

# **Fundamental analysis and stock returns in international equity markets**

Chi Cheong Allen Ng  
The Hong Kong Polytechnic University  
Hung Hom, Hong Kong  
afallen@polyu.edu.hk

Jianfu Shen  
Hang Seng Management College  
Siu Lek Yuen, Shatin  
Hong Kong  
jeffshen@hsmc.edu.hk

S. Ghon Rhee  
University of Hawaii  
Honolulu, HI, USA  
rheesg@hawaii.edu

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## **Abstract**

This paper investigates whether a simple fundamental analysis strategy yields significant returns to investors in 65 international equity markets. Financial strength signal, FSCORE proposed by Piotroski (2000), can distinguish winners from losers in overall stocks, glamour stocks and value stocks in most of these markets. The strategy by long value stocks with strong fundamental and short glamour stocks with weak fundamental can generate significantly positive return in 41 out of 65 markets. The profitability is still significant after controlling firm size, asset growth (or investment), profitability and momentum factors. Our results suggest that the anomaly by the fundamental analysis strategy can be explained by the hypothesis of the limits to arbitrage. The abnormal return is larger in the market if it is more difficult to arbitrage.

JEL Classifications: G12; G14; M41

Key Words: FSCORE, book-to-market, international stock markets, mispricing, limits to arbitrage

## **1. Introduction**

The fundamental analysis has been used by the proponents of value investing to identify undervalued stocks and capture the opportunities of market mispricing since Graham and Dodd (1934). The value investors believe that stock market price often deviates from the intrinsic value of a company in a short run and correct to the fundamental in the long run. The intrinsic value can be estimated from the financial statement data. A large number of studies (Ou and Penman, 1989; Lev and Thiagarajan, 1993; Abarbanell and Bushee, 1997) demonstrate that the financial statement variables are useful to predict future stock returns by comparing the fundamental value to market price, i.e., earnings to price ratio, cash flow to price ratio, sales to price ratio, dividend yield and book to market (BM) ratio (e.g., Fama and French, 1992; Frankel and Lee, 1998; Hou, Karolyi and Kho, 2011). Some studies propose one summary measure from multiple fundamental-based signals and investigate the predictive ability of the summary measure about subsequent stock returns (Piotroski, 2000; Mohanram, 2005). The empirical evidences support that the implementations of fundamental analysis yield significant abnormal returns in US market; however, the relevant studies are scarce in international markets.

This study explores the fundamental analysis strategy in the international markets. It has two objectives. The first objective of this paper is to examine the profitability of fundamental analysis strategy in stock markets outside of US. We aim to document whether the fundamental analysis is applicable to different markets in the world. The second objective is to explain the abnormal returns (if have) related to fundamental analysis in the markets with great variations of country characteristics. Risk-based

explanation argues that the abnormal return compensates for the systematic risk such as distress risk in a firm (Fama and French, 1993). The alternative explanation is that the abnormal return is earned due to the market mispricing. The mispricing explanation argues that the financial statement information, although it is public, is slow to be incorporated in the market. The investors have limited attentions and information processing power to the financial reports (Hirshleifer and Teoh, 2003; Hirshleifer, Lim and Teoh, 2009), and thus they underreact to the accounting information and cannot perform comprehensive fundamental analysis (Sloan, 1996; Abarbanell and Bushee, 1997). Behavioral theory also suggests that naïve investors are systematically pessimistic (optimistic) about the future performances of value (glamour) stocks (Lakonishok et al., 1994), even that financial signals from current financial statement indicate improvement (deterioration) on the fundamentals (Piotroski and So, 2012).

Among many fundamental analysis strategies in the academia, of particular interest in this paper is the FSCORE strategy created by Piotroski (2000)<sup>1</sup>. The FSCORE is a summary measure of nine accounting-based signals, including the measures in profitability, leverage, liquidity and source of fund, and operating efficiency. High (low) FSCORE indicates strong (weak) fundamental in a firm. Piotroski (2000) finds that the financial strength measured by FSCORE can distinguish winners from losers in the value (or high book to market) stocks. The strategy to buy value stocks with strong

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<sup>1</sup> We choose FSCORE instead of other fundamental measures for two major reasons. First, the construction of FSCORE is based on some usual items of accounting data, which are available in financial statements in international markets. Other measures in Ou and Penman (1989), Lev and Thiagarajan (1993) and Mohanram (2005) require data such as R&D, advertising, effective tax rate, order backlog, inventory method and audit qualification. These data are available in Compustat for US firms but may not be comprehensive for global companies. Second, previous studies have documented that the FSCORE can systematically screen winners from losers in fifteen European stock markets (Walkshausl, 2016), seven Asian markets (Ng and Shen, 2016) and Australia (Hyde, 2016). We extend the application of FSCORE as fundamental analysis strategy in most of stock markets in the world.

fundamental<sup>2</sup> or the combination of long financially strong value stocks and short financially weak value stocks yield significantly positive abnormal return. Piotroski and So (2012) show that FSCORE can systematically screen winners from losers in all stocks sorted by BM. Investors underreact to the deteriorations of financial strength in glamour stocks and the improvements of fundamentals in value stock. The market mispricing concentrates in the two contrarian portfolios, i.e. high FSCORE value firms and low FSCORE glamour firms. The most profitable strategy is to buy the high FSCORE value (underpriced) stocks and sell the low FSCORE glamour (overpriced) stocks. We examine the applications of these FSCORE strategies in the international markets.

We then investigate the explanatory powers of both risk-based and mispricing hypotheses on the returns from fundamental analysis strategy in the international markets. If the returns just compensate for the risks embedded in the fundamental analysis strategy, they should be explained by the popular Fama and French risk factors, such as firm size, profitability, investment and momentum. On the other hand, if the fundamental strategy returns are attributed to market mispricing, the profitability should be more prominent in the markets that are costly to arbitrage and correct the mispricing (Shleifer and Vishny, 1997). We measure the effect of limits to arbitrage by several variables at country level, including the average number of institutional investors, the average institutional ownership, the average number of analysts, the average idiosyncratic volatility, and the average cash flow volatility (Lam and Wei, 2011; Watanabe et al., 2013; Yan and Zheng,

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<sup>2</sup> The idea to choose stocks with high BM and high FSCORE is consistent with value investing and Graham's stock screen criteria (Graham and Dodd, 1934). Lee (2014) groups the Graham's ten criteria into two categories: the cheapness and the quality of the stocks. The FSCORE strategy in Piotroski (2000) is similar Graham's strategy, which is to buy quality companies (high FSCORE) at relatively low price (high BM).

2017). Our international market data provide new evidence to the effect of limits to arbitrage on mispricing across countries.

Using the sample of 65 countries/markets from 1991 to 2016, we document that FSCORE as a simple fundamental analysis strategy can successfully screen winners from losers in most of these markets. First, the portfolio of stocks with high FSCORE significantly outperforms the portfolio with low FSCORE stocks in the both equal-weighted and value-weighted portfolio returns. When the stocks are pooled across 65 markets and sorted by FSCORE, the portfolio of high FSCORE earns 1.10% monthly return and outperforms the low FSCORE stocks by a significant 0.82% on a monthly basis. The results show that the simple fundamental analysis strategy can be effectively implemented in the international markets.

Second, we find that the fundamental analysis signal FSCORE systematically screens subsequent winners from losers in the portfolios sorted by BM across different markets. High FSCORE stocks significantly outperform low FSCORE stocks in both value and glamour portfolios in the international markets, similar to the findings of Piotroski and So (2012) in US market. The spreads in equal-weighted method between high FSCORE and low FSCORE stocks are positive and significant in 40 countries in glamour portfolios and in 27 countries in value portfolios. The strategy to long high FSCORE value stocks and short low FSCORE glamour stocks yield significantly positive return in 44 out of 65 countries. We also form the value and glamour portfolios at global level. The high FSCORE stocks significantly outperform low FSCORE stocks by a 1.01% in glamour portfolio and a 0.72% in value portfolio in each month in the following year.

The long-short strategy in two extreme portfolios yields a significant return of 1.30% per month.

Third, we show that the abnormal returns in the fundamental analysis strategy cannot be fully explained by the traditional risk factors. In the monthly cross-sectional regressions, the differential returns between low FSCORE stocks and high FSCORE stocks in glamour portfolios are significantly negative, and the spreads between high FSCORE and low FSCORE are significantly negative in some countries, after controlling for firm size, asset growth, operating profitability and momentum. We also conduct the time-series regressions to estimate Fam-French five-factor alpha in the portfolios in global market, European market, Asia-Pacific market, US market and Japanese market. We find that the equal-weighted alphas are generally positive and significant in the strategies of long high FSCORE stocks, long high FSCORE stocks and short low FSCORE stocks, long high FSCORE value stocks, and the combination of long high FSCORE value stocks and short low FSCORE glamour stocks. The portfolios with low FSCORE stocks are generally yield negative alphas. Yet the alphas by value-weighted method in these markets are generally not significant. In sum, our findings show that the abnormal returns related to fundamental analysis strategy cannot be fully attributed to the risk factors.

Fourth, our evidences support the arguments of market mispricing and limits to arbitrage. We conduct cross-country analysis by examining the effects of limits to arbitrage on the fundamental analysis strategies. We find that the returns on long high FSCORE stocks, short low FSCORE stocks or the combination of long and short strategies are smaller in a country if the number of institutional investors, the institutional

ownership and the number of analysts are large; and while the strategies are more profitable if the idiosyncratic volatility and cash flow volatility in a market are large. Our findings are consistent with Yan and Zheng (2017) that fundamental anomaly is caused by the mispricing, that is, the market fails to fully and timely incorporate the fundamental signals into stock price.

This paper contributes to the literature in two major aspects. First, we apply the accounting-based fundamental analysis strategy to 65 markets in the world and document that the fundamental signals can predict subsequent stock returns in most of these markets. Our study adds to a growing literature on international evidence on the stock market anomalies (McLean, Pontiff and Watanabe, 2009; Chui, Titman and Wei, 2010; Hou, Karolyi and Kho, 2011; Watanabe et al., 2013). Second, the cross-country setting in this paper allows us to test two distinct explanations for the fundamental anomaly. Unlike the studies focusing on US market, we can measure the variety in the measures of market efficiency/inefficiency in different countries. Our cross-country analysis provides supplementary evidence on the economic cause of the stock anomaly to the US studies (e.g., Cooper, Gulen and Schill, 2008; Yan and Zheng, 2017).

The rest of the paper is organized as follows. Section 2 describes the data, sample and variables. Section 3 presents the returns to the fundamental analysis strategy. Section 4 tests whether the returns can be explained by the risk factors. Section 4 examines the effects of limits to arbitrage on the fundamental anomaly. The last section concludes this study.



## 2. Sample, Variables and Methodology

### 2.1 Data and sample

Our sample construction starts with all available equities (dead and alive) from Datastream (Instrument Type = “Equity”)<sup>3</sup>. The primary stocks in the major exchanges of each country are included. The firms in financial industry are further removed from the sample following previous studies (Fama and French, 1993; Hou et al., 2011). There are totally 108 markets/countries in Datastream that have stock data in the period from July 1991 to June 2016; however, some countries only have very few stocks in each year. To make sure that we have sufficient number of stocks to construct portfolios by FSCORE, we require that within each year, each market should have more than 30 stocks in the sample with financial statement and stock return data (Watanabe et al., 2013). After these sampling criteria, we obtain the final sample with 65 markets. Table 1 reports the country name, the start month, end month and the number of firms in each country in the sample. The data for developed countries generally start from July 1991. Some countries have shorter sample period as they do not meet the criteria above before the start date. US market has the largest number of firms per year in the sample. Three countries, Bangladesh, Kenya and Tunisia, have the numbers of firms per year less than 50.

[Insert Table 1 here]

We calculate the monthly stock returns (with the inclusions of dividend payments) in both local currency and US dollar, based on the return index (RI) in the Datastream. To avoid the coding error in Datastream, we clean the data of stock return by the procedure in Ince and Porter (2006) and Watanabe et al. (2013): (1) treat stock return as missing if

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<sup>3</sup> We exclude the securities such as American Depositary Receipts, ETF, Investment Trust, Preference Share, Closed-end Fund, Global Depositary Receipts and Warrant.

the return is above 300% and reversed in one month; (2) trim the samples of stock returns in each market at top and bottom 1%; and (3) treat stock return as missing after the month that a firm is delisted<sup>4</sup>.

The fundamental signal, FSCORE, is calculated based on the financial statement data from Worldscope, following the methods in Piotroski (2000) and Fama and French (2006). FSCORE is constructed annually from nine indicator variables, including positive return on asset (F\_ROA), positive cash flow from operation (F\_CFO), increase in return on asset (F\_ΔROA), cash flow from operation greater than net income (F\_ACCURAL), decrease in debt ratio (F\_ΔLEVER), increase in liquid ratio (F\_ΔLIQUID), no equity issuance (EQ\_OFFER), increase in gross margin (F\_ΔMARGIN), and increase in asset turnover ratio (F\_ΔTURN). An indicator variable is equal to 1 if there is an improving signal in the measure each year. FSCORE is the sum of these binary signals. Following Piotroski and So (2012), the stocks are assigned as low FSCORE firm if they have deteriorations in the financial strength and receive poor scores ( $FSCORE < 4$ ); and high FSCORE firms are those with strong improvements in the fundamental and receiving high score ( $FSCORE > 6$ ). We use FSCORE calculated at the end of fiscal year  $t-1$  to construct portfolios from the end of June of year  $t$ . The portfolios are rebalanced annually. Table 1 shows that the average FSCORE ranges 3 to 5 out of 9 across the countries. In the overall sample, 21.98% of stocks are belonged to high FSCORE firm and 21.02% are low FSCORE firm.

The strategies in Piotroski (2000) and Piotroski and So (2012) are to create portfolios by both FSCORE and book to market ratio. Following their strategies, we

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<sup>4</sup> We use the delisted price to calculate the stock return in the delisted month. The results are similar if the delisted return is set to be -30%.

double sort the stocks in our sample by FSCORE and BM independently. The variable BM is the ratio of book value of common equity over the market value of common equity at the end of fiscal year<sup>5</sup>. The firms are classified into the groups of “value stock” and “glamour stock” annually if their BM ratios are in the top 30% and bottom 30% of the distribution in each market. The portfolios are formed at the end of June of year  $t$  according to the FSCORE and BM in year  $t-1$ . The returns are computed from July of year  $t$  to June of year  $t+1$ . The average BM in the overall sample is 1.01, shown in the Table 1.

We measure several firm characteristic variables from the data in Datastream and Worldscope. Firm size is the natural logarithm of market capitalization at the end of June of year  $t$ . Asset growth is the change in total assets from fiscal year  $t-2$  to  $t-1$  (Cooper, Gulen and Schill, 2008; Watanabe et al., 2013). Operating profitability is the revenue minus the sum of cost of goods sold, selling, general and administrative expenses and interest expense, scaled by book value of equity at the end of fiscal year  $t-1$  (Fama and French, 2015). Momentum is cumulative stock return from Jan to May in year  $t$  (Watanabe et al., 2013). We also obtain the Fama-French five factors from Kenneth French’s data library for different markets, including global developed markets, global developed markets excluding US, European markets, Asia Pacific markets, US and Japan.

We use five variables to measure the limits to arbitrage in each market<sup>6</sup>: the number of institutional investors, the institutional ownership, the number of analysts,

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<sup>5</sup> The results are not essentially changed if the BM is measured as the book value of equity scaled by the market value of equity at the end of December.

<sup>6</sup> The variables of the number of institutional investors and the institutional ownership measure the investor sophistication in a market. The variables of analyst coverage and cash flow volatility measure the information uncertainty. The idiosyncratic stock return volatility measures arbitrage risk. It is more difficult to arbitrage if there are fewer sophisticated investors, less analyst coverage, more information uncertainty and higher arbitrage risk in a market.

idiosyncratic volatility, and cash flow volatility (Lam and Wei, 2011; Yan and Zheng, 2017). The number of institutional investors is the total institutional investors who hold the stocks of a firm, and the institutional ownership is the percentage of institutional holdings in shares outstanding in a firm, which are both obtained from FactSet in the June of year  $t$  for 45 countries from 2000 to 2016 (Ferreira and Matos, 2008); the number of analysts is the total analyst covering the firm in the June of year  $t$ , which are from IBES for 62 countries since 1991; idiosyncratic volatility in the June of year  $t$  is calculated by market model based on the stock returns in previous 24 to 60 months (Bali and Cakici, 2008); and cash flow volatility is the standard deviation of the cash flow from operations in past 5 years with minimum 3 year data at the end of fiscal year  $t-1$  (Zhang, 2006). We obtain the firm-level data for these variables and then take the average values of the variables in each country (Watanabe et al., 2013). Table 1 gives the mean values of these variables in country level.

The variable definitions are contained in Appendix 1.

### **3. Empirical Results**

We examine two types of fundamental analysis strategies using FSCORE in 65 countries. We firstly estimate the monthly returns to the fundamental analysis strategy based on the FSCORE only and examine whether fundamental signal alone can predict subsequent stock returns. The studies of Piotroski (2000) and Piotroski and So (2012) show that FSCORE can systematically screen winners from losers in value stocks and glamour stocks. Our second type of fundamental strategy is to investigate the profitability of FSCORE portfolios conditional on BM sorts.

### 3.1 FSCORE strategies and stock returns: portfolio approach

In this section, we report the returns on the portfolios sorted by FSCORE alone or by both FSCORE and BM in equal-weighted method and value-weighted method<sup>7</sup>, and in local currency and US dollar. The returns are time-series average returns in the sample period and the t-statistics are calculated from the Newey and West (1987) robust standard errors. Besides the returns in each country, we also estimate the cross-country portfolio returns using a pooling approach, following Watanabe et al. (2013). The stocks across countries are pooled to form portfolio at global level, in the overall developed countries or emerging countries. Following Fama and French (2012; 2017), we also create portfolios for 23 global developed markets, developed markets excluding US, Europe and Asia Pacific markets<sup>8</sup>.

Table 2 reports the monthly returns of unconditional FSCORE strategy both in local currency and US dollar in Panels A and B, respectively. Panel A shows that out of the 65 countries, 62 have positive equal-weighted returns on high FSCORE stocks and the positive returns are significant in 43 countries. The return spreads between high FSCORE stocks and low FSCORE stocks are positive in 61 countries and also significant in 42 countries, which range from -0.36% (Egypt) to 1.96% (Croatia). In value-weighted returns, 39 countries have significantly positive returns in high FSCORE stocks, and the return spreads from long-short strategy are still positive and significant in 24 countries. The value-weighted spreads per month range from -1.16% (Ukraine) to 2.48% (United Arab Emirates).

[Insert Table 2 here]

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<sup>7</sup> The value-weighted portfolios are weighted by the market capitalization of individual stock in June of year t.

<sup>8</sup> The returns on these cross-country portfolios are in US dollars only.

Panel B of Table 2 reports the returns denominated in US dollar and across countries. The portfolio of high FSCORE firms also yields positive and significant US dollar denominated returns in most of countries. The equal-weighted return spreads in US dollar are positive and significant in 41 countries; and the value-weighted spreads are also significantly positive in 21 countries. Panel B also presents the returns to FSCORE portfolios across countries. We pool the stocks with high FSCORE or low FSCORE in different countries and form cross-country portfolios in 7 regions: all countries in our sample (65 countries), all developed countries (35 countries), all emerging countries (30 countries)<sup>9</sup>, Fama-French developed countries (23 countries), Fama-French developed countries excluding US (22 countries), Fama-French European countries (16 countries), and Fama-French Asia-Pacific countries excluding Japan (4 countries). The portfolios of high FSCORE stocks in these regions all generate significantly positive returns in both equal-weighted method and value-weighted method. The equal-weighted spread between high FSCORE stocks and low FSCORE stocks across all countries is 0.82% per month ( $t=5.60$ ), and the largest spread is from the long-short strategy in the Fama-French European countries (1.42%;  $t=9.81$ ). The value-weighted spreads are also positive and mostly significant in 7 cross-country regions. In the 23 developed countries defined by Fama and French (2012), the returns on high FSCORE stocks and the long-short portfolios are significant regardless of whether the US is excluded or not.

In sum, these results suggest that FSCORE, as a simple fundamental analysis strategy, successfully screen winners from losers in global equity markets. The firms with strong improvements on fundamentals outperform those with deteriorations on

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<sup>9</sup> We group the countries into developed and emerging categories using the World Bank 2016 classifications.

fundamentals in subsequent periods. The simple strategy is robust in the international markets outside the US.

Table 3 reports the portfolio returns from FSCORE strategy conditional on book to market in each country and across countries. Piotroski and So (2012) argue that the returns in the FSCORE strategies concentrate in the two extreme portfolios, i.e., high FSCORE value stocks and low FSCORE glamour stocks. Following their study, we focus on these two portfolios and construct a hedge portfolio by long high FSCORE value stocks and short low FSCORE glamour stocks. We present the returns of value/glamour firms with high/low FSCORE and the long-short strategies among portfolios with high FSCORE stocks and low FSCORE stocks.

[Insert Table 3 here]

Panel A of Table 3 reports the equal-weighted portfolio returns in local currency in each country. In glamour firms, high FSCORE stocks outperform low FSCORE stocks in 61 countries and the return spreads are significant in 40 countries. The FSCORE's ability to screen winners from losers is also significant in value firms, which the spreads are positive in 55 countries. The hedged portfolio, which is long high FSCORE value stocks and short low FSCORE glamour stocks, yields monthly returns ranging from -0.43% (Kuwait) to 4.34% (Hungary). The returns are positive and significant in 44 countries. It is worth to mention that out of 21 developed countries in Europe, most have significantly positive returns on the long-short strategies in value/glamour firms and hedged portfolios, except Belgium, Czech Republic and Norway.

Panel B of Table 3 gives the value-weighted portfolio returns in local currency in each country. The results are similar to Panel A. The financial strength signal can

distinguish winners from losers in most of the countries. The value-weighted returns on hedged portfolio are positive and significant in 34 countries. Interestingly, in the US market<sup>10</sup>, FSCORE cannot screen winners from losers in value stocks and glamour stocks; and the return on the hedged portfolio is also not significant.

Panel C of Table 3 reports the equal-weighted portfolio returns in US dollar in each country and across countries<sup>11</sup>. The US dollar-denominated returns in the long-short FSCORE strategies are generally positive in value/glamour firms in each country. 41 countries have significantly positive returns on the hedged portfolio. At the global level, the high FSCORE stocks outperform low FSCORE stocks in glamour portfolios by a 1.01% per month ( $t=6.07$ ); and the differential in value portfolios is 0.72% ( $t=4.80$ ). Consistent with Piotroski and So (2012), the long-short strategy in two extreme portfolios (high FSCORE value stocks and low FSCORE glamour stocks) is the most profitable, which yields a 1.30% return ( $t=7.07$ ) across all countries in our sample. The returns on long-short strategies are all positive and significant in the portfolios formed in 7 cross-country regions, except the glamour stocks in 30 emerging countries.

Panel D of Table 3 presents the value-weighted portfolio returns in US dollar. The value-weighted returns are positive in most of countries but not as significant as equal-weighted returns. The returns on hedged portfolio are positive and significant in 32 out of 65 countries. The cross-country portfolios yield all positive returns in the long-short strategy applied in value stocks and glamour stocks. The value-weighted return from the

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<sup>10</sup> Piotroski and So (2012) only report the equal-weighted returns in the US market. Their portfolios are formed at the end of fourth month after fiscal-year end, while the portfolios in this study are constructed at the end of June in the next calendar year after fiscal-year end. The possible reason for significant equal-weighted return spreads and insignificant value-weighted return spreads in US is that the high FSCORE firms concentrate on small and medium stocks (Piotroski, 2000).

<sup>11</sup> To form cross-country portfolios, we pool all stocks in selected countries and sort them by BM, in which the firms in top (bottom) 30% of the distribution are value (glamour) stock across countries. We further form high FSCORE and low FSCORE portfolios in value firms and glamour firms, respectively.



hedged portfolio across 65 countries is 0.42% ( $t=1.86$ ), and it is also significant in the regions of emerging countries, Fama-French developed countries excluding US and Fama-French developed countries in Europe.

Overall, our results indicate that the fundamental signal can distinguish winners from losers in the portfolios sorted by BM in international equity markets. The strategy to long high FSCORE value stocks and short low FSCORE glamour stocks is also profitable in most countries and in the cross-country regions. The findings are consistent with the results of US market (Piotroski and So, 2012). The evidences on the fundamental anomaly are more obvious in equal-weighted portfolios than value-weighted portfolios.

### 3.2 Cross-sectional regression analysis on fundamental analysis returns

In this section, we explore whether the fundamental analysis returns are still robust after controlling firm characteristic variables. We employ Fama and MacBeth (1973) cross-sectional regressions of monthly stock returns on FSCORE and the firm characteristics that can predict the returns, such as firm size, book to market, asset growth, operating profitability and momentum effects (Fama and French, 1992, 2015; Carhart, 1997; Cooper, Gulen and Schill, 2008). We run the following two equations with FSCORE and other firm characteristics (Piotroski and So, 2012; Ng and Shen, 2016):

$$RET_{i,t+1} = \alpha_0 + \alpha_1 MidFSCORE_{i,t} + \alpha_2 HighFSCORE_{i,t} + \alpha_3 X_{i,t} + Country + \varepsilon_{i,t} \quad (1)$$

$$\begin{aligned}
RET_{i,t+1} = & \alpha_1 Glamour_{i,t} + \alpha_2 Glamour_{i,t} * LowFSCORE_{i,t} + \alpha_3 Glamour_{i,t} \\
& * MidFSCORE_{i,t} + \alpha_4 Middle_{i,t} + \alpha_5 Middle_{i,t} * LowFSCORE_{i,t} \\
& + \alpha_6 Middle_{i,t} * HighFSCORE_{i,t} + \alpha_7 Value_{i,t} + \alpha_8 Value_{i,t} \\
& * MidFSCORE_{i,t} + \alpha_9 Value_{i,t} * HighFSCORE_{i,t} + \alpha_{10} X_{i,t} \\
& + Country + \varepsilon_{i,t}
\end{aligned}
\tag{2}$$

The dependent variable in the two equations above is the monthly return of individual stock  $i$  denominated in US dollars from July of year  $t+1$  to June of year  $t+2$ . The variables *LowFSCORE*, *MidFSCORE* and *HighFSCORE* are dummy variables indicating which FSCORE classification ( $FSCORE \leq 3$ ,  $4 \leq FSCORE \leq 6$ , and  $FSCORE \geq 7$ ) the stock falls; the variables *Glamour*, *Middle* and *Value* are dummy variables for BM classifications (below 30%, between 30% and 70%, and above 70% of the distribution in each country). Following Piotroski and So (2012), we include the interaction term of FSCORE and BM dummies in Equation (2). The set of control variables  $X$  include book to market (BM, for Equation (1) only), firm size (*SIZE*), asset growth (*AG*), operating profitability (*OP*) and momentum (*MOM*). Following McLean, Pontiff and Watanabe (2009), Titman, Wei and Xie (2013), and Watanabe et al (2013), we use the country-pool cross-sectional regression and include the country dummies (*Country*) in the equations.

Table 4 reports the time-series averages of monthly coefficient estimates of Equation (1) using Fama and MacBeth (1993) regressions, and the t-statistics for the coefficients computed by Newey and West (1987) standard errors. We report the results for the all-country sample and subsamples of different groups of countries. In Equation (1), the coefficients on *MidFSCORE* and *HighFSCORE* give the return spreads between mid FSCORE stocks and low FSCORE stocks, and high FSCORE stocks and low FSCORE

stocks. In the all-country sample, the mid FSCORE and high FSCORE stocks outperform low FSCORE stocks by a 0.31% (t=6.25) and 0.49% (t=8.43), respectively. The return spreads are also positive and significant in the subsamples of developed countries, emerging countries, 23 developed countries, 22 developed countries (excluding US), 16 European developed countries and 4 Asia Pacific developed countries. The return spread between high FSCORE and low FSCORE stocks is the largest in the Europe sample (0.78%; t=9.24); and the estimated coefficient on the spread is larger in the Fama-French developed countries when the US firms are excluded (0.62%) than the sample with US (0.49%). The results are consistent with the analysis of portfolio returns sorted by FSCORE in Table 2.

[Insert Table 4 here]

Table 5 presents the coefficient estimates of cross-sectional regression model of Equation (2)<sup>12</sup>. The coefficients *Glamour*, *Middle* and *Value* capture the returns on three base portfolios, high FSCORE glamour stocks, mid FSCORE middle stocks and low FSCORE value stocks. The interaction terms give the return spreads between other portfolios and the base portfolios. The estimated coefficients on *Glamour\*LowFSCORE*, which captures the return spread of low FSCORE glamour stocks and high FSCORE glamour stocks, are all negative and significant in the full sample and subsamples except emerging markets. In all-country sample, the low FSCORE stocks underperform high FSCORE stocks in glamour firms by a -0.53% (t=-8.70) return per month. The coefficients on *Value\*HighFSCORE*, measuring the return differential between high FSCORE value stocks and low FSCORE value stocks, are all positive and significant. In

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<sup>12</sup> The intercept term in Equation (2) is suppressed as we include all three dummy variables for BM classifications.

all-country sample, the high FSCORE value stocks significantly outperform low FSCORE value stocks with a magnitude of 0.43% (t=6.72) each month. We also report the return on hedge portfolio (long high FSCORE value stocks and short low FSCORE glamour stocks)<sup>13</sup>. The returns are significantly positive, which range from 0.87% in 23 developed countries to 1.31% in 4 Asia Pacific developed countries. Consistent with the analysis in Table 4, the fundamental strength has predictive abilities of subsequent stock returns in glamour firms and value firms in the international equity markets. The long-short strategy using two extreme portfolios (hedge portfolio) yield more returns than the long-short strategies in glamour firms or value firms only.

[Insert Table 5 here]

In sum, the cross-section regression results suggest that the fundamental analysis returns are robust to controlling for book to market, firm size, asset growth, operating profitability and momentum. Our international evidences are consistent with the results in US market (Piotroski, 2000; Piotroski and So, 2012); while we show that the FSCORE can be solely used to screen winners from losers in the stock markets, the FSCORE portfolios conditional on BM yields higher returns. The fundamental analysis strategy is more profitable in the developed countries outside US.

### 3.3 Time-series regression analysis on fundamental analysis returns

We use the time-series regressions to explore whether the portfolio returns in the FSCORE strategies can be explained by Fama-French risk factors (Fama and French, 1993; 2015). In their recent studies, Fama and French (2015; 2017) estimate five factor returns for US and international developed markets in four regions, including North

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<sup>13</sup> The hedge portfolio return is estimated by the coefficients as  $\alpha_7 + \alpha_9 - \alpha_1 - \alpha_2$ .

America, Europe, Japan and Asia Pacific. Using these factor returns, we estimate the alphas of FSCORE strategies in these regions by running the following regression in each region:

$$RETRF_{j,t} = \alpha_0 + \alpha_1MKT_t + \alpha_2SMB_t + \alpha_3HML_t + \alpha_4RMW_t + \alpha_3CMA_t + \varepsilon_{j,t} \quad (3)$$

The dependent variable in Equation (3) is the monthly excess return on the portfolios by FSCORE strategies in the market/region  $j$ . The excess return is defined as portfolio return minus one month US T-bill rate. Following Fama and French (2012; 2017), we construct portfolios<sup>14</sup> in global developed markets (23 countries), global developed markets excluding US (22 countries), European markets (16 countries), Asia Pacific markets (4 countries), US and Japan. The risk factor returns for these markets/regions, including market (MKT), size (SMB), value (HML), profitability (RMW) and investment (CMA), are obtained from Kenneth French's website. Table 6 reports the five-factor alphas and the corresponding t statistics based on Newey and West (1987) standard errors.

[Insert Table 6 here]

Panel A of Table 6 reports the alphas estimated from the equal-weighted portfolio returns. The alphas on the high FSCORE stocks are all positive and significant in seven regions, and the alphas on the low FSCORE stocks are all negative and significant except the portfolio in the US market. The strategy that buys strong fundamental stocks and sells weak fundamental stocks yields positive alphas in six regions, ranging from 0.35% (t=3.61) in Japan to 0.98% (t=6.35) in Europe. The fundamental strength signal can also screen winners from losers in both glamour stocks and value stocks, which is reflected in

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<sup>14</sup> The portfolio construction approach for cross-country portfolios is described in section 3.1.

the positive and significant alphas of long-short strategies in the regions except the US. The results are consistent with Piotroski and So (2012) that the low FSCORE glamour stocks and high FSCORE value stocks are likely to be mispriced as the fundamental signals are slow to be incorporated into the stock price. The alphas of low FSCORE glamour stocks are all negative in seven regions and significant except the US; and the high FSCORE value stocks give positive alphas in all the regions. The alphas from hedge portfolio are also positive and significant in all regions except the US. The largest alphas come from Asia Pacific (1.26%;  $t=4.50$ ) and Europe (1.19%;  $t=7.85$ ).

Table B reports the alphas from value-weighted returns. The value-weighted portfolios of high FSCORE stocks yield positive alphas in the seven regions but only significant in the regions of 23 developed countries, 22 developed countries (excluding US) and Japan. The alphas from the long-short strategies are generally not significant in glamour firms, value firms or hedge portfolios. The hedge portfolio in Japan market gives significantly positive alpha (0.48%;  $t=1.93$ ), while the hedge portfolio in US market yields significantly negative alpha.

Overall, the time-series regression analysis provides contradicting evidences on whether the fundamental analysis returns are attributed to conventional risk factors. The equal-weighted portfolio returns based on FSCORE cannot be explained by the risk factors in the international developed markets, except the US. The alphas are very significant in high FSCORE stocks, low FSCORE stocks and the portfolios of long high FSCORE stocks and short low FSCORE stocks. In contrast, the alphas are generally not significant in the value-weighted portfolios. We conclude that Fama-French factors

cannot fully explain the superior performance of FSCORE strategies in the international equity markets of developed countries.

### 3.4 The tests of limits to arbitrage hypothesis

In this section, we turn to examine the mispricing explanation on the fundamental analysis returns. The mispricing explanation argues that the fundamental signals are gradually be incorporated into the stock prices (Piotroski and So, 2012; Choi and Sais, 2012): high FSCORE firms, especially those in value stocks, tend to be underpriced as the improvements of fundamentals are slow to be impounded in the market, while low FSCORE firms (and those in glamour stocks) are overpriced because investors underreact to the deteriorations in fundamentals. The hypothesis of limits to arbitrage indicates that the fundamental anomaly is larger in the market that is more difficult to arbitrage (Shleifer and Vishny, 1998; Lam and Wei, 2011; Yan and Zheng, 2017). We use two approaches to test the mispricing explanation. The first is country-level analysis based on the portfolio returns to fundamental analysis strategy in each country. Following LaPorta et al. (1997), Djankov, McLiesh and Shleifer (2007), Watanabe et al. (2013) and others, we run the cross-country regression as:

$$RET_{j,t+1} = \alpha_0 + \alpha_1 Arbitrage_{j,t/t+1} + Country + Year\_month + \varepsilon_{j,t} \quad (4)$$

The dependent variable is the monthly portfolio return of FSCORE strategies in country  $j$  from July of year  $t+1$  to June of year  $t+2$ . The limits to arbitrage (*Arbitrage*) are measured in each country annually with five measures: the number of institutional investors (*INS\_NUM*), institutional ownership (*IO*), the number of analysts (*ANA\_NUM*), idiosyncratic stock return volatility (*IVOL*) and cash flow volatility

(CFVOL)<sup>15</sup>. We also include the country and firm-month fixed effects in the regressions.

Table 7 reports the estimated coefficients on the variables of limits of arbitrage. In Panel A, the dependent variable is the portfolio return of long high FSCORE stocks and short low FSCORE stocks in each country. The coefficients on the number of institutional investors and institutional ownership are negative and significant at least at 5% level in the regressions by equal-weighted returns and value-weighted returns. The findings are consistent with the hypothesis of limits to arbitrage that the mispricing is less severe and the fundamental anomaly is less in a market with more sophisticated investors (Yan and Zheng, 2017).

[Insert Table 7 here]

In Panel B, the dependent variable is the portfolio return from the hedge portfolio, i.e., long high FSCORE value stocks and short low FSCORE glamour stocks. The regressions yield significantly positive slopes on the number of institutional investors, institutional ownership and the number of analysts, and significantly negative slopes on idiosyncratic volatility and cash flow volatility: in the regressions of equal-weighted returns, an increase of one institutional investor on average at the country level leads to a decrease of 0.03% return per month in the hedge portfolio return; if the within-country average of institutional ownership on individual stocks increases by 1% in a country, the portfolio return decreases by 0.14% each month; an increase of one financial analyst covered on the stocks in a country reduces the portfolio return by -0.20%; and the increases of 1% in within-country average idiosyncratic volatility and cash flow volatility increase the portfolio returns by 0.10% and 0.13%. The results are quantitatively similar

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<sup>15</sup> We calculate these measures at stock level and aggregate to country level by the mean of the measures across all stocks in a country.



in the regressions of value-weighted returns. The findings confirm the hypothesis of limits to arbitrage that the fundamental anomaly is stronger if a country has fewer sophisticated investors, less institutional ownership, smaller analyst coverage, larger idiosyncratic stock return volatility and larger cash flow volatility.

Piotroski and So (2012) indicate that mispricing is more severe in the portfolios of high FSCORE value stocks and low FSCORE glamour stocks. We examine the effects of the limits to arbitrage on the profitability of the strategies to long high FSCORE value stocks and short low FSCORE glamour stocks, respectively. In Panel C, the dependent variable is the portfolio returns from buying high FSCORE value stocks in each country. The coefficients on the number of institutional investors, institutional ownership, the number of analysts and idiosyncratic volatility are positive and the signs are consistent with the hypothesis of limits to arbitrage. Panel D presents the regression estimates using the portfolio return of selling low FSCORE glamour stocks (short selling strategy) as dependent variable. The coefficients on the three proxies of limits to arbitrage in a country, INS\_NUM, IO and CFVOL, are also significant and have signs that confirm the hypothesis of limits to arbitrage.

We further conduct firm-level analysis on the cross-country differences of limits to arbitrage and fundamental analysis returns. Following Titman, Wei and Xie (2013), we classify all countries by the distributions of the proxies of limits to arbitrage in our sample. The countries are assigned into three groups at the end of June in each year: low group (below 30%), medium group (between 30% and 70%), and high group (above 70%). We estimate the fundamental analysis returns in each group using the Equation (1) and (2).

Table 8 reports the coefficient estimates of Equation (1) in the groups based on five measures of limits to arbitrage at country level. In Panel A, the coefficients on MidFSCORE and HighFSCORE are all significant in different groups and larger in the high group of countries than the low group of countries in the classifications by the number of institutional investors, institutional ownership and the number of analysts. The differences in the HighFSOCRE coefficients are significant between high IO group and low IO group. The findings are not consistent with the hypothesis of limits to arbitrages that more sophisticated investors and analyst coverage lead to less mispricing and fundamental anomaly. Panel B shows that the coefficients of MidFSCORE and HighFSCORE are larger in the low IVOL group than in the high IVOL group, which again is inconsistent with the limits to arbitrage. The coefficients in high CFVOL group are larger than those in low CF VOL group, and the differences are significant. These are the only results that support the hypothesis of limits to arbitrage in Table 8.

[Insert Table 8 here]

Table 9 presents the coefficient estimates for the groupings based on the variables of limits to arbitrage using Equation (2). We focus on the interaction terms Glamour\*LowFSCORE and Value\*HighFSCORE, which capture the return differentials between high FSCORE stocks and low FSCORE stocks in glamour firms and value firms. We also look at the returns of hedge portfolio from the estimated coefficients. In Panel A, the magnitudes of the coefficients on Glamour\*LowFSCORE are similar in the high group and low group of countries based on the number of institutional investors and institutional ownership, and are larger in the high group than in low group of countries classified by the number of analysts. The differences are insignificant. The high group

has larger coefficients of Value\*HighFSCORE than low group and the estimated coefficients on hedge portfolio returns are similar in the two groups in three classifications. The results do not lend support to the hypothesis of limits to arbitrages. In Panel B, the high IVOL group has larger magnitudes in the coefficients of Glamour\*LowFSCORE, Value\*HighFSCORE and hedge portfolio return, which are contradicted to the predictions of the limits to arbitrage. The coefficients are not significantly different in high CFVOL group and low CFVOL group.

[Insert Table 9 here]

In sum, the cross-country analysis at portfolio level supports the mispricing explanation on the superior performance of FSCORE strategies. The fundamental anomaly is more pronounced in a market that the arbitrage cost/risk is higher, the investors are less sophisticated and the information uncertainty is more severe. However, the regression results from firm-level analysis classified by the country-level measures of limits to arbitrage do not support the mispricing explanation.

#### **4. Conclusions**

This study applies a simple fundamental analysis strategy, based on FSCORE created by Piotroski (2000), to 65 international markets. We find that high FSCORE stocks outperform low FSCORE stocks in most countries. Consistent with the evidences in the US market (Piotroski, 2000; Piotroski and So, 2012), FSCORE successfully screen winners from losers in the subsequent period in the international equity markets. Pooling all the stocks in 65 countries, the portfolio of long high FSCORE stocks and short low FSCORE stocks yields a 0.82% monthly return in subsequent one year; and the return on

the hedge portfolio that buys high FSCORE value stocks and sells low FSCORE glamour stocks is 1.30% per month. The portfolio returns in developed markets are even larger in the sample excluding US stocks.

We explore whether the fundamental anomaly can be explained by popular risk factors. The results in cross-sectional regression show that the profitability from the fundamental analysis strategy is still robust if the firm characteristics such as book to market, size, asset growth, operating profitability and momentum are controlled. We estimate the alphas for the FSCORE portfolios in seven regions using Fama-French five-factor returns. The superior performances are still significant at least in the equal-weighted portfolios.

We test the behavior argument that the returns of fundamental analyst strategy can be attributed to market mispricing. Due to the market inefficiency, fundamental anomaly is greater if the arbitrage is more likely to be limited in a market. The cross-country analysis indicates that the portfolio returns from FSCORE strategies are stronger if the investors are less sophisticated, the analysts are fewer, the arbitrage risk is higher and the information uncertainty is greater in a country. The findings support the hypothesis of limits to arbitrage and the mispricing explanations on fundamental anomaly. However, when the countries are grouped by the variables of limits to arbitrage, the firm-level regression analysis on the different groups do not support the mispricing arguments.

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Table 1: summary statistics at country level

Note: This table presents summary statistics at country level for 65 markets in our sample. It gives the starting month, ending month, the total firm-year observations, and the number of firms for each country. The columns of High FSCORE and Low FSCORE provide the percentages of firm-year observations with FSCORE larger than 6 and FSCORE less than 4 in each market. The average book to market ratio, the number of institutional investor, institutional ownership, the number of analysts, idiosyncratic volatility and cash flow volatility are also provided.

Country	Start month	End month	Firm-year obs	No. of firms	High FSCORE	Low FSCORE	Mean BM	Mean INS_NUM	Mean IO	Mean ANA_NUM	Mean IVOL	Mean CFVOL
Argentina	1997m7	2016m6	1,183	93	26.01%	17.25%	1.35			4.03	7.19%	5.79%
Australia	1991m7	2016m6	22,024	2,423	10.78%	43.65%	0.94	25.92	5.56%	5.53	11.51%	11.12%
Austria	1991m7	2016m6	1,507	130	22.69%	22.75%	0.83	50.55	9.44%	5.32	5.98%	4.97%
Bangladesh	2011m7	2016m6	206	49	31.25%	7.74%	0.40			1.02	9.48%	7.69%
Belgium	1991m7	2016m6	2,301	195	20.17%	22.72%	0.79	45.09	8.76%	6.18	5.28%	6.16%
Bosnia and Herzegovina	2009m9	2016m6	383	60	30.80%	14.03%	5.20				1.88%	4.11%
Brazil	1996m7	2016m6	2,132	227	16.66%	24.41%	1.14	57.15	10.92%	5.89	8.71%	9.54%
Bulgaria	2007m7	2016m6	1,535	181	20.19%	23.58%	4.24			1.22	7.14%	7.13%
Canada	1991m7	2016m6	29,001	3,508	9.46%	54.82%	0.96	32.62	15.99%	5.52	12.53%	11.26%
Chile	1992m7	2016m6	2,828	200	25.94%	16.19%	1.16	26.79	3.98%	3.48	5.74%	5.19%
China	1994m7	2016m6	28,384	2,865	16.71%	20.98%	0.43	22.04	5.82%	5.35	8.94%	6.23%
Colombia	2006m9	2016m6	393	53	30.12%	18.54%	1.35	18.81	2.62%	2.29	3.27%	4.31%
Croatia	2007m7	2016m6	817	97	24.86%	17.60%	1.87			2.04	5.36%	6.70%
Cyprus	2007m7	2016m6	679	90	20.48%	18.26%	3.59			2.79	9.17%	6.89%
Czech Republic	1997m7	2016m6	395	78	26.63%	14.59%	3.12	59.93	8.35%	6.76	5.66%	6.24%
Denmark	1991m7	2016m6	2,981	217	27.11%	18.94%	0.84	34.57	11.09%	5.55	7.09%	8.14%
Egypt	2004m7	2016m6	1,057	117	29.72%	13.92%	0.82	16.09	3.49%	2.66	4.30%	7.24%
Finland	1991m7	2016m6	2,467	185	27.63%	13.89%	0.78	58.39	16.02%	6.67	7.35%	5.97%
France	1991m7	2016m6	15,324	1,412	18.13%	25.69%	0.81	57.99	9.34%	7.02	7.34%	6.10%



Germany	1991m7	2016m6	14,728	1,271	19.48%	28.38%	0.74	50.13	9.92%	7.72	9.65%	8.08%
Greece	1992m7	2016m6	4,539	344	11.11%	36.65%	1.29	23.10	5.03%	4.77	11.83%	6.09%
Hong Kong	1991m7	2016m6	17,428	1,686	15.84%	23.44%	1.32	29.22	5.49%	8.39	12.32%	7.96%
Hungary	2000m7	2016m6	218	51	16.16%	19.45%	1.31	42.19	10.47%	5.75	7.72%	7.60%
India	1993m7	2016m6	23,785	2,673	20.67%	20.73%	1.67	20.07	7.13%	5.60	12.96%	7.44%
Indonesia	1992m7	2016m6	5,416	461	25.56%	14.98%	1.21	21.85	4.66%	5.80	12.44%	8.05%
Ireland	1991m7	2016m6	755	75	14.42%	26.54%	0.73	115.35	28.82%	4.37	6.83%	6.01%
Israel	1998m7	2016m6	3,365	383	19.66%	25.05%	1.00	23.22	8.28%	3.36	10.47%	6.98%
Italy	1991m7	2016m6	4,607	396	22.47%	19.31%	0.92	55.50	7.31%	7.73	6.86%	5.98%
Japan	1991m7	2016m6	74,778	4,755	25.57%	22.59%	1.13	37.30	5.09%	4.62	8.99%	4.13%
Jordan	2006m7	2016m6	1,245	143	19.34%	24.80%	1.01			1.72	7.96%	7.19%
Kenya	2007m6	2016m6	299	37	21.54%	17.32%	1.12			2.10	8.02%	6.24%
Kuwait	2005m10	2016m6	839	89	25.55%	15.65%	0.86			2.48	7.07%	7.47%
Malaysia	1991m7	2016m6	14,720	1,120	21.60%	18.13%	1.30	15.00	2.97%	7.16	10.10%	6.80%
Mexico	1993m7	2016m6	2,149	167	24.91%	15.11%	1.21	62.08	10.91%	5.66	5.77%	5.66%
Morocco	2006m7	2016m6	507	58	18.92%	23.64%	0.59	7.48	0.78%	1.61	4.26%	8.00%
Netherlands	1991m7	2016m6	3,165	246	20.81%	19.31%	0.70	115.52	21.84%	10.02	4.40%	6.45%
New Zealand	1995m7	2016m6	1,674	183	23.65%	17.58%	0.80	19.66	5.12%	4.26	6.13%	7.20%
Nigeria	2009m9	2016m6	407	83	22.30%	14.80%	0.97			2.75	3.93%	10.62%
Norway	1991m7	2016m6	3,608	407	18.73%	25.15%	0.97	31.35	13.67%	5.76	8.13%	9.22%
Oman	2006m7	2016m6	638	76	32.64%	12.59%	0.85			1.82	3.64%	7.31%
Pakistan	1993m7	2016m6	2,120	188	30.50%	14.97%	1.31			2.40	8.64%	9.31%
Peru	1999m7	2016m6	1,424	134	33.19%	12.49%	1.98	19.40	5.19%	3.31	7.17%	6.97%
Philippines	1993m7	2016m6	2,961	216	21.41%	21.53%	1.77	22.04	5.08%	5.48	11.68%	6.81%
Poland	1996m7	2016m6	4,475	554	20.47%	21.33%	1.10	20.62	13.14%	4.18	11.46%	8.14%
Portugal	1991m7	2016m6	1,312	114	21.86%	21.59%	1.33	56.63	6.58%	6.05	5.73%	5.17%
Romania	2007m7	2016m6	1,054	124	18.75%	24.09%	2.63			2.40	13.46%	7.88%
Russian Federation	2004m7	2016m6	3,758	510	20.68%	20.49%	1.73	44.46	9.30%	3.68	9.13%	7.93%

Saudi Arabia	2004m7	2016m6	991	115	29.56%	11.67%	0.47			3.78	5.48%	6.21%
Serbia	2009m5	2016m6	643	96	14.99%	32.23%	2.88				0.41%	6.87%
Singapore	1991m7	2016m6	10,336	914	18.85%	20.62%	1.19	29.04	5.19%	7.80	10.35%	7.49%
South Africa	1991m7	2016m6	5,446	587	19.53%	21.23%	1.00	35.36	9.31%	3.84	9.61%	8.09%
South Korea	1991m7	2016m6	22,029	2,158	21.26%	21.69%	1.54	21.61	4.78%	4.03	13.36%	7.55%
Spain	1991m7	2016m6	2,870	224	12.61%	29.26%	0.96	92.00	8.68%	11.06	6.38%	6.53%
Sri Lanka	2001m7	2016m6	1,651	186	31.26%	14.19%	1.03			1.81	8.84%	7.40%
Sweden	1991m7	2016m6	6,783	748	20.25%	27.22%	0.69	42.81	16.95%	5.40	7.67%	9.76%
Switzerland	1991m7	2016m6	4,232	288	28.77%	14.85%	0.80	97.33	15.27%	7.80	6.09%	5.47%
Taiwan	1994m7	2016m6	21,783	2,068	25.21%	16.30%	0.92	22.55	4.38%	3.72	10.13%	6.64%
Thailand	1992m7	2016m6	8,142	650	26.46%	15.99%	1.12	19.52	5.66%	5.58	10.38%	7.78%
Tunisia	2011m5	2016m6	204	41	19.76%	15.91%	0.64			1.06	4.99%	6.26%
Turkey	1994m7	2016m6	3,594	314	15.33%	29.16%	0.85	23.38	5.76%	4.80	15.19%	8.22%
Ukraine	2007m7	2016m6	681	96	18.56%	22.77%	2.50			1.50	7.47%	8.04%
United Arab Emirates	2006m7	2016m6	481	53	28.52%	15.77%	1.22			3.47	9.25%	6.41%
United Kingdom	1991m7	2016m6	33,590	3,702	14.88%	29.38%	0.81	47.30	19.93%	5.26	4.95%	9.01%
United States	1991m7	2016m6	80,768	7,559	18.94%	20.03%	0.63	139.49	43.83%	6.84	12.84%	7.81%
Vietnam	2007m4	2016m6	4,166	592	20.95%	20.75%	1.34				10.73%	11.64%
All			519,961	49,115	21.98%	21.02%	1.01	42.41	9.73%	4.65	8.07%	7.24%

Table 2: Unconditional FSCORE strategy and stock return: portfolio analysis

Note: This table reports the equal-weighted and value-weighted monthly returns for the portfolios constructed by FSCORE. The stocks are sorted at the end of June in year t based on the values of FSCORE in year t-1. Each portfolio is held from July of year t to June of year t+1. The value-weighted portfolios use firms' market capitalizations at the end of June of year t as weights. The portfolio of high FSCORE stocks consists of the firms with FSCORE larger than 6; and the portfolio of low FSCORE contains the firms with FSCORE less than 4. The portfolio H - L is to buy high FSCORE stocks and sell low FSCORE stocks. Panel A presents the portfolio returns in local currency for each country. The FSCORE portfolios are constructed within each country. The countries in the sample are classified by region and market developments according to the classifications by World Bank. Panel B reports the portfolio returns in US dollar in each country and across the countries. In cross-country portfolios, the stocks in different countries are pooled and sorted by FSCORE in seven regions: all countries in the sample (65 countries), developed countries (35 countries), emerging countries (30 countries), developed countries in Fama-French global portfolio (23 countries), developed countries excluding US (22 countries), European developed countries in Fama-French Europe portfolio (16 countries), and Asia Pacific developed countries excluding Japan in Fama-French Asia Pacific portfolio (4 countries). The sample periods for each country are reported in Table 1, and are from July of 1991 to June of 2016 for cross-country portfolios. All the portfolio returns are in percentage points. The t-statistics are adjusted by Newey and West (1987) robust standard errors with a 10-month lag.

Panel A: FSCORE portfolio returns in local currency

Region	Country	Equal-weighted method						Value-weighted method					
		High FSCORE		Low FSCORE		H - L		High FSCORE		Low FSCORE		H - L	
		Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat
Africa & Middle East-Developed:													
	Israel	0.89	1.59	0.51	0.60	0.38	0.63	0.76	1.54	0.82	0.92	-0.06	-0.08
	Kuwait	0.51	1.49	-0.01	-0.02	0.45	1.12	0.12	0.28	-0.05	-0.08	0.10	0.17
	Oman	0.80	3.03	0.62	1.41	0.23	0.47	0.47	1.09	0.60	0.91	-0.06	-0.08
	Saudi Arabia	0.49	0.78	0.82	0.87	-0.09	-0.19	0.25	0.39	0.68	0.76	-0.24	-0.44
	United Arab Emirates	0.80	1.18	-0.39	-0.42	1.19	1.85	0.99	1.66	-1.48	-1.27	2.48	2.43
Africa-Emerging:													
	Egypt	0.97	1.60	1.01	1.65	-0.36	-0.71	0.67	1.06	0.38	0.49	-0.16	-0.27

Jordan	0.58	1.51	-0.56	-1.94	1.13	3.86	0.73	0.92	-0.47	-1.27	1.19	1.80
Kenya	0.74	1.25	0.04	0.07	0.70	1.26	0.59	0.87	0.03	0.05	0.56	0.73
Morocco	0.75	2.18	0.21	0.45	0.54	1.55	0.75	1.73	-0.11	-0.20	0.86	1.53
Nigeria	1.04	1.50	-0.11	-0.20	1.08	2.02	0.54	0.96	-0.27	-0.31	0.81	1.54
South Africa	2.00	5.03	0.67	1.98	1.32	4.72	1.66	4.17	0.97	2.43	0.70	1.81
Tunisia	0.77	1.06	-0.38	-0.57	1.15	2.53	1.32	1.49	-1.09	-2.30	2.42	3.03
Asia-Developed:												
Hong Kong	0.88	1.60	0.36	0.65	0.73	1.82	0.70	1.40	1.00	1.73	-0.11	-0.22
Japan	0.56	1.84	-0.08	-0.23	0.55	3.77	0.51	1.45	0.11	0.34	0.31	1.25
South Korea	0.97	1.74	0.32	0.59	0.86	3.52	0.63	1.20	0.76	1.38	0.03	0.10
Singapore	1.23	2.22	0.21	0.41	1.04	4.61	1.13	2.32	0.40	0.77	0.78	2.21
Taiwan, China	0.61	1.36	0.15	0.30	0.46	2.66	0.71	1.74	0.37	0.81	0.34	1.55
Asia-Emerging:												
Bangladesh	1.72	2.23	0.65	0.66	1.07	0.95	1.83	2.02	1.04	0.84	0.79	0.67
China	1.73	2.60	1.26	1.92	0.37	1.22	1.32	2.02	0.88	1.38	0.36	0.98
India	2.10	3.24	1.51	2.26	0.39	1.79	1.59	3.18	1.44	2.25	0.25	0.76
Indonesia	1.56	3.26	0.48	1.10	1.15	4.49	1.54	2.67	0.49	0.83	1.18	2.16
Malaysia	1.25	2.49	0.30	0.57	0.96	5.19	1.13	2.50	0.26	0.56	0.91	3.40
Pakistan	1.82	3.44	1.47	2.58	0.41	1.05	1.55	2.72	1.65	2.56	0.10	0.19
Philippines	1.09	2.11	0.43	0.94	0.73	1.65	1.03	1.89	0.44	0.77	0.77	1.46
Sri Lanka	2.67	2.69	1.35	1.84	1.32	1.59	2.53	2.66	1.25	1.56	1.28	1.42
Thailand	0.94	2.19	0.17	0.40	0.90	4.45	0.89	1.92	0.23	0.41	0.83	2.34
Vietnam	0.95	0.87	-0.09	-0.09	1.04	4.86	0.82	0.72	-0.24	-0.18	1.07	1.29
Australasia-Developed:												
Australia	1.37	3.76	0.26	0.65	1.18	4.40	0.80	2.87	0.41	0.99	0.42	1.30
New Zealand	0.91	3.43	-0.18	-0.56	1.09	3.80	0.85	3.05	0.60	1.44	0.25	0.67
Europe-Developed:												
Austria	0.97	2.71	-0.18	-0.55	1.07	3.88	0.49	1.34	-0.47	-1.10	0.95	2.15

Belgium	0.98	3.16	0.17	0.62	0.82	3.92	1.09	3.34	0.85	2.70	0.16	0.58
Croatia	0.34	0.48	-1.62	-2.36	1.96	4.28	0.24	0.31	-1.71	-2.48	1.95	3.11
Cyprus	0.36	0.69	-0.35	-0.82	0.71	1.45	-0.24	-0.48	-1.21	-1.96	0.97	1.99
Czech Republic	1.01	1.45	0.72	0.85	0.89	1.43	0.76	1.11	0.37	0.39	0.95	1.06
Denmark	1.13	3.49	-0.16	-0.42	1.27	5.83	1.55	3.98	0.20	0.34	1.29	2.34
Finland	1.07	3.01	0.25	0.53	1.16	4.20	1.84	3.24	0.41	0.77	1.65	2.59
France	1.13	4.02	0.03	0.11	1.12	9.80	1.02	3.17	0.64	1.66	0.40	1.58
Germany	1.06	3.90	-0.46	-1.22	1.53	6.27	1.08	3.21	0.00	0.01	1.11	3.62
Greece	0.79	0.85	0.34	0.44	0.84	2.22	0.85	0.87	0.14	0.22	1.06	2.28
Hungary	-0.72	-1.10	-2.19	-2.10	1.48	1.56	-1.76	-2.19	-2.51	-1.74	0.76	0.76
Ireland	0.94	1.71	0.19	0.34	0.81	1.74	1.12	2.22	0.53	0.83	0.56	1.02
Italy	0.68	1.87	-0.70	-1.87	1.44	6.71	0.98	2.55	0.27	0.52	0.78	1.73
Netherlands	1.05	3.22	-0.17	-0.47	1.21	5.87	0.88	2.74	0.66	1.41	0.24	0.64
Norway	0.82	1.93	0.18	0.37	0.58	2.07	1.08	2.30	0.30	0.50	0.69	1.58
Poland	0.95	1.54	0.14	0.20	0.81	2.20	0.77	1.57	0.43	0.62	0.35	0.74
Portugal	1.20	3.52	-0.18	-0.47	1.33	3.62	1.44	4.02	0.08	0.16	1.45	2.94
Spain	1.27	3.13	0.09	0.22	1.08	4.53	1.29	3.41	0.28	0.65	0.88	2.37
Sweden	1.49	3.80	-0.25	-0.59	1.80	6.88	1.54	3.66	0.74	1.54	0.79	1.78
Switzerland	1.08	3.58	0.15	0.42	0.90	4.90	0.99	3.06	0.92	2.44	0.11	0.33
United Kingdom	0.98	3.32	-0.78	-2.56	1.76	10.02	0.69	2.50	0.52	1.79	0.17	0.77
Europe-Emerging:												
Bosnia and Herzegovina	-0.67	-2.66	-0.54	-4.19	-0.12	-0.41	0.04	0.10	-0.52	-1.36	0.56	1.11
Bulgaria	0.19	0.28	0.01	0.03	0.17	0.53	0.83	0.87	-0.40	-0.31	1.23	0.98
Romania	0.20	0.24	0.10	0.13	0.11	0.18	-0.96	-0.98	-0.26	-0.28	-0.70	-0.87
Russian Federation	1.43	2.73	0.76	1.32	0.67	2.69	1.33	1.78	0.26	0.28	1.07	1.92
Serbia	-0.75	-2.30	-0.57	-8.99	-0.16	-0.53	-0.64	-1.34	-0.47	-4.04	-0.17	-0.37
Turkey	2.98	4.50	2.95	3.96	0.20	0.59	2.61	4.16	3.45	4.08	-0.65	-1.31
Ukraine	0.25	0.17	0.15	0.22	0.01	0.02	-0.85	-0.49	0.26	0.23	-1.16	-1.11

Latin America-Emerging:												
Argentina	1.78	3.54	0.98	2.14	0.79	2.35	1.95	2.92	1.23	1.98	0.72	1.43
Brazil	1.90	3.71	0.96	1.94	0.93	2.89	2.12	4.03	1.07	1.61	1.18	2.32
Chile	0.71	2.56	0.54	2.07	0.19	1.07	0.61	1.78	1.16	2.72	-0.60	-1.87
Colombia	0.65	2.34	-0.63	-0.88	1.24	1.81	0.59	1.19	-0.83	-1.06	1.39	1.99
Mexico	1.53	4.02	0.71	2.19	0.93	3.57	1.63	3.84	1.16	2.36	0.59	1.69
Peru	1.14	1.97	0.66	1.65	0.49	0.86	1.18	2.03	0.52	0.89	0.65	1.01
North America-Developed:												
Canada	1.17	4.04	0.80	1.71	0.42	1.29	0.98	4.40	0.45	1.10	0.54	1.65
United States	1.30	5.12	0.90	2.80	0.39	2.80	0.95	3.75	0.87	2.61	0.08	0.45

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Panel B: FSCORE portfolio returns in US dollar

Region	Country	Equal-weighted method						Value-weighted method					
		High FSCORE		Low FSCORE		H - L		High FSCORE		Low FSCORE		H - L	
		Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat
Africa & Middle East-Developed:													
	Israel	0.91	1.52	0.55	0.65	0.36	0.60	0.80	1.46	0.88	0.97	-0.07	-0.11
	Kuwait	0.50	1.33	-0.06	-0.11	0.49	1.23	0.11	0.24	-0.07	-0.10	0.11	0.19
	Oman	0.80	3.03	0.62	1.41	0.24	0.47	0.47	1.10	0.60	0.91	-0.06	-0.08
	Saudi Arabia	0.49	0.78	0.82	0.87	-0.09	-0.19	0.25	0.39	0.68	0.76	-0.24	-0.44
	United Arab Emirates	0.80	1.18	-0.39	-0.42	1.19	1.85	0.99	1.66	-1.49	-1.27	2.48	2.43
Africa-Emerging:													
	Egypt	0.71	1.07	0.58	0.85	-0.23	-0.56	0.32	0.48	0.10	0.12	-0.19	-0.33
	Jordan	0.58	1.50	-0.56	-1.94	1.13	3.86	0.73	0.92	-0.47	-1.27	1.19	1.80
	Kenya	0.46	0.63	-0.26	-0.36	0.72	1.30	0.30	0.38	-0.28	-0.38	0.58	0.77
	Morocco	0.60	1.44	0.20	0.36	0.41	1.22	0.62	1.27	-0.07	-0.11	0.69	1.32
	Nigeria	0.40	0.48	-0.84	-1.10	1.12	2.14	-0.12	-0.16	-1.00	-0.96	0.88	1.52
	South Africa	1.54	2.98	0.19	0.43	1.37	5.10	1.24	2.76	0.53	1.09	0.75	1.98
	Tunisia	0.00	-0.01	-1.21	-1.80	1.20	2.71	0.55	0.75	-1.88	-4.21	2.43	3.09
Asia-Developed:													
	Hong Kong	0.88	1.62	0.36	0.66	0.73	1.83	0.70	1.41	1.00	1.73	-0.11	-0.22
	Japan	0.66	2.08	0.07	0.20	0.52	3.72	0.58	1.67	0.24	0.70	0.28	1.11
	South Korea	1.30	1.84	0.97	1.54	0.41	1.87	0.80	1.22	1.07	1.65	-0.18	-0.61
	Singapore	1.35	2.30	0.32	0.59	1.07	4.70	1.24	2.39	0.49	0.88	0.82	2.30
	Taiwan, China	0.59	1.22	0.14	0.27	0.45	2.59	0.72	1.60	0.36	0.74	0.36	1.57
Asia-Emerging:													
	Bangladesh	1.68	2.03	0.59	0.61	1.08	0.97	1.78	1.91	0.99	0.80	0.79	0.68
	China	1.82	2.74	1.36	2.08	0.36	1.20	1.41	2.17	0.99	1.54	0.36	0.97
	India	1.91	2.55	1.31	1.76	0.40	1.82	1.40	2.32	1.25	1.76	0.24	0.72

Indonesia	0.29	0.34	-1.12	-1.39	1.60	3.67	1.42	1.42	-0.31	-0.42	1.86	2.40
Malaysia	1.18	1.97	0.26	0.41	0.96	5.18	1.03	1.86	0.21	0.37	0.89	3.30
Pakistan	1.34	2.27	1.06	1.71	0.31	0.82	1.18	1.95	1.22	1.75	0.14	0.27
Philippines	0.95	1.50	0.32	0.56	0.70	1.52	0.84	1.26	0.34	0.52	0.68	1.28
Sri Lanka	2.40	2.30	1.06	1.31	1.34	1.62	2.25	2.29	1.03	1.19	1.22	1.36
Thailand	0.89	1.63	0.13	0.26	0.89	4.97	0.85	1.56	0.19	0.28	0.85	2.39
Vietnam	-7.53	-2.90	-12.34	-4.01	4.81	2.52	-2.44	-2.40	-2.67	-2.65	0.24	0.23
Australasia-Developed:												
Australia	1.48	3.00	0.37	0.71	1.15	4.46	0.92	2.23	0.68	1.31	0.26	0.84
New Zealand	1.00	2.24	-0.06	-0.14	1.06	3.71	0.97	2.07	0.61	1.11	0.36	0.94
Europe-Developed:												
Austria	0.91	2.18	-0.12	-0.31	1.03	3.97	0.45	1.05	-0.46	-0.97	1.00	2.22
Belgium	1.00	2.66	0.22	0.71	0.82	3.82	1.12	3.01	0.87	2.61	0.18	0.65
Croatia	0.20	0.26	-1.74	-2.18	1.94	4.28	0.06	0.07	-1.85	-2.31	1.91	3.04
Cyprus	0.28	0.43	-0.50	-0.89	0.78	1.62	-0.33	-0.51	-1.28	-1.79	0.95	1.97
Czech Republic	1.43	1.74	1.29	1.20	0.82	1.29	1.21	1.57	0.96	0.82	0.90	0.98
Denmark	1.15	3.28	-0.15	-0.36	1.33	6.05	1.61	4.64	0.32	0.53	1.28	2.33
Finland	1.12	3.03	0.22	0.46	1.15	4.26	1.93	3.64	0.36	0.70	1.64	2.58
France	1.10	3.43	0.07	0.24	1.11	9.69	1.01	3.09	0.83	2.19	0.25	1.05
Germany	1.05	3.23	-0.43	-1.06	1.55	6.35	1.07	2.95	0.06	0.12	1.10	3.60
Greece	0.88	0.93	0.22	0.29	0.85	2.25	1.07	1.08	0.10	0.16	1.11	2.31
Hungary	-0.70	-0.82	-1.50	-1.36	0.80	0.84	-1.76	-1.92	-2.35	-1.49	0.59	0.56
Ireland	1.14	2.10	0.35	0.59	0.85	1.80	1.42	2.78	0.67	1.01	0.72	1.19
Italy	0.58	1.46	-0.71	-1.77	1.42	6.74	0.91	2.38	0.29	0.55	0.76	1.76
Netherlands	1.04	3.05	-0.16	-0.43	1.25	6.17	0.94	3.17	0.69	1.45	0.32	0.85
Norway	0.77	1.63	0.20	0.39	0.57	2.00	1.03	1.98	0.35	0.59	0.64	1.46
Poland	0.88	1.25	0.15	0.20	0.72	2.09	0.81	1.47	0.47	0.64	0.34	0.72
Portugal	1.21	3.11	-0.14	-0.35	1.29	3.52	1.45	3.58	0.10	0.20	1.41	2.93



Spain	1.15	2.57	0.07	0.15	1.05	4.47	1.19	2.94	0.18	0.38	0.93	2.48
Sweden	1.52	3.41	-0.30	-0.67	1.83	7.01	1.58	3.34	0.71	1.41	0.79	1.81
Switzerland	1.22	3.87	0.31	0.91	0.92	5.14	1.16	3.73	1.09	3.07	0.15	0.47
United Kingdom	0.92	2.65	-0.83	-2.30	1.75	10.16	0.67	2.18	0.49	1.40	0.18	0.84
Europe-Emerging:												
Bosnia and Herzegovina	-0.84	-1.96	-0.84	-2.89	0.00	-0.01	-0.06	-0.11	-0.64	-1.26	0.58	1.13
Bulgaria	0.09	0.11	-0.10	-0.16	0.19	0.59	0.75	0.64	-0.55	-0.38	1.30	1.02
Romania	-0.16	-0.15	-0.26	-0.28	0.10	0.18	-1.29	-1.11	-0.56	-0.56	-0.73	-0.90
Russian Federation	1.24	1.93	0.58	0.90	0.66	2.53	1.01	1.10	-0.12	-0.10	1.13	2.01
Serbia	-1.04	-2.20	-0.89	-2.16	-0.21	-0.77	-0.82	-1.23	-0.80	-2.09	0.01	0.04
Turkey	1.73	2.91	1.39	1.98	0.28	0.84	1.34	2.40	1.89	2.56	-0.46	-0.96
Ukraine	-1.05	-0.64	-1.14	-1.13	0.05	0.06	-2.16	-1.13	-0.97	-0.73	-1.20	-1.15
Latin America-Emerging:												
Argentina	0.72	1.30	-0.11	-0.20	0.83	2.69	1.04	1.72	0.46	0.78	0.57	1.29
Brazil	1.75	2.22	0.73	0.99	0.80	2.64	2.04	2.70	1.27	1.47	0.80	1.59
Chile	0.55	1.42	0.44	1.27	0.14	0.73	0.51	1.15	1.11	2.25	-0.64	-1.99
Colombia	0.47	0.75	-0.50	-1.06	0.82	2.07	0.43	0.53	-0.65	-0.99	1.04	1.80
Mexico	1.18	2.78	0.18	0.45	1.02	4.25	1.38	2.99	0.77	1.46	0.73	2.06
Peru	1.16	1.82	0.59	1.30	0.57	0.98	1.12	1.80	0.53	0.84	0.60	0.91
North America-Developed:												
Canada	1.23	3.14	0.79	1.44	0.45	1.39	1.06	3.25	0.51	1.06	0.49	1.54
United States	1.30	5.12	0.90	2.80	0.39	2.80	0.95	3.75	0.87	2.61	0.08	0.45
Cross-country portfolios:												
All:	1.10***	4.22	0.28	0.81	0.82***	5.60	0.91***	3.60	0.48	1.38	0.42**	2.38
Developed:	1.05***	4.15	0.23	0.64	0.83***	4.98	0.89***	3.59	0.54	1.63	0.35**	1.99
Emerging:	1.24***	2.82	0.42	0.97	0.81***	4.77	0.89**	1.98	0.26	0.51	0.67**	2.31
Fama-French developed	1.04***	4.21	0.17	0.48	0.87***	4.77	0.90***	3.66	0.55*	1.66	0.36**	2.04
Fama-French developed ex US	0.95***	3.51	0.01	0.04	0.93***	5.03	0.87***	3.24	0.41	1.16	0.45***	2.72

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Fama-French Europe	1.03***	3.23	-0.40	-1.14	1.42***	9.81	1.03***	3.69	0.58	1.58	0.45**	2.58
Fama-French Asia Pacific ex JP	1.36***	2.89	0.30	0.62	1.12***	5.76	1.00**	2.54	0.75	1.54	0.29	1.08

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Table 3: Conditional FSCORE strategies and stock return: portfolio analysis

Note: This table reports the equal-weighted and value-weighted monthly returns for the portfolios constructed by FSCORE and BM. The stocks are sorted at the end of June in year t based on BM and FSCORE in year t-1. Each portfolio is held from July of year t to June of year t+1. The value-weighted portfolios use firms' market capitalizations at the end of June of year t as weights. The value/glamour stocks are firms with top/bottom 30% of BM in each year in each country or the cross-country sample. In value and glamour stocks, the firms are further sorted into high FSCORE and low FSCORE groups. The portfolio H – L is to buy high FSCORE firms and sell low FSCORE firms in glamour stocks or value stocks. The hedge portfolio is to long high FSCORE value stock and short low FSCORE glamour stocks. Panel A presents the equal-weighted portfolio returns in local currency for each country and Panel B reports the value-weighted portfolio returns in local currency for each country. The FSCORE portfolios are constructed within each country. The countries in the sample are classified by region and market developments according to the classifications by World Bank. Panels C and D report the equal-weighted and value-weighted portfolio returns in US dollar in each country and across the countries. In cross-country portfolios, the stocks in different countries are pooled and sorted by FSCORE in seven regions: all countries in the sample (65 countries), developed countries (35 countries), emerging countries (30 countries), developed countries in Fama-French global portfolio (23 countries), developed countries excluding US (22 countries), European developed countries in Fama-French Europe portfolio (16 countries), and Asia Pacific developed countries excluding Japan in Fama-French Asia Pacific portfolio (4 countries). The sample periods for each country are reported in Table 1, and are from July of 1991 to June of 2016 for cross-country portfolios. All the portfolio returns are in percentage points. The t-statistics are adjusted by Newey and West (1987) robust standard errors with a 10-month lag.

Panel A: Equal-weighted portfolio returns in local currency

Region	Country	Glamour stocks						Value stocks						Hedge portfolio	
		High FSCORE		Low FSCORE		H - L		High FSCORE		Low FSCORE		H - L		V & H - G & L	
		Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat
Africa & Middle East-Developed:															
	Israel	0.60	1.08	-0.82	-1.51	1.63	3.53	1.04	1.18	0.81	1.03	0.14	0.17	2.41	4.65
	Kuwait	0.23	0.61	0.73	1.03	-0.72	-0.90	0.52	0.91	-0.46	-0.59	1.10	1.49	-0.43	-0.51
	Oman	1.40	4.01	0.81	1.23	1.38	2.55	0.75	1.98	0.32	0.73	0.56	1.05	0.35	0.61
	Saudi Arabia	0.10	0.15	0.06	0.06	0.22	0.28	1.05	1.20	1.62	1.69	-0.18	-0.35	1.13	1.65
	United Arab Emirates	0.92	1.21	-1.89	-2.84	2.85	3.05	0.19	0.21	-0.36	-0.28	1.50	1.05	2.09	2.05

Africa-Emerging:														
Egypt	0.99	1.39	0.19	0.26	0.18	0.33	0.92	1.15	1.82	2.46	-1.33	-1.80	0.16	0.28
Jordan	0.63	1.68	-0.88	-2.62	1.52	3.78	0.04	0.10	-0.75	-2.42	0.97	2.27	0.93	2.13
Kenya	1.02	1.72	-0.19	-0.16	1.67	1.34	0.42	0.45	0.83	1.02	-0.65	-0.61	-0.17	-0.19
Morocco	1.22	2.74	0.59	1.18	0.63	1.14	0.52	0.91	0.31	0.61	0.22	0.37	0.40	0.81
Nigeria	1.19	1.78	-0.03	-0.02	1.60	1.44	0.97	1.30	-0.94	-1.49	0.94	1.18	2.91	3.65
South Africa	1.46	4.22	-0.35	-0.90	2.03	4.69	2.37	5.37	0.98	1.84	1.31	2.67	2.76	5.73
Tunisia	0.85	0.83	0.82	0.80	1.49	1.19	0.32	0.50	-0.34	-0.42	0.98	1.10	2.07	1.99
Asia-Developed:														
Hong Kong	1.04	2.18	0.07	0.12	1.35	3.48	1.54	2.72	0.88	1.49	0.84	3.02	1.82	4.79
Japan	0.30	0.89	-0.41	-1.09	0.63	3.44	0.74	2.16	0.27	0.74	0.48	3.11	1.18	6.67
South Korea	0.34	0.68	-0.34	-0.63	0.96	2.50	1.60	2.32	0.82	1.35	0.89	3.54	2.20	5.46
Singapore	0.70	1.33	0.00	0.00	0.92	3.22	0.85	1.59	0.49	0.86	0.54	1.82	1.06	3.53
Taiwan, China	0.56	1.22	0.27	0.55	0.35	1.31	0.59	1.06	0.17	0.29	0.42	1.70	0.29	0.56
Asia-Emerging:														
Bangladesh	2.41	1.87	-0.59	-0.52	3.03	2.31	0.42	0.78	1.91	2.82	-2.02	-2.35	1.36	0.99
China	1.24	1.70	1.37	2.04	-0.01	-0.06	1.56	2.10	1.36	2.06	0.11	0.40	0.41	1.03
India	1.79	2.92	1.69	2.68	0.01	0.02	2.34	3.41	1.22	1.64	0.59	1.93	0.56	1.61
Indonesia	1.01	2.11	-0.23	-0.47	1.20	3.27	2.03	2.92	1.44	2.40	0.64	1.22	2.22	4.43
Malaysia	1.14	2.32	-0.14	-0.27	1.44	3.71	1.48	2.74	0.71	1.21	0.78	3.59	1.61	6.47
Pakistan	2.12	4.19	1.14	1.81	0.96	1.89	2.41	3.53	1.54	2.08	0.48	0.67	0.81	1.04
Philippines	0.65	1.12	-0.44	-0.79	0.99	1.55	0.59	0.90	1.14	1.81	-0.80	-1.10	0.90	1.39
Sri Lanka	2.01	2.10	1.39	1.82	0.67	0.76	2.90	2.34	2.85	3.29	-0.13	-0.22	1.51	1.46
Thailand	0.70	1.61	-0.21	-0.39	0.91	2.68	1.24	2.64	0.41	0.80	0.74	2.09	1.39	3.56
Vietnam	0.91	0.85	-0.19	-0.17	1.10	4.86	1.27	1.05	-0.07	-0.06	1.35	4.01	1.46	3.08
Australasia-Developed:														
Australia	1.05	3.06	-0.16	-0.36	1.38	4.10	1.87	3.81	0.44	1.11	1.38	3.77	2.07	4.57
New Zealand	1.06	3.15	-0.97	-1.77	2.23	3.61	0.75	1.53	0.49	0.86	0.52	0.69	1.69	2.24

Europe-Developed:

Austria	0.80	1.98	-0.74	-2.03	1.49	3.20	0.85	1.99	-0.10	-0.18	0.64	0.96	1.47	2.43
Belgium	0.93	2.49	0.38	0.83	0.57	1.16	0.82	1.82	0.41	1.23	0.48	1.10	0.33	0.54
Croatia	0.52	0.56	-2.00	-2.32	2.52	3.79	0.19	0.38	0.06	0.06	0.03	0.04	1.95	2.40
Cyprus	-0.49	-1.03	-2.91	-2.52	2.47	1.76	0.80	0.66	1.46	2.07	-0.90	-0.62	3.88	2.33
Czech Republic	0.96	1.19	0.12	0.10	1.62	1.11	1.72	0.95	-0.30	-0.23	2.51	1.49	0.80	0.58
Denmark	1.08	3.23	-0.73	-1.48	1.72	3.93	1.15	2.78	0.09	0.20	1.10	2.59	1.85	4.53
Finland	0.70	1.23	-0.40	-0.69	1.32	2.92	1.04	2.60	0.37	0.77	1.03	2.70	1.86	4.04
France	0.67	1.88	-0.31	-0.97	1.02	4.20	1.19	3.66	0.37	1.45	0.84	4.64	1.54	5.68
Germany	0.74	2.40	-0.92	-2.14	1.78	5.69	1.13	3.47	-0.02	-0.04	1.22	4.37	2.22	5.35
Greece	1.28	1.50	0.16	0.22	1.27	2.48	1.83	1.92	0.43	0.47	1.54	3.37	1.96	2.85
Hungary	-0.46	-0.48	-2.84	-2.13	3.67	3.48	-1.09	-0.71	-2.21	-1.66	3.31	2.66	4.34	2.27
Ireland	0.71	0.96	-1.23	-1.62	2.25	2.40	1.53	1.81	1.86	2.87	0.40	0.44	3.11	2.62
Italy	0.74	2.00	-1.18	-2.70	1.97	5.25	0.47	0.98	-0.49	-1.24	1.09	2.77	1.84	3.93
Netherlands	1.18	3.29	-0.68	-1.51	2.11	6.57	0.85	2.01	0.32	0.76	0.59	1.53	1.78	4.46
Norway	0.80	1.70	-0.26	-0.50	1.07	2.71	0.66	1.27	0.88	1.29	-0.24	-0.40	0.87	1.55
Poland	0.45	0.70	-0.81	-1.12	0.98	1.74	1.84	2.55	1.13	1.32	0.53	0.97	2.50	3.66
Portugal	1.15	3.25	-1.32	-2.14	2.89	4.48	1.87	3.60	0.01	0.02	1.70	2.57	3.55	4.36
Spain	0.95	2.09	-0.11	-0.23	1.18	2.52	0.88	1.74	0.25	0.56	1.30	2.82	1.94	3.71
Sweden	1.17	2.47	-0.55	-1.14	1.78	5.32	1.26	2.83	-0.14	-0.29	1.66	4.46	2.00	4.00
Switzerland	0.99	3.13	-0.51	-1.32	1.35	4.93	1.21	3.48	0.31	0.75	0.83	2.68	1.69	5.38
United Kingdom	1.01	3.24	-1.02	-3.11	2.08	10.96	0.79	2.68	-0.52	-1.80	1.31	6.33	1.81	6.85

Europe-Emerging:

Bosnia and Herzegovina	-0.58	-1.52	-1.44	-2.69	1.15	1.31	-1.14	-2.78	-0.15	-0.38	-1.24	-1.77	0.18	0.24
Bulgaria	-0.40	-0.46	-0.39	-0.41	-0.01	-0.02	1.31	2.12	0.43	0.94	0.88	1.79	1.70	2.45
Romania	-0.96	-1.22	-0.48	-0.53	-0.48	-0.65	1.43	1.72	0.04	0.06	1.38	1.33	1.91	1.97
Russian Federation	1.26	1.94	0.06	0.07	1.25	2.03	1.05	2.16	0.88	1.56	0.10	0.24	0.99	1.31
Serbia	-0.27	-0.89	-0.92	-4.27	0.59	1.22	-1.17	-2.54	-1.03	-4.68	0.02	0.04	-0.29	-0.39

Turkey	2.32	3.27	2.58	3.14	0.22	0.37	2.78	3.16	3.38	4.29	0.09	0.15	1.15	2.30
Ukraine	-0.96	-0.88	-0.60	-0.79	0.07	0.09	1.71	1.05	0.29	0.32	1.37	1.02	2.17	1.76
Latin America-Emerging:														
Argentina	1.99	2.93	0.61	1.47	1.30	2.18	2.44	4.02	1.17	1.30	0.80	1.19	1.77	3.06
Brazil	1.65	2.81	0.30	0.49	2.14	3.37	1.47	2.38	1.70	2.21	-0.23	-0.36	1.32	1.70
Chile	0.69	2.52	0.52	1.57	0.15	0.46	0.86	2.47	0.87	3.15	0.01	0.03	0.51	1.59
Colombia	0.49	1.08	-0.34	-1.17	0.78	1.07	0.54	1.27	-0.22	-0.20	1.34	1.51	0.82	1.68
Mexico	1.55	4.12	1.34	2.86	0.34	0.73	1.60	2.65	0.78	1.85	1.44	2.85	0.50	0.68
Peru	1.21	2.30	0.63	1.10	0.70	0.89	1.12	2.04	0.99	1.50	0.57	0.80	0.64	0.73
North America-Developed:														
Canada	0.63	2.02	0.53	1.11	0.18	0.46	1.69	3.77	1.11	2.20	0.64	1.50	1.24	2.83
United States	1.19	4.55	0.70	2.00	0.50	2.86	1.40	4.84	1.03	3.06	0.37	2.76	0.71	2.67

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Panel B: Value-weighted portfolio returns in local currency

Region	Country	Glamour stocks						Value stocks						Hedge portfolio	
		High FSCORE		Low FSCORE		H - L		High FSCORE		Low FSCORE		H - L		V & H - G & L	
		Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat
Africa & Middle East-Developed:															
	Israel	0.41	0.75	0.23	0.38	0.28	0.48	0.89	0.96	1.02	1.20	-0.18	-0.22	0.97	2.25
	Kuwait	0.11	0.24	0.53	0.62	-0.74	-0.94	0.72	1.05	-0.66	-0.77	1.48	1.94	-0.09	-0.10
	Oman	0.76	1.56	0.90	1.17	0.92	1.39	0.82	0.93	-0.05	-0.07	1.01	1.14	0.50	0.43
	Saudi Arabia	0.50	0.67	-0.14	-0.12	0.86	1.00	0.15	0.18	1.86	1.93	-1.05	-1.55	0.44	0.47
	United Arab Emirates	1.48	1.73	-2.73	-3.24	4.54	3.83	0.17	0.18	-0.92	-0.76	2.05	1.61	2.84	2.25
Africa-Emerging:															
	Egypt	0.54	0.71	-0.01	-0.01	-0.19	-0.29	0.87	0.96	1.43	1.88	-1.06	-1.51	0.01	0.02
	Jordan	-0.02	-0.04	-0.96	-2.00	0.94	1.76	-0.46	-0.81	-0.83	-2.21	0.50	0.72	0.50	0.76
	Kenya	0.82	1.50	0.18	0.17	1.06	0.92	0.16	0.15	0.63	0.84	-0.58	-0.41	-1.03	-0.82
	Morocco	1.18	2.40	0.32	0.54	0.86	1.21	0.61	1.03	0.41	0.66	0.20	0.30	0.78	1.25
	Nigeria	0.84	1.51	-0.41	-0.29	0.80	0.69	0.09	0.16	-0.90	-1.41	0.81	0.83	2.22	2.42
	South Africa	1.50	3.70	0.02	0.05	1.64	2.76	3.04	4.51	0.79	1.26	2.20	2.86	3.06	3.69
	Tunisia	0.72	0.77	-0.32	-0.51	3.00	3.65	-0.13	-0.21	-1.13	-2.14	0.97	1.37	1.35	2.60
Asia-Developed:															
	Hong Kong	0.99	1.97	0.94	1.46	0.41	0.75	1.05	1.71	0.88	1.48	0.44	1.26	0.47	0.85
	Japan	0.27	0.81	-0.10	-0.29	0.27	1.11	0.88	2.61	0.49	1.35	0.34	1.40	0.97	3.96
	South Korea	0.42	0.77	0.28	0.45	0.45	0.84	1.67	2.58	1.03	1.55	0.58	1.30	1.66	3.30
	Singapore	0.65	1.55	0.19	0.33	0.69	1.36	0.97	1.62	0.66	1.11	0.39	0.81	1.00	1.95
	Taiwan, China	0.68	1.42	0.67	1.30	0.07	0.17	0.49	0.89	0.15	0.24	0.35	1.31	-0.26	-0.47
Asia-Emerging:															
	Bangladesh	2.03	1.45	-0.62	-0.52	2.71	1.88	0.23	0.41	3.00	5.06	-4.00	-3.33	1.15	0.91
	China	0.74	1.09	1.07	1.64	-0.31	-1.30	0.99	1.36	1.04	1.56	-0.08	-0.29	0.08	0.15
	India	1.45	2.84	1.41	2.11	0.21	0.40	2.00	2.97	1.06	1.45	0.44	0.87	0.77	1.61

Indonesia	1.54	2.57	0.19	0.30	1.27	2.16	1.96	2.23	1.06	1.71	0.95	1.23	1.70	2.04
Malaysia	1.25	2.54	0.05	0.10	1.29	2.36	1.29	2.38	0.70	1.23	0.59	1.84	1.20	3.29
Pakistan	1.86	3.28	1.38	1.97	0.55	0.71	2.11	3.10	0.85	1.10	0.92	1.46	0.26	0.36
Philippines	0.77	1.39	-0.08	-0.13	0.84	1.38	0.40	0.46	0.84	1.17	-0.73	-0.94	0.48	0.58
Sri Lanka	1.96	2.17	1.25	1.48	0.76	0.84	2.99	2.20	2.66	2.66	0.19	0.26	1.74	1.66
Thailand	0.71	1.54	0.10	0.15	0.66	1.24	1.18	2.11	0.28	0.44	0.90	1.54	1.13	2.49
Vietnam	1.16	1.01	-0.03	-0.02	1.19	1.19	1.40	1.06	-0.22	-0.16	1.63	3.39	1.43	1.92
Australasia-Developed:														
Australia	0.55	2.21	0.33	0.62	0.29	0.58	1.86	3.51	0.42	1.00	1.39	3.00	1.55	2.77
New Zealand	1.13	3.36	-0.66	-1.09	1.92	2.81	0.88	1.71	1.05	1.66	0.00	0.01	1.30	1.61
Europe-Developed:														
Austria	0.46	1.10	-0.92	-2.30	1.47	2.87	1.09	2.19	-0.20	-0.37	1.05	1.86	2.14	3.45
Belgium	0.92	2.33	0.74	1.64	0.18	0.39	0.57	1.19	0.73	1.99	-0.17	-0.34	-0.27	-0.44
Croatia	0.40	0.44	-2.01	-2.28	2.44	3.08	0.11	0.15	0.13	0.15	-0.09	-0.11	1.89	3.24
Cyprus	-0.95	-2.35	-3.04	-2.48	2.13	1.54	-0.27	-0.23	1.18	1.30	-1.73	-1.14	2.91	1.72
Czech Republic	0.60	0.79	-0.15	-0.11	1.63	1.03	2.43	1.21	-1.25	-0.76	3.88	2.51	1.75	1.07
Denmark	1.63	4.34	-0.37	-0.52	1.92	2.61	1.36	2.67	0.07	0.13	1.34	2.17	1.63	2.56
Finland	1.31	1.60	-0.22	-0.34	1.71	2.24	1.47	2.94	0.33	0.54	1.38	2.60	2.05	3.44
France	0.61	1.46	0.40	0.92	0.25	0.58	0.95	1.99	0.62	1.15	0.37	0.98	0.59	1.39
Germany	0.76	2.17	-0.41	-0.79	1.24	3.24	1.46	3.30	0.55	1.16	0.99	1.88	1.94	3.08
Greece	1.66	1.59	0.22	0.34	1.38	2.02	1.98	1.98	-0.10	-0.10	2.00	3.88	1.89	2.41
Hungary	-1.62	-1.78	-3.78	-2.04	3.23	2.36	-1.64	-1.07	-0.92	-0.72	0.91	0.51	6.19	3.01
Ireland	1.02	1.43	-1.01	-1.16	3.05	3.70	2.28	2.11	1.53	2.24	0.91	0.99	3.77	3.32
Italy	0.90	2.31	-0.56	-1.08	1.55	2.95	0.75	1.28	-0.11	-0.24	0.85	1.84	1.52	2.23
Netherlands	1.30	3.70	0.10	0.17	1.31	2.21	0.71	1.40	0.28	0.55	0.61	1.14	0.73	1.18
Norway	1.50	3.32	-0.31	-0.48	1.95	3.46	0.45	0.70	1.54	2.04	-1.13	-1.65	0.81	0.98
Poland	0.40	0.70	-0.12	-0.17	0.16	0.29	1.93	2.91	1.47	1.88	0.34	0.60	1.89	3.08
Portugal	1.69	4.64	-0.94	-1.30	3.35	4.56	1.63	3.17	-0.13	-0.20	1.55	2.24	3.31	3.79



Spain	1.25	2.81	0.22	0.40	1.23	2.02	0.86	1.49	0.27	0.50	1.21	1.67	1.52	2.09
Sweden	1.53	3.08	0.55	0.85	0.93	1.67	1.20	2.47	-0.20	-0.37	1.75	3.07	0.65	0.98
Switzerland	0.92	2.79	0.14	0.33	0.55	1.43	1.26	3.29	0.82	1.73	0.38	0.82	1.03	2.49
United Kingdom	0.70	2.19	0.34	0.93	0.40	1.12	1.00	2.73	0.28	0.70	0.72	1.87	0.66	1.54
Europe-Emerging:														
Bosnia and Herzegovina	0.34	0.81	-1.09	-1.74	1.88	1.62	-0.33	-0.48	-0.12	-0.37	-0.28	-0.27	1.04	1.20
Bulgaria	-0.29	-0.25	-0.34	-0.23	0.05	0.04	1.36	1.19	0.79	0.88	0.57	0.51	1.70	1.84
Romania	-1.28	-1.22	-1.13	-1.08	-0.14	-0.16	0.93	1.16	-1.20	-1.46	2.13	2.68	2.07	2.58
Russian Federation	1.13	1.45	0.47	0.47	0.90	1.33	1.26	1.35	1.16	1.18	0.49	0.65	0.98	1.01
Serbia	0.03	0.07	-1.16	-3.49	1.04	1.45	-1.35	-2.62	-1.06	-4.39	-0.18	-0.25	-0.25	-0.24
Turkey	2.21	3.21	3.19	3.28	-0.24	-0.32	2.87	3.17	3.49	3.87	0.24	0.44	1.10	1.61
Ukraine	-1.45	-1.08	-1.95	-2.05	0.95	0.90	0.99	0.57	0.52	0.40	0.56	0.34	2.68	2.10
Latin America-Emerging:														
Argentina	2.61	3.38	0.61	1.23	1.69	2.66	2.36	2.97	1.60	1.49	0.24	0.29	1.56	2.14
Brazil	2.14	3.61	1.20	1.94	1.47	1.99	1.15	1.89	1.07	1.29	-0.04	-0.04	-0.07	-0.10
Chile	0.59	1.65	1.03	2.62	-0.57	-1.53	0.80	1.74	1.42	2.55	-0.63	-1.18	-0.09	-0.21
Colombia	0.30	0.50	-0.90	-2.17	1.66	1.75	0.70	1.51	-0.13	-0.11	1.64	1.85	1.43	2.73
Mexico	1.64	3.74	1.43	2.45	0.45	0.79	2.05	2.33	1.28	2.15	1.36	1.97	1.16	1.10
Peru	1.11	2.65	0.67	1.14	0.42	0.66	1.50	1.74	1.34	1.46	0.89	0.80	0.66	0.60
North America-Developed:														
Canada	0.51	1.65	0.27	0.60	0.25	0.49	1.24	2.62	1.03	2.16	0.19	0.42	0.98	1.87
United States	0.86	3.06	1.08	3.35	-0.22	-1.18	1.26	4.40	0.93	2.58	0.33	1.47	0.17	0.52

Panel C: Equal-weighted portfolio returns in US dollar

Region	Country	Glamour stocks						Value stocks						Hedge portfolio	
		High FSCORE		Low FSCORE		H - L		High FSCORE		Low FSCORE		H - L		V & H - G & L	
		Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat
Africa & Middle East-Developed:															
	Israel	0.73	1.23	-0.69	-1.19	1.64	3.56	1.12	1.23	0.83	1.04	0.10	0.13	2.32	4.49
	Kuwait	0.21	0.52	0.72	0.98	-0.71	-0.89	0.42	0.70	-0.48	-0.59	1.09	1.48	-0.43	-0.50
	Oman	1.40	4.01	0.81	1.23	1.38	2.55	0.75	1.98	0.32	0.73	0.56	1.05	0.35	0.61
	Saudi Arabia	0.10	0.15	0.07	0.06	0.22	0.28	1.05	1.19	1.61	1.68	-0.18	-0.34	1.13	1.65
	United Arab Emirates	0.92	1.21	-1.89	-2.85	2.86	3.05	0.19	0.21	-0.36	-0.28	1.50	1.05	2.09	2.06
Africa-Emerging:															
	Egypt	0.69	0.95	-0.08	-0.09	0.09	0.17	0.63	0.77	1.27	1.72	-1.12	-1.75	0.03	0.05
	Jordan	0.63	1.68	-0.88	-2.62	1.52	3.78	0.04	0.10	-0.75	-2.42	0.97	2.28	0.93	2.13
	Kenya	0.71	1.01	-0.31	-0.24	1.59	1.34	0.53	0.52	0.45	0.50	-0.54	-0.50	-0.02	-0.02
	Morocco	0.92	2.09	0.63	1.00	0.30	0.68	0.38	0.57	0.27	0.50	0.11	0.19	0.36	0.72
	Nigeria	0.50	0.59	-1.11	-0.62	1.79	1.51	0.18	0.20	-1.92	-2.25	1.09	1.29	3.14	4.31
	South Africa	1.05	2.04	-0.81	-1.64	2.05	5.01	1.89	3.36	0.50	0.80	1.35	2.84	2.78	5.83
	Tunisia	0.00	0.00	0.03	0.04	1.49	1.20	-0.36	-0.50	-1.37	-1.65	1.10	1.38	2.05	2.00
Asia-Developed:															
	Hong Kong	1.05	2.19	0.07	0.11	1.36	3.53	1.55	2.74	0.88	1.51	0.85	3.03	1.85	4.88
	Japan	0.38	1.12	-0.23	-0.59	0.55	3.13	0.75	2.15	0.40	1.09	0.45	2.93	1.10	6.20
	South Korea	0.68	1.05	0.37	0.59	0.45	1.25	2.06	2.35	1.27	1.82	0.80	2.24	1.81	4.03
	Singapore	0.77	1.35	0.13	0.24	0.89	3.12	0.95	1.65	0.60	0.96	0.57	1.89	1.06	3.49
	Taiwan, China	0.55	1.16	0.29	0.59	0.34	1.27	0.53	0.89	0.14	0.23	0.39	1.58	0.22	0.43
Asia-Emerging:															
	Bangladesh	2.49	1.96	-0.67	-0.61	3.02	2.30	0.41	0.77	1.88	2.70	-2.05	-2.38	1.42	1.07
	China	1.36	1.85	1.47	2.20	-0.01	-0.06	1.66	2.22	1.47	2.21	0.11	0.38	0.40	1.01

India	1.59	2.26	1.41	2.06	0.08	0.25	2.16	2.75	1.03	1.28	0.58	1.88	0.65	1.75
Indonesia	0.78	0.84	-1.33	-1.41	2.16	3.24	-1.07	-0.94	-1.02	-1.01	0.51	0.51	0.46	0.52
Malaysia	0.97	1.64	-0.18	-0.30	1.36	3.85	1.50	2.39	0.66	0.95	0.87	3.76	1.68	6.87
Pakistan	1.67	2.89	0.61	0.88	0.99	1.96	1.95	2.68	1.10	1.44	0.41	0.60	0.84	1.10
Philippines	0.49	0.74	-0.55	-0.86	0.83	1.27	0.54	0.74	1.01	1.40	-0.72	-1.07	0.95	1.45
Sri Lanka	1.73	1.73	1.20	1.45	0.60	0.68	2.60	2.01	2.64	2.82	-0.06	-0.10	1.40	1.35
Thailand	0.63	1.16	-0.24	-0.37	0.87	2.47	1.15	2.01	0.44	0.73	0.62	1.95	1.34	3.28
Vietnam	-5.14	-2.21	-10.40	-3.65	4.90	2.38	-13.84	-4.89	-12.17	-3.77	0.22	0.05	-3.61	-1.08
Australasia-Developed:														
Australia	1.20	2.39	-0.06	-0.10	1.40	4.18	1.96	3.21	0.54	1.01	1.35	3.84	2.03	4.52
New Zealand	1.12	2.31	-0.89	-1.48	2.27	3.51	0.78	1.22	0.80	1.16	0.44	0.56	1.77	2.32
Europe-Developed:														
Austria	0.78	1.77	-0.66	-1.69	1.60	3.45	0.92	1.68	0.15	0.28	0.44	0.69	1.55	2.51
Belgium	0.89	2.12	0.41	0.89	0.54	1.07	0.95	1.82	0.45	1.31	0.56	1.40	0.41	0.67
Croatia	0.41	0.42	-2.13	-2.20	2.49	3.74	-0.10	-0.15	-0.10	-0.12	0.08	0.10	1.91	2.49
Cyprus	-0.49	-0.81	-2.91	-2.50	2.46	1.74	0.83	0.61	1.48	2.12	-0.85	-0.59	3.89	2.33
Czech Republic	1.39	1.80	0.52	0.35	1.66	1.13	2.38	1.11	-0.01	-0.01	2.47	1.55	0.79	0.62
Denmark	1.14	3.56	-0.78	-1.50	1.84	4.11	1.16	2.52	0.10	0.22	1.14	2.70	1.99	4.65
Finland	0.60	1.04	-0.43	-0.76	1.24	2.72	1.01	2.42	0.37	0.72	1.01	2.69	1.86	4.05
France	0.66	1.78	-0.28	-0.82	1.03	4.39	1.14	3.16	0.42	1.35	0.80	4.43	1.52	5.66
Germany	0.71	2.03	-0.88	-1.96	1.80	5.74	1.13	2.87	0.01	0.01	1.25	4.47	2.23	5.37
Greece	1.36	1.55	0.08	0.12	1.25	2.41	1.98	1.95	0.30	0.34	1.59	3.50	1.95	2.80
Hungary	-0.01	-0.01	-2.68	-1.88	3.60	3.53	-1.62	-0.91	-0.12	-0.08	1.23	0.71	4.68	2.31
Ireland	1.26	1.90	-1.00	-1.30	2.53	2.61	1.82	2.35	1.94	3.05	0.52	0.56	3.22	2.62
Italy	0.66	1.67	-1.22	-2.63	1.98	5.21	0.39	0.76	-0.51	-1.21	1.09	2.89	1.85	4.01
Netherlands	1.04	3.14	-0.64	-1.38	2.07	6.21	0.74	1.76	0.28	0.67	0.77	1.94	1.78	4.39
Norway	0.70	1.35	-0.27	-0.51	1.08	2.70	0.60	0.99	0.89	1.33	-0.26	-0.42	0.91	1.60
Poland	0.54	0.72	-0.80	-1.06	1.10	1.99	1.74	2.04	1.23	1.32	0.20	0.41	2.36	3.64

Portugal	1.14	2.93	-1.28	-2.01	2.89	4.45	1.90	3.38	0.02	0.04	1.70	2.59	3.54	4.34	
Spain	0.89	1.74	-0.13	-0.25	1.11	2.42	0.87	1.42	0.19	0.40	1.24	2.67	1.80	3.49	
Sweden	1.18	2.38	-0.62	-1.25	1.81	5.51	1.28	2.47	-0.17	-0.35	1.65	4.36	2.05	4.14	
Switzerland	1.18	3.51	-0.32	-0.89	1.36	5.10	1.30	3.56	0.46	1.21	0.82	2.85	1.67	5.54	
United Kingdom	0.90	2.60	-1.08	-2.88	2.09	10.94	0.69	1.86	-0.57	-1.61	1.25	5.75	1.76	6.42	
Europe-Emerging:															
Bosnia and Herzegovina	-0.64	-1.36	-2.31	-3.49	1.61	2.15	-1.27	-2.31	-0.63	-1.21	-0.96	-1.44	0.69	0.87	
Bulgaria	-0.44	-0.43	-0.50	-0.46	0.06	0.10	1.13	1.40	0.32	0.50	0.82	1.42	1.63	2.42	
Romania	-1.33	-1.41	-0.88	-0.82	-0.45	-0.67	1.05	1.11	-0.26	-0.28	1.30	1.27	1.92	2.06	
Russian Federation	0.99	1.25	-0.27	-0.29	1.29	2.03	0.76	1.19	0.69	1.07	-0.02	-0.04	1.05	1.37	
Serbia	-0.07	-0.10	-0.89	-2.15	0.54	1.41	-1.40	-2.97	-1.16	-2.82	-0.14	-0.29	-0.45	-0.74	
Turkey	1.42	2.16	0.93	1.23	0.31	0.56	2.00	2.39	1.85	2.38	0.20	0.36	1.40	2.50	
Ukraine	-2.72	-2.95	-1.88	-1.93	0.01	0.02	0.85	0.48	-1.12	-0.91	1.40	1.03	2.03	1.59	
Latin America-Emerging:															
Argentina	1.09	1.63	-0.20	-0.40	1.25	2.12	1.46	2.22	-0.31	-0.39	1.00	1.60	1.74	2.98	
Brazil	1.72	1.96	0.16	0.22	2.03	3.06	1.46	1.62	1.35	1.36	-0.04	-0.05	1.23	1.63	
Chile	0.55	1.46	0.48	1.20	0.11	0.33	0.64	1.43	0.69	2.04	0.03	0.09	0.37	1.09	
Colombia	0.27	0.35	-0.40	-0.66	0.57	0.72	0.30	0.43	-0.27	-0.41	1.07	1.44	0.76	1.73	
Mexico	1.25	2.90	0.86	1.52	0.43	0.90	1.34	2.06	0.25	0.56	1.50	2.99	0.56	0.76	
Peru	1.19	2.05	0.27	0.52	0.95	1.40	1.17	1.93	1.03	1.43	0.59	0.81	0.92	1.11	
North America-Developed:															
Canada	0.70	1.73	0.49	0.89	0.25	0.66	1.73	3.36	1.09	1.89	0.65	1.54	1.28	2.94	
United States	1.19	4.55	0.70	2.00	0.50	2.86	1.40	4.84	1.03	3.06	0.37	2.76	0.71	2.67	
Cross-country portfolios:															
All:	1.00***	3.79	-0.01	-0.02	1.01***	6.07	1.29***	4.71	0.58*	1.67	0.72***	4.80	1.30***	7.07	
Developed:	0.94***	3.58	-0.09	-0.23	1.03***	5.25	1.22***	4.64	0.53	1.54	0.70***	3.99	1.31***	6.28	
Emerging:	0.69	1.52	0.39	0.84	0.26	1.24	1.58***	3.49	0.70	1.58	0.83***	4.25	1.17***	3.14	
Fama-French developed:	0.98***	3.69	-0.11	-0.28	1.09***	5.28	1.15***	4.51	0.44	1.30	0.71***	3.80	1.26***	5.65	

Fama-French developed ex US:	0.71**	2.40	-0.40	-0.95	1.13***	4.80	1.10***	3.82	0.39	1.13	0.71***	3.73	1.50***	5.85
Fama-French Europe:	0.87***	2.75	-0.81**	-2.24	1.77***	11.4	1.04***	3.03	0.00	0.00	1.04***	7.21	1.85***	8.23
Fama-French Asia Pacific ex JP:	1.02**	2.38	-0.35	-0.66	1.37***	6.25	1.58***	3.11	0.48	0.88	1.10***	4.36	1.94***	6.27

Panel D: Value-weighted portfolio returns in US dollar

Region	Country	Glamour stocks						Value stocks						Hedge portfolio	
		High FSCORE		Low FSCORE		H - L		High FSCORE		Low FSCORE		H - L		V & H - G & L	
		Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat	Return	t-stat
Africa & Middle East-Developed:															
	Israel	0.53	0.87	0.36	0.54	0.26	0.46	1.00	1.05	1.05	1.20	-0.19	-0.23	0.91	2.11
	Kuwait	0.10	0.21	0.53	0.60	-0.74	-0.94	0.61	0.87	-0.67	-0.76	1.47	1.92	-0.11	-0.12
	Oman	0.76	1.56	0.90	1.17	0.92	1.39	0.82	0.93	-0.05	-0.07	1.01	1.15	0.50	0.43
	Saudi Arabia	0.50	0.66	-0.14	-0.12	0.86	0.99	0.15	0.18	1.86	1.93	-1.05	-1.55	0.44	0.47
	United Arab Emirates	1.48	1.73	-2.73	-3.24	4.54	3.83	0.17	0.18	-0.92	-0.76	2.05	1.61	2.84	2.25
Africa-Emerging:															
	Egypt	0.15	0.19	-0.37	-0.40	-0.20	-0.31	0.56	0.58	1.08	1.35	-1.08	-1.53	-0.04	-0.05
	Jordan	-0.02	-0.04	-0.96	-1.99	0.94	1.76	-0.46	-0.81	-0.83	-2.21	0.50	0.72	0.50	0.76
	Kenya	0.52	0.79	-0.01	-0.01	1.04	0.93	0.27	0.24	0.26	0.30	-0.19	-0.13	-0.62	-0.43
	Morocco	0.85	1.74	0.36	0.51	0.54	0.87	0.46	0.68	0.42	0.62	0.04	0.07	0.74	1.19
	Nigeria	0.17	0.21	-1.44	-0.84	0.96	0.76	-0.31	-0.48	-1.74	-2.11	1.14	1.18	2.98	4.33
	South Africa	1.08	2.24	-0.41	-0.69	1.62	2.90	2.57	3.31	0.35	0.49	2.21	2.91	3.05	3.73
	Tunisia	-0.13	-0.13	-1.08	-2.02	2.95	3.58	-0.81	-1.18	-2.15	-4.20	1.09	1.79	1.33	2.61
Asia-Developed:															
	Hong Kong	1.00	1.97	0.94	1.47	0.41	0.75	1.05	1.71	0.88	1.49	0.44	1.25	0.47	0.85
	Japan	0.34	1.02	0.05	0.14	0.22	0.90	0.90	2.87	0.61	1.76	0.33	1.36	0.94	3.81
	South Korea	0.57	0.86	0.80	1.18	-0.04	-0.08	1.75	2.28	1.39	1.79	0.23	0.48	1.10	2.27
	Singapore	0.74	1.57	0.26	0.42	0.74	1.48	0.95	1.64	0.71	1.10	0.36	0.73	0.96	1.80
	Taiwan, China	0.74	1.43	0.69	1.31	0.13	0.31	0.46	0.78	0.09	0.14	0.37	1.40	-0.29	-0.52
Asia-Emerging:															
	Bangladesh	2.11	1.51	-0.70	-0.60	2.70	1.87	0.24	0.40	2.95	4.92	-4.00	-3.36	1.24	1.01
	China	0.86	1.27	1.17	1.80	-0.30	-1.28	1.09	1.49	1.15	1.72	-0.09	-0.30	0.07	0.15

India	1.25	2.09	1.23	1.67	0.19	0.36	1.81	2.34	0.88	1.12	0.41	0.83	0.75	1.58
Indonesia	1.66	1.56	-0.23	-0.25	1.88	1.95	-0.11	-0.11	0.27	0.40	-0.18	-0.24	0.12	0.12
Malaysia	1.08	1.79	0.07	0.11	1.16	2.21	1.37	2.26	0.61	0.93	0.79	2.57	1.29	3.57
Pakistan	1.49	2.50	0.82	1.08	0.62	0.83	1.63	2.20	0.45	0.58	0.79	1.29	0.33	0.47
Philippines	0.61	0.97	-0.17	-0.26	0.64	1.00	0.33	0.34	0.67	0.85	-0.59	-0.91	0.48	0.58
Sri Lanka	1.68	1.79	1.06	1.19	0.67	0.75	2.71	1.94	2.56	2.46	0.19	0.25	1.65	1.58
Thailand	0.66	1.25	0.11	0.14	0.61	1.15	1.14	1.77	0.24	0.35	0.92	1.68	1.10	2.34
Vietnam	-2.66	-2.38	-3.15	-2.78	0.48	0.37	-2.28	-2.56	-1.83	-1.78	-0.45	-0.82	0.87	0.95
Australasia-Developed:														
Australia	0.68	1.64	0.63	1.06	0.07	0.15	1.99	3.19	0.53	0.94	1.39	3.04	1.33	2.35
New Zealand	1.23	2.50	-0.62	-0.93	2.05	2.78	0.93	1.43	1.32	1.75	-0.02	-0.03	1.47	1.81
Europe-Developed:														
Austria	0.42	0.89	-0.83	-2.02	1.55	3.01	1.17	1.89	0.02	0.03	0.88	1.56	2.23	3.56
Belgium	0.87	2.01	0.77	1.64	0.14	0.29	0.78	1.50	0.66	1.85	0.13	0.28	-0.12	-0.20
Croatia	0.09	0.09	-2.19	-2.19	2.25	2.86	-0.17	-0.19	-0.01	-0.01	-0.04	-0.05	1.93	3.76
Cyprus	-0.98	-1.84	-3.02	-2.48	2.08	1.50	-0.24	-0.18	1.19	1.39	-1.66	-1.11	2.90	1.73
Czech Republic	1.05	1.38	0.30	0.19	1.64	1.02	3.05	1.31	-0.97	-0.54	3.79	2.56	1.61	1.03
Denmark	1.72	4.93	-0.32	-0.47	1.97	2.89	1.46	2.92	0.10	0.17	1.48	2.44	1.76	2.89
Finland	1.21	1.54	-0.27	-0.45	1.55	2.00	1.61	3.34	0.38	0.62	1.50	2.63	2.14	3.45
France	0.62	1.54	0.64	1.54	0.08	0.19	0.95	1.90	0.68	1.22	0.36	0.96	0.41	0.95
Germany	0.73	1.96	-0.34	-0.63	1.23	3.26	1.45	2.86	0.59	1.09	0.99	1.87	1.91	3.06
Greece	1.83	1.74	0.18	0.28	1.38	2.01	2.13	2.00	-0.11	-0.12	1.90	3.68	1.81	2.27
Hungary	-1.19	-1.05	-3.71	-1.89	3.21	2.35	-2.19	-1.15	0.21	0.15	0.00	0.00	6.62	3.00
Ireland	1.66	2.59	-0.81	-0.92	3.72	4.03	2.75	2.81	1.62	2.43	1.30	1.32	4.45	3.44
Italy	0.89	2.18	-0.52	-0.99	1.55	2.95	0.68	1.18	-0.20	-0.44	0.98	2.38	1.46	2.23
Netherlands	1.21	3.77	0.19	0.32	1.27	2.16	0.82	1.69	0.33	0.63	0.80	1.40	0.88	1.45
Norway	1.42	2.65	-0.32	-0.48	1.97	3.51	0.50	0.76	1.45	1.93	-0.92	-1.35	0.96	1.17
Poland	0.56	0.89	-0.06	-0.08	0.30	0.56	1.89	2.32	1.69	1.96	-0.07	-0.12	1.76	3.04

Portugal	1.67	4.34	-0.90	-1.29	3.34	4.56	1.67	3.00	-0.20	-0.32	1.58	2.34	3.30	3.79	
Spain	1.19	2.51	0.21	0.39	1.15	1.95	0.90	1.31	0.25	0.44	1.14	1.55	1.43	2.03	
Sweden	1.52	3.05	0.56	0.90	0.84	1.61	1.32	2.62	-0.10	-0.19	1.70	3.10	0.70	1.08	
Switzerland	1.11	3.31	0.32	0.84	0.60	1.53	1.38	3.62	0.94	2.10	0.46	1.09	1.05	2.78	
United Kingdom	0.63	1.88	0.29	0.74	0.44	1.22	0.94	2.18	0.34	0.76	0.60	1.60	0.65	1.52	
Europe-Emerging:															
Bosnia and Herzegovina	0.26	0.65	-1.68	-2.01	2.42	2.63	-0.31	-0.34	-0.23	-0.57	-0.14	-0.14	1.64	1.27	
Bulgaria	-0.31	-0.24	-0.50	-0.31	0.20	0.17	1.30	0.98	0.79	0.79	0.51	0.46	1.80	1.94	
Romania	-1.60	-1.32	-1.45	-1.24	-0.16	-0.17	0.64	0.63	-1.54	-1.54	2.18	2.64	2.09	2.66	
Russian Federation	0.87	0.93	0.08	0.07	1.00	1.49	0.94	0.80	0.83	0.69	0.48	0.65	1.08	1.11	
Serbia	-0.02	-0.02	-1.20	-2.77	1.00	1.35	-1.35	-3.07	-1.08	-3.15	-0.10	-0.20	-0.20	-0.25	
Turkey	1.31	2.05	1.58	1.87	-0.22	-0.30	2.07	2.40	1.87	2.22	0.53	0.94	1.46	2.16	
Ukraine	-3.26	-2.92	-3.25	-2.91	0.88	0.84	0.16	0.09	-0.71	-0.44	0.39	0.24	2.56	1.95	
Latin America-Emerging:															
Argentina	1.79	2.53	-0.07	-0.14	1.61	2.50	1.39	1.70	0.04	0.04	0.51	0.62	1.38	1.81	
Brazil	2.22	2.55	1.12	1.42	1.41	1.91	1.23	1.38	1.34	1.26	0.11	0.12	0.00	0.00	
Chile	0.51	1.13	1.07	2.22	-0.63	-1.72	0.65	1.20	1.14	1.99	-0.44	-0.85	-0.25	-0.59	
Colombia	0.17	0.19	-0.91	-1.40	1.40	1.31	0.83	1.31	-0.06	-0.10	1.77	2.53	1.62	2.98	
Mexico	1.43	3.01	1.06	1.69	0.64	1.09	1.85	2.04	0.79	1.27	1.44	2.07	1.30	1.25	
Peru	1.04	2.20	0.58	0.91	0.34	0.56	1.54	1.68	1.38	1.43	0.91	0.81	0.70	0.64	
North America-Developed:															
Canada	0.58	1.52	0.34	0.65	0.20	0.40	1.32	2.39	1.10	2.04	0.15	0.34	0.94	1.81	
United States	0.86	3.06	1.08	3.35	-0.22	-1.18	1.26	4.40	0.93	2.58	0.33	1.47	0.17	0.52	
Cross-country portfolios:															
All:	0.86***	3.23	0.61**	1.97	0.25	1.35	1.03***	3.46	0.65*	1.81	0.38*	1.96	0.42*	1.86	
Developed:	0.85***	3.16	0.63**	2.02	0.21	1.18	0.97***	3.33	0.57	1.58	0.40*	1.91	0.34	1.45	
Emerging:	0.51	1.25	0.41	0.99	0.04	0.17	1.66***	2.83	1.00*	1.94	0.60	1.35	1.29***	2.75	
Fama-French developed:	0.86***	3.21	0.61*	1.92	0.25	1.38	0.95***	3.37	0.62*	1.78	0.33	1.52	0.34	1.44	



Fama-French developed ex US:	0.83***	2.84	0.34	0.92	0.47**	2.46	1.00***	3.19	0.55	1.54	0.44**	2.07	0.66***	2.61
Fama-French Europe:	0.98***	3.39	0.40	1.04	0.67***	2.68	1.21***	3.08	0.48	1.06	0.73***	2.75	0.81**	2.54
Fama-French Asia Pacific ex JP:	0.83**	2.02	0.57	1.10	0.25	0.80	1.01**	2.04	0.60	1.03	0.41	1.27	0.44	1.06

Table 4: Cross-sectional regression results of stock returns on unconditional FSCORE strategy

Note: This table reports the coefficient estimates of cross-sectional regressions using Equation (1). The dependent variable is the monthly return in US dollar for individual stock. The returns are in percentage points. The variables MidFSCORE and HighFSCORE are dummy variables if a firm has FSCORE value between 4 and 6, and larger than 6, respectively. The low FSCORE stocks are the base group that is omitted in the regression. The constants are not reported in the table. The control variables include book to market (BM), market capitalization (size), asset growth (AG), operating profitability (OP) and momentum (MM). The country dummies are included in the regressions. The regressions are run in full sample and six subsamples, including developed countries, emerging countries, Fama-French developed countries, Fama-French developed countries excluding US, Fama-French Europe countries and Fama-French Asia Pacific countries. The t-statistics in parentheses are calculated by Newey and West (1987) robust standard errors with a 10-month lag. \*\*\*, \*\*, and \* are 1%, 5%, and 10% significance levels, respectively.

	All	Developed	Emerging	Fama-French developed	Fama-French developed ex US	Fama-French Europe	Fama-French Asia Pacific
MidFSCORE	0.31*** (6.25)	0.31*** (5.51)	0.31*** (4.97)	0.32*** (5.05)	0.36*** (5.23)	0.49*** (8.93)	0.34*** (3.03)
HighFSCORE	0.49*** (8.43)	0.48*** (7.35)	0.42*** (3.08)	0.49*** (6.89)	0.62*** (7.46)	0.78*** (9.24)	0.73*** (4.51)
BM	0.19*** (3.92)	0.20*** (3.67)	0.21** (2.19)	0.18*** (3.34)	0.20*** (3.82)	0.18*** (3.11)	0.23*** (2.82)
SIZE	0.01 (0.92)	0.02* (1.71)	-0.02 (-1.09)	0.03** (2.34)	0.04*** (3.16)	0.09*** (5.77)	-0.04 (-1.38)
AG	-0.28*** (-4.70)	-0.29*** (-4.67)	-0.18* (-1.68)	-0.29*** (-4.55)	-0.37*** (-4.94)	-0.39*** (-5.38)	-0.44*** (-5.17)
OP	0.22*** (5.34)	0.20*** (4.80)	0.60*** (3.09)	0.18*** (4.44)	0.21*** (5.03)	0.19*** (5.08)	0.73*** (5.12)
MM	0.75*** (8.00)	0.72*** (7.13)	0.73*** (5.19)	0.78*** (7.04)	0.85*** (7.26)	1.68*** (13.16)	0.50*** (3.36)
N of months	300	300	300	300	300	300	300
Adj. R2	0.1495	0.1182	0.2140	0.1059	0.1202	0.0817	0.0923

Table 5: Cross-sectional regression results of stock returns on conditional FSCORE strategy

Note: This table reports the coefficient estimates of cross-sectional regressions using Equation (2). The dependent variable is the monthly return in US dollar for individual stock. The returns are in percentage points. The variables Glamour, Middle and Value are dummy variables for glamour stocks, middle stocks and value stocks in each country. These variables are interacted with dummy variables of high FSCORE, mid FSCORE and low FSCORE. The variable V & H - G & L estimate the return for hedge portfolio. Control variables and country dummies are included in the regressions. The regressions are run in full sample and six subsamples. The t-statistics in parentheses are calculated by Newey and West (1987) robust standard errors with a 10-month lag. \*\*, \*\*\*, and \* are 1%, 5%, and 10% significance levels, respectively.

	All	Developed	Emerging	Fama-French developed	Fama-French developed ex US	Fama-French Europe	Fama-French Asia Pacific
Glamour	0.36 (0.46)	0.38 (0.86)	0.18 (0.28)	0.48 (1.30)	0.65* (1.74)	0.47 (1.26)	0.49** (2.21)
Glamour*LowFSCORE	-0.53*** (-8.70)	-0.52*** (-7.76)	-0.16 (-0.73)	-0.54*** (-7.94)	-0.67*** (-8.21)	-0.90*** (-9.93)	-0.68*** (-4.14)
Glamour*MidFSCORE	-0.19*** (-5.99)	-0.19*** (-5.09)	0.24 (1.08)	-0.20*** (-4.94)	-0.30*** (-4.36)	-0.33*** (-4.26)	-0.39** (-2.58)
Middle	0.38 (0.49)	0.42 (0.97)	0.57 (0.83)	0.50 (1.33)	0.63 (1.52)	0.43 (1.13)	0.42 (1.48)
Middle*LowFSCORE	-0.30*** (-4.85)	-0.31*** (-4.30)	-0.24*** (-3.42)	-0.32*** (-3.98)	-0.37*** (-4.41)	-0.45*** (-7.15)	-0.29** (-2.11)
Middle*HighFSCORE	0.19*** (7.11)	0.16*** (5.82)	0.38*** (3.63)	0.17*** (5.61)	0.32*** (3.17)	0.37*** (2.95)	0.21 (1.41)
Value	0.27 (0.34)	0.31 (0.67)	0.49 (0.69)	0.38 (0.89)	0.47 (1.02)	0.12 (0.29)	0.26 (0.82)
Value*MidFSCORE	0.28*** (5.37)	0.28*** (4.61)	0.26** (2.03)	0.28*** (4.11)	0.31*** (4.17)	0.43*** (5.76)	0.44*** (3.41)
Value*HighFSCORE	0.43*** (6.72)	0.44*** (6.04)	0.44*** (2.90)	0.43*** (5.44)	0.55*** (5.43)	0.65*** (6.81)	0.86*** (3.30)
SIZE	0.01 (0.84)	0.02 (1.65)	-0.02 (-1.25)	0.03** (2.23)	0.04*** (3.10)	0.09*** (5.81)	-0.03 (-1.28)
AG	-0.26*** (-4.77)	-0.28*** (-4.77)	-0.18 (-1.60)	-0.28*** (-4.64)	-0.35*** (-5.06)	-0.38*** (-5.48)	-0.43*** (-5.07)
OP	0.22*** (5.24)	0.20*** (4.72)	0.60*** (2.68)	0.18*** (4.37)	0.21*** (5.16)	0.20*** (5.41)	0.72*** (4.99)
MM	0.74*** (7.91)	0.72*** (7.09)	0.70*** (4.77)	0.77*** (7.01)	0.85*** (7.24)	1.67*** (13.13)	0.48*** (3.17)
N of months	300	300	300	300	300	300	300
Adj. R2	0.2193	0.1940	0.2967	0.1824	0.2043	0.1911	0.2139
V & H - G & L	0.88*** (6.42)	0.89*** (6.15)	0.91*** (5.28)	0.87*** (6.03)	1.04*** (7.06)	1.20*** (7.80)	1.31*** (3.83)

Table 6: Fama-French five-factor alphas on FSCORE strategies

Note: This table presents the Fama-French five-factor alphas for the portfolios constructed by FSCORE alone and by both FSCORE and BM using Equation (3). Panel A reports the alphas from equal-weighted portfolios and Panel B reports the alphas from value-weighted portfolios. We obtain Fama-French five-factor returns for US market and international markets. The corresponding portfolios are constructed in four cross-country regions defined by Fama and French (2015) and two countries (US and Japan). The alphas for high FSCORE portfolio (H), low FSCORE portfolio (L) and the long-short portfolio (H - L) are estimated in all stocks, glamour stocks and value stocks. The hedge portfolio (V & H - G & L) is to buy high FSCORE value stocks and sell low FSCORE glamour stocks. The alphas are all in percentage points per month. The sample is from July of 1991 to June of 2016. The t-statistics in parentheses are calculated by Newey and West (1987) robust standard errors with a 10-month lag. \*\*, \*\*\*, and \* are 1%, 5%, and 10% significance levels, respectively.

Panel A: Equal-weighted alphas

	Unconditional			Glamour stocks			Value stocks			Hedge portfolio
	H	L	H - L	H	L	H - L	H	L	H - L	V & H - G & L
Fama-French developed:										
Alpha	0.22**	-0.70***	0.71***	0.21*	-0.84***	0.83***	0.34***	-0.51***	0.63***	0.96***
t-stat	(2.28)	(-3.93)	(3.98)	(1.94)	(-4.49)	(4.85)	(2.74)	(-2.88)	(3.11)	(5.10)
Fama-French developed countries ex US:										
Alpha	0.21**	-0.57***	0.57***	0.07	-0.79***	0.66***	0.34**	-0.37**	0.49**	0.91***
t-stat	(2.21)	(-3.28)	(3.12)	(0.58)	(-3.88)	(3.39)	(2.28)	(-2.36)	(2.36)	(3.88)
Fama-French Europe: 16 countries										
Alpha	0.21**	-0.98***	0.98***	0.18*	-1.25***	1.26***	0.15	-0.74***	0.68***	1.19***
t-stat	(2.11)	(-6.85)	(6.35)	(1.70)	(-7.97)	(7.80)	(1.57)	(-4.73)	(3.99)	(7.85)
Fama-French Asia Pacific ex JP:										
Alpha	0.38***	-0.45***	0.62***	0.30	-0.69***	0.78***	0.77***	-0.12	0.68**	1.26***
t-stat	(3.05)	(-2.69)	(3.35)	(1.44)	(-3.22)	(3.40)	(3.31)	(-0.59)	(2.48)	(4.50)
US:										
Alpha	0.24***	0.03	-0.01	0.19*	-0.09	0.06	0.33**	0.13	-0.01	0.21
t-stat	(2.67)	(0.19)	(-0.05)	(1.89)	(-0.58)	(0.43)	(2.42)	(0.79)	(-0.07)	(1.20)
Japan:										
Alpha	0.18*	-0.38***	0.35***	-0.02	-0.64***	0.41***	0.36**	-0.10	0.25	0.79***
t-stat	(1.74)	(-3.44)	(3.61)	(-0.14)	(-4.36)	(2.75)	(2.39)	(-0.99)	(1.64)	(4.48)

Panel B: Value-weighted alphas

	Unconditional			Glamour stocks			Value stocks			Hedge portfolio
	H	L	H - L	H	L	H - L	H	L	H - L	V & H - G & L
Fama-French developed:										
Alpha	0.17**	-0.18	0.13	0.12	-0.03	-0.07	0.12	-0.25	0.15	-0.07
t-stat	(2.20)	(-1.21)	(0.85)	(1.43)	(-0.22)	(-0.47)	(0.96)	(-1.05)	(0.55)	(-0.38)
Fama-French developed countries ex US:										
Alpha	0.25***	-0.09	0.12	0.22**	-0.04	0.03	0.18	-0.26*	0.23	0.00
t-stat	(3.15)	(-0.54)	(0.65)	(2.14)	(-0.21)	(0.14)	(0.87)	(-1.77)	(0.99)	(0.00)
Fama-French Europe:										
Alpha	0.11	-0.09	-0.02	0.15	-0.16	0.12	0.09	-0.36	0.23	0.04
t-stat	(1.06)	(-0.47)	(-0.09)	(1.11)	(-0.72)	(0.38)	(0.47)	(-1.25)	(0.71)	(0.13)
Fama-French Asia Pacific ex JP:										
Alpha	0.03	0.19	-0.36	-0.02	0.40	-0.62**	0.14	-0.19	0.13	-0.46
t-stat	(0.20)	(0.81)	(-1.53)	(-0.08)	(1.34)	(-2.04)	(0.50)	(-0.96)	(0.50)	(-1.08)
US:										
Alpha	0.07	-0.03	-0.12	0.01	0.28	-0.48**	0.03	-0.16	-0.03	-0.46**
t-stat	(0.80)	(-0.24)	(-0.83)	(0.09)	(1.60)	(-2.58)	(0.26)	(-0.86)	(-0.15)	(-2.23)
Japan:										
Alpha	0.23**	-0.14	0.16	-0.02	-0.30	0.07	0.39**	0.14	0.04	0.48*
t-stat	(2.48)	(-0.88)	(0.88)	(-0.24)	(-1.50)	(0.31)	(2.00)	(1.07)	(0.17)	(1.93)

Table 7: Limits to arbitrage and FSCORE portfolio returns: country-level analysis

Note: This table presents the coefficient estimates of the cross-country analysis using Equation (4). The dependent variable is the monthly return of FSCORE portfolio in each country in each month. The independent variables are five measures of limits to arbitrage at country level, including the number of institutional investors (INS\_NUM), institutional ownership (IO), the number of analysts (ANA\_NUM), idiosyncratic stock return volatility (IVOL) and cash flow volatility (CFVOL). The country and year-month fixed effects are included in the regressions. Panel A reports the results for the portfolio returns from the strategy of long high FSCORE stocks and show low FSCORE stocks. Panel B reports the results for the hedge portfolio returns. Panel C presents the results for the portfolio returns from long strategy of high FSCORE value stock and Panel C shows the results for short strategy of low FSCORE glamour stocks. The t-statistics in parentheses are calculated by robust standard errors. \*\*, \*\*\*, and \* are 1%, 5%, and 10% significance levels, respectively.

Panel A: Portfolio returns in long-short FSCORE strategy

	Long high FSCORE stocks and short low FSCORE stocks									
	Equal-weighted portfolio return					Value-weighted portfolio return				
INS_NUM	-0.01** (-2.35)					-0.02*** (-3.64)				
IO (%)	-0.06*** (-3.42)					-0.08*** (-3.11)				
ANA_NUM	-0.01 (-0.37)					0.03 (0.57)				
IVOL (%)	-0.03 (-1.19)					-0.00 (-0.03)				
CFVOL (%)	0.07** (2.43)					0.03 (1.03)				
Constant	1.45*** (7.80)	1.59*** (9.45)	0.94*** (5.02)	1.14*** (4.81)	0.35 (1.62)	1.60*** (6.05)	1.40*** (5.71)	0.44* (1.84)	0.59* (1.72)	0.35 (1.59)
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-month fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N of observations	8,036	8,036	13,023	13,337	12,523	8,036	8,036	13,023	13,337	12,523
N of countries	45	45	62	65	65	45	45	62	65	65

R-squared: within	0.0013	0.0021	0.0000	0.0001	0.0009	0.0025	0.0014	0.0000	0.0000	0.0001
R-squared: between	0.0422	0.0290	0.0449	0.0001	0.0045	0.0000	0.0041	0.0024	0.0096	0.0097
R-squared: overall	0.0001	0.0000	0.0006	0.0003	0.0007	0.0004	0.0004	0.0001	0.0001	0.0000

Panel B: Portfolio returns in hedge portfolio

	Long high FSCORE value and short low FSCORE glamour: V & H - G & L									
	Equal-weighted portfolio return					Value-weighted portfolio return				
INS_NUM	-0.03*** (-3.74)					-0.04*** (-4.35)				
IO (%)		-0.14*** (-4.44)					-0.19*** (-4.05)			
ANA_NUM			-0.20*** (-3.87)					-0.17*** (-2.68)		
IVOL (%)				0.10** (2.04)					0.12* (1.94)	
CFVOL (%)					0.13*** (3.11)					0.13*** (3.02)
Constant	3.01*** (8.95)	3.13*** (10.07)	2.59*** (9.28)	0.65 (1.56)	0.50 (1.62)	3.212*** (7.672)	3.295*** (7.015)	2.069*** (6.106)	0.144 (0.275)	0.142 (0.434)
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-month fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N of observations	7,483	7,483	11,477	11,715	11,228	7,483	7,483	11,477	11,715	11,228
N of countries	45	45	62	65	65	45	45	62	65	65
R-squared: within	0.0034	0.0039	0.0014	0.0004	0.0011	0.0040	0.0041	0.0006	0.0003	0.0007
R-squared: between	0.0298	0.0221	0.0160	0.0383	0.0269	0.0041	0.0001	0.0051	0.0080	0.0003
R-squared: overall	0.0000	0.0001	0.0001	0.0003	0.0010	0.0004	0.0006	0.0002	0.0001	0.0002

Panel C: Portfolio returns from the strategy of long high FSCORE value stocks

	Long high FSCORE value: V & H									
	Equal-weighted portfolio return					Value-weighted portfolio return				
INS_NUM	-0.01**					-0.02***				
	(-2.59)					(-3.42)				
IO (%)		-0.07***					-0.09***			
		(-2.93)					(-3.20)			
ANA_NUM			-0.19***					-0.20**		
			(-2.83)					(-2.65)		
IVOL (%)				0.15**					0.15*	
				(2.22)					(1.97)	
CFVOL (%)					0.02					0.05
					(0.65)					(1.47)
Constant	1.86***	2.02***	2.26***	-0.05	1.05***	2.23***	2.19***	2.29***	-0.07	0.76**
	(8.57)	(8.23)	(6.42)	(-0.09)	(4.12)	(8.65)	(8.38)	(5.73)	(-0.11)	(2.64)
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-month fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N of observations	7,752	7,752	12,067	12,357	6,744	7,752	7,752	12,067	12,357	6,744
N of countries	45	45	62	65	45	45	45	62	65	45
R-squared: within	0.0007	0.0011	0.0012	0.0009	0.0000	0.0012	0.0010	0.0010	0.0006	0.0002
R-squared: between	0.0096	0.0060	0.0001	0.2357	0.0396	0.0007	0.0002	0.0056	0.1346	0.0013
R-squared: overall	0.0006	0.0004	0.0005	0.0025	0.0003	0.0005	0.0002	0.0004	0.0013	0.0002



Panel D: Portfolio returns from the strategy of short low FSCORE glamour stocks

	Short low FSCORE glamour: - G & L									
	Equal-weighted portfolio return					Value-weighted portfolio return				
INS_NUM	-0.02** (-2.35)					-0.02*** (-2.82)				
IO (%)	-0.08** (-2.39)					-0.13*** (-3.01)				
ANA_NUM	-0.01 (-0.18)					0.03 (0.46)				
IVOL (%)	-0.06 (-0.71)					-0.05 (-0.52)				
CFVOL (%)	0.10*** (2.70)					0.08* (1.84)				
	1.23*** (3.61)	1.25*** (3.64)	0.18 (0.56)	0.63 (0.88)	-0.56* (-1.99)	1.09*** (2.97)	1.28*** (3.14)	-0.34 (-0.97)	0.30 (0.33)	-0.68** (-2.11)
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-month fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N of observations	7,749	7,749	13,089	13,365	11,903	7,749	7,749	13,089	13,365	11,903
N of countries	45	45	62	65	65	45	45	62	65	65
R-squared: within	0.0012	0.0012	0.0000	0.0001	0.0006	0.0014	0.0018	0.0000	0.0001	0.0003
R-squared: between	0.0901	0.0590	0.0001	0.0596	0.0102	0.0324	0.0085	0.0360	0.0868	0.0138
R-squared: overall	0.0003	0.0001	0.0001	0.0015	0.0000	0.0000	0.0001	0.0000	0.0011	0.0000

Table 8: Limits to arbitrage and firm-level fundamental analysis returns: unconditional FSCORE strategy

Note: This table reports the estimations results of the effects of limits to arbitrage on the fundamental analysis returns at firm level using Equation (1). The countries in our sample are classified into low group, medium group and high group annually based on the five measures of limits to arbitrage. The Fama and MacBeth (1973) regressions are used to estimate the coefficients of HighFSCOER and MidFSCORE in each group. The difference in the HighFSCORE coefficient is calculated between the high group and low group. The coefficients on control variables are not reported. Panel A gives the results for groups based on the investor sophistication and analyst coverage. Panel B reports the results grouped by idiosyncratic risk and information uncertainty. The t-statistics in parentheses are calculated by Newey and West (1987) robust standard errors with a 10-month lag. \*\*, \*\*\*, and \* are 1%, 5%, and 10% significance levels, respectively.

Panel A: Investor sophistication and analyst coverage

	Number of institutional investors			Institutional ownership			Number of analysts		
	Low	Medium	High	Low	Medium	High	Low	Medium	High
MidFSCORE	0.38*** (6.71)	0.41*** (4.31)	0.40*** (6.16)	0.29*** (6.94)	0.47*** (6.88)	0.41*** (3.40)	0.28*** (4.55)	0.27*** (3.73)	0.37*** (7.42)
HighFSCORE	0.56*** (6.93)	0.56*** (5.79)	0.60*** (7.12)	0.40*** (6.75)	0.66*** (8.43)	0.61*** (4.67)	0.43*** (3.07)	0.45*** (5.07)	0.65*** (10.35)
High - Low: HighFSCORE			0.04 (0.39)			0.22* (1.76)			0.22 (1.41)

Panel B: Idiosyncratic risk and information uncertainty

	Idiosyncratic stock return volatility			Cash flow volatility		
	Low	Medium	High	Low	Medium	High
MidFSCORE	0.50*** (8.84)	0.28*** (6.48)	0.25*** (3.64)	0.21*** (5.46)	0.36*** (7.67)	0.32*** (3.58)
HighFSCORE	0.80*** (8.91)	0.52*** (9.09)	0.42*** (4.97)	0.39*** (5.19)	0.54*** (8.51)	0.68*** (6.63)
High - Low: HighFSCORE			-0.38*** (-3.37)			0.30** (2.48)

Table 9: Limits to arbitrage and firm-level FSCORE stock returns: conditional FSCORE strategy

Note: This table reports the estimations results of the effects of limits to arbitrage on the fundamental analysis returns at firm level using Equation (2). The countries in our sample are classified into low group, medium group and high group annually based on the five measures of limits to arbitrage. The coefficients on the variables Glamour, Middle and Value, as well as their interacted variables with LowFSCORE, MidFSCORE and HighFSCORE, are estimated in Fama and MacBeth (1973) regressions. The coefficient on V & H - G & L shows the hedge portfolio return. The differences in the coefficients of Glamour\*LowFSCORE, Value\*HighFSCORE and V & H - G & L are calculated between the high group and low group. The coefficients on control variables are not reported. Panel A gives the results for groups based on the investor sophistication and analyst coverage. Panel B reports the results grouped by idiosyncratic risk and information uncertainty. The t-statistics in parentheses are calculated by Newey and West (1987) robust standard errors with a 10-month lag. \*\*, \*\*, and \* are 1%, 5%, and 10% significance levels, respectively.

Panel A: Investor sophistication and analyst coverage

	Number of institutional investors			Institutional ownership			Number of analysts		
	Low	Medium	High	Low	Medium	High	Low	Medium	High
Glamour	0.56 (1.10)	0.60 (1.29)	0.32 (0.50)	0.91** (2.39)	0.16 (0.42)	0.28 (0.50)	0.63 (1.48)	0.68* (1.85)	0.63 (1.60)
Glamour*LowFSCORE	-0.63*** (-5.71)	-0.55*** (-8.19)	-0.61*** (-5.16)	-0.50*** (-5.73)	-0.80*** (-7.34)	-0.54*** (-3.82)	-0.30 (-1.17)	-0.42*** (-3.94)	-0.66*** (-6.51)
Glamour*MidFSCORE	-0.19*** (-2.94)	-0.15*** (-3.34)	-0.17** (-2.20)	-0.14** (-2.38)	-0.24*** (-4.95)	-0.15** (-2.20)	0.04 (0.17)	-0.09 (-1.39)	-0.29*** (-4.56)
Middle	0.73 (1.32)	0.82* (1.73)	0.43 (0.68)	1.09*** (2.83)	0.33 (0.79)	0.43 (0.81)	0.99* (1.91)	0.78** (2.23)	0.62 (1.56)
Middle*LowFSCORE	-0.40*** (-4.59)	-0.45*** (-3.62)	-0.38*** (-4.16)	-0.29*** (-5.84)	-0.46*** (-5.15)	-0.48*** (-3.31)	-0.33*** (-3.63)	-0.26*** (-3.11)	-0.38*** (-5.96)
Middle*HighFSCORE	0.23*** (3.81)	0.16*** (3.96)	0.22*** (5.12)	0.12** (2.42)	0.23*** (4.92)	0.21*** (5.34)	0.29** (2.52)	0.26*** (2.71)	0.29*** (6.09)
Value	0.72 (1.24)	0.65 (1.14)	0.26 (0.38)	1.17*** (2.84)	0.16 (0.34)	0.23 (0.36)	1.04* (1.94)	0.72* (1.93)	0.38 (0.86)

Value*MidFSCORE	0.30*** (3.88)	0.34*** (3.13)	0.32*** (3.55)	0.20*** (3.17)	0.36*** (4.67)	0.30** (2.34)	0.18 (1.60)	0.23*** (2.93)	0.34*** (5.74)
Value*HighFSCORE	0.35*** (3.10)	0.48*** (4.18)	0.53*** (6.61)	0.24*** (3.08)	0.46*** (6.24)	0.54*** (3.77)	0.36** (2.39)	0.42*** (3.27)	0.58*** (7.35)
V & H - G & L	1.13*** (6.08)	1.08*** (6.88)	1.08*** (6.69)	1.00*** (5.55)	1.25*** (6.80)	1.03*** (5.14)	1.08*** (5.78)	0.88*** (4.54)	1.00*** (6.10)
High - Low: Glamour*LowFSCORE			0.01 (0.11)			-0.04 (-0.24)			-0.36 (-1.31)
High - Low: Value*HighFSCORE			0.18 (1.32)			0.29** (2.13)			0.22 (1.32)
High - Low: V & H - G & L			-0.05 (-0.33)			0.03 (0.13)			-0.07 (-0.37)

Panel B: Idiosyncratic risk and information uncertainty

	Idiosyncratic volatility			Cash flow volatility		
	Low	Medium	High	Low	Medium	High
Glamour	-0.26 (-0.66)	0.65 (1.47)	0.10 (0.15)	0.11 (0.30)	0.36 (0.67)	0.14 (0.18)
Glamour*LowFSCORE	-0.80*** (-8.11)	-0.56*** (-6.44)	-0.44*** (-4.51)	-0.35*** (-3.11)	-0.64*** (-7.00)	-0.60*** (-4.05)
Glamour*MidFSCORE	-0.30*** (-2.95)	-0.22*** (-3.63)	-0.17*** (-3.57)	-0.08 (-0.94)	-0.19*** (-4.22)	-0.30** (-2.50)
Middle	-0.28 (-0.68)	0.69 (1.57)	0.08 (0.13)	0.26 (0.70)	0.44 (0.79)	0.10 (0.13)
Middle*LowFSCORE	-0.51*** (-6.81)	-0.27*** (-6.02)	-0.22** (-2.58)	-0.19*** (-3.88)	-0.35*** (-5.68)	-0.35*** (-3.04)
Middle*HighFSCORE	0.40** (2.53)	0.40*** (3.02)	0.18*** (5.10)	0.24** (2.09)	0.19*** (4.59)	0.30*** (3.40)
Value	-0.58 (-1.28)	0.63 (1.36)	-0.02 (-0.03)	0.31 (0.80)	0.35 (0.63)	-0.05 (-0.07)
Value*MidFSCORE	0.43*** (5.02)	0.20*** (3.63)	0.27*** (3.38)	0.14*** (3.22)	0.28*** (4.67)	0.28*** (2.75)
Value*HighFSCORE	0.70*** (6.39)	0.42*** (5.05)	0.40*** (4.52)	0.35*** (3.20)	0.44*** (5.95)	0.60*** (5.06)
V & H - G & L	1.17*** (7.97)	0.96*** (8.09)	0.72*** (3.83)	0.90*** (6.74)	1.06*** (6.37)	1.01*** (5.04)
High - Low: Glamour*LowFSCORE			0.36** (2.43)			-0.25 (-1.16)
High - Low: Value*HighFSCORE			-0.29** (-2.20)			0.25 (1.54)

High - Low: V & H - G & L	-0.45*** (-3.16)	0.11 (0.59)
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Appendix 1: Variable definitions and data source

Variable	Definition	Data Source
Firm characteristic variables:		
RET	Monthly stock return in local currency or US dollar; calculated by the return index (RI)	Datastream
RETRF	Monthly excess return in the portfolio constructed by FSCORE alone or by FSCORE and BM	
F_ROA	Dummy variable; equal to 1 if net income before extraordinary items (WC01551-WC05401) is positive	Worldscope
F_CFO	Dummy variable; equal to 1 if cash flow from operations (WC04860) is positive	Worldscope
F_ΔROA	Dummy variable; equal to 1 if the growth in ROA (net income/total assets) from prior fiscal year is positive	Worldscope
F_ACCRUAL	Dummy variable; equal to 1 if cash flow from operations is larger than net income	Worldscope
F_ΔLEVER	Dummy variable; equal to 1 if the leverage is decreased from prior fiscal year; the leverage is the ratio of long term debt (WC03251) over total assets (WC02999)	Worldscope
F_ΔLIQUID	Dummy variable; equal to 1 if the liquidity is increased; the liquidity is measured by current ratio (WC08106)	Worldscope
EQ_OFFER	Dummy variable; equal to 1 if the proceeds from the sale of common and preferred stocks (WC04251) are zero	Worldscope
F_ΔMARGIN	Dummy variable; equal to 1 if the gross margin is increased from prior fiscal year; the gross margin is defined as the difference between sales (WC01001) and cost of goods sold (WC01051), scaled by sales	Worldscope
F_ΔTURN	Dummy variable; equal to 1 if the asset turnover is increased from prior fiscal year; the asset turnover is the ratio of sales (WC01001) over total assets (WC02999) at the beginning of the fiscal year	Worldscope
FSCORE	$FSCORE = F\_ROA + F\_CFO + F\_ΔROA + F\_ACCRUAL + F\_ΔLEVER + F\_ΔLIQUID + EQ\_OFFER + F\_ΔMARGIN + F\_ΔTURN$	
HighFSCORE	Dummy variable for high FSCORE stock; equal to 1 if $FSCORE > 6$	
MidFSCORE	Dummy variable for mid FSCORE stock; equal to 1 if $FSCORE > 3$ and $FSCORE < 7$	
LowFSCORE	Dummy variable for low FSCORE stock; equal to 1 if $FSCORE < 4$	
BM	The book to market ratio (1/WC09304)	Worldscope
Glamour	Dummy variable for glamour stock; equal to 1 if the BM is in the bottom 30% of the distribution	
Middle	Dummy variable for middle stock; equal to 1 if the BM is in between 30% and 70% of the distribution	
Value	Dummy variable for value stock; equal to 1 if the BM is in the top 30% of the distribution	
SIZE	Market capitalization (MV) in US dollar at the end of June each year	Datastream

AG	Asset growth ratio; the difference of total assets (WC02999) between this fiscal year and prior fiscal year, scaled by total assets in prior fiscal year	Worldscope
OP	Operating profitability ratio; the revenue (WC01001) minus the sum of cost of goods sold (WC01051), selling, general and administrative expenses (WC01101) and interest expense (WC01251), scaled by book value of equity (WC03501) in prior fiscal year	Worldscope
MM	Stock return momentum; cumulative stock return from Jan to May each year	Datastream
Country characteristics variables:		
NUM_INS	Within-country average of the number of institutional investors on the stocks in a country at the end of June each year	FactSet
IO	Within-country average of the institutional ownerships on the stocks in a country at the end of June each year	FactSet
NUM_ANA	Within-country average of the number of analysts covered the stocks in a country at the end of June each year	IBES
IVOL	Within-country average of idiosyncratic stock return volatility in a country at the end of June each year; idiosyncratic volatility calculated by market model based on the stock returns in past 60 months (minimum 24 months)	Datastream
CFVOL	Within-country average of cash flow volatility of firms in a country at the end of June each year; the volatility is the standard deviation of cash flow from operations in past 5 years (minimum 3 years)	Worldscope