

Online Appendix

International Portfolio Choice with Frictions: Evidence from Mutual Funds

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This Online Appendix has four sections. Section A presents the return differential regressions when applied to our EPFR portfolio sample. Section B presents results with alternative specifications of portfolio regressions and further robustness analysis. Section C provides detailed information on the heterogeneity of the country shares. Section D provides information on the representativeness of our EPFR data sample.

A Predicting Cross-Country Equity Return Differentials

The return differential regressions in Section 3 of the paper are done for 73 countries at different horizons. In the portfolio regressions using EPFR data, the number of non-US countries is reduced to 35. Moreover, the expected return differentials are discounted by the factor δ , so that we need to predict

$$er_{n,t,t+k}^{\delta} = (1 - \delta) \sum_{s=1}^k \delta^{s-1} er_{n,t+s}$$

Table A1 shows the results of the pooled regressions for the discounted return differential when using the 35 countries of the EPFR sample and setting $\delta = 0.9$. This table illustrates the predictability for the whole sample, but we use true forecasts to construct discounted expected return differentials.

Table A1: REGRESSIONS RETURN DIFFERENTIAL - DIFFERENT HORIZONS - DISCOUNTED - EPFR SAMPLE

	(1)	(2)	(3)	(4)
	$er_{n,t+1}$	$er_{n,t,t+12}^{0.9}$	$er_{n,t,t+24}^{0.9}$	$er_{n,t,t+36}^{0.9}$
Momentum	0.0378* (0.0194)	0.01717*** (0.00443)	0.01778*** (0.00447)	0.01916*** (0.00456)
Dividend-Price	0.0045 (0.0028)	0.00511*** (0.00070)	0.00691*** (0.00077)	0.00760*** (0.00080)
Earning-Price	0.0044** (0.0022)	0.00222*** (0.00054)	0.00312*** (0.00057)	0.00321*** (0.00058)
Observations	14672	14287	13867	12612
R^2	0.004	0.039	0.060	0.080

Standard errors clustered by month in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: Regressions with 35 countries over the interval 1970:01-2019:02. All regressions include a country fixed effects.

B Portfolio Regressions

Table B1 tests the benchmark portfolio equation over different specifications. In column (1), we do not include the valuation effect. It corresponds to the case $\lambda_2 = 0$. In columns (2) and (3), we change the horizon from $k = 24$ to $k = 12$ and $k = 36$, respectively. In columns (4) and (5), we change the value of β from 0.97 to 0.96 and 0.98, respectively. Changing β gives a value of δ of 0.917 and 0.936, respectively. In column (6), we use the past shares $z_{i,m,-n,t-1}$ instead of average shares $\bar{z}_{i,m,-n}$ to compute the return on the reference portfolio and therefore the excess return. We do the same to compute the instruments at the fund level, where we subtract the weighted average for the reference countries. Finally, in column (7), we use differentials in momentum, dividend-price and earning-price ratio nonrecursively, i.e., using the whole sample to estimate return differentials so that these are not true forecasts. The first stage Sanderson-Windmeijer F statistics are reported at the bottom of the table.

Table B1: PORTFOLIO REGRESSIONS, ALTERNATIVE SPECIFICATIONS

	(1) No $val_{i,n,t}$	(2) k = 12	(3) k = 36	(4) $\beta = 0.96$	(5) $\beta = 0.98$	(6) Weight $z_{i,m,-n,t-1}$	(7) Non- Recursive
$z_{i,n,t-1}$	0.918*** (0.014)	0.948*** (0.012)	0.960*** (0.012)	0.955*** (0.012)	0.955*** (0.012)	0.972*** (0.009)	0.971*** (0.010)
$ER_{i,n,t}$	15.374*** (3.155)	7.350*** (1.925)	12.701*** (4.563)	9.271*** (2.898)	10.257*** (3.283)	6.923*** (2.432)	8.047** (3.344)
$val_{i,n,t}$		0.199*** (0.074)	0.208*** (0.071)	0.228*** (0.072)	0.230*** (0.072)	0.270*** (0.069)	0.269*** (0.069)
Observations	150,179	150,179	141,322	150,179	150,179	150,179	150,179
R^2	0.87	0.87	0.87	0.87	0.87	0.87	0.87
SW F-test $z_{i,n,t-1}$	205.7	132.75	101.67	118.97	114.31	249.92	181.05
SW F-test $val_{i,n,t}$		58.56	50.46	54.84	53.89	58.48	56.84
SW F-test $ER_{i,n,t}$	135.79	134.85	95.47	116.7	111.55	232.64	123.86

Clustered standard errors by months in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: Regressions for 36 countries over the interval 2002:01-2016:07. The regressions include a fund-country fixed effect. The set of instruments in each regression corresponds to $val_{i,n,t-1}$, the log-level of earnings, the first difference in the log-level of dividends, the 3-months interest rates and the log-level of industrial production. SW F-test stands for the Sanderson-Windmeijer F-test of excluded instruments from the first stage regressions.

Table B2 tests the benchmark portfolio equation over different data samples.

Columns (1) and (2) are the benchmark equations when we start the sample in January 2010 and in January 2012. Column (3) restricts the sample to funds investing at least for 24 consecutive months. In column (4), we consider (i,n) pairs for which $\bar{k}_{i,n}$ is at least 1 percent. The first stage Sanderson-Windmeijer F-statistics are reported at the bottom of the table.

Table B2: PORTFOLIO REGRESSIONS, ALTERNATIVE SAMPLES

	(1)	(2)	(3)	(4)
	From Jan, 2010	From Jan, 2012	Report more than 24 months	$\bar{k}_{in} \geq 1\%$
$z_{i,n,t-1}$	0.965*** (0.018)	0.951*** (0.020)	0.959*** (0.012)	0.952*** (0.010)
$val_{i,n,t}$	0.229** (0.101)	0.274** (0.112)	0.239*** (0.072)	0.181** (0.079)
$ER_{i,n,t}$	10.769** (4.492)	11.390*** (3.953)	8.831*** (3.102)	7.254*** (2.035)
Observations	108,855	90,709	132,749	199,222
R^2	0.83	0.81	0.88	0.87
SW F-test $z_{i,n,t-1}$	81.63	114.38	109.21	127.70
SW F-test $val_{i,n,t}$	41.9	28.83	53.9	56.94
SW F-test $ER_{i,n,t}$	121.99	111.38	106.91	114.65

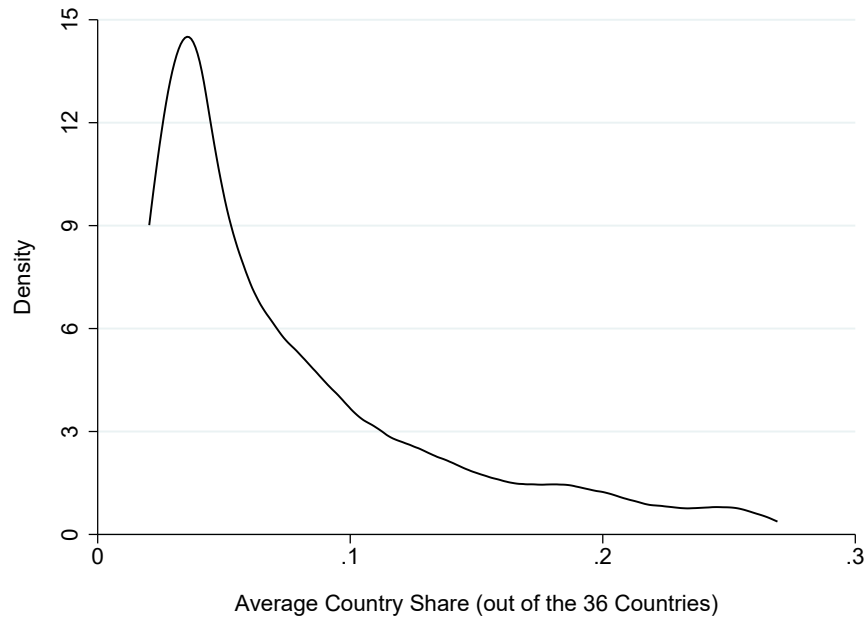
Clustered standard errors by months in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: Regressions for 36 countries over the interval 2002:01-2016:07. The regressions include a fund-country fixed effect. The set of instruments in each regression corresponds to $val_{i,n,t-1}$, the log-level of earnings, the first difference in the log-level of dividends, the 3-months interest rates and the log-level of industrial production. SW F-test stands for the Sanderson-Windmeijer F-test of excluded instruments from the first stage regressions

C Heterogeneous Country Shares

Figure C.1 shows the distribution of the mean portfolio shares $\bar{z}_{i,n}$ across (i,n). We truncate the sample to the bottom 95 percent of the observations because of large outliers in the top 5 percent. The average portfolio share $\bar{z}_{i,n}$ in the top 5 percent of the distribution ranges from 27 percent to 89 percent. The 10th, 50th and 90th percentiles of $\bar{z}_{i,n}$ are 2.7%, 6% and 20.4%, respectively.

Figure C.1: DISTRIBUTION OF $\bar{z}_{i,n}$



Notes: This Figure shows the distribution of $\bar{z}_{i,n}$ across (i,n) . We truncate the sample to the bottom 95 percent of the observations.

D Representativeness

How representative is our data? To answer this question, we report some evidence of how representative this sample is in terms of the allocation across foreign countries. Let $W_{n,t}^{EPFR}$ be the total equity holdings in country n by our EPFR mutual funds. Further, let $W_t^{EPFR} = \sum_{n \in 35} W_{n,t}^{EPFR}$ be the total foreign equity holdings of our US EPFR funds. We denote that aggregate share invested in country n by $z_{n,t}^{EPFR} = \frac{W_{n,t}^{EPFR}}{W_t^{EPFR}}$. Similarly, we denote the aggregate share of all US equity investors by $z_{n,t}^{all}$. The aggregate equity holdings correspond to the monthly US foreign equity holdings reported by Bertaut and Tryon (2007), later extended by Bertaut and Judson (2014), who have since further updated it through December 2018 (see section 4.1 in the paper).

Table D1 reports the share (expressed in percent) invested in each of the 35 foreign countries in July 2016 by all US equity investors and by the aggregate of the EPFR funds in our sample. The correlation between the two series is 88%.

Figure D.1 reports time series of portfolio shares (expressed in percent) allocated to 3 regions (Europe, Asia and Latin America) from January 2002 to July 2016.

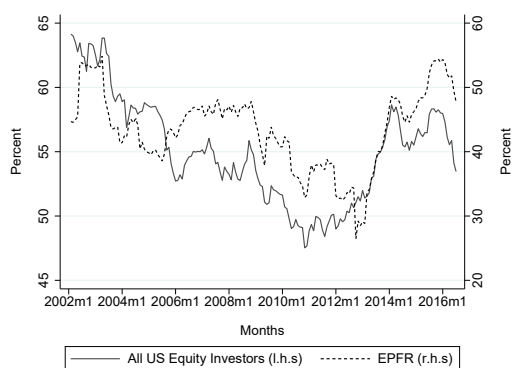
Table D1: ALL US EQUITY INVESTORS VS EPFR US FUNDS: COUNTRY SHARE IN JULY 2016 (OUT OF 35 COUNTRIES)

	All US equity investors (%)	EPFR (%)
Australia	3.1	4.2
Belgium	1.1	0.4
Brazil	2.0	2.8
Canada	7.7	2.2
Chile	0.1	0.1
China	1.9	8.0
Colombia	0.1	0.01
Denmark	0.7	0.5
Finland	0.6	0.4
France	6.4	8.8
Germany	5.4	8.2
Hong-Kong	2.4	2.2
India	2.6	3.4
Indonesia	0.6	0.9
Ireland	3.7	0.1
Israel	1.1	0.1
Italy	1.2	1.1
Japan	13.3	14.6
Korea, Rep. of	3.0	3.5
Malaysia	0.2	0.8
Mexico	1.1	1.4
Netherlands	5.1	2.9
Norway	0.2	0.1
Peru	0.04	0.02
Philippines	0.4	0.2
Poland	0.2	0.03
Singapore	1.9	0.3
South Africa	1.4	2.2
Spain	1.7	2.4
Sweden	1.6	1.7
Switzerland	8.1	7.0
Taiwan	2.5	4.3
Thailand	0.7	0.9
Turkey	0.4	0.2
United Kingdom	17.4	14.3

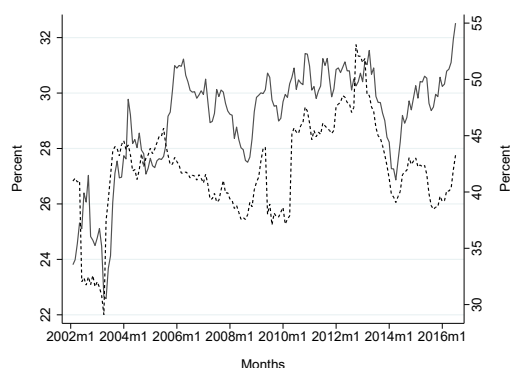
The Table reports the aggregate shares in July 2016. The data of the first column come from Bertaut and Tryon (2007) and Bertaut and Judson (2014).

Figure D.1: ALL US EQUITY INVESTORS VS EPFR US FUNDS: REGIONAL SHARES

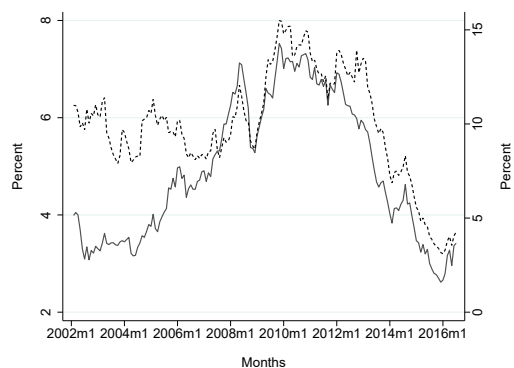
A. EUROPE



B. ASIA



C. LATIN AMERICA



Notes: Europe: Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Poland, Spain, Sweden, Switzerland, United Kingdom. Asia: Australia, China, Hong-Kong, India, Indonesia, Japan, Korea Rep. of, Malaysia, Philippines, Singapore, Taiwan, Thailand. Latin America: Brazil, Chile, Colombia, Mexico, Peru.