior growth, profitability and quality relative to local markets. The strategy will occasionally include the use of forward currency contracts to hedge some of the foreign currency exposure which accompanies investment in foreign currency-denominated securities.

The benchmark that best reflects the composite's investment strategy is the MSCI All Country World Ex US Investable Market Index (net), which is a free float-adjusted market capitalization index that is designed to measure equity market performance, net of withholding taxes, in the global developed and emerging markets, excluding the US. Prior to 1995, the MSCI All Country World Ex US Index preceded the current benchmark as returns are unavailable back to composite inception for the current benchmark.

Portfolios must have an initial market value greater than or equal to \$1 million to be included in the composite. New portfolios are added to the composite at the beginning of the month following the first full calendar month under management. Prior to July 2007, new portfolios were added to the composite at the beginning of the quarter following two full calendar months under management. Portfolios will be excluded from the composite the first month immediately following the last complete month of authorized management by the Firm. Portfolios are removed from this composite, in the event of a significant cash flow, for the month during which the flow occurs. Portfolios are typically added back into the composite the following month. A portfolio is determined to have a significant cash flow if the accumulated net external flows of cash and/or securities during a month total more than 25% of the beginning of month portfolio market value. Additional information regarding the treatment of significant cash flows is available upon request.

Portfolio and composite returns are calculated daily. Prior to January 2009, portfolio returns were calculated monthly using a time-weighted monthly linked return formula with adjustments for cash flows and composites were calculated monthly by weighting portfolio returns based on beginning of month market value. Valuations and returns are denominated in U.S. Dollars. Accrual accounting is used for dividends. The dividend accruals included in portfolio valuations are net of applicable withholding taxes. Pending withholding tax reclaims are not accrued for in the portfolio valuations. Composite dispersion measures represent the consistency of a firm's composite performance with respect to the individual portfolio returns within a composite. The dispersion of annual returns is measured by the asset-weighted standard deviation of the gross returns in the composite. Dispersion includes only those portfolios that have been included in the composite for the entire year. The three-year annualized standard deviation measures the variability of the gross composite returns and the benchmark returns over the preceding 36-month period. This statistic is not presented until there are 36 months of performance available.

Performance results are stated gross of management fees and net of the maximum management fee. The management fee schedule is as follows:

Up to \$20,000,000: 0.80%
 Next \$30,000,000: 0.60%
 Next \$50,000,000: 0.50%
 Next \$50,000,000: 0.45%
 Next \$50,000,000: 0.40%
 Over \$200,000,000: 0.30%

The International Growth Composite was created in October 2001. From creation through July 2014, the composite was named International Growth All Cap Growth. The composite performance inception date is December 1, 1992.

A complete list and description of firm composites is available upon request. Additional information regarding policies for valuing portfolios, calculating performance and preparing compliant presentations is also available upon request. Past performance is not indicative of future results.

International Growth Strategy

Performance for periods ending September 30, 2018

Composite Performance (% USD)	Qtr	YTD	1 Yr	Annualized				
				3 Yr	5 Yr	10 Yr	Since Oct 1 96 ¹	Strategy Inception (Dec 1 92)
International Growth (Gross)	0.06	-0.98	3.98	10.32	6.38	8.04	9.94	10.53
International Growth (Net)	-0.15	-1.57	3.15	9.44	5.53	7.16	9.00	9.59
MSCI AC World ex-US IMI Index	0.39	-3.27	1.79	10.14	4.39	5.60	5.17	6.39
Relative Performance (Gross)	-0.33	2.29	2.19	0.17	1.99	2.44	4.77	4.14

Annual Composite Performance (% USD)	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
International Growth (Gross)	30.95	-1.40	0.46	-1.40	21.14	23.94	-13.05	21.19	46.32	-52.27	19.73
International Growth (Net)	29.90	-2.18	-0.34	-2.18	20.17	22.95	-13.74	20.22	45.01	-52.73	18.68
MSCI AC World ex-US IMI Index	27.81	4.41	-4.60	-3.89	15.82	17.04	-14.31	12.73	43.60	-45.99	16.13

Annual Composite Performance (% USD)	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996 ²
International Growth (Gross)	25.04	23.07	20.12	44.10	-13.79	-12.99	-6.23	100.28	12.92	9.97	2.94
International Growth (Net)	23.95	21.99	19.07	42.85	-14.57	-13.77	-7.07	98.59	11.92	9.00	2.71
MSCI AC World ex-US IMI Index	26.51	17.68	21.93	42.34	-12.94	-19.83	-19.44	37.72	11.97	-3.30	0.16

¹Reflects the inception of the strategy's current management style. At this time, changes were made to the portfolio management team and the way the philosophy was implemented. Actual composite inception precedes this date. This information is supplemental to the composite disclosure slide located in the appendix.

²Partial year performance from December 1 to December 31, 1992.

Past performance is not indicative of future returns. Net investment performance represents the deduction of the highest possible fee. Actual client net returns may be higher or lower depending on fees charged to your account and the amount invested.

Returns for periods greater than one year are annualized. Gross performance results shown do not reflect the deduction of investment management fees, assume the reinvestment of dividends and capital gains, and are net of transaction costs. Performance results will be reduced by the fees incurred in the management of the account. For example, assuming an annual gross return of 8% and an annual management/advisory fee of .40%, the net annualized total return of the portfolio would be 7.58% over a 5-year period. Net investment performance represents the deduction of the highest possible fee. Investment management fees are described in William Blair's Form ADV Part 2A. The benchmark that best reflects the composite's investment strategy is the MSCI All Country World Ex US Investable Market Index (net), which is a free float-adjusted market capitalization index that is designed to measure equity market performance, net of withholding taxes, in the global developed and emerging markets, excluding the US. Prior to 1995, the MSCI All Country World Ex US Index preceded the current benchmark as returns are unavailable back to composite inception for the current benchmark. International investing involves special risk considerations, including currency fluctuations, lower liquidity, economic and political risk. Please see composite disclosure in appendix for a complete description of the composite.