Momentum and Investor Sentiment: Evidence from Asian Stock Markets

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Abstract: We investigate whether investor sentiment affects momentum profitability using a sample of 13 Asian countries: Bangladesh, China, Hong Kong, India, Indonesia, Japan, Malaysia, Pakistan, Philippines, Singapore, South Korea, Taiwan and Thailand. We find that momentum arises only during optimistic and mild periods. Momentum is absent for periods of pessimism. This suggests that investors are detail oriented during pessimistic periods and thereby hinder the occurrence of momentum in the stock market. We also find that global sentiment affects momentum which affirms the contagious nature of sentiment. In addition, the findings indicate that holding period sentiment also affects momentum. The results are robust to changes in sentiment period classification and the use of alternative proxies for investor sentiment.

Keywords: Momentum, investor sentiment, global sentiment, Asia, optimism.
JEL classification: G11, G12, G14, G15

1. Introduction

Within the large body of literature that documents return predictability, the momentum effect is arguably one of the most intriguing. It is one of the few anomalies that have yet to be explained in its entirety. Stocks which performed poorly (well) in the past continue to perform poorly (well) in the future. The basic concept of momentum strategy is to buy 'winners' (stocks that performed well in the past) and sell 'losers' (stocks that performed poorly in the past). The momentum effect was first documented by Jegadeesh and Titman (1993). Decades of subsequent research provided support for existence of momentum in international markets and in varying time periods (Cakici *et al.*, 2016; Dhouib and Abaoub, 2007; Fama and French, 2012; Griffin *et al.*, 2003; Khosroazad and Chitsazan, 2016).

Recently, Antoniou *et al.* (2013) found that momentum was influenced by investor sentiment in the US. Higher momentum was reported during periods of high investor sentiment compared to low sentiment. However, this relationship may or may not hold in Asia. Manifestation of momentum in Asia drastically differs from other regions around the world (Griffin *et al.*, 2003). So much so that Hameed and Kusnadi (2002) argued that the factors that drive momentum in Asia may not be the same as those in the US. More importantly, the psychology of Asians is notably distinct from Westerners including reasoning (Buchtel and Norenzayan, 2008; Hedden *et al.*, 2008). As highlighted by Schmeling (2009), the effect of sentiment varies from country to country, and as such the relationship between momentum and sentiment needs to be reexamined in Asian markets.

To the best of our understanding, the first study specifically on sentiment and momentum was conducted by Antoniou *et al.* (2013) for the US market. Subsequently, Stambaugh *et al.* (2012) tested the effect of sentiment on anomalies (including momentum) in the US stock market and reported that the anomalies were stronger for periods following high sentiment

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(i.e. optimism). Another related study is Hao *et al.* (2016), who demonstrated that Real Estate Investment Trust (REIT) momentum returns are significantly positive (negative) following optimistic (pessimistic) periods. Needless to say, the literature on momentum and sentiment is sparse. International evidence in support or against the existing results would provide much needed insight into the issue.

Thus, we investigate whether investor sentiment affects momentum profitability in Asian countries. Not only does this study provide out-of-sample evidence, it also expands the study of sentiment to incorporate other facets of sentiment: global investor sentiment and investor sentiment during the momentum portfolio holding period (i.e. holding period sentiment). Notably, this study is the first to explore the effect of holding period sentiment on momentum.

There is a plethora of studies on momentum in the US and other developed markets, investigating not only the magnitude of momentum but also the source of momentum. However, the studies on Asian markets are not as extensive and lack depth. The studies on investor sentiment have also predominantly focused on the US market. In spite of the increased attention paid to investor sentiment in recent years, the studies on international markets are limited. Thus, our study fills this critical gap by contributing to the literature on investor sentiment and momentum. The interest in exploring momentum in Asia is not a purely academic pursuit but is of interest to investors worldwide. The results of this study could be used to streamline the momentum strategy. Resources can be concentrated on periods where momentum is more likely to occur. As we examine each market individually, a detailed and market specific information is available compared to an overall study of the Asian region (e.g. Brown *et al.*, 2008). In short, insight is provided on improving the practical implementation of momentum strategy and into the underlying cause of momentum through the investigation of investor sentiment.

Sentiment represents the state of mind of the investors. A variety of studies have linked sentiment and other financial aspects from IPO prices to feedback trading (e.g. Chau *et al.*, 2011; Clarke *et al.*, 2016; Danbolt *et al*., 2015; Hung, 2016; Liang, 2016; Liston, 2016). In a positive state, individuals are more likely to stick to their normal routine but negative state elicits a more severe response whereby processing is more detail oriented (Schwarz, 2002). Ali and Gurun (2009) also echoed the view that optimism decreases the attentiveness of investors. To surmise, individuals are more alert during pessimistic periods and less attentive at optimistic times. Inattentiveness causes a delayed reaction to the arrival of new information supporting behavioural theories of underreaction (Dellavigna and Pollet, 2009). As for pessimistic periods, the increased awareness and processing of information could reduce or even remove the cognitive bias that drives momentum. Thus, it could be conjectured that optimism leads to a high level of momentum whereas pessimism is associated with lower or even absence of momentum.

In addition to sentiment in the local stock market, cognitive biases and correspondingly momentum returns could be swayed by sentiment on an international scale. Baker *et al.* (2012) also advocated the view and demonstrated the influence of global sentiments on stock prices. Analysis showed that US investor sentiment had the greatest bearing on global sentiment. Thus, we postulate that global investor sentiment, apart from local sentiment, would affect stock momentum in Asia.

Apart from formation period sentiment, it is anticipated that the investor sentiment during the holding period would also be of consequence. Though a mispricing has occurred in the previous period, the extent of correction may be affected by the investor sentiment in the current period. The state of mind of the investor could have a bearing on the extent of trading conducted to rectify the earlier mispricing. This implies that holding period sentiment would provide an indication of the extent of return continuation for the said holding period.

We find that momentum arises only during optimistic and mild periods. Notably momentum is absent for periods of pessimism. The results also indicated that global sentiment affects momentum, which affirms the contagious nature of sentiment. In addition, we find that holding period sentiment affects momentum. Overall, the findings suggest that investors seeking to implement momentum strategy should avoid pessimistic periods. Pessimistic periods do not yield any significant returns and in some cases may lead to substantial losses. On the other hand, optimistic periods are preferable as momentum strategy could provide investors with significant portfolio returns. As momentum is influenced by investor sentiment, investors should take into consideration the sentiment prevalent at the time, global sentiment and also the sentiment prevailing during the portfolio holding period prior to implementing the momentum strategy.

Given the strong influence of sentiment on momentum, a behavioural explanation, in part or in whole, seems likely. In particular, our evidence suggests that an underreaction theory of momentum is a likely explanation. Hong and Stein (1999) explain momentum in terms of the actions of heterogeneous agents: news watchers and momentum traders. Due to a gradual diffusion of information, news watchers cause underreaction (momentum) to occur. Subsequently, momentum traders would detect the underreaction and engage in trading in order to eliminate the mispricing. Momentum was generally found to be absent during pessimistic periods. The absence of momentum is likely due to the increased alertness and detail oriented information-processing capabilities of investors during the negative state. During pessimistic periods, information would be incorporated and disseminated rapidly; therefore, news watchers would cause less underreaction compared to the other sentiment states. Moreover, momentum is detected rapidly during pessimistic holding periods due to the increased alertness of momentum traders. Thus, momentum traders would quickly exploit the mispricing thereby eliminating any momentum. On the other hand, newswatchers would be less alert during optimistic periods and this would lead to momentum. Moreover, optimistic holding periods cause a delayed detection and correction of the mispricing as momentum traders are relatively not as alert and maintain their status quo with regards to information processing.

2. Data

The study encompasses a 12-year period from 1 January 2000 to 31 December 2011. This particular period is examined in order to avoid the Asian financial crisis. As noted by Abdelhédi-Zouch *et al.* (2015), the effect of sentiment may be amplified during times of crisis; the inclusion of crisis periods could distort the results. Based on data availability, we test stock exchanges from 13 Asian countries: Bangladesh, China, Hong Kong, India, Indonesia, Japan, Malaysia, Pakistan, Philippines, Singapore, South Korea, Taiwan and Thailand. Stock return index, trading volume and other data are obtained from Datastream. Table 1 (Panel A) states the number of stocks for each country. This figure includes active and delisted stocks.

Sentiment measures derived from stock market related data could be compounded by a multitude of factors, thus a proxy independent of the stock market is needed. As demonstrated by Sibley *et al.* (2016), the popular market derived sentiment proxy developed by Baker and Wurgler (2006) may not fully reflect investor sentiment. Sibley *et al.* (2016) showed that roughly 63% of the total variations in the Baker and Wurgler (2006) index may be explained by economic variables; this was suggested to be source of the index's predictive power. In contrast, consumer confidence index provides a measure based on direct survey of individual consumers. As stated by Schmeling (2009), consumer confidence index "seems to be the only consistent way to obtain a sentiment proxy that is largely comparable across countries" (p. 397). Table 1 (Panel B) details the source of the sentiment proxies. Consumer confidence index available for each country is obtained from Datastream. As the local sentiment data for

Malaysia and India are not available through Datastream, the information is procured from Malaysian Institute of Economic Research (MIER) and BluFin respectively. Consumer sentiment index obtained from MIER was shown to be a possible direct measure of investor sentiment in Malaysia (Tuyon *et al.*, 2016).

Table 1: Sample description

Panel A: Stock Data			
Country	Stock Exchange	Abbr.	No. of Stocks
Bangladesh	Dhaka Stock Exchange	DSE	351
China	Shanghai Stock Exchange	SSE	948
Hong Kong	Hong Kong Stock Exchange	HKEX	1505
India	Bombay Stock Exchange	BSE	3101
Indonesia	Indonesia Stock Exchange	IDX	498
Japan	Tokyo Stock Exchange	TSE	2913
Malaysia	Bursa Malaysia	MYX	1052
Pakistan	Karachi Stock Exchange	KSE	447
Philippines	Philippine Stock Exchange	PSE	274
Singapore	Singapore Exchange	SGX	775
South Korea	Korea Exchange	KRX	995
Taiwan	Taiwan Stock Exchange	TSEC	926
Thailand	Stock Exchange of Thailand	SET	675
Total Sample			14,460
Panel B: Sentiment Data			
Sentiment	Country/Index	Years	Source
Local Sentiment	Bangladesh	N/A	N/A
	China	2000-2011	Datastream
	Hong Kong	2000-2011	Datastream
	India	2008-2010	BluFin
	Indonesia	2000-2011	Datastream
	Japan	2000-2011	Datastream
	Malaysia	2000-2011	MIER
	Pakistan	N/A	N/A
	Philippines	2004-2011	Datastream
	Singapore	N/A	N/A
	South Korea	2000-2011	Datastream
	Taiwan	2009-2011	Datastream
	Thailand	2000-2011	Datastream
Global Sentiment	Conference Board Consumer Confidence Index	2000-2011	Datastream
	University of Michigan consumer sentiment index	2000-2011	Datastream
	Baker and Wurgler (2006) composite index	2000-2010	http://pages.stern. nyu.edu/~jwurgler/

A US based consumer confidence index is used to gauge the global investor sentiments. The choice is appropriate given the US market's standing as one of the most prominent and influential market in the world and its movements are purported to have wide and often global reach. Baker *et al.* (2012) further confirm this as analysis showed that US investor sentiment had the greatest bearing on global sentiment. As duly noted by Baker *et al.* (2012), "the United States is widely considered the world's bellwether market. Consistent with this position, the United States' total sentiment index exhibits a high degree of commonality with other countries' indices and receives the highest loading in the global index" (p.278). The Conference Board Consumer Confidence Index has been used to measure investor sentiment

in several US market based studies (e.g. Ho and Hung, 2009; Tang and Yan, 2010). Moreover, Qiu and Welch (2004) and Lemmon and Portniaguina (2006) noted that the consumer confidence index is an appropriate measure of investor sentiment.

3. Methodology

Stocks are ranked based on cumulative returns from *t-2* to *t-7*. Equally weighted winner and loser portfolios are formed using the top (winner stocks) and bottom (loser stocks) 10% of the stocks. A month is skipped after portfolio formation in order to mitigate microstructure biases. The constituents of the winner and loser portfolio are maintained for 6 months. The monthly returns for the winner, loser and momentum portfolio are computed for each month from *t* to *t+5*. At the end of formation period *t,* the weighted rolling average consumer confidence index of the previous 3 months is calculated with the weight of 3, 2 and 1 for month *t*, *t-1* and *t-2* respectively.

$$AvgSent = \frac{1}{6}Sent_{t-2} + \frac{2}{6}Sent_{t-1} + \frac{3}{6}Sent_t \tag{1}$$

where AvgSent is the weighted average sentiment used to classify formation periods as pessimistic or optimistic. $Sent_{t-2}$, $Sent_{t-1}$ and $Sent_t$ represent confidence index value at month t-2, t-1 and t respectively.

A particular formation period's sentiment is optimistic (pessimistic) when it ranks in the top (bottom) 30% of the average sentiment values. The remaining portfolios are assumed to have been formed during a 'mild' period. The momentum returns for the portfolios formed during pessimistic, mild and optimistic periods are assessed. For local sentiment, the consumer confidence index for each country is used for the aforementioned analysis. For global sentiment, the procedure is performed using the Conference Board Consumer Confidence Index. For holding period sentiment, the procedure is similar except that the weighted average of consumer confidence index values (local and global sentiment proxies) is computed over the portfolio holding period instead of portfolio formation period.

4. Empirical Results
4.1 Momentum Returns for Asian Markets

Table 2 presents the average monthly returns along with corresponding t-statistics for winner, loser and momentum portfolio for the 13 countries. The winner portfolio generates positive return for all of the countries. The returns are statistically significant for a majority of the countries, specifically for nine out of the thirteen countries. This provides evidence of significant return continuations for winner stocks. In other words, stocks that performed well in the past continue to perform well in the future. In contrast, loser portfolio returns are significant for only six countries.

Returns to the momentum portfolio are generally positive. Out of the sample of 13 countries, 11 countries have positive returns for the momentum portfolio while 2 countries have negative returns. The highest momentum can be observed for Bangladesh whilst Philippines have the lowest return. Roughly one third of the sample countries display statistically significant momentum. Certain countries exhibit a high degree of momentum comparable to those reported in the US market. In short, there is evidence of momentum profitability in selected Asian countries. Bangladesh, in particular, has markedly strong momentum in the stock market. The momentum portfolio earns 1.470% per month which is higher than the returns reported in the US (e.g. Jegadeesh and Titman, 1993). The findings of momentum in Bangladesh concur with the results of Chui *et al.* (2010).

Table 2: Returns for the momentum strategy (%)

Momentum	Winner	Loser	Momentum
Bangladesh	2.829***	1.358*	1.470**
	(3.76)	(1.72)	(2.27)
China	1.041	0.486	0.555
	(1.36)	(0.56)	(1.50)
Hong Kong	1.301*	0.320	0.981**
	(1.82)	(0.35)	(2.06)
India	2.666***	3.226***	-0.560
	(2.97)	(2.78)	(-0.91)
Indonesia	1.639***	1.363*	0.276
	(3.03)	(1.90)	(0.55)
Japan	0.156	0.014	0.142
	(0.32)	(0.02)	(0.43)
Malaysia	0.493	-0.260	0.753*
	(1.12)	(-0.37)	(1.71)
Pakistan	1.910***	1.298*	0.611
	(3.21)	(1.72)	(1.08)
Philippines	1.503**	2.442***	-0.939
	(2.39)	(2.87)	(-1.51)
Singapore	0.964*	0.067	0.897
	(1.66)	(0.08)	(1.65)
South Korea	1.682**	0.552	1.130**
	(2.32)	(0.65)	(2.40)
Taiwan	0.573	0.460	0.113
	(0.74)	(0.49)	(0.24)
Thailand	1.932***	1.347*	0.585
	(3.65)	(1.79)	(1.13)

Notes: *, **, *** represent statistical significance at 10, 5, and 1 percent level respectively.

4.2 Momentum and Local Sentiment

Table 3 reports the portfolio returns for the momentum strategy during three sentiment states: optimistic, mild and pessimistic. The average monthly returns, in percentages, are presented for the winner, loser and momentum portfolio with the associated t-statistics. Due to unavailability of local sentiment data, the effect of local sentiment on momentum could not be explored for Bangladesh, Singapore and Pakistan.

As can be observed there is no momentum for pessimistic periods. Momentum exists exclusively in the optimistic and mild periods. Moreover, there are instances where returns for the pessimistic period are negative whereas optimistic periods have strong positive returns. For example, the strategy in the Japanese markets undergoes significant losses of 2.599% for pessimistic period. The momentum portfolio in the optimistic period garners a significant return of 1.280%. Another notable finding is the presence of momentum during optimistic and mild periods in countries where momentum could not be found for the overall strategy (Indonesia, Japan and Taiwan). Thus, it could be conjectured that sentiment state is one the factors causing the apparent lack of momentum or rather masking the presence of momentum in Asia.

Overall, the evidence on local sentiment concurs with the findings of Antoniou *et al.* (2013); momentum is only present for high sentiment periods. The factor that differentiates high and low sentiment periods is largely the loser portfolio. Loser portfolio returns are higher during pessimistic periods than optimistic periods. Moreover, returns for loser portfolio are on par with or higher than winner portfolio for optimistic periods. This causes the absence of momentum during pessimistic periods. The evidence suggest that investors have a greater

propensity to engage in detailed processing during low sentiment periods which causes the elimination of momentum during pessimistic periods (Schwarz, 2002).

Table 3: Local sentiment and momentum strategy

Country	Optimistic			Mild			Pessimistic		
	Winner	Loser	Mom	Winner	Loser	Mom	Winner	Loser	Mom
China	-0.074	-0.600	0.526	1.816	0.983	0.833	0.152	0.243	-0.091
	(-0.06)	(-0.40)	(1.09)	(1.62)	(0.75)	(1.44)	(0.10)	(0.16)	(-0.14)
Hong Kong	3.172*	3.066*	0.106	-0.269	-1.997*	1.728***	3.116**	3.013	0.103
	(1.85)	(1.95)	(0.17)	(-0.29)	(-1.81)	(3.64)	(2.38)	(1.22)	(0.06)
India	-5.138	-5.439	0.301	0.460	3.162	-2.701	4.444	3.121	1.323
	(-1.13)	(-1.38)	(0.27)	(0.27)	(0.70)	(-0.81)	(1.88)	(1.53)	(0.79)
Indonesia	2.728**	1.263	1.465**	1.619**	2.035*	-0.416	0.758	-0.101	0.859
	(2.49)	(1.17)	(2.46)	(2.17)	(1.98)	(-0.56)	(0.68)	(-0.06)	(0.82)
Japan	1.182	-0.098	1.280***	-0.648	-1.203*	0.555*	1.125	3.725*	-2.599**
	(1.46)	(-0.11)	(2.74)	(-0.90)	(-1.69)	(1.68)	(1.11)	(2.02)	(-2.21)
Malaysia	-3.656*	-5.830**	2.174	0.849*	-0.127	0.976*	1.379	2.157	-0.779
	(-2.11)	(-2.66)	(1.43)	(1.74)	(-0.17)	(1.97)	(1.47)	(1.20)	(-0.70)
Philippines	1.335	2.063	-0.728	2.762**	2.991**	-0.229	2.100	1.742	0.358
	(0.86)	(1.56)	(-0.66)	(2.33)	(2.04)	(-0.22)	(1.47)	(1.55)	(0.44)
South Korea	1.354	-1.245	2.598***	1.312	0.105	1.207**	4.234**	5.608*	-1.374
	(0.93)	(-0.86)	(3.36)	(1.44)	(0.10)	(2.22)	(2.26)	(2.06)	(-0.74)
Taiwan	-4.939	-5.373	0.434	0.667	-1.281	1.947*	1.644	1.784	-0.140
	(-1.41)	(-1.55)	(0.26)	(0.57)	(-0.95)	(1.94)	(0.52)	(0.65)	(-0.22)
Thailand	2.145*	1.640	0.505	1.368**	0.392	0.976	4.918***	6.535***	-1.618
	(1.77)	(1.12)	(0.55)	(2.11)	(0.41)	(1.50)	(4.42)	(3.62)	(-0.90)

Notes: *, **, *** represent statistical significance at 10, 5, and 1 percent level respectively.

4.3 Momentum and Global Sentiment

Table 4 reports the winner, loser and momentum portfolio returns, along with the t-statistics, during periods of varying global sentiment. The portfolio return figures are in percentage and represent the average monthly return. Momentum portfolio returns are positive for all countries during the optimistic period, out of which five countries have significant returns. For the mild period, six countries have significant returns whilst there is no significant returns for the pessimistic period.

Overall, eight of the thirteen countries have significantly positive returns to the momentum portfolio during the optimistic and/or mild period. In other words, more than half of the Asian countries exhibit momentum. One of the apparent finding is that the pessimistic period is devoid of momentum. Furthermore, almost all of the countries have negative returns to the momentum portfolio. In contrast, momentum strategy fares better for the other sentiment states especially optimistic periods.

Similar to local investor sentiment, there are countries (China, Singapore and Thailand) which display strong momentum for high sentiment states but do not have any momentum for the overall momentum strategy. Global sentiment appears to have a stronger effect on momentum than local sentiment. An extreme example of this is the Chinese stock market where there was no momentum when using local sentiment but significant returns emerge when global sentiment is used for the analysis. It is suggested that sentiment spreads rapidly through mass media. Baker *et al.* (2012) suggested that "capital flows are a key mechanism through which global sentiment develops and propagates, but there are surely others, including word-of-mouth and the media" (p. 104). Regardless of the means by which sentiment spreads, the fact that global sentiment affects the level of momentum profitability in Asian markets further confirms the contagious nature of sentiment.

Table 4: Global sentiment and momentum strategy

Country	Optimistic			Mild			Pessimistic		
	Winner	Loser	Mom	Winner	Loser	Mom	Winner	Loser	Mom
Bangladesh	2.603**	0.036	2.568**	2.560***	1.010	1.549	3.502	2.880*	0.622
	(2.19)	(0.03)	(2.46)	(3.33)	(0.92)	(1.57)	(1.64)	(1.73)	(0.56)
China	1.556	0.269	1.288**	0.375	-0.644	1.019*	2.031	2.856*	-0.825
	(1.00)	(0.16)	(2.74)	(0.34)	(-0.51)	(1.80)	(1.43)	(1.82)	(-1.33)
Hong Kong	2.132	-0.772	2.904**	0.872	-0.497	1.369***	1.622	2.620	-0.998
	(1.04)	(-0.32)	(2.55)	(0.94)	(-0.46)	(2.98)	(1.25)	(1.31)	(-0.82)
India	1.833*	1.583	0.249	3.359**	4.199**	-0.840	1.826**	2.344	-0.518
	(1.94)	(0.77)	(0.15)	(2.16)	(2.30)	(-1.13)	(2.10)	(1.38)	(-0.39)
Indonesia	1.073	-0.753	1.826	1.455*	1.015	0.440	2.358***	3.384**	-1.026
	(0.72)	(-0.41)	(1.59)	(1.92)	(1.16)	(0.87)	(2.79)	(2.24)	(-0.79)
Japan	-0.353	-1.390	1.037	0.407	-0.151	0.558	-0.018	1.228	-1.246
	(-0.35)	(-1.06)	(1.47)	(0.57)	(-0.19)	(1.41)	(-0.02)	(1.04)	(-1.66)
Malaysia	-0.566	-1.536	0.970	0.413	-0.855	1.269***	1.319*	1.723	-0.403
	(-0.43)	(-0.62)	(0.55)	(0.71)	(-1.09)	(3.06)	(1.85)	(1.48)	(-0.51)
Pakistan	2.433*	0.697	1.736*	2.944***	2.595**	0.349	-0.463	-0.881	0.418
	(1.97)	(0.57)	(2.02)	(3.38)	(2.55)	(0.63)	(-0.49)	(-0.54)	(0.25)
Philippines	1.571	0.849	0.723	1.239	2.253**	-1.013	1.980**	3.823**	-1.843
	(0.87)	(0.34)	(0.49)	(1.35)	(2.09)	(-1.25)	(2.45)	(2.41)	(-1.43)
Singapore	0.369	-1.537	1.906*	1.269	-0.329	1.598**	0.736	1.861	-1.125
	(0.25)	(-0.77)	(1.98)	(1.49)	(-0.29)	(2.47)	(0.86)	(1.05)	(-0.85)
South Korea	3.436	1.702	1.734	1.161	-0.524	1.686***	1.601	1.949	-0.347
	(1.58)	(0.57)	(1.24)	(1.16)	(-0.52)	(2.93)	(1.54)	(1.46)	(-0.39)
Taiwan	-0.933	-1.478	0.545	0.614	0.529	0.084	1.442	1.546	-0.104
	(-0.42)	(-0.47)	(0.33)	(0.58)	(0.45)	(0.15)	(1.22)	(1.00)	(-0.14)
Thailand	2.807**	2.561	0.246	1.537*	0.255	1.281**	2.161**	2.734**	-0.574
	(2.53)	(1.00)	(0.11)	(1.92)	(0.28)	(2.60)	(2.60)	(2.30)	(-0.67)

Notes: *, **, *** represent statistical significance at 10, 5, and 1 percent level respectively.

4.4 Momentum and Holding Period Sentiment

Table 5 reports the winner, loser and momentum portfolio returns, along with the t-statistics, during periods of varying holding period sentiment (optimistic, mild and pessimistic). The portfolio return figures are in percentage and represent the average monthly return. As the consumer confidence index is unavailable for Bangladesh, Pakistan and Singapore, the local holding period sentiment (Panel A) could not be computed for these countries. Nevertheless, the global holding period sentiment is reported in Panel B.

Panel A reports the holding period sentiment using local sentiment proxies. The evidence for local holding period sentiment is mixed. There are significant positive returns to the momentum portfolio for optimistic and mild periods. Although there are a few instances of negative returns, these returns are insignificant. Moreover, the finding for pessimistic holding period is ambiguous with an equal number of significant positive and negative returns.

As can be observed in Panel B, the results are more prominent for holding period sentiment computed using global sentiment. During optimistic period, momentum portfolio returns are positive for all of the sample countries. Mild period has largely positive returns expect for two cases of negative albeit insignificant momentum portfolio returns. In total, optimistic and mild holding periods yield significant and high levels of momentum for a majority of the countries, specifically nine out of the thirteen countries have momentum. In a clear display of the lack of return continuation during pessimistic holding period, returns to the momentum portfolio are all negative (expect for Bangladesh). Loser portfolio performs

well during pessimistic holding period, thus causing the negative returns to the momentum portfolio**.**

Table 5: Holding period sentiment and momentum strategy

Country	Optimistic			Mild			Pessimistic		
	Winner	Loser	Mom	Winner	Loser	Mom	Winner	Loser	Mom
Panel A : Local Sentiment									
China	-0.336	-0.896	0.560	1.702	0.785	0.917	0.306	1.040	-0.734
	(-0.25)	(-0.61)	(1.14)	(1.64)	(0.64)	(1.66)	(0.18)	(0.62)	(-1.48)
Hong Kong	3.309**	2.941**	0.368	0.498	-0.035	0.533	1.135	-1.873	3.008***
	(2.25)	(2.07)	(0.61)	(0.49)	(-0.03)	(0.71)	(0.91)	(-1.14)	(3.80)
India	-5.138	-5.439	0.301	0.460	3.162	-2.701	4.444	3.121	1.323
	(-1.13)	(-1.38)	(0.27)	(0.27)	(0.70)	(-0.81)	(1.88)	(1.53)	(0.79)
Indonesia	2.216*	0.949	1.268*	1.781**	1.945*	-0.164	0.900	0.191	0.708
	(1.90)	(0.80)	(1.87)	(2.44)	(1.98)	(-0.24)	(0.82)	(0.13)	(0.68)
Japan	0.923	-0.318	1.241***	-0.174	-0.601	0.427	0.089	2.768	-2.679*
	(1.14)	(-0.38)	(3.38)	(-0.25)	(-0.86)	(1.28)	(0.07)	(1.21)	(-1.86)
Malaysia	-1.949	-3.791	1.841*	0.687	-0.292	0.979**	0.873	1.427	-0.554
	(-0.83)	(-1.50)	(1.80)	(1.45)	(-0.40)	(1.99)	(0.89)	(0.71)	(-0.44)
Philippines	0.722	2.133	-1.411	3.005***	3.369**	-0.364	1.802	1.150	0.652
	(0.46)	(1.45)	(-1.17)	(3.18)	(2.54)	(-0.36)	(0.82)	(0.59)	(0.56)
South Korea	0.249	-1.316	1.565*	1.885**	0.620	1.265**	2.460	2.686	-0.225
	(0.16)	(-0.98)	(1.81)	(2.24)	(0.65)	(2.39)	(0.93)	(0.73)	(-0.11)
Taiwan	-2.338	-1.294	-1.044	-0.801	-2.643	1.842**	1.418	1.966	-0.548
	(-0.29)	(-0.32)	(-0.26)	(-0.58)	(-1.71)	(2.16)	(0.45)	(0.79)	(-0.62)
Thailand	2.162*	1.823	0.339	1.449**	0.258	1.191*	3.770***	5.558**	-1.788
	(1.78)	(1.27)	(0.38)	(2.14)	(0.27)	(1.87)	(3.73)	(2.64)	(-0.99)
Panel B: Global Sentiment									
Bangladesh	2.242*	-0.581	2.823***	2.495**	1.060	1.435	4.157**	3.596**	0.561
	(1.93)	(-0.55)	(3.11)	(2.40)	(0.94)	(1.49)	(2.58)	(2.32)	(0.53)
China	3.725*	3.450	0.275	-0.126	-1.246	1.119**	2.176	2.925	-0.750
	(1.82)	(1.43)	(0.38)	(-0.14)	(-1.27)	(2.25)	(1.21)	(1.41)	(-1.01)
Hong Kong	1.991	0.109	1.883	0.729	-0.956	1.685***	2.320	3.891	-1.572
	(0.93)	(0.04)	(1.50)	(0.87)	(-1.09)	(4.04)	(1.45)	(1.55)	(-1.08)
India	-0.647	-2.507	1.861*	3.910***	5.163***	-1.253	1.795	2.295	-0.500
	(-0.59)	(-1.54)	(1.86)	(2.84)	(3.16)	(-1.66)	(1.62)	(1.04)	(-0.30)
Indonesia	1.493	-0.523	2.016	1.593**	1.234*	0.359	1.869	3.107	-1.238
	(0.92)	(-0.28)	(1.63)	(2.40)	(1.71)	(0.82)	(1.69)	(1.50)	(-0.76)
Japan	-0.929	-2.857**	1.928***	0.553	0.420	0.133	-0.100	1.060	-1.161
	(-0.95)	(-2.36)	(3.51)	(0.87)	(0.61)	(0.36)	(-0.09)	(0.67)	(-1.23)
Malaysia	-0.625	-1.988	1.364	0.321	-0.712	1.033***	1.785**	2.235	-0.451
	(-0.47)	(-0.80)	(0.75)	(0.60)	(-0.99)	(2.70)	(2.12)	(1.50)	(-0.46)
Pakistan	1.679	0.590	1.089	2.829***	2.065**	0.764	-0.382	-0.229	-0.153
	(1.53)	(0.49)	(1.48)	(3.39)	(2.15)	(1.40)	(-0.36)	(-0.12)	(-0.08)
Philippines	1.494	0.861	0.633	1.387	2.381**	-0.994	1.820*	3.780*	-1.959
	(0.85)	(0.34)	(0.43)	(1.64)	(2.55)	(-1.34)	(1.83)	(1.76)	(-1.23)
Singapore	0.592	-2.531	3.122***	1.095	-0.158	1.254**	0.887	2.597	-1.710
	(0.36)	(-1.24)	(3.33)	(1.51)	(-0.16)	(2.16)	(0.75)	(1.13)	(-1.06)
South Korea	2.697	0.686	2.011	1.568*	-0.075	1.643***	1.233	2.129	-0.895
	(1.20)	(0.23)	(1.45)	(1.76)	(-0.08)	(2.92)	(0.88)	(1.14)	(-0.93)
Taiwan	-1.698	-2.245	0.547	0.705	0.300	0.405	1.902	2.894	-0.992
	(-0.75)	(-0.70)	(0.32)	(0.72)	(0.28)	(0.73)	(1.35)	(1.62)	(-1.24)
Thailand	2.063*	1.913	0.149	1.928***	0.745	1.183**	1.846	2.538	-0.692
	(1.75)	(0.72)	(0.07)	(2.79)	(0.95)	(2.61)	(1.58)	(1.51)	(-0.66)

Notes: *, **, *** represent statistical significance at 10, 5, and 1 percent level respectively.

4.5 Alternative Sentiment Classification and Proxies

The investor sentiment investigations thus far have been conducted by classifying sentiment period based on a 30% cut off. A period is optimistic (pessimistic) if the index value is in the top 30% (bottom) of the time series of sentiment index values. In this section, an alternative sentiment cut-off of 40% is investigated to ensure the findings of this study are robust to changes in sentiment classification. For robustness, we also repeat the sentiment analysis using alternative sentiment measures: University of Michigan Sentiment Index (survey based sentiment measure) and Baker and Wurgler (2006) composite index (market based)[1].

For local sentiment, the findings are similar with the use of 40% cutoff instead of 30% cut off. Pessimistic periods are devoid of momentum. During optimistic and mild periods, there are countries that display high levels of profitability. Global sentiment also echoes the earlier findings. Returns to the momentum strategy are rampantly negative for pessimistic periods. High momentum profitability could be found in selected countries during optimistic and mild periods. For local holding period sentiment, the results are similar if not stronger with the use of 40% cut-off. Global holding period sentiment also retains its effect on momentum.

The alternative survey based measure, University of Michigan sentiment index, produces similar results. Significant returns can be observed for optimistic and mild holding periods. The failure of momentum strategy during pessimistic periods is clearly visible. On the other hand, the analysis with Baker and Wurgler (2006) composite index yields sporadic momentum across the sentiment states with no obvious pattern. Significant returns could be detected in optimistic and pessimistic holding period sentiment. It is possible that Baker and Wurgler (2006) composite index poorly captures global sentiment. The indices from Conference Board and University of Michigan are survey based proxy of sentiment which may provide an edge over the composite index which is derived from market based variables. As suggested Sibley *et al.* (2016), information in the Baker and Wurgler (2006) index largely reflects business cycle variables rather than investor sentiment.

4.6 Momentum, Sentiment and Size

Baker and Wurgler (2006) documented the presence of size effect in the stock market only during optimistic periods. Moreover, results of the study indicated that small firms are affected to a greater extent by sentiment. Therefore, we test the potential influence of firm size on the relationship between momentum and sentiment. Stocks are based on firm size at the end of each formation period and allocated into 'small', 'medium' and 'large' categories. Within each size categories, stocks are sorted based on past return and the winner, loser and momentum portfolios are formed. Then, the periods are classified as optimistic, mild or pessimistic and momentum portfolio returns are computed for each sentiment state.

The effect of local sentiment on momentum for the size categories is reported in Table 6. In each size category, a distinct pattern can be observed across the sentiment states; momentum is strong in optimistic and mild period whereas pessimistic periods have little or no momentum. In fact, the returns to the momentum portfolio are generally negative in the pessimistic period for the three size categories.

The effect of global sentiment on momentum for the size categories is reported in Table 7. Momentum returns for the large, medium and small stocks are all greatly affected during times of global pessimism. Small stocks suffer the most as evidenced by the significant negative returns (in two instances). Moreover, the presence of significant momentum is largely concentrated in large and medium stocks during optimistic and mild periods.

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[1] For brevity, tables are not reported. Our findings are also unaffected by market development and macroeconomic factors. Results are available upon request.

Table 6: Size, local sentiment and momentum portfolio returns

Country	Optimistic			Mild			Pessimistic		
	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small
China	0.759	0.500	0.321	0.833	0.594	0.111	0.158	0.089	-0.828**
	(1.38)	(1.20)	(0.62)	(1.30)	(1.24)	(0.30)	(0.16)	(0.15)	(-2.06)
Hong Kong	1.623*	1.527**	-0.039	1.824***	1.970***	1.653***	-1.514	2.183	-1.365
	(1.94)	(2.21)	(-0.04)	(3.29)	(3.75)	(2.70)	(-0.97)	(1.34)	(-0.77)
India	0.743	0.627	1.567	-2.118	-2.449	-4.057	0.901	3.938**	0.199
	(0.64)	(0.39)	(1.18)	(-0.56)	(-0.70)	(-1.48)	(1.69)	(3.59)	(0.15)
Indonesia	1.299	2.214**	1.246	0.144	0.168	-0.667	0.130	1.463	1.618
	(1.59)	(2.34)	(1.45)	(0.14)	(0.20)	(-0.73)	(0.07)	(1.03)	(0.99)
Japan	0.850	1.020**	1.081*	0.101	0.772**	0.981***	-2.453**	-2.351*	-2.223*
	(1.55)	(2.49)	(1.79)	(0.23)	(2.22)	(2.73)	(-2.07)	(-1.86)	(-1.80)
Malaysia	1.419	2.839*	1.730	0.942**	1.037**	0.251	-0.870	-0.184	0.052
	(1.20)	(1.98)	(1.43)	(2.08)	(2.27)	(0.40)	(-0.56)	(-0.14)	(0.05)
Philippines	2.021	-0.694	-1.411	0.504	-0.690	0.469	-0.258	2.010	-1.922
	(1.45)	(-0.61)	(-0.94)	(0.48)	(-0.50)	(0.33)	(-0.19)	(1.51)	(-1.49)
South Korea	1.983*	2.476***	1.573	1.199	1.229**	0.938*	-0.353	-1.906	-1.684
	(1.73)	(2.89)	(1.43)	(1.55)	(2.53)	(1.83)	(-0.17)	(-1.15)	(-0.79)
Taiwan	-0.832	1.812	1.091	2.565*	1.538*	1.557	-1.333	0.790	-0.378
	(-0.42)	(0.74)	(0.80)	(2.04)	(1.96)	(1.68)	(-1.40)	(1.40)	(-0.41)
Thailand	1.753	-0.223	0.207	0.978	1.463**	1.103*	-2.431	0.160	-2.477
	(1.53)	(-0.19)	(0.18)	(1.33)	(2.18)	(1.72)	(-0.93)	(0.10)	(-1.55)

Notes: *, **, *** represent statistical significance at 10, 5, and 1 percent level respectively.

Table 7: Size, global sentiment and momentum portfolio returns

Country	Optimistic			Mild			Pessimistic		
	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small
Bangladesh	1.471	1.102	0.812	1.739**	2.210***	-0.539	1.263	0.656	-0.492
	(1.00)	(1.32)	(0.84)	(2.42)	(2.85)	(-0.51)	(1.10)	(0.55)	(-0.27)
China	2.256***	0.977**	-0.449	0.862	0.765	0.697**	-0.747	-0.481	-1.328***
	(3.23)	(2.37)	(-0.75)	(1.50)	(1.64)	(2.03)	(-0.78)	(-0.83)	(-3.16)
Hong Kong	3.074**	4.335***	2.576*	1.468***	2.583***	0.544	-1.155	-0.934	-0.628
	(2.36)	(3.39)	(2.03)	(3.09)	(5.36)	(0.91)	(-0.89)	(-0.83)	(-0.44)
India	1.121	0.108	-0.011	1.188*	0.310	-2.263**	0.339	0.085	-1.605
	(0.44)	(0.06)	(-0.01)	(1.75)	(0.40)	(-2.61)	(0.23)	(0.06)	(-1.34)
Indonesia	2.046	4.165**	-0.002	0.750	0.221	1.094	-1.416	0.172	-1.167
	(0.97)	(2.68)	(0.00)	(0.96)	(0.29)	(1.50)	(-0.84)	(0.15)	(-0.85)
Japan	0.656	1.367*	0.597	0.211	0.559	1.063**	-1.525*	-1.092	-1.039
	(0.80)	(2.05)	(0.75)	(0.47)	(1.34)	(2.57)	(-1.87)	(-1.42)	(-1.25)
Malaysia	0.928	1.750	0.561	1.233***	1.345***	0.488	-0.759	-0.320	-0.087
	(0.61)	(1.07)	(0.24)	(2.89)	(3.32)	(1.06)	(-0.74)	(-0.36)	(-0.13)
Pakistan	1.380	2.608***	0.611	0.624	0.937*	-0.890	-0.442	0.487	1.251
	(1.04)	(2.96)	(0.48)	(0.70)	(1.76)	(-0.98)	(-0.26)	(0.26)	(0.65)
Philippines	-0.977	1.475	1.406	-0.222	-1.397	-0.801	-0.161	-2.073	-2.788**
	(-0.42)	(0.89)	(0.65)	(-0.22)	(-1.30)	(-0.77)	(-0.13)	(-1.27)	(-2.32)
Singapore	1.225	2.952**	2.554*	1.482***	2.206***	1.557*	-1.073	-1.474	-1.116
	(1.09)	(2.32)	(2.03)	(2.70)	(4.14)	(1.81)	(-0.66)	(-0.91)	(-1.08)
South Korea	3.209	1.009	-0.640	1.390**	1.690***	1.348**	-0.648	-0.157	0.354
	(1.37)	(0.76)	(-0.50)	(2.04)	(3.41)	(2.09)	(-0.61)	(-0.18)	(0.39)
Taiwan	1.156	0.851	-0.028	1.126*	0.307	0.175	-0.100	0.085	0.017
	(0.72)	(0.46)	(-0.01)	(1.81)	(0.55)	(0.31)	(-0.12)	(0.10)	(0.02)
Thailand	0.102	0.386	1.609	1.964***	1.349**	0.942	-1.128	0.478	-1.044
	(0.04)	(0.18)	(0.89)	(3.22)	(2.19)	(1.51)	(-0.98)	(0.58)	(-1.11)

Notes: *, **, *** represent statistical significance at 10, 5, and 1 percent level respectively.

Table 8: Size, holding period sentiment and momentum portfolio returns

Country	Optimistic			Mild			Pessimistic		
	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small
Panel A : Local Sentiment									
China	0.667	0.410	0.477	1.006	0.727	0.138	-0.574	-0.444	-1.419***
	(1.18)	(0.97)	(0.92)	(1.58)	(1.57)	(0.41)	(-0.71)	(-0.90)	(-2.92)
Hong Kong	1.810**	1.737**	0.236	0.694	1.044	0.197	0.993	4.615***	2.067***
	(2.50)	(2.59)	(0.26)	(0.90)	(1.43)	(0.22)	(0.91)	(5.00)	(2.83)
India	0.743	0.627	1.567	-2.118	-2.449	-4.057	0.901	3.938**	0.199
	(0.64)	(0.39)	(1.18)	(-0.56)	(-0.70)	(-1.48)	(1.69)	(3.59)	(0.15)
Indonesia	1.793*	1.769*	1.014	0.308	0.517	-0.457	-0.398	1.264	1.601
	(1.90)	(1.79)	(1.24)	(0.31)	(0.65)	(-0.53)	(-0.23)	(0.89)	(0.98)
Japan	0.755	1.015***	1.221**	-0.025	0.623*	0.747*	-2.342	-2.388	-2.200
	(1.57)	(3.05)	(2.60)	(-0.06)	(1.80)	(1.96)	(-1.66)	(-1.56)	(-1.47)
Malaysia	1.419	2.839*	1.730	0.942**	1.037**	0.251	-0.870	-0.184	0.052
	(1.20)	(1.98)	(1.43)	(2.08)	(2.27)	(0.40)	(-0.56)	(-0.14)	(0.05)
Philippines	1.514	-0.553	-2.287	0.205	-0.549	-0.836	1.424	-0.057	2.383
	(1.01)	(-0.40)	(-1.22)	(0.20)	(-0.42)	(-0.70)	(0.93)	(-0.03)	(1.08)
South Korea	0.566	1.568*	2.023**	1.576**	1.212**	0.529	-0.541	-0.511	0.081
	(0.48)	(1.77)	(2.34)	(2.07)	(2.56)	(1.02)	(-0.25)	(-0.27)	(0.03)
Taiwan	0.067	-1.957	0.069	1.766	2.096**	1.600*	-1.256	0.505	-0.781
	(0.01)	(-0.48)	(0.02)	(1.53)	(2.57)	(2.03)	(-1.29)	(0.56)	(-0.53)
Thailand	1.600	-0.355	-0.027	1.182	1.815***	1.135*	-2.395	-0.962	-1.488
	(1.44)	(-0.31)	(-0.02)	(1.57)	(2.88)	(1.77)	(-1.09)	(-0.53)	(-0.92)
Panel B: Global Sentiment									
Bangladesh	1.935	0.895	1.083	1.585**	2.221***	-0.331	1.217	0.393	-1.196
	(1.31)	(1.04)	(1.20)	(2.33)	(2.84)	(-0.30)	(0.91)	(0.36)	(-0.74)
China	1.256	-0.018	-0.288	1.014*	0.919**	0.432	-0.730	-0.429	-1.230**
	(1.32)	(-0.03)	(-0.43)	(1.96)	(2.29)	(1.38)	(-0.64)	(-0.62)	(-2.37)
Hong Kong	3.674***	3.702**	1.453	1.342***	2.731***	0.903*	-1.805	-1.598	-0.955
	(2.86)	(2.81)	(1.03)	(2.95)	(5.98)	(1.68)	(-1.17)	(-1.20)	(-0.54)
India	3.351*	2.473**	1.082	0.536	-0.451	-2.465***	0.236	0.309	-1.653
	(2.03)	(2.12)	(1.27)	(0.65)	(-0.57)	(-3.17)	(0.13)	(0.18)	(-1.13)
Indonesia	2.916	3.538*	0.721	0.562	0.387	0.742	-2.005	0.307	-1.308
	(1.33)	(2.07)	(0.33)	(0.81)	(0.58)	(1.11)	(-0.97)	(0.20)	(-0.76)
Japan	1.545**	1.976***	1.554**	-0.265	0.209	0.603	-1.288	-0.953	-1.008
	(2.44)	(3.63)	(2.38)	(-0.60)	(0.55)	(1.53)	(-1.30)	(-0.97)	(-0.96)
Malaysia	1.208	1.935	0.756	1.079***	1.135***	0.379	-1.014	-0.258	-0.068
	(0.77)	(1.14)	(0.32)	(2.74)	(3.12)	(0.87)	(-0.81)	(-0.23)	(-0.08)
Pakistan	1.470	1.369	-0.055	0.702	1.477***	-0.144	-0.935	-0.089	0.278
	(1.28)	(1.57)	(-0.05)	(0.82)	(2.86)	(-0.16)	(-0.46)	(-0.04)	(0.13)
Philippines	-1.591	1.820	1.398	0.092	-1.611*	-0.794	-0.558	-1.816	-3.178**
	(-0.65)	(1.11)	(0.67)	(0.10)	(-1.68)	(-0.81)	(-0.39)	(-0.87)	(-2.22)
Singapore	2.287**	4.436***	3.251**	1.330**	1.682***	1.140	-2.040	-1.981	-1.089
	(2.13)	(3.59)	(2.56)	(2.58)	(3.48)	(1.50)	(-1.05)	(-0.99)	(-0.80)
South Korea	3.861	1.591	-0.219	1.262*	1.518***	1.281**	-1.190	-0.568	-0.067
	(1.68)	(1.25)	(-0.17)	(1.86)	(3.03)	(2.13)	(-1.01)	(-0.59)	(-0.06)
Taiwan	1.619	0.934	0.081	1.259**	0.489	0.411	-1.075	-0.497	-0.738
	(1.01)	(0.50)	(0.04)	(2.11)	(0.90)	(0.77)	(-1.25)	(-0.55)	(-0.99)
Thailand	0.450	0.310	0.846	1.485**	1.462**	1.063*	-0.862	0.004	-1.230
	(0.19)	(0.14)	(0.46)	(2.61)	(2.61)	(1.79)	(-0.60)	(0.00)	(-1.13)

Notes: *, **, *** represent statistical significance at 10, 5, and 1 percent level respectively.

The effect of holding period sentiment on momentum for the size categories is reported in Table 8. In general, holding period sentiment also affects momentum across firm size

categories. The effect is especially conspicuous for global holding period sentiment (Panel B) as there is no momentum for pessimistic holding periods. The evidence for local holding period sentiment (Panel A) is less unanimous. Momentum is largely concentrated in optimistic and mild holding periods but there is significant momentum for Hong Kong and India for the pessimistic holding period. Nevertheless, a majority of the returns is insignificant during pessimistic holding period and there is also a significant negative return for small stocks in China. We conclude that momentum generally does not exist during pessimistic holding periods.

4.7 Momentum, Sentiment and Volume
Trading volume may contain an element of investor sentiment (Baker and Wugler, 2006). Optimistic investors are more likely to engage in trading activity in a market with short-sales constraints and this activity is reflected in trading volume and generally in liquidity (Baker and Stein, 2004). Trading volume may reflect investor sentiment but trading volume in itself is a simple and imperfect proxy of sentiment as it is confounded by factors unrelated to sentiment. Therefore, we test the robustness of the effect of sentiment on momentum by analyzing trading volume. At the end of each formation period, the stocks are segregated into three volume portfolios; high, medium and low. Winner, loser and momentum portfolios are formed within the three volume categories. Then, the periods are classified as optimistic, mild or pessimistic and the momentum returns for the respective states are computed.

Table 9 reports the results of this robustness analysis for local sentiment. 'High Vol.', 'Med. Vol.' and 'Low Vol.' refer to the high-, medium- and low-volume stock categories respectively. Pessimistic period is largely devoid of momentum while optimistic and mild period have instances of strong momentum. Momentum in all three volume categories appear to be affected by local sentiment. The earlier finding of momentum in Japan for high sentiment periods still holds and is perhaps stronger after taking into account trading volume.

Table 9: Volume, local sentiment and momentum portfolio returns

Country	Optimistic			Mild			Pessimistic		
	High Vol.	Med. Vol.	Low Vol.	High Vol.	Med. Vol.	Low Vol.	High Vol.	Med.Vol.	Low Vol.
China	0.853*	0.278	0.359	0.728	0.874	0.435	-0.018	-0.507	0.140
	(1.74)	(0.52)	(0.60)	(1.11)	(1.43)	(0.74)	(-0.04)	(-0.85)	(0.16)
Hong Kong	1.078	-0.069	-0.493	1.289**	1.982***	2.228***	-0.251	0.669	-0.747
	(1.48)	(-0.11)	(-0.57)	(2.24)	(3.94)	(3.73)	(-0.15)	(0.41)	(-0.59)
India	-0.495	1.630	-1.458	-1.491	-1.391	-1.343	0.373	-4.018	-7.297
	(-0.16)	(0.66)	(-0.95)	(-0.33)	(-0.58)	(-1.51)	(0.18)	(-0.72)	(-1.42)
Indonesia	1.207	2.741**	1.171*	-1.054	0.511	-0.340	1.880	1.373	0.171
	(1.32)	(2.70)	(1.77)	(-1.11)	(0.57)	(-0.42)	(1.38)	(0.95)	(0.13)
Japan	1.773***	1.086**	0.855**	0.394	0.764**	0.906***	-2.112	-3.032**	-2.049*
	(2.77)	(2.33)	(2.37)	(0.98)	(2.38)	(3.13)	(-1.69)	(-2.56)	(-1.87)
Malaysia	0.982	1.715	2.060*	1.314**	1.012**	0.966*	-1.483	-0.483	0.727
	(0.99)	(1.50)	(2.09)	(2.62)	(2.08)	(1.83)	(-1.00)	(-0.38)	(0.84)
Philippines	0.332	-0.851	-0.114	-0.384	0.557	-0.547	0.272	0.452	-0.535
	(0.15)	(-0.61)	(-0.07)	(-0.30)	(0.46)	(-0.41)	(0.24)	(0.44)	(-0.38)
South Korea	2.201*	2.640***	3.318***	1.140**	1.351**	1.329**	-0.561	-0.680	-2.221
	(2.03)	(2.97)	(3.90)	(2.06)	(2.29)	(2.05)	(-0.37)	(-0.34)	(-1.22)
Taiwan	-0.888	0.751	3.391**	2.787*	2.776**	1.335	0.570***	0.805	-0.414
	(-0.33)	(0.47)	(3.16)	(2.18)	(2.38)	(1.34)	(5.64)	(0.80)	(-0.39)
Thailand	0.138	1.066	-0.669	0.940	0.854	1.760**	-2.179	-1.905	-1.190
	(0.11)	(0.87)	(-0.63)	(1.27)	(1.17)	(2.12)	(-1.22)	(-0.98)	(-0.58)

Notes: *, **, *** represent statistical significance at 10, 5, and 1 percent level respectively.

Table 10 reports the results of the effect of global sentiment on momentum across volume categories. Momentum portfolio returns are all insignificant for global pessimistic periods for all of the volume categories, except for a marginally significant negative return in the medium volume category. On the other hand, there are momentum portfolio returns as high as 3.546% for global optimistic and mild periods.

Table 10: Volume, global sentiment and momentum portfolio returns

Country	Optimistic			Mild			Pessimistic		
	High Vol.	Med. Vol.	Low Vol.	High Vol.	Med. Vol.	Low Vol.	High Vol.	Med. Vol.	Low Vol.
Bangladesh	1.930	3.038***	1.068	2.718***	1.411	-0.366	1.186	0.486	-1.107
	(1.61)	(3.04)	(0.85)	(3.14)	(1.62)	(-0.32)	(0.84)	(0.48)	(-0.89)
China	0.568	1.292**	1.377*	1.122*	0.918	0.612	-0.483	-1.079*	-0.813
	(0.81)	(2.13)	(2.07)	(1.76)	(1.52)	(1.11)	(-1.00)	(-1.97)	(-0.95)
Hong Kong	1.232	2.917**	3.141**	1.774***	1.542***	0.552	-1.065	-0.540	0.240
	(0.83)	(2.38)	(2.37)	(4.10)	(3.00)	(0.99)	(-0.80)	(-0.48)	(0.22)
India	-0.240	0.937	-0.101	0.865	-0.419	-2.128**	0.540	0.382	-1.405
	(-0.08)	(0.54)	(-0.13)	(0.95)	(-0.59)	(-2.52)	(0.39)	(0.36)	(-1.25)
Indonesia	1.885	3.546*	2.161	0.242	0.937	0.092	-1.256	0.144	-1.215
	(1.10)	(2.00)	(1.34)	(0.30)	(1.33)	(0.14)	(-0.91)	(0.10)	(-1.08)
Japan	0.946	1.274*	0.874	0.881**	0.440	0.620	-1.358	-1.219	-0.577
	(0.98)	(1.84)	(1.65)	(2.04)	(1.06)	(1.60)	(-1.64)	(-1.68)	(-0.91)
Malaysia	0.428	0.984	0.787	1.596***	1.113**	1.447***	-0.775	-0.011	0.306
	(0.29)	(0.60)	(0.45)	(3.25)	(2.60)	(3.07)	(-0.75)	(-0.01)	(0.59)
Pakistan	0.521	2.637*	1.295	1.064	0.816	-1.149*	2.324	1.063	0.055
	(0.43)	(1.80)	(0.82)	(1.39)	(1.09)	(-1.72)	(1.46)	(0.72)	(0.03)
Philippines	1.691	-0.756	1.466	-2.010	-0.911	-1.290	-0.995	-1.196	-1.929
	(1.04)	(-0.50)	(0.54)	(-1.56)	(-0.95)	(-1.37)	(-0.56)	(-0.89)	(-1.30)
Singapore	1.520	3.048**	2.449**	2.369***	1.441*	0.893	-0.557	-0.806	-0.399
	(1.41)	(2.66)	(2.42)	(3.89)	(1.90)	(1.15)	(-0.42)	(-0.76)	(-0.33)
South Korea	1.059	2.120	1.685	1.495**	2.009***	1.610**	0.398	-0.528	0.217
	(0.77)	(1.32)	(0.85)	(2.48)	(3.25)	(2.59)	(0.46)	(-0.60)	(0.25)
Taiwan	0.141	-0.233	1.076	0.539	0.006	-0.077	0.295	0.693	-0.111
	(0.08)	(-0.13)	(0.49)	(0.91)	(0.01)	(-0.12)	(0.33)	(0.93)	(-0.13)
Thailand	0.059	-0.461	1.855	1.111	1.659***	1.324**	-0.725	-0.820	-0.585
	(0.03)	(-0.19)	(0.68)	(1.61)	(2.64)	(2.05)	(-0.79)	(-0.92)	(-0.63)

Notes: *, **, *** represent statistical significance at 10, 5, and 1 percent level respectively.

Table 11 reports the effect of holding period sentiment on momentum for the volume categories. As can be observed in Panel A, momentum portfolio returns during pessimistic holding periods are generally insignificant. In contrast to the pessimistic holding periods, momentum is prevalent during optimistic and mild holding periods. Panel B reports the results for global holding period sentiment. For the global pessimistic holding period, there is no momentum for all countries across the volume categories. Moreover, much of the returns are negative. In contrast, the momentum strategy garners significant profits during global optimistic and mild holding periods.

Table 11: Volume, holding period sentiment and momentum portfolio returns

Country	Optimistic			Mild			Pessimistic		
	High Vol.	Med. Vol.	Low Vol.	High Vol.	Med. Vol.	Low Vol.	High Vol.	Med. Vol.	Low Vol.
Panel A : Local Sentiment									
China	0.666	0.455	0.492	0.841	0.844	0.536	-0.447	-1.068**	-0.471
	(1.32)	(0.85)	(0.93)	(1.41)	(1.46)	(0.92)	(-0.83)	(-2.33)	(-0.58)
Hong Kong	1.501**	0.205	-0.164	0.027	0.823	1.013	2.612**	3.520***	1.976**
	(2.15)	(0.32)	(-0.19)	(0.03)	(1.11)	(1.38)	(2.60)	(4.50)	(2.39)
India	1.773	1.488	1.244	-1.902	-1.338	-4.220	1.831*	0.958	0.434
	(1.36)	(1.17)	(1.14)	(-0.57)	(-0.52)	(-1.59)	(2.78)	(0.56)	(0.95)
Indonesia	1.251	2.523**	0.895	-0.831	0.914	-0.066	1.707	0.920	-0.052
	(1.43)	(2.21)	(1.14)	(-0.91)	(1.07)	(-0.08)	(1.26)	(0.64)	(-0.04)
Japan	1.653***	1.178***	0.825**	0.348	0.557*	0.696**	-2.268	-3.145**	-1.781
	(3.25)	(3.17)	(2.67)	(0.81)	(1.77)	(2.46)	(-1.55)	(-2.13)	(-1.30)
Malaysia	0.982	1.715	2.060*	1.314**	1.012**	0.966*	-1.483	-0.483	0.727
	(0.99)	(1.50)	(2.09)	(2.62)	(2.08)	(1.83)	(-1.00)	(-0.38)	(0.84)
Philippines	-1.422	-2.287	0.304	-0.016	0.139	-0.997	-0.033	2.095	0.475
	(-0.73)	(-1.33)	(0.15)	(-0.01)	(0.13)	(-0.85)	(-0.03)	(1.29)	(0.24)
South Korea	1.715	1.229	2.116**	1.248**	1.539***	1.208*	-0.462	0.236	0.209
	(1.70)	(1.30)	(2.44)	(2.26)	(2.70)	(1.91)	(-0.28)	(0.11)	(0.10)
Taiwan	-2.859	-1.364	1.893	2.315*	2.653**	1.946**	0.430	0.486	-0.065
	(-0.41)	(-0.52)	(3.74)	(2.09)	(2.70)	(2.18)	(0.44)	(0.50)	(-0.08)
Thailand	-0.396	0.806	-0.575	1.160	1.041	1.748**	-1.656	-1.759	-0.668
	(-0.33)	(0.68)	(-0.54)	(1.59)	(1.42)	(2.07)	(-0.87)	(-0.94)	(-0.36)
Panel B: Global Sentiment									
Bangladesh	2.101*	3.060***	1.670	2.433**	1.271	-0.369	1.451	0.687	-1.666
	(1.82)	(3.49)	(1.48)	(2.63)	(1.58)	(-0.34)	(1.23)	(0.55)	(-1.22)
China	-0.059	0.370	0.047	1.235**	0.979*	0.755	-0.703	-0.998	-0.506
	(-0.07)	(0.43)	(0.05)	(2.19)	(1.84)	(1.62)	(-1.28)	(-1.56)	(-0.48)
Hong Kong	1.577	2.080	2.109	1.652***	1.783***	1.068**	-1.652	-0.990	-0.362
	(1.11)	(1.47)	(1.34)	(3.63)	(3.97)	(2.18)	(-1.06)	(-0.73)	(-0.29)
India	2.602	2.331**	0.545	0.067	-0.787	-2.171***	0.461	0.558	-1.541
	(1.44)	(2.28)	(0.75)	(0.06)	(-1.06)	(-2.84)	(0.28)	(0.42)	(-1.12)
Indonesia	2.001	3.557*	1.834	0.406	0.850	0.202	-2.066	0.273	-1.497
	(1.12)	(2.00)	(1.09)	(0.55)	(1.36)	(0.33)	(-1.27)	(0.15)	(-1.10)
Japan	2.239***	2.080***	0.987*	0.355	0.036	0.471	-1.412	-1.081	-0.524
	(2.94)	(3.55)	(1.94)	(0.84)	(0.09)	(1.35)	(-1.38)	(-1.17)	(-0.65)
Malaysia	1.260	1.215	1.276	1.271***	1.045***	1.145***	-1.095	-0.260	0.475
	(0.82)	(0.72)	(0.71)	(2.75)	(2.64)	(2.66)	(-0.88)	(-0.24)	(0.72)
Pakistan	-0.668	2.861*	0.691	1.684**	0.974	-0.720	1.812	0.590	-0.293
	(-0.62)	(2.06)	(0.45)	(2.27)	(1.32)	(-1.07)	(0.97)	(0.35)	(-0.14)
Philippines	1.569	-0.872	1.307	-1.906	-0.820	-1.322	-0.836	-1.411	-1.782
	(1.00)	(-0.59)	(0.47)	(-1.59)	(-0.93)	(-1.56)	(-0.40)	(-0.85)	(-0.94)
Singapore	2.945**	4.036***	3.251***	1.866***	1.245*	0.881	-0.956	-1.469	-1.205
	(2.59)	(3.45)	(3.21)	(3.41)	(1.84)	(1.24)	(-0.59)	(-1.14)	(-0.85)
South Korea	0.738	2.749*	2.171	1.619***	1.857***	1.599***	0.044	-1.156	-0.426
	(0.60)	(1.77)	(1.08)	(2.64)	(3.07)	(2.71)	(0.05)	(-1.22)	(-0.43)
Taiwan	1.034	0.212	1.402	0.547	0.296	0.245	-0.458	-0.266	-1.186
	(0.64)	(0.12)	(0.62)	(0.90)	(0.53)	(0.40)	(-0.51)	(-0.35)	(-1.24)
Thailand	0.478	-0.460	1.903	0.780	1.449**	1.224**	-0.600	-0.886	-0.767
	(0.21)	(-0.19)	(0.67)	(1.22)	(2.48)	(2.07)	(-0.53)	(-0.81)	(-0.68)

Notes: *, **, *** represent statistical significance at 10, 5, and 1 percent level respectively.

5. Conclusion

The central finding of this study is that sentiment affects momentum profitability in Asia. Momentum is present only during optimistic and mild periods. Pessimistic periods are fraught with negative returns. More importantly, countries where there is persistent absence of momentum display significant momentum once sentiment in taken into account. Japan, for example, has significant momentum during states of high sentiment. On the other hand, significant negative returns to the momentum portfolio are present during pessimistic periods. This is what deprives these markets of momentum. In addition to the local sentiment prevalent in the market, sentiment on a global scale influences momentum. In some cases, global sentiment appears to have a greater effect on momentum compared to local momentum. Sentiment prevalent during the portfolio holding period also dictates the level of momentum. The findings are robust to changes in the sentiment classification and proxy, and even after taking into account firm size and trading volume.

The findings provide an interesting revelation to investors. Whilst higher sentiment periods provide investors with significant momentum portfolio returns, pessimistic periods do not yield any significant returns and in some cases could even lead to substantial losses. Investors seeking to implement momentum strategy in Asia and possibly elsewhere should be cautious of the sentiment prevalent at the time of portfolio formation. Moreover, global sentiment should also be taken into consideration. Implementing momentum strategy during pessimistic periods could prove to be disastrous. It should be noted that trading costs were not taken into account and this area could be an interesting consideration for future studies.

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