Local, Regional, or Global Asset Pricing?

Online Appendix

JEL classification: G15, G12, G11

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OA1 Factor Construction

The definitions of the anomaly variables used for constructing the factors (names printed in *italic*) are in Section OA2.

RET RET is simply defined as the time-series average excess return.

CAPM Following Fama and French (2012), I use the value-weighted return on all stocks, measured in U.S. Dollars in excess of the 1-month U.S. Treasury Bill rate (MKT). The model equation is

$$r_{j,t} - r_{f,t} = \alpha_j + b_j \mathrm{MKT_t} + \epsilon_{\mathrm{j,t}}. \tag{OA1}$$

FF-3 and FF-5 Models For the SMB, HML, RMW, and CMA factors, I follow Fama and French (2017) and first sort stocks on their market capitalization. Big stocks are those in the top 90% of the cumulative market capitalization while small stocks are those in the bottom 10% of the cumulative market capitalization. The HML, RMW, and CMA factors each result from independent 2×3 portfolio sorts using the median of the market capitalization of big stocks as well as the 30th and 70th percentiles of the *book-to-market* ratio, *investment*, and *operating profitability* (see Section OA2 of the Online Appendix for the definitions of all variables) among big stocks as breakpoints, respectively. To be precise, the stocks are first split into small and big. Independently, they are allocated into 3 portfolios based on their *book-to-market* ratio. The intersection of these independent 2×3 sorts results in 6 portfolios. HML is the difference between the average of the returns of the two portfolios (of big stocks and small stocks, respectively) with high *book-to-market* ratios and those with low *book-to-market* ratios. In the following, I refer to this procedure as standard 2×3 portfolio sort. Similarly, RMW and CMA are the differences between the portfolios of firms with high *operating profitability* (low *investment*) and those with low *operating profitability* (high *investment*). For each double sort with the *book-to-market* ratio, *investment*, and *operating profitability*, there results one SMB observation as the difference between the simple average return of the 3 small stock portfolios and that of the

3 big stock portfolios. I average the 3 SMB observations to obtain the final SMB factor. Portfolio returns are value-weighted according to the stocks' market capitalizations. The portfolios are formed at the end of June each year and use information on accounting variables for the previous fiscal year (Fama and French (1993), Fama and French (2017)). Equation (OA2) displays the FF-3 model and Equation (OA3) the FF-5 model

$$r_{j,t} - r_{f,t} = \alpha_j + b_j \mathrm{MKT_t} + \mathrm{s_j SMB_t} + \mathrm{h_j HML_t} + \epsilon_{\mathrm{j,t}}. \tag{OA2}$$

$$r_{j,t} - r_{f,t} = \alpha_j + b_j \mathrm{MKT_t} + \mathrm{s_j SMB_t} + \mathrm{h_j HML_t} + \mathrm{r_j RMW_t} + \mathrm{c_j CMA_t} + \epsilon_{\mathrm{j,t}}. \tag{OA3}$$

C-4 Model The Carhart (1997) 4-factor model augments the Fama and French (1993) 3-factor model with a *momentum* factor. *Momentum* is measured as the cumulative return of a stock during the last 12 months while skipping 1 month. The *momentum* factor, WML, is constructed using the standard 2×3 portfolio sort on *SIZE* and *momentum*. The portfolios are formed every month. The model equation is

$$r_{j,t} - r_{f,t} = \alpha_j + b_j \mathrm{MKT_t} + \mathrm{s_j SMB_t} + \mathrm{h_j HML_t} + \mathrm{w_j WML_t} + \epsilon_{\mathrm{j,t}}. \tag{OA4}$$

HXZ-4 Model I follow the implementation of Hou et al. (2015). That is, I construct the *SIZE* ($\mathrm{SMB^{HXZ}}$), *investment* (INV), and ROE factors from an independent $2 \times 3 \times 3$ triple sort. For the sort breakpoints I use the big stocks as defined in the paragraph on the FF-3 model above. For *investment* and ROE, the breakpoints are the respective 30th and 70th percentiles of the variables among big stocks. The portfolios are formed every month. The model equation is

$$r_{j,t} - r_{f,t} = \alpha_j + b_j \mathrm{MKT_t} + \mathrm{s_j SMB_t^{HXZ}} + \mathrm{i_j INV_t} + \mathrm{r_j ROE_t} + \epsilon_{\mathrm{j,t}}. \tag{OA5}$$

HMXZ-5 Model Hou et al. (2020) augment the Hou et al. (2015) model by an *expected growth* (EG) factor. The portfolios are formed every month by the standard 2×3 portfolio

sort on *SIZE* and *expected growth*. The model equation is

$$\text{(OA6)} \qquad r_{j,t} - r_{f,t} = \alpha_j + b_j \mathrm{MKT_t} + \mathrm{s_j SMB_t^{HXZ}} + \mathrm{i_j INV_t} + \mathrm{r_j ROE_t} + \mathrm{e_j EG_t} + \epsilon_{\mathrm{j,t}}.$$

SY-4 Model I follow Stambaugh and Yuan (2017) and also consider a mispricing factor model. The first factor, MGMT, is derived from the average ranking on the following anomalies: *net stock issues* (sorting low minus high (L–H)), *composite equity issues* (L–H), *operating accruals* (L–H), *net operating assets* (L–H), *investment* (L–H), and *investment-to-assets* (L–H). The second factor, PERF, includes *momentum* ($\mathrm{MOM}_{0,1}^{12}$; H–L), *gross profitability* (H–L), *ROA* (H–L), *DISTRESS* (L–H), and *O-SCORE* (L–H). The factors are constructed similarly as for the FF-5 model, independently sorting into 2×3 portfolios based on *SIZE* and the average rank (minimum 3 anomalies available for one factor) using big stocks. Unlike the scheme in FF-3, the breakpoints for MGMT and PERF are the 20th and 80th percentiles, and the *SIZE* factor ($\mathrm{SMB^{SY}}$; also small minus big) is only defined from stocks that do not enter the extreme quintiles for MGMT and PERF. The portfolios are formed every month. The model equation is

$$\text{(OA7)} \qquad r_{j,t} - r_{f,t} = \alpha_j + b_j \mathrm{MKT_t} + \mathrm{s_j SMB_t^{SY}} + \mathrm{m_j MGMT_t} + \mathrm{p_j PERF_t} + \epsilon_{\mathrm{j,t}}.$$

C-4 Model plus Liquidity (C-5) This factor model augments the C-4 model with a traded liquidity factor following Pástor and Stambaugh (2003). To obtain the factor, I first estimate the regression $r_{j,\tau+1} - r_{M,\tau+1} = \theta_i + \phi ir_{i,\tau} + \gamma sign(r_{j,\tau} - r_{M,\tau}) Volume_{j,\tau} + \epsilon_{i,\tau+1}$ for every month and stock i while excluding days when $Volume_{j,\tau} = 0$. $r_{j,\tau}$ is the stock return on day τ while $r_{M,\tau}$ is that on the market. $Volume_{j,\tau}$ is the dollar trading volume of stock j on day τ. The time-series of $\hat{\gamma}_i$ is used to obtain the series u_t from $\Delta\hat{y}_t = a + b\Delta\hat{y}_{t-1} + c(\frac{m_{t-1}}{m_1})\hat{y}_{t-1} + u_t$ with $\Delta\hat{y}_t = (\frac{m_{t-1}}{m_1})\frac{1}{N}\sum_{i=1}^{N}(\hat{y}_{i,t} - \hat{y}_{i,t-1})$. m_t and m_1 are the aggregate stock market capitalizations at time t and at the base date 1, respectively. The liquidity risk of a stock is measured as the sensitivity l of that stock to aggregate liquidity, obtained from the regression $r_{i,t} - r_{f,t} = \alpha_j + b\mathrm{MKT_t} + \mathrm{sSMB_t} + \mathrm{hHML_t} + \upsilon \mathrm{u_t} + \epsilon_{\mathrm{j,t}}$ using a rolling window of 60 months. The liquidity factor is constructed using the standard 2×3 portfolio sort on *SIZE*

and estimates for v. The portfolios are formed monthly. The model equation is

$$r_{j,t} - r_{f,t} = \alpha_j + b_j \mathrm{MKT_t} + \mathrm{s_j SMB_t} + \mathrm{h_j HML_t} + \mathrm{w_j WML_t} + \mathrm{l_j LIQ_t} + \epsilon_{\mathrm{j,t}}. \tag{OA8}$$

DHS-3 Model Following Daniel et al. (2020), I use a 3-factor model that includes the market factor, a financing factor, FIN, and a post-earnings-announcement drift factor, PEAD. FIN is based on *net stock issues* and 5-year *composite equity issues* with annual sorts performed at the end of June. The combined factor is formed from stocks that are in the respective low and high portfolios for either both anomalies or for one of the two anomalies when there is no data available on the other. The allocation is based on a 2×5 sort with *SIZE* and *net stock issues*. The breakpoints are split for stocks with negative *net stock issues* based on the median for large stocks and the 30th and 70th percentiles of positive *net stock issues* for large stocks. Second, I use a standard 2×3 sort on *SIZE* and *composite equity issues*. PEAD results from monthly independent 2×3 sorts on *SIZE* and the *earnings announcement return*. The breakpoints for *composite equity issues* and the *earnings announcement return* are the 20th and 80th percentiles of large stocks. The model equation is

$$r_{j,t} - r_{f,t} = \alpha_j + b_j \mathrm{MKT_t} + \mathrm{f_j FIN_t} + \mathrm{p_j PEAD_t} + \epsilon_{\mathrm{j,t}}. \tag{OA9}$$

BS-6 Model Barillas and Shanken (2018) suggest a 6-factor model combining the factors from different models. Their model includes the market factor, SMB, the INV and ROE factors of Hou et al. (2015), the monthly HML factor ($\mathrm{HML^M}$), which results from a monthly standard 2×3 portfolio sort on *SIZE* and *book-to-market*, where using the most recent market capitalization in the denominator for *book-to-market*, as well as the WML *momentum* factor. The model equation is

$$r_{j,t} - r_{f,t} = \alpha_j + b_j \mathrm{MKT_t} + \mathrm{s_j SMB_t} + \mathrm{i_j INV_t} + \mathrm{r_j ROE_t} + \mathrm{h_j HML^M} + \mathrm{w_j WML_t} + \epsilon_{\mathrm{j,t}}. \tag{OA10}$$

FF-5^{Cash} Model Fama and French (2018) also use the FF-5 model with a RMW factor based on *cash operating profitability* (RMW^{C}). The model equation is

$$\text{(OA11)} \qquad r_{j,t} - r_{f,t} = \alpha_j + b_j \text{MKT}_\text{t} + \text{s}_\text{j}\text{SMB}_\text{t} + \text{h}_\text{j}\text{HML}_\text{t} + \text{r}_\text{j}\text{RMW}^{\text{C}}_\text{t} + \text{c}_\text{j}\text{CMA}_\text{t} + \epsilon_{\text{j,t}}.$$

FF-6 Model Fama and French (2018) also augment the FF-5 model with a *momentum* factor. The model equation is

$$\text{(OA12)} \quad r_{j,t} - r_{f,t} = \alpha_j + b_j \text{MKT}_\text{t} + \text{s}_\text{j}\text{SMB}_\text{t} + \text{h}_\text{j}\text{HML}_\text{t} + \text{r}_\text{j}\text{RMW}_\text{t} + \text{c}_\text{j}\text{CMA}_\text{t} + \text{w}_\text{j}\text{WML}_\text{t} + \epsilon_{\text{j,t}}.$$

HKK-3 Model Hou et al. (2011) use a 3-factor model including the market, a value factor based on the *cash flow to price ratio* (HML^{CF}), as well as a *momentum* factor. The model equation is

$$\text{(OA13)} \qquad r_{j,t} - r_{f,t} = \alpha_j + b_j \text{MKT}_\text{t} + \text{h}_\text{j}\text{HML}^{\text{CF}}_\text{t} + \text{w}_\text{j}\text{WML}_\text{t} + \epsilon_{\text{j,t}}.$$

Z-4 Model Zhang (2006) uses a 4-factor model that includes the return of the world market portfolio (MKT^{W}) as well as 3 foreign exchange risk factors. I use the dollar excess return of an investment at the local 3-month Treasury Bill yield (cash holding if not available) in British Pound, Euro (investment in Germany), and Japanese Yen. The model equation is

$$\text{(OA14)} \qquad r_{j,t} - r_{f,t} = \alpha_j + b_j \text{MKT}^{\text{W}}_\text{t} + \text{p}_\text{j}\text{FX}^{\text{GBP}}_\text{t} + \text{e}_\text{j}\text{FX}^{\text{EUR}}_\text{t} + \text{y}_\text{j}\text{FX}^{\text{JPY}}_\text{t} + \epsilon_{\text{j,t}}.$$

OA2 Anomalies

The selection of anomaly variables examined in this paper follows that in Hou et al. (2015) and Green et al. (2017). Due to lack of data availability, I have to skip the *brand capital to advertising expenses*, *advertising expenses to market*, *G*, and *earnings forecast dispersion* anomalies of Hou et al. (2015), as well as *change in the number of analysts*, *number of analysts*, *ms*, *secured debt*, and *secured debt indicator* of Green et al. (2017).

This is because I was not able to retrieve data from Datastream/Worldscope for advertising expenses (also needed for *ms*), earnings forecast dispersion, the number of analysts, as well as any information about secured debt. *G* is based on the corporate governance index of Gomes, Kogan and Zhang (2003), which is only available for the U.S.

Of the 80 anomalies examined by Hou et al. (2015), this paper thus includes 76. Furthermore, of the 102 anomalies studied by Green et al. (2017), I am able to include 97. 44 anomalies are in both papers, while 32 are exclusively used in Hou et al. (2015) and 53 only in Green et al. (2017).[1] The three anomalies added, which are not contained in the two lists are *cash operating profitability* (Fama and French, 2018), *expected growth* (Hou et al., 2020), and *MIN* (Bali, Cakici and Whitelaw, 2011).

If not indicated otherwise, I sort the stocks into 5 portfolios based on breakpoints derived from big stocks (those in the top 90% of the cumulative market capitalization). I follow Fama and French (1993, 2017) assuming that all accounting variables for fiscal year $t-1$ become available at the end of June of year t.[2] For quarterly variables, I assume that they become available by the end of the following quarter. The anomaly definitions follow Hou et al. (2015), Stambaugh and Yuan (2017), and Green et al. (2017). Detailed references to the studies that originally proposed the different anomaly variables can be found in these studies. In rare instances, the anomaly variable definitions are adjusted slightly to make them compatible with the data available from Datastream.

1 Momentum Anomalies

Abnormal Earnings Announcement Volume (AEAV) is defined as the average daily trading volume for the 2 trading days before until 1 day after the latest earnings announcement date minus the average daily trading volume during the 4-week period ending 2 weeks before the announcement date, divided by the average daily trading volume of this 4-week period.

[1] For three anomalies (earnings surprise, momentum, and standardized unexpected earnings), there are two or three holding periods. All other variables have only one specified holding period. None of my conclusions changes when only focusing on the one-month holding period for the three multiple-holding-period anomalies.

[2] If the fiscal year of a firm ends before the end of February, it is allocated to the previous year. In all other cases, the fiscal year is defined as the calendar year in which the firm's fiscal year ends.

Change in Momentum (DMOM) is the cumulative return of a stock during the last 6 months minus the cumulative return of the stock of the preceding 6 months.

Earnings Announcement Return (EAR) is the cumulative daily return of a stock in excess of that of the market for the period starting from 2 trading days before the latest quarterly earnings announcement until 1 day after the latest quarterly earnings announcement. I require the last earnings announcement day to be within 6 months before portfolio formation and examine holding periods of 1 month ($\text{EAR}_{0,1}$) and 6 months ($\text{EAR}_{0,6}$).

Earnings Surprise (ES) is the 6-month moving average of the change in IBES mean 12-month earnings forecast divided by the share price of the corresponding previous month. I require at least 4 monthly forecast changes when computing the variable and consider 1-month ($\text{ES}_{0,1}$) and 6-month ($\text{ES}_{0,6}$) holding periods.

Industry Momentum (IMOM) uses the Fama–French industry definition, excluding financials. The industry returns are value-weighted returns of all stocks in that industry. The remaining 45 industries are sorted into 9 equally weighted portfolios based on their cumulative return during the last 6 months.

Momentum (MOM) is the cumulative return of a stock during the last 6 months while skipping 1 month along with several holding periods. I use holding periods of 1 month ($\text{MOM}^6_{0,1}$), 6 months ($\text{MOM}^6_{0,6}$), 12 months ($\text{MOM}^6_{0,12}$), as well as lagged holding periods starting from 1 to 3 years and 3 to 5 years ($\text{MOM}^6_{12,36}$ and $\text{MOM}^6_{36,60}$). In addition, I use the cumulative return of a stock during the last 12 months while skipping 1 month and a 1-month holding period ($\text{MOM}^{12}_{0,1}$).

Standardized Unexpected Earnings (SUE) are standardized unexpected earnings. The most recently announced quarterly earnings per share (WC18193A) minus those 1 year before, divided by the standard deviation of past earnings changes during the prior 8 quarters (minimum 6 quarters available). I use several holding periods ($\text{SUE}_{0,1}$, $\text{SUE}_{0,6}$, $\text{SUE}_{0,12}$, $\text{SUE}_{12,36}$, and $\text{SUE}_{36,60}$; see *momentum* for the definition of sub- and superscripts).

2 Value vs. Growth Anomalies

9 BE/ME portfolios take the intersection of 9 independently sorted portfolios on *size* and *book-to-market*. Size is the market capitalization at the end of June of the current year. Portfolios are rebalanced every year in the end of June.

Book-to-Market (BTM) is defined as the ratio of book equity to market equity. Book equity is shareholders' equity (Worldscope: WC03995) plus balance sheet deferred taxes (WC03263, if available) minus the book value of preferred stock (WC03451, zero if missing). If shareholder equity is not available, I use common equity (WC03501) plus the book value of preferred stock, or total assets (WC02999) minus total liabilities (WC03351), in that order. Market equity is the market capitalization of December $t-1$.

Cash Flow to Debt (CFTD) is income before extraordinary items (WC01751) plus equity's share of depreciation plus deferred taxes (WC03263, if available), divided by total liabilities (WC03351). Equity's share of depreciation is market capitalization, divided by total assets minus book equity plus market capitalization, multiplied by depreciation (WC01151).

Cash Flow to Price Ratio (CFTP) is income before extraordinary items (WC01751) plus equity's share of depreciation (see CFTD) plus deferred taxes (WC03263, if available), divided by the market capitalization of December $t-1$. Stocks with negative cash flows are excluded.

Cash Flow Volatility (STCF) is the past 16 quarter standard deviation of the ratio of cash flows to sales (WC01001A). Cash flows are defined as for the *cash flow to price ratio*.

Convertible Debt Indicator (CDI) is an indicator equal to 1 if a company has convertible debt obligations (WC18282). I sort the stocks into 2 portfolios, depending on whether the indicator equals 0 or 1.

Current Ratio (CR) is current assets (WC02201) divided by current liabilities (WC03101).

Dividend Yield (DY) is the total amount of dividends paid during the most recent year (excluding special or one-off dividends) divided by the current market capitalization. Firms

that did not pay dividends during the most recent year are excluded.

DURATION is

$$\text{(OA15)}\ Dur = \frac{\sum_{t=1}^{T} tCD_t/(1+r)^t}{ME} + \left(T + \frac{1+r}{r}\right)\frac{ME - \sum_{t=1}^{T} CD_t/(1+r)^t}{ME}.$$

$CD_t = BE_{t-1}(ROE_t - g_t)$ is the net cash distribution, BE is the book equity, ROE is the return on equity, g is the book equity growth rate, and ME is the market equity. $ROE_t = 0.12 + 0.57ROE_{t-1} + \epsilon_t$, $g_t = 0.06 + 0.24g_{t-1} + \epsilon_t$, $T = 10$, and $r = 0.12$. ROE is income before extraordinary items (WC01551) divided by the firm's lagged book equity and the first observation of g is the annual growth rate in sales (WC01001).

Earnings Forecast to Price Ratio (EFTP) is the median earnings-to-price analyst forecast from IBES (EPS1FD12) divided by the share price.

Earnings to Price Ratio (ETP) is income before extraordinary items (WC01751) divided by the market capitalization of December $t-1$. Stocks with negative earnings are excluded.

Industry-Adjusted Book-to-Market (BTM^{IA}) is a firm's *book-to-market* ratio minus the average *book-to-market* ratio of all firms within the same 48 Fama–French (FF-48) industries.

Industry-Adjusted Cash Flow to Price Ratio (CFTP^{IA}) is a firm's *cash flow to price ratio* minus the average *cash flow to price ratio* of all firms within the same FF-48 industries.

Industry Sales Concentration (ISC) is the sum of squared percentage shares in sales of firms within one of the 48 Fama–French industries.

Leverage (LEV) is total liabilities (WC03351) divided by the market capitalization of December $t-1$.

Long-Term Growth (LTGRWTH) is the IBES median long-term earnings growth forecast (LTMD).

Long-Term Reversal (LTR) is the cumulative stock return during the last 5 years while skipping the most recent year.

Payouts–Price Ratio (POTP) is dividends on common stock plus the expenditure on the purchase of common and preferred stock (WC04751) plus decreases in preferred stock outstanding (WC03451) over the prior fiscal year (set to 0 if the number increased), divided by the market capitalization of December $t-1$. **Net Payouts–Price Ratio** (NPOTP) uses the same definition as the payouts–price ratio, but also subtracts increases of the value of the net number of preferred stocks outstanding (WC04251) in the numerator. Stocks with non-positive payouts and net payouts, respectively, are excluded.

QUICK is defined as current assets (WC02201) minus inventory (WC02101), divided by current liabilities (WC03101).

Real Estate Holdings (REH) is defined as buildings (WC18376) plus capitalized lease obligation (WC03249), divided by gross property, plant, and equipment (WC02301).

Sales Growth (SGRWTH) is the weighted average of the annual sales growth during the last 5 fiscal years. I measure the sales growth for each fiscal year as growth rate relative to the previous fiscal year and sort all stocks each year into 10 portfolios based on this growth rate, assigning the portfolio number to the stocks (sales: WC01001). The final sales growth variable is the average over the past 5 years while multiplying the most previous year by 5, the next by 4, and so on.

Sales to Price (STP) is defined as the ratio between annual sales (WC01001) and the market capitalization of December $t-1$.

Total Assets to Market (ATM) is defined as total assets (WC02999) divided by the market capitalization of December $t-1$.

3 Investment Anomalies

Absolute Accruals (ABSACC) is the absolute of *operating accruals*.

Accrual Volatility (STACC) is the standard deviation over the past 16 quarters of quarterly *operating accruals* scaled by sales (WC01001A). If quarterly sales are zero, I scale by 0.01.

ACI is the capital expenditure (WC04601) scaled by sales (WC01001) of the previous fiscal year, divided by the average over the 3 years before that minus 1. Stocks with sales below $10 million are excluded.

Cash Holdings (CHOLD) is cash and short-term investment (WC02001) divided by total assets (WC02999).

Composite Equity Issues (CEI) is the annual log growth rate in market value minus the annual log rate of return. A variation of this anomaly uses a 5-year window instead of a 1-year window to compute the composite equity issues (CEI^{5Y}).

Debt Growth (DEBTG) is defined as the annual percentage change in total liabilities (WC03351).

Depreciation Growth (DEPG) is the annual growth rate in depreciation (WC01151).

Depreciation to PPE Ratio (DTPPE) is depreciation (WC01151) divided by property, plant, and equipment (WC02301).

Dividend Initiation (DIVI) is an indicator equal to 1 if a company pays dividends for the first time during the prior year. I sort the stocks into 2 portfolios, depending on whether the indicator equals 0 or 1.

Dividend Omission (DIVO) is an indicator variable equal to 1 if a company pays dividends but did not in the prior year. I sort the stocks into 2 portfolios, depending on whether the indicator equals 0 or 1.

Expected Growth (EXPGRWTH) is from a cross-sectional regression $dInv = \theta_1 log(q) + \theta_2 Cop + \theta_3 dROE$ of the change in investment ($dInv$) on the following predictor variables, all lagged by 12 months: (i) the natural logarithm of Tobin's q, which is the current market equity plus long-term debt (WC03251, zero if missing), divided by total assets (WC02999), (ii) Cop, which is total revenues (WC01001) minus cost of goods sold (WC01051) minus selling, general, and administrative expenses (WC01101) plus research and development expenditures (WC01201) minus the change in accounts receivable (WC02051) minus the change in inventory (WC02101) minus the change in prepaid expenses (WC02140) plus the change in deferred revenues (WC03262) plus the

change in accounts payable (WC03040) plus the change in accrued expenses (sum of WC03054, WC03060, and WC03069), and (iii) $dROE$, which is the annual change in quarterly ROE. The forecasts are from a rolling window of 120 months, requiring a minimum of 30 observations for the coefficient averages.

Growth in Net Operating Assets (GNOA) is the annual growth rate in *net operating assets*.

Industry-Adjusted Investment Growth (INVG^{IA}) is a firm's *investment growth* minus the average *investment growth* of all firms within the same FF-48 industries.

Inventory Change (INVTRYCHG) is the annual change in inventory (WC02101) divided by the average of total assets and 1-year lagged total assets (WC02999). Firms with zero inventory change are excluded.

Inventory Growth (INVTRYGRWTH) is the growth rate in inventory (WC02101).

Investment (INV) is the annual growth rate of total assets (WC02999).

Investment to Assets (INVTA) is measured as the change in property, plant, and equipment (WC02301) plus changes in inventory (WC02101), divided by lagged total assets (WC02999).

Investment Growth (INVGRWTH) is the annual growth rate in capital expenditure (WC04601).

Net External Financing (NEXTFIN) is proceeds from the sale of common and preferred stocks (WC04251) minus the expenditure on the purchase of common and preferred stock (WC04751) minus dividends paid plus changes in long-term debt (WC03251, zero if missing) plus changes in current debt (WC03051). Firms with zero net external financing are excluded.

Net Operating Assets (NOA) is operating assets minus operating liabilities, divided by lagged total assets (WC02999). Operating assets are total assets minus cash and short-term investment (WC02001) minus other investments (WC02250, zero if missing). Operating liabilities are total assets minus debt in current liabilities (WC03051, zero if missing) minus long-term debt (WC03251, zero if missing) minus common equity

(WC03501) minus minority interests (WC04055, zero if missing) minus preferred stock (WC03451, zero if missing).

Net Stock Issues (NSI) are the annual log change in the product of shares outstanding (WC05301) with the adjustment factor for capital actions (AF). Stocks with net stock issues of zero are excluded.

Operating Accruals (OACC) are the change in non-cash working capital minus depreciation and amortization expense (WC01151, zero if missing), divided by average total assets (WC02999) over the previous 2 fiscal years; non-cash working capital is current assets (WC02201) minus cash and short-term investment (WC02001) minus current liabilities (WC03101) plus debt in current liabilities (WC03255) plus income taxes payable (WC03063, zero if missing).

Percent Operating Accruals (POACC) are operating accruals scaled by the absolute value of lagged net income (WC01751) instead of total assets.

Percent Total Accruals (PTACC) are total accruals scaled by the absolute value of lagged net income (WC01751) instead of total assets.

RD Increase (RDINC) is an indicator variable equal to 1 if the annual percentage change in research and development expenditures (WC01201) divided by total assets (WC02999) is larger than 5%. I sort the stocks into 2 portfolios, depending on whether the indicator equals 0 or 1.

Total Accruals (TACC) is the change in total assets (WC02999) minus the change in cash and short-term investment (WC02001) plus the change in short-term investment (WC02008, zero if missing) minus the change in total liabilities (WC03351) minus the change in preferred stock (WC03451, zero if missing), divided by lagged total assets (WC02999).

4 Profitability Anomalies

Asset Turnover (ATO) is sales (WC01001), divided by lagged operating assets minus operating liabilities (see *net operating assets*).

Capital Turnover (CAPTO) is sales (WC01001) divided by lagged total assets (WC02999).

Cash Operating Profitability (COProf) is measured as sales (WC01001) minus cost of goods sold (WC01051) minus selling, general, and administrative expenses (WC01101, if available) minus interest expenses (WC01075, if available) minus the change in accounts receivable (WC02051, if available) minus the change in inventory (WC02101, if available) minus the change in prepaid expenses (WC02140, if available) plus the change in deferred revenue (WC03262, if available) plus the change in accounts payable (WC03040, if available) plus the change in accrued expenses (sum of WC03054, WC03060, and WC03069, if available), divided by the firm's book equity.

Cash Productivity (CPROD) is the market capitalization of December $t-1$ plus long-term debt (WC03251) minus total assets (WC02999), divided by cash and short-term investment (WC02001).

Change in Common Shareholder Equity (CHSEQ) is the annual percentage change in common equity (WC03501).

Change in Current Ratio (CHCR) is the annual growth rate in the *current ratio*.

Change in Gross Margin Minus Change in Sales (CHGMS) is the annual percentage change in gross margin minus the annual percentage change in total revenues (WC01001). The gross margin is revenues minus cost of goods sold (WC01051).

Change in QUICK (CHQ) is the annual percentage change in *QUICK*.

Change in Sales Minus Change in Inventory (CHSI) is the annual percentage change in sales (WC01001) minus the annual percentage change in inventory (WC02101).

Change in Sales Minus Change in Receivables (CHSR) is the annual percentage change in sales (WC01001) minus the annual change in accounts receivable (WC02051).

Change in Sales Minus Change in SGA (CHSSGA) is the annual percentage change in sales (WC01001) minus the annual percentage change in selling, general, and administrative expenses (WC01101).

Change in Sales to Inventory (CHSTI) is the annual percentage change in *sales to inventory*.

DISTRESS is $\pi = -20.267NIMTAAVG + 1.416TLMTA - 7.129EXRET + 1.411\sigma - 0.045RSIZE - 2.132CASHMTA + 0.075MB - 0.058PRICE - 9.164$, where $NIMTAAVG = \frac{1-\phi^3}{1-\phi^{12}}(NIMTA_{t-1,t-3} + ... + \phi^9 NIMTA_{t-10,t-12})$ with $\phi = 2^{-1/3}$. $NIMTA$ is quarterly net income (WC01751A) divided by firm scale. Firm scale is the sum of quarterly total liabilities (WC03351A) and market capitalization. $TLMTA$ is quarterly total liabilities divided by firm scale. $EXRET = \frac{1-\phi}{1-\phi^{12}}(ER_{t-1} + ... + \phi^{11} ER_{t-12})$, where ER is the difference of the firm's log return and that of the market (roughly the share of the S&P 500 in the U.S. market). σ is the annualized standard deviation over the last 3 months using daily returns. $RSIZE$ is the log of the market capitalization of a firm divided by 0.7 times that of the aggregate market. $CASHMTA$ is cash and quarterly short-term investment (WC02001A) divided by firm scale. MB is the market-to-book ratio where the quarterly book equity is increased by 10% of the difference between book equity and market equity and set to \$1 if still negative. $PRICE$ is the log of the share price, truncated at \$15. Since data on quarterly statements is thin for some countries and generally not available in Worldscope before 1998, I supplement the data on accounting variables with annual balance sheet data. Following Campbell, Hilscher and Szilagyi (2008), I winsorize all variables at the 5% and 95% levels using the entire pooled firm–month distribution. The portfolio holding period is 6 months.

Earnings Volatility (STEARN) is the standard deviation for 16 quarters of income before extraordinary items (WC01751A) divided by the average total assets (WC02999A).

F-SCORE is the composite score measured as the sum over different indicator variables: (i) ROA greater than zero, (ii) cash flow from operations (WC04860) divided by lagged total assets (WC02999) greater than zero, (iii) the change in ROA is positive, (iv) cash flow from operations divided by lagged total assets greater than ROA, (v) change of the ratio of long-term debt (WC03251, zero if missing) to total assets is negative, (vi) change of the ratio between current assets (WC02201) and current liabilities (WC03101) is positive, (vii) sale of common and preferred stocks (WC04251) minus increases in preferred stock

outstanding (WC03451) is not greater than zero, (viii) change in sales (WC01001) minus cost of goods sold (WC01051), divided by sales is positive, and (ix) change in the ratio of total assets and lagged total assets is positive. Changes are all measured relative to the previous years' variables and the indicators are set to zero if the condition is not satisfied. Stocks are sorted into 7 portfolios and those stocks with score of 0, 1, or 2 are allocated to portfolio 1 while those with score of 8 or 9 are allocated to portfolio 7.

Gross Profitability (GPROF) is total revenues (WC01001) minus cost of goods sold (WC01051), divided by total assets (WC02999).

Industry-Adjusted Change in Capital Turnover (CHCTO^{IA}) is a firm's change in *capital turnover* minus the average change in *capital turnover* of all firms within the same FF-48 industry.

Industry-Adjusted Change in Profit Margin (CHPM^{IA}) is a firm's change in *profit margin* minus the average change in *profit margin* of all firms within the same FF-48 industry.

NEI is the number of consecutive quarters over the past 2 years for which the quarterly earnings per share (WC18193A) rose relative to the respective number 1 year before. The stocks are allocated into 9 portfolios based on the number achieved for *NEI* (0, 1, 2, 3, 4, 5, 6, 7, 8). I only compute *NEI* if there is non-missing data for at least 1 of the 2 previous quarters and at least 4 non-missing quarterly changes are available during the past 2 years.

O-SCORE is $O = -0.407SIZE + 6.03TLTA - 1.43WCTA + 0.076CLCA - 1.72OENEG - 2.37NITA - 1.83FUTL + 0.285INTWO - 0.521CHIN - 1.32$. $SIZE$ is the log of total assets (WC02999). $TLTA$ is book value of debt (WC03101 plus WC03251) divided by total assets. $WCTA$ is working capital (WC02201 minus WC03101) divided by total assets. $CLCA$ is current liabilities (WC03101) divided by current assets (WC02201). $OENEG$ is 1 if total liabilities (WC03351) exceed total assets. $NITA$ is net income (WC01751) divided by total assets. $FUTL$ is funds from operations (WC04201) divided by total liabilities. $INTWO$ is 1 if net income is negative for the last 2 years. $CHIN = (NI_t - NI_{t-1})/(|NI_t| + |NI_{t-1}|)$, where NI is net income.

Operating Profitability (OPROF) is measured as sales (WC01001) minus cost of goods sold (WC01051) minus selling, general, and administrative expenses (WC01101, if available) minus interest expense (WC01075, if available), divided by the firm's book equity.

Profit Margin (PMARG) is operating income (WC01250) minus depreciation (WC01151), divided by sales (WC01001).

Return on Invested Capital (ROIC) is earnings before interest and taxes (WC18191) minus non-operating income (WC01266), divided by the non-cash enterprise value. The non-cash enterprise value is defined as common equity (WC03501) plus total liabilities (WC03351) minus cash and short-term investments (WC02001).

Return on Net Operating Assets (RNOA) is operating income (WC01250) minus depreciation (WC01151), divided by lagged operating assets minus operating liabilities (see *net operating assets*).

Revenue Surprise (REVSURP) is standardized unexpected revenues. The most recently announced quarterly revenues (WC01001A) minus those 1 year before are divided by the standard deviation of past revenue changes during the prior 8 quarters (minimum 6 quarters available).

ROA is quarterly income before extraordinary items (WC01551A) divided by quarterly total assets (WC02999A) lagged by 1 quarter. Since data on quarterly statements is thin for some countries and generally not available in Worldscope before 1998, I supplement the *ROA* data with *ROA* from annual balance sheet data (divided by 4).

ROE is the quarterly income before extraordinary items (WC01551A) divided by the firm's quarterly book equity lagged by 1 quarter. Quarterly book equity is shareholders' equity (WC03995A) plus balance sheet deferred taxes (WC03263A, if available) minus the book value of preferred stock (WC03451A, zero if missing). If shareholder equity is not available, I use common equity (WC03501A) plus the book value of preferred stock, or total assets (WC02999A) minus total liabilities (WC03351A), in that order. Since data on quarterly statements is thin for some countries and generally not available in Worldscope before 1998, I supplement the *ROE* data with *ROE* from annual balance sheet data (divided by 4).

Sales to Cash (STC) is defined as the ratio between annual sales (WC01001) and cash and short-term investments (WC02001)

Sales to Inventory (STI) is defined as the ratio between annual sales (WC01001) and total inventory (WC02101).

Sales to Receivables (STREC) is defined as the ratio between annual sales (WC01001) and accounts receivable (WC02051).

Tax Expense Surprise (TAXES) is the change in quarterly tax expense (WC01451A) to that 1 year before, divided by quarterly total assets (WC02999A) 1 year before. Since data on quarterly statements is thin for some countries and generally not available in Worldscope before 1998, I supplement the data with tax expense surprises from annual balance sheet data (divided by 4).

Taxable Income to Book Income (TITBI) is pretax income (WC01401) divided by net income (WC01751). Firms with zero or negative net income are excluded.

5 Intangibles Anomalies

Accrual Quality (ACCQ) is the standard deviation of the residuals (ν) over the past 5 fiscal years of the regression
$TCA_{j,t} = \phi_{0,j} + \phi_{1,j}CFO_{j,t-1} + \phi_{2,j}CFO_{j,t} + \phi_{3,j}CFO_{j,t+1} + \phi_{4,j}\Delta Rev_{j,t} + \phi_{5,j}PPE_{j,t} + \nu_{j,t}$.
TCA is total current accruals, which is defined as the change in current assets (WC02201) minus the change in current liabilities (WC03101) minus the change in cash (WC02001) plus the change in short-term debt (WC03051; zero if missing), divided by lagged total assets (WC02999). CFO is income before extraordinary items (WC01751) minus the change in current assets plus the change in current liabilities plus the change in cash minus the change in short-term debt plus depreciation (WC01151), divided by lagged total assets. ΔRev is the change in revenues (WC01001) divided by total assets and PPE is gross property, plant, and equipment (WC02301) divided by total assets. All regressor variables are winsorized at the 1 and 99 percentiles.

Debt Capacity/Firm Tangibility (DCFC) is cash and short-term investment (WC02001) plus 0.715 times accounts receivable (WC02051) plus 0.547 times inventory

(WC02101) plus 0.535 times property, plant, and equipment (WC02301), all divided by total assets (WC02999).

Hiring Rate (HRATE) is $N_{t-1} - N_{t-2}/(0.5N_{t-1} + 0.5N_{t-2})$, where N_{t-1} is the number of employees (WC07011) in fiscal year $t-1$.

Industries 10 Industry portfolios are assigned based on their SIC-codes and the Fama–French industry definition.

Industry-Adjusted Change in Employees (CHEM^{IA}) is a firm's change in employees (WC07011) during the previous fiscal year minus the average change in employees of all firms within the same FF-48 industries.

Operating Leverage (OPLEV) is cost of goods sold (WC01051) plus selling, general, and administrative expenses (WC01101), divided by total assets (WC02999).

Organizational Capital to Assets (OCTA) is organizational capital divided by total assets (WC02999). Organizational capital is $OC_{j,t-1} = (1-\delta)OC_{j,t-2} + SGA_{j,t-1}/CPI_{t-1}$, where $OC_{j,0} = SGA_{j,0}/(g+\delta)$, $\delta = 0.15$ is the rate of depreciation, SGA is selling, general, and administrative expenses (WC01101), CPI is the consumer price index (data from Datastream) in the end of December of year $t-1$, and $g = 0.1$ is the long-term growth rate. If selling, general, and administrative expenses are missing after the start date, they are set to 0. Finally, $OC_{j,t}$ is industry-standardized using the Fama–French 17 industries.

RC to Assets (RCTA) is the weighted average of previous research and development expenditures (WC01201; RD) as
$RC_{j,t-1} = RD_{j,t-1} + 0.8RD_{j,t-2} + 0.6RD_{j,t-3} + 0.4RD_{j,t-4} + 0.2RD_{j,t-5}$, divided by total assets (WC02999). Firms with zero research and development expenditures for all prior 5 fiscal years are excluded.

RD to Market (RDTM) is research and development expenditures (WC01201) divided by the market capitalization of December $t-1$. Firms with zero research and development expenditures are excluded.

RD to Sales (RDTS) is research and development expenditures (WC01201) divided by sales (WC01001). Firms with zero research and development expenditures are excluded.

Sin Stocks (SIN) is an indicator variable equal to 1 if a company's primary industry classification is in smoke or tobacco, beer or alcohol, or gaming. I sort the stocks into 2 portfolios, depending on whether the indicator equals 0 or 1.

6 Trading Frictions

1/P is the inverse of the U.S. Dollar share price (using the unadjusted share price available from Datastream).

AGE is the time (in years) since the first data coverage in Datastream.

BETA is the correlation of a stock's return times the excess return standard deviation of the firm divided by that of the market. Following Frazzini and Pedersen (2014), the correlation is measured using overlapping 3-day returns during the past 5 years while the standard deviations use daily data over the most recent year, requiring at least half the observations to be non-missing.

Beta Squared (BETASQ) is the square of *beta*.

Bid–Ask Spread (BAS) is the difference between a firm's bid price at market close (PB) and the corresponding ask price (PA), divided by the average of bid and ask price.

Dimson Beta (DIMBETA) uses the beta estimator of Dimson (1979) with 1 lead and 1 lag. That is, a stock's excess return is not only regressed on the market excess return at the same time, but also the market excess return lagged and leaded by 1 period is included. The Dimson beta is the sum of the coefficients on the 3 regressors. The regression is performed using the most recent month, requiring at least half the observations to be non-missing.

Dollar Trading Volume (VOL) is the average daily dollar trading volume (shares traded multiplied by the share price) using daily observations over the previous 6 months, requiring at least 50 non-missing observations.

Idiosyncratic Volatility (IVOL) is the standard deviation of the residuals relative to the Fama and French (1993) FF-3 model during the past month, requiring at least half the observations to be non-missing.

Illiquidity (ILLIQ) is the average ratio of the absolute stock return over the dollar trading volume using daily observations over the previous 6 months, requiring at least 50 non-missing observations.

Industry-Adjusted Size (SIZE^{IA}) is a firm's *size* minus the average *size* of firms within an industry.

Initial Public Offering (IPO) is an indicator variable equal to 1 if a stock is available for the first year in the Datastream database. I sort the stocks into 2 portfolios, depending on whether the indicator equals 0 or 1.

MAX is the maximum daily return during the past month, requiring at least half the observations to be non-missing.

MIN is the minimum daily return during the past month, requiring at least half the observations to be non-missing.

Price Delay (PRDEL) is the proportion of variation in weekly returns for 36 months ending in month t explained by 4 lags of weekly market returns incremental to the contemporaneous market return. The measure of price delay is 1 minus the R^2 from a regression of weekly stock returns on the contemporaneous market return divided by the R^2 when adding 4 lagged weekly market returns.

Short-Term Reversal (STR) is the previous months' stock return.

SIZE is the market capitalization of a stock.

Systematic Volatility (SVOL) is the coefficient β_j^{VIX} from the regression $r_{j,d} - r_{f,d} = \alpha_j + \beta_j MKT_d + \beta_j^{VIX} dVIX_d + \epsilon_d$, where $dVIX_d$ is the daily innovation in the Chicago Board Options Exchange VIX index. The regression coefficients are estimated using data from the past month, requiring at least half the observations to be non-missing.

Total Volatility (TVOL) is the realized volatility of the daily (log-)returns of a stock during the past month.

Turnover (TO) is the average daily share turnover (shares traded on that day divided by the number of shares outstanding) using daily observations over the previous 6 months, requiring at least 50 non-missing observations.

Volatility of Trading Volume (STVOL) is the monthly standard deviation of daily dollar trading volume of the previous month.

Volatility of Turnover (STTO) is the monthly standard deviation of daily *turnover* of the previous month.

Zero Trading Days (ZERO) is the number of zero trading volume days during the previous month, plus one over the 1-month turnover divided by 480,000.

OA3 GRS Test

The GRS test statistic that is defined as

$$GRS = \frac{T-N-k}{N(T-k-1)}\hat{\alpha}'\hat{\Sigma}^{-1}\hat{\alpha}/\omega_{1,1}, \tag{OA16}$$

where T is the number of time-series observations and N is the number of different portfolios. Note that in the case of factor spanning regressions $N = k$. $\hat{\alpha}$ is a $N \times 1$ vector of estimated alpha coefficients. $\Sigma = \frac{1}{T-k-1}\epsilon'\epsilon$, where ϵ is a $T \times N$ matrix stacking all residuals from the regressions for each of the portfolios (factors), and $\omega_{1,1}$ is the $1,1$ element (first row, first column) of the matrix $(X'X)^{-1}$, where X is the $T \times (k+1)$ matrix of right-hand-side (RHS) factors with the first column containing ones. The GRS test statistic follows an F-distribution with degrees of freedom of N and $T-N-k$.

OA4 Country Characteristic Variables

Market Openness is the Chinn and Ito (2006) index of financial openness, which is based on several measures of capital controls. The data come from the authors' webpage.

ICRG is a political risk rating from the International Country Risk Guide.

MC to GDP is the ratio of stock market capitalization to the gross domestic product (GDP) (Carrieri, Errunza and Hogan (2007)). I obtain the data from the World Development Indicator provided by the World Bank.

Figure A1: Factor Alpha Summary: Global vs. Local – Best Models

This figure plots the average absolute annualized returns and alphas (in percentage points) of all anomaly quintile portfolios for each country. For each anomaly portfolio, Equation (1) is estimated for each of the global and local factor models. Reported are the (equally weighted) aggregated absolute alphas. The aggregation scheme proceeds as follows: first absolute alphas are averaged across all portfolios of an anomaly and then over all 134 anomalies within a country. In a third step, I pick those among my main global and local factor models that yield the respective lowest average absolute alphas. The light blue bar presents the average absolute alpha of the local versions of the factor models. The dark blue bar indicates the additional average absolute alpha when using global factor models. The average absolute return is the sum of the light blue, dark blue, and white bars. If the dark blue (white) bar is in the negative area, it means that the global absolute alphas (absolute returns) are on average lower than the local absolute alphas (global absolute alphas).

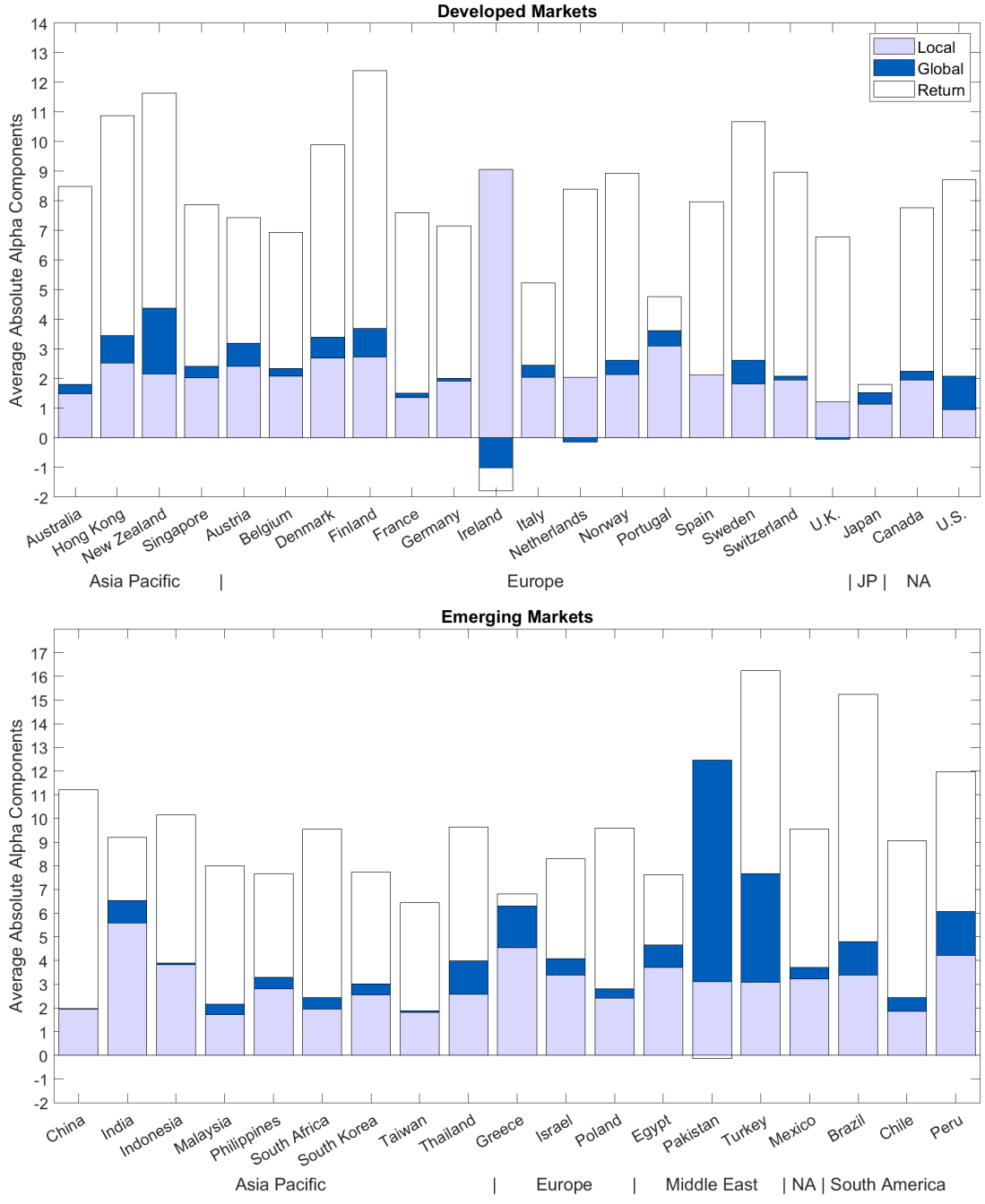


Figure A2: Factor Alpha Summary: Regional vs. Local – Best Models

This figure plots the average absolute annualized returns and alphas (in percentage points) of all anomaly quintile portfolios for each country. For each anomaly portfolio, Equation (1) is estimated for each of the regional and local factor models. Reported are the (equally weighted) aggregated absolute alphas. The aggregation scheme proceeds as follows: first absolute alphas are averaged across all portfolios of an anomaly and then over all 134 anomalies within a country. In a third step, I pick those among my main regional and local factor models that yield the respective lowest average absolute alphas. The light blue bar presents the average absolute alpha of the local versions of the factor models. The orange bar indicates the additional average absolute alpha when using regional factor models. The average absolute return is the sum of the light blue, orange, and white bars. If the orange (white) bar is in the negative area, it means that the regional absolute alphas (absolute returns) are on average lower than the local absolute alphas (global absolute alphas).

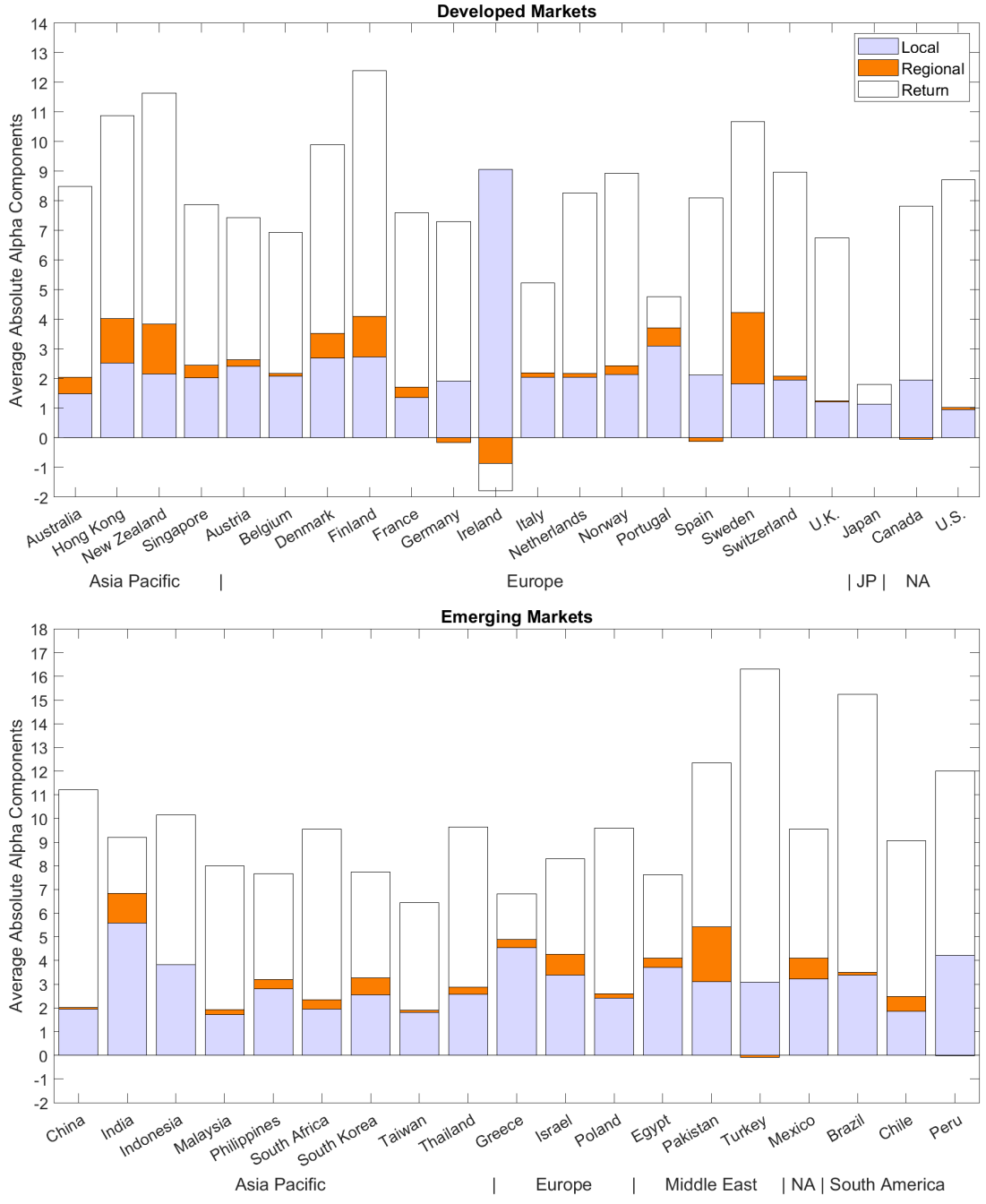


Figure A3: Factor Alpha Summary: Further Models

This figure plots the average absolute annualized alphas (in percentage points) of all anomaly quintile portfolios for further factor models. For each anomaly portfolio, Equation (1) is estimated for each of the global, regional, and local factor models (see Section OA1 of the Online Appendix for the definition of the factor model acronyms). Reported are the (equally weighted) aggregated absolute alphas. The aggregation scheme proceeds as follows: first absolute alphas are averaged across all portfolios of an anomaly, then over all 134 anomalies within a country, and finally across countries. The dark blue bar denotes alphas toward the global version of the factor models. The orange and light blue bars present the alphas toward the regional and local factor models, respectively. The average absolute returns for the different subpanels are 8.87% (all countries), 8.06% (Developed Markets), and 9.81% (Emerging Markets).

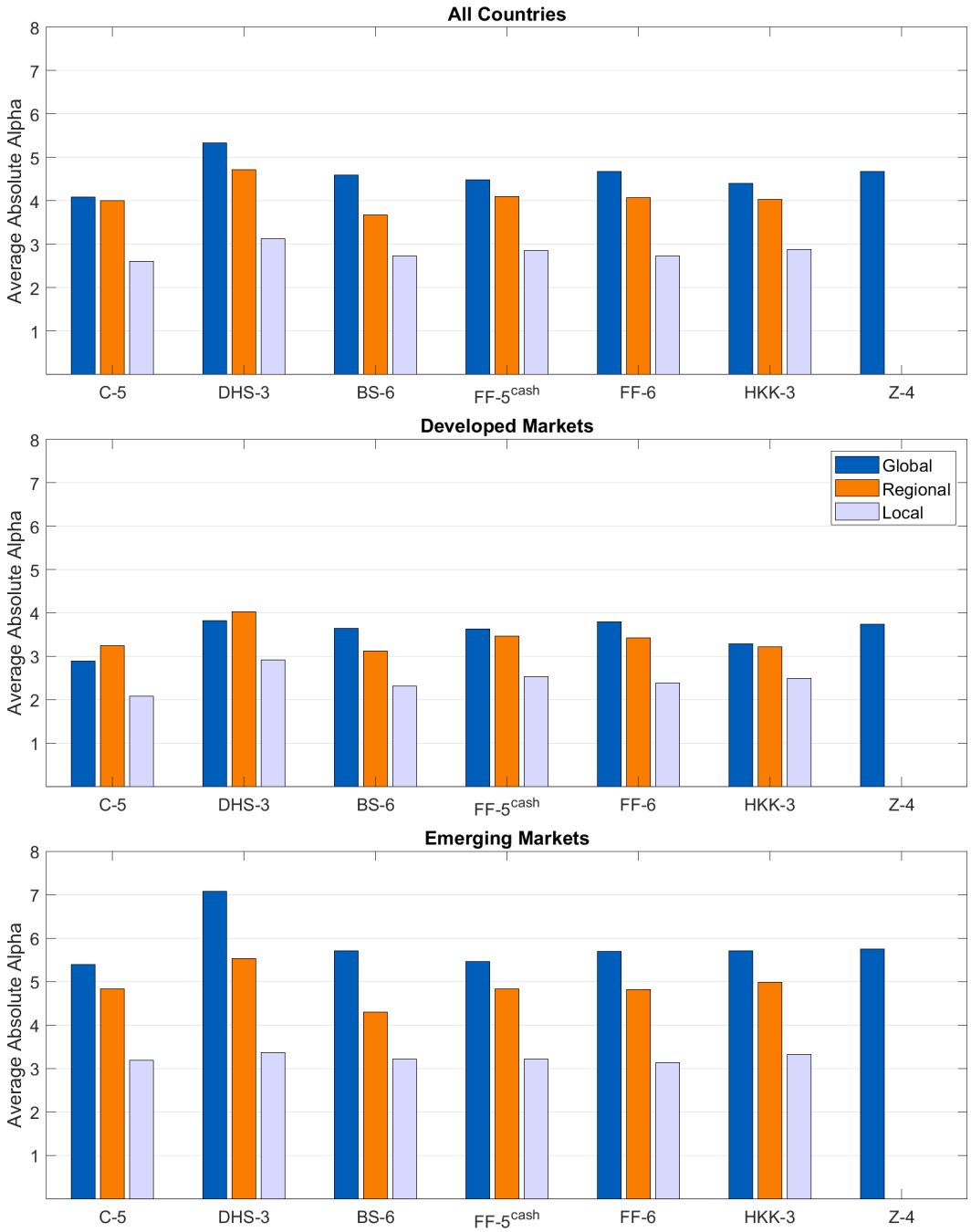


Figure A4: Factor Alpha Summary: World Factors with Regional Breakpoints

This figure plots the average absolute annualized alphas (in percentage points) of all anomaly quintile portfolios for different factor models, where the global factors use regional breakpoints. For each anomaly portfolio, Equation (1) is estimated for each of the global, regional, and local factor models (see Section OA1 of the Online Appendix for the definition of the factor model acronyms). Reported are the (equally weighted) aggregated absolute alphas. The aggregation scheme proceeds as follows: first absolute alphas are averaged across all portfolios of an anomaly, then over all 134 anomalies within a country, and finally across countries. The dark blue bar denotes alphas toward the global version of the factor models. The orange and light blue bars present the alphas toward the regional and local factor models, respectively. The average absolute returns for the different subpanels are 8.87% (all countries), 8.06% (Developed Markets), and 9.81% (Emerging Markets).

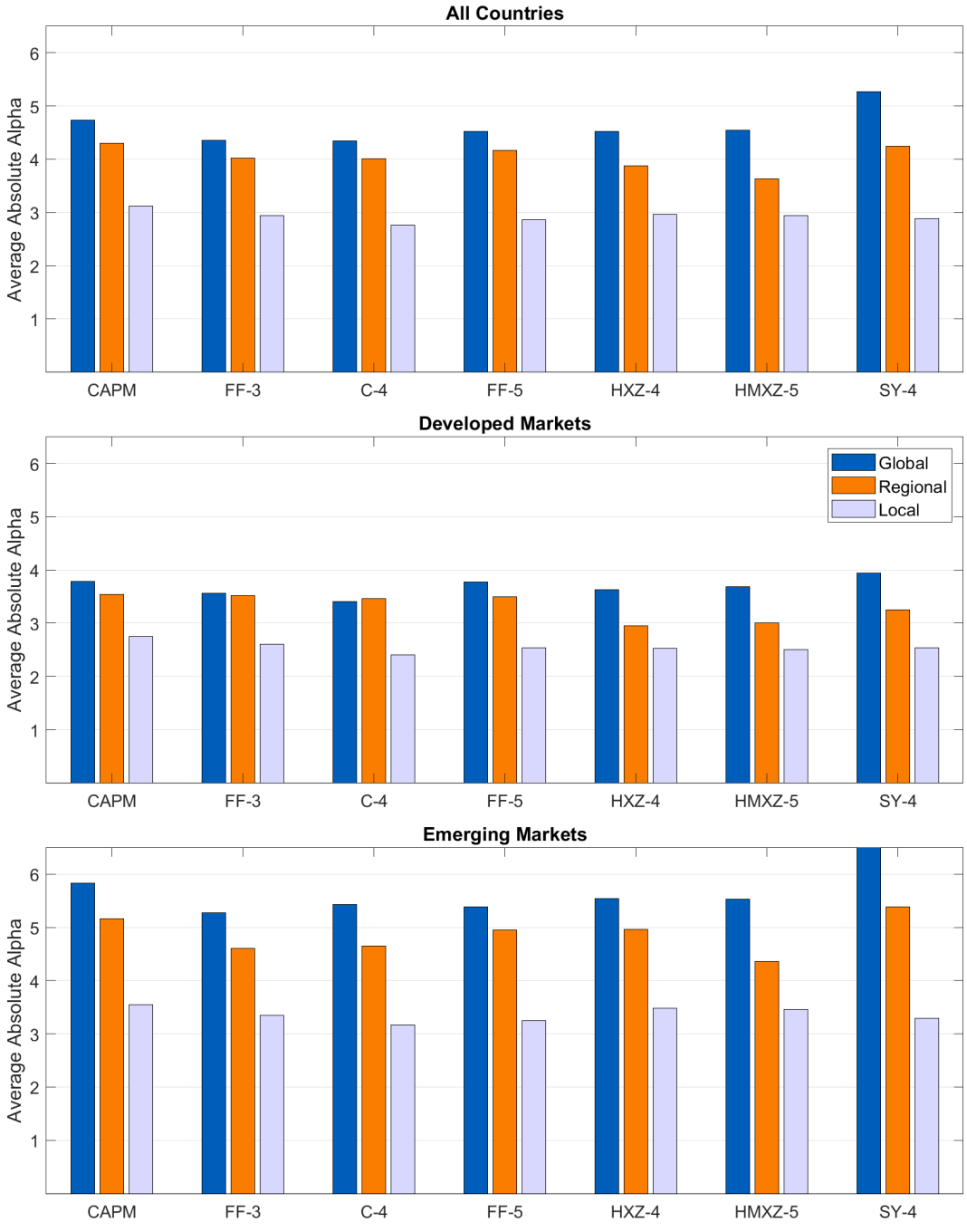
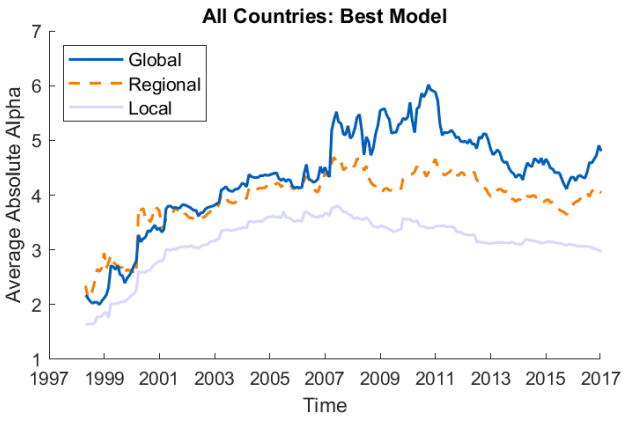
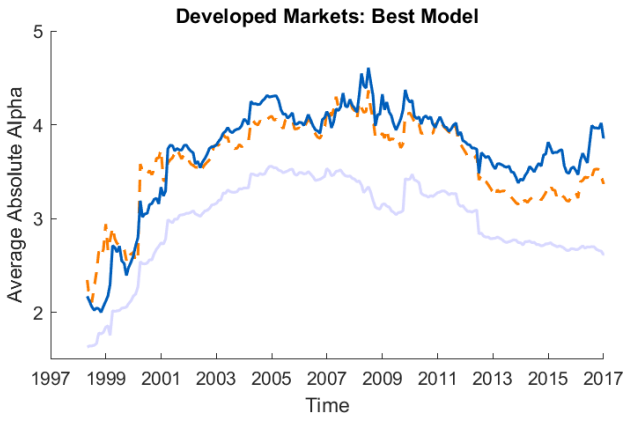


Figure A5: Global, Regional, and Local Alpha Trends – Best Models

This figure plots 100-month rolling average absolute annualized alphas (in percentage points) for global, regional, and local factor models. For each anomaly portfolio, Equation (1) is estimated for each of the global, regional, and local factor models using the past 100 months. Reported are the (equally weighted) aggregated absolute alphas. The aggregation scheme proceeds as follows: first absolute alphas are averaged across all portfolios of an anomaly and then over all 134 anomalies within a country. In a third step, at each point in time, I pick those among my main global, regional, and local factor models for each country that yield the respective lowest average absolute alphas. Finally, I aggregate the results over the countries indicated in the figure headings. The dark blue line represents the global, the dashed orange line the regional, and the light blue line the local factor models. For the figure, the results are allocated to the end dates of the 100-month windows.





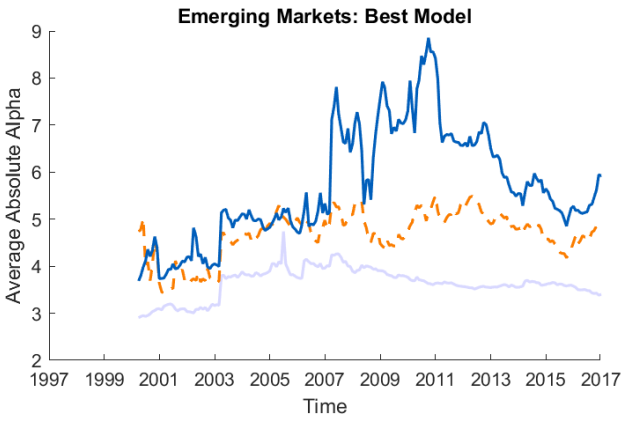


Table A1: Explaining Anomalies: Regions

This table compares the performance of several global, regional, and local factor models in explaining portfolio returns sorted by different anomaly variables. The different panels present average results across all developed or emerging countries in a specific region. For each anomaly portfolio in each country, Equation (1) is estimated for each of the global, regional, and local factor models (see Section OA1 of the Online Appendix for the definition of the factor model acronyms). Avg($|\alpha|$) is the average absolute annualized alpha (in percentage points), first averaged across all portfolios of an anomaly, then over all anomalies in a country, and finally across countries. Avg(α^{L-S}) is the average absolute annualized alpha (in percentage points) of the long–short portfolios, first averaged over all anomalies in a country and then across countries. $\Delta|\alpha|$ and $\Delta\alpha^{L-S}$ present the differences in average alphas for different factor model specifications (global, regional, local). To test whether these differences are statistically significant, I use double-clustered (by country and anomaly) standard errors of Cameron et al. (2011) applied to all anomaly–country observations. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Global		Regional		Local		Glob vs. Reg		Glob vs. Loc		Reg vs. Loc	
	Avg($\|\alpha\|$)	Avg(α^{L-S})	Avg($\|\alpha\|$)	Avg(α^{L-S})	Avg($\|\alpha\|$)	Avg(α^{L-S})	$\Delta\|\alpha\|$	$\Delta\alpha^{L-S}$	$\Delta\|\alpha\|$	$\Delta\alpha^{L-S}$	$\Delta\|\alpha\|$	$\Delta\alpha^{L-S}$
Asia Pacific – Developed (4 Countries)												
#	126	124	126	124	126	124						
RET	9.72	4.20	9.72	4.20	9.72	4.20	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	4.37	4.55	4.90	4.49	2.43	4.60	−0.52	0.06	1.95	−0.05	2.47**	−0.12***
FF-3	3.56	4.70	4.11	4.76	2.28	4.43	−0.55	−0.07	1.28**	0.26*	1.83***	0.33**
C-4	3.42	4.34	4.30	4.52	2.08	3.74	−0.88**	−0.18	1.34**	0.60***	2.22***	0.78***
FF-5	3.83	4.76	3.78	4.65	2.19	3.94	0.04	0.11	1.64***	0.82***	1.60*	0.71***
HXZ-4	3.94	4.86	3.20	4.60	2.31	4.13	0.73	0.26	1.62***	0.72	0.89***	0.46*
HMXZ-5	4.14	4.83	3.48	4.55	2.37	4.14	0.66	0.28	1.77***	0.69	1.11*	0.40
SY-4	3.60	4.05	3.46	4.14	2.46	4.03	0.14	−0.09	1.14	0.02	1.00	0.11
Asia Pacific – Emerging (9 Countries)												
#	126	124	126	124	126	124						
RET	8.85	5.68	8.85	5.68	8.85	5.68	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	4.94	5.86	4.66	5.82	3.17	5.90	0.28	0.04	1.77***	−0.04	1.49***	−0.08
FF-3	3.82	5.87	3.97	6.09	2.93	5.62	−0.15	−0.22*	0.89***	0.25	1.05***	0.47
C-4	3.90	5.70	4.24	5.92	2.90	5.24	−0.34*	−0.22	1.00**	0.46	1.35***	0.68
FF-5	3.76	5.87	4.65	6.03	2.93	5.25	−0.89	−0.15	0.84***	0.63**	1.73**	0.78*
HXZ-4	4.46	5.94	4.83	6.01	3.16	5.59	−0.37	−0.07	1.30**	0.35	1.67***	0.43*
HMXZ-5	4.37	5.97	3.67	5.85	3.12	5.41	0.69	0.11	1.25**	0.55***	0.55***	0.44
SY-4	5.14	5.73	4.88	6.38	3.03	5.35	0.26	−0.65***	2.11***	0.38	1.85***	1.03***
Europe – Developed (15 Countries)												
#	118	116	118	116	118	116						
RET	8.01	4.53	8.01	4.53	8.01	4.53	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	3.64	5.23	3.53	5.17	3.04	5.27	0.12**	0.06***	0.61***	−0.04	0.49**	−0.11
FF-3	3.44	5.35	3.68	5.35	2.88	5.04	−0.25**	0.00	0.55***	0.31***	0.80***	0.31**
C-4	3.30	4.70	3.56	4.41	2.69	4.14	−0.27**	0.29**	0.61***	0.55***	0.88***	0.26
FF-5	4.21	5.36	3.84	5.14	2.86	4.56	0.38	0.22**	1.35***	0.80***	0.97***	0.57**
HXZ-4	3.75	4.78	3.17	4.42	2.80	4.64	0.57	0.36***	0.94***	0.14	0.37**	−0.22
HMXZ-5	3.70	4.73	3.17	4.36	2.75	4.49	0.52	0.37***	0.95***	0.24**	0.42**	−0.14
SY-4	3.55	4.72	3.56	4.61	2.77	4.13	−0.01	0.12	0.78***	0.60***	0.79***	0.48***

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Table A1: Explaining Anomalies: Regions (continued)

	Global		Regional		Local		Glob vs. Reg		Glob vs. Loc		Reg vs. Loc	
	Avg($\lvert\alpha\rvert$)	Avg(α^{L-S})	Avg($\lvert\alpha\rvert$)	Avg(α^{L-S})	Avg($\lvert\alpha\rvert$)	Avg(α^{L-S})	$\Delta\lvert\alpha\rvert$	$\Delta\alpha^{L-S}$	$\Delta\lvert\alpha\rvert$	$\Delta\alpha^{L-S}$	$\Delta\lvert\alpha\rvert$	$\Delta\alpha^{L-S}$
Europe – Emerging (3 Countries)												
#	125	123	125	123	125	123						
RET	8.23	6.54	8.23	6.54	8.23	6.54	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	4.40	6.93	4.80	6.86	4.71	6.65	−0.41	0.07**	−0.32	0.28	0.09	0.21
FF-3	5.37	7.30	5.33	7.34	4.35	6.66	0.03	−0.04	1.02*	0.64**	0.98*	0.68*
C-4	5.11	6.91	4.61	6.50	3.53	5.11	0.50	0.41**	1.58*	1.80***	1.08**	1.39***
FF-5	6.60	7.51	6.12	7.13	3.94	5.74	0.49	0.37	2.67*	1.77***	2.18***	1.40**
HXZ-4	5.17	6.85	4.39	6.43	4.16	5.48	0.78	0.42*	1.00	1.37	0.22	0.94
HMXZ-5	5.13	6.84	4.33	6.39	4.04	5.44	0.80	0.45	1.08	1.40*	0.28	0.95
SY-4	5.74	7.09	4.61	6.44	3.77	4.95	1.13	0.65*	1.97**	2.14***	0.84	1.49***
Japan												
#	133	131	133	131	133	131						
RET	1.80	2.33	1.80	2.33	1.80	2.33	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	3.58	2.69	1.25	2.36	1.25	2.36	2.33***	0.33***	2.33***	0.33***	0.00	0.00
FF-3	2.98	2.32	1.19	2.27	1.19	2.27	1.79***	0.05	1.79***	0.05	0.00	0.00
C-4	1.51	2.37	1.13	1.99	1.13	1.99	0.38***	0.38**	0.38***	0.38**	0.00	0.00
FF-5	1.79	2.13	1.17	2.17	1.17	2.17	0.62***	−0.04	0.62***	−0.04	0.00	0.00
HXZ-4	3.22	2.11	1.18	2.29	1.18	2.29	2.05***	−0.18	2.05***	−0.18	0.00	0.00
HMXZ-5	3.13	2.11	1.16	2.22	1.16	2.22	1.97***	−0.12	1.97***	−0.12	0.00	0.00
SY-4	2.98	2.53	1.20	2.29	1.20	2.29	1.78***	0.24	1.78***	0.24	0.00	0.00
Middle East (3 Countries)												
#	121	119	121	119	121	119						
RET	12.1	5.65	12.1	5.65	12.1	5.65	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	9.79	5.61	7.54	5.51	3.52	5.89	2.25***	0.10	6.27**	−0.28	4.02	−0.38
FF-3	10.3	6.03	6.16	5.79	3.37	5.79	4.18**	0.24	6.96***	0.24	2.78*	0.00
C-4	10.9	6.07	6.14	5.79	3.31	5.43	4.75*	0.28	7.57***	0.64**	2.82*	0.36*
FF-5	11.6	6.49	4.81	5.74	3.33	5.63	6.80***	0.76	8.28***	0.86	1.49*	0.11
HXZ-4	11.3	6.60	7.54	5.80	3.65	6.09	3.74**	0.80*	7.63**	0.51	3.89**	−0.29
HMXZ-5	11.2	6.69	7.44	5.87	3.64	5.92	3.73**	0.82*	7.53**	0.77	3.80**	−0.05
SY-4	13.6	6.42	8.33	5.91	3.54	5.75	5.30*	0.52	10.1**	0.67	4.79***	0.16

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Table A1: Explaining Anomalies: Regions (continued 2)

	Global		Regional		Local		Glob vs. Reg		Glob vs. Loc		Reg vs. Loc	
	$\text{Avg}(\lvert\alpha\rvert)$	$\text{Avg}(\alpha^{L-S})$	$\text{Avg}(\lvert\alpha\rvert)$	$\text{Avg}(\alpha^{L-S})$	$\text{Avg}(\lvert\alpha\rvert)$	$\text{Avg}(\alpha^{L-S})$	$\Delta\lvert\alpha\rvert$	$\Delta\alpha^{L-S}$	$\Delta\lvert\alpha\rvert$	$\Delta\alpha^{L-S}$	$\Delta\lvert\alpha\rvert$	$\Delta\alpha^{L-S}$
North America – Developed (2 Countries)												
#	134	132	134	132	134	132						
RET	8.24	3.54	8.24	3.54	8.24	3.54	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	3.75	4.13	2.09	4.79	1.97	4.65	1.65	−0.66***	1.77	−0.52**	0.12*	0.14
FF-3	3.38	3.95	2.21	4.42	1.81	4.20	1.17	−0.47**	1.57	−0.25	0.41	0.22
C-4	3.10	3.48	2.22	3.88	1.58	3.30	0.87	−0.40***	1.51	0.18	0.64	0.58
FF-5	2.81	3.79	1.54	2.91	1.45	2.75	1.27*	0.88***	1.36**	1.05***	0.09***	0.16
HXZ-4	2.60	3.67	1.63	2.92	1.50	2.83	0.97***	0.75***	1.09***	0.84***	0.13***	0.09***
HMXZ-5	2.49	3.62	1.67	2.96	1.61	2.96	0.82***	0.66	0.88***	0.66*	0.07**	−0.00
SY-4	2.67	2.80	1.49	2.49	1.55	2.37	1.18	0.32**	1.12	0.44*	−0.06	0.12
North America – Emerging (1 Country)												
#	94	93	94	93	94	93						
RET	9.54	6.44	9.54	6.44	9.54	6.44	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	4.95	6.59	4.67	6.58	3.52	6.37	0.29***	0.00	1.43***	0.22	1.15***	0.22
FF-3	4.09	6.59	4.18	6.68	3.56	6.36	−0.09	−0.09	0.53***	0.23	0.62***	0.33**
C-4	4.13	6.29	4.13	6.46	3.23	5.41	−0.00	−0.17	0.90***	0.88**	0.90***	1.05***
FF-5	3.71	6.51	4.69	6.12	3.53	6.20	−0.98**	0.39	0.19*	0.31	1.16***	−0.08
HXZ-4	4.01	6.47	4.44	6.16	3.90	6.61	−0.43**	0.31	0.11	−0.14	0.55***	−0.45
HMXZ-5	4.08	6.41	4.10	6.14	3.89	6.59	−0.02	0.27	0.19	−0.18	0.20*	−0.45
SY-4	5.30	6.05	5.51	6.20	3.81	5.75	−0.20**	−0.15	1.49***	0.30	1.69***	0.45
South America (3 Countries)												
#	117	115	117	115	117	115						
RET	12.1	5.56	12.1	5.56	12.1	5.56	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	6.23	5.77	4.85	5.95	3.56	6.15	1.38*	−0.19	2.67***	−0.38*	1.29	−0.20
FF-3	5.02	6.00	4.37	6.20	3.49	5.85	0.65*	−0.19	1.54***	0.16	0.89*	0.35
C-4	5.44	5.84	4.57	5.84	3.46	5.73	0.87**	0.00	1.98***	0.11	1.11*	0.11***
FF-5	4.52	6.17	4.88	5.71	3.37	5.46	−0.36	0.46	1.15***	0.71	1.51**	0.25
HXZ-4	4.57	5.93	3.52	5.33	3.47	5.27	1.05	0.60	1.10***	0.67**	0.05	0.07
HMXZ-5	4.51	5.90	3.44	5.41	3.58	5.41	1.07*	0.49	0.93***	0.49	−0.14	0.00
SY-4	10.3	5.99	4.72	5.44	3.16	4.80	5.56**	0.55	7.11***	1.19	1.55**	0.63

Table A2: Anomaly Heatmap: Global vs. Local Factor Models

This table presents a heatmap to summarize information about the average absolute alphas of global and local versions of the main factor models for different anomaly categories. At the end of each month and for each anomaly variable, I form value-weighted quintile portfolios based on breakpoints derived from big stocks. I test whether the different global and local factor models can explain the anomaly long returns. The colors visualize the magnitude of the difference between the average annualized absolute alphas toward global vs. those toward local models ($|\bar{\alpha}|^{glob} - |\bar{\alpha}|^{loc}$; global minus local) within the different anomaly categories. Legend: <–1% <0% <1% <2% <3% <4% <5%.

	CAPM						FF-3						C-4						FF-5						HXZ-4						HMXZ-5						SY-4					
	Momentum	Value	Investment	Profitability	Accruals	Trading	Momentum	Value	Investment	Profitability	Accruals	Trading	Momentum	Value	Investment	Profitability	Accruals	Trading	Momentum	Value	Investment	Profitability	Accruals	Trading	Momentum	Value	Investment	Profitability	Accruals	Trading	Momentum	Value	Investment	Profitability	Accruals	Trading	Momentum	Value	Investment	Profitability	Accruals	Trading
Developed Markets																																										
Asia Pacific																																										
Australia																																										
Hong Kong																																										
New Zealand																																										
Singapore																																										
Europe																																										
Austria																																										
Belgium																																										
Denmark																																										
Finland																																										
France																																										
Germany																																										
Ireland																																										
Italy																																										
Netherlands																																										
Norway																																										
Portugal																																										
Spain																																										
Sweden																																										
Switzerland																																										
U.K.																																										
Japan																																										
Japan																																										
North America																																										
Canada																																										
U.S.																																										

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Table A2: Anomaly Heatmap: Global vs. Local Factor Models (continued)

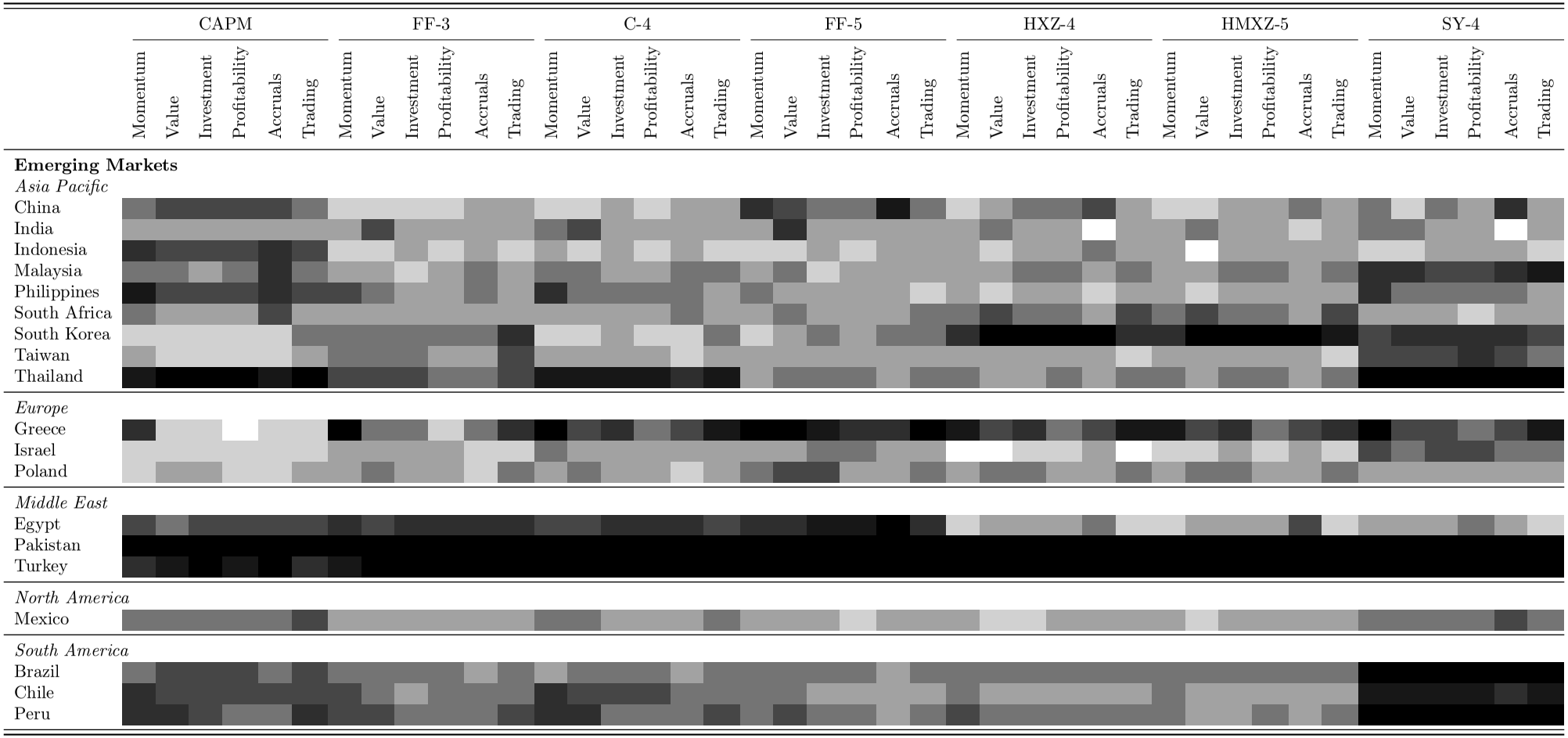

Table A3: Anomaly Heatmap: Regional vs. Local Factor Models

This table presents a heatmap to summarize information about the average absolute alphas of regional and local versions of the main factor models for different anomaly categories. At the end of each month and for each anomaly variable, I form value-weighted quintile portfolios based on breakpoints derived from big stocks. I test whether the different regional and local factor models can explain the anomaly long returns. The colors visualize the magnitude of the difference between the average annualized absolute alphas toward regional vs. those toward local models ($|\bar{\alpha}|^{reg} - |\bar{\alpha}|^{loc}$; regional minus local) within the different anomaly categories. Legend: <–1% <0% <1% <2% <3% <4% <5%.

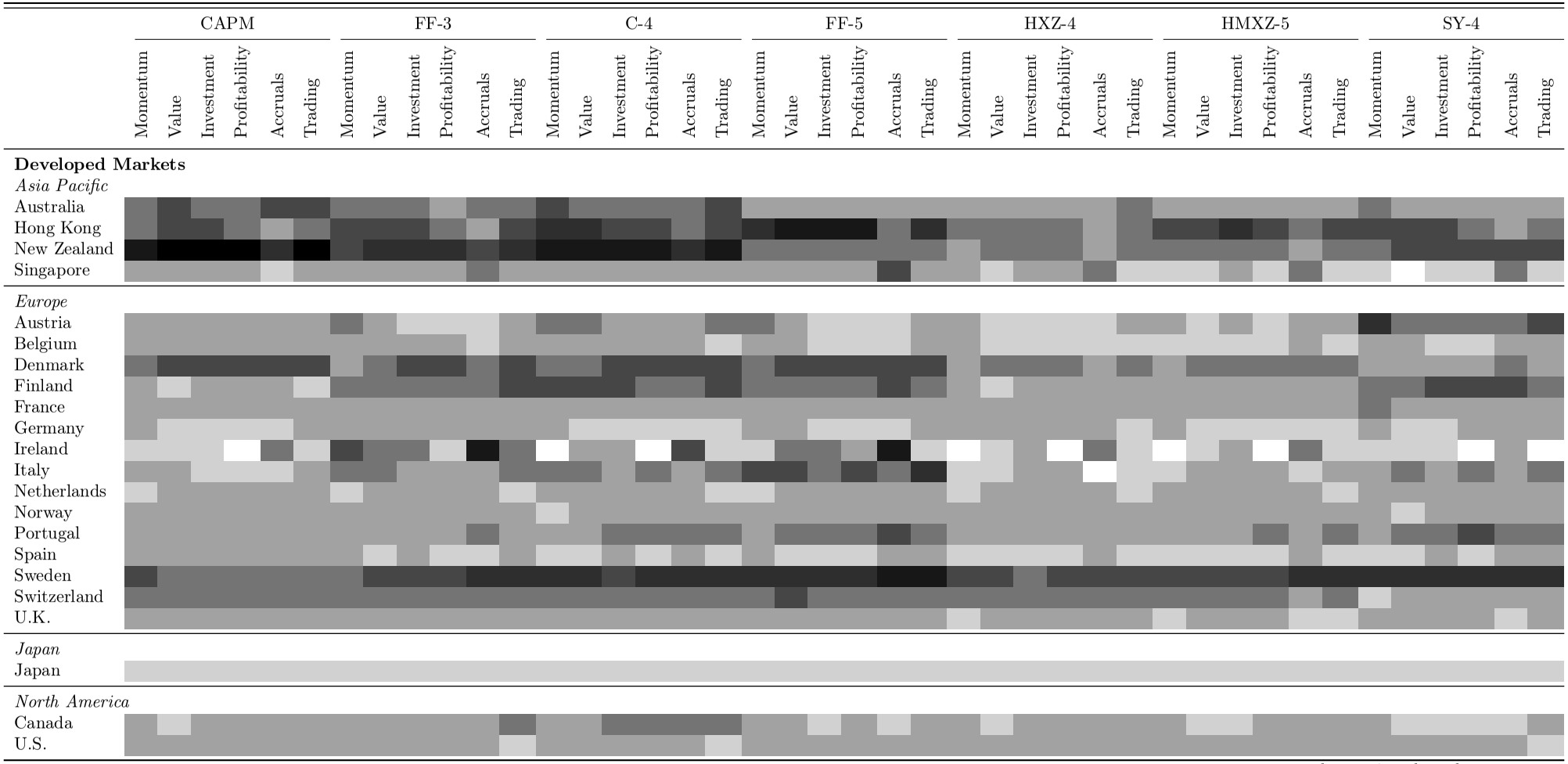

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Table A3: Anomaly Heatmap: Regional vs. Local Factor Models (continued)

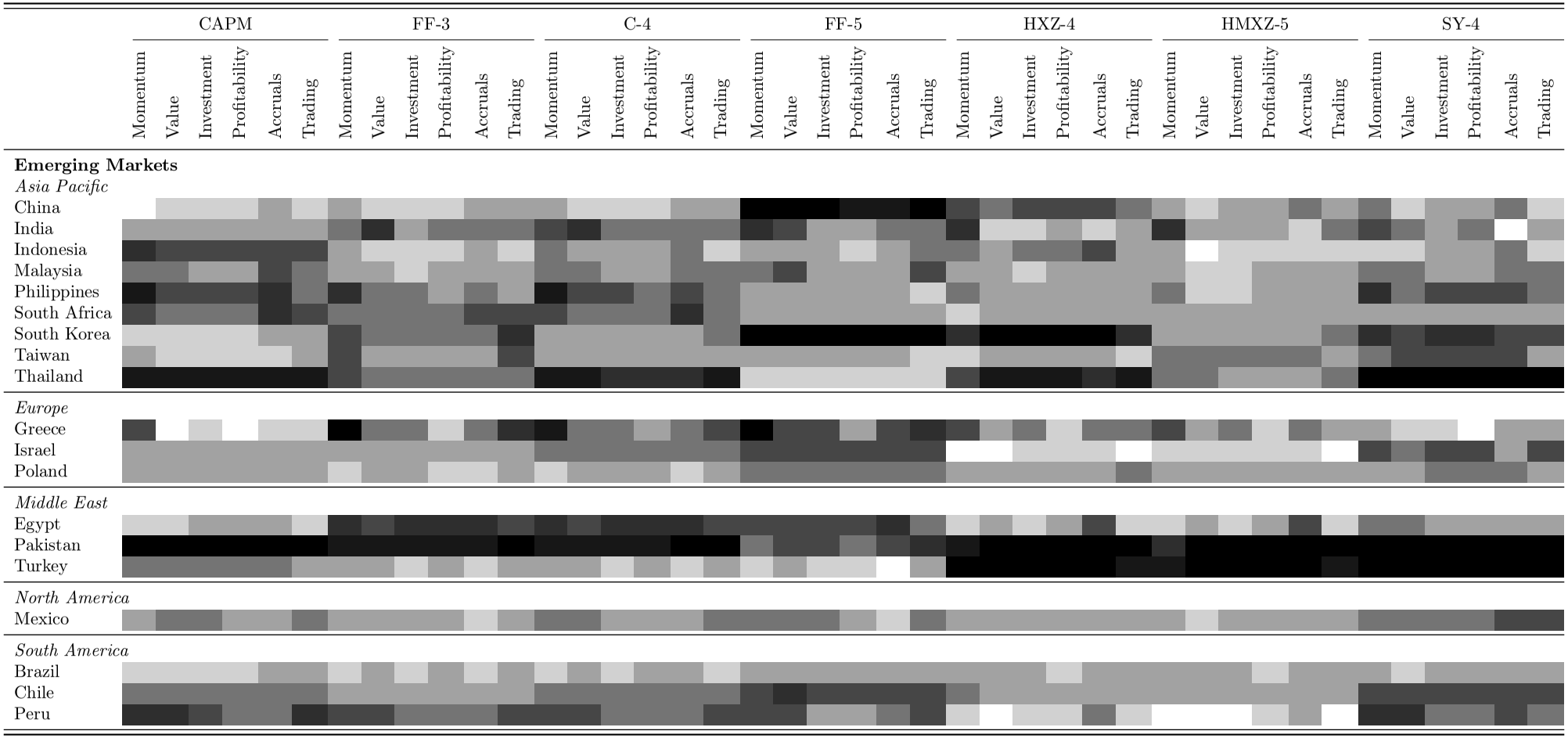

Table A4: Explaining Anomalies: Further Models

This table compares the performance of further global, regional, and local factor models in explaining portfolio returns sorted by different anomaly variables. The first panel presents average results across all countries. In addition, I present panels that consider Developed and Emerging Markets separately. For each anomaly portfolio in each country, Equation (1) is estimated for each of the global, regional, and local factor models (see Section OA1 of the Online Appendix for the definition of the factor model acronyms). Avg($|\alpha|$) is the average absolute annualized alpha (in percentage points), first averaged across all portfolios of an anomaly, then over all anomalies in a country, and finally across countries. Avg(α^{L-S}) is the average absolute annualized alpha (in percentage points) of the long–short portfolios, first averaged over all anomalies in a country and then across countries. $\Delta|\alpha|$ and $\Delta\alpha^{L-S}$ present the differences in average alphas for different factor model specifications (global, regional, local). To test whether these differences are statistically significant, I use double-clustered (by country and anomaly) standard errors of Cameron et al. (2011) applied to all anomaly–country observations. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Global		Regional		Local		Glob vs. Reg		Glob vs. Loc		Reg vs. Loc	
	Avg($\|\alpha\|$)	Avg(α^{L-S})	Avg($\|\alpha\|$)	Avg(α^{L-S})	Avg($\|\alpha\|$)	Avg(α^{L-S})	$\Delta\|\alpha\|$	$\Delta\alpha^{L-S}$	$\Delta\|\alpha\|$	$\Delta\alpha^{L-S}$	$\Delta\|\alpha\|$	$\Delta\alpha^{L-S}$
All Countries												
#	122	120	122	120	122	120						
RET	8.87	5.00	8.87	5.00	8.87	5.00	0.00	0.00	0.00	0.00	0.00	0.00
C-5	4.08	4.95	4.00	4.94	2.61	4.34	0.08	0.02	1.48***	0.61***	1.40***	0.60***
DHS-3	5.34	5.49	4.72	5.36	3.13	5.32	0.62	0.13	2.21***	0.17	1.59***	0.04
BS-6	4.60	5.34	3.67	5.03	2.73	4.29	0.93**	0.30***	1.87***	1.05***	0.94***	0.75***
FF-5^{cash}	4.48	5.51	4.10	5.38	2.85	4.85	0.38	0.13	1.63***	0.66***	1.25***	0.54***
FF-6	4.67	5.30	4.07	4.97	2.73	4.24	0.60	0.32***	1.95***	1.06***	1.34***	0.74***
HKK-3	4.40	5.15	4.04	4.96	2.88	4.59	0.37	0.19**	1.52***	0.56***	1.16***	0.37***
Z-4	4.67	5.41	4.67	5.41	4.67	5.41	0.00	0.00	0.00	0.00	0.00	0.00
Developed Markets												
#	122	120	122	120	122	120						
RET	8.06	4.28	8.06	4.28	8.06	4.28	0.00	0.00	0.00	0.00	0.00	0.00
C-5	2.90	3.92	3.25	3.84	2.08	3.44	−0.35*	0.08	0.82***	0.49***	1.17***	0.41***
DHS-3	3.82	4.89	4.02	4.74	2.92	5.02	−0.20	0.15	0.91***	−0.13	1.11***	−0.28
BS-6	3.64	4.58	3.13	4.24	2.32	3.55	0.51*	0.33***	1.32***	1.03***	0.81***	0.70***
FF-5^{cash}	3.63	4.92	3.46	4.73	2.53	4.26	0.17	0.19**	1.10***	0.66***	0.93***	0.47***
FF-6	3.79	4.55	3.43	4.15	2.38	3.52	0.36	0.41***	1.41***	1.04***	1.05***	0.63***
HKK-3	3.28	4.44	3.22	4.12	2.50	3.93	0.06	0.32**	0.78***	0.51***	0.72***	0.19*
Z-4	3.74	4.88	3.74	4.88	3.74	4.88	0.00	0.00	0.00	0.00	0.00	0.00
Emerging Markets												
#	122	120	122	120	122	120						
RET	9.81	5.83	9.81	5.83	9.81	5.83	0.00	0.00	0.00	0.00	0.00	0.00
C-5	5.39	6.10	4.84	6.15	3.19	5.34	0.56	−0.05	2.20***	0.75***	1.65***	0.80***
DHS-3	7.08	6.19	5.53	6.09	3.37	5.68	1.56*	0.11	3.71***	0.51**	2.16***	0.41**
BS-6	5.71	6.22	4.30	5.95	3.21	5.14	1.41*	0.27	2.50***	1.08***	1.09***	0.81***
FF-5^{cash}	5.47	6.19	4.84	6.14	3.22	5.53	0.63	0.05	2.25***	0.66***	1.62***	0.61**
FF-6	5.70	6.16	4.82	5.93	3.14	5.07	0.88	0.22	2.56***	1.09***	1.68***	0.86***
HKK-3	5.70	5.97	4.98	5.93	3.32	5.34	0.72	0.04	2.38***	0.62***	1.66***	0.59***
Z-4	5.76	6.03	5.76	6.03	5.76	6.03	0.00	0.00	0.00	0.00	0.00	0.00

Table A5: Explaining Anomalies: World Factors with Regional Breakpoints

This table compares the performance of several global (based on regional breakpoints), regional, and local factor models in explaining portfolio returns sorted by different anomaly variables. The first panel presents average results across all countries. In addition, I present panels that consider developed and emerging markets countries separately. For each anomaly portfolio in each country, Equation (1) is estimated for each of the global, regional, and local factor models (see Section OA1 of the Online Appendix for the definition of the factor model acronyms). Avg($|\alpha|$) is the average absolute annualized alpha (in percentage points), first averaged across all portfolios of an anomaly, then over all anomalies in a country, and finally across countries. Avg(α^{L-S}) is the average absolute annualized alpha (in percentage points) of the long–short portfolios, first averaged over all anomalies in a country and then across countries. $\Delta|\alpha|$ and $\Delta\alpha^{L-S}$ present the differences in average alphas for different factor model specifications (global, regional, local). To test whether these differences are statistically significant, I use double-clustered (by country and anomaly) standard errors of Cameron et al. (2011) applied to all anomaly–country observations. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Global		Regional		Local		Glob vs. Reg		Glob vs. Loc		Reg vs. Loc	
	Avg($\|\alpha\|$)	Avg(α^{L-S})	Avg($\|\alpha\|$)	Avg(α^{L-S})	Avg($\|\alpha\|$)	Avg(α^{L-S})	$\Delta\|\alpha\|$	$\Delta\alpha^{L-S}$	$\Delta\|\alpha\|$	$\Delta\alpha^{L-S}$	$\Delta\|\alpha\|$	$\Delta\alpha^{L-S}$
All Countries												
#	122	120	122	120	122	120						
RET	8.87	5.00	8.87	5.00	8.87	5.00	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	4.73	5.41	4.30	5.40	3.12	5.48	0.43***	0.01	1.61***	−0.07	1.18***	−0.08
FF-3	4.36	5.56	4.02	5.61	2.94	5.26	0.33	−0.05	1.41***	0.30***	1.08***	0.34***
C-4	4.34	5.09	4.01	5.07	2.76	4.56	0.33	0.02	1.59***	0.53***	1.25***	0.51***
FF-5	4.52	5.40	4.17	5.36	2.87	4.77	0.35	0.04	1.66***	0.63***	1.30***	0.58***
HXZ-4	4.52	5.26	3.88	5.02	2.97	4.91	0.64***	0.24***	1.55***	0.35***	0.91***	0.10
HMXZ-5	4.54	5.29	3.63	4.96	2.95	4.82	0.91***	0.32***	1.59***	0.46***	0.68***	0.14
SY-4	5.27	5.15	4.24	5.12	2.88	4.52	1.03**	0.03	2.39***	0.63***	1.36***	0.60***
Developed Markets												
#	122	120	122	120	122	120						
RET	8.06	4.28	8.06	4.28	8.06	4.28	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	3.78	4.89	3.54	4.88	2.75	4.96	0.24	0.01	1.03***	−0.07	0.79***	−0.08
FF-3	3.57	5.00	3.51	5.02	2.60	4.72	0.05	−0.02	0.97***	0.28***	0.91***	0.29***
C-4	3.41	4.32	3.46	4.27	2.40	3.90	−0.05	0.05	1.01***	0.42***	1.06***	0.37***
FF-5	3.78	4.73	3.50	4.71	2.53	4.18	0.28	0.02	1.24***	0.56***	0.96***	0.53***
HXZ-4	3.63	4.45	2.95	4.22	2.52	4.28	0.69**	0.23***	1.11***	0.17	0.42***	−0.06
HMXZ-5	3.69	4.45	3.00	4.17	2.50	4.19	0.69**	0.28***	1.19***	0.27**	0.50***	−0.02
SY-4	3.94	4.31	3.25	4.22	2.53	3.87	0.69*	0.08	1.41***	0.44***	0.71***	0.36**
Emerging Markets												
#	122	120	122	120	122	120						
RET	9.81	5.83	9.81	5.83	9.81	5.83	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	5.83	6.01	5.17	6.00	3.55	6.08	0.66**	0.02	2.28***	−0.07	1.62***	−0.09
FF-3	5.27	6.21	4.61	6.29	3.34	5.88	0.66	−0.08	1.93***	0.32*	1.26***	0.40*
C-4	5.43	5.99	4.65	6.01	3.17	5.33	0.78	−0.02	2.26***	0.66***	1.48***	0.67***
FF-5	5.38	6.17	4.95	6.11	3.25	5.47	0.44	0.06	2.13***	0.70***	1.70***	0.64**
HXZ-4	5.54	6.20	4.96	5.95	3.48	5.65	0.59	0.26*	2.06***	0.55**	1.48***	0.29
HMXZ-5	5.53	6.25	4.36	5.89	3.46	5.56	1.17***	0.36*	2.07***	0.69***	0.90**	0.33
SY-4	6.82	6.13	5.39	6.16	3.29	5.28	1.43*	−0.02	3.53***	0.85***	2.10***	0.87***

Table A6: Explaining Anomalies: Local and Foreign Factors

This table compares the performance of several local augmented by foreign global (FG; jointly: LFG) or foreign regional (FR; jointly: LFR), and local factor models in explaining portfolio returns sorted by different anomaly variables. The first panel presents average results across all countries. In addition, I present panels that consider developed and emerging markets countries separately. For each anomaly portfolio in each country, Equation (1) is estimated for each of the foreign global, foreign regional, and local factor models (see Section OA1 of the Online Appendix for the definition of the factor model acronyms). Avg($|\alpha|$) is the average absolute annualized alpha (in percentage points), first averaged across all portfolios of an anomaly, then over all anomalies in a country, and finally across countries. Avg(α^{L-S}) is the average absolute annualized alpha (in percentage points) of the long–short portfolios, first averaged over all anomalies in a country and then across countries. $\Delta|\alpha|$ and $\Delta\alpha^{L-S}$ present the differences in average alphas for different factor model specifications (global, regional, local). To test whether these differences are statistically significant, I use double-clustered (by country and anomaly) standard errors of Cameron et al. (2011) applied to all anomaly–country observations. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Loc + FG		Loc + FR		Local		LFG vs. LFR		LFG vs. L		LFR vs. L	
	Avg($\|\alpha\|$)	Avg(α^{L-S})	Avg($\|\alpha\|$)	Avg(α^{L-S})	Avg($\|\alpha\|$)	Avg(α^{L-S})	$\Delta\|\alpha\|$	$\Delta\alpha^{L-S}$	$\Delta\|\alpha\|$	$\Delta\alpha^{L-S}$	$\Delta\|\alpha\|$	$\Delta\alpha^{L-S}$
All Countries												
#	122	120	122	120	122	120						
RET	8.87	5.00	8.87	5.00	8.87	5.00	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	3.08	5.49	3.07	5.44	3.12	5.48	0.01	0.05***	−0.04	0.01	−0.05**	−0.04
FF-3	2.96	5.32	2.96	5.31	2.94	5.26	0.00	0.01	0.02	0.06	0.02	0.05
C-4	2.72	4.55	2.76	4.59	2.76	4.56	−0.04**	−0.04	−0.04	−0.01	−0.00	0.03
FF-5	2.89	4.76	2.79	4.67	2.87	4.77	0.10***	0.09	0.02	−0.02	−0.08	−0.11
HXZ-4	3.09	5.00	2.90	4.79	2.97	4.91	0.19***	0.22***	0.12***	0.09	−0.07	−0.13**
HMXZ-5	3.05	4.91	2.87	4.66	2.95	4.82	0.18***	0.25***	0.10**	0.09	−0.08**	−0.17**
SY-4	2.96	4.71	2.92	4.66	2.88	4.52	0.03	0.05	0.07	0.19*	0.04	0.14*
Developed Markets												
#	122	120	122	120	122	120						
RET	8.06	4.28	8.06	4.28	8.06	4.28	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	2.70	4.99	2.69	4.92	2.75	4.96	0.01*	0.07***	−0.05	0.03	−0.06	−0.04
FF-3	2.61	4.77	2.62	4.75	2.60	4.72	−0.00	0.03	0.01	0.05	0.02	0.02
C-4	2.34	3.87	2.36	3.85	2.40	3.90	−0.02	0.02	−0.06	−0.03	−0.04	−0.05
FF-5	2.48	4.08	2.41	3.99	2.53	4.18	0.07**	0.09	−0.06	−0.09	−0.13	−0.19**
HXZ-4	2.55	4.19	2.41	4.04	2.52	4.28	0.15***	0.15*	0.03	−0.08	−0.12**	−0.23***
HMXZ-5	2.51	4.06	2.40	3.95	2.50	4.19	0.11***	0.11*	0.01	−0.13	−0.10**	−0.23***
SY-4	2.48	3.85	2.44	3.88	2.53	3.87	0.04	−0.02	−0.06	−0.01	−0.09	0.01
Emerging Markets												
#	122	120	122	120	122	120						
RET	9.81	5.83	9.81	5.83	9.81	5.83	0.00	0.00	0.00	0.00	0.00	0.00
CAPM	3.52	6.07	3.51	6.05	3.55	6.08	0.01	0.02	−0.03	−0.01	−0.04	−0.03
FF-3	3.37	5.95	3.36	5.97	3.34	5.88	0.01	−0.02	0.03	0.07	0.02	0.08
C-4	3.15	5.34	3.21	5.45	3.17	5.33	−0.06*	−0.11*	−0.02	0.01	0.04	0.12**
FF-5	3.37	5.54	3.23	5.45	3.25	5.47	0.14**	0.09	0.12*	0.07	−0.02	−0.01
HXZ-4	3.70	5.94	3.46	5.65	3.48	5.65	0.24***	0.30**	0.22***	0.29**	−0.02	−0.00
HMXZ-5	3.67	5.89	3.41	5.47	3.46	5.56	0.27***	0.42***	0.21***	0.34**	−0.05	−0.09
SY-4	3.51	5.70	3.49	5.57	3.29	5.28	0.02	0.14	0.22**	0.42**	0.20**	0.29***

Table A7: Factor Spanning Regressions: Further Models

This table presents summary results about factor spanning regressions for further factor models. I use Equation (2) to regress the local or regional factors of each model on the corresponding regional or global factor models. The results for different specifications are allocated to separate panels. # is the number of regions or countries for which the factor models are available. Avg($|r|$) indicates the average annualized return across all factors of a model. Avg($|\alpha|$) denotes the average annualized alpha of the factors in that model when regressed on the factors of the regional or global model (as indicated in the panel headings). *GRS* presents the (average) GRS test statistic. The hypothesis of the GRS test is that all alphas of the spanning regression of a local or regional factor model are jointly equal to zero. A rejection at the 10% significance level for part of the countries is indicated by *italic* font and a rejection at 10% for a regional model or the local models of all countries is indicated by **bold** font. All alphas and R^2s are aggregated equally and presented in percentage points. DEV and EM indicate Developed Emerging Markets, respectively.

		C-5				DHS-3				BS-6				FF-5^{Cash}				FF-6				HKK-3			
	#	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2
Global vs. Regional																									
Asia Pacific	1	5.3	2.7	1.7	38	6.1	4.5	**3.3**	48	5.0	2.7	**2.0**	41	3.7	1.8	1.1	36	5.1	2.4	1.2	39	7.8	2.2	0.6	43
Europe	1	4.4	2.3	**3.2**	48	5.9	4.1	**3.1**	50	4.1	2.3	**3.0**	53	2.8	1.4	1.7	47	4.0	2.3	**3.5**	49	7.1	4.5	**7.5**	56
Japan	1	2.2	2.2	1.5	36	5.3	2.6	1.6	27	1.6	2.3	**1.9**	37	1.6	1.2	0.6	34	1.5	1.7	0.9	37	2.0	3.4	**2.3**	41
Middle East	1	5.0	4.1	1.1	16	7.3	5.4	1.3	19	6.2	8.0	**4.2**	20	6.3	6.8	**2.4**	16	5.2	6.8	**2.5**	19	7.3	6.5	2.0	21
North America	1	3.8	1.7	1.8	49	5.8	1.3	1.0	71	3.9	1.1	1.3	57	3.4	2.1	**4.2**	58	3.9	1.3	**2.7**	58	4.6	1.3	0.8	58
South America	1	4.6	2.1	1.3	22	7.2	5.7	**2.1**	24	6.0	4.4	**4.6**	23	5.7	4.5	**3.9**	23	5.7	4.6	**4.1**	23	6.9	2.6	1.7	30
Global vs. Local																									
Asia Pacific DEV	4	5.8	3.9	*3.6*	25	9.2	5.3	**4.6**	34	5.1	3.8	*3.6*	23	4.4	3.3	*3.2*	21	5.6	4.3	**4.6**	23	8.0	4.8	*4.7*	30
Asia Pacific EM	9	6.0	4.3	*2.2*	17	9.4	7.6	*5.6*	22	5.7	4.4	*2.9*	16	5.4	4.0	*1.7*	14	5.8	4.6	*2.1*	15	7.6	4.8	*2.4*	20
Europe DEV	16	5.4	4.2	*1.8*	28	8.1	6.7	*2.6*	30	5.2	4.3	*2.2*	27	4.1	3.5	*1.7*	24	5.3	4.4	*2.1*	26	7.4	5.6	*3.0*	35
Europe EM	3	5.4	4.1	*1.5*	22	8.6	8.8	*4.2*	27	6.7	6.4	*2.4*	21	6.4	4.7	*1.5*	20	6.4	4.7	*1.5*	22	8.4	6.2	*1.9*	29
Japan	1	2.2	2.2	1.5	36	5.3	2.6	1.6	27	1.6	2.3	**1.9**	37	1.6	1.2	0.6	34	1.5	1.7	0.9	37	2.0	3.4	**2.3**	41
Middle East	2	7.6	6.9	*2.8*	12	9.0	5.3	*1.9*	12	7.9	7.9	**4.0**	11	7.5	6.8	**2.6**	10	7.3	7.4	**3.2**	12	11	9.2	*3.4*	13
North America DEV	2	4.1	2.1	*2.0*	41	8.0	3.9	*2.9*	53	4.7	2.2	*2.1*	45	3.6	2.5	*3.0*	45	4.6	2.3	**2.5**	46	6.2	2.9	*2.6*	50
North America EM	1	6.1	4.5	1.4	19	11	8.0	**2.1**	22	7.5	6.7	**3.8**	21	4.5	2.0	0.4	18	5.6	4.7	1.2	19	11	7.2	2.0	26
South America	3	6.0	3.7	*1.3*	17	8.9	6.9	*2.5*	22	7.7	5.6	**2.9**	18	6.2	4.0	*1.6*	17	6.4	4.3	*1.6*	18	9.0	5.5	*2.3*	24
Regional vs. Local																									
Asia Pacific DEV	4	5.8	4.6	**4.6**	24	9.2	7.4	**6.5**	34	5.1	4.0	**4.3**	22	4.4	3.3	*3.3*	23	5.6	4.5	**4.9**	23	8.0	5.1	*5.4*	29
Asia Pacific EM	9	6.0	4.7	*2.4*	23	9.4	7.7	*6.1*	26	5.7	4.7	*3.2*	23	5.4	4.1	*1.7*	23	5.8	4.6	*2.3*	24	7.6	5.0	*2.7*	26
Europe DEV	16	5.4	3.6	*1.6*	36	8.1	5.5	*2.1*	35	5.2	3.7	*1.8*	36	4.1	3.5	*1.8*	32	5.3	3.7	*1.6*	35	7.4	4.0	*1.8*	46
Europe EM	3	5.4	4.0	1.0	25	8.6	6.9	*2.7*	27	6.7	4.4	*2.2*	23	6.4	5.1	*1.6*	21	6.4	4.7	1.3	23	8.4	5.2	1.4	31
Middle East	2	7.6	4.0	*1.9*	27	9.0	6.0	*1.6*	18	7.9	5.2	*2.5*	28	7.5	3.6	*1.4*	29	7.3	4.0	*1.9*	30	11	4.4	*2.2*	28
North America DEV	2	4.1	2.0	**3.7**	64	8.0	3.7	*3.8*	67	4.7	1.7	**2.6**	71	3.6	1.1	1.5	69	4.6	1.7	**3.1**	71	6.2	2.5	**5.8**	77
North America EM	1	6.1	4.6	1.7	19	11	8.9	**2.5**	20	7.5	6.1	**3.3**	19	4.5	2.2	0.5	17	5.6	4.3	1.2	17	11	7.7	**2.5**	25
South America	3	6.0	2.7	1.2	37	8.9	4.9	*2.0*	34	7.7	4.7	*2.8*	37	6.2	3.2	1.2	35	6.4	3.8	*1.5*	36	9.0	5.1	*2.7*	46

Table A8: Factor Spanning Regressions: World Factors with Regional Breakpoints

This table presents summary results about factor spanning regressions, using global factors with regional breakpoints. I use Equation (2) to regress the local or regional factors of each model on the corresponding regional or global factor models. The results for different specifications are allocated to separate panels. # is the number of regions or countries for which the factor models are available. Avg($|r|$) indicates the average annualized return across all factors of a model. Avg($|\alpha|$) denotes the average annualized alpha of the factors in that model when regressed on the factors of the regional or global model (as indicated in the panel headings). *GRS* presents the (average) GRS test statistic. The hypothesis of the GRS test is that all alphas of the spanning regression of a local or regional factor model are jointly equal to zero. A rejection at the 10% significance level for part of the countries is indicated by *italic* font and a rejection at 10% for a regional model or the local models of all countries is indicated by **bold** font. All alphas and R^2s are aggregated equally and presented in percentage points. DEV and EM indicate Developed Emerging Markets, respectively.

		CAPM				FF-3				C-4				FF-5				HXZ-4				HMXZ-5				SY-4			
	#	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2	Avg($\|r\|$)	Avg($\|\alpha\|$)	*GRS*	R^2
Global vs. Regional																													
Asia Pacific	1	5.8	0.4	0.0	64	5.2	2.2	1.4	47	6.3	2.3	1.2	44	4.2	1.7	1.0	37	3.8	2.2	1.5	37	3.7	2.8	**2.4**	33	7.8	3.7	**4.0**	39
Europe	1	5.8	1.0	0.5	82	3.7	0.9	1.0	64	5.2	1.9	**2.9**	66	2.9	1.0	1.1	54	3.0	1.5	1.2	50	2.9	1.4	1.2	46	6.4	2.1	**3.6**	65
Japan	1	0.4	4.8	**2.8**	49	2.4	2.7	1.9	37	1.9	3.0	**2.0**	39	1.7	2.4	**2.0**	31	0.7	2.3	**2.1**	34	0.8	1.8	1.5	30	1.4	2.6	**2.5**	35
Middle East	1	11	5.9	1.1	32	8.0	5.6	1.9	14	6.1	5.3	1.6	18	6.1	6.8	**3.2**	16	6.0	7.5	**2.8**	17	5.8	7.2	**2.5**	16	5.4	5.7	1.6	20
North America	1	8.0	4.0	**9.1**	79	4.0	3.2	**8.7**	68	4.3	2.6	**6.2**	72	3.6	2.9	**8.7**	73	4.1	0.9	1.7	60	3.9	1.1	**1.9**	67	5.2	3.2	**7.7**	71
South America	1	10	3.2	0.7	58	6.9	3.4	**2.7**	29	5.7	2.4	1.7	27	6.5	5.3	**4.8**	21	6.2	3.6	**3.0**	26	5.8	3.8	**2.5**	24	5.5	4.0	1.7	28
Global vs. Local																													
Asia Pacific DEV	4	9.5	3.3	*1.8*	58	5.8	3.1	*1.9*	30	7.0	4.3	**4.1**	30	4.7	3.2	*2.9*	22	3.7	2.8	*1.9*	22	3.5	3.0	*1.9*	19	7.5	4.6	*3.2*	26
Asia Pacific EM	9	8.4	3.3	0.4	33	6.9	4.2	*1.5*	18	6.7	4.3	*1.7*	18	5.8	4.5	*2.1*	15	5.5	4.3	*2.2*	15	5.3	4.4	*2.4*	14	7.7	5.2	*1.7*	17
Europe DEV	16	7.0	2.7	*1.0*	60	4.4	3.2	*1.4*	33	5.9	4.3	*2.0*	34	4.3	3.5	*1.5*	25	4.4	3.5	*1.5*	24	4.2	3.5	*1.5*	21	6.6	4.6	*1.7*	28
Europe EM	3	11	2.0	0.4	55	5.6	2.6	0.7	23	6.2	4.0	1.5	24	6.1	4.8	*1.6*	19	7.5	7.0	*2.5*	22	7.1	6.3	*2.3*	19	9.9	6.7	*2.1*	26
Japan	1	0.4	4.8	**2.8**	49	2.4	2.7	1.9	37	1.9	3.0	**2.0**	39	1.7	2.4	**2.0**	31	0.7	2.3	**2.1**	34	0.8	1.8	1.5	30	1.4	2.6	**2.5**	35
Middle East	2	18	12	*3.8*	23	9.7	7.9	*3.0*	12	9.3	8.8	*3.4*	13	7.1	6.8	**2.7**	10	8.0	6.4	*2.9*	9	6.7	5.9	*2.5*	8	9.3	11	*4.7*	11
North America DEV	2	7.5	3.2	*5.2*	72	3.8	2.4	*4.9*	55	5.1	2.8	**4.4**	58	3.7	3.1	*5.5*	55	4.3	1.7	1.7	45	4.3	1.8	*1.7*	48	6.8	3.6	**4.8**	54
North America EM	1	12	5.5	2.0	57	6.1	2.6	0.5	25	7.2	5.1	1.5	23	4.5	3.5	0.9	17	6.8	6.2	**3.5**	22	5.5	5.1	**2.8**	20	12	12	**5.0**	23
South America	3	12	5.4	1.2	46	7.1	3.4	1.0	19	6.9	4.0	*1.4*	20	6.5	5.1	*1.8*	17	7.9	5.8	*2.7*	19	7.8	5.9	*2.2*	16	8.8	9.1	*3.5*	22

Table A9: Anomaly Correlations Across Countries: Regions

This table presents the average correlations of different anomaly strategies across countries of different regions before and after removing global, regional, and local systematic return components. For each country, I first form 6 average strategies based on the anomaly categories (see Section OA2 for details on the anomalies contained in the different categories). For each category, I aggregate the long–short returns to one strategy using an equally weighted average in every country. The definition of anomaly long and short sides is based on which of the two returns is higher for the U.S. I present the average of all bivariate correlations of the anomaly return time-series of the excess returns (CORR^{RET}) in the different countries as well as the average of all bivariate correlations of these time-series after removing the expected return components implied by the global ($\text{CORR}^{-\text{GLOB}}$), regional ($\text{CORR}^{-\text{REG}}$), and local ($\text{CORR}^{-\text{LOC}}$) factor models. For removing the expected return components, for each anomaly long–short return, I estimate Equation (1) and subtract the part $\hat{\beta}_j' f_t^{glob/reg}$ from the portfolio excess return. The correlations are aggregated equally across the main factor models.

	Momentum	*Value*	*Investment*	*Profitability*	*Accruals*	*Trading*
Asia Pacific – Developed (4 Countries)						
CORR^{RET}	0.231	0.121	0.091	0.050	0.059	0.280
$\text{CORR}^{-\text{GLOB}}$	0.171	0.076	0.052	0.044	0.063	0.088
$\text{CORR}^{-\text{REG}}$	0.200	0.102	0.052	0.048	0.057	0.103
$\text{CORR}^{-\text{LOC}}$	0.167	0.066	0.028	0.011	0.057	0.098
Asia Pacific – Emerging (9 Countries)						
CORR^{RET}	0.145	0.057	0.039	0.001	0.035	0.139
$\text{CORR}^{-\text{GLOB}}$	0.126	0.037	0.016	0.003	0.025	0.069
$\text{CORR}^{-\text{REG}}$	0.123	0.029	0.002	0.008	0.019	0.049
$\text{CORR}^{-\text{LOC}}$	0.119	0.007	0.008	0.008	0.015	0.030
Europe – Developed (15 Countries)						
CORR^{RET}	0.344	0.267	0.076	0.053	0.044	0.439
$\text{CORR}^{-\text{GLOB}}$	0.272	0.177	0.050	0.031	0.011	0.281
$\text{CORR}^{-\text{REG}}$	0.249	0.129	0.035	0.030	0.011	0.240
$\text{CORR}^{-\text{LOC}}$	0.253	0.145	0.037	0.038	0.014	0.259
Europe – Emerging (3 Countries)						
CORR^{RET}	0.208	0.116	0.107	0.002	0.130	0.151
$\text{CORR}^{-\text{GLOB}}$	0.158	0.016	0.075	0.012	0.046	0.122
$\text{CORR}^{-\text{REG}}$	0.148	0.019	0.052	0.013	0.035	0.110
$\text{CORR}^{-\text{LOC}}$	0.162	−0.001	0.041	0.017	0.031	0.088
Middle East (3 Countries)						
CORR^{RET}	0.134	−0.080	0.106	0.052	0.138	0.037
$\text{CORR}^{-\text{GLOB}}$	0.065	−0.045	0.089	0.029	0.112	−0.009
$\text{CORR}^{-\text{REG}}$	0.051	−0.049	0.080	0.017	0.121	−0.069
$\text{CORR}^{-\text{LOC}}$	0.023	−0.041	0.069	0.046	0.085	−0.022
North America – Developed (2 Countries)						
CORR^{RET}	0.541	0.348	0.350	0.223	0.315	0.514
$\text{CORR}^{-\text{GLOB}}$	0.543	0.301	0.258	0.168	0.290	0.296
$\text{CORR}^{-\text{REG}}$	0.439	0.225	0.174	0.108	0.286	0.136
$\text{CORR}^{-\text{LOC}}$	0.425	0.253	0.212	0.081	0.273	0.294
South America (3 Countries)						
CORR^{RET}	0.187	−0.006	0.077	−0.015	0.044	0.189
$\text{CORR}^{-\text{GLOB}}$	0.181	0.027	0.041	0.004	0.021	0.121
$\text{CORR}^{-\text{REG}}$	0.154	0.021	−0.009	−0.016	−0.027	0.006
$\text{CORR}^{-\text{LOC}}$	0.163	0.027	0.010	−0.023	0.002	0.046

Table A10: Summary Statistics: Country Characteristics

This table presents summary statistics and correlations of the main country characteristics. Mean is the panel average of a characteristic. Std., Skewness, and Kurtosis are the standard deviation, skewness, and kurtosis, respectively, of the country characteristics (see Section OA4 of the Online Appendix for the definition of the country characteristics). Min, Median, and Max denote the lowest, median and highest value of the respective country characteristics.

	Summary Statistics							Correlations	
	Mean	Std.	Skewness	Kurtosis	Min	Median	Max	ICRG	MC to GDP
Market Openness	0.73	0.30	−0.74	2.05	0.15	0.89	1.00	0.53	0.17
ICRG	0.74	0.09	−0.84	3.45	0.49	0.76	0.90		0.24
MC to GDP	79.1	91.2	4.55	26.8	18.1	58.6	615		