

This is the first of a series of Research Bulletins on the new regional Barra Asia Pacific Equity Model (ASE1). While the Asia Pacific region shares many common characteristics, it also possesses significant heterogeneity, with Japan and the China A share market being clear examples. We find that Momentum has performed better in some markets than others, and its effectiveness varies across time. We highlight the ability of ASE1 to capture these variations across markets and over time. Lastly, we test a Momentum timing strategy based on hedging exposure to Momentum in certain periods. The filter we apply, which is based on those months in which the Momentum factor was negative and statistically important, mitigates drawdowns from Momentum significantly at the regional level.

Introduction

Momentum is one of the most commonly followed strategies in equity markets around the world. However, investors in the Asia Pacific region have long noted the heterogeneous nature of markets in the region. This Research Bulletin considers the effectiveness of the Momentum strategy across the Asia Pacific equity markets, including Japan, Australia and New Zealand, as well as China's domestic equity market. It considers the performance of the Momentum strategy not only for Asia Pacific as a whole, but also analyzes differences across various local scopes. In addition, this paper goes on to examine variations across time, since Momentum may work better under certain market conditions, such as when stock prices are showing a strong, sustained trend. Finally, a filter is shown to significantly reduce drawdowns from Momentum at the regional level.

Capturing Regional Commonalities and Differences

The newly launched ASE1 provides a great platform for examining Momentum in the Asia Pacific equity markets¹. Firstly, it has wide coverage of stocks traded within the region, covering more than 20,000 securities in its universe². Through liquidity and other screening filters, only part of this total enters the estimation universe, ensuring that illiquid stocks do not distort the estimation results.

Secondly, the use of a number of other style factors besides Momentum, as well as country and industry factors, helps to explain the risk and return of stocks in the region³. The factor return of Momentum is estimated by netting out the influences of these other factors, as in all Barra models.

Thirdly, ASE1 is specifically designed to not only capture the pan-regional effects, but also the local differences within the Asia Pacific region. There are seven local scopes, including Pacific (Australia, New Zealand), East Asia Developed & China International (Hong Kong, Singapore, China International), East Asia Emerging (South Korea, Taiwan), South East Asia (Thailand,

¹ For details, please refer to the Barra Asia Pacific Equity Model Research Notes by Beat G. Briner, Rachael C. Smith and Paul Ward (March 2010).

² Figure as of March 2010.

³ The risk factors in ASE1 are comprehensive. There is a regional market factor spanning Asia-Pacific ex Japan, and another one for Japan alone, because it has significant differences with the rest of the region. In addition, for the Asia-Pacific ex Japan region, 23 industry factors based on the Global Industry Classification Standard (GICS®) are included to capture industry differences, while the same industry factors also exist separately for Japan. There are also 14 country factors that further allows for intra-regional variations at the country level. As for style factors, the model has eight: Momentum, Volatility, Size, Liquidity, Value, Growth, Leverage and Foreign Sensitivity. For three of the most important styles, Momentum, Volatility and Size, the model captures local differences from the regional averages. Likewise, factors for six key GICS® sectors are added to account for sectoral variations within each of the sub-regions. A list of the risk factors and a high level model description can be found in the paper Barra Asia Pacific Equity Model Research Notes by Beat G. Briner, Rachael C. Smith and Paul Ward (March 2010).

Malaysia, Indonesia, the Philippines), South Asia (India, Pakistan), Japan, and China Domestic. These groupings are determined based on historical correlations, and are also in line with market perception.⁴ As a result, some important factors such as Momentum have additional local factors corresponding to the seven local scopes mentioned above. This provides a more granular analysis of the impact of these factors, while still allowing for the commonalities within each local scope. This forms the basis for the analysis of the intra-regional differences of Momentum that follow in a later part of this paper.

Momentum

In ASE1, the Momentum factor captures return and risk associated with the trending of stock returns over a horizon of about a year. It is a weighted combination of three series, two of which reflect relative strength of stock prices, and the third is the two-year historical alpha. The two relative strength series are computed as the cumulative return net of the risk-free rate over six months and twelve months, respectively. Based on a weighted combination of these three series, an exposure score to each factor is computed for every stock. High-Momentum stocks, for instance, would have higher exposures to the Momentum factor than low-Momentum ones⁵.

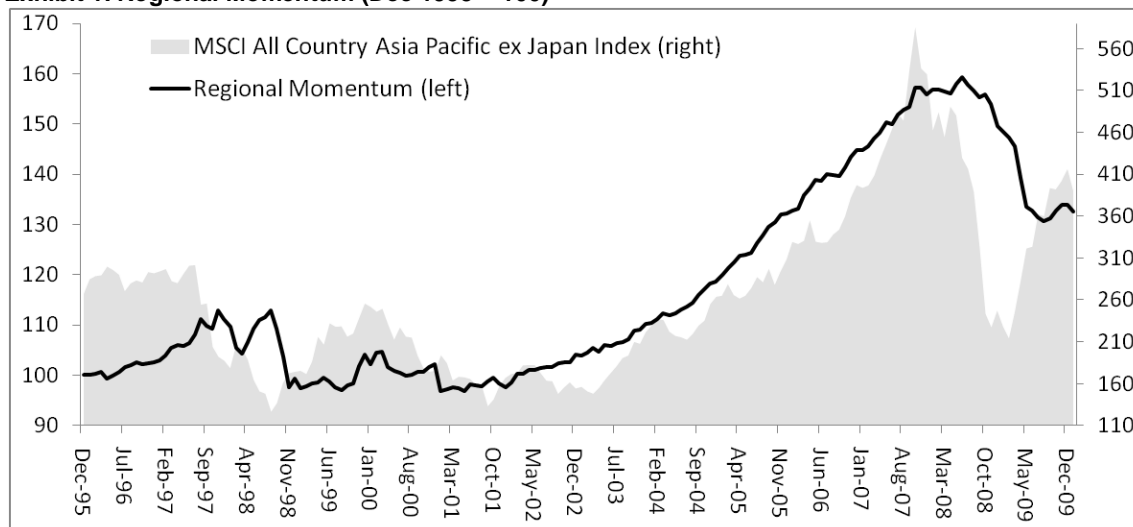
We begin by examining the Momentum factor at the regional level. Exhibit 1 shows the Momentum factor return together with the MSCI All Country Asia Pacific ex Japan Index⁶. Generally, the correlation between Momentum and the overall market is positive during trending phases, but negative following a market crash. The regional Momentum factor has performed exceptionally well from 2002 to 2008, which roughly corresponds to the bull market over that period. In 1998, the Asian financial crisis caused the factor to fall sharply, i.e., companies with strong recent price performance were hit harder during the crash than companies that did not develop strong positive Momentum. Similarly, not long after the bear market in 2008 began, the Momentum factor started to decline sharply. Its performance has stabilized after the market rebounded in early 2009.

⁴ The groupings here may not necessarily coincide with those of the MSCI indices.

⁵ The return of the Momentum factor, as well as other factors within ASE1, is computed from cross-sectional regressions that regress monthly net returns of individual stocks on the exposures to all factors. The advantage of such a procedure is that it analyzes the impact of each factor by holding others constant. This enables us to obtain a purer effect of the factor without being affected by the interference from multiple influences. The Momentum factor return can therefore be interpreted as the net return to a stock due solely to a unit increase in the exposure to Momentum.

⁶ Notice that in the estimation process, Japan and China Domestic are excluded so that their country-specific characteristics do not affect the regional average.

Exhibit 1: Regional Momentum (Dec 1995 = 100)

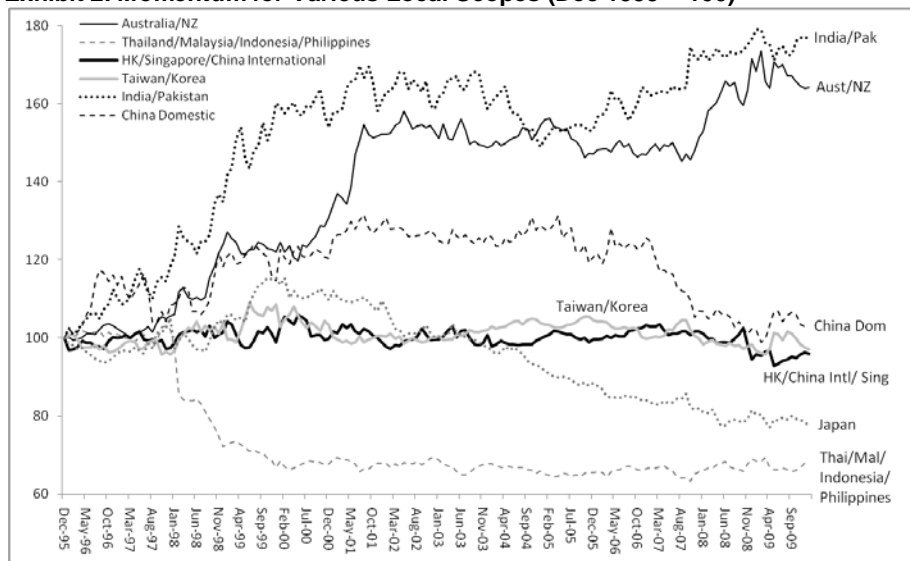


Local Differences

The Momentum factor for the region captures regional effects but not the differences across various markets. ASE1, however, accounts for this by dividing the Asia Pacific region into seven local scopes. Each of these has a local Momentum factor that can therefore be used to examine the intra-regional variations. These local factors may be interpreted as deviations away from the regional average, which is represented by the regional Momentum factor shown in Exhibit 1. A rise in the local Momentum factor would therefore imply that Momentum is performing better in the associated local scope *relative to* the region as whole, and vice versa. These local Momentum factors are therefore ideal for analyzing differences within the region, as shown in Exhibit 2 below.

We look at the performance of the local factors over the entire period. First, we observe that Momentum performed best in the South Asia (India/Pakistan) and Pacific (Australia/New Zealand) markets. For China Domestic, the local Momentum factor has visibly declined from 2007 due to the bear market, as these Chinese domestic equities have generally fallen more steeply than the rest of Asia Pacific. The East Asia Developed & China International and East Asia Emerging markets include Hong Kong, Singapore, Taiwan, and Korea. It is therefore unsurprising that their local Momentum factors have largely moved sideways throughout the whole sample period, suggesting that there was little deviation from the regional average. The last group is the emerging markets in South East Asia, covering Thailand, Malaysia, Indonesia and the Philippines. These countries were severely affected during the Asian crisis in the late 1990s, resulting in stock market crashes that dragged down the performance of Momentum. However, since these markets stabilized around the year 2000, the local Momentum factor has moved sideways, which again indicates that Momentum has not deviated much from the regional average since that time.

Exhibit 2: Momentum for Various Local Scopes (Dec 1995 = 100)



Interestingly, the picture for Momentum in Japan is one of the worst in the region over the whole period. The only period of general uptrend in the sample was from 1996 to 1999, which roughly coincided with the bull market in the late 1990s. Japanese equities benefitted more from the technology boom at that time because of its greater weight in those sectors as compared to the rest of the region in general. However, the Momentum factor has been in almost continuous decline since 1999, which is near the height of the technology boom. The Japan Momentum factor continued to decline during the rise in the stock market from 2003-2007, a period which Japanese equities significantly underperformed the rest of the region. Generally, the Momentum strategy appears not to perform well in the Japanese market, relative to the region as a whole, a conclusion that seems consistent with the finding in an earlier Research Bulletin that the Momentum strategy has underperformed in Japan as compared to the US and Europe⁷.

A Filter for Momentum

Overall, we see that the Momentum factors tend to be volatile and susceptible to market crashes. As an exercise, we consider what happens if we try to reduce the risk of such drawdowns using information from the model. Specifically, we use a filter to avoid exposure to Momentum during periods of sharp market declines. This filter involves having full exposure to the Momentum factor except during months in which the previous month's Momentum factor return was significantly negative, in which case we impose zero exposure⁸.

How do we gauge the significance of the prior month's Momentum return? Given that ASE1 uses a regression approach to generate the factor returns for the Momentum and other factors, a by-product is the t-statistic associated with each factor return. This statistic measures the explanatory power of its factor in accounting for variations in stock returns, and could thus be used as the basis of a filter. Our filter here simply involves having zero exposure to Momentum for the current month if the t-statistic of Momentum in the preceding month is less than -2. This level is chosen because it corresponds to the upper limit that, on a 95% confidence level, the factor return is sufficiently negative.

⁷ Global Momentum, *MSCI Barra Research Bulletin GEM2 Series*, January 2009.

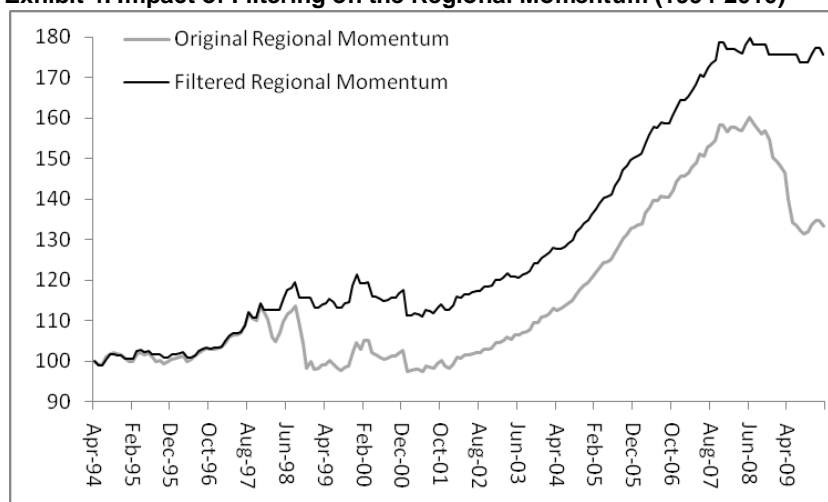
⁸ In practice, factor portfolios may be constructed; please see Melas, Suryanarayanan and Cavaglia (2010) for more details: "Efficient Replication of Factor Returns: Theory and Applications," *Journal of Portfolio Management*, Winter 2010.

Given this straightforward filter, the impact on the Momentum factor within the entire sample period from 1994 to 2010 is shown in Exhibit 3⁹. The impact appears to be the most significant for region-level Momentum, whose annualized return almost doubled from 1.9% to 3.6% after using this filter. At the local level, the effect is relatively small. Looking at the time-series plot of the regional Momentum factor in Exhibit 4, it becomes clear that the filter helps in avoiding losses during market crashes, especially during the Asian financial crisis in the late 1990s, and the recent global financial crisis in 2008-2009. This filter, however, does not overly detract from gains on the other hand, which is most evident during the bull market after 2002. While in practice these hedges may be difficult to implement through systematic strategies (given the scarcity of historical events to test robustness), this evidence suggests that they could make a big difference during steep declines in the market.

Exhibit 3: Annualized Return of Momentum Before and After Filtering

Local Scope	Member Countries	Original	Filtered
Regional	–	1.9%	3.6%
Pacific	Australia/New Zealand	3.3%	3.3%
East Asia Devel'd & China Int'l	HK/Singapore/China International	0.3%	0.2%
East Asia Emerging	Korea/Taiwan	-0.3%	-0.1%
South East Asia	Indonesia/Malaysia/Philippines/Thailand	-2.7%	-1.0%
South Asia	India/Pakistan	4.2%	3.9%
Japan	–	-2.1%	-1.6%
China Domestic	China A Market	0.2%	-0.4%

Exhibit 4: Impact of Filtering on the Regional Momentum (1994-2010)



Conclusion

This Research Bulletin considers the Momentum strategy in the context of the Asia Pacific region. It illustrates how investors might use ASE1 to analyze various regional Asian portfolios. Using the model, this paper separates the performance of Momentum at the regional and local levels. It was found that such differences are significant, and Momentum has performed best in South

⁹ For Southeast Asia (Indonesia, Malaysia, Philippines and Thailand), South Asia (India, Pakistan) and China Domestic the sample period starts from 1996 due to data reasons.

Asia, together with Australia and New Zealand. On the other hand, South East Asian markets, which include Indonesia, Malaysia, the Philippines and Thailand, have been among the worst for Momentum on a relative basis, but that was due largely to the sharp correction during the Asian financial crisis in the late 1990s. Relative to the region as a whole, Momentum has also performed poorly in Japan, with relative performance declining steadily since 1999. Overall, regional Momentum has been performing well, except during the Asian financial crisis and the recent global financial crisis. Finally, this Research Bulletin analyzes how a filter could help reduce the risk of drawdowns for Momentum during these bear market retracements. It was found that the use of a filter significantly hedges against these market crashes at the regional level.

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