

CONTRIBUTOR

Utkarsh Agrawal
Associate Director
Global Research & Design
utkarsh.agrawal@spglobal.com

Earnings Revision Overlay on Fundamental Factors in Asia

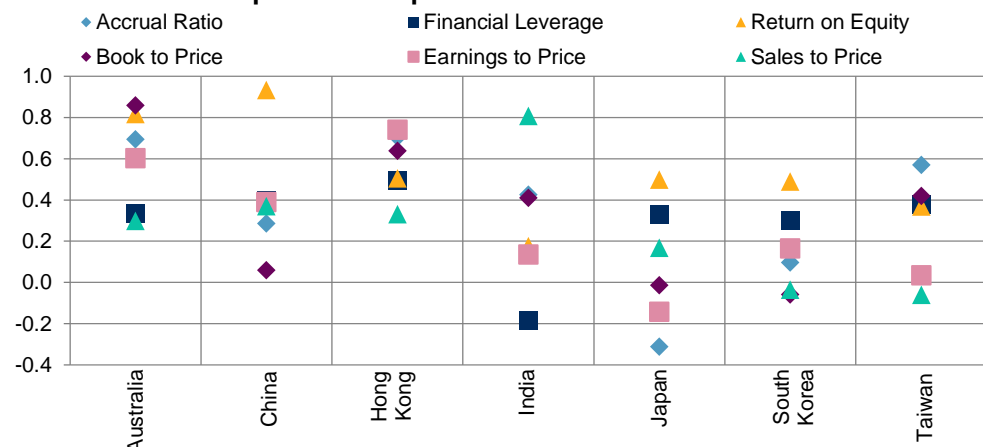
EXECUTIVE SUMMARY

In this research paper, we explore the effectiveness of overlaying earnings revision strategies on traditional fundamental value and quality factors across seven Pan Asian markets—Australia, China, Hong Kong, India, Japan, South Korea, and Taiwan—between March 31, 2006, and March 31, 2018.

HIGHLIGHTS

- The earnings revision-screened factor portfolios outperformed their respective comparable factor portfolios across the majority of Pan Asian markets for the value and quality factors.
- Our screening approach did not introduce a large increase in portfolio turnover or strong sector or size biases to the fundamental factor portfolios historically.
- Among various Asian markets, the earnings revision overlay generated the most significant excess return in Australia and Hong Kong for a majority of fundamental factors.

Exhibit 1: Information Ratios of EPS Diffusion-Screened Factor Portfolios Vis-à-Vis Their Respective Comparable Factor Portfolios



All portfolios shown are hypothetical and back-tested.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Performance based on monthly local currency total return from March 31, 2006, to March 31, 2018. Earnings diffusion was computed as the number of upward revisions minus the number of downward revisions of EPS estimates divided by the total number of EPS estimates. Past performance does not guarantee future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

INTRODUCTION

We tested if the earnings revisions strategies were historically effective in generating alpha over the factor portfolios by filtering out the stocks with relatively poor earnings revisions from the factor portfolios.

In our previous research paper "[Do Earnings Revisions Matter in Asia?](#)", we concluded that stock prices tended to move in the same direction as their earnings revisions in the majority of Pan Asian markets, and the earnings revision strategies delivered excess returns in a majority of the markets. Due to the high portfolio turnover of this strategy, using earnings revision as an overlay to fundamental factors may be more practical.

The goal of this research is to evaluate the effectiveness of earnings revision strategies over the fundamental factor portfolios. We overlaid two earnings revision screens (EPS change and EPS diffusion) on the fundamental value and quality factor portfolios, respectively. Specifically, we examined if the earnings revision screens were historically effective in generating return alpha or reducing the risk of the factor portfolios by filtering out the stocks with relatively poor earnings revisions from the factor portfolios.¹

METHODOLOGY

Portfolio Construction

In this research paper, we used the analysts' consensus earnings-per-share (EPS) estimates data from the Thomson Reuters Institutional Brokers Estimate System (I/B/E/S) database, and the companies' actual reported fundamental data from the Thomson Reuters Worldscope database.

We studied the effectiveness of overlaying the two earnings revision screens²—the six-month change in the EPS estimate (EPS change) and the six-month diffusion of the EPS estimate (EPS diffusion)—on the value and quality factors. The value factors³ included the book-to-price ratio, earnings-to-price ratio, and sales-to-price ratio. The quality factors⁴ included the accrual ratio, financial leverage ratio, and return-on-equity ratio. We studied the effect of overlaying the EPS change and EPS diffusion screens separately on each of the underlying value and quality factors.

¹ See Exhibits 21, 22, 23, and 24 in the Appendix for the total return of the comparable factor portfolios over the entire back-tested period.

² We used a six-month measurement period to measure EPS change and EPS diffusion using the same methodology as mentioned in our research paper "[Do Earnings Revisions Matter in Asia?](#)". Stocks with higher EPS change and EPS diffusion will rank higher in comparison to other stocks.

³ The value factors (book-to-price ratio, earnings-to-price ratio, and sales-to-price ratio) were measured using the same methodology as used by the [S&P Enhanced Value Indices](#). Stocks with higher ratios will rank higher in comparison to other stocks.

⁴ Two of the quality factors (accrual ratio and financial leverage ratio) were measured using the same methodology as used by the [S&P Quality Indices](#). The return-on-equity ratio was calculated as a company's trailing 12-month earnings divided by its average book value over the past two years. Stocks with a lower accrual ratio, lower financial leverage ratio, and higher return-on-equity ratio were ranked higher in comparison to other stocks.

We overlaid two earnings revision strategies—the six-month change in the EPS estimate (EPS change) and the six-month diffusion of the EPS estimate (EPS diffusion)—on the value and quality factors.

The earnings revision-screened factor portfolios for each factor were formed in two steps. First, we selected the top quartile of stocks by each fundamental factor from the base universe. Next, we dropped the bottom quintile of stocks by earnings revision from the stocks selected in the first step.⁵ Our aim was to remove only a small portion of stocks with poor earnings revisions to avoid a large increase in the portfolio turnover.⁶ To have an apples-to-apples comparison, we also formed the comparable factor portfolios by selecting the top quintile stocks from the base universe by the same fundamental factors.

We equally weighted all the portfolios and rebalanced them after the close of the second Friday of March and September, with data reference dates as of the Wednesday following the third Friday of February and August, respectively.

Sample Universe

Our study included seven Pan Asian equity markets: Australia, China, Hong Kong, India, Japan, South Korea, and Taiwan.

Our study covered seven Pan Asian equity markets including Australia, China, Hong Kong, India, Japan, South Korea, and Taiwan. Companies domiciled in each market from the [S&P Global BMI](#)⁷ with at least three analyst estimates at the time of the rebalancing formed the base universe for the respective markets.⁸ Our study period was from March 31, 2006, to March 31, 2018,⁹ and the performances of all the portfolios were measured in the local currency of their respective markets.

EFFECTIVENESS OF OVERLAYING EARNINGS REVISION STRATEGIES ON TRADITIONAL FUNDAMENTAL FACTORS

In this section, we examine the effectiveness of overlaying the earnings revision strategies on fundamental factor portfolios in various Pan Asian markets. We evaluated the average monthly excess returns, beta, and portfolio turnover of the earnings revision-screened factor portfolios versus their respective comparable factor portfolios, and we also reviewed the sector and size concentration bias.

⁵ At each step in the portfolio formation process, the stocks at the threshold values were included in the respective portfolios.

⁶ In our previous research paper, "[Do Earnings Revisions Matter in Asia?](#)", we discussed that the earnings revision strategies had high turnover.

⁷ The S&P Global BMI is a comprehensive, rules-based index measuring global stock market performance that has been fully float adjusted since its inception in 1989. Constituents of the [S&P China A BMI](#) were used in the analysis for the China market.

⁸ We formed the base universe from stocks with at least three analyst estimates to avoid bias from a single analyst. This is consistent with our research paper "[Do Earnings Revisions Matter in Asia?](#)".

⁹ The monthly number of upward and downward revisions of the EPS estimates is not available prior to 2005 from the Thomson Reuters I/B/E/S database. Therefore, for a six-month measurement period, the earliest possible rebalancing could be done in March 2006 only.

Risk, Return, and Turnover

The earnings revision-screened portfolios outperformed their respective comparable factor portfolios across a majority of the markets for the value and quality factors.

Historically, the earnings revision-screened factor portfolios outperformed their respective comparable factor portfolios across a majority of the markets for the value and quality factors (see Exhibits 2 and 3). This suggests that, historically, the earnings revision screen was effective in generating return alpha over traditional fundamental factor portfolios. In particular, the effectiveness was higher when the EPS change screen was overlaid with the value factors; this generated higher excess return than the EPS diffusion screen across a majority of the markets. For the quality factors, the EPS diffusion screen was more effective.

Among the various markets, Australia and Hong Kong had statistically significant excess returns for a majority of the earnings revision-screened factor portfolios, indicating higher synergy of the earnings revision screen with fundamental factors in these markets.

Exhibit 2: Monthly Average Excess Returns of Earnings Revision-Screened Value Portfolios Over Their Respective Comparable Value Portfolios

MARKET	BOOK TO PRICE		EARNINGS TO PRICE		SALES TO PRICE	
	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	0.41**	0.26**	0.25*	0.18*	0.13	0.07
China	0.03	0.02	0.05	0.09	0.12	0.11
Hong Kong	0.23*	0.21*	0.29**	0.25*	0.31**	0.10
India	0.20	0.10	0.03	0.00	0.32**	0.24*
Japan	0.01	-0.02	-0.04	-0.04	0.03	0.02
South Korea	0.03	-0.03	-0.05	0.04	0.05	-0.02
Taiwan	0.04	0.12	0.15	-0.01	0.03	-0.03

All portfolios shown are hypothetical and back-tested. * denotes statistical significance at 5% using one-tailed t-test. ** denotes statistical significance at 1% using one-tailed t-test.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Exhibit 3: Monthly Average Excess Returns of Earnings Revision-Screened Quality Portfolios Over Their Respective Comparable Quality Portfolios

MARKET	ACCRUAL RATIO		FINANCIAL LEVERAGE		RETURN ON EQUITY	
	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	0.18	0.20*	0.13	0.10	0.11	0.25**
China	0.11	0.05	0.07	0.09	0.13	0.21**
Hong Kong	0.29*	0.24*	0.12	0.18*	0.08	0.20
India	0.03	0.08	0.01	-0.05	0.03	0.02
Japan	-0.07	-0.07	0.03	0.06	0.08	0.10
South Korea	0.02	0.03	-0.10	0.09	0.01	0.13
Taiwan	0.12	0.17*	0.12	0.11	0.16*	0.10

All portfolios shown are hypothetical and back-tested. * denotes statistical significance at 5% using one-tailed t-test. ** denotes statistical significance at 1% using one-tailed t-test.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

The earnings revision overlay lowered the risk of the value and quality factors significantly across a majority of the markets.

We also found that the earnings revision overlay on the fundamental factors lowered the risk of the value and quality factors significantly across a majority of the markets (see Exhibits 4 and 5). In particular, the beta of the EPS change-screened factor portfolios was less than that of their respective EPS diffusion-screened factor portfolios. Therefore historically, the risk reduction from the EPS change screen was more than the EPS diffusion screen for the value and quality factors.

Exhibit 4: Beta of Earnings Revision-Screened Value Portfolios Vis-à-Vis Their Respective Comparable Value Portfolios

MARKET	BOOK TO PRICE		EARNINGS TO PRICE		SALES TO PRICE	
	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	0.88**	0.91**	0.89**	0.91**	0.91**	0.93**
China	0.98**	1.00	0.97**	0.98**	1.01	1.02**
Hong Kong	0.94**	0.97*	0.94**	0.97*	0.93**	0.92**
India	0.93**	0.93**	0.93**	0.93**	0.93**	0.95**
Japan	0.91**	0.94**	0.95**	0.97**	0.91**	0.94**
South Korea	0.96**	0.97*	0.95**	0.97*	0.94**	0.98
Taiwan	0.96**	0.97*	0.94**	0.95**	0.94**	0.97*

All portfolios shown are hypothetical and back-tested. * denotes statistical significance at 5% using one-tailed t-test. ** denotes statistical significance at 1% using one-tailed t-test.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Exhibit 5: Beta of Earnings Revision-Screened Quality Portfolios Vis-à-Vis Their Respective Comparable Quality Portfolios

MARKET	ACCRUAL RATIO		FINANCIAL LEVERAGE		RETURN ON EQUITY	
	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	0.87**	0.92**	0.90**	0.95**	0.88**	0.93**
China	0.98**	0.99	0.97**	0.99	0.96**	0.98*
Hong Kong	0.92**	0.95**	0.98	1.00	0.89**	0.93**
India	0.91**	0.94**	0.91**	0.97*	0.85**	0.88**
Japan	0.93**	0.97**	0.94**	0.96**	0.96**	0.99
South Korea	0.99	1.00	0.91**	0.95**	0.90**	0.95**
Taiwan	0.97*	0.99	0.91**	0.95**	0.95**	0.99

All portfolios shown are hypothetical and back-tested. * denotes statistical significance at 5% using one-tailed t-test. ** denotes statistical significance at 1% using one-tailed t-test.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Our method of overlaying earnings revision screens did not introduce high turnover to the fundamental factor portfolios, historically.

After overlaying earnings revision screens on fundamental factors, we found a marginal increase in portfolio turnover compared with their respective comparable factor portfolio (see Exhibits 6 and 7). Over the entire back-tested period, the maximum increase in the average annual (one-way) turnover was only 29% across different markets.

Exhibit 6: Average Annual Turnover (One-Way) of the Earnings Revision-Screened Value Portfolios and Their Respective Comparable Value Factor Portfolios

MARKET	BOOK TO PRICE			EARNINGS TO PRICE			SALES TO PRICE		
	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	80.57	87.21	92.14	104.59	103.48	107.17	63.67	70.20	80.23
China	77.95	94.15	97.64	80.07	96.59	99.89	72.68	88.48	93.63
Hong Kong	69.28	75.05	80.54	86.22	92.59	97.05	62.82	74.36	77.28
India	65.83	76.57	82.63	78.90	91.40	92.54	61.97	76.57	80.34
Japan	72.80	86.81	88.75	98.81	101.52	105.26	57.08	72.00	74.60
South Korea	77.96	85.79	91.85	100.83	105.41	109.54	64.51	77.26	80.26
Taiwan	85.97	97.36	100.76	110.59	115.55	127.33	65.76	78.63	90.20

All portfolios shown are hypothetical and back-tested.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Exhibit 7: Average Annual Turnover (One-Way) of the Earnings Revision-Screened Quality Portfolios and Their Respective Comparable Quality Portfolios

MARKET	ACCRUAL RATIO			FINANCIAL LEVERAGE			RETURN ON EQUITY		
	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	95.81	105.68	109.11	67.42	76.00	84.75	64.00	72.80	80.50
China	105.77	116.60	118.18	71.35	89.31	92.23	83.19	95.62	96.61
Hong Kong	96.07	105.34	107.45	52.14	69.75	74.36	66.91	82.78	82.67
India	92.06	103.63	107.00	40.13	61.36	66.93	61.31	76.88	79.85
Japan	91.61	105.03	105.26	44.86	64.20	67.48	72.54	82.57	86.72
South Korea	102.63	107.03	109.44	58.35	70.67	81.96	85.65	91.94	100.59
Taiwan	107.29	117.25	120.12	62.95	86.55	91.93	73.81	81.51	89.88

All portfolios shown are hypothetical and back-tested.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Sector and Size Composition

The sector composition of earnings revision-screened factor portfolios was highly correlated to their respective comparable factor portfolios, historically (see Exhibits 8 and 9).¹⁰ This observation implies that the earnings revision strategies did not introduce a strong sector bias in the fundamental factor portfolios, and the excess returns were likely not driven by the sector bias.

Exhibit 8: Average Sector Weight Correlations Between the Earnings Revision-Screened Value Portfolios and Their Respective Comparable Value Portfolios

MARKET	BOOK TO PRICE		EARNINGS TO PRICE		SALES TO PRICE	
	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	93.52	94.57	97.51	93.98	96.49	97.15
China	93.15	95.69	96.06	96.00	95.55	96.83
Hong Kong	97.25	97.74	97.09	97.47	96.54	96.20
India	95.33	94.97	95.92	95.39	94.98	94.75
Japan	96.54	97.11	97.26	97.77	98.28	98.38
South Korea	93.71	94.94	94.14	93.91	95.67	96.43
Taiwan	97.17	97.93	97.62	97.47	98.94	98.86

All portfolios shown are hypothetical and back-tested.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Table is provided for illustrative purposes. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

The earnings revision strategies did not introduce a strong sector bias in the fundamental factor portfolios.

¹⁰ The average sector weight correlation was calculated in two steps. First, the correlation of the sector weights of earnings revision overlay portfolios versus their comparison factor portfolios was calculated for each month historically. Then, historical month-end correlations were averaged over the entire back-tested period.

Exhibit 9: Average Sector Weight Correlations Between the Earnings Revision-Screened Quality Portfolios and Their Respective Comparable Quality Portfolios

MARKET	ACCRUAL RATIO		FINANCIAL LEVERAGE		RETURN ON EQUITY	
	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	89.29	92.32	92.66	95.13	91.24	92.07
China	96.36	96.64	95.83	96.31	94.23	94.93
Hong Kong	91.99	93.21	95.85	96.13	94.54	94.84
India	88.07	88.92	91.38	91.12	91.13	91.97
Japan	96.97	97.48	97.15	97.45	97.39	97.63
South Korea	94.18	95.67	96.20	96.99	93.77	95.07
Taiwan	98.42	98.50	99.49	99.60	98.96	98.74

The earnings revision screens did not result in a strong bias to either large-mid-cap or small-cap stocks in the factor portfolios.

All portfolios shown are hypothetical and back-tested.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Table is provided for illustrative purposes. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

The average historical weight of the small-cap stocks in the earnings revision-screened factor portfolios was similar to their respective comparable factor portfolios (see Exhibits 10 and 11). Therefore, the overlaying of earnings revision screens on fundamental factors did not result in a strong bias to either large-mid-cap or small-cap stocks in the factor portfolios. Hence, size bias was also not a dominant driver of excess returns.

Exhibit 10: Average Weight of Small-Cap Stocks in Earnings Revision-Screened Value Portfolios and Their Respective Comparable Value Portfolios

MARKET	BOOK TO PRICE			EARNINGS TO PRICE			SALES TO PRICE		
	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	85.50	82.33	84.71	79.55	75.86	77.38	81.24	77.25	79.33
China	13.02	14.80	14.43	10.52	10.99	11.71	20.12	19.07	19.61
Hong Kong	57.53	48.44	51.47	49.79	45.74	46.65	62.36	60.68	62.25
India	70.92	64.94	66.92	66.54	62.36	63.13	72.73	68.40	70.15
Japan	58.66	56.66	57.41	54.98	53.66	54.77	55.05	54.05	54.67
South Korea	61.37	59.77	62.12	64.96	60.53	64.13	59.59	57.78	60.64
Taiwan	37.93	33.83	35.08	48.05	40.01	43.42	37.91	34.21	35.61

All portfolios shown are hypothetical and back-tested.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Table is provided for illustrative purposes. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Exhibit 11: Average Weight of Small-Cap Stocks in Earnings Revision-Screened Quality Portfolios and Their Respective Comparable Quality Portfolios

MARKET	ACCRUAL RATIO			FINANCIAL LEVERAGE			RETURN ON EQUITY		
	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	75.11	71.94	75.10	92.05	90.22	91.92	77.00	75.38	77.40
China	28.03	25.70	27.14	30.85	29.01	30.12	16.59	16.29	17.50
Hong Kong	63.67	55.32	57.79	72.68	66.23	67.79	51.97	50.25	51.90
India	65.12	61.47	63.97	48.47	44.55	47.41	52.29	49.97	52.07
Japan	53.02	49.07	50.06	63.32	60.63	61.66	56.94	53.77	54.87
South Korea	67.05	65.90	67.21	79.05	75.20	78.12	67.01	64.78	67.59
Taiwan	41.36	36.63	40.48	56.31	51.25	54.68	46.99	45.24	47.59

All portfolios shown are hypothetical and back-tested.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Table is provided for illustrative purposes. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Performance in Up, Down, and Neutral Markets

Historically, the earnings revision-screened factor portfolios significantly outperformed their respective comparable factor portfolios across a majority of the markets during down market periods¹¹ (see Exhibits 12 and 13).

During down markets, earnings revision overlay provided a defensive tilt to what otherwise would not be a defensive strategy. This is consistent with our previous research paper where we discussed that market participants tended to penalize stocks with poor earnings revisions more when the market was in a downward trend.¹²

The earnings revision overlay portfolios significantly outperformed their comparison factor portfolios across a majority of the markets during down market periods.

More specifically, EPS change-screened portfolios outperformed the EPS diffusion-screened portfolios across a majority of the markets in a downward trend.

¹¹ We defined the trend for each market based on its respective float-weighted broad market index, with periods of monthly returns greater than 1% representing up markets, periods of monthly returns less than -1% representing down markets, and the rest of the periods representing neutral markets.

¹² For more details, please see "[Do Earnings Revisions Matter in Asia?](#)".

Exhibit 12: Monthly Average Excess Returns of Earnings Revision-Screened Value Portfolios Over Their Respective Comparable Value Portfolios in Different Market Trends

MARKET	TREND	BOOK TO PRICE		EARNINGS TO PRICE		SALES TO PRICE	
		EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	Up	0.27	0.14	0.02	-0.03	-0.04	-0.02
	Neutral	-0.01	-0.05	0.14	0.10	0.07	0.00
	Down	0.83**	0.59**	0.64**	0.53**	0.41*	0.24
China	Up	-0.05	0.07	-0.12	-0.03	0.08	0.17
	Neutral	0.26	0.12	0.35*	0.21	0.32*	0.19
	Down	0.12	-0.09	0.25*	0.23*	0.15	0.01
Hong Kong	Up	0.29	0.26*	0.22	0.28*	0.24	-0.04
	Neutral	-0.10	-0.02	0.13	-0.10	0.16	-0.10
	Down	0.35	0.25	0.52*	0.41*	0.55**	0.49*
India	Up	-0.22	-0.17	-0.21	-0.20	-0.12	-0.03
	Neutral	0.63*	0.46*	0.55	0.47	0.68*	0.53
	Down	0.70**	0.37*	0.18	0.10	0.85**	0.54**
Japan	Up	-0.25	-0.18*	-0.13	-0.07	-0.13	-0.09
	Neutral	-0.02	-0.08	-0.15	-0.16	-0.09	-0.17
	Down	0.38**	0.23*	0.18	0.09	0.34*	0.29**
South Korea	Up	-0.28	-0.11	-0.21*	-0.06	-0.29	-0.09
	Neutral	0.30	0.07	-0.15	-0.03	0.47	0.05
	Down	0.35*	0.05	0.25	0.22	0.34*	0.06
Taiwan	Up	-0.05	0.05	-0.07	-0.20	-0.09	-0.09
	Neutral	-0.15	0.06	0.28	0.12	0.11	0.19
	Down	0.31	0.25	0.46**	0.26*	0.19	-0.04

All portfolios shown are hypothetical and back-tested. * denotes statistical significance at 5% using one-tailed t-test. ** denotes statistical significance at 1% using one-tailed t-test.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Market participants tended to penalize stocks with poor earnings revisions more when the market was in a downward trend.

Exhibit 13: Monthly Average Excess Returns of Earnings Revision-Screened Quality Portfolios Over Their Comparable Quality Portfolios in Different Market Trends

MARKET	TREND	ACCRUAL RATIO		FINANCIAL LEVERAGE		RETURN ON EQUITY	
		EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	Up	-0.04	0.15	-0.13	-0.02	-0.17	0.16
	Neutral	0.05	0.09	0.44	0.13	-0.06	-0.01
	Down	0.59**	0.34*	0.39*	0.28	0.62**	0.51*
China	Up	-0.03	0.01	-0.10	0.03	-0.13	0.10
	Neutral	0.13	-0.04	0.40*	0.52**	0.01	-0.05
	Down	0.33*	0.13	0.26*	0.11	0.57**	0.42**
Hong Kong	Up	0.07	0.05	0.09	0.23*	-0.19	0.00
	Neutral	0.38	0.35	0.28	0.17	0.08	0.15
	Down	0.65**	0.54**	0.05	0.08	0.61*	0.62*
India	Up	-0.43**	-0.18	-0.16	0.04	-0.25	-0.17
	Neutral	-0.06	0.02	0.14	-0.06	0.26	0.28
	Down	0.82**	0.54**	0.23	-0.18	0.38*	0.22
Japan	Up	-0.25*	-0.13	-0.13	-0.02	0.01	0.13
	Neutral	-0.12	-0.19	-0.09	-0.13	0.00	-0.06
	Down	0.21	0.09	0.32**	0.29**	0.21*	0.18*
South Korea	Up	-0.06	0.10	-0.16	0.14	-0.28*	-0.14
	Neutral	0.30	0.03	-0.34	-0.26	-0.02	0.26
	Down	-0.04	-0.07	0.13	0.20	0.47**	0.47**
Taiwan	Up	0.05	0.10	-0.19	-0.07	0.13	0.20
	Neutral	0.23	0.34*	0.42*	0.34	-0.04	-0.22
	Down	0.17	0.19	0.48**	0.29	0.31*	0.11

The earnings revision overlay delivered positive return alpha and lowered the risk of the factor portfolios in the majority of the markets studied.

All portfolios shown are hypothetical and back-tested. * denotes statistical significance at 5% using one-tailed t-test. ** denotes statistical significance at 1% using one-tailed t-test.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

In general, earnings revision-screened factor portfolios delivered positive return alpha with lower risk over their respective comparable factor portfolios in the majority of the markets studied. Moreover, the earnings revision screen did not result in strong sector or size biases in the factor portfolios. During down markets, the earnings revision-screened factor portfolios significantly outperformed their respective comparable factor portfolios across a majority of the markets. This indicates the earnings revision strategies were effective in enhancing the return of the traditional fundamental factors.

EFFECTIVENESS OF OVERLAYING EARNINGS REVISION STRATEGIES ON FUNDAMENTAL FACTOR PORTFOLIOS FORMED FROM SECTOR-NEUTRAL, LARGE-MID-CAP, AND SMALL-CAP UNIVERSES

As concluded in the previous section, our approach of overlaying the earnings revision screens did not result in strong sector or size biases in the factor portfolios. In this section, we further investigate the effectiveness of overlaying earnings revision screens on factor portfolios in formation of sector-neutral, large-mid-cap, and small-cap factor portfolios.

Effectiveness on Sector-Neutral Factor Portfolios

The sector-neutral earnings revision-screened factor portfolios and their respective sector-neutral comparable factor portfolios were formed using the same methodology as mentioned in the methodology section, except that the stocks were selected within the respective GICS® sectors, and the stocks selected from each sector were aggregated to form the final portfolios.

Historically, the sector-neutral earnings revision-screened factor portfolios outperformed their respective sector-neutral comparable factor portfolios in the majority of the markets studied, except for the sales-to-price ratio (see Exhibits 14 and 15).

Furthermore, the sector-neutral earnings revision-screened factor portfolios delivered positive excess returns for all the fundamental factors in Australia and Hong Kong, which is in congruence with the results from the previous section.

The sector-neutral earnings revision-screened portfolios delivered positive excess returns for all the fundamental factors in Australia and Hong Kong.

Exhibit 14: Monthly Average Excess Returns of Sector-Neutral Earnings Revision-Screened Value Portfolios Over Their Respective Sector-Neutral Comparable Value Portfolios

MARKET	BOOK TO PRICE		EARNINGS TO PRICE		SALES TO PRICE	
	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	0.17	0.10	0.07	0.04	0.30**	0.13
China	0.00	0.03	0.08	0.10	0.01	-0.02
Hong Kong	0.03	0.00	0.18	0.21*	0.23*	0.20*
India	0.00	-0.04	0.13	0.15	-0.11	-0.08
Japan	-0.04	-0.04	-0.01	0.00	-0.04	-0.02
South Korea	-0.06	-0.09	-0.04	0.07	-0.05	-0.06
Taiwan	0.05	0.10	0.24**	0.09	-0.03	-0.07

All portfolios shown are hypothetical and back-tested. * denotes statistical significance at 5% using one-tailed t-test. ** denotes statistical significance at 1% using one-tailed t-test.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Exhibit 15: Monthly Average Excess Returns of Sector-Neutral Earnings Revision-Screened Quality Portfolios Over Their Respective Sector-Neutral Comparable Quality Portfolios

MARKET	ACCRUAL RATIO		FINANCIAL LEVERAGE		RETURN ON EQUITY	
	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	0.03	0.07	0.19*	0.20*	0.07	0.14*
China	-0.05	-0.06	0.12	0.09	0.15*	0.20**
Hong Kong	0.11	0.10	0.18*	0.15*	0.06	0.05
India	-0.03	0.05	-0.05	0.03	-0.02	0.02
Japan	-0.10	-0.07	0.00	0.05	0.04	0.03
South Korea	0.10	0.10	0.12	0.23**	0.02	0.05
Taiwan	0.11	0.23**	0.18*	0.09	0.11	0.02

All portfolios shown are hypothetical and back-tested. * denotes statistical significance at 5% using one-tailed t-test. ** denotes statistical significance at 1% using one-tailed t-test.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Effectiveness on Large-Mid-Cap Factor Portfolios

The large-mid-cap earnings revision overlay portfolios delivered positive excess returns for all the fundamental factors in Australia.

The large-mid-cap earnings revision-screened factor portfolios and their respective large-mid-cap comparable factor portfolios were formed using the same methodology as mentioned in the methodology section, except that the stocks were selected within the large-mid-cap universe.

Historically, the large-mid-cap earnings revision-screened factor portfolios outperformed their respective comparable large-mid-cap factor portfolios in the majority of the markets studied, except for the book-to-price ratio (see Exhibits 16 and 17). Australia was the only market in which the large-mid-cap earnings revision-screened factor portfolios delivered positive excess returns across all the fundamental factors.

Exhibit 16: Monthly Average Excess Returns of Large-Mid-Cap Earnings Revision-Screened Value Portfolios Over Their Respective Large-Mid-Cap Comparable Value Portfolios

MARKET	BOOK TO PRICE		EARNINGS TO PRICE		SALES TO PRICE	
	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	0.26	0.19	0.27*	0.11	0.11	0.10
China	-0.04	-0.03	0.17*	0.22**	0.16	0.17
Hong Kong	-0.02	-0.06	0.08	0.07	0.03	0.07
India	0.01	0.05	-0.01	-0.02	-0.06	0.01
Japan	0.05	-0.05	0.04	0.05	0.01	-0.07
South Korea	-0.17	-0.15	-0.10	-0.19	0.14	0.08
Taiwan	0.04	0.07	0.24*	0.07	-0.16	-0.24*

All portfolios shown are hypothetical and back-tested. * denotes statistical significance at 5% using one-tailed t-test. ** denotes statistical significance at 1% using one-tailed t-test.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Exhibit 17: Monthly Average Excess Returns of Large-Mid-Cap Earnings Revision-Screened Quality Portfolios Over Their Respective Large-Mid-Cap Comparable Quality Portfolios

MARKET	ACCRUAL RATIO		FINANCIAL LEVERAGE		RETURN ON EQUITY	
	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	0.14	0.09	0.14	0.15	0.12	0.17
China	0.07	0.08	0.17	0.12	0.14	0.17*
Hong Kong	0.28*	0.12	0.11	0.21	-0.01	0.09
India	-0.02	-0.09	0.07	0.03	-0.09	-0.11
Japan	-0.02	-0.02	0.02	-0.01	0.00	0.00
South Korea	-0.06	0.02	-0.11	0.04	0.11	0.05
Taiwan	0.20	0.25**	0.16	0.05	0.26*	0.13

All portfolios shown are hypothetical and back-tested. * denotes statistical significance at 5% using one-tailed t-test. ** denotes statistical significance at 1% using one-tailed t-test.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

The small-cap earnings revision-screened portfolios delivered positive excess returns for all the fundamental factors in Australia and India.

Effectiveness on Small-Cap Factor Portfolios

The small-cap earnings revision-screened factor portfolios and their respective small-cap comparable factor portfolios were formed using the same methodology as mentioned in the methodology section, except the stocks were selected from the small-cap universe.

Historically, the small-cap earnings revision-screened factor portfolios outperformed their respective small-cap comparable factor portfolios in the

majority of the markets studied (see Exhibits 18 and 19). In Australia and India, the small-cap earnings revision-screened factor portfolios delivered positive excess returns for all the fundamental factors.

Exhibit 18: Monthly Average Excess Returns of Small-Cap Earnings Revision-Screened Value Portfolios Over Their Respective Small-Cap Comparable Value Portfolios

MARKET	BOOK TO PRICE		EARNINGS TO PRICE		SALES TO PRICE	
	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	0.41**	0.22	0.24	0.23*	0.24*	0.16
China	0.00	-0.02	-0.14	0.00	0.17	0.02
Hong Kong	0.23	0.17	0.19	0.14	0.28	0.00
India	0.24*	0.10	0.20	0.12	0.13	0.12
Japan	-0.02	0.00	-0.12	-0.05	-0.08	-0.02
South Korea	0.15	-0.04	-0.02	0.12	0.07	-0.04
Taiwan	0.14	0.10	0.06	0.03	0.38*	0.40**

All portfolios shown are hypothetical and back-tested. * denotes statistical significance at 5% using one-tailed t-test. ** denotes statistical significance at 1% using one-tailed t-test.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

The earnings revision-screened portfolios remained effective in sector-neutral, large-mid-cap, and small-cap universes with a majority of the quality fundamental factors.

Exhibit 19: Monthly Average Excess Return of Small-Cap Earnings Revision-Screened Portfolios Over Their Respective Small-Cap Comparable Quality Factor Portfolios

MARKET	ACCRUAL RATIO		FINANCIAL LEVERAGE		RETURN ON EQUITY	
	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	0.18	0.10	0.35**	0.27*	0.11	0.28*
China	0.12	-0.06	0.27	0.04	0.04	0.17
Hong Kong	0.23	0.16	0.25	0.20	-0.02	0.21
India	0.14	0.19	0.09	0.04	0.08	0.16
Japan	-0.10	-0.14	-0.05	0.07	0.04	-0.01
South Korea	0.24*	0.15	-0.14	0.12	0.10	0.35**
Taiwan	0.21	0.12	0.26*	0.13	-0.01	-0.02

All portfolios shown are hypothetical and back-tested. * denotes statistical significance at 5% using one-tailed t-test. ** denotes statistical significance at 1% using one-tailed t-test.

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

The results showed that the earnings revision-screened factor portfolios remained effective on the sector-neutral, large-mid-cap, and small-cap universes for a majority of the quality fundamental factors. For the value fundamental factors, the effectiveness of the earnings revision screens was reduced to a large degree.

CONCLUSION

In this research paper, we overlaid two earnings revision strategies (EPS change and EPS diffusion) on the value factors (book-to-price ratio, earnings-to-price ratio, and sales-to-price ratio) and the quality factors (accrual ratio, financial leverage ratio, and return-on-equity ratio) to evaluate if earnings revision strategies were effective in generating return alpha over the fundamental factor portfolios. We examined seven Pan Asian markets—Australia, China, Hong Kong, India, Japan, South Korea, and Taiwan—from March 31, 2006, to March 31, 2018.

The results suggested overlaying earnings revision screens on fundamental value and quality factors generated positive return alpha across the majority of the markets studied. Among the various markets, the earnings revision-screened factor portfolios generated statistically significant positive excess return compared with their respective factor portfolios for Australia and Hong Kong for a majority of the fundamental factors.

The earnings revision overlay on the fundamental factors lowered the risk of the value and quality factors significantly. Moreover, our approach of applying the earnings revision screens to the fundamental factors did not result in a large increase in portfolio turnover or strong sector or size biases.

We also discovered that the earnings revision-screened factor portfolios significantly outperformed their respective comparable factor portfolios across a majority of the markets during down market periods.

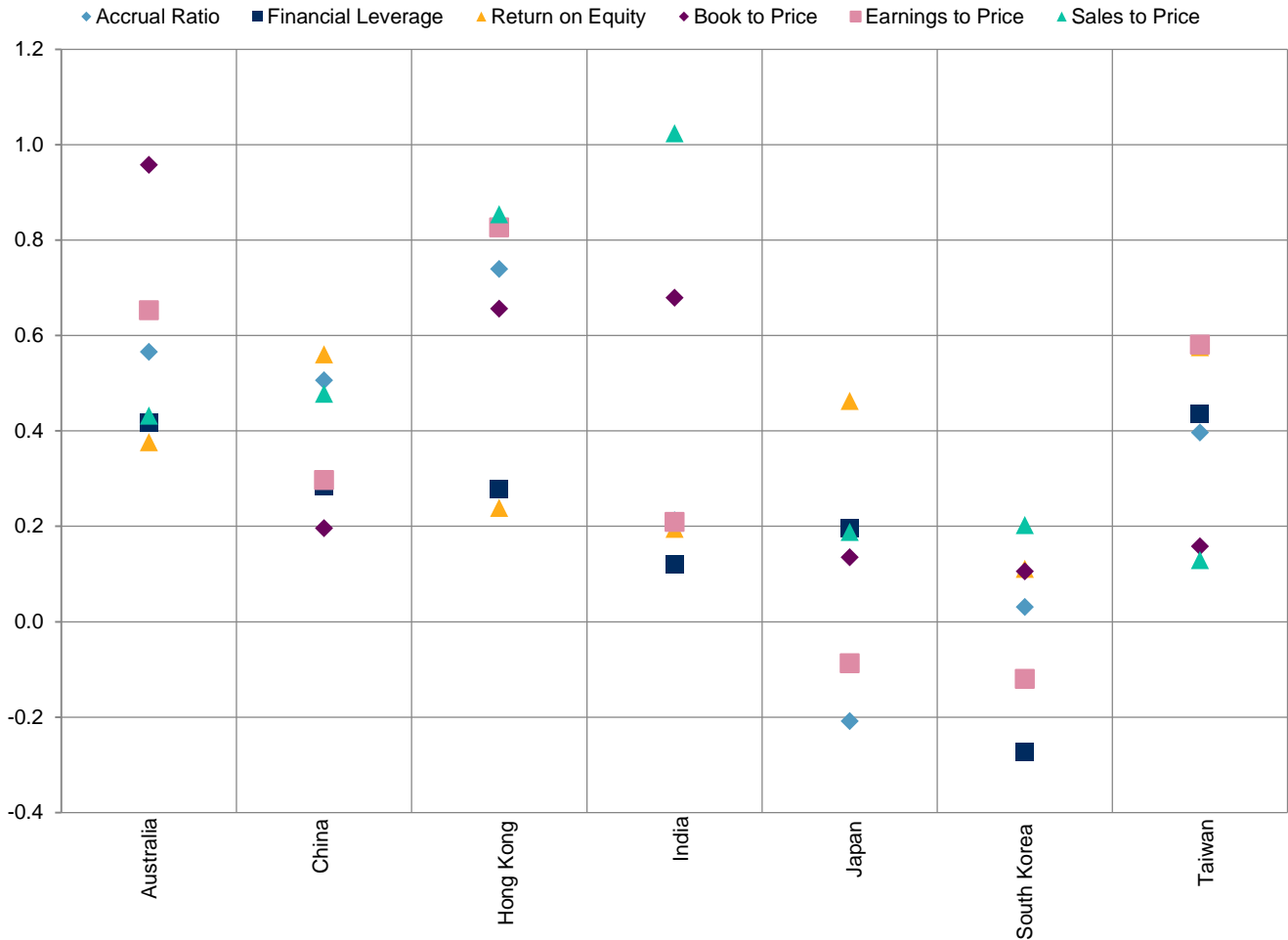
Earnings revision overlay on fundamental factors remained effective in the sector-neutral, large-mid-cap, and small-cap universes for a majority of the quality factors. In the case of the value factors, the effectiveness of the earnings revision screens was reduced to a large degree.

The results of our research suggest that the signals from earnings revisions were important even for fundamental factor strategies since the earnings revision-screened factor portfolios reduced the risk and enhanced the return of the comparable factor portfolios, historically, across a majority of the markets.

The signals from earnings revisions were important even for fundamental factor strategies.

APPENDIX

Exhibit 20: Information Ratios of EPS Change-Screened Factor Portfolios Vis-à-Vis Their Respective Comparable Factor Portfolios



All portfolios shown are hypothetical and back-tested.
 Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Performance based on monthly local currency total return from March 31, 2006, to March 31, 2018. The earnings change was computed as change in the EPS estimate divided by the absolute value of prior EPS estimate. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Exhibit 21: Equal-Weighted Performance of the Earnings Revision-Screened Value Portfolios and Their Respective Comparable Value Factor Portfolios

MARKET	METRIC	BOOK TO PRICE			EARNINGS TO PRICE			SALES TO PRICE		
		COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	Annualized Return (%)	-2.22	3.37	1.43	-1.31	2.30	1.36	2.85	4.84	4.07
	Annualized Volatility (%)	25.60	23.17	23.56	25.77	23.29	23.71	23.28	21.48	21.85
	Risk-Adjusted Return	-0.09	0.15	0.06	-0.05	0.10	0.06	0.12	0.23	0.19
China	Annualized Return (%)	19.76	20.46	19.95	18.44	19.51	19.91	21.16	22.75	22.43
	Annualized Volatility (%)	33.77	33.20	33.84	35.91	34.96	35.23	34.14	34.52	34.97
	Risk-Adjusted Return	0.58	0.62	0.59	0.51	0.56	0.57	0.62	0.66	0.64
Hong Kong	Annualized Return (%)	9.04	12.53	11.96	9.15	13.22	12.50	6.09	10.54	7.87
	Annualized Volatility (%)	29.18	27.86	28.80	25.95	24.81	25.52	26.69	25.28	24.92
	Risk-Adjusted Return	0.31	0.45	0.42	0.35	0.53	0.49	0.23	0.42	0.32
India	Annualized Return (%)	7.58	11.21	9.71	14.66	15.76	15.32	11.21	16.39	15.11
	Annualized Volatility (%)	39.60	37.06	37.19	34.65	32.66	32.51	37.24	35.05	35.59
	Risk-Adjusted Return	0.19	0.30	0.26	0.42	0.48	0.47	0.30	0.47	0.42
Japan	Annualized Return (%)	7.03	7.56	6.99	5.03	4.75	4.66	7.38	8.12	7.83
	Annualized Volatility (%)	22.46	20.71	21.30	21.96	21.18	21.53	21.35	19.82	20.26
	Risk-Adjusted Return	0.31	0.36	0.33	0.23	0.22	0.22	0.35	0.41	0.39
South Korea	Annualized Return (%)	9.40	9.91	9.16	6.67	6.21	7.25	7.82	8.80	7.66
	Annualized Volatility (%)	23.87	23.39	23.46	22.83	22.05	22.48	25.80	24.66	25.69
	Risk-Adjusted Return	0.39	0.42	0.39	0.29	0.28	0.32	0.30	0.36	0.30
Taiwan	Annualized Return (%)	8.07	8.83	9.71	7.99	10.23	8.12	7.54	8.13	7.30
	Annualized Volatility (%)	24.26	23.68	23.85	23.32	22.21	22.48	22.32	21.40	21.95
	Risk-Adjusted Return	0.33	0.37	0.41	0.34	0.46	0.36	0.34	0.38	0.33

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Exhibit 22: Equal-Weighted Performance of the Earnings Revision-Screened Quality Portfolios and Their Respective Comparable Quality Factor Portfolios

MARKET	METRIC	ACCRUAL RATIO			FINANCIAL LEVERAGE			RETURN ON EQUITY		
		COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED	COMPARABLE FACTOR	EPS CHANGE-SCREENED	EPS DIFFUSION-SCREENED
Australia	Annualized Return (%)	5.12	7.81	7.92	2.09	4.05	3.48	8.18	10.04	11.73
	Annualized Volatility (%)	18.40	16.45	17.34	20.51	18.91	19.81	20.19	18.21	19.15
	Risk-Adjusted Return	0.28	0.47	0.46	0.10	0.21	0.18	0.41	0.55	0.61
China	Annualized Return (%)	19.38	21.17	20.22	20.87	22.11	22.29	18.07	20.34	21.15
	Annualized Volatility (%)	30.67	30.16	30.42	31.91	31.27	31.70	32.07	31.00	31.70
	Risk-Adjusted Return	0.63	0.70	0.66	0.65	0.71	0.70	0.56	0.66	0.67
Hong Kong	Annualized Return (%)	7.13	11.13	10.35	4.71	6.10	6.86	7.83	9.40	10.78
	Annualized Volatility (%)	20.99	19.93	20.50	22.33	22.54	22.71	25.60	23.67	24.39
	Risk-Adjusted Return	0.34	0.56	0.50	0.21	0.27	0.30	0.31	0.40	0.44
India	Annualized Return (%)	17.06	18.04	18.62	14.77	15.27	14.21	16.07	17.18	16.95
	Annualized Volatility (%)	26.60	24.45	25.27	21.13	19.63	20.80	22.95	20.11	20.64
	Risk-Adjusted Return	0.64	0.74	0.74	0.70	0.78	0.68	0.70	0.85	0.82
Japan	Annualized Return (%)	6.30	5.60	5.46	6.80	7.29	7.59	2.05	3.13	3.33
	Annualized Volatility (%)	19.12	18.00	18.67	15.94	15.22	15.46	19.37	18.79	19.27
	Risk-Adjusted Return	0.33	0.31	0.29	0.43	0.48	0.49	0.11	0.17	0.17
South Korea	Annualized Return (%)	9.02	9.14	9.37	7.59	6.52	8.80	5.89	6.41	7.79
	Annualized Volatility (%)	20.34	20.60	20.74	18.55	17.28	18.05	21.86	20.08	21.03
	Risk-Adjusted Return	0.44	0.44	0.45	0.41	0.38	0.49	0.27	0.32	0.37
Taiwan	Annualized Return (%)	8.57	10.15	10.70	7.09	9.01	8.73	5.43	7.68	6.77
	Annualized Volatility (%)	21.67	21.46	21.84	23.21	21.49	22.43	23.57	22.79	23.66
	Risk-Adjusted Return	0.40	0.47	0.49	0.31	0.42	0.39	0.23	0.34	0.29

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Exhibit 23: Float-Weighted Performance of the Earnings Revision-Screened Value Portfolios and Their Respective Comparable Value Factor Portfolios

MARKET	METRIC	BMI	BOOK TO PRICE			EARNINGS TO PRICE			SALES TO PRICE		
			COMPAR- ABLE FACTOR	EPS CHANGE- SCREENED	EPS DIFFUSION- SCREENED	COMPAR- ABLE FACTOR	EPS CHANGE- SCREENED	EPS DIFFUSION- SCREENED	COMPAR- ABLE FACTOR	EPS CHANGE- SCREENED	EPS DIFFUSION- SCREENED
Australia	Annualized Return (%)	5.35	3.40	6.23	7.77	2.76	6.18	2.83	8.27	8.19	9.65
	Annualized Volatility (%)	13.85	22.30	19.18	19.84	21.75	18.39	20.64	17.19	15.01	15.28
	Risk-Adjusted Return	0.39	0.15	0.33	0.39	0.13	0.34	0.14	0.48	0.55	0.63
China	Annualized Return (%)	14.99	19.27	19.01	18.93	18.21	19.27	20.40	18.30	19.86	19.33
	Annualized Volatility (%)	31.98	33.26	32.94	33.46	35.34	34.83	34.95	33.14	33.08	33.33
	Risk-Adjusted Return	0.47	0.58	0.58	0.57	0.52	0.55	0.58	0.55	0.60	0.58
Hong Kong	Annualized Return (%)	8.29	10.51	11.14	10.76	10.24	11.55	10.63	8.53	9.57	8.52
	Annualized Volatility (%)	20.79	27.32	26.95	27.16	22.85	22.29	22.47	22.07	21.72	21.21
	Risk-Adjusted Return	0.40	0.38	0.41	0.40	0.45	0.52	0.47	0.39	0.44	0.40
India	Annualized Return (%)	11.53	8.61	10.77	9.14	15.30	15.67	14.59	12.29	17.07	16.04
	Annualized Volatility (%)	23.12	39.35	36.65	36.87	34.03	32.28	31.61	34.22	31.61	31.74
	Risk-Adjusted Return	0.50	0.22	0.29	0.25	0.45	0.49	0.46	0.36	0.54	0.51
Japan	Annualized Return (%)	1.78	5.47	6.45	5.52	3.48	3.09	2.56	2.84	3.56	2.77
	Annualized Volatility (%)	18.15	22.75	21.66	22.18	21.72	21.19	21.71	22.93	21.88	22.10
	Risk-Adjusted Return	0.10	0.24	0.30	0.25	0.16	0.15	0.12	0.12	0.16	0.13
South Korea	Annualized Return (%)	7.41	8.85	8.40	8.27	11.61	8.63	5.42	8.25	9.67	11.26
	Annualized Volatility (%)	17.36	20.97	22.59	21.96	23.63	21.81	22.67	24.39	22.96	24.33
	Risk-Adjusted Return	0.43	0.42	0.37	0.38	0.49	0.40	0.24	0.34	0.42	0.46
Taiwan	Annualized Return (%)	6.98	4.64	5.93	5.78	11.58	12.72	10.72	5.38	6.97	4.29
	Annualized Volatility (%)	19.05	22.87	22.83	22.68	20.16	19.16	19.36	21.58	21.38	21.30
	Risk-Adjusted Return	0.37	0.20	0.26	0.25	0.57	0.66	0.55	0.25	0.33	0.20

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

Exhibit 24: Float-Weighted Performance of the Earnings Revision-Screened Quality Portfolios and Their Respective Comparable Quality Factor Portfolios

MARKET	METRIC	BMI	ACCRUAL RATIO			FINANCIAL LEVERAGE			RETURN ON EQUITY		
			COMPAR- ABLE FACTOR	EPS CHANGE- SCREENED	EPS DIFFUSION- SCREENED	COMPAR- ABLE FACTOR	EPS CHANGE- SCREENED	EPS DIFFUSION- SCREENED	COMPAR- ABLE FACTOR	EPS CHANGE- SCREENED	EPS DIFFUSION- SCREENED
Australia	Annualized Return (%)	5.35	6.71	8.30	10.15	3.54	5.85	7.74	6.06	6.37	7.14
	Annualized Volatility (%)	13.85	13.61	13.72	14.04	17.83	17.26	17.54	16.86	15.85	15.83
	Risk-Adjusted Return	0.39	0.49	0.60	0.72	0.20	0.34	0.44	0.36	0.40	0.45
China	Annualized Return (%)	14.99	17.15	18.09	18.32	17.96	19.79	19.56	17.96	18.50	19.17
	Annualized Volatility (%)	31.98	29.78	29.81	29.84	30.20	29.55	30.33	30.80	30.87	30.80
	Risk-Adjusted Return	0.47	0.58	0.61	0.61	0.59	0.67	0.64	0.58	0.60	0.62
Hong Kong	Annualized Return (%)	8.29	3.98	5.71	5.21	6.32	6.65	6.90	10.34	10.86	11.62
	Annualized Volatility (%)	20.79	20.78	20.61	20.81	26.91	25.46	25.90	24.38	24.06	24.68
	Risk-Adjusted Return	0.40	0.19	0.28	0.25	0.23	0.26	0.27	0.42	0.45	0.47
India	Annualized Return (%)	11.53	13.26	14.17	13.88	12.78	12.42	11.75	10.98	12.43	11.07
	Annualized Volatility (%)	23.12	21.82	20.61	20.79	17.80	17.52	17.84	19.63	18.17	18.35
	Risk-Adjusted Return	0.50	0.61	0.69	0.67	0.72	0.71	0.66	0.56	0.68	0.60
Japan	Annualized Return (%)	1.78	2.88	1.42	1.37	6.42	6.69	6.68	0.79	1.21	1.42
	Annualized Volatility (%)	18.15	19.94	19.48	19.41	16.34	16.13	16.17	20.08	19.10	19.05
	Risk-Adjusted Return	0.10	0.14	0.07	0.07	0.39	0.41	0.41	0.04	0.06	0.07
South Korea	Annualized Return (%)	7.41	9.86	9.97	10.08	6.83	10.16	6.67	4.20	3.55	2.21
	Annualized Volatility (%)	17.36	19.07	19.05	19.36	15.39	15.96	15.68	21.51	19.37	19.66
	Risk-Adjusted Return	0.43	0.52	0.52	0.52	0.44	0.64	0.43	0.20	0.18	0.11
Taiwan	Annualized Return (%)	6.98	3.64	6.92	9.96	6.99	9.11	10.27	9.37	12.90	11.34
	Annualized Volatility (%)	19.05	19.03	18.80	19.03	17.64	16.58	17.29	22.64	20.17	20.64
	Risk-Adjusted Return	0.37	0.19	0.37	0.52	0.40	0.55	0.59	0.41	0.64	0.55

Source: S&P Dow Jones Indices LLC, Factset, and Thomson Reuters. Figures based on monthly local currency total return from March 31, 2006, to March 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Indices used for each region are as follows: S&P Australia BMI, S&P China A BMI, S&P Hong Kong BMI, S&P India BMI, S&P Japan BMI, S&P Korea BMI, and S&P Taiwan BMI.

S&P DJI RESEARCH CONTRIBUTORS		
Sunjiv Mainie, CFA, CQF	Global Head	sunjiv.mainie@spglobal.com
Jake Vukelic	Business Manager	jake.vukelic@spglobal.com
GLOBAL RESEARCH & DESIGN		
AMERICAS		
Aye M. Soe, CFA	Americas Head	aye.soe@spglobal.com
Phillip Brzenk, CFA	Director	phillip.brzenk@spglobal.com
Smita Chirputkar	Director	smitta.chirputkar@spglobal.com
Rachel Du	Senior Analyst	rachel.du@spglobal.com
Bill Hao	Director	wenli.hao@spglobal.com
Qing Li	Director	qing.li@spglobal.com
Berlinda Liu, CFA	Director	berlinda.liu@spglobal.com
Maria Sanchez	Associate Director	maria.sanchez@spglobal.com
Kelly Tang, CFA	Director	kelly.tang@spglobal.com
Hong Xie, CFA	Director	hong.xie@spglobal.com
APAC		
Priscilla Luk	APAC Head	priscilla.luk@spglobal.com
Utkarsh Agrawal, CFA	Associate Director	utkarsh.agrawal@spglobal.com
Akash Jain	Associate Director	akash.jain@spglobal.com
Liyu Zeng, CFA	Director	liyu.zeng@spglobal.com
EMEA		
Sunjiv Mainie, CFA, CQF	EMEA Head	sunjiv.mainie@spglobal.com
Leonardo Cabrer, PhD	Senior Analyst	leonardo.cabrer@spglobal.com
Andrew Cairns	Senior Analyst	andrew.cairns@spglobal.com
Andrew Innes	Associate Director	andrew.innes@spglobal.com
INDEX INVESTMENT STRATEGY		
Craig J. Lazzara, CFA	Global Head	craig.lazzara@spglobal.com
Fei Mei Chan	Director	feimei.chan@spglobal.com
Tim Edwards, PhD	Managing Director	tim.edwards@spglobal.com
Anu R. Ganti, CFA	Director	anu.ganti@spglobal.com
Hamish Preston	Senior Associate	hamish.preston@spglobal.com
Howard Silverblatt	Senior Index Analyst	howard.silverblatt@spglobal.com

PERFORMANCE DISCLOSURE

The S&P China A BMI was launched on November 27, 2013. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. Complete index methodology details are available at www.spdji.com. Past performance of the Index is not an indication of future results. Prospective application of the methodology used to construct the Index may not result in performance commensurate with the back-test returns shown.

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the Index is set at a fixed value for calculation purposes. The Launch Date designates the date upon which the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P Dow Jones Indices defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its datafeed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

The back-test period does not necessarily correspond to the entire available history of the Index. Please refer to the methodology paper for the Index, available at www.spdji.com for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Another limitation of using back-tested information is that the back-tested calculation is generally prepared with the benefit of hindsight. Back-tested information reflects the application of the index methodology and selection of index constituents in hindsight. No hypothetical record can completely account for the impact of financial risk in actual trading. For example, there are numerous factors related to the equities, fixed income, or commodities markets in general which cannot be, and have not been accounted for in the preparation of the index information set forth, all of which can affect actual performance.

The Index returns shown do not represent the results of actual trading of investable assets/securities. S&P Dow Jones Indices LLC maintains the Index and calculates the Index levels and performance shown or discussed, but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the Index or investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US \$100,000 investment for a 12-month period (or US \$10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US \$1,650), the net return would be 8.35% (or US \$8,350) for the year. Over a three year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US \$5,375, and a cumulative net return of 27.2% (or US \$27,200).

GENERAL DISCLAIMER

Copyright © 20[xx] S&P Dow Jones Indices LLC, a division of S&P Global. All rights reserved. STANDARD & POOR'S, S&P, S&P 500, S&P 500 LOW VOLATILITY INDEX, S&P 100, S&P COMPOSITE 1500, S&P MIDCAP 400, S&P SMALLCAP 600, S&P GIVI, GLOBAL TITANS, DIVIDEND ARISTOCRATS, S&P TARGET DATE INDICES, GICS, SPIVA, SPDR and INDEXOLOGY are registered trademarks of Standard & Poor's Financial Services LLC, a division of S&P Global ("S&P"). DOW JONES, DJ, DJIA and DOW JONES INDUSTRIAL AVERAGE are registered trademarks of Dow Jones Trademark Holdings LLC ("Dow Jones"). These trademarks together with others have been licensed to S&P Dow Jones Indices LLC. Redistribution or reproduction in whole or in part are prohibited without written permission of S&P Dow Jones Indices LLC. This document does not constitute an offer of services in jurisdictions where S&P Dow Jones Indices LLC, S&P, Dow Jones or their respective affiliates (collectively "S&P Dow Jones Indices") do not have the necessary licenses. Except for certain custom index calculation services, all information provided by S&P Dow Jones Indices is impersonal and not tailored to the needs of any person, entity or group of persons. S&P Dow Jones Indices receives compensation in connection with licensing its indices to third parties and providing custom calculation services. Past performance of an index is not an indication or guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index may be available through investable instruments based on that index. S&P Dow Jones Indices does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. S&P Dow Jones Indices makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. S&P Dow Jones Indices LLC is not an investment advisor, and S&P Dow Jones Indices makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document. Prospective investors are advised to make an investment in any such fund or other vehicle only after carefully considering the risks associated with investing in such funds, as detailed in an offering memorandum or similar document that is prepared by or on behalf of the issuer of the investment fund or other investment product or vehicle. S&P Dow Jones Indices LLC is not a tax advisor. A tax advisor should be consulted to evaluate the impact of any tax-exempt securities on portfolios and the tax consequences of making any particular investment decision. Inclusion of a security within an index is not a recommendation by S&P Dow Jones Indices to buy, sell, or hold such security, nor is it considered to be investment advice.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, research, valuations, model, software or other application or output therefrom) or any part thereof ("Content") may be modified, reverse-engineered, reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of S&P Dow Jones Indices. The Content shall not be used for any unlawful or unauthorized purposes. S&P Dow Jones Indices and its third-party data providers and licensors (collectively "S&P Dow Jones Indices Parties") do not guarantee the accuracy, completeness, timeliness or availability of the Content. S&P Dow Jones Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN "AS IS" BASIS. S&P DOW JONES INDICES PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall S&P Dow Jones Indices Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.

S&P Global keeps certain activities of its various divisions and business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain divisions and business units of S&P Global may have information that is not available to other business units. S&P Global has established policies and procedures to maintain the confidentiality of certain non-public information received in connection with each analytical process.

In addition, S&P Dow Jones Indices provides a wide range of services to, or relating to, many organizations, including issuers of securities, investment advisers, broker-dealers, investment banks, other financial institutions and financial intermediaries, and accordingly may receive fees or other economic benefits from those organizations, including organizations whose securities or services they may recommend, rate, include in model portfolios, evaluate or otherwise address.