Does Investor Sentiment Impact Global Equity Markets?

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Abstract
We explore whether investor sentiment (proxied by the Baker-Wurgler US sentiment index) impacts 38 developed and developing equity markets, over the period 1977 to 2004. We find that this US sentiment measure has predictive power on returns for various long-short portfolios designed to reflect sentiment prone (difficult to value and difficult to arbitrage) stocks. This is particularly the case for developed markets, and the predictability lasts for at least 2 years. Our analysis indicates that compensation for systematic risk cannot explain sentiment predictability. The US sentiment impact seems further strengthened when local sentiment is high. Interestingly, we also find that greater market integration, richer information, and stronger collectivism, to varying degrees, help strengthen the predictive power of the sentiment index. Finally, the sentiment predictability is mainly prevalent among those portfolios that are highly correlated with US counterparts.

JEL Classifications: Investor Sentiment; Global Markets; Consumer Confidence; Liberalization; Collectivism.

Keywords: G15; G14

1. Introduction

Investor sentiment is investor opinion, usually influenced by emotion, about future cash flows and investment risks. It is documented that investor sentiment could explain a number of puzzles in finance. Lee, Shleifer and Thaler (1991) find that investor sentiment tends to drive prices of closed-end fund shares away from the per share market value of assets that each fund holds. Ljungqvist, Nanda and Singh (2006) find that investor sentiment resolves the IPO puzzle – namely, that issuers do not appear to price their stock aggressively in hot markets because carrying IPO stock in their inventory is risky, as sentiment-related demand may disappear prematurely. Rosen (2006) suggests that investor sentiment could give rise to (1) merger momentum, in which bidder stock prices are more likely to increase when a merger is announced if recent mergers by other firms have been received well (i.e., in a "hot" merger market) and (2) long run reversal for "hot" market deals.

Apart from its potential impact on stock markets, investor sentiment is found to be influential in various other markets, including options markets (Han (2008)), index futures markets (Wang (2003)), agricultural futures markets (Wang (2001)), foreign exchange markets (Ahn, Lee and Suh (2002)), property markets (Gallimore and Gray(2002)), and football betting markets (Avery and Chevalier (1999)). It is also argued that investor sentiment is responsible for the formation of bubbles, as rational investors may prefer to ride bubbles because of predictable investor sentiment and limits to arbitrage (Brunnermeier and Nagel (2004)). Furthermore, it is documented that investor sentiment has other real effects. For example, Polk and Sapienza (2008) find that corporate investment is sensitive to some mispricing proxies for firms with higher R&D intensity (suggesting longer periods of information asymmetry and thus mispricing) or share turnover (suggesting that the firms' shareholders are short-term

investors).

While there is clear evidence that investor sentiment matters, the extent of its influence is yet to be quantified, particularly outside the US, as most sentiment studies exclusively rely on US data. Such findings might not be validly generalized to other markets. For example, using Greek data, Doukas and Milonas (2004) find that investor sentiment does not affect this capital market that is argued to be more susceptible to investor sentiment than is the US market. While Brown, Goetzmann, Hiraki, Shiraishi and Watanabe (2002) find that daily mutual fund flows are worthwhile instruments for investor sentiment in both the US and Japan, they find that there are both foreign and (independent) domestic sentiment factors in Japan – a result that is not duplicated in contemporaneous US data. These findings suggest that it is important to consider the significance of investor sentiment outside the US. Accordingly, such a task is the core research focus of our paper.

We begin our study by considering whether the influence of investor sentiment on stock prices, as reported by Baker and Wurgler (2006, 2007), is a global phenomenon. In particular, we examine how robustly the Baker-Wurgler results extend to a broad range of other stock markets using a sample which pools into more than 30,000 observations, covering 38 stock markets over the period from 1977 to 2004. As such, we are able to gather comprehensive international evidence that spans both developed and emerging market settings. We also examine whether local consumer confidence indexes could additionally explain stock returns. Our main motivation for this research angle is that (in addition to the sentiment index constructed by Baker and Wurgler (2006, 2007)), the literature suggests that consumer confidence could be an insightful proxy for investor sentiment.[1, 2] Our core findings

[1] Lemmon and Portniaguina (2006) find that investor sentiment measured using consumer confidence

are summarized as follows.

First, we find that when beginning-of-period proxies for sentiment are high, subsequent return is relatively low for securities whose valuations are highly subjective and difficult to arbitrage, including small stocks, high volatility stocks, unprofitable stocks, non-dividend-paying stocks, less tangibility stocks, and extreme growth stocks for the developed stock markets in our analysis. The impact lasts up to 2 years. However, for the remaining (mainly emerging) stock markets, we find weaker results, mainly for low fixed assets stocks and extreme growth stocks. These results could not be explained by the co-movement with the well-known asset pricing factors – the US and local Fama-French three factors and US and local momentum factors, as we control for these factors.

Second, echoing Baker and Wurgler (2006), we caution against the view that the effect of investor sentiment simply picks up compensation for systematic risk. Indeed, our analysis shows that systematic risk is unlikely to explain the effect of investor sentiment on stock prices. Like Baker and Wurgler (2006), we find that the interaction term between the US market factor and the investor sentiment index is typically of the wrong sign or insignificant, which goes against the systematic risk argument. Also, the interaction term between the local market factor and the investor sentiment index is usually insignificant, while the investor sentiment index itself remains robustly significant.

A plausible reason why the Baker-Wurgler investor sentiment index shows success in predicting global stock returns is that the US sentiment index affects other

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forecasts the returns of small stocks and stocks with low institutional ownership in a manner consistent with the predictions of models based on noise-trader sentiment. Qiu and Welch (2006) examine two potential proxies for investor sentiment – the closed-end fund discount and consumer confidence. They find that only the consumer confidence plays a robust role in financial market pricing.

[2] Also, as discussed above, different markets may have different sentiment proxies. The use of a consumer confidence index is attractive empirically, because of its wide availability across many market settings.

markets via the local sentiment channel. Therefore, we consider the relation between local sentiment and US sentiment. Specifically, we take local consumer confidence as a plausible proxy for local investor sentiment. While we find that both local consumer confidence and the US sentiment index have some separate predictive power for future returns, we do observe that the predictability of the US sentiment index is strengthened during periods of high local sentiment.

Our results probably suggest that the sentiment index captures sentiment of international investors that simultaneously plays an important role in different stock markets. The mechanism underlying this phenomenon is difficult to pinpoint, but might plausibly be related to a "contagious" flow of sentiment across international boundaries. This is more likely if the markets in question are somehow globally integrated. A simple hypothesis would then be: the more integrated the stock markets, the stronger the effect of investor sentiment. We test this hypothesis using two sets of analysis.

The first set of analysis is to study whether investor sentiment has a greater impact on stock returns of European stock markets after the creation of the Euro, since this event is expected to further integrate European markets into the global market. We find evidence consistent with the hypothesis that more integration is associated with a stronger investor sentiment effect. The second method is to examine whether the effect of investor sentiment is stronger when a stock market is more open. Contrary to the hypothesis, we do not find a stronger effect of investor sentiment for more open developed markets. These results clearly indicate that the influence of investor sentiment captured by the Baker-Wurgler index does not necessarily depend on the degree of openness of the markets.

The spread of investor sentiment is also influenced by the quality of the

information environment. A richer information environment could facilitate the spread of investor sentiment and speculative activities. However, it could also improve the quality of investors' information and, hence, rationality such that investors will be less influenced by sentiment. We find that various proxies for the information environment (international internet bandwidth, fixed telephone, and international voice traffic) have the effect of facilitating the spread of investor sentiment for a number of portfolios, particularly for the profitability and growth opportunities portfolios.

If the US sentiment index captures some element of global sentiment, it should explain future returns of global portfolios. Consistent with this notion, we find that the sentiment predictability is mainly prevalent among portfolios prone to have more "globalness".

Our paper is organized as follows. Section 2 outlines the full empirical framework. Section 3 presents our basic empirical results. Section 4 studies the relation between local sentiment and US sentiment while Section 5 explores some potential explanations for our key finding. Section 6 concludes.

2. Data and Empirical Design

2.1 Investor Sentiment Index

It has been suggested by many researchers that what transpires in one financial market, particularly if that market is large, could well have a wide-reaching impact on the returns (and other features) of many markets around the world (see, for example, Lin, Engle and Ito (1994) and Ferreira and Gama (2007)). Spillover effects across stock markets, especially from the US market to other markets, are also widely reported in the literature. For example, Baele (2005) finds contagion from the US market to a number of local European equity markets.

What about investor sentiment? Does it have an underlying global force, that might impact investor behavior worldwide? To be able to answer this question, we need to have access to a global sentiment measure. Since the US market is so closely associated with and influential over the global equities market,[3] we argue that US-based investor sentiment indices are credible proxies for underlying international/global sentiment. Therefore, we use US-based investor sentiment indices and test whether future stock returns in other markets are sensitive to these indices.

Specifically, our sentiment indices are chosen to be the same as those developed by Baker and Wurgler (2007). Given that there are no universally accepted proxies for investor sentiment, Baker and Wurgler consider a number of proxies suggested in the literature and form a composite sentiment index based on their first principal component.[4] The six proxies used to form their index are: trading volume (NYSE turnover), dividend premium, the closed-end fund discount, the number of

[3] The correlation between the US excess return and the world excess return is 0.86 between 1970 and 1989, 0.64 between 1991 and 1995, 0.92 between 1996 and 2000, and 0.95 between 2001 and 2005 (Harvey (1991) and Bodie, Kane, and Marcus (2008)).

[4] The first principal component of a set of time series variables is the linear combination of those variables with the coefficients chosen such that the joint variation across the series is maximized. The second principal component has the same property but is based on the series that are the residuals from the first principal component.

IPOs, the average first-day returns on IPOs, and the equity share in new issues.[5] To some extent these sentiment proxies might reflect economic fundamentals, and thus Baker and Wurgler also form an alternative index based on the same set of sentiment proxies that have been orthogonalized relative to a set of macroeconomic indicators – namely, growth in industrial production; real growth in durable, nondurable, and services consumption; growth in employment; and an NBER recession indicator. The indices are obtained from Wurgler's website.[6]

On the other hand, the literature suggests that different markets may have different sentiment proxies (e.g. Brown, Goetzmann, Hiraki, Shiraishi and Watanabe (2002)), and that local consumer confidence indices could serve as reliable proxies for domestic investor sentiment (e.g. Lemmon and Portniaguina (2006) and Qiu and Welch (2006)). Empirically, this is an attractive proposition since a consumer confidence index is readily available for many different markets. Consequently, we choose the consumer confidence index as our main proxy for local investor sentiment. These data are obtained from Datastream.[7]

2.2 Test Portfolios

Following Baker and Wurgler (2006), our test portfolios are groups of long-short portfolios based on weekly ranked firm characteristics. The rationale for our specific choice of portfolios will be discussed later (in Section 2.5). We measure all stock returns in US dollars. The exchange rates are obtained from Datastream and the

[5] See Baker and Wurgler (2007) for the details underlying these sentiment components.

[6] We are very grateful to Jeffrey Wurgler for making these data available at: http://www.stern.nyu.edu/~jwurgler.

[7] As a robustness check, we also use the turnover component of the US index and turnover of local stock markets as proxies for global and local investor sentiment, respectively. The US component is obtained from Wurgler's website while the local counterparts are retrieved from Datastream.

Federal Reserve website.[8] Our sample consists of 38 different major equity markets, over a maximum sample period that extends from 1977 to 2004. The sample is described in Appendix A. We distinguish between developed and developing markets in our analysis.

The portfolios are constructed as follows. At the beginning of each week, for each market, we separately rank all stocks based on each of the following six characteristics: size (ME), measured by market capitalization; volatility (σ), measured by standard deviation of the previous 52 week returns;[9] fixed assets (PPE/A), measured by the book value of net property, plant and equipment divided by the book value of total assets; research and development (RD/A), measured by research and development expense divided by the book value of total assets; book-to-market ratio (BE/ME), measured by the ratio of the book value of equity to market capitalization of equity; and sales growth (SG), measured by the growth of net sales. To minimize the influence of bid-ask bounce and infrequent trading (e.g., Lo and MacKinlay (1990) and Kaul and Nimalendra (1990)), we skip the immediately prior 4 weeks for our portfolio formation.[10] The top (middle) [bottom] one-third ranked stocks of each characteristic in each market are collectively defined as a 'High', H ('Medium', M) ['Low', L], portfolio. We also require that each of these portfolios comprises at least 30 individual stocks.

We create 13 long-short portfolios, as described below. First, our long-short *size* portfolio is the portfolio that goes long in the H size portfolio (bigger stocks) and shorts the L size portfolio (smaller stocks). Second, the long-short *risk* portfolio is the portfolio that goes long in the H volatility portfolio and shorts the L volatility

[8] http://www.federalreserve.gov/RELEASES/H10/hist/
[9] We require that at least 40 weekly return observations are available to compute the standard deviation.
[10] For example, in the case of ME portfolios for week *t*, we use ME at the end of week *t-5* to rank all stocks and form these portfolios.

portfolio. Third and fourth, there are two long-short *tangibility* portfolios likewise formed based on (PPE/A) and (RD/A). Fifth and sixth, there are two other long-short *growth opportunities and distress* portfolios formed similarly based on BE/ME and SG. Seventh, the portfolio that goes long in the M BE/ME portfolio and shorts the L BE/ME portfolio and, eighth, the portfolio that goes long in the H SG portfolio and shorts the M SG portfolio give us the two long-short portfolios capturing *growth opportunities*. Ninth and tenth, the two long-short *distress* portfolios are: the portfolio that goes long in the H BE/ME portfolio and shorts the M BE/ME portfolio and the portfolio that goes long in the M SG portfolio and shorts the L SG portfolio.

Eleventh and twelfth, we have two portfolios based on two alternative earnings measures: operating income and net income (both scaled by the book value of total assets). We separately short the portfolios with non-positive earnings and long the corresponding positive earning portfolios, thereby creating two long-short *profitability* portfolios. Finally, all stocks in each market are partitioned into either a non-dividend paying stock or a dividend paying stock portfolio. We then go long in the latter and short in the former, thus producing the long-short *dividend* portfolio. All data for the test portfolios are retrieved from Datastream.

2.3 Control Factors

There exist a range of well-known factors that explain stock returns. It is necessary to differentiate predictability effects of investor sentiment from well-known co-movement. Therefore, we control for familiar asset pricing factors in our regression analysis. Similar to Baker and Wurgler (2006), the asset pricing factors we consider are Fama-French's three factors, plus a momentum factor. If markets are to some extent segmented, stock returns will be affected by local factors. Therefore, we

control for local versions of the well-known asset pricing factors and the data for constructing them are obtained from Datastream. The construction of the local factors follows the same general method as that of the US factors (Fama and French (1993)). On the other hand, if markets are at least partially integrated, stock returns will be affected by global factors. Since the global equity market portfolio is highly correlated with the US equity market (due to its immense size), we control for the corresponding US factors that presumably mimic, to a great degree, the global asset pricing factors. The US factors are obtained from French's website.[11]

2.4 Mediating Factors

As will be seen shortly, our empirical model argues for the potential role of a range of mediating factors. The sampling and data aspects of these variables are described below.

2.4.1 Collectivism

We use a 'collectivism' score, which is equal to 100 minus an 'individualism' score. Individualism scores are obtained from Hofstede's website.[12] Collectivism aims to capture the extent to which individuals tend to form and are integrated into cohesive groups. A society is described as "individualistic" if the prevailing attitude is one in which people are expected to look after themselves (immediate family), whereas a "collectivistic" society is one "in which people from birth onwards are integrated into strong, cohesive in-groups, which continue protecting them in exchange for unquestioning loyalty."[13]

[11] We are very grateful to Ken French for making these data available at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_library.html

[12] We are very grateful to Geert Hofstede for making these data available at http://www.geert-hofstede.com

[13] Refer to the website http://www.geert-hofstede.com for further details. Individualism scores have been used by Chui, Titman, and Wei (2005) to study momentum in stock returns around the world.

2.4.2 Openness of the Markets

We have selected two measures for the extent of openness of markets. One measure is combined Foreign Direct Investment and portfolio inflows scaled by GDP. This measure has been used previously by Wei and Wu (2002) to study life and death implications of globalization, and Arizenman (2004), and Bussière and Fratzscher (2008) to study financial openness and growth/development. The second measure is equity investment by foreigners scaled by GDP. The fund flow data required for the numerator in each of these two measures originates from the IMF's Balance of Payment Statistics database. GDP data is obtained from the United Nations Statistics Division.

2.4.3 Quality of the Information Environment

We explore seven alternative measures to gauge the quality of the information environment.[14] They are all available at a country level. First, *daily newspapers* (denoted as "*papers*") refers to those domestic newspapers published at least four times a week and calculated as the average circulation (or copies printed) per 1,000 people. Second, *households with television* (%) (denoted as "*tv*") is the share of households having at least one television set. Third, we have a variable *internet users* (denoted as "*internet*") (per 1,000 people) measuring the number of people with access to the worldwide network. Fourth, *international internet bandwidth* (bits per capita) (denoted as "*iinternet*") is the contracted capacity of international connections between countries for transmitting internet traffic. Fifth, we have a variable

[14] All of these measures have been used in other literatures. For example, Asiedu (2002) used the number of telephones (from World Development Indicators) as a measure of infrastructure development to examine whether determinants of foreign direct investment of Sub-Saharan Africa are different from those of other developing countries. Beilock and Dimitrova (2003) used the number of residential telephones and the number of computers (also from the World Development Indicators) to study global inter-country differences in internet usage rates.

information and communications technology expenditures (per capita in US dollars) (denoted as "*expense*").[15] Sixth, *fixed telephone mainlines* (per 1,000 people) (denoted as "*phone*") is the number of telephone lines connecting subscribers to telephone exchange equipment. Lastly, *international voice traffic* (denoted as "*iphone*") is the sum of international incoming and outgoing telephone traffic (in minutes) divided by total population. All these data are obtained from *World Development Indicators 2006*.

2.5 Empirical Design

We apply a top-down approach. This approach builds on the two central premises of behavioral finance. The first premise is that investors are susceptible to sentiment (Delong, Shleifer, Summers, and Waldmann (1990)). In other words, investors could be influenced and form beliefs about future cash flows and investment risks that are not supported by fundamentals. The second premise is that there are limits to arbitrage (Shleifer and Vishny (1997)). Arbitrage efforts against sentiment-driven investors could be costly and risky because prices could further deviate from their fundamental value before any ultimate correction.

Consequently, there are two channels through which investor sentiment might affect the cross-section of stock prices (Baker and Wurgler (2006)). In the first channel, limits of arbitrage are the same, but sentiment demand shocks vary across stocks. As a result, when sentiment intensifies, we expect stocks that are sensitive to speculation to have contemporaneous higher-than-justifiable returns. In the second channel, sentiment is uniform, but the difficulty of arbitrage differs among stocks.

[15] This measure includes expenditure on computer hardware (computers, storage devices, printers, and other peripherals); computer software (operating systems, programming tools, utilities, applications, and internal software development); computer services (information technology consulting, computer and network systems integration, web hosting, data processing services, and other services); and communications services (voice and data communications services) and wired and wireless communication equipment.

Similarly, we expect sentiment to have a stronger effect on stocks that tend to be riskier and more costly to arbitrage. This leads to a key prediction of investor sentiment. If high sentiment causes overvaluation, then future returns on more sentiment-prone stocks will be lower when markets return to fundamentals and corrections are made. This prediction is distinct from those of the classical finance theories and disagreement models. According to the classical finance theories, such as the CAPM, a stock's expected return depends only on its systematic risk and the market risk premium. This type of model predicts that there is no relation between expected returns and sentiment. On the other hand, disagreement models suggest that hard-to-arbitrage stocks could be overvalued while sentiment models predict that these stocks could either be overvalued or be undervalued, conditional on the state of sentiment prevailing in the market.

As pointed out by Baker and Wurgler (2006, 2007), in practice, the securities that tend to be difficult to value, i.e., easily subject to speculation, also tend to be difficult to arbitrage. These include companies with the following or analogous characteristics: smaller size, higher volatility, no profit, non-dividend payer, more distress, or better growth potential. Therefore, we expect lower future returns on stocks which possess these characteristics, conditional on higher values of beginning-of-period sentiment. As such, this motivates our choice of test portfolios described in Section 2.2.

A natural starting point would be a univariate analysis in which we examine whether future returns of more sentiment-prone stocks is lower, conditional on higher values for various proxies of beginning-of-period investor sentiment. In particular, we contrast the average future returns between High and Low portfolios, described in Section 2.2.

To test the hypothesis more formally, we adopt a regression approach, which allows us to control for the well-known asset pricing factors. Specifically, we have the following regression models:

$$R_{X_{it}=High,t} - R_{X_{it}=Low,t} = a + bSENTIMENT_{t-1} + u_{it} \quad (1)$$

$$R_{X_{it}=High,t} - R_{X_{it}=Low,t} = a + bSENTIMENT_{t-1} + \beta MKT_t + sSMB_t + hHML_t + mMOM_t + u_{it} \quad (2)$$

The dependent variable is the 26-week return (sampled weekly) on a long-short portfolio, (e.g. Big minus Small), and the weekly returns are regressed on weekly observations of the prior 3-calendar month average sentiment index ($SENTIMENT_{t-1}$).[16] The variable *MKT* is the excess return of the value-weighted market portfolio over the risk-free rate of the US market. The variable *SMB* is the difference between the returns on small and large capitalization portfolios. The variable *HML* is the difference between the returns on high and low book-to-market portfolios. The variable *MOM* is the difference between the returns on high and low momentum portfolio.

The coefficient of interest in both equations is *b*. We expect *b* to be positive for size, profitability, dividends, fixed assets, book-to-market ratio based growth opportunities, and sales-growth based distress portfolios, while it should be negative for volatility, research and development, sales-growth based growth opportunities, and book-to-market ratio based distress portfolios. While equation (1) gives us baseline results, equation (2) allows us to separate the predictability effect of sentiment from well-known sources of co-movement. Since the raw Baker-Wurgler sentiment index may be contaminated with contemporaneous macroeconomic conditions, we also use

[16] Given that the sentiment index is a first-order autoregressive process, it is empirically appropriate that we employ longer-horizon returns. Specifically, we choose to use 26-week returns. Since this choice of horizon is arbitrary, in subsequent analysis we explore returns of alternate horizons to check the robustness of our results.

the Baker-Wurgler sentiment index that is orthogonalized to macroeconomic indicators. Subsequently, we also additionally control for the local asset pricing factors.

Beyond the basic model, we then move on to study whether and to what extent various mediating factors affect the influence of investor sentiment. The mediating factors we consider include collectivism, the extent of openness of markets, and the quality of the information environment. To this end, we add an interaction term between the sentiment index and the moderating factor of interest. Specifically, the model specification becomes:

$$\begin{aligned} R_{X_{it}=High,t} - R_{X_{it}=Low,t} = {} & a + bSENTIMENT_{t-1} \\ & + cSENTIMENT * MEDIATING\_FACTOR \\ & + \delta LMKT_t + \gamma LSMB_t + \lambda LHML_t + \kappa LMOM_t \\ & + \beta MKT_t + sSMB_t + hHML_t + mMOM_t + u_{it} \end{aligned} \quad (3)$$

The variables *SENTIMENT, MKT, SMB, HML*, and *MOM are* defined as above. The variable *MEDIATING_FACTOR* is the mediating factor under consideration. The variables *LMKT, LSMB, LHML,* and *LMOM* are the corresponding local or domestically-based versions of the market, size, book-to-market, and momentum factors, respectively. The coefficient of interest in this equation is *c*. We expect *c* to have the same sign as that of *b* predicted by the sentiment hypothesis. In particular, we expect *c* to be positive for size, profitability, dividends, fixed assets, book-to-market ratio based growth opportunities, and sales-growth based distress portfolios while it should be negative for volatility, research and development, sales-growth based growth opportunities, and book-to-market ratio based distress portfolios.

3. Basic Analysis of US Investor Sentiment Impact on International Markets

3.1 Univariate Analysis

As discussed above, a key prediction of investor sentiment is lower future returns on firms with lower capitalization, no profit, higher volatility, no dividend payment, higher growth or more financial distress, conditional on higher values of beginning-of-period sentiment.

To test our hypothesis, we begin our analysis in a univariate framework using the test portfolios based on size (ME), volatility (σ), two earnings measures (Earnings1 and Earnings2), dividends (Dividends), fixed assets (PPE/A), research and development (RD/A), book-to-market ratio (BE/ME), and sales growth (SG). Since the literature suggests that emerging markets are highly non-normal and different from developed markets (see, for example, Bekaert, Erb, Harvey and Viskanta (1998)), we separately conduct analysis for the developed and the other (mainly emerging) markets. To facilitate discussion, we "label" these other markets as developing markets hereafter.

Table 1 reports the univariate results, divided into developed (Panel A) and developing (Panel B) markets. Overall, the return patterns are more consistent with the prediction of the sentiment hypothesis conditional on periods of high sentiment than conditional on periods of low sentiment. Consider first Panel A. For the developed markets, the first two rows show the size effect, conditional on the Baker-Wurgler orthogonalized sentiment index ($SENTIMENT^{\perp}$). Like Baker and Wurgler (2006), the size effect of Banz (1981) is more evident during low sentiment periods for the developed market group. In particular, Table 1 shows that for these markets, for the bottom 25% of $SENTIMENT^{\perp}$, 26-week returns average 8.22% for the one-third smallest size stocks and 6.47% for the one-third largest size stocks. Following

periods of high sentiment (i.e. for the top 25% of $SENTIMENT^{\perp}$), consistent with the hypothesis, returns on smaller stocks are generally lower than those on larger stocks. The next two rows consider volatility portfolios. Consistent with the expectation of investor sentiment, there appear price corrections for High volatility stocks following high sentiment periods when they are subject to investor sentiment and overvalued, as they exhibit (on average) a negative average return of -1.08%. The average return is also significantly lower than that on the Low volatility portfolios at the 1% level. The cross-sectional effect of volatility reverses in low sentiment conditions.

The next four rows look at asset tangibility characteristics. The notion is that firms with fewer tangible assets may be more difficult to value, tend to be influenced by investor sentiment and relatively overvalued during periods of high sentiment. The Low (PPE/A) portfolio and the High (RD/A) portfolio consist of firms with fewer tangible assets. Consistent with the hypothesis of investor sentiment, their returns are on average significantly lower than returns on firms with more tangible assets, after high sentiment periods. However, the return patterns after periods of low sentiment are contrary to the sentiment hypothesis. Nevertheless, in the case of PPE/A the average return in high sentiment periods is substantially more positive than in low sentiment periods, consistent with the sentiment hypothesis.

The table also shows that consistent with the literature, returns in developed markets are generally higher for higher BE/ME stocks (Fama and French (1992)) or lower SG stocks (Lakonishok, Shleifer, and Vishny (1994)). BE/ME and SG could be a measure of growth opportunities. Lower BE/ME and higher SG suggest more growth opportunities. However, they could also be a measure of financial distress: higher (lower) BE/ME (SG) might indicate more distress. Growth opportunities and distress have opposite implications. In particular, if BE/ME or SG reflects more (less)

about distress than about growth opportunities, we should find lower (higher) future returns on higher BE/ME stocks or lower SG stocks, conditional on higher values of beginning-of-period sentiment. Our results suggest that these variables are generally more associated with growth potential than distress.

The remaining rows examine profitability and dividends. Stocks of unprofitable and non-dividend paying companies are more susceptible to speculation and thus are likely to be hard-to-arbitrage, thereby prone to being relatively overvalued during high sentiment periods. Consistent with this view, their returns are significantly lower than those on profitable and dividend paying companies. However, the reverse does not hold following periods of low sentiment. Nevertheless, in all cases the average return in high sentiment periods is substantially more positive than in low sentiment periods, consistent with the sentiment hypothesis.

For developing markets (Panel B), we also find evidence in support of the sentiment hypothesis. Specifically, returns of both volatility and SG portfolios are in the predicted direction. We also cannot reject the sentiment hypothesis based on the results of the profitability and BE/ME portfolios following periods of high sentiment, and those of the ME portfolios following periods of low sentiment. Generally, Table 1 suggests that the sentiment hypothesis is more descriptive of developed than of developing markets in our sample.

Before formally testing our hypotheses, we examine the correlations among the test portfolios and the figures for the developed markets are shown in Table 2.[17] Unsurprisingly, the table shows that long-short portfolios based on size, volatility, profitability, dividend payment, tangibility, growth opportunities, and distress are

[17] These correlations for the developing markets are untabulated to conserve space, but are available from the authors upon request.

typically significantly correlated. This suggests that they possess a common underlying nature. However, compared with the US (Table IV in Baker and Wurgler (2006)), the magnitude of these correlation coefficients is much smaller. As in the US, the long-short growth opportunity portfolios and the long-short distress portfolios are, in general, significantly and negatively correlated. This suggests that it might not be appropriate to simply apply "High minus Low" analyses to BE/ME and SG variables.

3.2 Core Regression Analysis

3.2.1 Baseline Regressions

We now formally test whether sentiment predicts returns on the various long-short portfolios. Since the returns are overlapping, we conduct tests based on Newey-West standard errors that assume a heteroskedastic and autocorrelated error structure. We run baseline regressions as specified in equations (1) and (2) in Section 2.[18] We exclude *SMB* and *HML* from the right side of the equation when they are the portfolios being analyzed. Table 3 reports the baseline regression results for the *SENTIMENT*-based coefficients.

For the developed markets, as documented in the US setting, *SENTIMENT* and $SENTIMENT^{\perp}$ coefficients for most of the thirteen long-short portfolios are estimated with the predicted sign, of similar magnitude, and strongly significant. The clear exceptions are the RD/A and distress portfolios. This suggests that macroeconomic conditions are of less importance. The second to last column shows that when we further control for *MKT*, *SMB*, *HML*, and *MOM*, the significance for the dividend, PPE/A and SG portfolios vanish.

For the developing markets, the predictive power of sentiment is much weaker

[18] To enhance presentation of results, the original Baker-Wurgler indices are scaled down by a factor of 100.

than that observed in the developed markets. The predictive power is mostly maintained for the volatility, dividend and SG portfolios. Although generally significant, the estimated sentiment coefficient on the RD/A portfolio is in the wrong direction.

Although we also find the 'U-shaped' pattern for SG portfolios, the patterns are less pronounced than those seen in the US setting. In contrast to the US evidence, we do not find the "U-shaped" pattern for BE/ME portfolios.

3.2.2 Local Asset Pricing Factors

Sentiment predictability established above might (at least) partially capture co-movement between returns and local asset pricing factors. Therefore, it is important to control for the local pricing factors. To this end, we run regressions by additionally incorporating the local factors, *LMKT*, *LSMB*, *LHML*, and *LMOM*, into the right side of equation (2).[19] Tables 4 reports the results.

Panel A of the table shows that for the developed markets, controlling for the local factors generally gives similar results, although this leads to the loss of significance for the size portfolio. Panel B of Table 4 shows that for the developing markets, controlling for the local factors generally leads to weaker results. First, the sentiment coefficient for the dividend and H-M SG portfolios becomes insignificant. Second, this coefficient for the tangibility portfolios has an opposite sign. However, the sentiment index now has predictive power for the *earnings2* portfolio. Consistent with Doukas and Milonas (2004), our results show that for certain characteristics, the local factors play a more important role than sentiment in the developing markets. However, it is also possible that the Baker-Wurgler index does not adequately capture

[19] To conserve space, we only report results for the Baker-Wurgler orthogonalized sentiment index (*SENTIMENT*$^{\perp}$) hereafter. Results for the Baker-Wurgler raw index (*SENTIMENT*) are qualitatively the same.

investor sentiment in these markets. We will further address this issue later.

3.2.3 Systematic Risk

A possible alternative explanation for sentiment predictability is that it simply mirrors time variation in market-wide risk premia. However, it would require that there are significant periods of time when larger, less volatile, profitable, and dividend paying firms require a risk premium over smaller, more volatile, unprofitable, and non-dividend paying firms. As Baker and Wurgler (2006) put it, this is counterintuitive. Another plausible explanation is that apparent sentiment predictability reflects time variation in beta loadings. If this is the case, sentiment would coincide with time-variation in market betas. In particular, if we run the following regression on the characteristic portfolios

$$\begin{aligned} R_{X_{it}=High,t} - R_{X_{it}=Low,t} &= a + bSENTIMENT^{\perp}{}_{t-1} \\ &\quad + \beta(c + dSENTIMENT^{\perp}{}_{t-1})MKT_t \\ &\quad + \delta(e + fSENTIMENT^{\perp}{}_{t-1})LMKT_t + u_{it} \end{aligned} \tag{4}$$

the interaction coefficients βd and δf should have the same sign as the estimates of sentiment coefficients reported above and coefficient b should not be significantly different from zero. Table 5 reports the results.

The table shows that about half of the coefficients βd are insignificant. When it is significant, it is generally of the wrong sign. The coefficient δf is significant in five regressions and again mostly takes the wrong sign. The coefficient b itself shows strong explanatory power, in the predicted direction similar to Table 4. These results suggest that compensation for systematic risk cannot explain the sentiment predictability that we observe.

3.2.4 Longer Horizon Returns

Next, we examine robustness of the predictive power of the sentiment index. We first test whether the sentiment index predicts different horizon returns on the long-short portfolios. To this end, we employ 13-, 52-, and 104-week continuously compounded returns in our baseline regressions. Table 6 reports the results. The table shows that the sentiment predictability can last up to 2 years, especially for the volatility, profitability, and book-to-market portfolios in the developed markets.

3.2.5 Monthly Seasonality

Given the prevalence of the January effect documented in the literature (e.g., Keim (1983) and Reinganum (1983)), we also study whether the explanatory power of the sentiment index is solely confined to January. Our results show that investor sentiment is not a purely a January phenomenon, as we find robust explanatory power of the sentiment index in non-January months.[20]

3.2.6 High versus Low Sentiment Analysis

As the predictions conditional on low values of beginning-of-period sentiment is opposite to those conditional on high values of beginning-of-period sentiment, we study them separately. Table 7 shows that sentiment predictability predominantly follows periods of high sentiment in developed markets. Indeed, 11 out of the 13 cases show a significant effect as predicted for the high sentiment regimes, whereas only 5 cases are significant in the predicted direction in the low sentiment regimes. Therefore, we focus attention on periods of high sentiment hereafter.

[20] These results are untabulated to conserve space, but are available from the authors upon request.

4. US Investor Sentiment Impact in the Presence of Local Sentiment

4.1 Local Consumer Confidence

As the literature suggests that there exists domestic sentiment component that is distinct from foreign sentiment component, we consider local sentiment indices in addition to the US sentiment index. Particularly, we consider local consumer confidence, which we treat as a plausible proxy for local investor sentiment. We examine whether local consumer confidence has any predictive power and how well the Baker-Wurgler sentiment index explains future returns along with the local consumer confidence indices.

The untabulated (for publication) results show that local consumer confidence has generally less explanatory power than the US sentiment index.[21] However, it outperforms the sentiment index in predicting future returns on the research and development portfolios (where the Baker-Wurgler sentiment index fails to explain the returns). Our results also show that for the developed markets, the predictive power of the Baker-Wurgler US sentiment index is largely unaffected by the inclusion of local indexes (magnitude and significance levels of coefficient estimates are basically unchanged). In the developing markets, for some portfolios, particularly the H-L BE/ME and M-L BE/ME portfolios, predictability becomes stronger (reflected by estimated sentiment coefficients of larger magnitudes). However, the significance of the sentiment coefficient for the PPE/A portfolios vanishes.

4.2 Local Consumer Confidence and the US Sentiment Index

Intuitively, the impact of global sentiment might depend on the status of local sentiment. Therefore, we next study whether there is any impact on the predictability

[21] These results are untabulated to conserve space, but are available from the authors upon request.

of the US sentiment index conditional on local sentiment. To this end, we introduce a dummy variable (*High* CCI_{t-1}) that takes a value of unity if local sentiment is in the top 25 percentile, and 0 otherwise. We then interact this dummy variable with the US sentiment index and include it in our regression model. If the predictability of the US sentiment index is strengthened during periods of high local sentiment, we expect that the estimated coefficient on the new interaction term will have the same sign as that of the standalone US sentiment index predicted by the hypothesis of investor sentiment.

Table 8 reports these results (using only those observations that classify as high sentiment). In general, the table shows that the impact of the US sentiment index might be stronger when local sentiment is high. Specifically, we find that the predictability of the US sentiment index is stronger when the local sentiment is high for volatility, dividends, BE/ME, and SG portfolios in the developed markets. However, the new interaction term has a wrong sign for a number of portfolios in the developing markets. The US sentiment index alone retains its strong predictive power for the size, earnings, and tangibility portfolios in the developed markets. Similarly, the US sentiment index alone retains predictive power for the H-L BE/ME, and M-L BE/ME portfolios in the developing markets. As for the role of local consumer confidence in its own right, it explains future returns on the earnings2, R&D, H-L BE/ME, and H-L SG portfolios in the developed markets and the R&D, BE/ME, and M-L SG portfolios in the developing markets. Consistent with the literature (e.g., Brown, Goetzmann, Hiraki, Shiraishi and Watanabe (2002)), our results suggest that there exist both global and local investor sentiment, which represent two underlying forces. Interestingly, our results suggest that in some situations they might reinforce each other.

4.3 Collectivism

As we have seen that there exists interaction between the US-based investor sentiment and local investor sentiment, the impact of the US-based investor sentiment index may be stronger when local investors exhibit more collectivism. It has been argued that collectivism may cause people to place more weight on a consensus opinion, thereby boosting "herd like overreaction" when sentiment is high (e.g., Chui, Titman and Wei (2005)). Accordingly, we further study whether there are such boosts to "herd like overreaction" by introducing two new interaction terms. One is an interaction between the local consumer confidence index and the collectivism score. The other one is a three-way interaction between the US sentiment index, High CCI, and the collectivism score. In untabulated (for publication) results, we find that the collectivism effect is weak. The three-way interaction is only significant and in the right direction for the SG portfolios in the developed markets and for the H-M BE/ME portfolio in the developing markets. [22]

4.4 Local Turnover and US Turnover

Finally, to explore the robustness of our findings with regard to the potential interaction between local and global investor sentiment we employ share turnover as an alternative proxy for global and local investor sentiment. Notably, in untabulated (for publication) findings we do not observe strong supportive evidence for an interaction effect between local and US sentiment based on this turnover proxy.[23] However, through all of these variations the US sentiment index itself maintains

[22] These results are untabulated to conserve space, but are available from the authors upon request.

[23] Specifically, the interaction term between the US sentiment index and the high local turnover dummy is only significant with the right sign for the H-M BE/ME portfolio in the developed markets and for the RD/A portfolio in the developing markets. The full results for this variation of the analysis are untabulated to conserve space, but are available from the authors upon request.

robust explanatory power for a number of long-short portfolios. In particular, these portfolios include the profitability, dividends, fixed assets, and BE/ME cases in both the developed and developing markets; the sales growth portfolios in the developed markets; and the size and RD portfolios in the developing markets. Local turnover is significant for only a few portfolios. Generally, our results suggest that US turnover captures a dimension of investor sentiment that is largely unrelated to local turnover.

5. Exploring Potential Reasons for the Global Influence of US Investor Sentiment

We have established the robustness of the predictability of the Baker-Wurgler sentiment index across international markets, and particularly developed markets, and that the predictability is largely independent of local sentiment. Our results, while interesting in their own right, throw up a fundamental question which thus far we have not explored. Specifically, *why* is the US sentiment effect much stronger in developed markets? And, related to this question – is it possible to identify the channel through which US investor sentiment affects these local markets? We now consider these questions, from several plausible angles. Specifically, our basic empirical strategy for achieving this task is to examine several potential mediating factors that might give rise to differential rates of sentiment predictability.

5.1 Global Integration

Our results suggest that the Baker-Wurgler sentiment index captures sentiment of international investors that play a significant role in different national markets. This is more likely if the markets in question are more globally integrated. In other words, we expect the predictive power of the index to be stronger when a market is more globally integrated. We test this hypothesis using the empirical model specified in

equation (3) to perform two sets of analysis.

The first set of analysis studies whether the predictive power of the sentiment index is stronger in European markets following the creation of the Euro currency. The creation of the Euro is expected to further integrate European markets into the global market. Therefore, our first approach is to examine whether the predictability of the sentiment index is enhanced after the creation of the Euro. The mediating factor that we choose to test this proposition is an indicator variable which takes a value of unity on and after the establishment of the conversion rate between the Euro and the local currency, and zero otherwise. Accordingly, the European markets are the focus of these tests. If our hypothesis is correct, then we should find that the coefficient on the interaction term is significant and has the same sign as that on the sentiment index predicted by the sentiment hypothesis.

The results are reported in Panel A of Table 9. The panel shows that 6 of the 13 estimated coefficients are significant and have the predicted sign. The corresponding long-short portfolios are risk, profitability (x2), dividends, and distress (x2) portfolios.

In the second set of analysis, we examine whether the predictability of the sentiment index is stronger in those markets that can be described as being more "open" (using only those observations that classify as high sentiment). In this case, the mediating factor is the degree of the openness of the markets. As before, if our hypothesis holds, then we should find that the coefficient on the interaction term between "openness" and the US sentiment index is significant, sharing the same sign as that predicted for coefficient on the sentiment index. Since sentiment predictability occurs mainly among the developed markets, we only report results for this group. Panels B and C of Table 9 display the results and they reveal that most of the interaction terms are insignificant. Moreover, when they are significant, some of them

take the wrong sign. Overall, our results suggest that the influence of the sentiment force does not depend on the openness of these non-US markets.

5.2 Information Environment

It is conceivable that the quality of the information environment could affect the spread of investor sentiment. For example, a more technologically efficient information environment could accelerate speculative activities and the spread of investor sentiment. Conversely, a higher quality of information environment could also improve the quality of investors' information, thereby enhancing investors' rationality such that they will be less affected by investor sentiment. How the quality of information environment affects the influence of investor sentiment is an empirical question. To explore this we create a mediating factor measuring the quality of information environment (various proxies described earlier in Section 2.4.3), in the context of equation (3). Our untabulated (for publication) results show that a richer information environment tends to enhance investors' rationality (as the interaction term tends to take the opposite sign to that predicted by the sentiment hypothesis). However, international internet bandwidth, fixed telephone, and international voice traffic are proxies that the information environment can facilitate the spread of investor sentiment for a number of portfolios, particularly for the profitability and growth opportunities portfolios, in the developed markets.[24]

5.3 Similarity between US and Local Portfolios

If the US sentiment index captures any *global* sentiment force, the index should be able to predict future returns on the *global* long-short portfolios that are considered by

[24] These results are untabulated to conserve space, but are available from the authors upon request.

international investors. Since the US market is so closely associated with and influential over the global equities market, we gauge the "globalness" of the local long-short portfolios in the non-US markets by the correlation between the US and local long-short portfolios based on weekly returns observed in the past year. Specifically, we use this correlation as a mediating factor proxying "globalness", in the context of equation (3). If the US sentiment index captures global sentiment, we expect the predictability will be stronger for those portfolios that are highly and positively correlated with the US portfolios i.e. the coefficient on the interaction term should be significant, sharing the same sign as that predicted for coefficient on the sentiment index.

The outcome of testing this "globalness" hypothesis is reported in Table 10 (using only those observations that classify as high sentiment). The table shows that the predictability of the US sentiment index in the developed markets is predominantly confined to those times when the portfolios are highly correlated with their US counterparts. Indeed, for all but one of the 13 long-short portfolios we have significant coefficients on the interaction term, in the predicted direction. The evidence is much weaker for the developing market group – only three of 13 cases support the hypothesis.

6. Conclusions

Does Investor sentiment possess an underlying global force that impacts investor behavior worldwide? With this question in mind, the primary focus of our paper is to explore investor sentiment effects using weekly return data observed across 38 developed and developing equity markets, over the period 1977 to 2004. Specifically, a range of (long-short) portfolios are formed, designed to magnify the role of sentiment prone stocks which are difficult to value and hard to arbitrage, to assess the return prediction ability of a proxy for investor sentiment. We choose the Baker-Wurgler US sentiment index as our proxy for global sentiment.

Our basic results show that the sentiment index has predictive power on returns for various long-short portfolios based on size, volatility, profitability, dividend payment, fixed assets, research and development, book-to-market ratio, and sales growth in other markets, especially developed markets, and that the predictability lasts for at least 2 years. The predictive power of the index remains strong when the well-known market, size, book-to-market, momentum factors, and a local consumer confidence index are controlled. Furthermore, our analysis indicates that compensation for systematic risk cannot explain the sentiment predictability. However, we do find that the US sentiment impact tends to be further strengthened when local sentiment is high.

We make further extensive efforts to pinpoint the underlying forces that might give rise to the widespread global influence of the sentiment index. In particular, we consider whether (1) greater integration with the global market or (2) a richer information environment could strengthen the predictive power of the sentiment index. While there is some weak supportive evidence for each of these channels, collectively, they are far from complete explanations of the international success of the Baker-

Wurgler US investor sentiment measure. Thus, a clear idea of the channel(s) through which the US sentiment index impacts other markets remains elusive. This is the object of ongoing research.

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Appendix A. Markets Covered and Sample Period

Market	The first portfolio date			The last portfolio date		
	year	month	day	year	month	day
Australia*	1977	1	12	2004	12	29
Austria*	1987	12	9	2004	12	29
Belgium*	1986	12	24	2004	12	29
Brazil	1994	7	13	2004	12	29
Canada*	1977	1	12	2004	12	29
Chile	1989	8	23	2004	12	29
China	1993	6	30	2004	12	29
Denmark*	1988	4	13	2004	12	29
Finland*	1989	8	23	2004	12	29
France*	1977	1	12	2004	12	29
Germany*	1977	1	12	2004	12	29
Greece*	1988	1	13	2004	12	29
Hong Kong*	1983	10	5	2004	12	29
India	1990	1	10	2004	12	29
Indonesia	1990	4	11	2004	12	29
Ireland*	1986	7	16	2004	12	29
Israel	1998	1	14	2004	12	29
Italy*	1983	1	5	2004	12	29
Japan*	1977	1	12	2004	12	29
Malaysia	1986	1	15	2004	12	29
Mexico	1988	7	6	2004	12	29
Netherlands*	1977	1	12	2004	12	29
New Zealand*	1993	7	7	2004	12	29
Norway*	1988	7	6	2004	12	29
Pakistan	1993	7	7	2004	12	29
Philippines	1991	7	17	2004	12	29
Poland	1996	9	25	2004	12	29
Portugal*	1988	1	13	2004	12	29
Singapore*	1983	3	30	2004	12	29
South Africa	1982	4	7	2004	12	29
South Korea	1984	7	11	2004	12	29
Spain*	1987	7	1	2004	12	29
Sweden*	1982	1	13	2004	12	29
Switzerland*	1985	4	3	2004	12	29
Taiwan	1989	7	12	2004	12	29
Thailand	1987	1	14	2004	12	29
Turkey	1988	2	17	2004	12	29
United Kingdom*	1977	1	12	2004	12	29

* Developed markets are based on MSCI classifications and comprise: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the United Kingdom

Table 1. Future Returns by Sentiment Index and Firm Characteristics

For each week, we form separately equal-weighted portfolios based on each of the following firm characteristics: firm size (*ME*), total risk (σ), fixed assets (*PPE/A*), research and development (*RD/A*), book-to-market ratio (*BE/ME*), and sales growth (*SG*). Three portfolios are formed in each case based on breakpoints of 33% and 67% to achieve Low, medium and High portfolios. We also calculate weekly portfolio returns based on profitability and dividends. Two portfolios are formed for each: positive and non-positive. Earnings1 is operating income/assets. Earnings2 is net income/assets. Dividends is dividends/share price. We then report average 26-week portfolio returns for weeks in which past three-month average ofthe *Sentiment*$^{\perp}$ index (Baker and Wurgler (2007)) that prevailed at the end of the prior week is in the top (bottom) 25% of all sentiment realizations. We also report the difference between High and Low portfolios and between Positive and Non-Positive portfolios, along with the significance level of the difference. Our hypotheses for the difference in returns are given in the columns (H_A). ***, **, and * indicate 1%, 5%, and 10% levels of significance. *Sentiment*$^{\perp}$ index is based on six sentiment proxies that have been orthogonalized to growth in industrial production, the growth in durable, nondurable, and services consumption, the growth in employment, and a dummy variable for NBER recessions. The sample is described in Appendix A.

		Panel A: Developed Markets					**Panel B: Developing Markets**				
	Prior Sentiment$^{\perp}$	High	Medium	Low	High – Low	H_A	High	Medium	Low	High – Low	H_A
ME	Top 25%	0.02990	0.02603	0.02659	0.00331***	+	-0.02216	-0.01345	0.01491	-0.03707	+
	Bottom 25%	0.06470	0.07094	0.08220	-0.01750***	-	0.09480	0.10323	0.12005	-0.02525***	-
σ	Top 25%	-0.01076	0.04517	0.05165	-0.06241***	-	-0.03864	-0.00896	0.02270	-0.06135***	-
	Bottom 25%	0.08178	0.07828	0.04746	0.03431***	+	0.14357	0.13238	0.09229	0.05128***	+
PPE/A	Top 25%	0.02733	0.01883	0.01329	0.01404***	+	-0.03416	-0.02315	-0.03498	0.00082	+
	Bottom 25%	0.07486	0.07243	0.07170	0.00316***	-	0.13284	0.13361	0.11053	0.02231	-
RD/A	Top 25%	-0.04804	-0.02429	-0.03128	-0.01676***	-	-0.05815	-0.06458	-0.08516	0.02701	-
	Bottom 25%	0.07696	0.09628	0.09525	-0.01829***	+	0.08519	0.10976	0.13204	-0.04684***	+
BE/ME	Top 25%	0.04718	0.03430	-0.01245	0.05923***	+	-0.00719	-0.02696	-0.05753	0.05034***	+
	Bottom 25%	0.09078	0.08078	0.06044	0.03035***	-	0.17051	0.13807	0.06044	0.07071***	-
SG	Top 25%	-0.00040	0.03639	0.02502	-0.02522***	-	-0.03662	-0.01155	-0.03283	-0.00379**	-
	Bottom 25%	0.06536	0.08034	0.07159	-0.00623***	+	0.13084	0.13141	0.11315	0.01768***	+
		Positive	Non-Positive		P – Non-P		Positive	Non-Positive		P – Non-P	
Dividends	Top 25%	0.05654	0.01611		0.04050***	+	0.01183	-0.02069		0.03027***	+
	Bottom 25%	0.07754	0.05477		0.02277***	-	0.10543	0.08549		0.02034***	-
Earnings1	Top 25%	0.05225	0.00314		0.04936***	+	0.00649	0.00314		0.04599***	+
	Bottom 25%	0.07273	0.06362		0.01096***	-	0.09971	0.06422		0.03542***	-
Earnings2	Top 25%	0.05173	0.00594		0.04552***	+	0.00767	-0.03546		0.03480***	+
	Bottom 25%	0.07335	0.05266		0.02014***	-	0.09372	0.08063		0.01985***	-

Table 2. Correlation of Portfolio Returns for Developed Markets

This table reports correlations among characteristics-based portfolios for developed markets. The sample countries are described in Appendix A. The long-short portfolios are formed based on firm characteristics: total risk (σ), firm size (ME), Earnings1 (operating income/assets), Earnings2 (net income/assets), dividends (dividends/price), fixed assets (PPE/assets), research and development (RD/assets), book-to-market ratio (BE/ME), and sales growth (SG). High (H) is defined as a firm in the top one-third in its stock market. Low (L) is defined as a firm in the bottom one-third in its stock market. Medium (M) is defined as a firm in the middle one-third in its stock market.

		Size and Risk		Profitability, Dividends			Tangibility		Growth Opportunities and Distress		Growth Opportunities		Distress	
		ME	σ	Earnings1	Earnings2	Dividends	PPE/A	RD/A	BE/ME	SG	BE/ME	SG	BE/ME	SG
		H-L	H-L	>0 - <0	>0 - <0	>0 - =0	H-L	H-L	H-L	H-L	M-L	H-M	H-M	M-L
σ	High-Low	-0.5642	1											
		(0.00)												
Earnings1	>0 - <0	0.4689	-0.5373	1										
		(0.00)	(0.00)											
Earnings2	>0 - <0	0.4561	-0.5099	0.6757	1									
		(0.00)	(0.00)	(0.00)										
Dividends	>0 - =0	0.5267	-0.6031	0.5704	0.6272	1								
		(0.00)	(0.00)	(0.00)	(0.00)									
PPE/A	High-Low	0.0831	-0.262	0.2171	0.1871	0.2065	1							
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)								
RD/A	High-Low	-0.0113	0.3164	-0.3377	-0.3332	-0.3486	-0.5442	1						
		(0.56)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)							
BE/ME	HML	-0.1566	-0.1445	0.0775	0.058	0.1227	0.3573	-0.4722	1					
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)						
SG	High-Low	0.0685	0.208	0.0656	0.0639	-0.0519	-0.3623	0.4174	-0.4088	1				
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)					
BE/ME	Medium-Low	0.0459	-0.32	0.289	0.2643	0.3314	0.3793	-0.5297	0.7786	-0.3514	1			
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)				
SG	High-Medium	-0.1959	0.4875	-0.3171	-0.2632	-0.3992	-0.3633	0.526	-0.3608	0.6682	-0.4136	1		
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			
BE/ME	High-Medium	-0.3079	0.1793	-0.2456	-0.2452	-0.2279	0.0845	-0.168	0.598	-0.2094	-0.0374	-0.0491	1	
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
SG	Medium-Low	0.318	-0.3132	0.4574	0.3916	0.4055	-0.0302	-0.1112	-0.0994	0.4783	0.0359	-0.3338	-0.2102	1
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	

Table 3. Baseline Time Series Regressions of Portfolio Returns on Sentiment Index

We run simple regressions of long-short portfolio returns (measured over 26 weeks) on the lagged three-month average sentiment index, and multiple regressions that additionally control for the contemporaneous US market risk premium (*MKT*), the contemporaneous US Fama-French factors (*SMB* and *HML*) and a contemporaneous US momentum factor (*MOM*). Market dummies are also included. Overlapping weekly observations are employed. This table reports the estimated coefficient on the sentiment index (Baker and Wurgler (2007)), the corresponding *t*-statistic (in parentheses) based on robust standard errors, and the number of observations. For brevity, all other coefficients are untabulated. The sample is described in Appendix A. The long-short portfolios are formed based on firm characteristics: firm size (*ME*), total risk (σ), earnings1 (operating income/assets), earnings2 (net income/assets), dividends (dividends/price), fixed assets (*PPE*/assets), research and development (*RD*/assets), book-to-market ratio (*BE/ME*), and sales growth (*SG*). High (Medium) [Low] is defined as a firm in the top (middle) [bottom] 1/3 in its stock market. Equally-weighted average weekly returns are matched to the sentiment index that prevailed at the end of the prior week. *Sentiment*$^{\perp}$ index is based on six sentiment proxies that have been orthogonalized to growth in industrial production, the growth in durable, nondurable, services consumption, the growth in employment, and a dummy variable for NBER recessions; the components of *Sentiment* are not orthogonalized. The predicted sign of each coefficient is given in the column (H_A). The first, second, fifth and sixth columns show simple regression results while the remaining columns show the results from running the multiple regression model. *SMB* (*HML*) is not included as a control variable when *BMS* (*HML*) is the dependent variable. ***, **, and * indicate 1%, 5%, and 10% level of significance, respectively.

		Sentiment(last 3 months)		Sentiment(last 3 months) controlling for US four factors		Sentiment$^{\perp}$(last 3 months)		Sentiment$^{\perp}$(last 3 months) controlling for US four factors	
	H_A	Developed	Developing	Developed	Developing	Developed	Developing	Developed	Developing
Panel A: Size and Risk									
ME: Big-Small	+	1.130***	-0.688	1.019**	-0.047	1.154***	-0.541	1.074***	-0.224
		(3.00)	(0.81)	(2.50)	(0.05)	(3.32)	(0.72)	(2.75)	(0.28)
Observations		20947	11807	20099	11221	20947	11807	20099	11221
σ: High-Low	–	-4.958***	-5.673***	-2.700***	-3.256***	-5.227***	-5.563***	-2.871***	-3.378***
		(8.60)	(5.97)	(5.04)	(3.43)	(9.63)	(6.90)	(5.45)	(4.10)
Observations		19330	10645	18899	10384	19330	10645	18899	10384
Panel B: Profitability and Dividend Policy									
Earnings1: >0 - <0	+	2.485***	0.640	1.337***	0.345	2.538***	0.914	1.209***	0.474
		(5.28)	(0.71)	(2.72)	(0.34)	(6.06)	(1.23)	(2.67)	(0.55)
Observations		20027	11196	19569	10937	20027	11196	19569	10937
Earnings2: >0 - <0	+	2.133***	0.705	1.170**	0.124	2.040***	1.649**	0.948**	1.097
		(4.33)	(0.74)	(2.25)	(0.11)	(4.62)	(2.15)	(2.00)	(1.22)
Observations		19980	10881	19523	10630	19980	10881	19523	10630
Dividend: >0 - =0	+	1.656***	1.266	0.466	1.237	1.729***	1.518**	0.317	1.342*
		(3.49)	(1.61)	(0.93)	(1.37)	(4.06)	(2.43)	(0.69)	(1.82)
Observations		19551	9674	19097	9446	19551	9674	19097	9446
Panel C: Tangibility									
PPE/A: High-Low	+	1.086**	-0.108	-0.149	-1.167*	1.167***	0.134	-0.501	-0.983
		(2.54)	(0.17)	(0.37)	(1.65)	(2.79)	(0.24)	(1.25)	(1.52)
Observations		15365	7288	15003	7105	15365	7288	15003	7105
RD/A: High-Low	-	-1.575	2.738**	0.303	5.855***	-1.590	1.780	0.693	5.164***
		(1.32)	(2.12)	(0.28)	(4.43)	(1.29)	(1.42)	(0.58)	(4.13)
Observations		2638	1397	2573	1364	2638	1397	2573	1364
Panel D: Growth Opportunities and Distress									
BE/ME: HML	+/-	1.961***	-1.029	1.494***	-1.494	2.332***	-0.603	1.499***	-1.368
		(4.59)	(0.95)	(3.90)	(1.38)	(5.64)	(0.59)	(4.05)	(1.30)
Observations		15039	6759	14684	6566	15039	6759	14684	6566
SG: High-Low	-/+	-1.158***	-1.150**	-0.273	-0.666	-1.286***	-1.178**	-0.196	-0.887
		(2.97)	(1.98)	(0.74)	(1.03)	(3.35)	(2.34)	(0.53)	(1.53)
Observations		14358	6331	14011	6171	14358	6331	14011	6171
Panel E: Growth Opportunities									
BE/ME: Medium-Low	+	1.610***	-0.576	1.060***	-1.006	2.106***	-0.061	1.287***	-0.722
		(4.66)	(0.77)	(3.54)	(1.37)	(6.12)	(0.08)	(4.31)	(1.04)
Observations		15039	6758	14684	6566	15039	6758	14684	6566
SG: High-Medium	-	-1.359***	-1.208**	-0.326	-0.941	-1.538***	-1.435***	-0.311	-1.166**
		(3.98)	(2.33)	(1.05)	(1.62)	(4.69)	(3.10)	(0.98)	(2.19)
Observations		14358	6331	14011	6171	14358	6331	14011	6171
Panel F: Distress									
BE/ME: High-Medium	-	0.352	-0.456	0.434*	-0.488	0.225	-0.545	0.212	-0.646
		(1.49)	(0.70)	(1.81)	(0.73)	(1.13)	(0.96)	(1.01)	(1.05)
Observations		15039	6758	14684	6566	15039	6758	14684	6566
SG: Medium-Low	+	0.201	0.058	0.053	0.275	0.252	0.258	0.115	0.279
		(0.68)	(0.11)	(0.17)	(0.50)	(0.95)	(0.54)	(0.41)	(0.56)
Observations		14358	6331	14011	6171	14358	6331	14011	6171

Table 4. Time Series Regressions of Portfolio Returns on Orthogonalized Sentiment Index, Controlling for Local Risk Factors

We run regressions of long-short portfolio returns (measured over 26 weeks) on the lagged three-month average orthogonalized sentiment index (*Sentiment*$^{\perp}$), the contemporaneous local and US market risk premia (*MKT*), the contemporaneous local and US Fama-French factors (*SMB* and *HML*) and contemporaneous local and US momentum factor (*MOM*). Market dummies are also included. Overlapping weekly observations are employed. This table reports the estimated coefficient on the sentiment index (Baker and Wurgler (2007)), the corresponding *t*-statistic (in parentheses) based on robust standard errors, and the number of observations. For brevity, all other coefficients are untabulated. The sample is described in Appendix A. Panel A reports results for developed markets, while Panel B reports results for developing markets. The long-short portfolios are formed based on firm characteristics: firm size (*ME*), total risk (σ), earnings1 (operating income/assets), earnings2 (net income/assets), dividends (dividends/price), fixed assets (*PPE*/assets), research and development (*RD*/assets), book-to-market ratio (*BE/ME*), and sales growth (*SG*). High, H, (Medium, M) [Low, L] is defined as a firm in the top (middle) [bottom] 1/3 in its stock market. Equally-weighted average weekly returns are matched to the *Sentiment*$^{\perp}$ index that prevailed at the end of the prior week. *Sentiment*$^{\perp}$ index is based on six sentiment proxies that have been orthogonalized to growth in industrial production, the growth in durable, nondurable, services consumption, the growth in employment, and a dummy variable for NBER recessions; the components of *Sentiment* are not orthogonalized. The predicted sign of each coefficient is given in the first row (H_A). *SMB* (*HML*) is not included as a control variable when *BMS* (*HML*) is the dependent variable. ***, **, and * indicate 1%, 5%, and 10% level of significance, respectively.

	Size and Risk		Profitability, Dividends			Tangibility		Growth Opportunities and Distress		Growth Opportunities		Distress	
	ME	σ	Earnings1	Earnings2	Dividends	PPE/A	RD/A	BE/ME	SG	BE/ME	SG	BE/ME	SG
	B-S	H-L	>0 - <0	>0 - <0	>0 - =0	H-L	H-L	H-L	H-L	M-L	H-M	H-M	M-L
Prediction: H_A	+	-	+	+	+	+	-	+	-	+	-	-	+
Panel A: Developed Markets													
Sentiment$^{\perp}$	0.663	-3.209***	1.427***	1.202**	0.365	-0.366	1.131	1.548***	-0.122	1.360***	-0.215	0.188	0.093
	(1.27)	(4.97)	(3.44)	(2.57)	(0.82)	(0.90)	(0.90)	(4.08)	(0.33)	(4.47)	(0.69)	(0.88)	(0.34)
Observations	14079	13882	14067	14067	14062	13868	2528	13785	13418	13785	13418	13785	13418
Panel B: Developing Markets													
Sentiment$^{\perp}$	-0.750	-3.630***	0.649	1.480**	0.787	-1.681***	4.268***	-1.444	-0.812	-1.036	-0.821	-0.409	0.009
	(0.74)	(3.96)	(0.89)	(2.06)	(1.08)	(2.83)	(3.97)	(1.37)	(1.40)	(1.49)	(1.50)	(0.65)	(0.02)
Observations	5932	5840	5932	5932	5792	5760	1331	5660	5495	5660	5495	5660	5495

Table 5. Time Series Regressions of Portfolio Returns on Orthogonalized Sentiment Index with Market Premia Interactions

This table reports the results of regressions of long-short portfolio returns (measured over 26 weeks) on the lagged three-month average orthogonalized sentiment index (*Sentiment*$^{\perp}$), the contemporaneous local and US market risk premia (*MKT*), and the market risk premia interacted with *Sentiment*$^{\perp}$. Overlapping weekly observations are employed. The corresponding *t*-statistic (in parentheses) based on robust standard errors, and the number of observations. The sample is described in Appendix A. The long-short portfolios are formed based on firm characteristics: firm size (*ME*), total risk (σ), earnings1 (operating income/assets), earnings2 (net income/assets), dividends (dividends/price), fixed assets (*PPE*/assets), research and development (*RD*/assets), book-to-market ratio (*BE/ME*), and sales growth (*SG*). High, H, (Medium, M) [Low, L] is defined as a firm in the top (middle) [bottom] 1/3 in its stock market. Equally-weighted average weekly returns are matched to the *Sentiment*$^{\perp}$ index that prevailed at the end of the prior week. *Sentiment*$^{\perp}$ index is based on six sentiment proxies that have been orthogonalized to growth in industrial production, the growth in durable, nondurable, services consumption, the growth in employment, and a dummy variable for NBER recessions. The predicted sign of each coefficient is given in the first row (H_A). ***, **, and * indicate 1%, 5%, and 10% level of significance, respectively.

	Size and Risk		Profitability, Dividends			Tangibility		Growth Opportunities and Distress		Growth Opportunities		Distress	
	ME	σ	Earnings1	Earnings2	Dividends	PPE/A	RD/A	BE/ME	SG	BE/ME	SG	BE/ME	SG
	B-S	H-L	>0 - <0	>0 - <0	>0 - =0	H-L	H-L	H-L	H-L	M-L	H-M	H-M	M-L
Prediction H_A:	+	-	+	+	+	+	-	+	-	+	-	-	+
Panel A: Developed Markets													
Sentiment$^{\perp}$	1.180***	-2.783***	1.504***	1.164***	0.641	-0.237	0.728	0.941**	-0.340	0.837***	-0.465	0.104	0.125
	(3.08)	(5.67)	(3.54)	(2.60)	(1.51)	(0.63)	(0.66)	(2.52)	(1.00)	(2.85)	(1.58)	(0.48)	(0.47)
Sentiment$^{\perp}$**local MKT*	-1.795*	0.467	-1.758**	-0.838	-0.588	1.268**	1.555	-2.131	-0.895	-1.739	-0.379	-0.392	-0.516
	(1.94)	(0.25)	(2.09)	(0.81)	(0.57)	(2.21)	(0.16)	(1.32)	(1.62)	(1.32)	(0.71)	(0.76)	(0.89)
local MKT	-0.005	-0.001	0.004	-0.001	0.000	0.002	-0.014	0.003	0.000	0.000	-0.002	0.003	0.002
	(1.50)	(0.40)	(1.46)	(0.33)	(0.09)	(0.72)	(0.45)	(0.71)	(0.12)	(0.05)	(0.82)	(1.52)	(0.66)
Sentiment$^{\perp}$**US MKT*	-3.021	0.981	-13.644***	-5.997	-12.174***	-8.699***	24.452***	-26.061***	11.394***	-18.891***	8.444***	-7.169***	2.950
	(0.95)	(0.24)	(3.91)	(1.58)	(3.57)	(2.63)	(2.69)	(7.98)	(3.86)	(7.62)	(3.38)	(3.60)	(1.27)
US MKT	0.048**	0.545***	-0.152***	-0.153***	-0.180***	-0.236***	0.281***	-0.131***	0.135***	-0.144***	0.174***	0.013	-0.039**
	(2.07)	(16.98)	(6.19)	(5.65)	(7.54)	(10.69)	(4.76)	(5.45)	(7.11)	(8.90)	(9.78)	(0.86)	(2.51)
Observations	19618	18590	19250	19184	18783	14754	2528	14440	13777	14440	13777	14440	13777
Panel B: Developing Markets													
Sentiment$^{\perp}$	-0.073	-3.633***	0.900	1.561*	0.785	-1.242*	5.166***	-1.921*	-0.748	-1.438**	-0.950*	-0.483	0.202
	(0.08)	(4.20)	(1.05)	(1.66)	(0.96)	(1.77)	(3.37)	(1.87)	(1.12)	(2.06)	(1.67)	(0.74)	(0.36)
Sentiment$^{\perp}$**local MKT*	0.538	0.911	-0.060	-6.986	-1.041	3.513**	12.045	-4.875	-1.688	-2.889**	-0.770	-1.985	-0.917
	(0.17)	(0.31)	(0.02)	(1.42)	(0.47)	(2.30)	(0.77)	(1.63)	(1.18)	(1.99)	(0.70)	(0.96)	(0.62)
local MKT	-0.013	-0.010	0.023	0.167	0.022	-0.059*	-0.056	0.085	0.025	0.053*	0.007	0.032	0.017
	(0.19)	(0.16)	(0.40)	(1.56)	(0.47)	(1.79)	(0.43)	(1.36)	(0.80)	(1.74)	(0.31)	(0.72)	(0.54)
Sentiment$^{\perp}$**US MKT*	-10.553	-6.774	-0.073	1.248	-7.262	-5.594	23.143**	-26.756***	-2.747	-18.696***	3.717	-8.060	-6.463
	(1.52)	(0.96)	(0.01)	(0.17)	(1.17)	(0.95)	(2.32)	(3.04)	(0.49)	(3.08)	(0.86)	(1.40)	(1.48)
US MKT	0.107**	0.371***	-0.038	-0.012	-0.056	-0.151***	0.264***	-0.058	0.084**	-0.066*	0.063**	0.008	0.021
	(2.12)	(7.41)	(0.83)	(0.22)	(1.23)	(4.01)	(3.60)	(0.92)	(2.45)	(1.85)	(2.02)	(0.18)	(0.86)
Observations	10261	9634	10174	9909	8804	6596	1344	6176	5784	6176	5784	6176	5784

Table 6. Time Series Regressions of Portfolio Returns on Orthogonalized Sentiment Index for Different Horizons

We run regressions of long-short portfolio returns (measured over 13-, 52-, and 104-weeks) on the lagged three-month average orthogonalized sentiment index (*Sentiment*$^{\perp}$), the contemporaneous local and the US market risk premia (*MKT*), the contemporaneous local and the US Fama-French factors (*SMB and HML*) and the contemporaneous local and the US momentum factor (*MOM*). Market dummies are also included. Overlapping weekly observations are employed. This table reports the estimated coefficient on the sentiment index, and the corresponding *t*-statistic (in parentheses) based on robust standard errors are also reported. For brevity, all other coefficients are untabulated. The sample is described in Appendix A. The long-short portfolios are formed based on firm characteristics: firm size (*ME*), total risk (σ), earnings1 (operating income/assets), earnings2 (net income/assets), dividends (dividends/price), fixed assets (*PPE*/assets), research and development (*RD*/assets), book-to-market ratio (*BE/ME*), and sales growth (*SG*). High, H, (Medium, M) [Low, L] is defined as a firm in the top (middle) [bottom] 1/3 in its stock market. Equally-weighted average weekly returns are matched to the *Sentiment*$^{\perp}$ index that prevailed at the end of the prior week. *Sentiment*$^{\perp}$ index is based on six sentiment proxies that have been orthogonalized to growth in industrial production, the growth in durable, nondurable, services consumption, the growth in employment, and a dummy variable for NBER recessions. The predicted sign of each coefficient is given in the first row (H_A). *SMB* (*HML*) is not included as a control variable when *BMS* (*HML*) is the dependent variable. ***, **, and * indicate 1%, 5%, and 10% level of significance, respectively.

	Size and Risk		Profitability, Dividends			Tangibility		Growth Opportunities and Distress		Growth Opportunities		Distress	
	ME	σ	Earnings1	Earnings2	Dividends	PPE/A	RD/A	BE/ME	SG	BE/ME	SG	BE/ME	SG
	B-S	H-L	>0 - <0	>0 - <0	>0 - =0	H-L	H-L	H-L	H-L	M-L	H-M	H-M	M-L
Prediction H_A:	+	-	+	+	+	+	-	+	-	+	-	-	+
Panel A: Developed Markets													
13-week returns	0.265	-2.175***	1.064***	1.011***	0.464*	0.249	-0.346	1.110***	-0.270	0.975***	-0.248	0.135	-0.023
Sentiment$^{\perp}$	(0.93)	(5.92)	(4.44)	(3.71)	(1.87)	(1.07)	(0.48)	(5.17)	(1.21)	(5.36)	(1.29)	(1.13)	(0.15)
52-week returns	0.860	-5.126***	2.135***	1.420*	0.871	-0.728	0.424	2.618***	-0.218	2.018***	-0.645	0.600	0.427
Sentiment$^{\perp}$	(0.90)	(4.66)	(3.07)	(1.79)	(1.16)	(1.05)	(0.23)	(4.16)	(0.44)	(4.51)	(1.30)	(1.40)	(0.94)
104-week returns	0.163	-4.743***	3.559***	2.808**	1.459	-1.769	3.032	3.131**	0.319	1.772**	0.047	1.359*	0.272
Sentiment$^{\perp}$	(0.10)	(2.71)	(3.15)	(2.24)	(1.22)	(1.64)	(1.58)	(2.54)	(0.38)	(2.01)	(0.05)	(1.77)	(0.31)
Panel B: Developing Markets													
13-week returns	-0.502	-2.523***	0.206	0.679*	0.474	-0.623**	2.225***	-0.270	-0.399	0.010	-0.604*	-0.279	0.204
Sentiment$^{\perp}$	(0.93)	(4.95)	(0.53)	(1.76)	(1.32)	(2.00)	(3.19)	(0.42)	(1.35)	(0.02)	(1.96)	(0.83)	(0.70)
52-week returns	0.728	-1.585	0.401	1.235	0.467	-2.545**	8.554***	-4.016**	-0.536	-2.363*	-0.532	-1.653	-0.004
Sentiment$^{\perp}$	(0.49)	(1.19)	(0.26)	(1.03)	(0.37)	(2.07)	(4.62)	(2.16)	(0.47)	(1.91)	(0.57)	(1.50)	(0.00)
104-week returns	3.975	-1.959	6.176***	2.206	-2.871	-0.330	4.955	-4.140	-0.308	-1.549	-2.154	-2.591	1.846
Sentiment$^{\perp}$	(1.18)	(1.02)	(3.80)	(1.32)	(1.17)	(0.18)	(1.41)	(1.40)	(0.20)	(0.81)	(1.40)	(1.56)	(1.39)

Table 7. Time Series Regressions of Portfolio Returns on Orthogonalized US Sentiment Index Conditioned by High/Low Sentiment

This table reports the results for regressions of long-short portfolio returns (measured over 26 weeks) on the lagged three-month average orthogonalized sentiment index (*Sentiment*$^{\perp}$), the contemporaneous local and US market risk premia (*MKT*), the contemporaneous local and US Fama-French factors (*SMB* and *HML*) and contemporaneous local and US momentum factor (*MOM*) separately for periods of high (top 1/3) and low (bottom 1/3) sentiment. Market dummies are also included. Overlapping weekly observations are employed. The estimated coefficients of control variables are not reported for brevity. The table reports the estimated coefficients on Sentiment$^{\perp}$ conditioned by dummies that isolate the top and bottom 25% of sentiment observations (high and low sentiment, respectively), and the corresponding t-statistics (in parentheses) based on robust standard errors. The sample is described in Appendix A. The long-short portfolios are formed based on firm characteristics: firm size (*ME*), total risk (σ), earnings1 (operating income/assets), earnings2 (net income/assets), dividends (dividends/price), fixed assets (*PPE*/assets), research and development (*RD*/assets), book-to-market ratio (*BE/ME*), and sales growth (*SG*). High, H, (Medium, M) [Low, L] is defined as a firm in the top (middle) [bottom] 1/3 in its stock market. Equally-weighted average weekly returns are matched to the *Sentiment*$^{\perp}$ index that prevailed at the end of the prior week. *Sentiment*$^{\perp}$ index is based on six sentiment proxies that have been orthogonalized to growth in industrial production, the growth in durable, nondurable, services consumption, the growth in employment, and a dummy variable for NBER recessions. *SMB* (*HML*) is not included as a control variable when *BMS* (*HML*) is the dependent variable. The predicted sign of each coefficient is given in the first row (H_A). ***, **, and * indicate 1%, 5%, and 10% level of significance, respectively.

	Size and Risk		Profitability, Dividends			Tangibility		Growth Opportunities and Distress		Growth Opportunities		Distress	
	ME	σ	Earnings1	Earnings2	Dividends	PPE/A	RD/A	BE/ME	SG	BE/ME	SG	BE/ME	SG
	B-S	H-L	>0 - <0	>0 - <0	>0 - =0	H-L	H-L	H-L	H-L	M-L	H-M	H-M	M-L
Prediction H_A: High	+	–	+	+	+	+	–	+	–	+	–	–	+
Low	–	+	–	–	–	–	+	–	+	–	+	+	–
Panel A: Developed Markets													
High Sentiment	2.661***	-5.164***	3.921***	3.494***	2.135***	2.662***	-4.182**	3.241***	-2.050**	2.739***	-2.222***	0.502	0.172
Sentiment$^{\perp}$	(2.83)	(4.69)	(5.48)	(4.53)	(2.87)	(3.33)	(2.09)	(3.43)	(2.43)	(3.55)	(3.55)	(1.12)	(0.31)
Low Sentiment	-4.432**	2.615	-2.729	-3.225*	-5.478***	-2.101	4.632*	2.438*	-0.476	-1.117	0.933	3.555***	-1.408
Sentiment$^{\perp}$	(2.17)	(1.17)	(1.52)	(1.71)	(3.04)	(1.30)	(1.73)	(1.83)	(0.41)	(1.26)	(0.92)	(3.66)	(1.22)
Panel B: Developing Markets													
High Sentiment	-0.238	-1.471	0.927	1.608	0.369	2.205**	-0.430	2.485	-0.862	1.927	-2.058*	0.558	1.197
Sentiment$^{\perp}$	(0.14)	(0.91)	(0.89)	(1.42)	(0.37)	(2.11)	(0.19)	(1.45)	(0.84)	(1.42)	(1.83)	(0.52)	(0.99)
Low Sentiment	0.337	-4.682	-15.518***	0.090	13.359*	-2.556	5.891*	-4.489	4.665	-4.010	2.435	-0.480	2.230
Sentiment$^{\perp}$	(0.07)	(1.18)	(3.89)	(0.02)	(1.79)	(0.91)	(1.74)	(0.89)	(1.64)	(1.42)	(1.03)	(0.13)	(0.82)

Table 8. Time Series Regressions of Portfolio Returns on Orthogonalized Sentiment Index and the Local Consumer Confidence Indices

For periods of high sentiment, we run regressions of long-short portfolio returns (measured over 26 weeks) on the lagged three-month average local consumer confidence index (*CCI*), the lagged three-month average orthogonalized sentiment index (*Sentiment*$^{\perp}$), the interaction between the orthogonalized sentiment index and a *High CCI dummy* that takes a value of 1 when *CCI* is in the top 25%, the contemporaneous local and US market risk premia (*MKT*), the contemporaneous local and US Fama-French factors (*SMB and HML*) and the contemporaneous local and US momentum factor (*MOM*). Market dummies are also included. Overlapping weekly observations are employed. The estimated coefficients of control variables are not reported for brevity. The table reports the estimated coefficients on *CCI*, *Sentiment*$^{\perp}$ *and Sentiment*$^{\perp}$ *interacting with the High CCI dummy*, their corresponding t-statistics (in parentheses) based on robust standard errors and the number of observations. The sample is described in Appendix A. The long-short portfolios are formed based on firm characteristics: firm size (*ME*), total risk (σ), earnings1 (operating income/assets), earnings2 (net income/assets), dividends (dividends/price), fixed assets (*PPE*/assets), research and development (*RD*/assets), book-to-market ratio (*BE/ME*), and sales growth (*SG*). High, H, (Medium, M) [Low, L] is defined as a firm in the top (middle) [bottom] 1/3 in its stock market. Equally-weighted average weekly returns are matched to the *Sentiment*$^{\perp}$ index that prevailed at the end of the prior week. *Sentiment*$^{\perp}$ index is based on six sentiment proxies that have been orthogonalized to growth in industrial production, the growth in durable, nondurable, services consumption, the growth in employment, and a dummy variable for NBER recessions. *SMB* (*HML*) is not included as a control variable when *BMS* (*HML*) is the dependent variable. The predicted sign of each coefficient is given in the first row (H_A). ***, **, and * indicate 1%, 5%, and 10% level of significance, respectively.

	Size and Risk		Profitability, Dividends			Tangibility		Growth Opportunities and Distress		Growth Opportunities		Distress	
	ME	σ	Earnings1	Earnings2	Dividends	PPE/A	RD/A	BE/ME	SG	BE/ME	SG	BE/ME	SG
	B-S	H-L	>0 - <0	>0 - <0	>0 - =0	H-L	H-L	H-L	H-L	M-L	H-M	H-M	M-L
Prediction H_A:	+	-	+	+	+	+	-	+	-	+	-	-	+
Panel A: Developed Markets													
CCI	0.004	0.006*	-0.000	0.005***	-0.011***	-0.001	-2.304***	0.007***	-0.017**	0.004	-0.007*	0.003	-0.010*
	(1.59)	(1.66)	(0.20)	(3.68)	(4.54)	(0.15)	(3.94)	(2.78)	(2.11)	(1.28)	(1.82)	(0.80)	(1.66)
Sentiment$^{\perp}$	2.865**	-1.216	4.039***	2.512***	0.257	2.849***	-4.154*	0.572	-0.177	1.147	-0.848	-0.574	0.672
	(2.23)	(0.90)	(4.04)	(2.71)	(0.26)	(2.72)	(1.83)	(0.39)	(0.19)	(1.12)	(1.10)	(0.77)	(0.89)
Sentiment$^{\perp}$**High CCI*	-1.016	-5.965***	0.122	1.095	2.493**	0.716	1.359	3.573***	-4.039***	2.055**	-2.779***	1.518***	-1.260**
	(1.06)	(4.96)	(0.13)	(0.99)	(2.43)	(0.77)	(0.80)	(3.07)	(4.64)	(2.28)	(3.56)	(2.75)	(2.08)
Observations	3239	3239	3239	3239	3239	3157	667	3128	3051	3128	3051	3128	3051
Panel B: Developing Markets													
CCI	-1.417**	-0.281	-0.793**	-0.199	-0.118	0.179	-0.894***	1.610**	0.496	1.598**	-0.290	0.012	0.786***
	(2.18)	(0.58)	(2.45)	(0.40)	(0.31)	(0.39)	(4.07)	(2.05)	(1.50)	(2.43)	(0.89)	(0.05)	(2.87)
Sentiment$^{\perp}$	-2.405	-0.601	-0.617	1.555	2.566	1.043	-0.700	9.300*	-1.804	8.206*	-3.343	1.094	1.538
	(0.76)	(0.28)	(0.38)	(0.90)	(1.46)	(0.52)	(0.30)	(1.92)	(1.28)	(1.91)	(1.63)	(1.09)	(1.12)
Sentiment$^{\perp}$**High CCI*	1.210	7.720***	-0.433	-2.144	-2.939**	3.017	3.389*	-10.831**	-0.105	-8.953**	0.386	-1.878	-0.491
	(0.32)	(3.93)	(0.31)	(1.16)	(2.10)	(1.48)	(1.70)	(2.23)	(0.07)	(2.40)	(0.29)	(1.12)	(0.34)
Observations	713	713	713	713	713	687	109	687	675	687	675	687	675

Table 9. Time Series Regressions of Portfolio Returns on Orthogonalized Sentiment Index and the Impact of Global Integration

For periods of high sentiment, we run regressions of long-short portfolio returns (measured over 26 weeks) on the lagged three-month average orthogonalized sentiment index (*Sentiment*$^{\perp}$), the interaction between the orthogonalized sentiment index and a mediating factor for integration, the contemporaneous local and US market risk premia (*MKT*), the contemporaneous local and US Fama-French factors (*SMB and HML*) and the contemporaneous local and US momentum factor (*MOM*). Market dummies are also included. Overlapping weekly observations are employed. The three mediating factors are *Euro*, *Open1*, and *Open2*. *Euro* is a dummy that takes a value of unity on and after the establishment of the conversion between the Euro and the local currency, and zero otherwise. *Open1* is the combined FDI and portfolio inflow over GDP. *Open2* is equity investment by foreigners scaled by GDP. The estimated coefficients of control variables are not reported for brevity. The table reports the estimated coefficients on Sentiment$^{\perp}$ and Sentiment$^{\perp}$ interacting with proxies for global integration, their corresponding t-statistics (in parentheses) based on robust standard errors, and the number of observations. The sample is described in Appendix A. The long-short portfolios are formed based on firm characteristics: firm size (*ME*), total risk (σ), earnings1 (operating income/assets), earnings2 (net income/assets), dividends (dividends/price), fixed assets (*PPE*/assets), research and development (*RD*/assets), book-to-market ratio (*BE/ME*), and sales growth (*SG*). High, H, (Medium, M) [Low, L] is defined as a firm in the top (middle) [bottom] 1/3 in its stock market. Equally-weighted average weekly returns are matched to the *Sentiment*$^{\perp}$ index that prevailed at the end of the prior week. *Sentiment*$^{\perp}$ index is based on six sentiment proxies that have been orthogonalized to growth in industrial production, the growth in durable, nondurable, services consumption, the growth in employment, and a dummy variable for NBER recessions. *SMB* (*HML*) is not included as a control variable when *BMS* (*HML*) is the dependent variable. The predicted sign of each coefficient is given in the first row (H_A). ***, **, and * indicate 1%, 5%, and 10% level of significance, respectively.

	Size and Risk		Profitability, Dividends			Tangibility		Growth Opportunities and Distress		Growth Opportunities		Distress	
	ME	σ	Earnings1	Earnings2	Dividends	PPE/A	RD/A	BE/ME	SG	BE/ME	SG	BE/ME	SG
	B-S	H-L	>0 - <0	>0 - <0	>0 - =0	H-L	H-L	H-L	H-L	M-L	H-M	H-M	M-L
Prediction H_A:	+	-	+	+	+	+	-	+	-	+	-	-	+
Panel A: Creation of the Euro (European Markets only)													
Sentiment$^{\perp}$	0.973	0.944	1.109	1.847	-3.285	0.887	-3.786*	7.746*	-7.395*	2.340	2.517	5.405**	-9.912***
	(0.60)	(0.35)	(0.58)	(0.89)	(1.62)	(0.22)	(1.78)	(1.77)	(1.74)	(0.66)	(0.62)	(2.19)	(4.13)
Sentiment$^{\perp}$*Euro	0.846	-7.507***	3.200*	4.065**	4.588***	3.503	0.000	-4.285	2.010	-0.618	-4.753	-3.667*	6.763***
	(0.60)	(3.27)	(1.92)	(2.21)	(2.70)	(1.04)	(.)	(1.12)	(0.57)	(0.20)	(1.40)	(1.71)	(3.37)
Observations	1259	1259	1259	1259	1259	1202	109	1173	1149	1173	1149	1173	1149
Panel B: Combined FDI and Portfolio Inflow over GDP (Developed Markets only)													
Sentiment$^{\perp}$	3.016***	-4.976***	3.974***	3.403***	2.076***	2.602***	-4.184**	2.993***	-1.804**	2.585***	-2.100***	0.408	0.296
	(3.08)	(4.18)	(5.17)	(4.07)	(2.60)	(3.07)	(2.09)	(3.01)	(1.97)	(3.18)	(3.14)	(0.85)	(0.51)
Sentiment$^{\perp}$*Open1	-1.457	-2.054	-4.867**	1.076	-0.854	1.727	60.803	0.754	-4.676**	-0.398	-0.509	1.152	-4.166***
	(0.82)	(0.74)	(2.47)	(0.46)	(0.31)	(0.81)	(0.65)	(0.23)	(2.36)	(0.19)	(0.26)	(0.60)	(3.19)
Observations	3782	3782	3770	3770	3765	3675	687	3646	3519	3646	3519	3646	3519
Panel C: Equity Securities Liabilities over GDP (Developed Markets only)													
Sentiment$^{\perp}$	3.245***	-4.811***	4.010***	3.495***	2.251***	2.547***	-4.179**	2.800***	-1.741*	2.624***	-1.950***	0.176	0.209
	(3.21)	(4.02)	(5.14)	(4.10)	(2.77)	(3.00)	(2.10)	(2.80)	(1.86)	(3.21)	(2.81)	(0.37)	(0.36)
Sentiment$^{\perp}$*Open2	-34.260	-34.018*	-29.546*	-8.663	-21.311	10.275	-103.513	23.404	-33.599*	-4.569	-17.474	27.972***	-16.124
	(1.42)	(1.91)	(1.81)	(0.44)	(1.35)	(0.71)	(1.55)	(1.28)	(1.92)	(0.31)	(1.23)	(3.36)	(1.64)
Observations	3727	3727	3715	3715	3710	3620	687	3591	3464	3591	3464	3591	3464

Table 10. Time Series Regressions of Portfolio Returns on Orthogonalized US Sentiment Index and "Globalness" of Local Portfolios

For periods of high sentiment, we run regressions of long-short portfolio returns (measured over 26 weeks) on the lagged three-month average orthogonalized sentiment index (*Sentiment*$^{\perp}$), its interaction with "globalness" of local portfolios, the contemporaneous local and US market risk premia (*MKT*), and the contemporaneous local and US Fama-French factors (*SMB and HML*) and the contemporaneous local and US momentum factor (*MOM*). "Globalness" is measured by the correlation between the local portfolio and the US counterpart using weekly returns in the past year. Market dummies are also included. Overlapping weekly observations are employed. The estimated coefficients of control variables are not reported for brevity. The table reports the estimated coefficients on Sentiment$^{\perp}$ and the interaction term, and the corresponding t-statistics (in parentheses) based on robust standard errors, and the number of observations. The sample is described in Appendix A. The long-short portfolios are formed based on firm characteristics: firm size (*ME*), total risk (σ), earnings1 (operating income/assets), earnings2 (net income/assets), dividends (dividends/price), fixed assets (*PPE*/assets), research and development (*RD*/assets), book-to-market ratio (*BE/ME*), and sales growth (*SG*). High, H, (Medium, M) [Low, L] is defined as a firm in the top (middle) [bottom] 1/3 in its stock market. Equally-weighted average weekly returns are matched to the *Sentiment*$^{\perp}$ index that prevailed at the end of the prior week. *Sentiment*$^{\perp}$ index is based on six sentiment proxies that have been orthogonalized to growth in industrial production, the growth in durable, nondurable, services consumption, the growth in employment, and a dummy variable for NBER recessions. *SMB* (*HML*) is not included as a control variable when *BMS* (*HML*) is the dependent variable. The predicted sign of each coefficient is given in the first row (H_A). ***, **, and * indicate 1%, 5%, and 10% level of significance, respectively.

	Size and Risk		Profitability, Dividends			Tangibility		Growth Opportunities and Distress		Growth Opportunities		Distress	
	ME	σ	Earnings1	Earnings2	Dividends	PPE/A	RD/A	BE/ME	SG	BE/ME	SG	BE/ME	SG
	B-S	H-L	>0 - <0	>0 - <0	>0 - =0	H-L	H-L	H-L	H-L	M-L	H-M	H-M	M-L
Prediction H_A:	+	-	+	+	+	+	-	+	-	+	-	-	+
Panel A: Developed Markets													
Sentiment$^{\perp}$	1.688	2.145	2.516**	0.588	-0.653	-1.169	2.964	-0.202	1.177*	-0.662	1.275*	0.833*	-0.433
	(1.61)	(1.46)	(2.57)	(0.37)	(0.59)	(1.54)	(0.56)	(0.17)	(1.65)	(0.71)	(1.68)	(1.82)	(0.88)
Sentiment$^{\perp}$**Globalness*	4.891**	-14.891***	4.414***	6.645***	7.155***	9.540***	-9.693	7.543***	-9.159***	7.177***	-7.743***	-2.529*	5.136***
	(2.26)	(7.11)	(2.72)	(2.69)	(4.40)	(8.25)	(1.49)	(4.02)	(6.27)	(5.18)	(5.91)	(1.71)	(4.01)
Observations	4011	4011	3997	3997	3992	3900	685	3873	3737	3873	3737	3873	3737
Panel B: Developing Markets													
Sentiment$^{\perp}$	-1.700	-1.204	1.185	1.629	0.218	2.270**	0.551	1.555	-1.246	1.883	-1.073	0.359	1.186
	(0.98)	(0.52)	(1.09)	(1.39)	(0.22)	(2.11)	(0.32)	(0.82)	(1.01)	(0.80)	(0.89)	(0.33)	(1.00)
Sentiment$^{\perp}$**Globalness*	14.922**	-0.830	11.298***	0.452	3.221	-0.503	-7.478	6.027	1.731	0.202	-6.312*	5.424	-2.044
	(2.38)	(0.17)	(3.49)	(0.15)	(1.16)	(0.17)	(0.79)	(1.51)	(0.43)	(0.03)	(1.94)	(1.54)	(0.58)
Observations	1919	1919	1919	1919	1902	1865	440	1860	1747	1860	1747	1860	1747