Internet Appendix for
"International Stock Return Predictability: What is the Role of the United States?"

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This Internet Appendix describes the wild bootstrap procedures used to compute empirical p-values and confidence intervals for testing return predictability. It also outlines the adaptive elastic net estimation procedure, examines the role of stale pricing in illiquid markets, and reports complete tabulated results for the robustness checks discussed in the paper.

Bootstrap Procedures for Computing Empirical p-Values

This section describes the wild bootstrap procedure underlying the empirical p-values reported in Tables II and III of the paper and Tables AIII–AV, AVIII, and AX–AXIII of this Internet Appendix. The resampling scheme for the wild bootstrap is based on Cavaliere, Rahbek, and Taylor (2010), which is a multiequation extension of the time-series wild bootstrap.

We begin by describing the procedure that generates the wild bootstrapped p-values for the test statistics for the benchmark predictive regressions reported in Tables II and AIII–AV. The benchmark predictive regression model is given by

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1}, \tag{1}$$

where $r_{i,t+1}$ is the excess stock return for country i ($i = 1, \ldots, N$), $bill_{i,t}$ ($dy_{i,t}$) is the nominal interest rate (log dividend yield) at the end of month t, and $\varepsilon_{i,t+1}$ is a zero-mean disturbance term. We test H_0: $\beta_{i,b} = 0$ against H_A: $\beta_{i,b} < 0$ (H_0: $\beta_{i,d} = 0$ against H_A: $\beta_{i,d} > 0$) using t-statistics and H_0: $\beta_{i,b} = \beta_{i,d} = 0$ using χ^2-statistics. The wild bootstrap procedure simulates data under the null of no return predictability.

Let

$$\hat{\varepsilon}_{i,t+1} = r_{i,t+1} - (\hat{\beta}_{i,0} + \hat{\beta}_{i,b} bill_{i,t} + \hat{\beta}_{i,d} dy_{i,t}), \tag{2}$$

where $\hat{\beta}_i = (\hat{\beta}_{i,0}, \hat{\beta}_{i,b}, \hat{\beta}_{i,d})'$ is the vector of ordinary least squares (OLS) parameter estimates for

(1). Following convention, we assume that the predictors in (1) follow a VAR(1) process:

$$bill_{i,t+1} = \rho_{i,b,0} + \rho_{i,b,b} bill_{i,t} + \rho_{i,b,d} dy_{i,t} + v_{i,b,t+1}, \tag{3}$$

$$dy_{i,t+1} = \rho_{i,d,0} + \rho_{i,d,b} bill_{i,t} + \rho_{i,d,d} dy_{i,t} + v_{i,d,t+1}. \tag{4}$$

Define

$$\hat{v}^c_{i,b,t+1} = bill_{i,t+1} - (\hat{\rho}^c_{i,b,0} + \hat{\rho}^c_{i,b,b} bill_{i,t} + \hat{\rho}^c_{i,b,d} dy_{i,t}), \tag{5}$$

$$\hat{v}^c_{i,d,t+1} = dy_{i,t+1} - (\hat{\rho}^c_{i,d,0} + \hat{\rho}^c_{i,d,b} bill_{i,t} + \hat{\rho}^c_{i,d,d} dy_{i,t}), \tag{6}$$

where

$$(\hat{\rho}^c_{i,b,0}, \hat{\rho}^c_{i,b,b}, \hat{\rho}^c_{i,b,d})' \tag{7}$$

and

$$(\hat{\rho}^c_{i,d,0}, \hat{\rho}^c_{i,d,b}, \hat{\rho}^c_{i,d,d})' \tag{8}$$

denote vectors of reduced-bias estimates of the VAR(1) parameters in (3) and (4), respectively. The reduced-bias estimates of the VAR parameters are computed by iterating on the Nicholls and Pope (1988) expression for the analytical bias of the OLS estimates; see Amihud, Hurvich, and Wang (2009, pp. 417–418). Armed with these VAR parameter estimates and fitted residuals, we build up a pseudo sample under the null hypothesis of no return predictability for each i:

$$r^*_{i,t+1} = \bar{r}_i + \hat{\varepsilon}_{i,t+1} w_{t+1}, \tag{9}$$

$$bill^*_{i,t+1} = \hat{\rho}^c_{i,b,0} + \hat{\rho}^c_{i,b,b} bill^*_{i,t} + \hat{\rho}^c_{i,b,d} dy^*_{i,t} + \hat{v}^c_{i,b,t+1} w_{t+1}, \tag{10}$$

$$dy^*_{i,t+1} = \hat{\rho}^c_{i,d,0} + \hat{\rho}^c_{i,d,b} bill^*_{i,t} + \hat{\rho}^c_{i,d,d} dy^*_{i,t} + \hat{v}^c_{i,d,t+1} w_{t+1}, \tag{11}$$

where $\bar{r}_i$ is the sample mean of $r_{i,t+1}$, w_{t+1} is a draw from the standard normal distribution, $bill^*_{i,0} = bill_{i,0}$, and $dy^*_{i,0} = dy_{i,0}$. Observe that we multiply each month-$(t+1)$ fitted residual by the same scalar, w_{t+1}, when generating the pseudo residuals. In addition to preserving the contemporaneous correlations in the data, this allows the wild bootstrap to capture the pattern of conditional heteroskedasticity characterizing the entire vector of shocks,

$$(\varepsilon_{1,t+1},\ldots,\varepsilon_{N,t+1},v_{1,b,t+1},\ldots,v_{N,b,t+1},v_{1,d,t+1},\ldots,v_{N,d,t+1})'. \tag{12}$$

Employing reduced-bias parameter estimates in (10) and (11) helps to ensure that the we adequately capture the persistence in $bill_{i,t}$ and $dy_{i,t}$. Using the pseudo sample,

$$\{(r^*_{i,t+1},bill^*_{i,t},dy^*_{i,t})'\}_{t=0}^{T-1}, \tag{13}$$

we estimate the slope coefficients and corresponding t-statistics in (1) for each i, along with each χ^2-statistic for testing $\beta_{i,b}=\beta_{i,d}=0$. We store the $2N$ t-statistics and N χ^2-statistics.

Repeating this process 2,000 times yields empirical distributions for the $2N$ t-statistics and N χ^2-statistics. For the t-statistic corresponding to each $\beta_{i,b}$ ($\beta_{i,d}$) estimate, the empirical p-value is the proportion of the sorted bootstrapped t-statistics less (greater) than the t-statistic for the original sample. For each χ^2-statistic, the empirical p-value is the proportion of the sorted bootstrapped χ^2-statistics greater than the χ^2-statistic for the original sample.

The pairwise Granger causality tests in Tables III, AVIII, and AX–AXIII are based on the augmented prediction regression model,

$$r_{i,t+1}=\beta_{i,0}+\beta_{i,i}r_{i,t}+\beta_{i,j}r_{j,t}+\beta_{i,b}bill_{i,t}+\beta_{i,d}dy_{i,t}+\varepsilon_{i,t+1},\ i\neq j, \tag{14}$$

where we test H_0: $\beta_{i,j}=0$ against H_A: $\beta_{i,j}>0$ using the t-statistic. For the pairwise Granger causality tests, we simulate data under the null by allowing for return predictability emanating from a country's own lagged return, as well as its own nominal interest rate and log dividend yield, but not another country's lagged return.

We modify the previous wild bootstrap procedure to generate data for $r_{i,t}$, $r_{j,t}$, $bill_{i,t}$, $bill_{j,t}$ $dy_{i,t}$ and $dy_{j,t}$ under the null. We continue to assume that $bill_{i,t}$ and $dy_{i,t}$ (as well as $bill_{j,t}$ and $dy_{j,t}$)

follow a VAR(1) process and use (3)–(6) and (10)–(11). In accord with the null, (9) becomes

$$r^*_{i,t+1} = \hat{\beta}_{i,0} + \hat{\beta}_{i,i} r^*_{i,t} + \hat{\beta}_{i,b} bill^*_{i,t} + \hat{\beta}_{i,d} dy^*_{i,t} + \hat{\varepsilon}_{i,t+1} w_{t+1}, \tag{15}$$

where $\hat{\beta}_{i,0}$, $\hat{\beta}_{i,i}$, $\hat{\beta}_{i,b}$, and $\hat{\beta}_{i,d}$ are OLS parameter estimates. A similar process is assumed for $r^*_{j,t+1}$. We use this process to simulate data for countries i and j and compute the t-statistic corresponding to $\beta_{i,j}$ in (14) for the pseudo sample. Repeating this process 2,000 times, the empirical p-value is the proportion of the sorted bootstrapped t-statistics greater than the t-statistic for the original sample.

Bootstrap Procedures for Computing Confidence Intervals

For the general model specifications considered in Section II.B of the paper, we are interested in the predictive ability of multiple lagged country returns in a single regression model. Rather than directly imposing multiple zero restrictions on the return-generating process to compute empirical p-values for test statistics, we calculate 90% confidence intervals for the slope coefficients using a fixed-design wild bootstrap in Tables IV, V, and AXVI. Gonçalves and Kilian (2004) and Clark and McCracken (2012) employ the fixed-design wild bootstrap in time-series contexts.

The pooled version of the general model specification is given by:

$$r_{i,t+1} = \beta_{i,0} + \bar{\beta}_i r_{i,t} + \sum_{j \neq i} \bar{\beta}_j r_{j,t} + \bar{\beta}_b bill_{i,t} + \bar{\beta}_d dy_{i,t} + \varepsilon_{i,t+1},\ i = 1, \ldots, N. \tag{16}$$

Let

$$\hat{\varepsilon}_{i,t+1} = r_{i,t+1} - (\hat{\beta}_{i,0} + \hat{\bar{\beta}}_i r_{i,t} + \sum_{j \neq i} \hat{\bar{\beta}}_j r_{j,t} + \hat{\bar{\beta}}_b bill_{i,t} + \hat{\bar{\beta}}_d dy_{i,t}),\ i = 1, \ldots, N, \tag{17}$$

where $\hat{\beta}_{i,0}$ $(i = 1, \ldots, N)$, $\hat{\bar{\beta}}_i$ $(i = 1, \ldots, N)$, $\hat{\bar{\beta}}_j$ $(j = 1, \ldots, N)$, $\hat{\bar{\beta}}_b$, and $\hat{\bar{\beta}}_d$ are the pooled OLS estimates of the parameters in (16). We simulate data for $r_{i,t+1}$ via the following process:

$$r_{i,t+1}^{*} = \hat{\beta}_{i,0} + \hat{\bar{\beta}}_i r_{i,t} + \sum_{j \neq i} \hat{\bar{\beta}}_j r_{j,t} + \hat{\bar{\beta}}_b bill_{i,t} + \hat{\bar{\beta}}_d dy_{i,t} + \hat{\varepsilon}_{i,t+1} w_{t+1},\ i = 1, \ldots, N, \tag{18}$$

where w_{t+1} is a draw from the standard normal distribution. This procedure employs the regressor observations from the original sample, making it a "fixed-design" wild bootstrap. We use (18) and the original regressor observations to generate 2,000 pseudo samples. For each simulated sample, we calculate the pooled OLS estimates and store the $\hat{\bar{\beta}}_j$ $(j = 1, \ldots, N)$ estimates.

Based on the empirical distributions, we compute a bias-corrected bootstrapped confidence interval (e.g., MacKinnon (2002)) for each $\bar{\beta}_j$, which we report in Table IV. Let $\{\hat{\bar{\beta}}_{j,b}^{*}\}_{b=1}^{B}$ denote the bootstrapped draws of $\hat{\bar{\beta}}_j$, where $B = 2,000$. Define the bootstrap standard error as:

$$s_{\bar{\beta}_j}^{*} = \left[\frac{1}{B-1} \sum_{b=1}^{B} (\hat{\bar{\beta}}_{j,b}^{*} - \bar{\bar{\beta}}_j^{*})^2 \right]^{0.5}, \tag{19}$$

where $\bar{\bar{\beta}}_j^{*} = (1/B) \sum_{b=1}^{B} \hat{\bar{\beta}}_{j,b}^{*}$. The bias-corrected wild bootstrapped 90% confidence interval for $\bar{\beta}_j$ is then given by:

$$[2\hat{\bar{\beta}}_j - \bar{\bar{\beta}}_j^{*} - s_{\bar{\beta}_j}^{*} 1.645,\ 2\hat{\bar{\beta}}_j - \bar{\bar{\beta}}_j^{*} + s_{\bar{\beta}_j}^{*} 1.645]. \tag{20}$$

We straightforwardly modify the previous procedure to compute the bias-corrected wild bootstrapped confidence intervals reported in Tables V and AXVI.

Adaptive Elastic Net Estimation Procedure

Express a multiple predictive regression model for country i as:

$$r_{i,t+1} = x_t' \beta_i + \varepsilon_{i,t+1}, \tag{21}$$

where x_t is a $K \times 1$ vector of predictors and $\beta_i = (\beta_{i,1}, \ldots, \beta_{i,K})'$ is a $K \times 1$ vector of parameters. Adaptive elastic net estimation is based on a penalized sum of squared errors objective function:

$$\min_{\beta_i} \left[\sum_{t=0}^{T-1} (r_{i,t+1} - x_t' \beta_i)^2 + \lambda_1 \sum_{k=1}^{K} \omega_k |\beta_{i,k}| + \lambda_2 \sum_{k=1}^{K} \beta_{i,k}^2 \right], \tag{22}$$

where λ_1 and λ_2 are regularization parameters corresponding to ℓ_1 and ℓ_2 penalty terms, respectively, and $\omega = (\omega_1, \ldots, \omega_K)'$ is a $K \times 1$ vector of weighting factors for the $\beta_{i,k}$ parameters in the ℓ_1 penalty. For the elastic net, $\omega_k = 1$ for all k, while the adaptive elastic net allows for more general weighting factors. Following Zou (2006), the weighting factor is given by $\omega_k = |\hat{\beta}_{i,k}|^{-\gamma}$ for $\gamma > 0$, where $\hat{\beta}_{i,k}$ is the OLS estimate of $\beta_{i,k}$ in (21). This moderates shrinkage in the ℓ_1 penalty.

For given values of λ_1, λ_2, and γ, we solve (22) using the Friedman, Hastie, and Tibshirani (2010) algorithm. Following convention in penalized regression, the regressand and regressors are standardized before solving (22); the final estimates are rescaled to correspond to the original scale of the variables. We select λ_1, λ_2, and γ using five-fold cross-validation.

Stale Pricing in Illiquid Markets

We also check the relevance of microstructure biases for explaining the predictive ability of lagged U.S. returns in Section II of the paper. Our monthly return data begin in 1980 and are based on value-weighted indices that cover a large number of stocks traded on major national exchanges, mitigating the effects of stale pricing in illiquid markets. Furthermore, given the growth in financial asset trade flows associated with the "new" era of globalization in the latter part of the twentieth century, as well as continuing improvements in information technology, equity markets have grown more liquid. If stale prices are primarily responsible for the predictive power of lagged U.S. returns, we should see less predictability with more recent data. However, as reported in Table AXIV, we fail to find significant evidence of structural instability in $\beta_{i,\text{USA}}$ in (3) of the paper when we allow for a linear trend in $\beta_{i,\text{USA}}$ or when we use the Elliott and Müller (2006) $\widehat{qLL}$ statistic to test H_0: $\beta_{i,\text{USA},t} = \beta_{i,\text{USA}}$ for all t. (The Elliott and Müller (2006) test is an asymptotically efficient test for a broad class of persistent breaking processes, and it has good size and power properties in the presence of heteroskedasticity.) In addition, for the countries for which stock index futures price data beginning in 1990 or earlier are available from *Datastream*, Table AXV demonstrates that estimates of $\beta_{i,\mathrm{USA}}$ in (3) of the paper with $r_{i,t}$ and $r_{\mathrm{USA},t}$ computed from stock index futures prices are quite similar to estimates computed from spot prices. Overall, stale prices appear to play a minimal role in accounting for the predictive ability of lagged U.S. returns.

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Table AI

Information on *Global Financial Data* total stock return indices and national equity market opening/closing times

The second column gives the names of the total stock return indices in *Global Financial Data*, and the third column indicates the coverage of the total stock return indices. All of the total return indices are value weighted according to market capitalization. The last column reports opening and closing times (Eastern Standard Time) for national equity markets from marketclock.com.

(1) Country	(2) *Global Financial Data* series name	(3) Coverage	(4) Opening/closing times
Australia	ASX Accumulation Index—All Ordinaries	500 largest companies listed on Australian Securities Exchange	7:00p/1:00a
Canada	Canada S&P/TSX-300 Total Return Index	300 largest companies listed on Toronto Stock Exchange	9:30a/4:00p
France	CAC All-Tradable Total Return Index	250 largest companies listed on Paris Stock Exchange	3:00a/11:30a
Germany	CDAX Total Return Index	All companies listed on Frankfurt Stock Exchange	3:00a/2:00p
Italy	BCI Global Return Index	All companies listed on Borsa Italiana	3:00a/11:30a
Japan	Nikko Securities Composite Total Return	All companies listed on Tokyo and Osaka Stock Exchanges	7:00p/1:00a
Netherlands	All-Share Return Index	All companies listed on Amsterdam Stock Exchange	3:00a/11:30a
Sweden	OMX Stockholm Benchmark Gross Index	80–100 largest/most-traded stocks on Stockholm Stock Exchange	3:00a/11:30a
Switzerland	Swiss Performance Index	400 largest companies listed on Swiss Exchange	3:00a/11:20a
United Kingdom	FTSE All-Share Return Index	All companies listed on London Stock Exchange	3:00a/11:30a
United States	S&P 500 Total Return Index	500 largest companies on NYSE/AMEX/NASDAQ	9:30a/4:00p

Table AII

Summary statistics, monthly country excess stock returns based on *Morgan Stanley Capital International* country indices, 1980:02–2010:12

The table reports summary statistics for monthly national currency excess returns (in percent) for eleven industrialized countries. The excess return is the return on a broad market index in excess of the three-month Treasury bill rate. Sharpe ratio is the mean of the excess return divided by its standard deviation. Return data are from *Morgan Stanley Capital International*.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Country	Mean	Standard deviation	Minimum	Maximum	Autocorrelation	Sharpe ratio
Australia	0.35	5.16	−42.20	14.60	0.03	0.07
Canada	0.33	4.89	−22.40	15.10	0.09	0.07
France	0.49	5.79	−22.50	21.60	0.11	0.09
Germany	0.57	6.10	−25.20	20.80	0.07	0.09
Italy	0.44	6.99	−19.60	26.20	0.08	0.06
Japan	0.25	5.53	−21.10	19.60	0.10	0.05
Netherlands	0.70	5.44	−22.70	17.20	0.07	0.13
Sweden	1.07	7.08	−22.60	33.90	0.13	0.15
Switzerland	0.62	4.76	−23.50	13.40	0.16	0.13
United Kingdom	0.45	4.72	−26.70	13.70	−0.01	0.10
United States	0.55	4.50	−21.80	12.80	0.06	0.12

Table AIII
Benchmark predictive regression model estimation results, 1980:02–2010:12

The table reports OLS estimates of $\beta_{i,b}$ and $\beta_{i,d}$ (denoted by $\hat{\beta}_{i,b}$ and $\hat{\beta}_{i,d}$, respectively) and the R^2 statistic for the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1},$$

where $r_{i,t+1}$ is the monthly national currency excess return and $bill_{i,t}$ ($dy_{i,t}$) is the three-month Treasury bill rate (log dividend yield) for country i. Heteroskedasticity-robust t-statistics are reported in parentheses in the second, third, sixth, and seventh columns; t-statistics for $\hat{\beta}_{i,b}$ ($\hat{\beta}_{i,d}$) are for testing H_0: $\beta_{i,b} = 0$ against H_A: $\beta_{i,b} < 0$ (H_0: $\beta_{i,d} = 0$ against H_A: $\beta_{i,d} > 0$). Parentheses below the R^2 statistics in the fourth and eighth columns report heteroskedasticity-robust χ^2 statistics for testing H_0: $\beta_{i,b} = \beta_{i,d} = 0$. Brackets report wild bootstrapped p-values. "Pooled" estimates impose the restrictions that $\beta_{i,b} = \bar{\beta}_b$ and $\beta_{i,d} = \bar{\beta}_d$ for all i. Bold indicates significance at the 10% level. Data are from *Global Financial Data*.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i	$\hat{\beta}_{i,b}$	$\hat{\beta}_{i,d}$	R^2	i	$\hat{\beta}_{i,b}$	$\hat{\beta}_{i,d}$	R^2
Australia	−0.05	0.68	0.13%	Netherlands	**−0.32**	1.82	**1.72%**
	(−0.49)	(0.29)	(0.26)		(−2.54)	(1.81)	(6.48)
	[0.28]	[0.61]	[0.91]		[0.02]	[0.11]	[0.07]
Canada	**−0.23**	1.44	**2.58%**	Sweden	−0.01	1.18	0.45%
	(−2.42)	(1.22)	(6.47)		(−0.19)	(1.24)	(1.54)
	[0.02]	[0.35]	[0.08]		[0.46]	[0.26]	[0.53]
France	−0.09	0.92	0.31%	Switzerland	−0.15	0.23	0.55%
	(−1.00)	(0.86)	(1.09)		(−1.32)	(0.25)	(2.01)
	[0.24]	[0.45]	[0.67]		[0.11]	[0.65]	[0.46]
Germany	**−0.33**	1.68	1.24%	United Kingdom	**−0.16**	**3.71**	**2.60%**
	(−1.86)	(1.24)	(3.78)		(−1.67)	(2.90)	(8.75)
	[0.10]	[0.22]	[0.21]		[0.06]	[0.01]	[0.02]
Italy	−0.01	−0.69	0.14%	United States	−0.19	1.61	1.51%
	(−0.08)	(−0.59)	(0.37)		(−1.66)	(2.03)	(4.15)
	[0.44]	[0.88]	[0.85]		[0.11]	[0.12]	[0.24]
Japan	0.04	0.41	0.10%	Pooled	−0.06	0.53	1.35%
	(0.32)	(0.68)	(0.59)		(−1.06)	(1.20)	(2.06)
	[0.61]	[0.50]	[0.80]		[0.13]	[0.20]	[0.32]

Table AIV

Benchmark predictive regression model estimation results based on *Morgan Stanley Capital International* country indices, 1980:02–2010:12

The table reports OLS estimates of $\beta_{i,b}$ and $\beta_{i,d}$ (denoted by $\hat{\beta}_{i,b}$ and $\hat{\beta}_{i,d}$, respectively) and the R^2 statistic for the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1},$$

where $r_{i,t+1}$ is the monthly national currency excess return and $bill_{i,t}$ ($dy_{i,t}$) is the three-month Treasury bill rate (log dividend yield) for country i. Heteroskedasticity-robust t-statistics are reported in parentheses in the second, third, sixth, and seventh columns; t-statistics for $\hat{\beta}_{i,b}$ ($\hat{\beta}_{i,d}$) are for testing H_0: $\beta_{i,b} = 0$ against H_A: $\beta_{i,b} < 0$ (H_0: $\beta_{i,d} = 0$ against H_A: $\beta_{i,d} > 0$). Parentheses below the R^2 statistics in the fourth and eighth columns report heteroskedasticity-robust χ^2 statistics for testing H_0: $\beta_{i,b} = \beta_{i,d} = 0$. Brackets report wild bootstrapped p-values. "Pooled" estimates impose the restrictions that $\beta_{i,b} = \bar{\beta}_b$ and $\beta_{i,d} = \bar{\beta}_d$ for all i. Bold indicates significance at the 10% level. Return data are from *Morgan Stanley Capital International*; Treasury bill rate and dividend yield data are from *Global Financial Data*.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i	$\hat{\beta}_{i,b}$	$\hat{\beta}_{i,d}$	R^2	i	$\hat{\beta}_{i,b}$	$\hat{\beta}_{i,d}$	R^2
Australia	−0.03	0.60	0.07%	Netherlands	**−0.29**	**1.91**	1.56%
	(−0.33)	(0.25)	(0.11)		(−2.26)	(1.86)	(5.34)
	[0.32]	[0.60]	[0.96]		[0.04]	[0.10]	[0.11]
Canada	**−0.22**	1.12	**2.33%**	Sweden	−0.03	1.21	0.43%
	(−2.22)	(0.91)	(5.93)		(−0.33)	(1.22)	(1.50)
	[0.04]	[0.46]	[0.09]		[0.42]	[0.27]	[0.54]
France	−0.08	0.87	0.25%	Switzerland	−0.10	0.23	0.24%
	(−0.88)	(0.81)	(0.88)		(−0.86)	(0.24)	(0.79)
	[0.26]	[0.47]	[0.72]		[0.21]	[0.65]	[0.73]
Germany	−0.31	1.49	0.93%	United Kingdom	**−0.15**	**3.66**	**2.51%**
	(−1.64)	(1.04)	(2.98)		(−1.49)	(2.89)	(8.94)
	[0.15]	[0.28]	[0.30]		[0.08]	[0.01]	[0.02]
Italy	0.02	−0.39	0.11%	United States	−0.19	1.63	1.52%
	(0.31)	(−0.34)	(0.31)		(−1.66)	(2.04)	(4.21)
	[0.58]	[0.82]	[0.88]		[0.12]	[0.11]	[0.23]
Japan	0.06	0.41	0.11%	Pooled	−0.05	0.52	0.31%
	(0.48)	(0.63)	(0.62)		(−0.86)	(1.14)	(1.67)
	[0.67]	[0.49]	[0.78]		[0.19]	[0.21]	[0.38]

Table AV

Predictive regression model estimation results based on U.S. predictors, 1980:02–2010:12

The table reports OLS estimates of $\beta_{i,b}$ and $\beta_{i,d}$ (denoted by $\hat{\beta}_{i,b}$ and $\hat{\beta}_{i,d}$, respectively) and the R^2 statistic for the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,b} bill_{\text{USA},t} + \beta_{i,d} dy_{\text{USA},t} + \varepsilon_{i,t+1},$$

where $r_{i,t+1}$ is the monthly national currency excess return for country i and $bill_{\text{USA},t}$ ($dy_{\text{USA},t}$) is the U.S. three-month Treasury bill rate (log dividend yield). Heteroskedasticity-robust t-statistics are reported in parentheses in the second, third, sixth, and seventh columns; t-statistics for $\hat{\beta}_{i,b}$ ($\hat{\beta}_{i,d}$) are for testing H_0: $\beta_{i,b} = 0$ against H_A: $\beta_{i,b} < 0$ (H_0: $\beta_{i,d} = 0$ against H_A: $\beta_{i,d} > 0$). Parentheses below the R^2 statistics in the fourth and eighth columns report heteroskedasticity-robust χ^2 statistics for testing H_0: $\beta_{i,b} = \beta_{i,d} = 0$. Brackets report wild bootstrapped p-values. "Pooled" estimates impose the restrictions that $\beta_{i,b} = \bar{\beta}_b$ and $\beta_{i,d} = \bar{\beta}_d$ for all i. Bold indicates significance at the 10% level. Data are from *Global Financial Data*.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i	$\hat{\beta}_{i,b}$	$\hat{\beta}_{i,d}$	R^2	i	$\hat{\beta}_{i,b}$	$\hat{\beta}_{i,d}$	R^2
Australia	**−0.20**	0.79	0.95%	Netherlands	−0.03	0.88	0.38%
	(−1.83)	(1.19)	(3.38)		(−0.22)	(1.03)	(1.53)
	[0.05]	[0.25]	[0.24]		[0.56]	[0.34]	[0.55]
Canada	**−0.29**	0.99	**2.42**%	Sweden	−0.05	1.41	0.60%
	(−2.39)	(1.13)	(6.22)		(−0.36)	(1.22)	(2.12)
	[0.01]	[0.34]	[0.08]		[0.46]	[0.23]	[0.39]
France	−0.05	0.33	0.04%	Switzerland	−0.08	0.57	0.22%
	(−0.34)	(0.36)	(1.15)		(−0.87)	(0.78)	(0.79)
	[0.47]	[0.55]	[0.94]		[0.29]	[0.46]	[0.75]
Germany	−0.05	0.66	0.15%	United Kingdom	−0.16	**1.72**	**1.49**%
	(−0.39)	(0.67)	(0.50)		(−1.45)	(2.51)	(6.38)
	[0.47]	[0.46]	[0.83]		[0.14]	[0.02]	[0.06]
Italy	0.06	0.02	0.07%	United States	−0.19	1.61	1.51%
	(0.30)	(0.02)	(0.18)		(−1.66)	(2.03)	(4.15)
	[0.70]	[0.61]	[0.91]		[0.11]	[0.12]	[0.24]
Japan	−0.03	0.68	0.21%	Pooled	−0.10	0.88	0.44%
	(−0.26)	(0.80)	(0.93)		(−0.97)	(1.25)	(1.57)
	[0.50]	[0.31]	[0.64]		[0.29]	[0.30]	[0.57]

Table AVI
Benchmark predictive regression model mARM estimation results, 1980:02–2010:12

The table reports Amihud, Hurvich, and Wang (2009) mARM reduced-bias estimates of $\beta_{i,b}$ and $\beta_{i,d}$ (denoted by $\hat{\beta}^c_{i,b}$ and $\hat{\beta}^c_{i,d}$, respectively) for the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1},$$

where $r_{i,t+1}$ is the monthly national currency excess return and $bill_{i,t}$ ($dy_{i,t}$) is the three-month Treasury bill rate (log dividend yield) for country i. Parentheses report mARM t-statistics; t-statistics for $\hat{\beta}_{i,b}$ ($\hat{\beta}_{i,d}$) are for testing H_0: $\beta_{i,b} = 0$ against H_A: $\beta_{i,b} < 0$ (H_0: $\beta_{i,d} = 0$ against H_A: $\beta_{i,d} > 0$). Brackets report mARM p-values; 0.00 indicates < 0.005. Bold indicates significance at the 10% level. Data are from *Global Financial Data*.

(1)	(2)	(3)	(4)	(5)	(6)
i	$\hat{\beta}^c_{i,b}$	$\hat{\beta}^c_{i,d}$	i	$\hat{\beta}^c_{i,b}$	$\hat{\beta}^c_{i,d}$
Australia	−0.05	0.13	Netherlands	**−0.18**	**1.48**
	(−0.64)	(0.14)		(−1.37)	(1.98)
	[0.26]	[0.44]		[0.08]	[0.02]
Canada	**−0.19**	**0.99**	Sweden	−0.01	**1.02**
	(−2.52)	(1.45)		(−0.18)	(1.32)
	[0.01]	[0.07]		[0.43]	[0.09]
France	−0.07	0.79	Switzerland	−0.12	−0.19
	(−0.85)	(1.09)		(−1.05)	(−0.25)
	[0.20]	[0.14]		[0.15]	[0.60]
Germany	**−0.28**	**1.65**	United Kingdom	**−0.13**	**3.13**
	(−1.81)	(1.79)		(−1.54)	(3.65)
	[0.04]	[0.04]		[0.06]	[0.00]
Italy	−0.01	−0.69	United States	**−0.17**	**1.16**
	(−0.09)	(−0.82)		(−1.79)	(2.02)
	[0.46]	[0.79]		[0.04]	[0.02]
Japan	0.04	0.41			
	(0.34)	(0.61)			
	[0.63]	[0.27]			

Table AVII

Data adjustments for lagged country excess stock returns

The table reports the adjustments made to $r_{j,t}$ in the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,i} r_{i,t} + \beta_{i,j} r_{j,t} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1},\ i \neq j,$$

where $r_{i,t+1}$ is the monthly national currency excess return and $bill_{i,t}$ ($dy_{i,t}$) is the three-month Treasury bill rate (log dividend yield) for country i. Each entry gives the adjustment made to the lagged country excess return given in the column heading when testing its predictive ability for the country excess return given in the row heading. "All" indicates that the lagged country excess return is computed based on the value of the total return index at the end of the last trading day of a given month relative to its value at the end of the last trading day of the previous month. "Exclude" indicates that the lagged country excess return is computed based on the value of the total return index at the end of the penultimate trading day of a given month relative to its value at the end of the penultimate trading day of the previous month.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	j										
i	AUS	CAN	FRA	DEU	ITA	JPN	NLD	SWE	CHE	GBR	USA
AUS		Exclude	Exclude	Exclude	Exclude	All	Exclude	Exclude	Exclude	Exclude	Exclude
CAN	All		All	All	All	All	All	All	All	All	All
FRA	All	Exclude		Exclude	All	All	All	All	All	All	Exclude
DEU	All	Exclude	All		All	All	All	All	All	All	Exclude
ITA	All	Exclude	All	Exclude		All	All	All	All	All	Exclude
JPN	All	Exclude	Exclude	Exclude	Exclude		Exclude	Exclude	Exclude	Exclude	Exclude
NLD	All	Exclude	All	Exclude	All	All		All	All	All	Exclude
SWE	All	Exclude	All	Exclude	All	All	All		All	All	Exclude
CHE	All	Exclude	All	Exclude	All	All	All	All		All	Exclude
GBR	All	Exclude	All	Exclude	All	All	All	All	All		Exclude
USA	All	All	All	All	All	All	All	All	All	All	

Table AVIII

Pairwise Granger causality test results, 1980:02–2010:12

The table reports OLS estimates of $\beta_{i,j}$ (denoted by $\hat{\beta}_{i,j}$) and the R^2 statistic for the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,i} r_{i,t} + \beta_{i,j} r_{j,t} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1},\ i \neq j,$$

where $r_{i,t+1}$ is the monthly national currency excess return, $bill_{i,t}$ ($dy_{i,t}$) is the three-month Treasury bill rate (log dividend yield) for country i, and $r_{j,t}$ is adjusted for differences in market closing times (as described in Table AVII). Heteroskedasticity-robust t-statistics are reported in parentheses; t-statistics are for testing H_0: $\beta_{i,j} = 0$ against H_A: $\beta_{i,j} > 0$. Brackets report wild bootstrapped p-values; 0.00 indicates < 0.005. R^2 statistics are given below the bracketed p-values. Bold indicates significance at the 10% level. "Average" is the column average of the $\hat{\beta}_{i,j}$ estimates. "Pooled" estimates impose the restrictions that $\beta_{i,j} = \bar{\beta}_j$ for all $i \neq j$. Data are from *Global Financial Data*.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i	$\hat{\beta}_{i,\text{AUS}}$	$\hat{\beta}_{i,\text{CAN}}$	$\hat{\beta}_{i,\text{FRA}}$	$\hat{\beta}_{i,\text{DEU}}$	$\hat{\beta}_{i,\text{ITA}}$	$\hat{\beta}_{i,\text{JPN}}$	$\hat{\beta}_{i,\text{NLD}}$	$\hat{\beta}_{i,\text{SWE}}$	$\hat{\beta}_{i,\text{CHE}}$	$\hat{\beta}_{i,\text{GBR}}$	$\hat{\beta}_{i,\text{USA}}$
AUS		**0.11**	**0.12**	**0.13**	**0.08**	**0.10**	**0.13**	**0.08**	**0.11**	0.07	**0.20**
		(1.35)	(1.96)	(2.06)	(2.24)	(1.91)	(1.77)	(1.91)	(1.67)	(0.94)	(2.34)
		[0.10]	[0.03]	[0.02]	[0.01]	[0.03]	[0.05]	[0.04]	[0.05]	[0.21]	[0.01]
		0.95%	1.70%	1.84%	1.48%	1.27%	1.59%	1.12%	1.08%	0.67%	2.34%
CAN	0.05		0.06	0.06	**0.06**	0.06	0.06	**0.15**	0.08	0.07	**0.21**
	(0.84)		(1.21)	(1.24)	(1.53)	(1.26)	(0.79)	(3.73)	(1.00)	(0.99)	(2.19)
	[0.21]		[0.13]	[0.12]	[0.07]	[0.12]	[0.26]	[0.00]	[0.17]	[0.18]	[0.01]
	4.13%		4.37%	4.34%	4.59%	4.35%	4.20%	7.24%	4.35%	4.27%	5.58%
FRA	0.01	−0.01		−0.03	−0.05	0.04	0.002	**0.14**	**0.16**	0.03	0.12
	(0.15)	(−0.15)		(−0.31)	(−0.91)	(0.53)	(0.02)	(2.27)	(1.47)	(0.26)	(1.28)
	[0.44]	[0.60]		[0.64]	[0.82]	[0.34]	[0.52]	[0.02]	[0.09]	[0.43]	[0.14]
	2.14%	2.14%		2.17%	2.36%	2.24%	2.13%	3.92%	2.94%	2.17%	2.64%
DEU	0.03	0.09	**0.13**		0.06	**0.09**	0.06	**0.14**	**0.26**	0.07	**0.22**
	(0.37)	(1.11)	(1.49)		(1.29)	(1.43)	(0.55)	(2.49)	(2.26)	(0.77)	(2.33)
	[0.37]	[0.17]	[0.09]		[0.11]	[0.09]	[0.31]	[0.01]	[0.02]	[0.25]	[0.01]
	2.20%	2.50%	2.84%		2.47%	2.73%	2.25%	3.78%	3.99%	2.35%	3.86%
ITA	−0.01	0.06	**0.16**	0.11		0.05	−0.06	0.06	**0.21**	**0.15**	**0.15**
	(−0.07)	(0.66)	(1.63)	(1.21)		(0.72)	(−0.59)	(0.99)	(1.84)	(1.48)	(1.59)
	[0.51]	[0.29]	[0.05]	[0.13]		[0.27]	[0.74]	[0.19]	[0.03]	[0.08]	[0.06]
	0.77%	0.89%	1.91%	1.32%		0.91%	0.91%	1.02%	2.15%	1.50%	1.46%
JPN	0.04	**0.12**	**0.11**	0.02	0.03		0.07	**0.09**	**0.11**	**0.11**	**0.11**
	(0.70)	(1.70)	(2.07)	(0.44)	(0.78)		(1.17)	(1.77)	(1.61)	(1.71)	(1.48)
	[0.26]	[0.05]	[0.02]	[0.35]	[0.22]		[0.15]	[0.04]	[0.05]	[0.05]	[0.09]
	1.75%	2.51%	2.65%	1.68%	1.78%		2.02%	2.55%	2.34%	2.43%	2.28%

Table AVIII (continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i	$\hat{\beta}_{i,\text{AUS}}$	$\hat{\beta}_{i,\text{CAN}}$	$\hat{\beta}_{i,\text{FRA}}$	$\hat{\beta}_{i,\text{DEU}}$	$\hat{\beta}_{i,\text{ITA}}$	$\hat{\beta}_{i,\text{JPN}}$	$\hat{\beta}_{i,\text{NLD}}$	$\hat{\beta}_{i,\text{SWE}}$	$\hat{\beta}_{i,\text{CHE}}$	$\hat{\beta}_{i,\text{GBR}}$	$\hat{\beta}_{i,\text{USA}}$
NLD	**0.10**	**0.15**	**0.15**	**0.15**	0.05	**0.11**		**0.16**	**0.33**	0.11	**0.32**
	(1.46)	(1.95)	(2.20)	(1.79)	(1.05)	(2.12)		(2.76	(3.28)	(1.11)	(3.69)
	[0.09]	[0.03]	[0.02]	[0.05]	[0.16]	[0.02]		[0.00]	[0.00]	[0.17]	[0.00]
	3.46%	3.88%	3.94%	3.77%	3.03%	3.78%		4.99%	6.16%	3.21%	6.09%
SWE	−0.03	**0.16**	0.05	0.08	0.08	0.06	0.01		0.12	0.10	**0.23**
	(−0.31)	(1.75)	(0.58)	(0.88)	(1.09)	(0.76)	(0.13)		(1.23)	(0.90)	(2.22)
	[0.63]	[0.06]	[0.31]	[0.21]	[0.16]	[0.25]	[0.48]		[0.13]	[0.22]	[0.02]
	3.02%	3.91%	3.08%	3.21%	3.46%	3.15%	2.99%		3.43%	3.27%	4.54%
CHE	0.03	0.03	0.005	−0.02	−0.003	0.02	−0.01	**0.13**		0.02	**0.14**
	(0.50)	(0.41)	(0.07)	(−0.20)	(−0.08)	(0.51)	(−0.08)	(3.14)		(0.32)	(1.67)
	[0.32]	[0.37]	[0.48]	[0.58]	[0.54]	[0.33]	[0.56]	[0.00]		[0.40]	[0.07]
	3.70%	3.69%	3.63%	3.64%	3.63%	3.69%	3.63%	5.75%		3.66%	4.54%
GBR	**0.11**	0.08	0.08	0.02	0.01	**0.09**	−0.02	**0.09**	**0.11**		**0.23**
	(1.74)	(1.02)	(1.17)	(0.26)	(0.24)	(1.85)	(−0.18)	(2.03)	(1.42)		(2.26)
	[0.05]	[0.19]	[0.17]	[0.43]	[0.43]	[0.04]	[0.61]	[0.03]	[0.10]		[0.02]
	3.51%	3.00%	3.15%	2.66%	2.65%	3.49%	2.65%	3.72%	3.24%		4.82%
USA	0.06	0.03	0.01	−0.01	**0.06**	−0.0003	0.01	**0.09**	0.04	0.02	
	(1.00)	(0.27)	(0.20)	(−0.20)	(1.52)	(−0.01)	(0.18)	(2.31)	(0.48)	(0.22)	
	[0.16]	[0.42]	[0.44]	[0.57]	[0.09]	[0.50]	[0.48]	[0.02]	[0.35]	[0.43]	
	2.24%	1.97%	1.95%	1.95%	2.55%	1.93%	1.95%	3.28%	2.01%	1.95%	
Average	0.04	0.08	0.09	0.05	0.04	0.06	0.03	0.11	0.15	0.08	0.19
Pooled	0.03	**0.07**	**0.08**	0.05	**0.04**	**0.06**	0.02	**0.11**	**0.13**	**0.08**	**0.17**
	(0.65)	(1.34)	(2.02)	(1.08)	(1.32)	(1.52)	(0.42)	(3.56)	(2.22)	(1.45)	(2.982)
	[0.22]	[0.07]	[0.02]	[0.13]	[0.08]	[0.05]	[0.32]	[0.00]	[0.01]	[0.07]	[0.00]
	1.69%	1.70%	1.87%	1.69%	2.01%	1.80%	1.49%	2.59%	2.12%	1.88%	2.72%

Table AIX
Granger causality test results for industrial production growth, 1980:02–2010:12

The table reports estimation results for the autoregressive distributed lag model,

$$\Delta y_{i,t+1} = \beta_{i,0} + \sum_{q=1}^{q_1} \beta_{i,i,q} \Delta y_{i,t-(q-1)} + \sum_{q=1}^{q_2} \beta_{i,\mathrm{USA},q} \Delta y_{\mathrm{USA},t-(q-1)} + u_{i,t+1},$$

where $\Delta y_{i,t+1}$ is monthly industrial production growth for country i. The lag lengths are selected using the AIC and a maximum value of 6 for q_1 and q_2 and a minimum value of 0 (1) for q_1 (q_2). The second and sixth columns report OLS estimates of $\sum_{q=1}^{q_2} \beta_{i,\mathrm{USA},q}$; heteroskedasticity-robust t-statistics are reported in parentheses. The F-statistics in the fourth and eighth columns are for testing H_0: $\beta_{i,\mathrm{USA},q} = 0$ for all q; p-values are reported in brackets; 0.00 indicates < 0.005. Bold indicates significance at the 10% level.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i	$\sum \hat{\beta}_{i,\mathrm{USA},q}$	R^2	F-statistic	i	$\sum \hat{\beta}_{i,\mathrm{USA},q}$	R^2	F-statistic
Canada	**0.32**	18.04%	**12.49**	Netherlands	**1.06**	33.11%	**7.40**
	(3.53)		[0.00]		(4.50)		[0.00]
France	**0.63**	20.37%	**5.78**	Sweden	**0.68**	21.26%	**2.00**
	(3.77)		[0.00]		(1.82)		[0.09]
Germany	**0.97**	44.79%	**5.48**	United Kingdom	**0.45**	14.34%	**4.70**
	(3.31)		[0.00]		(3.64)		[0.00]
Japan	**0.56**	12.19%	**5.75**				
	(3.20)		[0.00]				

Table AX

Pairwise Granger causality test results for unadjusted lagged country returns, 1980:02–2010:12

The table reports OLS estimates of $\beta_{i,j}$ (denoted by $\hat{\beta}_{i,j}$) and the R^2 statistic for the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,i} r_{i,t} + \beta_{i,j} r_{j,t} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1},\ i \neq j,$$

where $r_{i,t+1}$ is the monthly national currency excess return and $bill_{i,t}$ ($dy_{i,t}$) is the three-month Treasury bill rate (log dividend yield) for country i. In contrast to Table AVIII, $r_{j,t}$ is not adjusted for differences in market closing times. Heteroskedasticity-robust t-statistics are reported in parentheses; t-statistics are for testing H_0: $\beta_{i,j} = 0$ against H_A: $\beta_{i,j} > 0$. Brackets report wild bootstrapped p-values; 0.00 indicates < 0.005. R^2 statistics are given below the bracketed p-values. Bold indicates significance at the 10% level. "Average" is the column average of the $\hat{\beta}_{i,j}$ estimates. "Pooled" estimates impose the restrictions that $\beta_{i,j} = \bar{\beta}_j$ for all $i \neq j$. Data are from *Global Financial Data*.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i	$\hat{\beta}_{i,\mathrm{AUS}}$	$\hat{\beta}_{i,\mathrm{CAN}}$	$\hat{\beta}_{i,\mathrm{FRA}}$	$\hat{\beta}_{i,\mathrm{DEU}}$	$\hat{\beta}_{i,\mathrm{ITA}}$	$\hat{\beta}_{i,\mathrm{JPN}}$	$\hat{\beta}_{i,\mathrm{NLD}}$	$\hat{\beta}_{i,\mathrm{SWE}}$	$\hat{\beta}_{i,\mathrm{CHE}}$	$\hat{\beta}_{i,\mathrm{GBR}}$	$\hat{\beta}_{i,\mathrm{USA}}$
AUS		**0.15**	**0.12**	**0.11**	**0.08**	**0.10**	**0.13**	**0.08**	**0.13**	0.07	**0.20**
		(1.81)	(1.82)	(1.86)	(2.17)	(1.91)	(1.83)	(2.02)	(2.08)	(0.93)	(2.54)
		[0.04]	[0.05]	[0.03]	[0.01]	[0.03]	[0.04]	[0.03]	[0.02]	[0.21]	[0.01]
		1.46%	1.85%	1.53%	1.42%	1.27%	1.58%	1.24%	1.42%	0.66%	2.49%
CAN	0.05		0.06	0.06	**0.06**	0.06	0.06	**0.15**	0.08	0.07	**0.21**
	(0.84)		(1.21)	(1.24)	(1.53)	(1.26)	(0.79)	(3.73)	(1.00)	(0.99)	(2.19)
	[0.21]		[0.13]	[0.12]	[0.07]	[0.12]	[0.26]	[0.00]	[0.17]	[0.18]	[0.01]
	4.13%		4.37%	4.34%	4.59%	4.35%	4.20%	7.24%	4.35%	4.27%	5.58%
FRA	0.01	−0.004		−0.07	−0.05	0.04	0.002	**0.14**	**0.16**	0.03	0.13
	(0.15)	(−0.05)		(−0.84)	(−0.91)	(0.53)	(0.02)	(2.27)	(1.47)	(0.26)	(1.41)
	[0.44]	[0.56]		[0.80]	[0.82]	[0.34]	[0.52]	[0.02]	[0.09]	[0.43]	[0.11]
	2.14%	2.13%		2.37%	2.36%	2.24%	2.13%	3.92%	2.94%	2.17%	2.79%
DEU	0.03	**0.11**	**0.13**		**0.06**	**0.09**	0.06	**0.14**	**0.26**	0.07	**0.21**
	(0.37)	(1.46)	(1.49)		(1.29)	(1.43)	(0.55)	(2.49)	(2.26)	(0.77)	(2.49)
	[0.37]	[0.09]	[0.09]		[0.11]	[0.09]	[0.31]	[0.01]	[0.02]	[0.25]	[0.01]
	2.20%	2.72%	2.84%		2.47%	2.73%	2.25%	3.78%	3.99%	2.35%	3.84%
ITA	−0.01	0.08	**0.16**	0.08		0.05	−0.06	0.06	**0.21**	**0.15**	**0.18**
	(−0.07)	(0.86)	(1.63)	(0.91)		(0.72)	(−0.59)	(0.99)	(1.84)	(1.48)	(1.98)
	[0.51]	[0.22]	[0.05]	[0.20]		[0.27]	[0.74]	[0.19]	[0.03]	[0.08]	[0.02]
	0.77%	0.98%	1.91%	1.08%		0.91%	0.91%	1.02%	2.15%	1.50%	1.89%
JPN	0.04	**0.16**	**0.11**	0.03	0.04		0.08	**0.08**	**0.12**	**0.13**	**0.17**
	(0.70)	(2.40)	(2.06)	(0.50)	(0.83)		(1.34)	(1.72)	(1.65)	(1.92)	(2.49)
	[0.26]	[0.01]	[0.02]	[0.33]	[0.21]		[0.11]	[0.05]	[0.05]	[0.04]	[0.01]
	1.75%	3.33%	2.69%	1.70%	1.81%		2.13%	2.50%	2.44%	2.66%	3.21%

Table AX (continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i	$\hat{\beta}_{i,\text{AUS}}$	$\hat{\beta}_{i,\text{CAN}}$	$\hat{\beta}_{i,\text{FRA}}$	$\hat{\beta}_{i,\text{DEU}}$	$\hat{\beta}_{i,\text{ITA}}$	$\hat{\beta}_{i,\text{JPN}}$	$\hat{\beta}_{i,\text{NLD}}$	$\hat{\beta}_{i,\text{SWE}}$	$\hat{\beta}_{i,\text{CHE}}$	$\hat{\beta}_{i,\text{GBR}}$	$\hat{\beta}_{i,\text{USA}}$
NLD	**0.10**	**0.13**	**0.15**	0.09	0.05	**0.11**		**0.16**	**0.33**	0.11	**0.27**
	(1.46)	(1.62)	(2.20)	(1.06)	(1.05)	(2.12)		(2.76	(3.28)	(1.11)	(3.31)
	[0.10]	[0.07]	[0.02]	[0.17]	[0.16]	[0.02]		[0.00]	[0.00]	[0.17]	[0.00]
	3.46%	3.58%	3.94%	3.13%	3.03%	3.78%		4.99%	6.16%	3.21%	5.36%
SWE	−0.03	**0.20**	0.05	0.04	0.08	0.06	0.01		0.12	0.10	**0.25**
	(−0.31)	(2.23)	(0.58)	(0.50)	(1.09)	(0.76)	(0.13)		(1.23)	(0.90)	(2.61)
	[0.63]	[0.02]	[0.31]	[0.32]	[0.16]	[0.25]	[0.48]		[0.13]	[0.22]	[0.01]
	3.02%	4.46%	3.08%	3.06%	3.46%	3.15%	2.99%		3.43%	3.27%	4.89%
CHE	0.03	0.04	0.005	−0.02	−0.003	0.02	−0.01	**0.13**		0.02	**0.16**
	(0.50)	(0.47)	(0.07)	(−0.24)	(−0.08)	(0.51)	(−0.08)	(3.14)		(0.32)	(1.89)
	[0.32]	[0.34]	[0.48]	[0.59]	[0.54]	[0.33]	[0.56]	[0.00]		[0.40]	[0.04]
	3.70%	3.72%	3.63%	3.65%	3.63%	3.69%	3.63%	5.75%		3.66%	4.94%
GBR	**0.11**	0.08	0.08	0.0004	0.01	**0.09**	−0.02	**0.09**	**0.11**		**0.22**
	(1.74)	(0.96)	(1.17)	(0.01)	(0.24)	(1.85)	(−0.18)	(2.03)	(1.42)		(2.18)
	[0.05]	[0.20]	[0.17]	[0.52]	[0.43]	[0.04]	[0.61]	[0.03]	[0.10]		[0.02]
	3.51%	2.96%	3.15%	2.63%	2.65%	3.49%	2.65%	3.72%	3.24%		4.62%
USA	0.06	0.03	0.01	−0.01	**0.06**	−0.0003	0.01	**0.09**	0.04	0.02	
	(1.00)	(0.27)	(0.20)	(−0.20)	(1.52)	(−0.01)	(0.18)	(2.31)	(0.48)	(0.22)	
	[0.16]	[0.42]	[0.44]	[0.57]	[0.09]	[0.50]	[0.48]	[0.02]	[0.35]	[0.43]	
	2.24%	1.97%	1.95%	1.95%	2.55%	1.93%	1.95%	3.28%	2.01%	1.95%	
Average	0.04	0.10	0.09	0.03	0.04	0.06	0.03	0.11	0.16	0.08	0.20
Pooled	0.03	**0.09**	**0.08**	**0.03**	**0.04**	**0.06**	0.02	**0.11**	**0.13**	**0.08**	**0.19**
	(0.65)	(1.66)	(1.97)	(0.74)	(1.31)	(1.52)	(0.46)	(3.61)	(2.27)	(1.47)	(3.47)
	[0.22]	[0.04]	[0.02]	[0.20]	[0.08]	[0.05]	[0.30]	[0.00]	[0.01]	[0.07]	[0.00]
	1.69%	1.84%	1.89%	1.60	2.01%	1.80%	1.50%	2.60%	2.17%	1.90%	2.98%

Table AXI

Pairwise Granger causality test results based on *Morgan Stanley Capital International* country indices, 1980:02–2010:12

The table reports OLS estimates of $\beta_{i,j}$ (denoted by $\hat{\beta}_{i,j}$) and the R^2 statistic for the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,i} r_{i,t} + \beta_{i,j} r_{j,t} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1}, \ i \neq j,$$

where $r_{i,t+1}$ is the monthly national currency excess return and $bill_{i,t}$ ($dy_{i,t}$) is the three-month Treasury bill rate (log dividend yield) for country i. Heteroskedasticity-robust t-statistics are reported in parentheses; t-statistics are for testing H_0: $\beta_{i,j} = 0$ against H_A: $\beta_{i,j} > 0$. Brackets report wild bootstrapped p-values; 0.00 indicates < 0.005. R^2 statistics are given below the bracketed p-values. Bold indicates significance at the 10% level. "Average" is the column average of the $\hat{\beta}_{i,j}$ estimates. "Pooled" estimates impose the restrictions that $\beta_{i,j} = \bar{\beta}_j$ for all $i \neq j$. Return data are from *Morgan Stanley Capital International*; Treasury bill rate and dividend yield data are from *Global Financial Data*.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i	$\hat{\beta}_{i,\text{AUS}}$	$\hat{\beta}_{i,\text{CAN}}$	$\hat{\beta}_{i,\text{FRA}}$	$\hat{\beta}_{i,\text{DEU}}$	$\hat{\beta}_{i,\text{ITA}}$	$\hat{\beta}_{i,\text{JPN}}$	$\hat{\beta}_{i,\text{NLD}}$	$\hat{\beta}_{i,\text{SWE}}$	$\hat{\beta}_{i,\text{CHE}}$	$\hat{\beta}_{i,\text{GBR}}$	$\hat{\beta}_{i,\text{USA}}$
AUS		**0.11**	**0.11**	**0.09**	**0.07**	**0.09**	**0.11**	**0.06**	**0.14**	0.04	**0.20**
		(1.47)	(1.74)	(1.73)	(1.90)	(1.82)	(1.62)	(1.63)	(2.17)	(0.58)	(2.60)
		[0.08]	[0.05]	[0.05]	[0.04]	[0.03]	[0.07]	[0.07]	[0.02]	[0.31]	[0.00]
		0.89%	1.43%	1.14%	1.04%	0.94%	1.08%	0.75%	1.33%	0.28%	2.27%
CAN	**0.07**		**0.08**	**0.07**	**0.06**	**0.06**	0.07	**0.15**	0.09	0.08	**0.26**
	(1.30)		(1.52)	(1.42)	(1.60)	(1.33)	(1.12)	(3.70)	(1.22)	(1.12)	(2.43)
	[0.09]		[0.08]	[0.09]	[0.07]	[0.10]	[0.15]	[0.00]	[0.13]	[0.15]	[0.01]
	3.26%		3.54%	3.41%	3.54%	3.35%	3.33%	6.38%	3.49%	3.28%	5.28%
FRA	0.02	−0.03		−0.08	−0.03	0.02	0.01	**0.11**	**0.16**	0.01	0.13
	(0.26)	(−0.39)		(−1.00)	(−0.53)	(0.25)	(0.12)	(1.84)	(1.56)	(0.11)	(1.39)
	[0.39]	[0.67]		[0.84]	[0.70]	[0.44]	[0.47]	[0.04]	[0.07]	[0.49]	[0.11]
	1.57%	1.59%		1.87%	1.63%	1.57%	1.55%	2.70%	2.46%	1.55%	2.17%
DEU	0.06	0.09	**0.16**		**0.07**	0.07	0.03	**0.13**	**0.26**	0.06	**0.25**
	(0.72)	(1.22)	(1.73)		(1.43)	(1.14)	(0.33)	(2.19)	(2.35)	(0.66)	(2.66)
	[0.27]	[0.13]	[0.06]		[0.08]	[0.15]	[0.38]	[0.02]	[0.01]	[0.28]	[0.01]
	1.65%	1.87%	2.41%		1.87%	1.84%	1.50%	2.79%	3.45%	1.62%	3.59%
ITA	0.02	0.03	**0.16**	0.08		0.03	−0.04	0.05	**0.22**	**0.13**	**0.18**
	(0.25)	(0.33)	(1.66)	(0.98)		(0.50)	(−0.39)	(0.92)	(1.98)	(1.36)	(1.97)
	[0.38]	[0.39]	[0.05]	[0.18]		[0.33]	[0.65]	[0.21]	[0.02]	[0.09]	[0.02]
	0.65%	0.67%	1.73%	0.97%		0.70%	0.70%	0.84%	2.30%	1.24%	1.69%
JPN	0.02	**0.15**	**0.11**	0.03	0.05		0.07	**0.08**	**0.11**	**0.11**	**0.19**
	(0.33)	(2.19)	(1.96)	(0.58)	(1.00)		(1.21)	(1.85)	(1.47)	(1.60)	(2.73)
	[0.38]	[0.02]	[0.03]	[0.29]	[0.17]		[0.14]	[0.04]	[0.08]	[0.07]	[0.01]
	1.13%	2.51%	2.11%	1.19%	1.40%		1.47%	1.99%	1.77%	1.84%	3.07%

Table AXI (continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i	$\hat{\beta}_{i,\text{AUS}}$	$\hat{\beta}_{i,\text{CAN}}$	$\hat{\beta}_{i,\text{FRA}}$	$\hat{\beta}_{i,\text{DEU}}$	$\hat{\beta}_{i,\text{ITA}}$	$\hat{\beta}_{i,\text{JPN}}$	$\hat{\beta}_{i,\text{NLD}}$	$\hat{\beta}_{i,\text{SWE}}$	$\hat{\beta}_{i,\text{CHE}}$	$\hat{\beta}_{i,\text{GBR}}$	$\hat{\beta}_{i,\text{USA}}$
NLD	**0.11**	0.09	**0.14**	0.06	0.05	**0.10**		**0.13**	**0.31**	0.09	**0.26**
	(1.58)	(1.22)	(2.17)	(0.90)	(1.18)	(1.91)		(2.48	(3.33)	(0.83)	(3.13)
	[0.07]	[0.14]	[0.02]	[0.21]	[0.13]	[0.03]		[0.01]	[0.00]	[0.25]	[0.00]
	2.81%	2.48%	3.19%	2.26%	2.37%	2.86%		3.76%	5.36%	2.30%	4.43%
SWE	0.003	**0.21**	0.07	0.04	0.09	0.07	0.001		0.11	0.09	**0.27**
	(0.03)	(2.26)	(0.82)	(0.43)	(1.24)	(0.96)	(0.01)		(0.98)	(0.77)	(2.66)
	[0.50]	[0.01]	[0.23]	[0.34]	[0.12]	[0.20]	[0.51]		[0.20]	[0.25]	[0.01]
	2.23%	3.77%	2.43%	2.29%	2.89%	2.49%	2.23%		2.56%	2.45%	4.25%
CHE	0.04	−0.004	0.004	−0.04	−0.01	0.02	−0.03	**0.10**		0.01	**0.16**
	(0.78)	(−0.05)	(0.05)	(−0.61)	(−0.18)	(0.31)	(−0.35)	(2.32)		(0.11)	(1.91)
	[0.24]	[0.54]	[0.49]	[0.72]	[0.59]	[0.41]	[0.64]	[0.02]		[0.48]	[0.04]
	2.83%	2.66%	2.66%	2.80%	2.67%	2.69%	2.70%	4.02%		2.67%	3.96%
GBR	**0.14**	0.05	0.09	0.005	0.02	**0.09**	−0.01	**0.07**	**0.12**		**0.21**
	(2.23)	(0.64)	(1.30)	(0.08)	(0.46)	(1.94)	(−0.13)	(1.64)	(1.57)		(2.13)
	[0.02]	[0.30]	[0.13]	[0.51]	[0.35]	[0.03]	[0.58]	[0.07]	[0.08]		[0.02]
	3.97%	2.66%	3.16%	2.52%	2.56%	3.47%	2.53%	3.26%	3.33%		4.39%
USA	0.07	−0.01	0.03	−0.03	**0.05**	−0.01	−0.03	**0.09**	0.04	0.01	
	(1.17)	(−0.15)	(0.48)	(−0.55)	(1.44)	(−0.24)	(−0.40)	(2.16)	(0.52)	(0.10)	
	[0.12]	[0.57]	[0.34]	[0.70]	[0.09]	[0.60]	[0.65]	[0.02]	[0.33]	[0.47]	
	2.34%	1.96%	2.01%	2.03%	2.47%	1.96%	2.00%	3.18%	2.04%	1.95%	
Average	0.05	0.07	0.09	0.02	0.04	0.05	0.02	0.10	0.15	0.06	0.21
Pooled	0.05	**0.06**	**0.08**	0.02	**0.04**	**0.05**	0.02	**0.09**	**0.13**	0.07	**0.19**
	(0.96)	(1.26)	(2.12)	(0.62)	(1.44)	(1.38)	(0.37)	(3.19)	(2.35)	(1.21)	(3.64)
	[0.14]	[0.09]	[0.01]	[0.25]	[0.07]	[0.07]	[0.31]	[0.00]	[0.01]	[0.11]	[0.00]
	1.27%	1.24%	1.50%	1.14%	1.53%	1.29%	1.06%	1.89%	1.80%	1.33%	2.56%

Table AXII

Pairwise Granger causality test results controlling for additional economic variables, 1980:02–2010:12

The table reports OLS estimates of $\beta_{i,j}$ (denoted by $\hat{\beta}_{i,j}$) and the R^2 statistic for the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,i} r_{i,t} + \beta_{i,j} r_{j,t} + \beta_{i,f,1} \hat{f}_{1,i,t} + \beta_{i,f,2} \hat{f}_{2,i,t} + \varepsilon_{i,t+1},\ i \neq j,$$

where $r_{i,t+1}$ is the monthly national currency excess return; $\hat{f}_{1,i,t}$ ($\hat{f}_{2,i,t}$) is the first (second) principal component extracted from the three-month Treasury bill rate, log dividend yield, term spread, inflation rate, real oil price growth, real exchange rate growth, and real industrial production growth for country i; and $r_{j,t}$ is adjusted as described in Table AVII. Heteroskedasticity-robust t-statistics are reported in parentheses; t-statistics are for testing H_0: $\beta_{i,j} = 0$ against H_A: $\beta_{i,j} > 0$. Brackets report wild bootstrapped p-values; 0.00 indicates < 0.005. R^2 statistics are given below the bracketed p-values. Bold indicates significance at the 10% level. "Average" is the column average of the $\hat{\beta}_{i,j}$ estimates. "Pooled" estimates impose the restrictions that $\beta_{i,j} = \bar{\beta}_j$ for all $i \neq j$. Data are from *Global Financial Data*.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i	$\hat{\beta}_{i,\mathrm{AUS}}$	$\hat{\beta}_{i,\mathrm{CAN}}$	$\hat{\beta}_{i,\mathrm{FRA}}$	$\hat{\beta}_{i,\mathrm{DEU}}$	$\hat{\beta}_{i,\mathrm{ITA}}$	$\hat{\beta}_{i,\mathrm{JPN}}$	$\hat{\beta}_{i,\mathrm{NLD}}$	$\hat{\beta}_{i,\mathrm{SWE}}$	$\hat{\beta}_{i,\mathrm{CHE}}$	$\hat{\beta}_{i,\mathrm{GBR}}$	$\hat{\beta}_{i,\mathrm{USA}}$
AUS		**0.12**	**0.12**	**0.13**	**0.08**	**0.10**	**0.13**	**0.08**	**0.11**	0.07	**0.21**
		(1.40)	(1.95)	(2.04)	(2.29)	(1.95)	(1.76)	(1.92)	(1.65)	(0.97)	(2.34)
		[0.09]	[0.04]	[0.02]	[0.01]	[0.03]	[0.05]	[0.03]	[0.05]	[0.19]	[0.01]
		1.00%	1.54%	1.72%	1.43%	1.19%	1.56%	1.05%	0.99%	0.61%	2.32%
CAN	0.04		0.05	0.05	0.05	0.05	0.04	**0.14**	0.06	0.06	**0.20**
	(0.74)		(0.91)	(0.93)	(1.17)	(1.20)	(0.61)	(3.54)	(0.73)	(0.84)	(2.01)
	[0.24]		[0.20]	[0.19]	[0.13]	[0.13]	[0.29]	[0.00]	[0.25]	[0.22]	[0.02]
	3.03%		3.14%	3.14%	3.32%	3.23%	3.05%	6.02%	3.12%	3.13%	4.29%
FRA	0.01	0.001		−0.02	−0.05	0.04	0.01	**0.15**	**0.16**	0.03	0.13
	(0.19)	(0.02)		(−0.25)	(−0.85)	(0.58)	(0.07)	(2.44)	(1.50)	(0.31)	(1.34)
	[0.42]	[0.53]		[0.59]	[0.79]	[0.32]	[0.48]	[0.01]	[0.08]	[0.41]	[0.12]
	1.69%	1.68%		1.70%	1.88%	1.80%	1.68%	3.70%	2.52%	1.72%	2.23%
DEU	0.05	**0.11**	**0.11**		**0.06**	**0.11**	0.09	**0.15**	**0.24**	0.08	**0.22**
	(0.62)	(1.51)	(1.36)		(1.41)	(1.73)	(0.88)	(2.73)	(2.15)	(0.89)	(2.37)
	[0.29]	[0.08]	[0.10]		[0.09]	[0.04]	[0.21]	[0.00]	[0.02]	[0.20]	[0.02]
	2.46%	2.96%	2.87%		2.69%	3.26%	2.58%	4.25%	3.94%	2.60%	4.10%
ITA	−0.03	0.09	**0.15**	**0.13**		0.07	−0.03	0.07	**0.20**	**0.15**	**0.15**
	(−0.38)	(1.04)	(1.52)	(1.39)		(0.92)	(−0.26)	(1.10)	(1.86)	(1.43)	(1.61)
	[0.34]	[0.16]	[0.07]	[0.09]		[0.20]	[0.58]	[0.15]	[0.03]	[0.07]	[0.06]
	3.86%	4.13%	4.78%	4.49%		4.07%	3.86%	4.12%	5.13%	4.51%	4.54%
JPN	0.04	**0.11**	**0.11**	0.02	0.03		0.07	**0.09**	**0.11**	**0.12**	**0.11**
	(0.69)	(1.66)	(2.02)	(0.42)	(0.79)		(1.16)	(1.76)	(1.55)	(1.75)	(1.47)
	[0.26]	[0.06]	[0.02]	[0.35]	[0.23]		[0.14]	[0.04]	[0.06]	[0.04]	[0.09]
	1.67%	2.40%	2.54%	1.61%	1.72%		1.95%	2.46%	2.23%	2.39%	2.20%

Table AXII (continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i	$\hat{\beta}_{i,\text{AUS}}$	$\hat{\beta}_{i,\text{CAN}}$	$\hat{\beta}_{i,\text{FRA}}$	$\hat{\beta}_{i,\text{DEU}}$	$\hat{\beta}_{i,\text{ITA}}$	$\hat{\beta}_{i,\text{JPN}}$	$\hat{\beta}_{i,\text{NLD}}$	$\hat{\beta}_{i,\text{SWE}}$	$\hat{\beta}_{i,\text{CHE}}$	$\hat{\beta}_{i,\text{GBR}}$	$\hat{\beta}_{i,\text{USA}}$
NLD	**0.10**	**0.16**	**0.14**	**0.15**	0.04	**0.13**		**0.17**	**0.32**	0.12	**0.32**
	(1.49)	(2.05)	(2.06)	(1.74)	(0.93)	(2.42)		(2.94	(3.11)	(1.24)	(3.60)
	[0.08]	[0.03]	[0.03]	[0.05]	[0.19]	[0.01]		[0.00]	[0.00]	[0.13]	[0.00]
	2.61%	3.13%	2.87%	2.80%	2.08%	3.15%		4.37%	4.97%	2.38%	5.10%
SWE	−0.03	**0.17**	0.04	0.07	0.08	0.06	0.02		0.10	0.12	**0.24**
	(−0.30)	(1.94)	(0.89)	(0.84)	(1.12)	(0.83)	(0.21)		(1.06)	(1.08)	(2.33)
	[0.62]	[0.03]	[0.34]	[0.22]	[0.15]	[0.22]	[0.44]		[0.17]	[0.17]	[0.01]
	3.20%	4.29%	3.23%	3.37%	3.67%	3.37%	3.18%		3.49%	3.59%	4.83%
CHE	0.05	0.06	0.01	−0.02	0.01	0.04	0.03	**0.13**		0.04	**0.16**
	(0.90)	(0.83)	(0.09)	(−0.21)	(0.16)	(0.79)	(0.35)	(3.27)		(0.62)	(1.88)
	[0.21]	[0.23]	[0.48]	[0.57]	[0.45]	[0.24]	[0.37]	[0.00]		[0.29]	[0.04]
	4.94%	4.96%	4.72%	4.74%	4.73%	4.88%	4.76%	6.90%		4.82%	5.87%
GBR	**0.10**	0.08	0.06	0.001	−0.0001	**0.08**	−0.03	**0.09**	0.09		**0.23**
	(1.46)	(0.97)	(0.85)	(0.02)	(−0.003)	(1.61)	(−0.40)	(1.99)	(1.23)		(2.23)
	[0.09]	[0.18]	[0.23]	[0.49]	[0.51]	[0.05]	[0.63]	[0.04]	[0.13]		[0.01]
	0.87%	0.55%	0.48%	0.21%	0.21%	0.86%	0.28%	1.29%	0.66%		2.32%
USA	0.06	0.04	0.003	−0.02	**0.05**	−0.001	0.01	**0.09**	0.03	0.02	
	(1.08)	(0.36)	(0.06)	(−0.28)	(1.39)	(−0.03)	(0.16)	(2.30)	(0.36)	(0.21)	
	[0.15]	[0.36]	[0.50]	[0.58]	[0.10]	[0.50]	[0.45]	[0.01]	[0.37]	[0.43]	
	1.38%	1.09%	1.04%	1.06%	1.57%	1.04%	1.05%	2.37%	1.08%	1.06%	
Average	0.05	0.09	0.08	0.05	0.04	0.07	0.03	0.12	0.14	0.08	0.20
Pooled	0.03	**0.08**	**0.08**	0.05	0.03	**0.06**	0.02	**0.11**	**0.13**	**0.08**	**0.17**
	(0.64)	(1.34)	(1.88)	(1.02)	(1.20)	(1.50)	(0.36)	(3.49)	(2.17)	(1.45)	(2.93)
	[0.19]	[0.05]	[0.03]	[0.16]	[0.11]	[0.04]	[0.26]	[0.00]	[0.02]	[0.06]	[0.00]
	1.43%	1.49%	1.62%	1.44%	1.63%	1.51%	1.27%	2.38%	1.83%	1.69%	2.53%

Table AXIII

Pairwise Granger causality test results for returns measured in U.S. dollars, 1980:02–2010:12

The table reports OLS estimates of $\beta_{i,\text{USA}}$ (denoted by $\hat{\beta}_{i,\text{USA}}$) and the R^2 statistic for the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,i} r_{i,t} + \beta_{i,\text{USA}} r_{\text{USA},t} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1},\ i \neq \text{USA},$$

where $r_{i,t+1}$ is the monthly U.S. dollar excess return, $bill_{i,t}$ ($dy_{i,t}$) is the three-month Treasury bill rate (log dividend yield) for country i, and $r_{\text{USA},t}$ is adjusted for differences in market closing times (as described in Table AVII). Heteroskedasticity-robust t-statistics are reported in parentheses; t-statistics are for testing H_0: $\beta_{i,\text{USA}} = 0$ against H_A: $\beta_{i,\text{USA}} > 0$. Brackets report wild bootstrapped p-values; 0.00 indicates < 0.005. R^2 statistics are given below the bracketed p-values. Bold indicates significance at the 10% level. “Average” is the average of the $\hat{\beta}_{i,\text{USA}}$ estimates. “Pooled” estimate imposes the restrictions that $\beta_{i,\text{USA}} = \bar{\beta}_{\text{USA}}$ for all $i \neq \text{USA}$. Data are from *Global Financial Data*.

(1) i	(2) $\hat{\beta}_{i,\text{USA}}$	(3) i	(4) $\hat{\beta}_{i,\text{USA}}$	(5) i	(6) $\hat{\beta}_{i,\text{USA}}$
Australia	0.13	Italy	0.06	Switzerland	0.04
	(1.11)		(0.61)		(0.46)
	[0.15]		[0.29]		[0.34]
	1.16%		0.78%		1.25%
Canada	**0.23**	Japan	**0.11**	United Kingdom	**0.21**
	(2.09)		(1.34)		(2.09)
	[0.02]		[0.10]		[0.02]
	4.59%		2.26%		2.33%
France	0.04	Netherlands	**0.21**	Average	0.14
	(0.38)		(2.19)		
	[0.38]		[0.02]		
	1.01%		2.88%		
Germany	0.13	Sweden	**0.20**	Pooled	**0.12**
	(1.14)		(1.59)		(1.65)
	[0.15]		[0.07]		[0.04]
	1.52%		1.90%		1.27%

Table AXIV

Stability tests for augmented predictive regression models, 1980:02–2010:12

The table reports OLS estimates of $\beta_{i,\mathrm{USA},1}$ (denoted by $\hat{\beta}_{i,\mathrm{USA},1}$) for the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,i} r_{i,t} + (\beta_{i,\mathrm{USA},0} + \beta_{i,\mathrm{USA},1} \cdot t) r_{\mathrm{USA},t} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1},\ i \neq \mathrm{USA},$$

where $r_{i,t+1}$ is the monthly national currency excess return, $bill_{i,t}$ ($dy_{i,t}$) is the three-month Treasury bill rate (log dividend yield) for country i, and $r_{\mathrm{USA},t}$ is adjusted for differences in market closing times (as described in Table AVII). Heteroskedasticity-robust t-statistics are reported in parentheses; t-statistics are for testing H_0: $\beta_{i,\mathrm{USA},1} = 0$ against H_A: $\beta_{i,\mathrm{USA},1} < 0$. Brackets report p-values. The table also reports the Elliott and Müller (2006) $\widehat{qLL}$ statistic for testing H_0: $\beta_{i,\mathrm{USA},t} = \beta_{i,\mathrm{USA}}$ for all t in the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,i} r_{i,t} + \beta_{i,\mathrm{USA},t} r_{\mathrm{USA},t} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1},\ i \neq \mathrm{USA}.$$

The 10%, 5%, and 1% critical values from Elliott and Müller (2006, Table 1) are −7.14, −8.36, and −11.05 (where we reject for small values of $\widehat{qLL}$). Data are from *Global Financial Data*.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i	$\hat{\beta}_{i,\mathrm{USA},1}$	$\widehat{qLL}$	i	$\hat{\beta}_{i,\mathrm{USA},1}$	$\widehat{qLL}$	i	$\hat{\beta}_{i,\mathrm{USA},1}$	$\widehat{qLL}$
Australia	−0.0004	−6.39	Italy	0.0005	−3.05	Switzerland	0.0002	−1.53
	(−0.64)			(0.73)			(0.33)	
	[0.26]			[0.77]			[0.67]	
Canada	0.0004	−6.22	Japan	0.0001	−3.60	United Kingdom	0.0003	−3.71
	(0.79)			(0.16)			(0.44)	
	[0.78]			[0.56]			[0.67]	
France	0.0004	−2.45	Netherlands	0.0009	−4.77			
	(0.63)			(1.37)				
	[0.73]			[0.91]				
Germany	0.0003	−2.54	Sweden	−0.0007	−4.93			
	(0.52)			(−0.93)				
	[0.70]			[0.18]				

Table AXV

Testing the predictive power of lagged U.S. returns for returns computed from spot and futures prices

The table reports OLS estimates of $\beta_{i,\text{USA}}$ (denoted by $\hat{\beta}_{i,\text{USA}}$) and the R^2 statistic for the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \beta_{i,i} r_{i,t} + \beta_{i,\text{USA}} r_{\text{USA},t} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1},,$$

where $r_{i,t+1}$ is the monthly national currency excess return, $bill_{i,t}$ ($dy_{i,t}$) is the three-month Treasury bill rate (log dividend yield) for country i, and $r_{\text{USA},t}$ is adjusted for differences in market closing times (as described in Table AVII). Heteroskedasticity-robust t-statistics are reported in parentheses; t-statistics are for testing H_0: $\beta_{i,\text{USA}} = 0$ against H_A: $\beta_{i,\text{USA}} > 0$. Brackets report p-values; 0.00 indicates < 0.005. Bold indicates significance at the 10% level. The results in the third and fourth columns are based on returns computed from spot price data from *Global Financial Data*; the results in the fifth and sixth columns are based on returns computed from futures price data from *Datastream*. Treasury bill rate and dividend yield data are from *Global Financial Data*.

(1)	(2)	(3)	(4)	(5)	(6)
		Spot		Futures	
i	Sample	$\hat{\beta}_{i,\text{USA}}$	R^2	$\hat{\beta}_{i,\text{USA}}$	R^2
Germany	1990:12–2010:12	**0.22**	3.45%	**0.27**	2.91%
		(1.54)		(1.95)	
		[0.06]		[0.03]	
Japan	1988:10–2010:12	0.09	2.38%	0.08	0.92%
		(0.88)		(0.67)	
		[0.19]		[0.25]	
Netherlands	1988:11–2010:12	**0.39**	5.86%	**0.43**	6.04%
		(3.57)		(3.77)	
		[0.00]		[0.00]	
Switzerland	1990:12–2010:12	0.12	4.21%	**0.15**	3.25%
		(1.09)		(1.28)	
		[0.14]		[0.10]	
United Kingdom	1984:06–2010:12	**0.16**	4.23%	**0.19**	3.65%
		(1.47)		(1.55)	
		[0.07]		[0.06]	

Table AXVI

Testing the predictive power of lagged U.S. returns controlling for lagged returns for each non-U.S. country in turn, 1980:02–2010:12

The table reports pooled OLS estimates of $\bar{\beta}_{i,\text{USA}}$ and $\bar{\beta}_{i,j}$ (denoted by $\hat{\bar{\beta}}_{i,\text{USA}}$ and $\hat{\bar{\beta}}_{i,j}$, respectively) for the predictive regression model,

$$r_{i,t+1} = \beta_{i,0} + \bar{\beta}_i r_{i,t} + \bar{\beta}_{\text{USA}} r_{\text{USA},t} + \bar{\beta}_j r_{j,t} + \bar{\beta}_b bill_{i,t} + \bar{\beta}_d dy_{i,t} + \varepsilon_{i,t+1},$$

where $r_{i,t+1}$ is the monthly national currency excess return, $bill_{i,t}$ ($dy_{i,t}$) is the three-month Treasury bill rate (log dividend yield) for country i, and $r_{\text{USA,t}}$ and $r_{j,t}$ are adjusted for differences in market closing times (as described in Table AVII). Brackets report bias-corrected wild bootstrapped 90% confidence intervals. Bold indicates significance at the 10% level. Data are from *Global Financial Data*.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$\hat{\bar{\beta}}_{\text{USA}}$	$\hat{\bar{\beta}}_{\text{AUS}}$	$\hat{\bar{\beta}}_{\text{USA}}$	$\hat{\bar{\beta}}_{\text{CAN}}$	$\hat{\bar{\beta}}_{\text{USA}}$	$\hat{\bar{\beta}}_{\text{FRA}}$	$\hat{\bar{\beta}}_{\text{USA}}$	$\hat{\bar{\beta}}_{\text{DEU}}$	$\hat{\bar{\beta}}_{\text{USA}}$	$\hat{\bar{\beta}}_{\text{ITA}}$
0.19	−0.02	**0.19**	−0.02	**0.16**	0.03	**0.17**	0.001	**0.17**	0.02
[0.07, 0.29]	[−0.11, 0.07]	[0.08, 0.29]	[−0.13, 0.08]	[0.06, 0.26]	[−0.04, 0.09]	[0.07, 0.27]	[−0.07, 0.07]	[0.07, 0.26]	[−0.03, 0.06]
$\hat{\bar{\beta}}_{\text{USA}}$	$\hat{\bar{\beta}}_{\text{JPN}}$	$\hat{\bar{\beta}}_{\text{USA}}$	$\hat{\bar{\beta}}_{\text{NLD}}$	$\hat{\bar{\beta}}_{\text{USA}}$	$\hat{\bar{\beta}}_{\text{SWE}}$	$\hat{\bar{\beta}}_{\text{USA}}$	$\hat{\bar{\beta}}_{\text{CHE}}$	$\hat{\bar{\beta}}_{\text{USA}}$	$\hat{\bar{\beta}}_{\text{GBR}}$
0.16	0.03	**0.20**	−0.06	**0.14**	**0.07**	**0.15**	0.06	**0.17**	0.005
[0.07, 0.25]	[−0.03, 0.10]	[0.10, 0.30]	[−0.14, 0.02]	[0.04, 0.23]	[0.03, 0.12]	[0.04, 0.25]	[−0.05, 0.15]	[0.06, 0.27]	[−0.10, 0.11]

Table AXVII
Out-of-sample predictive ability of lagged U.S. returns for alternative baseline models, 1985:01–2010:12

The table reports the Campbell and Thompson (2008) out-of-sample R^2 statistic, R^2_{OS} (in percent), which measures the reduction in mean squared forecast error for the first-order autoregressive (AR) or benchmark predictive regressive model relative to a competing model that utilizes lagged U.S. returns. The AR model is given by $r_{i,t+1} = \beta_{i,0} + \beta_{i,i} r_{i,t} + \varepsilon_{i,t+1}$, where $r_{i,t+1}$ is the monthly national currency excess return for country i; the benchmark predictive regression model is given by $r_{i,t+1} = \beta_{i,0} + \beta_{i,b} bill_{i,t} + \beta_{i,d} dy_{i,t} + \varepsilon_{i,t+1}$, where $bill_{i,t}$ ($dy_{i,t}$) is the three-month Treasury bill rate (log dividend yield) for country i. The competing models include $r_{\mathrm{USA},t}$ as an additional regressor. The third, fifth, eighth, and tenth columns report results when slope homogeneity restrictions are imposed on the forecasting models. The simulated out-of-sample forecasts are based on models estimated recursively using OLS and data available through the month of forecast formation. Parentheses below the R^2_{OS} statistic report the Clark and West (2007) *MSFE-adjusted* statistic for testing H_0: $R^2_{OS} = 0$ against H_A: $R^2_{OS} > 0$. Bold indicates significance at the 10% level. "AVG" is the average of the R^2_{OS} statistics across the ten countries. Data are from *Global Financial Data*.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Baseline: AR		Baseline: benchmark predictive regression			Baseline: AR		Baseline: benchmark predictive regression	
i	R^2_{OS}	R^2_{OS}, pooled	R^2_{OS}	R^2_{OS}, pooled	i	R^2_{OS}	R^2_{OS}, pooled	R^2_{OS}	R^2_{OS}, pooled
AUS	**−0.27%**	**0.71%**	**−0.58%**	0.18%	NLD	**3.52%**	**3.66%**	**3.54%**	**6.72%**
	(1.42)	(3.57)	(1.56)	(0.77)		(3.35)	(2.35)	(2.58)	(3.52)
CAN	−1.94%	**0.34%**	**2.48%**	**5.43%**	SWE	**1.09%**	**1.83%**	**3.35%**	**4.59%**
	(0.85)	(1.99)	(2.60)	(2.78)		(1.59)	(2.79)	(2.38)	(3.35)
FRA	0.09%	**1.28%**	**1.56%**	**4.36%**	CHE	0.14%	**1.69%**	**2.68%**	**4.66%**
	(0.54)	(1.96)	(1.91)	(2.76)		(0.94)	(2.90)	(2.53)	(2.77)
DEU	**0.99%**	**2.23%**	**1.59%**	**3.37%**	GBR	**0.74%**	**2.34%**	0.47	**1.22%**
	(1.58)	(1.84)	(1.80)	(2.35)		(1.29)	(1.31)	(1.12)	(2.53)
ITA	0.36%	**1.76%**	**0.81%**	**3.26%**	AVG	0.49%	1.84%	1.68%	3.75%
	(1.00)	(4.33)	(1.47)	(1.62)					
JPN	0.14%	**1.65%**	**0.95%**	**3.68%**					
	(0.90)	(2.74)	(1.40)	(1.41)					