The Profitability Effect: Insights from International Equity Markets*

Te-Feng Chen
The Hong Kong Polytechnic University
Email: tefeng.chen@polyu.edu.hk

Lei Sun
Boston Consulting Group
Shanghai, China
Email: sunlei.sun@hotmail.com

K. C. John Wei+
The Hong Kong Polytechnic University
Email: johnwei@ust.hk

Feixue Xie
The University of Texas at El Paso
Email: fxie@utep.edu

May 2018

Abstract

Using data from 33 international markets over the period 1990-2017, we reveal that the profitability effect exists in many countries other than the U.S., but the size of this effect is sensitive to the measure of profitability and portfolio sorts. Furthermore, the profitability effect is significant in pooled developed and global markets though less so in emerging markets, suggesting justification for incorporating a profitability factor in regional/global factor models. Our cross-region and cross-country analyses show mixed evidence for a positive relation between profitability effects and market developments, though the overall findings lean toward supporting the prediction of the investment model.

* We thank Lu Zhang (the editor) and an anonymous referee for constructive and insightful comments and suggestions that have significantly improved the paper. We also appreciate the helpful comments from Andrew Karolyi, Hugues Langlois, Sheridan Titman, Neng Wang, and seminar and conference participants from the 2014 European Finance Association (EFA) conference, the 2014 Financial Management Association (FMA) conference, the 2014 Asian Finance Association (Asian FA) conference, Dongbei University of Finance and Economics, Fudan University, National Chengchi University, National Sun Yat-sen University, and National Taiwan University. The previous version of the paper carried the titles "On explanations for the gross profitability effect: Insights from international equity markets" and "The gross profitability effect: International evidence." John Wei acknowledges financial support from the Research Grants Council of the Hong Kong Special Administrative Region, China (project no. 16503514). Any remaining errors are our sole responsibility.

+ Corresponding author: K.C. John Wei, School of Accounting and Finance, Hong Kong Polytechnic University. Tel: (852)-2766-4953; Fax: (852)-2330-9845. Email: johnwei@ust.hk.

The Profitability Effect:
Insights from International Equity Markets

Abstract

Using data from 33 international markets over the period 1990-2017, we reveal that the profitability effect exists in many countries other than the U.S., but the size of this effect is sensitive to the measure of profitability and portfolio sorts. Furthermore, the profitability effect is significant in pooled developed and global markets though less so in emerging markets, suggesting justification for incorporating a profitability factor in regional/global factor models. Our cross-region and cross-country analyses show mixed evidence for a positive relation between profitability effects and market developments, though the overall findings lean toward supporting the prediction of the investment model.

JEL Classification: G12; G14; G15

Keywords: Profitability effect; Profitability factor; Cross-sectional returns; Investment CAPM; Behavioral finance; International equity markets

1. Introduction

The primary goals of this study are to provide large-scale empirical evidence on the profitability effect based on different profitability measures in international equity markets and to examine how the profitability effect varies across countries with different levels of market development. We first examine whether extant findings on the profitability effect transfer beyond the U.S. and whether the size of this effect is sensitive to the denominator of profitability measures and portfolio sorts. We focus on the six measures of profitability commonly used in the literature: gross profitability of Novy-Marx (2013), operating profitability of Fama and French (2015), operating profitability of Ball et al. (2015), two lagged gross profitability measures of Zhang (2017), and the profitability measure of Hou, Xue, and Zhang (HXZ, 2015).

For each profitability measure we construct four measures to quantify the profitability effect in each country in our sample. The first two measures of the profitability effect are the equal-weighted (EW) and value-weighted (VW) return spreads between the two extreme profitability quintiles within each country. The other two measures are the Fama and MacBeth (1973) type of ordinary least squares (OLS) and weighted least squares (WLS) regression coefficients on profitability. Because profitability measures may be substantially affected by the variation in accounting standards across countries, we take a within-country approach by comparing returns on high and low profitability firms within the same country when measuring the profitability effect. This helps alleviate the concern that cross-country differences in accounting standards may lead to differences in profitability measures and hence the profitability effect in different countries. We also configure a composite measure of profitability and an average measure of the profitability effect across the six measures of profitability for each country.

We next examine how the profitability effect varies across countries in the context of predictions from behavioral finance and the investment CAPM. As elaborated in Zhang (2017),

behavioral finance, which mechanistically relies on dysfunctional markets, predicts that profitability should be stronger in emerging markets and weaker in developed markets. The rationale is that investors in emerging markets are less sophisticated and markets are less efficient with more severe limits to arbitrage. The investment CAPM that, by contrast, depends on well-functioning markets, predicts that the profitability effect should be stronger in developed markets where markets are more efficient and managers are more likely to practice capital budgeting to maximize firm value, and weaker in emerging markets.[1] We hence investigate the profitability effect at the levels of pooled developed markets, emerging markets, and global markets based on portfolio sorts and Fama and MacBeth (1973) regressions. We also apply the Carhart (1997) four-factor model controlling for well-known risk factors to explore whether there is justification for including a profitability factor in regional and global factor models. Furthermore, we directly examine cross-country differences in the profitability effect in relation to capital market development to determine whether evidence exists for the investment CAPM or behavioral finance explanations.

Our study makes several contributions. First, it broadens current understandings of the profitability effect beyond the U.S. market. Using monthly stock returns from 33 countries over 1990-2017, we find a pervasive and significant profitability effect outside the U.S. market, especially for results based on EW return spreads or OLS regression slopes. However, the evidence of a significant profitability effect is weaker based on VW return spreads or WLS regression slopes. In addition, by averaging the profitability effects across countries into the aggregated levels of developed markets, developing markets, and global markets, we find a significant profitability effect for every measure of profitability in every aggregated category of markets based on EW

[1] Titman, Wei, and Xie (2013) also put forward a similar argument for the investment effect (proxied by total asset growth) regarding the comparison between behavioral and rational (i.e., *q* theory) explanations.

returns. Moreover, the profitability effect on average is about 40% greater in developed markets than in developing markets in most cases. In contrast, the evidence based on VW returns is again weaker and for some profitability measures the profitability effect tends to be larger in developing markets than in developed markets although the difference seems economically small.

Second, we find that portfolio sorts and deflators matter for the profitability effect. Take the gross profitability of Novy-Marx (2013) that is based on annual gross profit-to-assets with annual sorts for example. The EW return spread on the high-minus-low quintile portfolio is significant at the 5% level in 16 countries. Meanwhile, the EW return spread on annual gross profit-to-*lagged assets* is statistically significant only in six economies. By contrast, it is statistically significant in 25 economies with monthly sorts based on quarterly earnings updates. Third, both portfolio and regression analyses indicate that quarterly earnings with monthly sorts provide evidence of a strong profitability effect in more economies than any other measures of profitability. This finding supports HXZ's (2015) choice of earnings as the profitability measure for a workhorse factor in their *q*-factor model.

Fourth, based on analysis at the aggregated levels of pooled regions, the evidence from EW or VW return spreads either with or without controlling for risk shows that the profitability effect exists at the global level and in developed markets, but not in emerging markets. The difference in the profitability effect between developed and emerging markets is economically large. These findings are consistent with the prediction of the investment CAPM and inconsistent with the behavioral explanation. These findings also lend support for the addition of a profitability factor to regional and global factor models to explain regional/global equity anomalies as in Fama and French (2017). The results from OLS or WLS regressions are in general consistent with those from portfolios analysis, except for emerging markets. The profitability slopes from WLS are mostly

significant and in some cases larger for the pooled emerging markets than for the pooled developed markets, inconsistent with the investment CAPM prediction. Our country-level and regional/global-level results are robust to alternative measures of profitability and alternative measures of the profitability effect, in local currency or in U.S. dollars. Our global profitability effect is not driven by large economies such as the U.S. and Japan, or by small firms.

Lastly, our evidence generally fails to support the behavioral finance explanation for the cross-sectional variation in the profitability effect based on cross-country and cross-region analyses. When profitability effects are measured by average EW or VW return spreads in cross-region analysis as well as by average EW return spreads or average OLS profitability slopes in cross-country analysis, the results tend to support the investment model. That is, profitability effects are significantly stronger in more developed economies where capital markets tend to be more efficient, managers appear to be more likely to practice capital budgeting to maximize firm value, and limits to arbitrage are less severe. However, we find no support for the investment model when profitability effects are measured by Fama and MacBeth (1973) regression slopes in cross-region analysis as well as by average VW return spreads or WLS profitability slopes in cross-country analysis. Collectively, although our results lean toward supporting the investment CAPM, the evidence is overall mixed, thereby calling for further future work on this topic.

2. Literature Review

The predictive power of firm earnings or profitability on the cross-section of average stock returns has attracted considerable attention over the last decade. For example, Fama and French (2006) test the positive relation between expected profitability and expected returns predicted by valuation theory. Using the fitted value from the first-stage cross-sectional regression for expected

profitability as one of the explanatory variables in the second-stage cross-sectional regressions, Fama and French (2006) show that the profitability effect is not significant. Fama and French (2008) further indicate that hedge returns on profitability sorts do not "provide much basis for the conclusion that there is a positive relation between average returns and profitability" (p. 1663) controlling for firm size and book-to-market equity.

In contrast, Novy-Marx (2013) shows that gross profit-to-assets has about the same power as book-to-market equity in predicting the cross-section of average returns. Novy-Marx (2013) shows that gross profitability exhibits greater predictability than earnings. He also provides some international evidence on the gross profitability effect. However, Zhang (2017) shows that the gross profitability effect of Novy-Marx (2013) is not significant for annually rebalanced portfolios when annual gross profit is scaled by one-year-lagged total assets. He argues that it is more appropriate to scale gross profit by one-period-lagged assets. Current profit is generated from last period's assets and, as a result, the gross profitability effect of Novy-Marx (2013) is contaminated by a hidden asset growth effect. With monthly rebalancing of portfolios, Zhang (2017) reveals that quarterly gross profit-to-lagged assets produces a significant gross profitability effect. These findings suggest that lagging of the deflator and annual versus monthly portfolio sorts matter in portfolio analysis of the profitability effect. HXZ (2017) further show that two earnings measures, ROE (earnings-to-lagged book equity) and ROA (earnings-to-lagged total assets), generate greater cross-sectional return spreads than does gross profit-to-lagged assets in monthly portfolio sorts in the U.S. market. Zhang (2017) hence concludes that gross profit is largely irrelevant in predicting the cross-section of average returns in monthly sorts because earnings outperform profit.

Moreover, Ball, Gerakos, Linnainmaa, and Nikolaev (2015) document that net income offers similar predictive utility to gross profit when it has consistent deflators, such as book equity,

market equity, or total assets.[2] They further construct an alternative measure of profitability, operating profitability, and show that this exhibits much stronger predictive power on the cross-section of average returns than either gross profit or earnings. Ball et al. (2015) argue that their operating profitability measure, which deducts administrative expenses (excluding expenditures on R&D) from gross profit, better matches current expenses with current revenue and hence is a better predictor of future returns.

HXZ (2015) show that the profitability effect is strong and should be used as a workhorse factor. The *q*-factor model of HXZ (2015) consists of market, size, profitability, and investment factors. Motivated by the pervasive investment effect originally documented by Titman, Wei, and Xie (2004) and the profitability effect derived from the dividend discount valuation model, Fama and French (2015) propose a five-factor model by adding profitability and investment factors to their influential three-factor model (Fama and French (1993)). Both the HXZ (2015) *q*-factor model and the Fama and French (2015) five-factor model provide an acceptable description of cross-sectional variation in average returns for portfolios sorted on size, book-to-market, profitability, and investment that are used to construct their factors. However, the *q*-factor model is found to outperform the five-factor model in explaining a wide array of equity market anomalies in the U.S. (HXZ (2017)).[3]

The current debate on return predictability across different measures of profitability mainly focuses on the U.S. market and emerged only very recently after Novy-Marx (2013). Moreover, the performance of factor models in explaining cross-sectional stock returns is related not only to the way that factors are constructed but also to the way that underlying factors are measured (Fama

[2] Ball et al. (2015) also show that scaling a profit measure by total assets provides the strongest predictive power among all three deflators.
[3] Moreover, Stambaugh and Yuan (2017) indicate that the *q*-factor model can explain the Fama and French (2015) five-factor returns in time-series regressions, but the five-factor model cannot explain *q*-factor returns.

and French (2015, 2016, 2018); HXZ (2015, 2017)). We therefore suggest that it is important to expand our current understanding of the profitability effect and hence the profitability factor in U.S. and global markets.

3. Data, Measures, and Descriptive Statistics

3.1. Data sources and sample selection

For firms in the U.S., we obtain stock returns and prices from the Center for Research in Security Prices (CRSP) and accounting data from Compustat/North America. For firms in Canada, we obtain stock and accounting information from Compustat/North America. For firms in other countries, data from Compustat/Global are used. We include all domestic common stocks listed on the major stock exchange(s) in each country and exclude financial and utility firms.

To ensure the quality of data, we apply the following screening procedures. First, we follow Chui, Titman, and Wei (2010), Hou, Karolyi, and Kho (2011), and others by setting monthly returns to be missing if returns are above 500% or above 300% but reversed within the next day. Second, to construct a meaningful measure of profitability, we require a firm's total assets, book equity, sales, and cost of goods sold to be positive. For each profitability measure, we set profitability to one if it is greater than one. Third, we exclude firm-year observations with missing book-to-market equity or market value in the following June. Finally, we require each country to have a minimum of 30 stocks that meet our sample selection criteria in any month over the sample period from as early as November 1990 for most countries to December 2017. Exchange rates are acquired from the U.S. Federal Reserve Board's H.10 release and used to calculate the U.S. dollar return. The 30-day U.S. Treasury bill is used as the risk-free rate. Our final sample covers 23 developed economies and 10 emerging markets.

3.2. Measures of profitability

We adopt the following notation for expository purposes. We use GP to denote gross profits, which is the difference between sales revenue (REVT) and cost of goods sold (COGS). Selling, general, and administrative expenses are denoted as $XSGA$. IBQ is quarterly earnings before extraordinary income. TA is total assets, BE is book equity, and IE is interest expenses. We generate empirical results based on the following six measures of profitability.

First, $GPA_{t\text{-}1}$, the gross profitability of Novy-Marx (2013), is calculated as $GP_{t\text{-}1}/TA_{t\text{-}1}$. Second, $GPLagA_{t\text{-}1}$, the gross profitability scaled by lagged total assets, is calculated as $GP_{t\text{-}1}/TA_{t\text{-}2}$. Third, $OP(FF5)_{t\text{-}1}$, the operating profitability of Fama and French (2015), is calculated as $(GP - XSGA - IE)_{t\text{-}1}/BE_{t\text{-}1}$. Fourth, $OP(Ball)_{t\text{-}1}$, the operating profitability of Ball et al. (2015), is calculated as $(GP - XSGA \text{ excluding } R\&D)_{t\text{-}1}/TA_{t\text{-}1}$. Fifth, $GPLagAQ_{t\text{-}1}$, a quarterly version of $GPLagA$, is calculated as quarterly GP scaled by one-quarter-lagged total assets. Sixth, $ROEQ_{t\text{-}1}$, the quarterly return on equity of HXZ (2015), is calculated as IBQ scaled by one-quarter-lagged book equity.[4] Accounting variables for each country are winsorized at the 1% and 99% levels. Following the literature, accounting data in year *t*-1 are matched with monthly return data between July in year *t* and June in year *t*+1. Detailed definitions of variables are provided in Table A1 in the Appendix.

3.3. Descriptive statistics

[4] We also examine two additional measures of profitability. One is a variant of $OP(Ball)$ that scales the numerator by lagged one-period total assets. The other is $ROAQ$, the quarterly return on assets, calculated as IBQ scaled by one-quarter-lagged total assets. Results from using these two measures are consistent with $OP(Ball)$ and $ROEQ$, respectively.

Table 1 reports the sample period, the number of observations at annual and quarterly frequencies, and the summary statistics of variables for each country. The sample period is from 1990 to 2017 for accounting data and from November 1990 to December 2017 for monthly return data for most sample countries.[5] In total, we have over 62,000 unique stocks and over 6.6 million monthly return observations. As expected, the U.S. and Japan are the two largest developed countries in terms of total observations on annual accounting data, with over 15,000 and 5,000 unique stocks, respectively. The two largest emerging economies are China and India. The number of unique stocks is generally smaller based on quarterly data in each country due to the limited coverage for quarterly accounting items.[6]

Panel A in Table 1 reports that the mean monthly return in U.S. dollars in excess of the risk-free rate across all countries is 1.02% with an average cross-sectional standard deviation of 14.62%. The average of median profitability across all countries is 27.21%, 19.03%, 11.79%, 30.08%, 6.99%, and 1.85% for GPA, $OP(FF5)$, $OP(Ball)$, $GPLagA$, $GPLagAQ$, and $ROEQ$, respectively. Taking GPA as an example, time-series averages of cross-sectional median gross profitability range from a low of 14.92% in China to a high of 71.29% in Germany, and the corresponding standard deviations range from 11.52% in China to 52.66% in the Netherlands. It also appears that firms in developed countries are generally more profitable than firms in emerging markets.

4. International Evidence on the Profitability Effect: Portfolio Analysis

4.1. Portfolio formation

[5] Brazil, Canada, China, Greece, Ireland, Mexico, New Zealand, Portugal, and Sri Lanka appear later in the sample due to data availability issues.
[6] Japan only mandates annual and semiannual financial statements.

To compare between the U.S. and other countries, we follow Ball et al. (2015), Fama and French (2015), and HXZ (2015) and form profitability portfolios based on GPA, $OP(FF5)$, $OP(Ball)$, or $GPLagA$ annually and on $GPLagAQ$ or $ROEQ$ monthly. Specifically, for sorting variables GPA, $OP(FF5)$, $OP(Ball)$, or $GPLagA$, at the end of June in year *t*, all stocks in each country are sorted into quintiles based on a profitability measure in year *t*-1. Stocks remain in the portfolios from July in year *t* to June in year *t*+1, and portfolio returns are calculated each month. These quintile portfolios are rebalanced at the end of June in each year. For sorting variables $GPLagAQ$ or $ROEQ$, at the beginning of each month *t*, stocks in each country are split into quintiles based on the sorting variable measured by the most recent quarterly information. Quarterly data are used after earnings announcement dates (if available from I/B/E/S) or four months after the end of the fiscal quarter until six months after the fiscal quarter end.[7] Returns on these portfolios are calculated for month *t* and quintile portfolios are rebalanced at the beginning of month *t*+1. In the U.S., quintile portfolios are formed using NYSE breakpoints. In other countries, portfolios are formed using equal-size breakpoints within each country.

These profitability portfolios formed for each country are hereafter referred to as "country-specific" profitability portfolios. For each country-specific portfolio, monthly returns are calculated by equal-weighting or value-weighting all stocks in the quintile. The value-weights are based on the market value of individual stocks in the quintile at the end of the previous month. We then form a high-minus-low profitability portfolio by taking a long position in the top and a short position in the bottom quintiles in the country and refer it as the "country-specific" zero-cost hedge portfolio. The monthly return on the hedge portfolio is the difference between the return on the top quintile and that on the bottom quintile in the corresponding month, which is also referred to as

[7] Where quarterly book value of equity is unavailable, the annual book value of equity before December 31 in year *t*-1 is used to form a portfolio from July 1 in year *t* to June 30 in year *t*+1.

the monthly return spread. We then calculate the time-series average of equal-weighted (EW) or value-weighted (VW) monthly return spreads for each country and use the average return spread to gauge the magnitude of the profitability effect within each country. In addition to the above individual profitability measure, we compute an average measure of the profitability effect by averaging across the six measures of individual profitability effects. A significantly positive return spread indicates a strong profitability effect.

In addition, we follow the methodology in Stambaugh and Yuan (2017) and construct a composite ranking index, $AvgRankPM$, for each stock in an attempt to provide a single measure for the average profitability effect across the six profitability measures. Specifically, for each profitability measure PM, RankPM is the cross-sectional ranking based on NYSE decile breakpoints. The composite index $AvgRankPM$ for each stock is the average value of RankPM across all six profitability measures. Stocks in each country are then placed in quintiles based on $AvgRankPM$. Monthly returns on quintile portfolios and return spreads are calculated accordingly, in the same way as if we treat $AvgRankPM$ as the ranking of one profitability measure. We also compute profitability effects for developed, developing, and global markets by simply averaging return spreads across countries, first in each month and then across months. We refer to this measure as the "country-average" profitability effect where each country is equally weighted.[8]

4.2. The profitability effect based on annual and monthly sorts at the country level

Table 2 reports the averages of EW return spreads in U.S. dollars for each measure of profitability in each country.[9] The results based on GPA (i.e., the gross profitability of Novy-Marx

[8] This averaging method implies that countries with a small number of stocks such as Ireland are overweighted and countries with a large number of stocks such as the U.S. are underweighted.

[9] All results reported herein are based on U.S. dollars. Results based on local currencies are consistent with those based on U.S. dollars.

(2013)) suggest that 32 out of the 33 sample countries exhibit a positive return spread. Among them, 14 show a significant gross profitability effect at the 5% level or better with the magnitude ranging from 0.45% in Spain to 1.38% in Sri Lanka, per month. Return spreads based on $OP(FF5)$ and $OP(Ball)$ suggest a significant profitability effect in 12 and 18 economies, respectively. Together these results appear to indicate a strong profitability effect in many countries outside the U.S. However, results based on $GPLagA$ (i.e., annual gross profit-to-lagged total assets) indicate that the return spread is significantly positive at the 5% level in only six countries.[10] Our international evidence based on $GPLagA$ is consistent with results for the U.S.: lagging the deflator matters in annual sorts on gross profitability.

Table 2 also reports the time-series averages of EW return spreads on profitability portfolios with monthly sorts (i.e., $GPLagAQ$ and $ROEQ$) in each country. Results based on $GPLagAQ$ (i.e., the quarterly gross profitability scaled by one-quarter-lagged total assets) suggest that all sample countries exhibit a positive return spread. Moreover, 24 countries exhibit a gross profitability effect that is significant at the 1% level, suggesting that lagging the deflator matters very little in monthly sorts on gross profitability. Finally, the return spread based on $ROEQ$ (i.e., the quarterly profitability measure of HXZ (2015)) indicates that a strong and significant profitability effect exists in all 33 sample countries. The EW return spread based on $GPLagAQ$ is smaller than the return spread based on $ROEQ$ in most countries, suggesting that earnings predict a stronger profitability effect than gross profit based on monthly sorts. Again, our findings in international markets are consistent with Zhang's (2017) findings in the U.S.

Because the profitability effect varies substantially across different measures even within the same country, we provide two measures to capture the average profitability effect across all six

[10] The portfolio results in Table 3 suggest that this measure of the gross profitability effect is insignificant for value-weighted returns in the U.S.

measures of profitability so that the profitability effect is more comparable across countries. The results are reported in the last two columns of Table 2. The first measure ("$AvgRankPM$") is the time-series average of monthly returns on the "country-specific" zero-cost hedge portfolio based on $AvgRankPM$. The second ("$Average$") is calculated by averaging return spreads across the six measures each month first and then averaging across months. We find that the average profitability effect is statistically significant at the 5% level in 21 countries based on both measures. Ireland displays the strongest overall monthly profitability effect (1.87%) followed by Sri Lanka (1.71%) based on the $AvgRankPM$ measure. China is the only country that exhibits a negative, although insignificant, average profitability effect according to both measures.

Panel C of Table 2 reports "country-average" profitability effects. We observe that the profitability effects on monthly sorts (i.e., $GPLagAQ$ and $ROEQ$) are mostly stronger than those based on annual sorts (i.e., GPA, $OP(FF5)$, $OP(Ball)$, and $GPLagA$) for both regions and for global markets. Take global markets (Global) for example. The "country-average" profitability effects are 0.60% (*t*-stat = 4.72), 0.59% (*t*-stat = 5.31), 0.70% (*t*-stat = 5.74), and 0.35% (*t*-stat = 2.67) according to annual sorts based on GPA, $OP(FF5)$, $OP(Ball)$, and $GPLagA$, respectively. In contrast, those based on monthly sorts by $GPLagAQ$ and $ROEQ$ are 1.12% (*t*-stat = 8.78) and 1.95% (*t*-stat = 11.40), respectively. We also observe that, in general, the profitability effect is more pronounced in developed markets than in emerging markets, especially for quarterly earnings. Based on the $AvgRankPM$ measure, the profitability effect is 0.99% (*t*-stat = 6.18) in developed markets and only 0.67% (*t*-stat = 4.50) in emerging markets. According to $Average$, the corresponding numbers are 0.88% (*t*-stat = 6.65) and 0.64% (*t*-stat = 4.88) based on the average of the six profitability effects.

Table 3 presents time-series averages of VW monthly return spreads on various profitability measures for each country. These VW return spreads are generally positive but weaker and less significant compared to EW return spreads. For instance, the profitability effect is significant at the 5% level in only five, six, seven, three, thirteen, and fifteen countries with the GPA, $OP(FF5)$, $OP(Ball)$, $GPLagA$, $GPLagAQ$, and $ROEQ$ profitability measures, respectively. Consistent with the results from the EW return spreads, monthly sorts with quarterly updated profitability information yield a stronger profitability effect than annual sorts with annually updated information. In addition, the "country-average" profitability effects shown in Panel C of Table 3 are significant for developed, emerging, and global markets based on VW returns on the individual measure and the composite measure except for the $GPLagA$ measure of profitability. Unlike the results based on EW return spreads in Table 2, we observe that the profitability effect based on VW return spreads, on average, tends to be slightly smaller in developed markets than in developing markets. For example, it is 0.48% (*t*-stat = 2.52) vs. 0.55% (*t*-stat = 2.95) for the $AvgRankPM$ measure and 0.46% (*t*-stat = 2.73) vs. 0.50% (*t*-stat = 3.05) for the $Average$ measure, respectively, which is inconsistent with the prediction of the investment model.

To visualize cross-country differences in profitability effects, Figure 1 plots the effect based on the composite profitability measure (from "$AvgRankPM$" in the penultimate column of Tables 2 and 3). Figure 2 plots the country-by-country profitability effect based on the average of the six measures with both EW and VW returns (from "$Average$" in the last column of Tables 2 and 3).

Overall, the results based on portfolio analysis highlight the significance of profitability effects outside the U.S. and are consistent with recent findings in the U.S. following the work of Novy-Marx (2013). Specifically, we find that lagging the deflator matters in annual sorts on gross profitability and that monthly portfolio rebalancing with quarterly earnings updates yields a

stronger profitability effect than annual rebalancing with annual earnings updates. In addition, the profitability effect is stronger based on EW return spreads than on VW return spreads. Finally, due to the diversification advantage, the country-average profitability effect is significant in developed, emerging, and global markets.

5. International Evidence on the Profitability Effect: Regression Analysis

5.1. The Fama and MacBeth (1973) regressions

This section presents regression analysis on the profitability effect in international markets. HXZ (2017) argue that collinearity can be a serious problem for cross-sectional regressions with multiple anomaly variables, hence we adopt a univariate regression approach.[11] Specifically, we estimate Fama and MacBeth (1973) regressions for each country as per Eq. (1).

$$R_{i,t}\text{-}R_{ft} = \alpha + \beta_1 RankPM_{i,t\text{-}1} + \varepsilon_{i,t}, \quad (1)$$

where $R_{i,t}$ represents the monthly raw percentage return for stock *i* from July of year *t* to June of year t+1. R_{ft} is the risk-free rate in the corresponding month, proxied by the one-month U.S. Treasury bill rate. $RankPM_{i,t\text{-}1}$ is the ranking of a profitability measure. We use the rank instead of the value of a profitability measure to alleviate the concern that regression coefficients are susceptible to outliers and values of regressors (HXZ (2017)). Eq. (1) is estimated cross-sectionally each month using both OLS and WLS methods. Observations are treated equally in each regression with the OLS method whereas they are weighted based on the market capitalization of each

[11] For example, results from Fama-MacBeth (1973) regressions where a profitability measure is the only independent variable, suggest an insignificant profitability premium in Japan across all six profitability measures, and are consistent with the results from portfolio analysis. However, results from Fama-MacBeth (1973) regressions that include multiple well-known anomaly variables such as firm size, book-to-market, momentum, and asset growth suggest a strong profitability premium in Japan. Because profitability is the other side of value (Novy-Marx (2013)), it is possible that the profitability effect appears to be significant in a regression with multiple variables due to the strong value premium in Japan (Daniel, Titman, and Wei (2001)).

individual stock in the prior month with the WLS method. To capture the average profitability effect across all six measures of profitability, in addition to the composite index $AvgRankPM$, we also calculate the "$Average$" by averaging regression coefficients across the six measures each month first and then averaging across months.

5.2. The profitability effect at the country level

Table 4 presents the average Fama and MacBeth (1973) slopes of profitability measures and their corresponding *t*-statistics for each country according to OLS. The slope coefficients are mostly positive for all profitability measures. Specifically, profitability slopes are significantly positive at the 5% level in 16, 13, 14, and 8 countries based on the annually updated profitability measures of GPA, $OP(FF5)$, $OP(Ball)$, and $GPLagA$, respectively. In addition, more countries show a strong profitability effect for quarterly updated profitability measures. The slope coefficients are significantly positive at the 5% level in 27 and 30 countries for the $GPLagAQ$ and $ROEQ$ measures of profitability, respectively. The last two columns (AvgRankPM and Average) in Table 4 indicate a significant average profitability effect across the six profitability measures in 23 and 20 countries, respectively. The profitability slopes with quarterly updates are generally more significant than those with annual updates. The results from regression analysis are consistent with those from portfolio analysis for most countries.

Table 5 presents the average Fama and MacBeth (1973) slopes on profitability measures with *t*-statistics for each country according to WLS. The results are much weaker than those generated using OLS. For instance, the profitability effect is insignificant for most countries based on the profitability measures with annual updates and is significant at the 10% level in 15 and 17 countries for $GPLagAQ$ and $ROEQ$ with quarterly updates, respectively. The last two columns show that the

average profitability premium is significant at the 10% level in only seven and nine countries for $AvgRankPM$ and $Average$, respectively. Our results from both EW and VW portfolio returns and those from OLS and WLS regressions suggest that microcaps are influential in equal-weighted returns and could inflate the profitability effect.

Overall, our regression results are largely consistent with those from portfolio analysis, suggesting that the profitability effect exists in many countries outside the U.S., that quarterly updated profitability measures yield a stronger profitability effect than those with annual updates, and that the size of this effect is sensitive to the deflator used in profitability measures. Moreover, profitability effects are more significant according to OLS than according to WLS.

6. The Aggregated Profitability Effect: Pooled Regions/Markets Analysis

In this section, we study profitability effects in international markets at the aggregated level, mainly for three "pooled" markets (global, developed, and emerging markets). Compared with the country-average profitability effects reported in Tables 2 and 3, where each country is weighted equally, this pooled method weights each firm equally. That is, large countries like the U.S. and Japan are overweighted and small countries such as Ireland and Portugal are underweighted in measuring the regional and global profitability effects in this section. Specifically, we examine regional/global profitability effects using EW and VW portfolio analysis, the Carhart (1997) four-factor model, and the Fama and MacBeth (1973) regression of profitability with and without controlling for other firm characteristics. We carry out robustness checks on our results for global markets by excluding the U.S. and Japan and by excluding small firms with market equity of less than US$100 million.

6.1. Regional profitability effects: Portfolio analysis

Panel A of Table 6 presents results on profitability effects for each pooled region based on EW and VW portfolio analysis. We follow Novy-Marx (2013) and use the NYSE breakpoints to form profitability quintiles for each pooled region. We then construct a high-minus-low quintile portfolio for each profitability measure and calculate the monthly EW and VW returns on the high-minus-low quintiles. Panel A shows the time-series averages of EW and VW monthly return spreads and the risk-adjusted profitability effect based on Carhart's (1997) four-factor alphas (α-FFC4).[12]

The top half of Panel A1 indicates that EW return spreads for global and developed economies are significantly positive for all but the $OP(FF5)$ measure of profitability, suggesting a strong global profitability effect and a strong profitability effect in developed markets. In contrast, for developing markets, EW return spreads are statistically insignificant for all measures of profitability except $ROEQ$.

We next apply the Carhart (1997) four-factor model, which controls for well-known risk factors, in our international analysis to examine whether the profitability effect exists and hence whether a profitability factor is warranted in global and regional factor models. The four-factor model adds a momentum factor to the Fama and French (1993) three-factor model as per the time-series regression specification presented in Eq. (2).

$$R_{it}\text{-}R_{ft} = a_i + b_i\left(R_{mt} - R_{ft}\right) + s_i SMB_t + h_i HML_t + r_i WML_t + \epsilon_{it}, \quad (2)$$

where the left-hand-side (LHS) variable is the excess return on a test portfolio i in month t (i.e., R_{it}-R_{ft}). R_{mt}-R_{ft} is the excess return on the value-weighted market portfolio. SMB (Small-minus-

[12] The corresponding Carhart (1997) four-factor alphas (α-FFC4) for individual countries based on $AvgRankPM$ and $Average$ for measuring the profitability effect are reported in Panel A of Table A2 in the Appendix. The results indicate a significant profitability premium at the 5% level in 25 and 17 economies, respectively, based on EW return spreads as the measure of the profitability effect, consistent with the results reported in the main text.

Big), HML (High-minus-Low), and WML (Winner-minus-Loser) are size, book-to-market, and momentum factors, respectively.[13] As in Fama and French (2012, 2017), we use four regional factors to explain LHS portfolio returns for the same region. Specifically, we construct the factors at the regional and global level using NYSE breakpoints along the lines of HXZ (2015) for the U.S. market. We use the EW and VW return spreads on the LHS test portfolios (i.e., the returns on the high-minus-low profitability quintile portfolio) for the respective pooled regions. If the four-factor model captures all variation in average returns on the LHS portfolio, the intercept a_i should not be significantly different from zero for all i.

The bottom half of Panel A1 in Table 6 reports the four-factor alphas (α-FFC4) where EW monthly return spreads are used as the LHS assets. The α-FFC4s are generally insignificant for most individual and composite measures of profitability for emerging markets, while they are mostly significant at the 1% level for developed markets and global markets and its variants. These observations suggest that a regional profitability premium exists in developed and global markets, which warrants further exploration, perhaps by a regional or global factor model that incorporates a profitability factor.

The results based on VW return spreads and the VW Carhart four-factor model presented in Panel A2 are generally consistent with the results based on EW return spreads and the EW Carhart four-factor model. That is, there is a significant profitability effect or premium for global and developed markets, but not for emerging markets. We also observe that the profitability effects based on monthly sorts on $GPLagAQ$ and $ROEQ$ are substantially larger than those based on annual sorts on GPA, $OP(FF5)$, $OP(Ball)$, and $GPLagA$ for EW return spreads but not for VW return spreads.

[13] Refer to Carhart (1997) for details about the construction of the four factors.

Overall, our findings from EW and VW portfolio analysis and the Carhart four-factor model are consistent with the prediction of the investment CAPM and contradict the behavioral finance explanation. That is, the profitability effect is stronger in developed markets where markets are more efficient, managers are more likely to practice capital budgeting to maximize firm value, investors are more sophisticated, and limits-to-arbitrage are less severe than in emerging markets.

6.2. Regional profitability effect: Regression analysis

Panel B of Table 6 reports Fama and MacBeth (1973) regression slopes on profitability for each region by estimating Eq. (1) cross-sectionally with and without control variables.[14,15] The OLS regression results presented in Panel B1 show that the slopes on different profitability measures are mostly significant and positive for global and developed markets and less significant in emerging markets. For example, in the OLS regression without control variables, the $AvgRankPM$ slopes are 0.11 (*t*-stat = 3.94), 0.11 (*t*-stat = 4.11), and 0.09 (*t*-stat = 1.78) for global, developed, and developing markets, respectively. The corresponding slope averages (under the heading of "Average") are 0.09 (*t*-stat = 4.84), 0.09 (*t*-stat = 4.97), and 0.06 (*t*-stat = 1.45), respectively. Although the regression slopes on profitability are generally larger for developed markets than for developing markets, the differences are economically small and likely to be insignificant. The results from OLS regressions with controls are consistent with those without controls. Furthermore, excluding the U.S. and Japan or excluding small firms from global markets does not change the significance of the global profitability effect.

[14] The profitability slopes after controlling for other firm characteristics in individual countries using $AvgRankPM$ and $Average$ for measuring the profitability effect are reported in Panel B of Table A2 in the Appendix. The results indicate a strong profitability effect that is significant at the 5% level in 26 and 25 economies, respectively, based on OLS.

[15] Regression coefficients for control variables in the full regression model are reported in Table A3 in the Appendix for each region, based on both OLS and WLS.

The WLS regression results presented in Panel B2 are largely consistent with those from OLS except for emerging markets. Specifically, in emerging markets, half of the WLS profitability slope coefficients without control variables are significant and the other half are insignificant. Furthermore, the profitability coefficients with controls are mostly significant and larger than those in developed markets, which are inconsistent with the prediction of the investment CAPM.

Overall, we observe a strong global profitability effect and a strong regional profitability effect in pooled developed markets and a less significant profitability effect in pooled emerging markets based on Fama and MacBeth (1973) cross-sectional regressions, especially from OLS regressions. While the evidence from OLS supports the investment model that the profitability effect is stronger in developed than in developing markets, the evidence from WLS seems to indicate otherwise.

7. Cross-country Analysis: The Profitability Effect and Capital Market Development

To further our understanding of how the profitability effect varies across countries, we perform a cross-country analysis to explore whether evidence exists in support of the investment CAPM explanation or the behavioral finance explanation. We regress the profitability effect measures on the access-to-capital index ($AccessCap$), where $AccessCap$ proxies for capital market development. For each country-year, from the *Global Competitiveness Report* published by the World Economic Forum, we define the sum of mean survey scores of respondents concerning the ease of equity financing and debt financing as the access-to-capital score (Titman, Wei, and Xie (2013)). The access-to-capital index is the time-series average of the annual access-to-capital scores over the sample period. Economies with a higher index value are generally

regarded as having more developed and efficient capital markets, possibly with more sophisticated investors and less severe limits to arbitrage.

Table 7 presents the cross-country regression results. In Panel A, the profitability effect is measured by monthly EW or VW return spreads on the high-minus-low profitability quintiles formed on each profitability measure for each country; and the dependent variable is the Shape ratio of the return spreads, which is the time-series mean of the return spreads divided by the time-series standard deviation. In Panel B, the profitability effect is measured by the monthly OLS or WLS cross-sectional regression coefficients on each profitability measure for each country; and the dependent variable is the time-series mean of the regression coefficients divided by the time-series standard deviation (i.e., proportional to *t*-statistics). For both panels, the dependent variables are then regressed on the access-to-capital index.

[Insert Table 7 here]

Panel A of Table 7 shows that when average EW return spreads are used as the dependent variable, the coefficient on $AccessCap$ is all positive and mostly statistically significant. For instance, the coefficient on $AccessCap$ is 5.00 (*t*-stat = 3.46) and 4.71 (*t*-stat = 2.54) based on average profitability effects measured by $AvgRankPM$ and $Average$, respectively. By contrast, the slope coefficient on $AccessCap$ is generally small and insignificant based on average VW return spreads.

Panel B presents the results when average profitability slope coefficients are used as the measure for the profitability effect. The results are essentially consistent with the corresponding results in Panel A. In particular, when average OLS slope coefficients on profitability are used as the dependent variable, the coefficients on $AccessCap$ are all positive and mostly highly significant. For example, the coefficients on $AccessCap$ are 4.20 (*t*-stat = 2.25) and 4.34 (*t*-stat =

2.48) for $AvgRankPM$ and $Average$ measures of the profitability effect, respectively. However, when average WLS slope coefficients on profitability are used as the dependent variable, the coefficients on $AccessCap$ are all negative although insignificant except two ($RankGPA$, and $RankGPLagA$), which are inconsistent with the prediction of the investment CAPM.

Overall, the results in Table 7 in support of the investment CAPM are mixed. Though the results largely fail to support the behavioral finance explanation, the support for the investment CAPM comes only from average EW return spreads and average OLS profitability slopes.

8. Conclusions

This study documents a strong and pervasive profitability effect in international equity markets based on country-by-country analysis. Using both portfolio and regression analyses with alternative measures of profitability, we show that the profitability effect exists in many countries other than the U.S. This finding suggests that the cross-sectional return pattern on profitability found in the U.S. is unlikely to be due to chance or data snooping.

With these international data we confirm recent findings on the return predictability of different profitability measures in the U.S. after Novy-Marx (2013). Specifically, we find that lagging the deflator in gross profit-to-assets matters in annual sorts but not in monthly sorts with quarterly earnings updates. We also reveal that earnings perform better than gross profit in predicting the cross-section of average stock returns. Furthermore, our findings indicate that profitability measured with quarterly updates yields a stronger profitability effect than those measured with annual updates. The results suggest that annual updates may be less effective in predicting average returns.

At the aggregated level, we find that the profitability effects are significant in global and developed markets but less so in emerging markets. These empirical findings lend support for the inclusion of a profitability factor in regional and global factor models. We also find that the profitability effect is generally stronger in developed markets than in emerging markets based on portfolio analysis and OLS regression analysis, however, the opposite holds for WLS regression analysis in some cases.

Finally, we perform a cross-country analysis by regressing average return spreads or average profitability slopes (which are used to measure a country profitability effect) on a country-level market development index. The results from EW return spreads and OLS profitability slopes suggest that the profitability effect varies positively with the market development index. That is, countries with more developed capital markets and less severe limits to arbitrage tend to have a stronger profitability effect. However, the results from VW return spreads and WLS profitability slopes are mostly insignificant. Although our findings on the profitability effect across countries and at the aggregated level lean toward supporting the general prediction of the investment model and fail to support the behavioral explanation, the evidence is overall mixed. We thereby call for further studies on the topic.

Our study adds to the expanding literature on the stock return predictability of a wide range of firm characteristics in international markets, originally documented in the U.S. More specifically, it furthers our understanding of the profitability effect by providing extensive and in depth empirical analysis of this effect in international markets. It also contributes to the literature that attempts to invoke the investment CAPM or behavioral finance to explain equity anomalies associated with *q*-theory (see, e.g., Li and Zhang (2011) and Lam and Wei (2011)). Lastly, this work contributes to current debates on the performance of the Fama and French (2015) five-factor

model versus the HXZ (2015) *q*-factor model by providing international evidence on which profitability measures exhibit the strongest profitability effect. We find that the ROE profitability measure based on quarterly earrings with monthly rebalance proposed by HXZ (2015) generates the highest profitability effect in most individual countries and at the aggregated global markets and developed markets.

References

Ball, Ray, Joseph Gerakos, Juhani Linnainmaa, and Valeri Nikolaev, 2015, Deflating profitability, *Journal of Financial Economics* 117, 225-248.

Carhart, Mark M., 1997, On persistence in mutual fund performance. *Journal of Finance, 52*, 57-82.

Chui, Andy C.W., Sheridan Titman, and K. C. John Wei, 2010, Individualism and momentum around the world, *Journal of Finance* 65, 361-392.

Daniel, Kent, Sheridan Titman, and K.C. John Wei, 2001, "Explaining the cross-section of stock returns in Japan: factors or characteristics?" *Journal of Finance* 56, 743-766.

Fama, Eugene F., and Kenneth R. French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3-56.

Fama, Eugene F., and Kenneth R. French, 2006, Profitability, investment and average returns, *Journal of Financial Economics* 82, 491-518.

Fama, Eugene F., and Kenneth R. French, 2008, Dissecting anomalies, *Journal of Finance* 63, 1653-1678.

Fama, Eugene F., and Kenneth R. French, 2012, Size, value, and momentum in international stock returns, *Journal of Financial Economics* 105, 457-472.

Fama, Eugene F., and Kenneth R. French, 2015, A five-factor asset pricing model, *Journal of Financial Economics* 116, 1-28.

Fama, Eugene F., and Kenneth R. French, 2016, Dissecting anomalies with a five-factor model, *Review of Financial Studies* 29, 69-103.

Fama, Eugene F., and Kenneth R. French, 2017, International tests of a five-factor asset pricing model, *Journal of Financial Economics* 123, 441-463.

Fama, Eugene F., and Kenneth R. French, 2018, Choosing factors, *Journal of Financial Economics*, 128, 234-252.

Fama, Eugene F., and James D. MacBeth, 1973, Risk, return, and equilibrium: Empirical tests, *Journal of Political Economy* 81, 607-636.

Hou, Kewei, G. Andrew Karolyi, and Bong-Chan Kho, 2011, What factors drive global stock returns? *Review of Financial Studies* 24, 2527-2574.

Hou, Kewei, Chen Xue, and Lu Zhang, 2015, Digesting anomalies: An investment approach, *Review of Financial Studies* 28, 650-705.

Hou, Kewei, Chen Xue, and Lu Zhang, 2017, A comparison of new factor models, NBER Working Paper 20682.

Li, Dongmei, and Lu Zhang, 2010, Does *q*-theory with investment frictions explain anomalies in the cross-section of returns? *Journal of Financial Economics* 98, 297–314.

Lam, Eric F.Y.C., and K.C. John Wei, 2011, Limits-to-arbitrage, investment frictions, and the asset growth anomaly, *Journal of Financial Economics* 102, 127-149.

Newey, Whitney K., and Kenneth D. West, 1987, A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix, *Econometrica* 55, 703-708.

Novy-Marx, Robert, 2013, The other side of value: The gross profitability premium, *Journal of Financial Economics* 108, 1-28.

Stambaugh, R.F. and Yuan, Y., 2017. Mispricing factors. *Review of Financial Studies* 30, 1270-1315.

Titman, Sheridan, K.C. John Wei, and Feixue Xie, 2004, Capital investments and stock returns, *Journal of Financial and Quantitative Analysis* 39, 677-700.

Titman, Sheridan, K. C. John Wei, and Feixue Xie, 2013, Market development and the asset growth effect: International evidence, *Journal of Financial and Quantitative Analysis* 48, 1405-1432.

White, Halbert, 1980, A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity, *Econometrica* 48, 817-838.

Zhang, Lu, 2017, The investment CAPM, *European Financial Management* 23, 545-603.

Table 1. Summary statistics

This table provides the time-series means or medians of variables used in the paper. Excess return is the monthly raw return minus the risk-free rate, proxied by the US Treasury-bill rate. GPA is annual gross profitability during year *t*-1divided by total assets at the end of year *t*-1. OP(FF5) is operating profitability used in Fama and French (2015), OP(Ball) is operating profitability suggested by Ball et al. (2015), and GPLagA is annual gross profitability deflated by lagged total assets. GPLagAQ is quarterly gross profitability divided by lagged quarterly total assets. ROEQ is quarterly return on equity of Hou et al. (2015). MV is market value in million dollars at the end of June in year *t*, BM is book-to-market equity at the end of year *t*-1, MOM is the cumulative return from month *t*-7 to month *t*-1, and TAG is total asset growth in year *t*-1. AccessCap is the access-to-capital index. This table provides the summary statistics for the developed markets, developing markets, and global markets. All variables are sampled at the end of each month. Annual accounting data in year *t*-1 are used to match stock returns between July in year *t* and June in year *t*+1. Quarterly data are used after the earning announcement dates (if available from I/B/E/S) or four months after the end of the fiscal quarter until six months after the fiscal quarter end. Excess returns and profitability measures are reported in Panel A. Firm characteristics and the number of observations are reported in Panel B. For each country or region, only the months with available observations more than 30 are considered for the cross-sectional statistics and then the time-series average value is computed from those available months. Detailed definitions of variables are provided in Table A1 in the Appendix.

Panel A: Summary statistics for excess returns and profitability measures

Country	Excess returns (%)		GPA(%)		OP(FF5) (%)		OP(Ball) (%)		GPLagA(%)		GPLagAQ(%)		ROEQ(%)	
	Mean	Stdev	Median	Stdev	Median	Stdev	Median	Stdev	Median	Stdev	Median	Stdev	Median	Stdev
	A1: Developed countries													
Australia	0.98	13.80	15.42	50.56	11.28	97.96	9.09	60.45	18.46	65.85	5.62	10.86	-0.25	25.32
Austria	0.33	8.18	63.03	36.77	121.85	264.72	53.24	32.27	58.33	41.86	9.43	6.42	2.51	63.45
Belgium	0.68	7.51	63.04	51.80	137.77	219.80	58.11	51.98	62.79	55.23	7.24	5.72	2.06	9.05
Canada	1.08	13.74	15.88	23.66	17.18	56.65	11.08	27.90	18.14	26.45	4.18	5.99	1.40	9.75
Denmark	0.66	8.83	41.82	43.15	31.41	89.78	19.58	43.06	44.59	52.69	9.53	8.96	1.83	11.52
Finland	0.98	9.11	70.09	42.69	150.36	84.21	64.82	41.00	68.11	48.42	8.57	9.14	2.32	10.20
France	0.70	10.27	66.50	44.97	151.18	134.54	59.04	43.04	68.43	51.10	8.18	6.88	2.08	9.48
Germany	0.36	11.27	71.29	50.44	135.13	135.17	63.68	50.39	76.27	55.44	8.15	7.34	2.06	10.44
Greece	0.62	12.07	18.69	13.39	13.88	31.83	7.82	7.78	19.63	16.10	4.85	3.94	0.78	7.69
Hong Kong	1.29	15.13	16.69	23.66	12.09	42.85	7.61	19.66	18.99	29.63	4.59	5.85	1.88	12.06
Ireland	0.53	10.86	25.23	27.67	20.83	60.59	11.08	25.48	29.02	35.49	6.73	4.92	2.10	9.02
Italy	0.25	9.23	46.29	28.76	109.04	118.83	41.65	26.73	44.49	34.50	5.14	6.29	1.23	45.01
Japan	0.44	10.56	24.07	17.94	13.68	17.74	7.43	5.69	24.74	19.31				
Netherlands	0.61	8.61	69.56	52.66	126.38	121.29	56.41	56.83	72.56	56.98	9.03	8.62	2.57	18.70
New Zealand	0.85	8.53	31.15	48.03	29.60	70.01	18.01	54.88	34.37	60.84	7.69	9.27	2.09	11.06
Norway	0.76	11.98	58.52	43.23	113.58	284.69	55.26	42.02	67.85	50.82	5.68	8.77	1.49	194.42
Portugal	0.28	8.55	35.31	30.19	80.88	96.64	29.59	29.33	34.66	32.80	5.07	4.54	1.89	9.68
Singapore	0.94	11.38	20.85	24.70	17.89	50.48	10.77	22.83	23.55	33.96	5.28	5.53	2.21	7.97
Spain	0.50	9.03	54.24	35.72	110.99	151.72	49.33	33.12	54.15	40.37	8.30	9.73	2.08	94.45

Sweden	0.98	10.89	37.81	43.06	27.27	93.98	15.57	42.84	41.37	52.17	9.14	9.52	2.49	14.72
Switzerland	0.73	7.93	57.39	39.99	91.88	118.33	44.49	39.27	60.87	42.54	10.39	6.83	2.49	9.90
The U.K.	0.66	11.80	34.90	40.37	25.80	94.33	14.26	40.82	39.71	49.65	7.91	10.13	1.10	24.25
The U.S.	1.43	16.27	32.76	29.82	19.05	51.91	13.37	16.65	36.61	34.92	8.33	8.28	1.82	12.18
	A2: Developing countries													
Brazil	1.40	12.12	23.76	15.66	22.14	82.75	12.80	19.03	27.26	21.51	6.34	4.87	2.66	22.68
China	1.38	10.84	14.92	11.52	14.47	20.12	8.45	9.03	17.78	17.72	3.35	3.14	1.67	4.45
India	1.54	13.61	29.27	48.08	29.05	48.59	16.74	45.71	34.86	54.19	9.61	16.16	3.57	7.99
Malaysia	0.95	10.79	18.29	26.73	15.37	39.04	10.20	25.49	20.13	40.73	3.99	5.58	1.84	4.93
Mexico	0.76	9.32	26.20	16.78	22.07	49.45	13.62	10.51	29.62	21.58	7.50	6.31	2.63	8.51
South Africa	0.89	11.07	34.62	31.68	31.98	64.49	17.62	33.38	41.06	42.31	8.80	7.78	3.82	8.73
South Korea	0.97	14.43	17.84	13.30	12.72	38.88	8.12	7.09	19.82	15.78	4.70	14.06	1.52	19.02
Sri Lanka	1.51	9.03	23.72	20.43	20.51	30.61	11.78	14.91	27.17	19.92	6.64	5.11	2.86	7.39
Taiwan	0.68	11.00	18.34	12.69	16.36	16.74	11.01	10.93	19.76	16.33	4.94	3.87	1.79	4.66
Thailand	1.11	12.49	20.78	15.20	18.03	37.42	10.57	9.62	23.21	19.27	5.86	4.73	2.97	6.40
	A3: Pooled regions													
Developed	0.99	14.46	29.51	36.96	19.63	108.47	12.20	36.20	32.19	42.81	7.48	8.79	1.75	46.45
Developing	0.97	14.50	18.41	24.56	16.33	45.80	9.87	23.37	20.96	30.06	4.55	8.82	2.20	9.80
Global	1.02	14.62	27.21	35.50	19.03	99.96	11.79	34.56	30.08	41.47	6.99	8.88	1.85	42.21

Panel B: Summary statistics for firm characteristics and number of observations

Country	Sample Period		MV	BM	MOM	TAG	Access	No. of observations		No. of observations		No. of observations	
			($m)	(%)	(%)	(%)	Cap	(stocks)		(annual statements)		(quarterly statements)	
	Start	End	Median	Median	Median	Median	Mean	Unique	Mean	Unique	Mean	Unique	Mean
	B1: Developed countries												
Australia	199011	201712	110.3	0.57	3.37	8.90	10.09	3,151	731	2,315	644	2,293	671
Austria	199011	201712	371.6	0.71	2.11	3.49	8.91	199	62	125	45	76	44
Belgium	199011	201712	298.2	0.73	4.49	3.69	9.06	368	116	206	71	139	78
Canada	199011	201712	146.1	0.75	3.68	7.76	9.56	2,670	816	1,805	552	1,901	556
Denmark	199011	201712	209.5	0.71	4.03	4.70	9.76	375	125	224	79	154	88
Finland	199011	201712	253.8	0.78	5.36	-0.34	10.53	293	103	231	91	180	111
France	199011	201712	229.4	0.62	3.43	4.90	9.47	1,751	538	1,200	402	836	413
Germany	199011	201712	324.3	0.57	1.57	4.81	8.97	2,353	742	1,660	561	1,321	677

Greece	199410	201712	97.3	1.09	2.88	6.38	8.00	423	173	251	124	241	123
Hong Kong	199011	201712	155.7	1.01	2.04	10.60	10.44	2,318	831	1,945	800	1,893	888
Ireland	199401	201712	520.6	0.64	4.28	12.41	8.60	131	39	96	34	67	34
Italy	199011	201712	309.2	0.85	0.61	-0.78	7.45	644	238	405	166	326	185
Japan	199011	201712	235.8	0.94	0.20	2.45	8.67	5,411	2,968	4,174	2,178	5	0
Netherlands	199011	201712	475.6	0.59	4.09	3.68	9.86	397	150	243	93	166	84
New Zealand	199203	201712	141.0	0.60	5.80	5.49	9.82	311	93	181	81	179	84
Norway	199011	201712	211.8	0.82	3.32	9.15	10.22	537	134	371	103	301	147
Portugal	199204	201712	353.6	0.85	1.90	-1.03	8.47	140	45	85	37	58	34
Singapore	199011	201712	111.7	0.89	2.28	8.64	10.02	1,139	407	911	445	887	452
Spain	199011	201712	584.8	0.69	2.87	1.38	7.96	395	135	237	96	183	104
Sweden	199011	201712	232.9	0.91	4.83	6.86	10.21	1,105	270	811	248	707	296
Switzerland	199011	201712	472.1	0.84	4.31	3.21	9.57	541	204	346	137	249	148
The U.K.	199011	201712	236.3	0.51	3.67	8.00	10.00	5,521	1,366	3,386	881	2,486	746
The U.S.	199011	201712	321.2	0.59	103.63	6.47	10.10	15,699	4,899	10,981	3,395	12,729	3,420
	B2: Developing countries												
Brazil	199704	201712	779.8	1.07	6.16	10.27	7.61	402	143	317	128	287	146
China	199310	201712	398.8	0.55	3.95	12.72	6.59	3,577	1,378	3,396	1,292	3,384	1,724
India	199012	201712	99.2	0.71	4.88	13.31	9.09	3,060	804	2,465	868	2,244	659
Malaysia	199011	201712	97.6	0.89	1.67	8.52	9.33	1,346	577	1,069	554	1,045	585
Mexico	199312	201712	919.1	0.96	3.39	11.15	6.59	298	83	190	62	144	77
South Africa	199011	201712	299.5	0.60	3.24	11.98	9.37	958	243	382	150	346	153
South Korea	199011	201712	90.7	1.34	0.33	7.51	7.96	2,854	1,013	1,860	578	1,596	831
Sri Lanka	199311	201712	36.1	0.73	5.45	12.23	8.46	269	118	179	103	180	98
Taiwan	199011	201712	174.8	0.74	-0.03	6.13	9.71	2,314	892	2,034	985	1,905	1,308
Thailand	199011	201712	90.1	0.73	1.57	7.88	8.50	1,277	386	823	257	748	389
	B3: Pooled regions												
Developed	199011	201712	185.9	0.67	29.42	5.23		45,872	15,134	32,189	10,509	27,377	6,979
Developing	199011	201712	157.4	0.65	0.35	10.62		16,355	5,376	12,715	4,072	11,879	4,255
Global	199011	201712	176.4	0.65	21.02	6.08		62,227	20,509	44,904	14,345	39,256	9,825

Table 2. The profitability effect based on equal-weighted returns: Country-by-country analysis

This table reports the time-series averages of equal-weighted (EW) monthly return spreads on the high-minus-low (i.e., zero-cost) quintile portfolios of various profitability measures for each country. For each country and each sorting variable GPA, OP(FF5), OP(Ball), or GPLagA, at the end of June in year *t*, stocks are sorted into quintiles based on a specific sorting variable measured in year *t*-1. Equal-weighted portfolio returns are calculated each month from July in year *t* to June in year *t*+1. These portfolios are rebalanced each year in June. For sorting variables GPLagAQ and ROEQ, at the beginning of each month *t*, stocks are sorted into quintiles on a specific sorting variable. Equal-weighted portfolio returns are calculated each month. These portfolios are rebalanced each month. In the US, the quintile portfolios are formed using NYSE breakpoints. In other countries, portfolios are formed using equal-size breakpoints within each country. For each profitability measure *PM*, $RankPM$ is the cross-sectional ranking based on NYSE decile breakpoints. $AvgRankPM$ for each stock is a composite index, which is measured by the average value of $RankPM$ across six profitability measures. Monthly returns on the zero-cost portfolio are the difference in monthly returns between the two extreme profitability quintiles. The mean of the return spreads is the time-series average of the monthly returns on the zero-cost portfolio. The last column reports the simple average of the return spreads across all six profitability measures. The *t*-statistics are reported in parentheses. Detailed descriptions of variables are presented in Table A1 in the Appendix. Panel A reports the results for the developed economies and Panel B for the developing economies. Panel C reports the simple country-average of the return spreads across countries in each market category.

	Mean of return spreads (5-1, EW)															
	GPA		OP(FF5)		OP(Ball)		GPLagA		GPLagAQ		ROEQ		AvgRankPM		Average	
	Panel A: Developed countries															
Australia	0.79	(1.74)	1.19	(3.10)	1.19	(3.33)	0.35	(0.63)	1.64	(3.78)	2.83	(7.14)	1.39	(2.78)	1.34	(3.43)
Austria	0.52	(1.52)	0.35	(1.08)	0.58	(1.85)	0.15	(0.48)	0.61	(1.27)	1.82	(3.89)	0.63	(2.19)	0.50	(1.90)
Belgium	0.29	(1.17)	-0.03	(-0.10)	0.22	(0.98)	-0.11	(-0.46)	0.72	(2.02)	1.80	(5.34)	0.37	(1.52)	0.24	(1.09)
Canada	0.38	(0.98)	0.30	(0.77)	0.47	(1.21)	0.36	(0.97)	0.98	(2.48)	1.24	(3.34)	0.77	(1.97)	0.62	(1.74)
Denmark	1.06	(3.53)	0.97	(3.33)	0.89	(3.14)	0.77	(2.45)	1.21	(3.55)	1.88	(5.07)	1.10	(3.82)	0.97	(3.86)
Finland	0.77	(2.59)	0.48	(1.42)	0.81	(2.65)	0.67	(1.95)	1.01	(4.74)	1.89	(7.33)	0.75	(2.36)	0.84	(2.97)
France	0.31	(1.71)	0.32	(1.44)	0.54	(2.85)	0.01	(0.04)	1.01	(4.32)	2.31	(7.73)	0.37	(1.74)	0.46	(2.60)
Germany	0.57	(2.11)	0.51	(1.65)	0.68	(2.53)	0.11	(0.64)	1.20	(7.10)	1.79	(9.18)	0.59	(2.86)	0.55	(2.40)
Greece	0.32	(0.60)	0.52	(0.90)	0.69	(1.19)	0.43	(1.13)	1.25	(3.89)	2.72	(7.07)	0.59	(1.15)	0.64	(1.25)
Hong Kong	1.05	(2.20)	0.74	(1.57)	0.75	(1.64)	0.34	(0.93)	1.05	(2.56)	1.47	(3.35)	0.77	(1.60)	1.14	(2.79)
Ireland	1.04	(1.46)	1.52	(2.04)	1.46	(2.20)	1.17	(1.72)	0.68	(0.54)	1.65	(2.01)	1.87	(2.79)	1.32	(2.12)
Italy	0.47	(2.05)	0.27	(1.01)	0.51	(2.23)	0.23	(1.00)	1.25	(4.85)	1.92	(7.27)	0.61	(2.56)	0.48	(2.14)
Japan	0.15	(0.94)	0.05	(0.51)	0.15	(0.98)	0.10	(0.62)					0.12	(0.87)	0.11	(0.90)
Netherlands	0.41	(1.55)	0.27	(1.01)	0.74	(2.81)	0.44	(1.84)	0.87	(2.37)	1.77	(5.37)	0.55	(1.96)	0.49	(2.23)
New Zealand	0.13	(0.38)	0.29	(0.68)	0.60	(1.59)	-0.45	(-1.27)	0.67	(1.54)	1.95	(4.31)	0.79	(2.19)	0.53	(1.76)
Norway	0.53	(1.38)	0.56	(1.68)	0.39	(1.05)	0.15	(0.36)	1.19	(2.82)	1.20	(2.77)	0.57	(1.33)	0.50	(1.51)
Portugal	0.54	(1.58)	0.13	(0.35)	0.82	(2.52)	0.65	(1.52)	0.67	(1.34)	2.08	(4.43)	1.02	(2.77)	0.60	(2.02)
Singapore	0.34	(1.33)	0.84	(3.35)	0.83	(3.29)	0.44	(1.94)	1.25	(5.11)	2.15	(7.49)	1.22	(5.62)	0.92	(4.39)
Spain	0.45	(2.01)	0.53	(1.99)	0.69	(2.68)	0.24	(0.98)	0.37	(1.21)	1.39	(3.63)	0.73	(2.84)	0.55	(2.92)

Sweden	0.62	(2.16)	0.73	(2.59)	0.91	(3.64)	0.33	(0.94)	1.19	(4.45)	1.80	(6.27)	0.88	(2.89)	0.81	(3.11)
Switzerland	0.73	(3.87)	0.55	(2.82)	0.63	(3.07)	0.66	(3.75)	1.16	(5.52)	1.59	(6.19)	0.75	(3.62)	0.69	(4.30)
The U.K.	0.94	(3.37)	0.96	(3.62)	1.10	(3.81)	0.57	(2.17)	2.26	(6.99)	2.95	(8.13)	1.26	(4.55)	1.18	(4.87)
The U.S.	0.64	(3.80)	0.12	(0.50)	0.48	(2.53)	0.34	(2.05)	1.02	(6.14)	0.94	(3.67)	0.86	(3.82)	0.59	(3.44)
	Panel B: Developing countries															
Brazil	0.54	(1.01)	0.63	(1.49)	0.69	(1.32)	0.61	(1.50)	1.32	(2.98)	0.90	(2.19)	1.08	(2.38)	0.69	(1.74)
China	-0.15	(-0.56)	-0.47	(-1.46)	-0.27	(-0.89)	-0.18	(-0.68)	0.65	(2.58)	0.38	(1.71)	-0.07	(-0.21)	-0.17	(-0.62)
India	0.63	(1.60)	0.82	(2.48)	0.52	(1.59)	0.70	(1.87)	1.19	(2.87)	1.16	(3.26)	0.91	(2.45)	0.71	(2.25)
Malaysia	0.54	(2.22)	0.57	(2.92)	0.50	(2.08)	0.38	(1.57)	1.49	(6.19)	2.22	(8.32)	1.06	(4.55)	0.86	(4.03)
Mexico	0.50	(1.19)	0.43	(0.98)	0.39	(0.89)	0.28	(0.57)	0.47	(1.55)	1.30	(3.56)	0.53	(1.31)	0.49	(1.22)
South Africa	0.28	(0.69)	0.14	(0.39)	0.22	(0.66)	-0.28	(-0.59)	1.94	(5.10)	2.41	(6.20)	0.64	(1.71)	0.47	(1.24)
South Korea	0.93	(3.07)	0.90	(2.68)	0.65	(1.96)	0.61	(2.13)	1.70	(3.07)	1.24	(2.53)	0.93	(2.94)	0.87	(3.21)
Sri Lanka	1.38	(3.44)	1.06	(3.14)	1.39	(4.38)	1.34	(3.13)	1.49	(4.52)	1.85	(4.86)	1.71	(4.22)	1.38	(5.53)
Taiwan	0.43	(1.26)	0.44	(1.40)	0.40	(1.16)	0.23	(0.70)	0.92	(3.83)	1.08	(3.51)	0.57	(1.53)	0.53	(1.60)
Thailand	0.70	(2.06)	0.59	(1.71)	0.48	(1.32)	0.42	(1.28)	1.54	(6.24)	1.58	(6.11)	0.76	(2.20)	0.76	(2.48)
	Panel C: Country-average															
Developed	0.69	(4.73)	0.68	(4.64)	0.84	(5.51)	0.48	(3.41)	1.03	(7.33)	1.92	(11.50)	0.99	(6.18)	0.88	(6.55)
Developing	0.46	(2.67)	0.44	(3.50)	0.40	(2.76)	0.34	(2.12)	1.11	(4.94)	1.47	(7.12)	0.67	(4.50)	0.64	(4.88)
Global	0.60	(4.72)	0.59	(5.31)	0.70	(5.74)	0.35	(2.67)	1.12	(8.78)	1.95	(11.40)	0.83	(6.05)	0.81	(7.75)

Table 3. The profitability effect based on value-weighted returns: Country-by-country analysis

This table reports the time-series averages of value-weighted (VW) monthly return spreads on the high-minus-low (i.e., zero-cost) quintile portfolios of various profitability measures for each country. For each country and each sorting variable GPA, OP(FF5), OP(Ball), or GPLagA, at the end of June in year *t*, stocks are sorted into quintiles based on a specific sorting variable measured in year *t*-1. Value-weighted portfolio returns are calculated each month from July in year *t* to June in year *t*+1 using the market capitalization at the end of June in year *t* as the weight. These portfolios are rebalanced each year in June. For sorting variables GPLagAQ and ROEQ, at the beginning of each month *t*, stocks are sorted into quintiles on a specific sorting variable. Value-weighted portfolio returns are calculated each month using the market capitalization at the end of the previous month as the weight and are rebalanced each month. In the US, the quintile portfolios are formed using NYSE breakpoints. In other countries, portfolios are formed using equal-size breakpoints within each country. For each profitability measure PM, $RankPM$ is the cross-sectional ranking based on NYSE decile breakpoints. $AvgRankPM$ for each stock is a composite index, which is measured by the average value of $RankPM$ across six profitability measures. Monthly returns on the zero-cost portfolio are the difference in monthly returns between the two extreme profitability quintiles. The mean of the return spreads is the time-series average of the monthly returns on the zero-cost portfolio. The last column reports the simple average of the return spreads across all six profitability measures. The *t*-statistics are reported in parentheses. Detailed descriptions of variables are presented in Table A1 in the Appendix. Panel A reports the results for the developed economies and Panel B for the developing economies. Panel C reports the simple country-average of the return spreads across countries in each market category.

	Mean of return spreads (5-1, VW)															
	GPA		OP(FF5)		OP(Ball)		GPLagA		GPLagAQ		ROEQ		AvgRankPM		Average	
	Panel A: Developed countries															
Australia	0.86	(1.70)	0.90	(1.91)	0.70	(1.63)	0.11	(0.21)	1.48	(3.47)	1.90	(4.04)	0.53	(1.05)	1.00	(2.74)
Austria	0.29	(0.67)	-0.09	(-0.23)	0.07	(0.19)	-0.36	(-0.78)	-0.06	(-0.10)	0.50	(0.75)	0.38	(0.93)	0.14	(0.46)
Belgium	0.06	(0.18)	-0.13	(-0.36)	0.13	(0.40)	0.04	(0.12)	0.14	(0.32)	1.21	(2.41)	0.21	(0.73)	0.12	(0.45)
Canada	0.80	(1.37)	0.25	(0.54)	0.63	(1.29)	0.14	(0.26)	1.15	(2.65)	0.64	(1.19)	0.70	(1.67)	0.60	(1.57)
Denmark	0.11	(0.19)	0.54	(1.30)	0.85	(1.83)	0.30	(0.58)	1.51	(2.00)	0.75	(0.97)	0.68	(1.31)	0.49	(1.12)
Finland	0.77	(1.54)	0.14	(0.36)	0.58	(1.27)	0.89	(2.35)	0.51	(1.17)	0.59	(1.06)	0.73	(1.98)	0.67	(2.01)
France	0.56	(2.52)	0.29	(1.36)	0.40	(1.99)	0.01	(0.06)	0.46	(1.29)	0.94	(2.28)	0.29	(1.21)	0.36	(2.12)
Germany	-0.11	(-0.40)	0.11	(0.39)	-0.02	(-0.10)	-0.16	(-0.67)	0.07	(0.29)	0.12	(0.32)	0.00	(0.01)	-0.11	(-0.53)
Greece	0.37	(0.60)	0.31	(0.37)	0.34	(0.44)	0.41	(0.87)	1.04	(2.31)	1.65	(3.26)	0.29	(0.44)	0.41	(0.65)
Hong Kong	0.43	(1.19)	1.22	(2.45)	0.84	(1.66)	0.43	(1.15)	0.49	(1.38)	1.38	(2.71)	0.86	(1.90)	0.80	(2.21)
Ireland	0.32	(0.51)	0.82	(0.81)	1.01	(1.17)	-0.39	(-0.48)	0.03	(0.02)	-0.26	(-0.18)	1.52	(1.93)	0.41	(0.68)
Italy	0.66	(2.15)	0.71	(2.04)	0.71	(1.95)	0.22	(0.60)	1.25	(3.46)	0.80	(1.63)	1.01	(2.87)	0.57	(2.05)
Japan	0.03	(0.17)	0.06	(0.29)	0.14	(0.57)	0.01	(0.04)					0.04	(0.20)	0.06	(0.30)
Netherlands	0.12	(0.31)	0.34	(0.85)	0.85	(2.09)	0.38	(0.97)	0.38	(0.54)	0.14	(0.22)	0.37	(0.97)	0.31	(1.01)
New Zealand	-0.20	(-0.57)	-0.92	(-1.47)	-0.55	(-1.12)	-0.49	(-1.39)	-0.01	(-0.02)	0.65	(0.93)	-0.21	(-0.60)	-0.26	(-0.95)
Norway	-0.03	(-0.09)	0.44	(1.18)	-0.08	(-0.22)	0.01	(0.01)	0.38	(0.73)	0.89	(2.16)	0.25	(0.57)	0.06	(0.20)
Portugal	0.18	(0.37)	0.57	(1.13)	0.37	(0.71)	0.50	(1.08)	1.18	(1.96)	1.92	(2.30)	0.49	(1.01)	0.40	(0.91)
Singapore	0.26	(0.57)	0.60	(1.41)	0.66	(1.43)	0.11	(0.32)	0.24	(0.54)	0.95	(2.44)	0.44	(1.15)	0.50	(1.47)

Spain	0.05	(0.16)	0.30	(0.81)	0.28	(0.76)	0.07	(0.19)	0.84	(1.74)	1.07	(1.75)	0.07	(0.20)	0.27	(0.88)
Sweden	-0.06	(-0.14)	0.15	(0.36)	0.11	(0.26)	0.11	(0.23)	-0.70	(-1.36)	0.04	(0.10)	-0.19	(-0.42)	0.09	(0.29)
Switzerland	0.52	(1.93)	0.13	(0.46)	0.46	(2.10)	0.33	(1.40)	0.06	(0.16)	0.19	(0.39)	0.29	(0.88)	0.25	(1.29)
The U.K.	0.43	(1.25)	0.18	(0.65)	0.93	(2.54)	0.43	(1.29)	0.93	(2.28)	1.34	(2.16)	0.66	(2.19)	0.59	(2.36)
The U.S.	0.36	(2.16)	0.29	(1.26)	0.34	(1.97)	0.22	(1.26)	0.43	(2.63)	0.47	(1.81)	0.42	(2.43)	0.35	(2.15)
	Panel B: Developing countries															
Brazil	0.51	(0.82)	0.42	(0.63)	1.07	(1.39)	0.67	(1.29)	0.95	(1.56)	1.21	(1.99)	1.04	(1.68)	0.67	(1.26)
China	0.05	(0.17)	-0.46	(-1.28)	-0.37	(-1.06)	0.08	(0.28)	0.44	(1.29)	0.42	(1.23)	-0.07	(-0.21)	-0.09	(-0.29)
India	-0.39	(-0.65)	-0.47	(-0.74)	-0.71	(-1.13)	0.05	(0.09)	0.67	(1.02)	0.61	(1.34)	0.00	(0.00)	-0.17	(-0.33)
Malaysia	0.60	(2.52)	0.56	(2.17)	0.42	(1.54)	0.51	(2.03)	1.17	(4.89)	1.48	(4.50)	0.80	(2.94)	0.74	(3.42)
Mexico	0.76	(1.44)	0.22	(0.47)	0.07	(0.15)	0.36	(0.63)	0.04	(0.08)	0.85	(1.57)	0.24	(0.61)	0.41	(0.91)
South Africa	0.34	(0.67)	-0.01	(-0.02)	0.30	(0.76)	0.14	(0.21)	1.37	(3.29)	1.49	(2.47)	0.62	(1.33)	0.36	(0.84)
South Korea	1.09	(1.70)	1.58	(3.23)	0.98	(2.17)	0.88	(1.37)	1.78	(3.05)	0.11	(0.23)	1.09	(1.96)	1.17	(2.28)
Sri Lanka	1.20	(1.91)	1.12	(2.00)	1.25	(2.96)	0.88	(2.16)	1.63	(3.48)	2.19	(5.04)	1.33	(2.92)	1.32	(3.75)
Taiwan	0.84	(2.11)	0.74	(2.05)	0.62	(1.71)	0.38	(1.08)	0.74	(2.19)	1.42	(2.96)	0.85	(2.14)	0.77	(2.12)
Thailand	0.25	(0.46)	0.09	(0.19)	-0.10	(-0.19)	0.60	(1.34)	0.82	(1.92)	1.42	(2.99)	0.23	(0.48)	0.37	(0.87)
	Panel C: Country-average															
Developed	0.40	(2.11)	0.43	(2.28)	0.53	(2.48)	0.24	(1.42)	0.48	(2.59)	0.88	(3.53)	0.48	(2.52)	0.46	(2.73)
Developing	0.37	(1.77)	0.30	(1.81)	0.21	(1.08)	0.31	(1.49)	0.72	(2.46)	1.19	(4.24)	0.55	(2.95)	0.50	(3.05)
Global	0.38	(2.35)	0.40	(2.80)	0.44	(2.68)	0.20	(1.33)	0.67	(3.92)	1.18	(5.11)	0.52	(3.24)	0.51	(3.91)

Table 4. Fama-MacBeth regressions (OLS) of stock returns on profitability: Country-by-country analysis

This table reports the profitability effect based on regression analysis. For each country, the following regression model is estimated based on the Fama and MacBeth (1973) procedure:

$$R_{i,t}\text{-}R_{ft} = \alpha + \beta_1 RankPM_{i,t\text{-}1} + \varepsilon_{i,t},$$

where $R_{i,t}$ is the monthly raw return in percent (in U.S. dollars) for stock i from July in year t to June in year t+1. R_{ft} is the risk-free rate in percent in the corresponding month, proxied by the one-month U.S. Treasury-bill rate. $PM_{i,t\text{-}1}$ is one of the six profitability measures in year t-1. $RankPM_{i,t\text{-}1}$ is the cross-sectional ranking of the profitability measure PM based on NYSE decile breakpoints. $AvgRankPM$ for each stock is a composite index, which is measured by the average value of $RankPM$ across six profitability measures. The monthly cross-sectional regressions based on the Fama and MacBeth (1973) procedure are performed with ordinary least squares (OLS) method. The last column "Average" reports the average of coefficients across Fama and MacBeth (1973) regressions on each of the six profitability measures. This table reports the average of coefficients on each profitability measure (i.e., β_1) for each country. Detailed descriptions of variables are presented in Table A1 in the Appendix. The robust Newey and West (1987) t-statistics are reported in parentheses. Panel A reports the results for the developed economies and Panel B for the developing economies.

	Average coefficient on profitability from cross-sectional OLS regressions															
	RankGPA		RankOP(FF5)		RankOP(Ball)		RankGPLagA		RankGPLagAQ		RankROEQ		AvgRankPM		Average	
	Panel A: Developed countries															
Australia	0.08	(1.70)	0.08	(2.12)	0.08	(1.93)	0.05	(0.90)	0.18	(4.25)	0.31	(6.89)	0.15	(2.85)	0.12	(3.05)
Austria	0.07	(1.69)	0.11	(3.14)	0.02	(0.27)	0.04	(1.04)	0.07	(1.18)	0.20	(3.69)	0.15	(2.88)	0.07	(1.89)
Belgium	0.05	(1.52)	0.04	(1.29)	0.05	(1.59)	-0.01	(-0.35)	0.08	(2.09)	0.23	(5.50)	0.07	(2.16)	0.05	(1.97)
Canada	0.07	(1.75)	0.04	(1.26)	0.05	(1.48)	0.06	(1.57)	0.16	(4.04)	0.15	(3.78)	0.14	(2.65)	0.09	(2.65)
Denmark	0.11	(3.45)	0.09	(3.15)	0.08	(2.92)	0.08	(2.70)	0.13	(3.03)	0.22	(5.46)	0.14	(3.54)	0.10	(3.76)
Finland	0.16	(2.42)	0.04	(0.94)	0.06	(1.60)	0.12	(1.70)	0.10	(3.73)	0.20	(6.31)	0.37	(2.13)	0.11	(2.74)
France	0.02	(1.03)	0.06	(2.06)	0.04	(1.92)	0.00	(-0.20)	0.12	(4.70)	0.27	(8.34)	0.07	(2.57)	0.05	(2.48)
Germany	0.07	(2.09)	0.06	(1.59)	0.06	(2.04)	0.00	(0.20)	0.14	(6.92)	0.20	(9.91)	0.10	(2.49)	0.06	(2.10)
Greece	0.05	(0.66)	0.01	(0.18)	0.06	(0.88)	0.07	(1.34)	0.17	(4.06)	0.28	(6.37)	0.12	(1.30)	0.06	(0.97)
Hong Kong	0.09	(1.66)	0.02	(0.35)	0.03	(0.70)	-0.03	(-0.53)	0.15	(3.10)	0.15	(3.12)	0.08	(1.32)	0.07	(1.69)
Ireland	0.13	(1.63)	0.17	(2.23)	0.06	(0.96)	0.14	(1.57)	0.08	(0.55)	0.16	(1.76)	0.20	(2.10)	0.12	(1.79)
Italy	0.06	(2.36)	0.04	(1.07)	0.07	(2.49)	0.03	(1.28)	0.13	(4.47)	0.20	(6.66)	0.09	(2.42)	0.06	(2.43)
Japan	0.02	(0.97)	-0.01	(-0.75)	0.03	(1.10)	0.01	(0.52)					0.02	(0.72)	0.01	(0.71)
Netherlands	0.08	(2.03)	0.06	(1.67)	0.08	(2.70)	0.05	(1.55)	0.12	(2.79)	0.21	(5.34)	0.12	(2.82)	0.07	(2.25)
New Zealand	-0.01	(-0.18)	0.04	(1.22)	0.04	(1.21)	-0.04	(-0.96)	0.07	(1.57)	0.23	(4.62)	0.09	(2.18)	0.05	(1.61)
Norway	0.04	(0.67)	0.05	(0.76)	0.00	(0.05)	0.01	(0.22)	0.13	(2.86)	0.13	(2.98)	0.06	(0.83)	0.04	(0.61)
Portugal	0.09	(2.24)	-0.02	(-0.39)	0.13	(2.47)	0.09	(1.96)	0.12	(2.22)	0.27	(4.31)	0.16	(2.79)	0.09	(2.42)
Singapore	0.08	(2.63)	0.08	(3.05)	0.08	(2.82)	0.07	(2.55)	0.15	(4.35)	0.26	(7.84)	0.16	(4.40)	0.12	(4.41)
Spain	0.08	(2.48)	0.11	(2.49)	0.15	(3.05)	0.05	(1.58)	0.05	(1.38)	0.18	(4.12)	0.14	(3.50)	0.11	(3.52)
Sweden	0.07	(2.60)	0.07	(3.07)	0.07	(3.45)	0.04	(1.05)	0.12	(4.53)	0.18	(6.09)	0.12	(3.80)	0.08	(3.57)

Switzerland	0.08	(2.80)	0.10	(3.21)	0.10	(3.29)	0.07	(2.54)	0.15	(6.49)	0.19	(6.80)	0.13	(4.16)	0.10	(4.16)
The U.K.	0.10	(3.75)	0.09	(3.63)	0.09	(3.77)	0.06	(2.42)	0.22	(7.29)	0.31	(7.49)	0.15	(4.35)	0.12	(4.99)
The U.S.	0.09	(4.50)	0.03	(0.91)	0.08	(3.41)	0.04	(2.21)	0.12	(6.38)	0.12	(3.36)	0.14	(3.92)	0.08	(3.73)
	Panel B: Developing countries															
Brazil	0.08	(1.29)	0.01	(0.16)	0.05	(0.94)	0.07	(1.51)	0.17	(3.19)	0.12	(2.55)	0.10	(1.55)	0.07	(1.58)
China	-0.02	(-0.32)	-0.04	(-1.08)	-0.03	(-0.68)	-0.04	(-0.70)	0.12	(2.75)	0.08	(2.27)	-0.02	(-0.37)	-0.01	(-0.25)
India	0.13	(2.95)	0.06	(1.73)	0.05	(1.31)	0.07	(1.44)	0.15	(3.33)	0.14	(3.72)	0.13	(2.52)	0.09	(2.47)
Malaysia	0.08	(2.58)	0.07	(3.27)	0.06	(2.54)	0.05	(2.16)	0.18	(5.73)	0.28	(8.89)	0.16	(4.65)	0.11	(4.65)
Mexico	0.03	(0.48)	0.02	(0.49)	0.03	(0.58)	0.06	(1.02)	0.07	(1.76)	0.15	(3.24)	0.08	(1.20)	0.05	(1.05)
South Africa	0.03	(0.77)	0.02	(0.48)	0.02	(0.70)	-0.02	(-0.37)	0.18	(4.06)	0.30	(6.01)	0.09	(1.83)	0.06	(1.52)
South Korea	0.12	(2.50)	0.05	(1.53)	0.10	(1.84)	0.08	(1.71)	0.20	(3.01)	0.10	(1.92)	0.14	(2.73)	0.10	(2.59)
Sri Lanka	0.21	(3.16)	0.13	(3.34)	0.14	(3.75)	0.19	(3.28)	0.23	(4.87)	0.22	(5.61)	0.27	(5.02)	0.18	(4.90)
Taiwan	0.06	(1.08)	0.06	(1.26)	0.04	(1.10)	0.02	(0.30)	0.13	(3.37)	0.13	(3.53)	0.08	(1.51)	0.07	(1.44)
Thailand	0.09	(1.66)	0.10	(3.28)	0.08	(1.93)	0.07	(1.53)	0.19	(5.89)	0.20	(6.88)	0.16	(3.41)	0.11	(2.86)

Table 5. Fama-MacBeth Regressions (WLS) of Stock Returns on Profitability: Country-by-country Analysis

This table reports the profitability effect based on regression analysis. For each country, the following regression model is estimated based on the Fama and MacBeth (1973) procedure:

$$R_{i,t}\text{-}R_{ft} = \alpha + \beta_1 RankPM_{i,t\text{-}1} + \varepsilon_{i,t},$$

where $R_{i,t}$ is the monthly raw return in percent (in U.S. dollars) for stock *i* from July in year *t* to June in year *t*+1. R_{ft} is the risk-free rate in percent in the corresponding month, proxied by the one-month U.S. Treasury-bill rate. $PM_{i,t\text{-}1}$ is one of the six profitability measures in year *t*-1. $RankPM_{i,t\text{-}1}$ is the cross-sectional ranking of the profitability measure *PM* based on NYSE decile breakpoints. $AvgRankPM$ for each stock is a composite index, which is measured by the average value of $RankP$M across six profitability measures. The monthly cross-sectional regressions based on the Fama and MacBeth (1973) procedure are performed with weighted-least-squares (WLS) method, where the weight is the market capitalizations of the stock in the previous month. The last column "$Average$" reports the average of coefficients across Fama and MacBeth (1973) regressions on each of the six profitability measures. This table reports the average of coefficients on each profitability measure (i.e., β_1) for each country. Detailed descriptions of variables are presented in Table A1 in the Appendix. The robust Newey and West (1987) *t*-statistics are reported in parentheses. Panel A reports the results for the developed economies and Panel B for the developing economies.

	Average coefficient on profitability from cross-sectional WLS regressions															
	RankGPA		RankOP(FF5)		RankOP(Ball)		RankGPLagA		RankGPLagAQ		RankROEQ		$AvgRankPM$		$Average$	
	Panel A: Developed countries															
Australia	0.01	(0.24)	0.01	(0.21)	0.02	(0.57)	0.00	(0.07)	0.09	(2.68)	0.17	(3.49)	0.06	(1.31)	0.06	(1.76)
Austria	-0.03	(-0.43)	0.04	(0.79)	-0.12	(-1.12)	-0.04	(-0.60)	-0.03	(-0.45)	0.02	(0.33)	-0.04	(-0.51)	-0.04	(-0.65)
Belgium	-0.01	(-0.21)	-0.01	(-0.11)	-0.03	(-0.49)	-0.05	(-0.92)	-0.09	(-1.40)	0.08	(1.23)	-0.02	(-0.32)	-0.02	(-0.32)
Canada	0.05	(0.70)	0.06	(1.50)	0.04	(0.80)	0.00	(-0.02)	0.14	(3.02)	0.09	(1.75)	0.09	(1.37)	0.06	(1.84)
Denmark	0.03	(0.57)	0.01	(0.26)	0.02	(0.50)	0.02	(0.45)	0.11	(1.47)	0.11	(1.62)	0.06	(1.00)	0.04	(0.73)
Finland	0.10	(1.04)	0.04	(0.51)	0.08	(0.87)	0.08	(0.77)	-0.06	(-1.05)	0.07	(1.07)	0.28	(1.65)	0.08	(1.43)
France	0.04	(1.61)	0.02	(0.85)	0.01	(0.34)	0.02	(0.60)	0.07	(1.75)	0.11	(3.15)	0.05	(1.46)	0.03	(1.31)
Germany	0.01	(0.44)	0.02	(0.68)	0.01	(0.22)	-0.01	(-0.33)	0.06	(1.63)	0.03	(1.07)	0.02	(0.56)	0.01	(0.21)
Greece	0.06	(0.88)	-0.01	(-0.08)	0.03	(0.39)	0.07	(1.39)	0.10	(1.81)	0.13	(2.22)	0.05	(0.55)	0.04	(0.68)
Hong Kong	0.02	(0.50)	0.01	(0.32)	0.02	(0.49)	0.04	(0.90)	0.06	(1.16)	0.10	(1.77)	0.05	(1.11)	0.03	(0.72)
Ireland	0.10	(0.96)	0.13	(1.32)	-0.02	(-0.19)	0.13	(1.22)	0.15	(0.97)	-0.11	(-0.82)	0.08	(0.80)	0.07	(0.89)
Italy	0.09	(2.37)	0.14	(1.53)	0.08	(1.43)	0.05	(1.11)	0.10	(2.42)	0.09	(1.81)	0.11	(1.98)	0.10	(2.17)
Japan	0.01	(0.27)	-0.01	(-0.55)	0.03	(0.87)	0.01	(0.20)					0.01	(0.22)	0.01	(0.33)
Netherlands	0.07	(1.07)	0.09	(1.68)	0.10	(2.52)	0.09	(1.64)	0.14	(1.46)	0.05	(0.72)	0.11	(1.61)	0.08	(1.86)
New Zealand	0.00	(0.06)	0.01	(0.11)	-0.01	(-0.10)	-0.01	(-0.18)	0.04	(1.16)	0.11	(1.92)	0.01	(0.26)	0.03	(0.71)
Norway	0.05	(0.91)	-0.05	(-0.65)	-0.03	(-0.39)	0.02	(0.40)	0.07	(1.20)	0.05	(1.10)	0.02	(0.39)	-0.01	(-0.11)
Portugal	0.04	(0.70)	-0.03	(-0.38)	-0.02	(-0.34)	0.06	(1.11)	0.16	(2.16)	0.24	(3.22)	0.04	(0.57)	0.03	(0.54)
Singapore	0.01	(0.11)	-0.01	(-0.33)	-0.01	(-0.13)	0.01	(0.22)	0.01	(0.20)	0.09	(1.82)	0.02	(0.37)	0.02	(0.48)

Spain	0.01	(0.21)	0.21	(2.84)	0.08	(1.36)	0.00	(0.06)	0.07	(1.13)	0.14	(2.19)	0.03	(0.46)	0.08	(2.05)
Sweden	-0.05	(-0.84)	-0.05	(-0.96)	-0.05	(-0.85)	-0.09	(-1.64)	-0.13	(-1.82)	-0.01	(-0.26)	-0.06	(-0.90)	-0.04	(-0.84)
Switzerland	0.04	(0.65)	-0.01	(-0.24)	0.05	(1.17)	0.03	(0.45)	0.07	(0.88)	0.03	(0.75)	0.05	(0.84)	0.03	(0.70)
The U.K.	0.02	(0.90)	0.00	(0.08)	0.01	(0.69)	0.01	(0.46)	0.11	(1.77)	0.02	(0.33)	0.02	(0.81)	0.02	(1.20)
The U.S.	0.05	(2.07)	0.04	(1.45)	0.04	(2.08)	0.03	(1.09)	0.06	(2.69)	0.06	(2.10)	0.07	(2.36)	0.04	(2.24)
	Panel B: Developing countries															
Brazil	0.07	(0.93)	0.04	(0.68)	0.10	(1.43)	0.07	(1.06)	0.14	(1.92)	0.15	(2.01)	0.10	(1.19)	0.08	(1.32)
China	0.03	(0.67)	-0.01	(-0.21)	0.01	(0.26)	0.02	(0.48)	0.09	(1.57)	0.08	(1.59)	0.03	(0.57)	0.03	(0.60)
India	0.04	(0.56)	-0.01	(-0.15)	-0.01	(-0.13)	0.02	(0.30)	0.05	(0.76)	0.12	(1.89)	0.03	(0.47)	0.03	(0.55)
Malaysia	0.04	(1.53)	0.04	(1.60)	0.05	(1.80)	0.01	(0.46)	0.10	(3.61)	0.15	(4.00)	0.10	(3.15)	0.06	(2.60)
Mexico	0.05	(0.78)	0.03	(0.65)	0.03	(0.69)	0.04	(0.59)	0.04	(0.66)	0.10	(1.66)	0.06	(0.90)	0.05	(0.93)
South Africa	0.04	(0.78)	0.02	(0.56)	0.01	(0.20)	0.01	(0.14)	0.14	(2.62)	0.16	(2.14)	0.05	(0.98)	0.04	(0.79)
South Korea	0.18	(1.79)	0.12	(2.06)	0.18	(1.90)	0.17	(1.38)	0.19	(2.65)	0.08	(1.53)	0.20	(1.98)	0.18	(1.96)
Sri Lanka	0.17	(2.36)	0.08	(1.66)	0.07	(1.42)	0.18	(3.00)	0.25	(3.89)	0.23	(3.36)	0.17	(2.64)	0.15	(2.91)
Taiwan	0.09	(1.66)	0.09	(1.92)	0.06	(1.52)	0.05	(1.14)	0.12	(2.87)	0.16	(3.79)	0.12	(2.20)	0.09	(2.05)
Thailand	0.07	(0.99)	0.06	(1.28)	0.05	(1.03)	0.13	(1.76)	0.09	(1.70)	0.19	(3.82)	0.11	(1.74)	0.10	(1.81)

Table 6. The profitability effect for pooled regions

This table reports the profitability effect of various measures of profitability for the pooled regions. Panel A reports the EW and VW mean return spreads (Excess returns) on the high-minus-low profitability quintile portfolios and the Carhart (1997) four-factor adjusted returns (α-FFC4) where the dependent variables are EW and VW monthly return spreads. For each profitability measure *PM*, $RankPM$ is the cross-sectional ranking based on NYSE decile breakpoints. $AvgRankPM$ for each stock is a composite index, which is measured by the average value of $RankPM$ across six profitability measures. Portfolios for the pooled region are formed is the same way as for individual country but using the NYSE breakpoints for the portfolios in the pooled region. Panel B reports the average slopes on each profitability measure for the pooled region regression with and without the control variables. The Fama-French factors as well as the Carhart momentum factor in each pooled region are constructed from 2×3 sorts on two size (SZ) portfolios independently intersected with each set of the three portfolios formed on B/M and MOM12. NYSE median is used to form two size portfolios, *Small* and *Big*, based on SZ. Independently, NYSE breakpoints of the 30th and 70th percentiles are used to form three portfolios, *Low*, *Mid*, and *High*, based on each variable considered. For the six portfolios produced by the 2×3 sorts on Size and B/M, the *HML* factor is the average of the returns on the two portfolios with *High* B/M minus the average of the returns on two portfolios with *Low* B/M; the *SMB* factor is the average of the returns on the three portfolios with *Small* SZ minus the average of the returns on the three portfolios with *Big* SZ. Similarly, the Carhart momentum factor *WML* (winner minus loser) is the average of the returns on the two portfolios with *High* MOM12 minus the average of the returns on two portfolios with *Low* MOM12. The robust Newey and West (1987) *t*-statistics are reported in parentheses. The results are reported for all economies pooling together (Global), global excluding the US and Japan (exUSJP), global excluding firms with market value less than $100 million (ex<$100m) measured at the end of June, Developed, and Developing markets.

Panel A: Portfolio analysis results

	A1: Return spreads based on NYSE breakpoints (5-1, EW), pooled															
	GPA		OP(FF5)		OP(Ball)		GPLagA		GPLagAQ		ROEQ		AvgRankPM		Average	
	Excess returns															
Global	0.57	(3.13)	0.28	(1.62)	0.48	(2.73)	0.40	(2.20)	1.15	(6.09)	1.41	(7.09)	0.74	(3.86)	0.71	(4.73)
exUSJP	0.40	(1.67)	0.39	(1.89)	0.37	(1.65)	0.31	(1.29)	1.49	(4.68)	1.77	(8.05)	0.58	(2.48)	0.79	(4.00)
ex<$100m	0.62	(3.15)	0.53	(2.64)	0.65	(3.05)	0.47	(2.38)	0.97	(4.75)	1.10	(5.38)	0.76	(3.52)	0.72	(4.32)
Developed	0.61	(3.56)	0.26	(1.45)	0.53	(3.08)	0.45	(2.73)	1.13	(7.09)	1.41	(6.60)	0.78	(4.16)	0.73	(4.86)
Developing	0.07	(0.16)	0.43	(1.39)	0.20	(0.56)	0.02	(0.05)	0.70	(1.12)	1.03	(2.45)	0.37	(1.05)	0.26	(0.71)
	Carhart four-factor model adjusted returns (α-FFC4)															
Global	0.62	(3.98)	0.21	(1.41)	0.43	(2.93)	0.47	(2.87)	1.17	(6.59)	1.32	(8.17)	0.74	(4.58)	0.70	(5.79)
exUSJP	0.52	(2.49)	0.47	(2.81)	0.47	(2.57)	0.50	(2.35)	1.52	(5.09)	1.73	(8.37)	0.71	(3.57)	0.87	(5.18)
ex<$100m	0.58	(3.54)	0.36	(2.06)	0.52	(2.79)	0.46	(2.64)	0.96	(5.05)	1.02	(5.97)	0.70	(3.72)	0.65	(4.84)
Developed	0.69	(4.95)	0.19	(1.29)	0.50	(3.46)	0.55	(3.74)	1.21	(8.47)	1.32	(8.21)	0.83	(5.29)	0.74	(6.26)
Developing	0.07	(0.19)	0.28	(1.20)	0.21	(0.71)	0.07	(0.21)	0.95	(1.83)	1.21	(3.41)	0.41	(1.29)	0.23	(0.74)
	A2: Return spreads based on NYSE breakpoints (5-1, VW), pooled															
	GPA		OP(FF5)		OP(Ball)		GPLagA		GPLagAQ		ROEQ		AvgRankPM		Average	
	Excess returns															
Global	0.51	(3.02)	0.50	(2.23)	0.57	(2.69)	0.42	(2.42)	0.55	(3.49)	0.58	(2.39)	0.60	(2.92)	0.52	(3.13)
exUSJP	0.32	(1.83)	0.33	(1.92)	0.35	(2.05)	0.19	(1.17)	1.08	(2.69)	0.86	(2.16)	0.41	(2.38)	0.52	(3.23)
ex<$100m	0.52	(3.09)	0.50	(2.30)	0.56	(2.73)	0.45	(2.52)	0.54	(3.42)	0.56	(2.39)	0.60	(2.96)	0.52	(3.17)
Developed	0.48	(2.92)	0.48	(2.15)	0.58	(2.82)	0.41	(2.34)	0.52	(3.27)	0.54	(2.17)	0.57	(2.83)	0.50	(3.01)
Developing	0.16	(0.39)	0.81	(2.18)	0.68	(1.71)	0.32	(0.89)	0.06	(0.11)	0.51	(1.32)	0.51	(1.40)	0.39	(1.27)
	Carhart four-factor model adjusted returns (α-FFC4)															
Global	0.59	(4.16)	0.46	(2.54)	0.58	(3.31)	0.55	(3.75)	0.73	(5.62)	0.62	(3.44)	0.66	(3.94)	0.59	(4.59)
exUSJP	0.48	(3.01)	0.46	(3.89)	0.50	(3.93)	0.41	(2.62)	1.15	(2.62)	0.76	(2.09)	0.63	(4.48)	0.63	(4.02)
ex<$100m	0.58	(4.18)	0.45	(2.67)	0.57	(3.46)	0.55	(3.81)	0.70	(5.55)	0.56	(3.23)	0.64	(3.88)	0.57	(4.64)
Developed	0.54	(3.87)	0.41	(2.27)	0.58	(3.30)	0.51	(3.46)	0.68	(5.52)	0.56	(3.26)	0.60	(3.51)	0.55	(4.31)
Developing	0.12	(0.33)	0.59	(2.75)	0.51	(1.71)	0.35	(1.00)	0.42	(0.78)	0.77	(2.26)	0.37	(1.13)	0.29	(1.16)

Panel B: Fama and MacBeth (1973) regression results

B1: Average coefficient on profitability from cross-sectional OLS regressions

	RankGPA		RankOP(FF5)		RankOP(Ball)		RankGPLagA		RankGPLagAQ		RankROEQ		AvgRankPM		Average	
$R_{i,t}$-$R_{ft} = \alpha + \beta_1 RankPM_{i,t-1} + \varepsilon_{i,t}$																
Global	0.08	(3.17)	0.05	(2.25)	0.07	(3.10)	0.05	(2.18)	0.14	(6.17)	0.18	(6.41)	0.11	(3.94)	0.09	(4.84)
exUSJP	0.05	(1.75)	0.05	(2.00)	0.04	(1.59)	0.04	(1.29)	0.18	(5.01)	0.21	(6.55)	0.08	(2.43)	0.09	(3.86)
ex<$100m	0.07	(2.89)	0.07	(2.63)	0.08	(2.95)	0.06	(2.22)	0.12	(4.79)	0.14	(5.07)	0.11	(3.51)	0.09	(4.19)
Developed	0.08	(3.61)	0.04	(2.04)	0.07	(3.48)	0.05	(2.59)	0.14	(7.17)	0.17	(5.84)	0.11	(4.11)	0.09	(4.97)
Developing	0.06	(1.24)	0.06	(1.81)	0.04	(0.98)	0.05	(1.02)	0.10	(1.34)	0.15	(2.93)	0.09	(1.78)	0.06	(1.45)
$R_{i,t}$-$R_{ft} = \alpha + \beta_1 RankPM_{i,t-1} + \beta_2 Ln(BM_{i,t-1}) + \beta_3 Ln(SZ_{i,t}) + \beta_4 MOM_{i,t} + \beta_5 TAG_{i,t-1} + \varepsilon_{i,t}$																
Global	0.08	(3.57)	0.08	(3.15)	0.09	(4.19)	0.08	(3.46)	0.12	(5.41)	0.18	(6.96)	0.14	(4.71)	0.10	(5.13)
exUSJP	0.07	(2.40)	0.06	(2.56)	0.06	(2.26)	0.06	(2.22)	0.14	(4.73)	0.18	(7.02)	0.10	(3.12)	0.09	(4.02)
ex<$100m	0.08	(3.23)	0.08	(2.96)	0.09	(3.57)	0.08	(3.19)	0.10	(3.95)	0.13	(5.00)	0.13	(3.95)	0.09	(4.17)
Developed	0.09	(4.30)	0.08	(3.29)	0.10	(5.17)	0.08	(4.19)	0.12	(6.86)	0.17	(6.61)	0.15	(5.28)	0.11	(5.74)
Developing	0.06	(1.34)	0.07	(1.84)	0.03	(0.90)	0.07	(1.52)	0.10	(1.64)	0.16	(3.50)	0.10	(1.95)	0.08	(1.96)

B2: Average coefficient on profitability from cross-sectional WLS regressions

	RankGPA		RankOP(FF5)		RankOP(Ball)		RankGPLagA		RankGPLagAQ		RankROEQ		AvgRankPM		Average	
$R_{i,t}$-$R_{ft} = \alpha + \beta_1 RankPM_{i,t-1} + \varepsilon_{i,t}$																
Global	0.06	(2.72)	0.06	(2.16)	0.05	(2.31)	0.06	(2.41)	0.08	(3.65)	0.08	(3.13)	0.09	(2.94)	0.06	(3.20)
exUSJP	0.04	(2.05)	0.04	(1.84)	0.03	(1.40)	0.05	(1.99)	0.13	(3.76)	0.11	(2.20)	0.06	(2.58)	0.07	(3.65)
ex<$100m	0.06	(2.72)	0.06	(2.19)	0.06	(2.34)	0.06	(2.42)	0.08	(3.60)	0.08	(3.09)	0.09	(2.96)	0.06	(3.21)
Developed	0.06	(2.60)	0.05	(1.88)	0.05	(2.29)	0.05	(2.03)	0.07	(3.23)	0.07	(2.71)	0.08	(2.69)	0.06	(2.87)
Developing	0.09	(1.54)	0.09	(2.19)	0.07	(1.56)	0.12	(2.37)	0.04	(0.57)	0.06	(1.08)	0.11	(1.93)	0.08	(1.77)
$R_{i,t}$-$R_{ft} = \alpha + \beta_1 RankPM_{i,t-1} + \beta_2 Ln(BM_{i,t-1}) + \beta_3 Ln(SZ_{i,t}) + \beta_4 MOM_{i,t} + \beta_5 TAG_{i,t-1} + \varepsilon_{i,t}$																
Global	0.10	(4.54)	0.08	(3.01)	0.09	(4.18)	0.09	(4.53)	0.10	(5.34)	0.10	(3.89)	0.14	(4.84)	0.09	(5.09)
exUSJP	0.09	(5.00)	0.08	(4.34)	0.08	(4.54)	0.09	(4.96)	0.14	(5.20)	0.11	(2.87)	0.12	(5.66)	0.10	(6.47)
ex<$100m	0.10	(4.52)	0.08	(2.97)	0.09	(4.16)	0.09	(4.51)	0.10	(5.28)	0.10	(3.78)	0.14	(4.82)	0.09	(5.05)
Developed	0.08	(3.73)	0.06	(2.38)	0.07	(3.64)	0.07	(3.75)	0.08	(4.50)	0.08	(3.20)	0.12	(4.06)	0.08	(4.22)
Developing	0.15	(2.67)	0.14	(3.42)	0.10	(2.86)	0.17	(2.66)	0.14	(3.29)	0.16	(3.87)	0.20	(3.76)	0.15	(3.31)

Table 7. Cross-country analysis: Capital market development and the profitability effect

This table reports the results of cross-country regressions of the profitability effect measures on the access-to-capital index ($AccessCap$). The access-to-capital index for each country is the time-series average of the annual access-to-capital scores, where the annual access-to-capital score is the sum of the mean survey scores of respondents concerning the ease of equity financing and debt financing, obtained from the *Global Competitiveness Report* published by the World Economic Forum. In Panel A, the profitability effect is measured by the monthly EW or VW return spreads on the high-minus-low profitability quintiles formed on each profitability measure for each country, and the dependent variable is the Shape ratio of the return spreads, which is defined by the time-series mean of the return spreads divided by the time-series standard deviation. In Panel B, the profitability effect is measured by the monthly OLS or WLS cross-sectional regression coefficients on each profitability measure for each country and the dependent variable is the time-series mean of the regression coefficients divided by the time-series standard deviation. For both panels, the dependent variables are regressed on the access-to-capital index. The associated *t*-statistics are reported in parentheses. The sample period for the regressions starts from April 1997 when the profitability effects are available for all sample countries to December 2017.

	Panel A: Profitability effect measured by return spreads on the high-minus-low profitability quintile (5 – 1)															
	GPA		OP(FF5)		OP(Ball)		GPLagA		GPLagAQ		ROEQ		AvgRankPM		Average	
	A1: Dependent variable = Shape ratio of EW return spreads															
Constant	-17.88	(-1.59)	-35.70	(-3.00)	-17.41	(-1.29)	0.35	(0.03)	0.36	(0.02)	-11.51	(-0.46)	-27.88	(-2.11)	-24.53	(-1.68)
AccessCap	3.31	(2.69)	5.01	(3.84)	3.29	(2.23)	0.93	(0.75)	3.32	(1.63)	5.67	(2.05)	5.00	(3.46)	4.71	(2.94)
Adj-R^2	0.16		0.30		0.11		-0.01		0.05		0.09		0.25		0.19	
	A2: Dependent variable = Shape ratio of VW return spreads															
Constant	0.33	(0.03)	-3.67	(-0.43)	6.66	(0.71)	5.09	(0.53)	28.02	(2.20)	24.05	(1.61)	4.38	(0.45)	4.51	(0.47)
AccessCap	0.53	(0.44)	0.77	(0.83)	-0.28	(-0.27)	-0.13	(-0.13)	-1.64	(-1.18)	-0.98	(-0.60)	0.10	(0.10)	0.36	(0.34)
Adj-R^2	-0.03		-0.01		-0.03		-0.03		0.01		-0.02		-0.03		-0.03	
Nobs	33		33		33		33		32		32		33		33	
	Panel B: Profitability effect measured by coefficients on profitability from cross-sectional regressions															
	RankGPA		RankOP(FF5)		RankOP(Ball)		RankGPLagA		RankGPLagAQ		RankROEQ		AvgRankPM		Average	
	B1: Dependent variable = OLS regression coefficients, Mean/Stdev															
Constant	-12.72	(-0.92)	-24.81	(-1.79)	-19.35	(-1.38)	5.24	(0.37)	-1.58	(-0.09)	0.95	(0.04)	-16.98	(-1.13)	-19.38	(-1.31)
AccessCap	3.10	(2.03)	4.15	(2.73)	3.76	(2.43)	0.51	(0.33)	3.62	(1.78)	4.49	(1.56)	4.20	(2.55)	4.34	(2.48)
Adj-R^2	0.09		0.17		0.13		-0.03		0.07		0.04		0.15		0.14	
	B2: Dependent variable = WLS regression coefficients, Mean/Stdev															
Constant	23.95	(3.01)	17.44	(2.06)	12.06	(1.41)	23.42	(2.64)	31.55	(1.94)	26.14	(1.65)	17.48	(1.90)	20.43	(2.26)
AccessCap	-2.04	(-2.34)	-1.49	(-1.61)	-0.89	(-0.95)	-2.13	(-2.19)	-2.19	(-1.23)	-1.31	(-0.76)	-1.19	(-1.18)	-1.47	(-1.48)
Adj-R^2	0.12		0.05		0.00		0.11		0.02		-0.01		0.01		0.04	
Nobs	33		33		33		33		32		32		33		33	

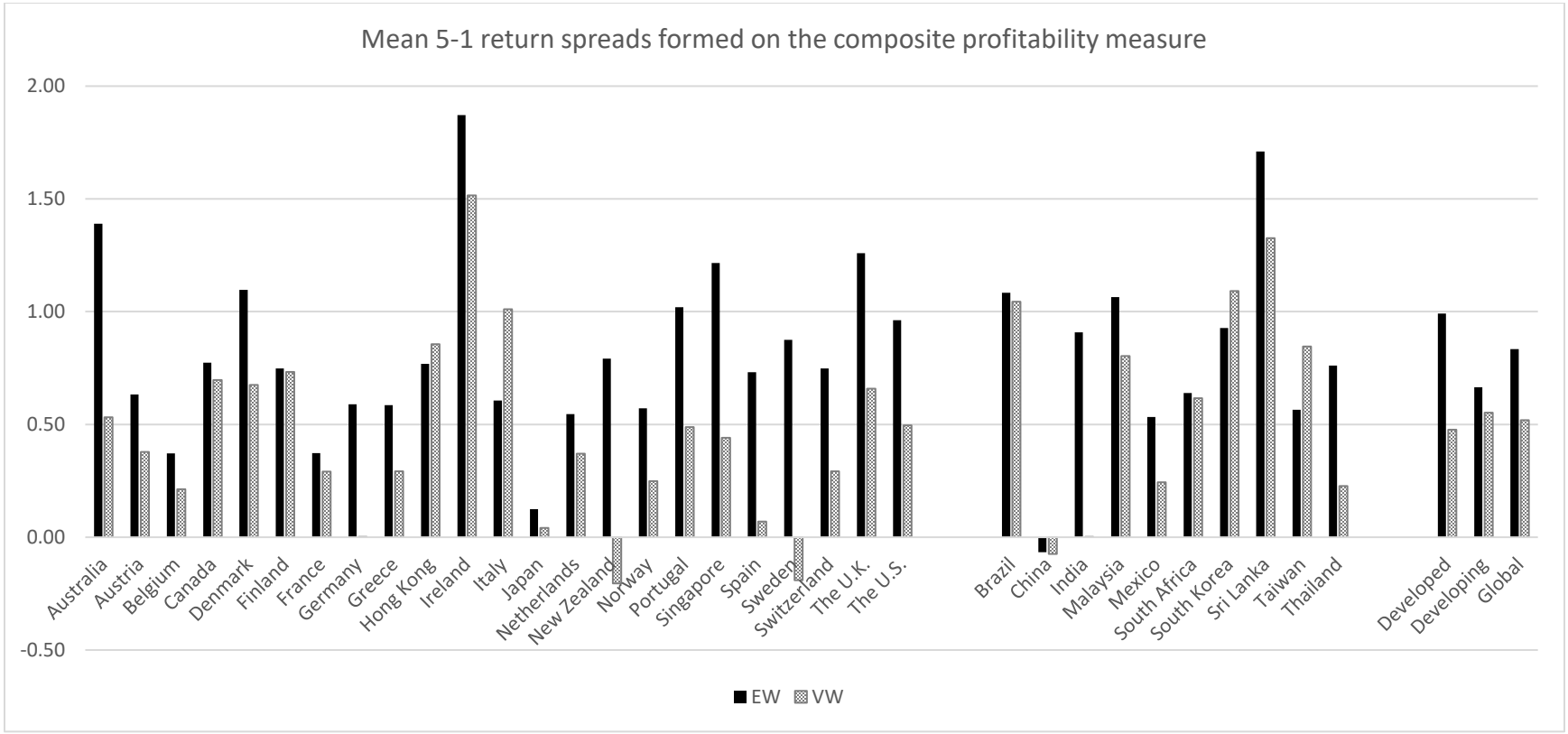

Figure 1. The profitability effect across countries measured by the mean 5-1 return spreads between the two extreme profitability quintile portfolios formed on the composite profitability measure (AvgRankPM). This figure plots the time-series mean of the return spreads formed on the composite profitability measure (AvgRankPM) based on equal-weighted portfolio returns (EW) and value-weighted portfolio returns (VW).

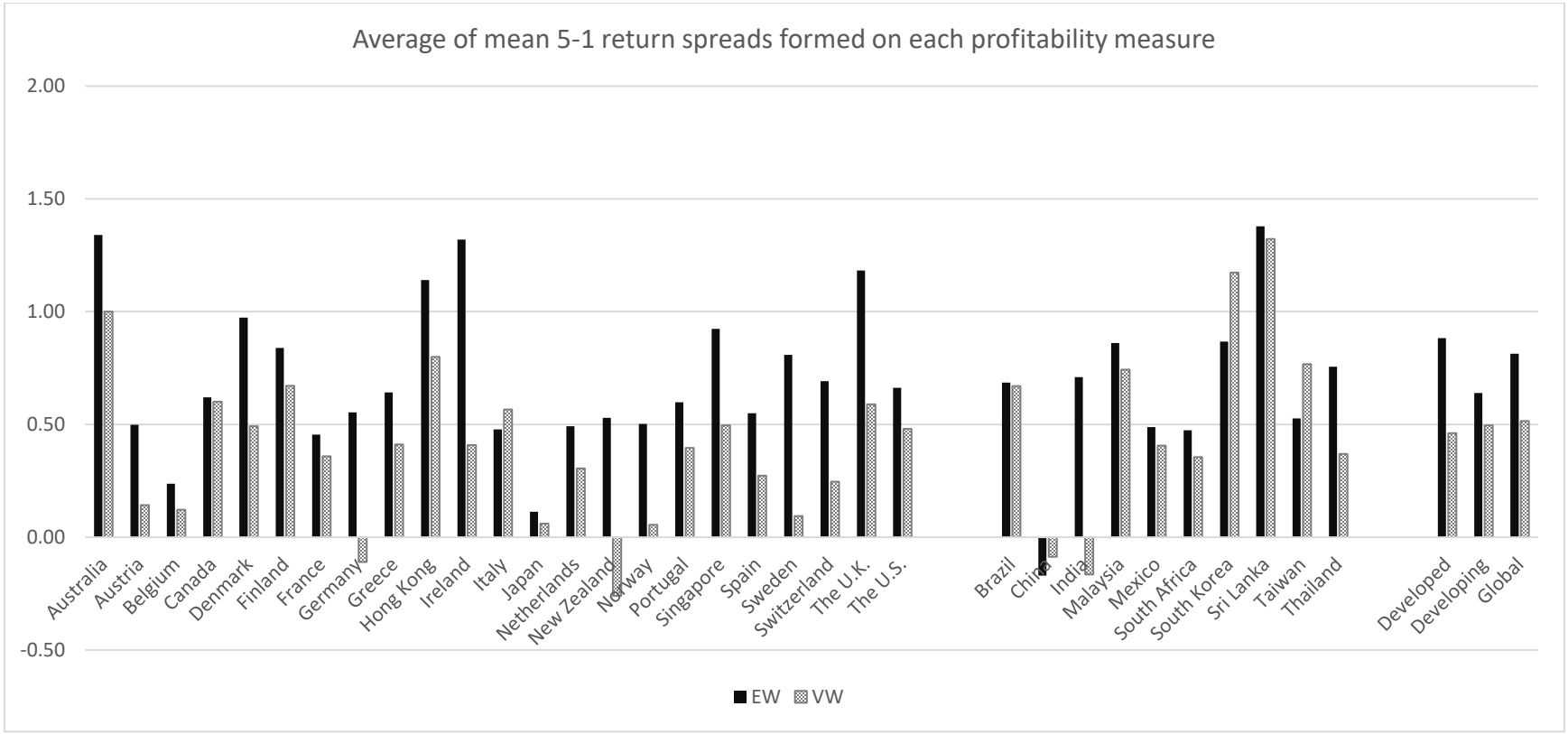

Figure 2. The profitability effect across countries measured by the average of mean 5-1 return spreads between the two extreme profitability quintile portfolios formed on each profitability measure. This figure plots the time-series mean of the simple average of the return spreads across all six profitability measures based on equal-weighted portfolio returns (EW) and value-weighted portfolio returns (VW).

Appendix

Table A1: Variable Description

Variable	Definition and data source
Gross profitability (GPA)	Annual revenues (item REVT) minus cost of goods sold (item COGS), scaled by total assets (item AT). Data source: Compustat.
OP(FF5)	Annual revenues (item REVT) minus cost of goods sold (item COGS), interest expense (item XINT), and selling, general, and administrative expenses (item XSGA), scaled by book equity (BE). Data source: Compustat.
OP(Ball)	Annual revenues (item REVT) minus cost of goods sold (item COGS) and selling, general, and administrative expenses (item XSGA) plus research & development expenditures (item XRD) scaled by total assets (item AT). Data source: Compustat.
GPLagA	Annual revenues (item REVT) minus cost of goods sold (item COGS), all divided by one-year lagged total assets (item AT). Data source: Compustat.
GPLagAQ	Quarterly revenues (item REVTQ) minus cost of goods sold (item COGSQ), scaled by one-quarter lagged total assets (item ATQ). Data source: Compustat.
ROEQ	Quarterly income before extraordinary items (item IBQ) scaled by 1-quarter lagged book equity (BEQ). Data source: Compustat.
Market capitalization (MV or SZ)	Market equity value. For non-U.S. firms, the data are from Compustat security file. For U.S. firms, the data are from CRSP.
Book-to-market equity (BM)	Common shareholders' equity for the last fiscal year-end in calendar year *t* divided by market equity in December of calendar year *t*. Data source: Compustat.
Momentum (MOM)	Momentum return for firm-month *t* is the holding period return from month *t*−6 to month *t*−2. Data source: CRSP.
Momentum (MOM12)	Momentum return for firm-month *t* is the holding period return from month *t*−12 to month *t*−2. Data source: CRSP.
Total asset growth (TAG)	Total asset growth rate from year *t*-1 to year *t*. Data source: Compustat.
Book equity (BE)	Annual stockholders' book equity, plus balance-sheet deferred taxes and investment tax credit (item TXDITC) if available, minus the book value of preferred stock. Stockholders' equity is the annual reported value (item SEQ) if available or book value of common equity (item CEQ) plus the par value of preferred stock (item PSTK) if available or total assets (item AT) minus total liabilities (item LT). Book value of preferred stock is measured by its redemption value (item PSTKRV) if available, liquidating value (item PSTKL) if available, or par value (item PSTK). If balance-sheet deferred taxes and investment tax credit (item TXDITC) is not available, we use the sum of deferred taxes (item TXDB) and investment tax credit (item ITCB). Data source: Compustat.
Book equity (BEQ)	Quarterly stockholders' book equity, plus balance-sheet deferred taxes and investment tax credit (item TXDITCQ) if available, minus the book value of preferred stock. Stockholders' equity is the annual reported value (item SEQQ) if available or book value of common equity (item CEQQ) plus the par value of preferred stock (item PSTKQ) if available or total assets (item ATQ) minus total liabilities (item LTQ). Book value of preferred stock is measured by its redemption value (item PSTKRQ) if available. If balance-sheet deferred taxes and investment tax credit (item TXDITCQ) is not available, we use deferred taxes (item TXDBQ). Data source: Compustat.
AccessCap	Access-to-capital index. For each country-year, we define the sum of the mean survey scores of respondents concerning the ease of equity financing and debt financing as the access-to-capital score (Titman, Wei, and Xie (2013)). The access-to-capital index is the time-series average of the annual access-to-capital scores. Data source: Global Competitiveness Report published by the World Economic Forum.

Table A2. The profitability effect with control variables: Country-by-country analysis

This table presents the intercept estimates of the Carhart (1997) four-factor model and the profitability slopes from Fama and MacBeth (1973) regressions with control variables for each country. For each country and each sorting variable GPA, OP(FF5), OP(Ball), or GPLagA, at the end of June in year *t*, stocks are sorted into quintiles based on a specific sorting variable measured in year *t*-1. Equal-weighted and value-weighted portfolio returns are calculated each month from July in year *t* to June in year *t*+1 using the market capitalization at the end of June in year *t* as the value weight. These portfolios are rebalanced each year in June. For sorting variables GPLagAQ and ROEQ, at the beginning of each month *t*, stocks are sorted into quintiles on a specific sorting variable. Equal-weighted and value-weighted portfolio returns are calculated each month using the market capitalization at the end of the previous month as the value weight and are rebalanced each month. In the U.S., the quintile portfolios are formed using NYSE breakpoints. In other countries, portfolios are formed using equal-size breakpoints within each country. For each profitability measure PM, $RankPM$ is the cross-sectional ranking based on NYSE decile breakpoints. $AvgRankPM$ for each stock is a composite index, which is measured by the average value of $RankPM$ across six profitability measures. Monthly returns on the zero-cost portfolio are the difference in monthly returns between the two extreme profitability quintiles. Panel A reports the time-series the intercept estimates (alphas) for the monthly return spreads with the robust Newey-West (1987) *t*-statistics in parentheses from the time-series regressions using the Carhart (1997) four factor model (α-FFC4). The last column "$Average$" denotes the simple average of the return spreads across all six profitability measures. Panel B reports the average coefficient of OLS and WLS cross-sectional regressions on each profitability measure estimated in each country, including Ln(BM), Ln(SZ), MOM, TAG as control variables: $R_{i,t}$-$R_{ft} = \alpha + \beta_1 RankPM_{i,t\text{-}1} + \beta_2 Ln(BM_{i,t\text{-}1}) + \beta_3 Ln(SZ_{i,t}) + \beta_4 MOM_{i,t} + \beta_5 TAG_{i,t\text{-}1} + \varepsilon_{i,t}$. The robust Newey and West (1987) *t*-statistics are reported in parentheses.

	Panel A: Carhart four-factor adjusted alpha (α-FFC4) for return spreads (5-1)								Panel B: Average coefficient on profitability from cross-sectional regressions							
	EW				VW				OLS				WLS			
	AvgRankPM		Average		AvgRankPM		Average		AvgRankPM		Average		AvgRankPM		Average	
	Developed countries															
Australia	1.46	(3.32)	1.29	(3.57)	0.76	(1.63)	1.01	(3.62)	0.14	(3.59)	0.11	(3.80)	0.06	(1.44)	0.05	(1.95)
Austria	0.60	(2.20)	0.45	(1.71)	0.61	(1.55)	0.35	(1.19)	0.13	(2.08)	0.08	(1.80)	0.16	(1.61)	0.09	(1.65)
Belgium	0.49	(1.96)	0.36	(1.66)	0.32	(1.06)	0.27	(1.05)	0.10	(2.30)	0.07	(2.03)	0.08	(1.14)	0.05	(1.09)
Canada	0.98	(3.46)	0.78	(3.05)	0.67	(2.01)	0.62	(2.21)	0.13	(2.87)	0.08	(2.90)	0.09	(2.07)	0.05	(1.86)
Denmark	1.17	(4.43)	1.06	(4.46)	0.89	(2.03)	0.68	(1.67)	0.17	(3.79)	0.11	(3.89)	0.11	(1.74)	0.05	(1.13)
Finland	0.74	(2.81)	0.92	(3.76)	0.74	(2.17)	0.68	(2.38)	0.11	(2.92)	0.08	(2.58)	0.06	(1.01)	0.06	(1.25)
France	0.42	(2.03)	0.40	(2.55)	0.38	(1.62)	0.36	(2.50)	0.08	(2.97)	0.06	(3.03)	0.10	(3.21)	0.06	(2.88)
Germany	0.55	(2.87)	0.43	(2.34)	0.13	(0.62)	-0.05	(-0.25)	0.05	(1.83)	0.03	(1.55)	0.07	(2.07)	0.04	(1.78)
Greece	0.64	(1.63)	0.71	(1.90)	0.52	(1.18)	0.61	(1.74)	0.27	(5.05)	0.17	(4.97)	0.13	(1.88)	0.08	(1.83)
Hong Kong	1.02	(2.09)	1.26	(3.57)	0.93	(1.84)	0.75	(2.43)	0.17	(2.68)	0.15	(2.91)	0.13	(3.58)	0.11	(3.07)
Ireland	1.69	(2.47)	1.13	(1.75)	0.96	(1.22)	-0.01	(-0.02)	0.20	(1.46)	0.14	(1.43)	0.06	(0.37)	0.05	(0.40)
Italy	0.44	(1.86)	0.46	(2.04)	0.51	(1.73)	0.40	(1.61)	0.10	(2.83)	0.07	(2.80)	0.13	(2.17)	0.12	(2.60)
Japan	0.27	(2.07)	0.22	(1.97)	0.20	(1.30)	0.23	(1.72)	0.10	(4.28)	0.06	(4.32)	0.04	(1.42)	0.03	(1.49)
Netherlands	0.59	(2.05)	0.55	(2.38)	0.50	(1.39)	0.38	(1.28)	0.11	(2.66)	0.07	(2.37)	0.18	(2.88)	0.12	(2.95)
New Zealand	0.82	(2.74)	0.56	(2.13)	-0.06	(-0.19)	-0.05	(-0.21)	0.04	(0.79)	0.03	(0.99)	-0.03	(-0.62)	-0.01	(-0.37)

Norway	0.68	(1.80)	0.55	(1.87)	0.24	(0.56)	-0.02	(-0.06)	0.05	(1.01)	0.03	(0.64)	0.05	(0.81)	0.05	(0.88)
Portugal	0.92	(2.43)	0.60	(2.07)	0.70	(1.45)	0.63	(1.92)	0.18	(3.00)	0.08	(2.02)	0.29	(2.80)	0.12	(1.88)
Singapore	1.25	(5.45)	1.03	(4.96)	0.79	(2.41)	0.75	(2.36)	0.20	(5.56)	0.15	(6.44)	0.14	(2.12)	0.10	(2.36)
Spain	0.85	(3.61)	0.66	(3.66)	0.47	(1.61)	0.58	(2.25)	0.17	(3.79)	0.13	(3.93)	0.08	(1.12)	0.10	(2.40)
Sweden	0.84	(3.18)	0.76	(3.43)	0.27	(0.70)	0.37	(1.50)	0.11	(3.07)	0.07	(2.80)	-0.02	(-0.25)	-0.01	(-0.24)
Switzerland	0.77	(3.56)	0.66	(3.80)	0.27	(0.89)	0.37	(1.88)	0.11	(3.52)	0.08	(3.42)	0.09	(1.38)	0.05	(1.31)
The U.K.	1.42	(5.32)	1.31	(5.67)	0.79	(2.90)	0.73	(3.22)	0.15	(4.54)	0.11	(4.98)	0.08	(3.25)	0.06	(3.42)
The U.S.	0.91	(4.84)	0.59	(4.07)	0.61	(3.57)	0.53	(3.81)	0.15	(4.87)	0.09	(4.84)	0.10	(3.14)	0.06	(3.12)
								Developing countries								
Brazil	1.11	(2.68)	0.90	(2.51)	1.17	(1.97)	1.06	(2.15)	0.27	(3.81)	0.17	(3.90)	0.25	(3.19)	0.17	(3.32)
China	0.07	(0.31)	0.05	(0.22)	0.29	(1.22)	0.24	(1.04)	0.04	(0.46)	-0.00	(-0.01)	0.10	(1.02)	0.04	(0.47)
India	1.31	(4.04)	1.12	(4.19)	0.80	(1.71)	0.64	(1.68)	0.20	(3.51)	0.16	(4.04)	0.11	(1.74)	0.12	(2.29)
Malaysia	1.10	(4.82)	0.91	(4.43)	0.94	(4.15)	0.85	(4.51)	0.18	(5.06)	0.13	(6.33)	0.17	(4.34)	0.10	(4.60)
Mexico	0.75	(2.30)	0.62	(1.95)	0.55	(1.70)	0.60	(1.70)	0.11	(1.78)	0.08	(1.80)	0.06	(0.88)	0.05	(1.04)
South Africa	0.63	(1.98)	0.46	(1.35)	0.57	(1.36)	0.28	(0.78)	0.12	(2.38)	0.08	(2.31)	0.03	(0.43)	0.02	(0.33)
South Korea	0.79	(3.08)	0.67	(3.20)	0.99	(2.79)	1.05	(3.26)	0.28	(5.24)	0.20	(5.17)	0.31	(3.20)	0.23	(3.02)
Sri Lanka									0.36	(3.69)	0.23	(3.71)	0.22	(2.36)	0.16	(2.92)
Taiwan	0.37	(1.26)	0.32	(1.18)	0.60	(2.46)	0.50	(2.37)	0.22	(3.87)	0.17	(3.70)	0.16	(2.60)	0.12	(2.52)
Thailand	0.84	(2.83)	0.86	(2.98)	0.27	(0.70)	0.42	(1.15)	0.21	(3.76)	0.15	(3.24)	0.12	(1.72)	0.11	(1.80)

Table A3. Fama-MacBeth regressions of stock returns on profitability: the pooled regions

This table reports the average slopes on each profitability measure estimated in the same way as for individual country except that the regressions are estimated by including Ln(BM), Ln(SZ), MOM, and TAG in the pooled region regression. The robust Newey and West (1987) *t*-statistics are reported in parentheses. The results are reported for all economies pooling together (Global markets (Global)); global markets that exclude the U.S. and Japan (exUSJP), global markets that exclude firms with market value less than $100 million measured at the end of June (ex<$100m), Developed markets (Developed), and Developing markets (Developing). Detailed descriptions of variables are presented in Table A1 in the Appendix.

Panel A: Average coefficient on profitability from cross-sectional OLS regressions																
	RankGPA		RankOP(FF5)		RankOP(Ball)		RankGPLagA		RankGPLagAQ		RankROEQ		AvgRankPM		Average	
A1: Global markets (Global)																
RankPM	0.08	(3.57)	0.08	(3.15)	0.09	(4.19)	0.08	(3.46)	0.12	(5.41)	0.18	(6.96)	0.14	(4.71)	0.10	(5.13)
Ln(BM)	0.36	(3.76)	0.35	(3.45)	0.37	(3.85)	0.36	(3.71)	0.32	(3.02)	0.34	(3.26)	0.40	(3.92)	0.35	(3.58)
Ln(SZ)	-0.03	(-0.90)	-0.07	(-2.08)	-0.06	(-1.83)	-0.03	(-0.98)	-0.04	(-0.82)	-0.10	(-2.81)	-0.05	(-1.67)	-0.05	(-1.58)
MOM	0.55	(2.85)	0.59	(2.96)	0.55	(2.86)	0.55	(2.86)	0.46	(2.68)	0.50	(2.84)	0.53	(2.75)	0.53	(2.98)
TAG	-0.24	(-5.21)	-0.27	(-6.25)	-0.27	(-6.23)	-0.33	(-8.13)	-0.33	(-6.13)	-0.32	(-6.22)	-0.27	(-6.44)	-0.29	(-6.75)
A2: Global markets that exclude the US and Japan (exUSJP)																
RankPM	0.07	(2.40)	0.06	(2.56)	0.06	(2.26)	0.06	(2.22)	0.14	(4.73)	0.18	(7.02)	0.10	(3.12)	0.09	(4.02)
Ln(BM)	0.34	(3.30)	0.33	(3.17)	0.33	(3.22)	0.33	(3.23)	0.34	(2.84)	0.37	(3.14)	0.36	(3.41)	0.34	(3.26)
Ln(SZ)	-0.01	(-0.17)	-0.02	(-0.76)	-0.02	(-0.50)	-0.01	(-0.20)	-0.06	(-1.58)	-0.12	(-2.94)	-0.02	(-0.65)	-0.04	(-1.22)
MOM	1.09	(3.69)	1.09	(3.69)	1.08	(3.64)	1.10	(3.68)	1.39	(4.22)	1.23	(3.77)	1.05	(3.58)	1.16	(3.91)
TAG	-0.11	(-1.79)	-0.12	(-1.97)	-0.12	(-1.89)	-0.19	(-2.96)	-0.19	(-1.79)	-0.12	(-1.17)	-0.13	(-2.18)	-0.14	(-2.37)
A3: Global markets that exclude firms with market value less than $100 million (ex<$100million)																
RankPM	0.08	(3.17)	0.08	(2.93)	0.09	(3.53)	0.08	(3.06)	0.10	(3.90)	0.13	(4.91)	0.13	(3.86)	0.09	(4.10)
Ln(BM)	0.28	(2.72)	0.28	(2.54)	0.30	(2.83)	0.28	(2.68)	0.26	(2.10)	0.27	(2.23)	0.32	(2.88)	0.28	(2.57)
Ln(SZ)	-0.03	(-0.88)	-0.06	(-2.06)	-0.05	(-1.65)	-0.03	(-0.89)	-0.06	(-1.23)	-0.10	(-2.40)	-0.05	(-1.55)	-0.06	(-1.58)
MOM	0.46	(2.29)	0.49	(2.37)	0.44	(2.19)	0.47	(2.31)	0.36	(1.79)	0.38	(1.77)	0.44	(2.22)	0.43	(2.31)
TAG	-0.14	(-2.47)	-0.15	(-2.86)	-0.16	(-2.85)	-0.24	(-4.48)	-0.18	(-3.03)	-0.18	(-3.19)	-0.17	(-3.15)	-0.17	(-3.34)
A4: Developed markets (Developed)																
RankPM	0.09	(4.30)	0.08	(3.29)	0.10	(5.17)	0.08	(4.19)	0.12	(6.86)	0.17	(6.61)	0.15	(5.28)	0.11	(5.74)
Ln(BM)	0.35	(3.97)	0.34	(3.53)	0.37	(4.13)	0.35	(3.93)	0.32	(3.29)	0.32	(3.26)	0.39	(4.16)	0.34	(3.77)
Ln(SZ)	-0.02	(-0.62)	-0.06	(-1.98)	-0.06	(-1.79)	-0.02	(-0.70)	-0.02	(-0.57)	-0.10	(-2.74)	-0.05	(-1.50)	-0.05	(-1.39)
MOM	0.55	(3.27)	0.58	(3.41)	0.55	(3.28)	0.55	(3.26)	0.43	(3.02)	0.45	(3.09)	0.53	(3.20)	0.52	(3.45)
TAG	-0.24	(-4.91)	-0.26	(-5.63)	-0.26	(-5.64)	-0.32	(-6.77)	-0.31	(-6.06)	-0.31	(-6.14)	-0.26	(-5.62)	-0.28	(-6.21)

A5: Developing markets (Developing)

RankPM	0.06	(1.34)	0.07	(1.84)	0.03	(0.90)	0.07	(1.52)	0.10	(1.64)	0.16	(3.50)	0.10	(1.95)	0.08	(1.96)
Ln(BM)	0.44	(2.48)	0.46	(2.52)	0.41	(2.36)	0.47	(2.53)	0.20	(1.28)	0.38	(2.02)	0.46	(2.51)	0.44	(2.48)
Ln(SZ)	0.03	(0.41)	0.01	(0.08)	0.00	(0.06)	0.03	(0.41)	0.03	(0.42)	0.02	(0.23)	0.01	(0.19)	0.02	(0.29)
MOM	0.44	(0.88)	0.46	(0.96)	0.46	(0.94)	0.44	(0.89)	0.35	(0.68)	0.31	(0.63)	0.43	(0.88)	0.43	(0.89)
TAG	-0.19	(-1.44)	-0.20	(-1.54)	-0.21	(-1.62)	-0.31	(-2.31)	-0.34	(-2.49)	-0.31	(-2.46)	-0.24	(-1.88)	-0.23	(-1.81)

Panel B: Average coefficient on profitability from cross-sectional WLS regressions

	RankGPA		RankOP(FF5)		RankOP(Ball)		RankGPLagA		RankGPLagAQ		RankROEQ		AvgRankPM		Average	
B1: Global markets (Global)																
RankPM	0.10	(4.54)	0.08	(3.01)	0.09	(4.18)	0.09	(4.53)	0.10	(5.34)	0.10	(3.89)	0.14	(4.84)	0.09	(5.09)
Ln(BM)	0.27	(3.29)	0.20	(2.30)	0.22	(2.82)	0.26	(3.30)	0.23	(2.45)	0.17	(1.70)	0.31	(3.52)	0.23	(2.74)
Ln(SZ)	-0.04	(-1.15)	-0.07	(-2.05)	-0.06	(-1.85)	-0.04	(-1.17)	-0.06	(-1.45)	-0.09	(-2.31)	-0.06	(-1.79)	-0.06	(-1.70)
MOM	0.39	(2.55)	0.37	(2.54)	0.36	(2.44)	0.39	(2.54)	0.39	(2.33)	0.38	(2.31)	0.37	(2.51)	0.38	(2.67)
TAG	-0.06	(-0.79)	-0.06	(-0.92)	-0.08	(-1.10)	-0.19	(-2.64)	-0.17	(-2.09)	-0.13	(-1.78)	-0.09	(-1.32)	-0.11	(-1.69)
B2: Global markets that exclude the US and Japan (exUSJP)																
RankPM	0.09	(5.00)	0.08	(4.34)	0.08	(4.54)	0.09	(4.96)	0.14	(5.20)	0.11	(2.87)	0.12	(5.66)	0.10	(6.47)
Ln(BM)	0.28	(3.19)	0.23	(2.60)	0.23	(2.70)	0.27	(3.18)	0.39	(2.32)	0.38	(2.88)	0.31	(3.43)	0.30	(2.95)
Ln(SZ)	-0.05	(-1.24)	-0.07	(-1.66)	-0.07	(-1.64)	-0.05	(-1.21)	-0.08	(-1.38)	-0.07	(-1.44)	-0.07	(-1.68)	-0.06	(-1.55)
MOM	0.65	(1.63)	0.65	(1.65)	0.64	(1.62)	0.66	(1.66)	1.14	(2.51)	0.99	(2.06)	0.62	(1.54)	0.79	(1.98)
TAG	-0.05	(-0.73)	-0.07	(-0.95)	-0.07	(-0.89)	-0.18	(-2.26)	-0.22	(-1.53)	-0.13	(-0.88)	-0.08	(-1.12)	-0.12	(-1.57)
B3: Global markets that exclude firms with market value less than $100 million (ex<$100million)																
RankPM	0.09	(4.35)	0.08	(2.93)	0.08	(4.05)	0.09	(4.32)	0.09	(5.02)	0.10	(3.73)	0.13	(4.69)	0.09	(4.88)
Ln(BM)	0.26	(3.19)	0.20	(2.25)	0.22	(2.73)	0.25	(3.21)	0.22	(2.26)	0.16	(1.60)	0.30	(3.42)	0.22	(2.63)
Ln(SZ)	-0.04	(-1.08)	-0.07	(-1.94)	-0.06	(-1.76)	-0.04	(-1.09)	-0.06	(-1.43)	-0.09	(-2.23)	-0.06	(-1.69)	-0.06	(-1.63)
MOM	0.39	(2.49)	0.36	(2.45)	0.35	(2.36)	0.39	(2.47)	0.29	(1.30)	0.26	(1.16)	0.37	(2.44)	0.34	(2.25)
TAG	-0.05	(-0.84)	-0.05	(-0.88)	-0.07	(-1.09)	-0.17	(-2.58)	-0.12	(-1.69)	-0.09	(-1.41)	-0.08	(-1.32)	-0.09	(-1.52)
B4: Developed markets (Developed)																
RankPM	0.08	(3.73)	0.06	(2.38)	0.07	(3.64)	0.07	(3.75)	0.08	(4.50)	0.08	(3.20)	0.12	(4.06)	0.08	(4.22)
Ln(BM)	0.22	(2.75)	0.16	(1.86)	0.19	(2.53)	0.21	(2.78)	0.18	(1.97)	0.13	(1.29)	0.26	(2.99)	0.18	(2.26)
Ln(SZ)	-0.03	(-0.94)	-0.06	(-1.74)	-0.05	(-1.55)	-0.04	(-0.98)	-0.06	(-1.35)	-0.09	(-2.18)	-0.05	(-1.49)	-0.05	(-1.49)
MOM	0.36	(2.51)	0.33	(2.45)	0.32	(2.40)	0.36	(2.49)	0.31	(1.92)	0.29	(1.86)	0.34	(2.44)	0.33	(2.48)
TAG	-0.06	(-0.84)	-0.06	(-0.92)	-0.08	(-1.03)	-0.17	(-2.33)	-0.16	(-2.03)	-0.12	(-1.72)	-0.09	(-1.23)	-0.11	(-1.59)

B5: Developing markets (Developing)

RankPM	0.15	(2.67)	0.14	(3.42)	0.10	(2.86)	0.17	(2.66)	0.14	(3.29)	0.16	(3.87)	0.20	(3.76)	0.15	(3.31)
Ln(BM)	0.40	(2.36)	0.37	(2.10)	0.35	(2.00)	0.44	(2.59)	0.50	(2.81)	0.64	(2.90)	0.44	(2.55)	0.43	(2.47)
Ln(SZ)	0.01	(0.12)	-0.01	(-0.11)	-0.02	(-0.30)	0.02	(0.23)	-0.07	(-0.66)	0.01	(0.05)	-0.03	(-0.36)	0.02	(0.26)
MOM	0.65	(1.15)	0.73	(1.35)	0.74	(1.34)	0.68	(1.25)	-0.19	(-0.28)	-0.14	(-0.23)	0.64	(1.18)	0.68	(1.23)
TAG	0.25	(1.20)	0.25	(1.12)	0.22	(1.05)	-0.03	(-0.14)	-0.10	(-0.55)	-0.04	(-0.27)	0.18	(0.88)	0.17	(0.81)