Internet Appendix to accompany

Currency Momentum Strategies

by

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Table A.1

Descriptive statistics: Individual currencies.

    This table shows descriptive statistics for individual currencies. Means and standard deviations for excess returns and forward discounts are annualized and in percent. Bid-ask spreads are in basis points. The sample period runs from January 1976 to January 2010.

	Sample		Excess returns		Forward discounts				Spreads	
Country	Start	End	mean	std	mean	std	max	min	mean	std
Australia	1984.12	2010.01	0.28	3.35	0.26	0.25	1.37	-0.57	12.92	6.47
Austria	1976.01	1998.12	-0.16	3.33	-0.32	0.28	0.54	-1.70	26.12	19.76
Belgium	1976.01	1998.12	-0.07	3.38	-0.10	0.33	2.23	-1.19	21.67	7.70
Brazil	2004.03	2010.01	1.45	4.49	0.81	0.35	0.69	-0.98	14.43	5.30
Bulgaria	2004.03	2010.01	0.24	3.12	0.06	0.19	1.17	-0.64	6.20	2.08
Canada	1976.01	2010.01	0.02	1.89	0.03	0.21	3.05	-0.35	7.60	2.44
Croatia	2004.03	2010.01	0.42	3.09	0.21	0.31	2.72	-1.12	17.93	6.74
Cyprus	2004.03	2007.12	0.43	2.05	0.01	0.17	1.77	-2.77	21.94	9.54
Czech Rep.	1997.01	2010.01	0.38	3.73	0.13	0.40	1.91	-0.85	13.80	9.41
Denmark	1976.01	2010.01	0.15	3.16	0.12	0.32	0.16	-0.55	13.12	6.92
Egypt	2004.03	2010.01	0.82	0.95	0.64	0.51	0.55	-1.52	43.86	18.60
Euro	1999.01	2010.01	0.12	3.03	-0.03	0.13	1.96	-0.95	4.99	1.83
Finland	1997.01	1998.12	-0.38	2.56	-0.19	0.03	1.93	-0.92	10.44	2.69
France	1976.01	1998.12	0.03	3.15	0.11	0.37	0.54	-1.07	14.31	10.80
Germany	1976.01	1998.12	-0.06	3.31	-0.22	0.34	1.80	-0.89	16.64	14.46
Greece	1997.01	2000.12	-0.31	3.12	0.41	0.25	-0.14	-0.25	11.17	5.69
Hong Kong	1983.1	2010.01	-0.01	0.21	-0.02	0.13	0.59	-2.04	4.10	6.98
Hungary	1997.1	2010.01	0.58	3.92	0.58	0.30	0.86	-0.60	16.74	7.87
Iceland	2004.03	2010.01	-0.20	5.77	0.60	0.20	21.51	-1.88	17.80	18.70
India	1997.1	2010.01	0.11	1.71	0.28	0.20	1.02	-1.80	10.34	8.01
Indonesia	1997.01	2010.01	-0.46	9.56	0.42	3.36	1.21	-1.11	61.67	80.27
Ireland	1976.01	1998.12	-0.31	2.72	0.08	0.24	3.34	-0.28	20.85	21.23
Israel	2004.03	2010.01	0.32	2.69	0.04	0.10	1.19	-0.15	18.67	6.42
Italy	1976.01	1998.12	0.14	3.11	0.42	0.39	1.38	0.07	18.61	11.56
Japan	1978.06	2010.01	-0.09	3.40	-0.30	0.27	1.02	-0.18	12.12	9.68
Kuwait	1997.01	2010.01	0.09	0.58	0.06	0.12	11.19	-17.43	11.45	16.30
Malaysia	1997.01	2010.01	-0.16	4.11	0.04	0.25	0.73	-0.23	6.66	9.84
Mexico	1997.01	2010.01	0.43	2.82	0.75	0.54	1.56	-0.32	9.56	8.47
Netherl.	1976.01	1998.12	-0.04	3.30	-0.16	0.29	2.81	0.14	17.06	16.45
New Z.	1984.12	2010.01	0.52	3.54	0.39	0.40	1.97	-0.03	22.15	15.67
Norway	1976.01	2010.01	0.14	2.94	0.15	0.37	0.72	-0.12	13.41	8.66
Philippines	1997.01	2010.01	0.08	2.85	0.44	0.33	7.62	-0.79	34.78	28.12
Poland	2002.02	2010.01	0.62	4.26	0.22	0.22	0.24	-0.27	14.18	4.60
Portugal	1976.01	1998.12	-0.05	3.36	0.74	1.03	0.34	-0.89	156.33	162.70
Russia	2004.03	2010.01	0.30	2.87	0.39	0.87	3.45	-1.15	6.83	3.23
S. Africa	1983.1	2010.01	0.55	5.19	1.15	2.30	1.00	-0.90	51.61	85.08

Table A.1 *(continued)*

Country	Sample Start	End	Excess returns mean	std	Forward discounts mean	std	max	min	Spreads mean	std
S. Korea	2002.02	2010.01	0.18	3.84	0.05	0.20	4.51	-0.20	17.56	18.83
Saudi A.	1997.01	2010.01	0.01	0.13	0.01	0.06	1.46	0.00	2.53	3.69
Singapore	1984.12	2010.01	0.02	1.53	-0.13	0.19	2.02	0.10	18.06	18.92
Slovakia	2002.02	2010.01	0.96	3.46	0.12	0.23	4.42	-0.27	14.48	5.38
Slovenia	2004.03	2006.12	0.25	2.21	0.02	0.15	0.58	-0.19	8.96	2.46
Spain	1976.01	1998.12	0.03	3.30	0.40	0.56	1.31	-0.20	24.61	14.74
Sweden	1976.01	2010.01	0.00	3.16	0.13	0.34	0.43	-0.20	14.85	6.08
Switz.	1976.01	2010.01	-0.07	3.57	-0.29	0.34	0.27	-0.14	16.11	15.88
Taiwan	1997.01	2010.01	-0.17	1.69	-0.07	0.30	1.15	0.10	17.09	11.17
Thai	1997.01	2010.01	0.07	3.76	0.22	0.52	0.35	-0.18	21.43	19.18
UK	1976.01	2010.01	0.12	3.10	0.18	0.24	0.42	-0.22	7.01	4.22
Ukraine	2004.03	2010.01	0.10	4.16	0.69	0.75	4.80	-0.33	61.04	55.17

Table A.2

Momentum returns over subsamples.

This table shows average momentum excess returns and Sharpe Ratios for four subsamples of equal length. All five momentum strategies have a holding period of one month ($h = 1$) and the formation period (f) is $f = 1, 3, 6, 9, 12$ months. Numbers in brackets are t-statistics based on Newey and West (1987).

				Formation period f		
		1	3	6	9	12
02/1976 – 07/1984	Mean	6.20	9.58	7.12	4.39	4.67
	t	[1.96]	[2.94]	[2.48]	[1.45]	[1.47]
	SR	0.70	1.02	0.84	0.53	0.53
08/1984 – 01/1993	Mean	7.79	9.86	6.40	5.80	4.96
	t	[2.09]	[3.15]	[2.06]	[1.75]	[1.77]
	SR	0.78	0.84	0.58	0.57	0.50
09/1984 – 07/2001	Mean	10.16	6.59	10.84	7.81	4.72
	t	[3.11]	[1.53]	[2.51]	[1.75]	[1.17]
	SR	0.93	0.53	0.82	0.56	0.41
08/2001 – 01/2010	Mean	12.37	12.83	9.08	11.49	10.10
	t	[3.05]	[3.86]	[2.43]	[3.00]	[2.47]
	SR	1.28	1.42	0.95	1.21	1.04

Table A.3
Momentum for individual currencies.

  This table reports descriptive statistics (mean, standard deviation, skewness, kurtosis) and Sharpe Ratios of momentum strategies in individual currencies (against the USD) in Panel A. These strategies go long (short) in the foreign currency if last month's return was positive (negative). Panel B reports the average of all individual countries' statistics ("Aver."), the same statistics as in Panel A but for an equally weighted portfolio of all individual strategies ("EW"), and, for comparison, the same statistics for the high minus low portfolio of a cross-sectional momentum strategy (MOM(1,1)).

Panel A. Individual currencies

	Mean	Std	Skew	Kurt	SR		Mean	Std	Skew	Kurt	SR
Australia	6.18	11.51	0.62	5.04	0.54	Japan	4.80	11.67	0.03	4.49	0.41
Austria	4.53	11.50	-0.07	3.88	0.39	Kuwait	0.73	2.04	2.27	18.88	0.36
Belgium	3.48	11.71	0.14	4.33	0.30	Malaysia	0.69	13.48	-4.83	49.52	0.05
Brazil	7.98	16.29	0.38	3.53	0.49	Mexico	4.63	9.83	0.47	8.23	0.47
Bulgaria	3.76	10.86	-0.69	5.96	0.35	Neth.	5.63	11.34	0.00	4.11	0.50
Canada	0.59	6.55	-0.75	12.62	0.09	New Z.	5.57	12.30	-0.20	4.96	0.45
Croatia	6.05	10.73	0.10	4.76	0.56	Norway	4.65	10.13	0.12	4.47	0.46
Cyprus	-0.57	7.32	0.08	2.66	-0.08	Philipp.	3.57	9.86	-0.36	8.02	0.36
Czech R.	2.19	12.95	-0.35	3.89	0.17	Poland	4.29	14.91	-0.20	5.24	0.29
Denmark	5.95	10.83	-0.12	4.14	0.55	Portugal	2.33	11.66	0.24	6.33	0.20
Egypt	9.44	3.41	1.25	8.69	2.76	Russia	10.91	9.52	2.86	15.05	1.15
Euro	7.58	10.19	-0.45	4.96	0.74	S. Africa	9.76	17.85	0.92	5.00	0.55
Finland	-7.53	8.52	0.13	3.43	-0.88	S. Korea	3.91	13.30	0.21	8.43	0.29
France	2.75	10.89	-0.17	3.88	0.25	Saudi A.	0.12	0.46	-6.06	52.52	0.26
Germany	5.00	11.39	0.01	3.96	0.44	Singapore	1.89	5.28	-0.76	5.76	0.36
Greece	3.20	10.88	-0.48	3.76	0.29	Slovakia	7.17	12.32	-0.54	4.15	0.58
Hong K.	0.37	0.73	0.31	8.79	0.51	Slovenia	2.19	7.76	0.27	2.33	0.28
Hungary	4.86	13.70	-0.50	8.69	0.35	Spain	5.99	11.11	-0.67	6.93	0.54
Iceland	8.50	19.99	1.08	7.18	0.43	Sweden	5.94	10.83	0.56	5.62	0.55
India	5.31	5.50	1.21	6.68	0.97	Switzerl.	3.46	12.33	-0.56	4.73	0.28
Indonesia	25.50	32.42	2.33	17.03	0.79	Taiwan	2.42	5.86	-0.52	6.99	0.41
Ireland	6.08	9.37	-0.14	3.42	0.65	Thailand	3.59	13.02	-1.48	15.83	0.28
Israel	0.90	9.46	-0.37	3.96	0.10	Ukraine	9.35	14.25	2.05	14.58	0.66
Italy	6.67	10.61	-0.17	4.86	0.63	U. Kingdom	4.11	10.68	0.00	4.69	0.39

Panel B. Aggregate statistics

	Mean	Std	Skew	Kurt	SR
Aver.	4.86	10.81	-0.06	8.48	0.45
EW	4.86	6.39	-0.14	5.97	0.76
MOM(1,1)	9.46	9.92	0.15	5.28	0.95

Table A.4

Comparing momentum and carry trade portfolios.

    This Table shows descriptive statistics for six momentum (Panel A) and six carry trade portfolios (Panel B). Currencies are sorted into six portfolios depending on their lagged one month excess return rx_{-1} (momentum portfolios) or their lagged forward discount $(f - s)_{-1}$ (carry trade portfolios). The 1/6 (16.67%) of all currencies with the lowest lagged excess return (or forward discount) are allocated to portfolio "Low", whereas the 1/6 of all currencies with the highest lagged excess returns (or forward discounts) are allocated to portfolio "High". Portfolios $2-5$ each consist of 1/6 of all currencies and have increasingly higher lagged excess returns (or forward discounts). Portfolios are rebalanced monthly. We also report results for an the average of all six portfolios ("Av.") and a portfolio that is long in portfolio "High" and short in portfolio "Low" ("H–L"). Shown are average annualized excess returns, the standard deviation, skewness, and kurtosis of excess returns. The last two rows of each panel show average lagged excess returns $\overline{rx}_{-1}$ and forward discounts $\overline{(f - s)}_{-1}$ for currencies in each portfolio at the time of portfolio formation. Also shown are average returns across the six portfolios ("Av.") and the difference between the "High" and "Low" portfolios ("H-L"). The sample period is Januar 1976 – January 2010.

	Low	2	3	4	5	High	Av.	H–L
Panel A: Momentum Portfolios ($f = 1$, $h = 1$)								
Mean	-4.17	-0.87	0.27	2.25	2.08	5.28	0.81	9.46
	[-2.36]	[-0.49]	[0.16]	[1.31]	[1.25]	[2.94]	[0.53]	[5.26]
Stand. Dev.	2.88	2.57	2.61	2.57	2.64	2.64	2.28	2.87
Skewness	-0.27	-0.79	-0.32	-0.26	-0.58	-0.29	-0.42	0.06
Kurtosis	5.97	6.38	4.45	4.61	6.78	4.49	4.48	5.29
$\overline{rx}_{-1}$	-2.93	-1.03	-0.23	0.42	1.21	2.94		
$\overline{(f - s)}_{-1}$	0.44	0.75	1.17	1.34	1.93	5.13		
Panel B: Carry Trade Portfolios								
Mean	-3.39	-1.41	0.24	1.32	2.04	6.77	0.93	10.15
	[-1.94]	[-0.93]	[0.15]	[0.81]	[1.17]	[3.22]	[0.61]	[5.79]
Stand. Dev.	2.71	2.39	2.39	2.49	2.64	2.98	2.28	2.64
Skewness	-0.21	-0.42	-0.28	-0.37	-0.75	-0.35	-0.37	-0.69
Kurtosis	4.85	4.34	5.58	5.12	5.84	4.33	4.34	4.20
$\overline{rx}_{-1}$	-0.32	-0.11	0.01	0.13	0.23	0.52		
$\overline{(f - s)}_{-1}$	-4.81	-1.79	0.02	1.59	4.02	11.65		

Table A.5
Turnover and relative bid-ask spreads of momentum portfolios.

This table shows turnover for different momentum portfolios, different combinations of formation (f) and holding (h) periods in Panel A. Numbers are in percent and show the average fraction of portfolio switches (relative to the total number of currencies in a portfolio) per month. We report results for the winner portfolio that contains currencies with the highest lagged excess returns (rows "High"), the loser portfolio that contains the currencies with the lowest lagged returns (rows "Low"), and the average across all six momentum portfolios for a given combination of f and h. Panel B shows relative bid-ask spreads for winner and loser portfolios. We report average bid-ask spreads (in basis points) in excess of the cross-sectional average bid-ask spread of all currencies in a given month. The sample period runs from January 1976 to January 2010.

| | | Panel A: Turnover | | | | | | | Panel B: Bid-ask spreads | | | | |
| | | Holding period h | | | | | | | Holding period h | | | | |
f	PF	1	3	6	9	12	f	PF	1	3	6	9	12
1	High	74.3	24.5	12.2	7.9	5.9	1	High	2.6	1.4	1	0.1	0.8
	Low	72.2	26.0	13.1	8.8	6.5		Low	3.1	2.1	1.4	0.4	0.8
	All	77.8	26.3	13.4	8.6	6.4							
3	High	42.4	24.2	12.8	7.9	6.1	3	High	2.7	0.3	0.8	0	0.9
	Low	43.8	24.9	12.9	8.8	6.3		Low	2.6	0.6	-0.1	-0.2	0.1
	All	59.1	26.3	13.0	8.8	6.5							
6	High	29.9	17.7	12.6	8.4	6.8	6	High	2.6	1	0.4	0.9	0.1
	Low	31.1	17.6	12.3	8.4	6.7		Low	4.1	0.6	0.1	0.4	0.4
	All	48.4	22.3	13.0	8.6	6.7							
9	High	23.6	13.8	9.9	8.3	6.5	9	High	3.5	1.4	1.2	0.2	0.5
	Low	24.0	14.3	9.8	7.7	6.4		Low	5.3	1.6	0.6	0.7	0.4
	All	40.3	19.1	11.7	8.5	6.6							
12	High	21.9	12.0	9.2	8.1	6.5	12	High	3.3	0.9	0.3	0	0.1
	Low	20.3	12.5	8.8	6.8	6.0		Low	6.9	2.4	0.9	0.6	0.6
	All	37.2	18.0	11.4	8.4	6.6							

Table A.6

Portfolio belongings.

  This table reports the share of months in which a country is included in the portfolio with lowest lagged returns (Portfolio Low) and the portfolio with highest lagged returns (Portfolio High). Results are based on the strategy with a formation and holding period of one month (MOM(1,1)).

Country	Low	High	Country	Low	High
Australia	0.18	0.19	Japan	0.32	0.21
Austria	0.08	0.02	Kuwait	0.04	0.02
Belgium	0.07	0.05	Malaysia	0.06	0.04
Brazil	0.03	0.09	Mexico	0.07	0.09
Bulgaria	0.01	0.01	Netherlands	0.07	0.05
Canada	0.24	0.26	New Zealand	0.15	0.21
Croatia	0.02	0.02	Norway	0.11	0.11
Cyprus	0.00	0.00	Philippines	0.07	0.08
Czech Republic	0.08	0.10	Poland	0.06	0.08
Denmark	0.08	0.11	Portugal	0.05	0.08
Egypt	0.00	0.03	Russia	0.01	0.01
Euro	0.03	0.02	South Africa	0.20	0.21
Finland	0.00	0.00	South Korea	0.04	0.04
France	0.05	0.05	Saudi A.	0.05	0.04
Germany	0.08	0.06	Singapore	0.11	0.05
Greece	0.01	0.02	Slovakia	0.03	0.05
Hong Kong	0.18	0.11	Slovenia	0.00	0.00
Hungary	0.04	0.08	Spain	0.07	0.12
Iceland	0.05	0.05	Sweden	0.12	0.13
India	0.04	0.05	Switzerland	0.27	0.18
Indonesia	0.12	0.10	Taiwan	0.07	0.02
Ireland	0.05	0.06	Thailand	0.05	0.06
Israel	0.02	0.03	United Kingdom	0.16	0.20
Italy	0.05	0.12	Ukraine	0.02	0.04

Table A.7

Momentum returns: Different base currencies.

    This table shows annualized average excess returns for different momentum strategies $(\overline{r^{f,h}})$ as in Table 1 in the main text but here we compute excess returns from the perspective of a non-U.S. investor, i.e., we change the base currency from U.S. dollars to British Pound (GBP), Swiss Franc (CHF), Canadian dollar (CAD), or Swedish kronor (SEK).

	Holding period h					f	Holding period h				
	1	3	6	9	12		1	3	6	9	12
f	Excess returns (GBP)						Excess returns (CHF)				
1	9.44	6.89	6.17	5.15	5.75	1	9.40	6.86	6.04	5.09	5.31
	[5.32]	[4.05]	[3.13]	[2.73]	[3.16]		[5.37]	[4.07]	[3.08]	[2.72]	[2.94]
3	9.38	6.36	5.05	4.92	4.66	3	9.47	6.39	4.93	4.76	4.41
	[5.28]	[3.80]	[3.08]	[3.06]	[2.87]		[5.34]	[3.85]	[3.03]	[2.98]	[2.74]
6	8.58	6.56	3.74	3.66	3.34	6	8.49	6.21	3.69	3.26	3.14
	[4.79]	[3.79]	[2.10]	[2.02]	[1.82]		[4.74]	[3.58]	[2.09]	[1.79]	[1.70]
9	7.28	6.93	5.45	3.89	3.50	9	7.09	6.72	5.43	3.76	3.47
	[3.86]	[3.71]	[2.91]	[2.07]	[1.79]		[3.78]	[3.63]	[2.90]	[2.01]	[1.77]
12	6.20	5.52	3.07	2.00	1.80	12	6.22	5.41	2.99	2.05	1.98
	[3.43]	[3.26]	[1.79]	[1.14]	[1.00]		[3.45]	[3.21]	[1.75]	[1.18]	[1.10]
f	Excess returns (CAD)					f	Excess returns (SEK)				
	1	3	6	9	12		1	3	6	9	12
1	9.27	6.81	5.96	5.01	5.32	1	9.48	6.98	6.12	5.09	5.63
	[5.23]	[4.06]	[3.05]	[2.68]	[2.94]		[5.33]	[4.06]	[3.09]	[2.72]	[3.09]
3	9.49	6.43	4.98	4.67	4.43	3	9.44	6.37	4.98	4.79	4.43
	[5.33]	[3.86]	[3.04]	[2.92]	[2.74]		[5.32]	[3.83]	[3.04]	[2.99]	[2.74]
6	8.57	6.43	3.61	3.27	3.15	6	8.58	6.30	3.76	3.27	3.20
	[4.77]	[3.68]	[2.02]	[1.80]	[1.70]		[4.76]	[3.63]	[2.11]	[1.80]	[1.73]
9	7.16	6.81	5.54	3.90	3.37	9	7.18	6.74	5.46	3.90	3.21
	[3.79]	[3.66]	[2.93]	[2.06]	[1.73]		[3.81]	[3.61]	[2.90]	[2.06]	[1.65]
12	6.18	5.44	3.04	2.06	1.96	12	6.17	5.46	3.14	2.04	1.96
	[3.40]	[3.20]	[1.76]	[1.17]	[1.08]		[3.41]	[3.22]	[1.82]	[1.17]	[1.08]

Table A.8

Momentum returns: Exchange rate changes for different base currencies.

This table shows annualized average spot exchange rate changes for different momentum strategies $(\overline{r^{f,h}})$ as in Table 1 in the main text but here we compute spot rate changes from the perspective of a non-U.S. investor, i.e., we change the base currency from U.S. dollars to British Pound (GBP), Swiss Franc (CHF), Canadian dollar (CAD), or Swedish kronor (SEK).

	Holding period h					f	Holding period h				
	1	3	6	9	12		1	3	6	9	12
f	Spot rate changes (GBP)						Spot rate changes (CHF)				
1	7.95	4.74	3.67	4.47	2.98	1	7.86	5.01	4.33	4.37	4.11
	[4.59]	[3.26]	[2.10]	[2.62]	[1.79]		[4.56]	[3.52]	[2.49]	[2.68]	[2.61]
3	9.31	6.27	5.49	5.36	5.66	3	8.96	5.58	5.24	4.88	5.81
	[5.35]	[3.92]	[3.74]	[3.16]	[3.72]		[5.33]	[3.53]	[3.66]	[2.97]	[3.88]
6	7.06	6.18	4.36	4.54	3.68	6	7.03	5.92	4.08	4.37	3.53
	[4.11]	[4.15]	[2.57]	[2.69]	[2.02]		[4.22]	[4.03]	[2.53]	[2.63]	[2.03]
9	8.90	8.07	7.42	5.52	5.40	9	8.76	7.67	6.65	5.27	4.51
	[5.05]	[4.74]	[4.40]	[3.24]	[2.94]		[5.14]	[4.61]	[4.05]	[3.18]	[2.59]
12	8.05	6.69	4.65	3.10	3.30	12	7.64	6.10	4.11	3.65	3.06
	[4.68]	[4.25]	[2.91]	[1.82]	[1.96]		[4.60]	[4.02]	[2.72]	[2.26]	[1.94]
	Spot rate changes (CAD)						Spot rate changes (SEK)				
f	1	3	6	9	12	f	1	3	6	9	12
1	8.57	5.02	3.56	5.06	3.24	1	7.84	4.97	3.72	5.42	3.48
	[4.98]	[3.41]	[2.01]	[3.02]	[2.08]		[4.51]	[3.47]	[2.11]	[3.28]	[2.23]
3	8.65	5.55	5.45	4.71	5.32	3	9.46	5.80	5.31	4.97	5.61
	[5.10]	[3.52]	[3.81]	[2.99]	[3.67]		[5.46]	[3.60]	[3.68]	[3.02]	[3.77]
6	7.16	5.47	3.53	4.17	3.26	6	6.68	5.65	3.78	4.48	3.68
	[4.23]	[3.76]	[2.13]	[2.63]	[1.80]		[3.95]	[3.83]	[2.34]	[2.74]	[2.09]
9	8.76	7.47	6.57	5.15	4.46	9	8.64	7.61	6.68	4.89	4.55
	[5.07]	[4.51]	[4.00]	[3.01]	[2.52]		[4.95]	[4.51]	[4.01]	[2.92]	[2.55]
12	7.58	5.92	3.88	3.40	3.02	12	8.04	6.39	4.68	3.61	3.54
	[4.54]	[3.87]	[2.56]	[2.14]	[1.90]		[4.73]	[4.08]	[3.02]	[2.21]	[2.17]

Table A.9

Macro risk for other base currencies.

    This table shows regressions of momentum returns (MOM(1,1)-strategy) for different base currencies (see Table A.7) on macro risk factors of the respective country. These risk factors are growth in industrial production (IP), CPI inflation (INF), growth in real money balances (narrow money, M), changes in terms spreads (10 year minus 3 month maturity, TS), and local stock market returns (Datastream country stock market indices, S). We report the intercept (α), slope coefficient (β), t-statistics (in brackets), and the R^2 (in percent) of univariate regressions of returns on one of these risk factors. The sample period is 1976 to 2010 and the frequency is monthly.

	IP	INF	M	TS	S
			United Kingdom		
α	0.77	0.73	0.77	0.83	0.77
	[5.01]	[4.61]	[5.02]	[4.35]	[5.02]
β	1.71	32.99	0.71	0.25	-2.45
	[0.17]	[1.15]	[0.23]	[0.24]	[-0.75]
$R^2(\%)$	0.01	0.31	0.01	0.04	0.20
			Switzerland		
α	1.14	0.87	0.86	0.76	0.83
	[4.47]	[4.87]	[4.75]	[5.01]	[3.97]
β	-73.85	-56.97	7.54	-0.26	-1.64
	[-2.58]	[-1.49]	[0.35]	[-0.87]	[-0.30]
$R^2(\%)$	3.59	0.53	0.04	0.16	0.08
			Canada		
α	1.01	0.78	0.75	0.76	0.76
	[3.77]	[4.09]	[4.92]	[5.01]	[4.66]
β	-20.93	-3.41	13.46	0.03	1.51
	[-0.71]	[-0.10]	[1.03]	[0.23]	[0.36]
$R^2(\%)$	0.42	0.00	0.30	0.01	0.07
			Sweden		
α	0.78	0.74	0.77	0.77	0.82
	[4.89]	[4.07]	[5.04]	[5.03]	[4.68]
β	-1.93	9.83	-1.89	0.02	-3.60
	[-0.38]	[0.51]	[-0.45]	[0.09]	[-1.08]
$R^2(\%)$	0.03	0.04	0.05	0.00	0.48

Table A.10

Momentum and currency regimes.

This table shows average excess returns for momentum portfolios when we restrict our universe of currencies to managed floats and floating currencies (Panel A) or only floating currencies (Panel B). We report average excess returns for six portfolios sorted on lagged one, six, and twelve month returns, and the high minus low momentum portfolio (H-L). Numbers in brackets are t-statistics based on Newey and West (1987). The sample starts in 1986 to obtain a sufficiently broad cross-section of floating currencies.

f	L	2	3	4	5	H	H-L
Panel A. Managed floats and floating currencies							
1	-4.17	1.18	2.28	2.43	2.93	9.02	13.19
	[-1.59]	[0.57]	[1.29]	[1.07]	[1.49]	[3.48]	[4.40]
6	-2.16	1.10	1.54	2.77	2.65	8.09	10.25
	[-0.68]	[0.58]	[0.87]	[1.46]	[1.28]	[2.97]	[3.07]
12	0.33	-0.09	1.32	2.69	5.45	6.98	6.65
	[0.11]	[-0.05]	[0.70]	[1.45]	[2.67]	[2.83]	[2.02]
Panel B. Floating currencies							
1	-1.28	-0.14	1.50	0.82	1.43	8.22	9.50
	[-0.51]	[-0.07]	[0.72]	[0.36]	[0.65]	[2.81]	[2.76]
6	0.12	-0.71	0.44	1.56	2.30	7.60	7.48
	[0.05]	[-0.38]	[0.22]	[0.86]	[1.08]	[2.35]	[2.27]
12	-0.51	-1.18	1.28	1.53	3.51	8.21	8.72
	[-0.19]	[-0.61]	[0.64]	[0.83]	[1.58]	[2.82]	[2.47]

Table A.11

Momentum returns and central bank interventions.

This table reports results for regressions of momentum returns (MOM(1,1), MOM(6,1), MOM(12,1)) on central bank intervention activity. Central bank interventions are calculated as the sum of absolute intervention volumes (in 100 million dollars) within each month and we consider all interventions in the USD based on data from the FRED database (Fed St. Louis). We include contemporaneous intervention volumes (cb), and two lags of intervention volumes. The sample period is 1976 to 2010 and the frequency is monthly.

	MOM(1,1)	MOM(6,1)	MOM(12,1)
const.	0.93	0.78	0.50
	[5.02]	[4.18]	[2.68]
cb	-0.03	0.01	0.03
	[-2.02]	[0.67]	[1.37]
cb_{t-1}	-0.01	-0.02	-0.02
	[-0.86]	[-1.08]	[-0.99]
cb_{t-2}	-0.01	-0.01	0.00
	[-0.76]	[-1.01]	[-0.24]
$\overline{R}^2(\%)$	0.43	-0.28	-0.18

Table A.12

Momentum returns since 1992.

    This table is identical to Table 1 in the maint text but here the sample period is January 1992 – January 2010 so that we are looking at a period where bid-ask spreads are significantly lower than in the very early part of our sample.

	Excess returns (without b/a)						Spot rate changes (without b/a)				
	Holding period h						Holding period h				
f	1	3	6	9	12	f	1	3	6	9	12
1	11.69	7.74	8.15	5.08	7.45	1	7.88	2.80	1.82	2.18	3.99
	[4.54]	[3.06]	[2.73]	[1.85]	[2.58]		[3.27]	[1.41]	[0.72]	[1.01]	[1.57]
3	9.95	8.12	7.82	3.25	6.79	3	6.90	5.99	5.65	2.64	5.63
	[3.64]	[3.11]	[3.09]	[1.29]	[2.66]		[2.78]	[2.64]	[2.63]	[1.11]	[2.42]
6	9.96	7.99	5.74	5.26	4.41	6	6.02	4.77	2.33	3.63	3.61
	[3.51]	[2.82]	[2.13]	[1.84]	[1.55]		[2.53]	[2.52]	[1.07]	[1.61]	[1.54]
9	9.77	8.59	7.08	5.20	1.93	9	8.47	6.36	6.12	4.68	2.62
	[3.25]	[2.87]	[2.34]	[1.66]	[0.72]		[3.54]	[2.65]	[2.46]	[1.90]	[1.26]
12	7.04	7.18	4.12	2.95	1.70	12	6.66	5.66	2.64	1.21	0.34
	[2.36]	[2.60]	[1.47]	[1.02]	[0.61]		[2.66]	[2.61]	[1.30]	[0.53]	[0.17]
	Excess returns (with b/a)						Spot rate changes (with b/a)				
	Holding period h						Holding period h				
f	1	3	6	9	12	f	1	3	6	9	12
1	7.27	4.21	4.87	2.07	4.33	1	4.55	1.49	1.06	1.81	3.70
	[2.85]	[1.70]	[1.68]	[0.75]	[1.54]		[1.89]	[0.77]	[0.43]	[0.84]	[1.46]
3	6.03	4.72	4.68	0.33	3.82	3	5.08	4.95	5.19	2.22	5.32
	[2.21]	[1.77]	[1.85]	[0.13]	[1.48]		[2.00]	[2.14]	[2.39]	[0.92]	[2.28]
6	6.41	4.70	2.86	2.16	1.51	6	4.69	4.05	1.74	3.30	3.41
	[2.28]	[1.64]	[1.05]	[0.75]	[0.52]		[1.96]	[2.13]	[0.80]	[1.47]	[1.45]
9	6.35	5.29	3.87	1.90	-0.86	9	7.53	5.80	5.73	4.39	2.47
	[2.07]	[1.76]	[1.27]	[0.59]	[-0.31]		[3.14]	[2.40]	[2.30]	[1.78]	[1.18]
12	3.79	4.00	1.12	0.08	-0.85	12	5.80	5.16	2.40	1.00	0.27
	[1.25]	[1.43]	[0.39]	[0.03]	[-0.30]		[2.31]	[2.36]	[1.17]	[0.44]	[0.13]

Table A.13

Momentum returns in developed countries.

    This setup of this table is identical to Table 1 in the main text but here we show results for a smaller sub-sample of 15 developed countries as defined in the main text.

	Excess returns						Spot rate changes				
	Holding period h						Holding period h				
f	1	3	6	9	12	f	1	3	6	9	12
1	3.83	4.79	3.88	2.95	2.24	1	2.89	3.67	4.44	3.05	2.82
	[2.72]	[3.27]	[2.00]	[1.40]	[1.39]		[1.60]	[2.28]	[2.54]	[1.64]	[1.70]
3	5.71	3.85	2.26	2.60	2.42	3	4.94	2.74	1.83	2.03	1.21
	[3.58]	[1.68]	[1.97]	[0.76]	[2.17]		[2.99]	[1.63]	[1.07]	[1.30]	[0.77]
6	3.70	2.59	1.83	1.85	-0.14	6	2.14	2.50	1.91	1.87	0.27
	[2.46]	[1.49]	[1.91]	[1.12]	[0.63]		[1.23]	[1.47]	[1.18]	[1.02]	[0.15]
9	3.96	3.35	2.04	1.36	-0.82	9	4.04	4.06	3.42	3.10	0.98
	[1.61]	[1.63]	[1.32]	[0.85]	[-0.65]		[2.14]	[2.22]	[1.92]	[1.77]	[0.53]
12	3.14	2.98	0.54	1.27	-0.16	12	3.06	2.69	1.28	1.63	0.55
	[1.84]	[2.02]	[1.14]	[1.66]	[0.77]		[1.63]	[1.53]	[0.75]	[1.03]	[0.33]

Table A.14

Momentum returns in developed countries after transaction costs.

    This setup of this table is identical to Table 1 in the main text but here we show results for a smaller sub-sample of 15 developed countries as defined in the main text.

	Net excess returns						Net spot rate changes				
	Holding period h						Holding period h				
f	1	3	6	9	12	f	1	3	6	9	12
1	0.79	2.11	1.38	1.50	0.50	1	0.86	3.00	4.14	2.83	2.58
	[0.44]	[1.23]	[0.77]	[0.79]	[0.29]		[0.47]	[1.83]	[2.39]	[1.52]	[1.55]
3	3.32	1.02	-1.23	1.31	-0.49	3	3.69	2.05	1.46	1.82	1.04
	[2.05]	[0.61]	[-0.73]	[0.79]	[-0.30]		[2.23]	[1.21]	[0.86]	[1.14]	[0.66]
6	1.96	0.83	-0.47	0.15	-1.87	6	1.33	2.03	1.59	1.65	0.11
	[1.18]	[0.49]	[-0.27]	[0.08]	[-1.04]		[0.76]	[1.19]	[0.94]	[0.87]	[0.06]
9	1.59	1.30	0.26	0.08	-3.55	9	3.38	3.66	3.15	2.88	0.79
	[0.89]	[0.76]	[0.14]	[0.05]	[-1.89]		[1.78]	[2.00]	[1.75]	[1.60]	[0.42]
12	1.25	1.05	-1.68	-0.17	-1.62	12	2.42	2.39	1.14	1.45	0.73
	[0.70]	[0.62]	[-0.95]	[-0.11]	[-1.01]		[1.29]	[1.36]	[0.65]	[0.89]	[0.42]

Table A.15

Momentum returns in developed countries starting in 1992.

This setup of this table is identical to Table A.14 but here we show results for developed countries of the sample period 1992 – 2010.

	Excess returns (without b/a)						Spot rate changes (without b/a)				
	Holding period h						Holding period h				
f	1	3	6	9	12	f	1	3	6	9	12
1	1.56	4.34	2.76	0.55	2.94	1	0.08	2.76	1.80	-0.28	2.37
	[1.04]	[2.07]	[0.51]	[-0.12]	[1.11]		[0.03]	[1.22]	[0.79]	[-0.12]	[0.91]
3	3.62	2.39	1.70	-0.21	3.38	3	2.35	1.13	0.83	0.29	4.27
	[2.01]	[0.61]	[1.67]	[-0.88]	[1.18]		[1.06]	[0.52]	[0.38]	[0.15]	[2.07]
6	0.80	0.31	2.26	3.30	4.95	6	-0.96	-0.25	1.54	2.66	4.47
	[0.86]	[0.11]	[1.18]	[0.89]	[1.38]		[-0.42]	[-0.11]	[0.70]	[1.02]	[1.70]
9	3.13	1.84	1.22	0.89	1.35	9	1.48	1.27	1.99	1.63	1.93
	[0.82]	[0.65]	[0.83]	[0.23]	[0.52]		[0.58]	[0.52]	[0.77]	[0.70]	[0.90]
12	2.27	2.41	0.97	1.87	0.35	12	1.20	1.89	0.89	0.81	0.94
	[0.89]	[1.27]	[1.07]	[1.87]	[0.48]		[0.47]	[0.77]	[0.38]	[0.38]	[0.41]
	Excess returns (with b/a)						Spot rate changes (with b/a)				
	Holding period h						Holding period h				
f	1	3	6	9	12	f	1	3	6	9	12
1	-0.73	2.16	0.79	-0.27	1.38	1	-1.50	2.26	1.65	-0.48	2.25
	[-0.32]	[0.93]	[0.34]	[-0.10]	[0.54]		[-0.65]	[0.96]	[0.74]	[-0.19]	[0.85]
3	1.38	-0.24	-1.82	-0.84	2.20	3	1.32	0.60	0.57	0.13	4.15
	[0.61]	[-0.10]	[-0.73]	[-0.35]	[0.90]		[0.59]	[0.28]	[0.26]	[0.06]	[1.87]
6	-1.19	-0.45	0.84	2.29	4.70	6	-1.55	-0.55	1.35	2.50	4.34
	[-0.53]	[-0.20]	[0.35]	[0.80]	[1.58]		[-0.68]	[-0.25]	[0.56]	[0.89]	[1.50]
9	1.29	0.45	0.35	0.51	0.46	9	1.03	0.96	1.82	1.48	1.64
	[0.52]	[0.19]	[0.13]	[0.20]	[0.18]		[0.40]	[0.40]	[0.69]	[0.59]	[0.71]
12	1.23	1.30	-1.06	1.37	-1.14	12	0.72	1.77	0.93	0.66	0.81
	[0.48]	[0.53]	[-0.42]	[0.63]	[-0.51]		[0.28]	[0.72]	[0.37]	[0.29]	[0.33]

Table A.16

Comparing momentum and carry trade portfolios: Risk characteristics.

    This Table shows shows portfolio excess returns for a momentum strategy with a one month formation and holding period (Panel A) as well as for the carry trade strategy (Panel B). For each portfolio of the two strategies, we report the average value of the country risk rating ($CRISK$) and exchange rate stability risk rating ($XSTAB$) at the time of portfolio formation. The risk ratings for each country are relative to the risk rating of the U.S. (deviation in %) and a higher value indicates higher risk.

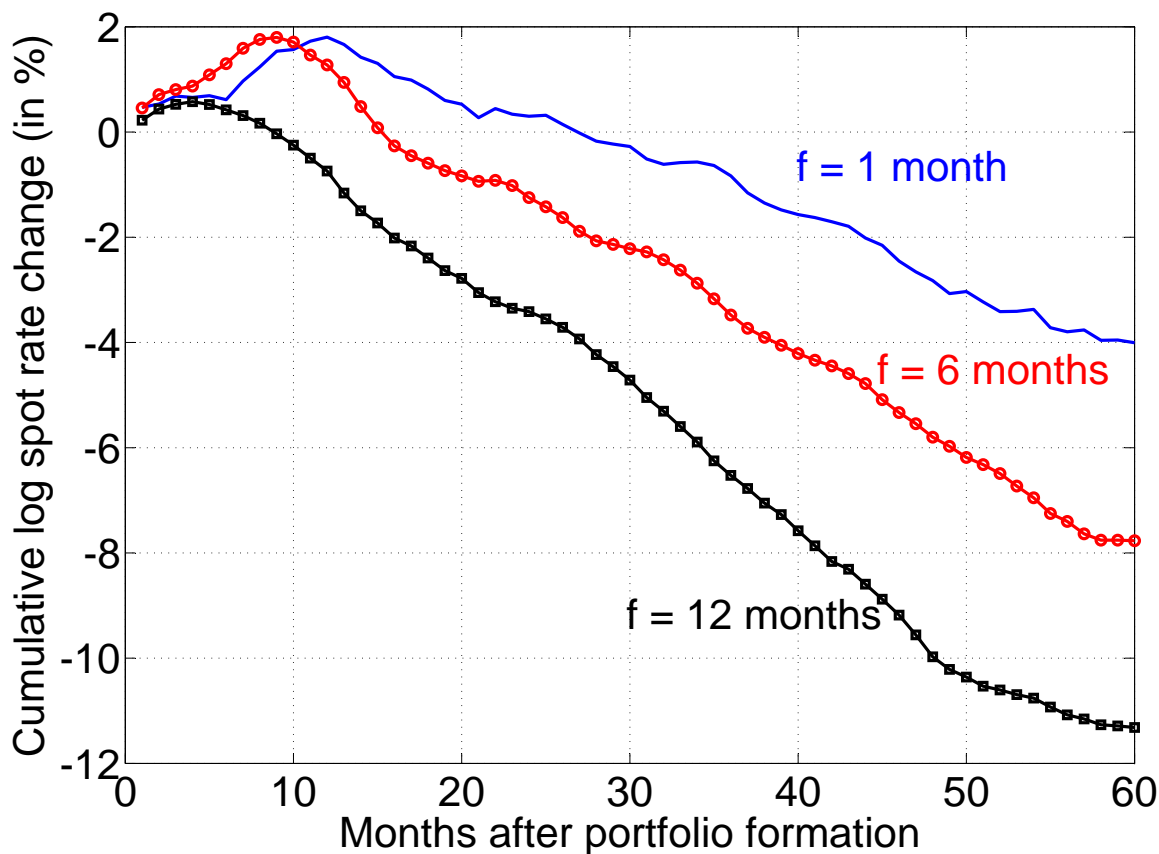|	Low	2	3	4	5	High	H–L
	Panel A: Momentum Portfolios ($f = 1$, $h = 1$)						
	Low	2	3	4	5	High	H–L
$CRISK$	2.71	0.96	0.52	0.71	1.25	3.58	0.87
	[3.91]	[1.91]	[1.07]	[1.37]	[2.65]	[5.76]	[1.44]
$XSTAB$	3.19	-0.25	-1.03	-0.57	-0.13	2.72	-0.47
	[0.56]	[-0.05]	[-0.18]	[-0.10]	[-0.02]	[0.47]	[-0.47]
	Panel B: Carry Trade Portfolios						
	Low	2	3	4	5	High	H–L
$CRISK$	-7.15	-5.36	-2.53	-1.99	0.44	4.72	11.87
	[-12.99]	[-8.57]	[-3.90]	[-3.22]	[0.68]	[8.44]	[20.47]
$XSTAB$	-7.66	-3.97	-1.67	-0.48	1.59	5.47	13.13
	[-1.30]	[-0.74]	[-0.30]	[-0.09]	[0.27]	[0.91]	[12.47]

Fig. A.1. Long-horizon spot rate changes of momentum portfolios. This figure shows cumulative average spot rate changes to three different long-short currency momentum portfolios after portfolio formation. Momentum portfolios differ in their formation period ($f = 1, 6, 12$ months) and post-formation returns are shown for $1, 2, \ldots, 60$ months following the formation period (i.e. we build new portfolios each months but track these portfolios for the first 60 months after their formation so that we are effectively using overlapping horizons). Spot rate changes are monthly and the sample period is 1976:1 – 2010:1.

Fig. A.2. Cumulative net excess returns of momentum strategies. This figure shows cumulative log excess returns adjusted for transaction costs accruing to three different momentum returns. The momentum strategies are for a formation period of 1, 6, and 12 months, respectively, and the holding period is one month. The bold, blue line shows returns to the momentum strategy with a one month formation period (MOM(1,1) in the figure), the dashed, red line shows returns to a strategy with a six months formation period (MOM(6,1)), whereas the thin, black line shows returns to a momentum strategy with a twelve months formation period (MOM(12,1)). Shaded areas correspond to NBER recessions.
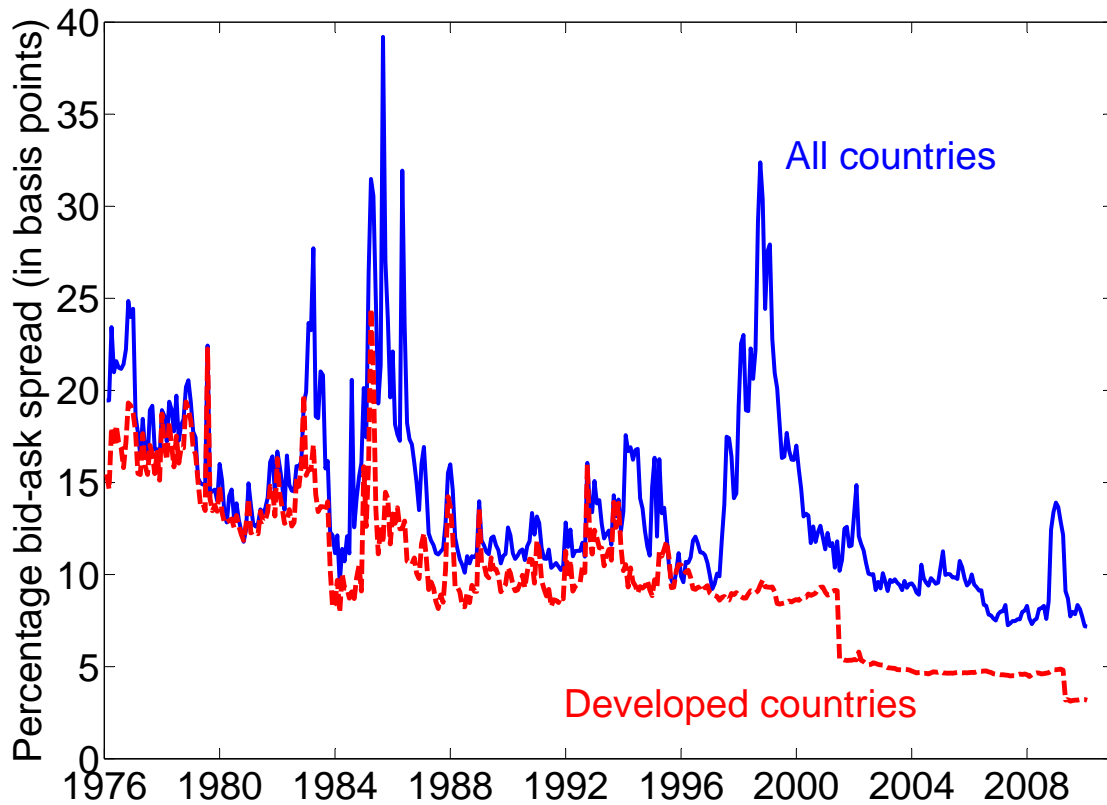
Fig. A.3. Bid-ask spreads over time. This figure shows percentage bid-ask spreads in basis points for the sample period from 1976:1 to 2010:1. The blue solid line shows average spreads for all countries whereas the red dashed line shows spreads for a subset of 15 developed countries. Shown are the average bid-ask spread across countries in a given month and we include both bid-ask spreads between spot rates as well as 1-month forward rates.
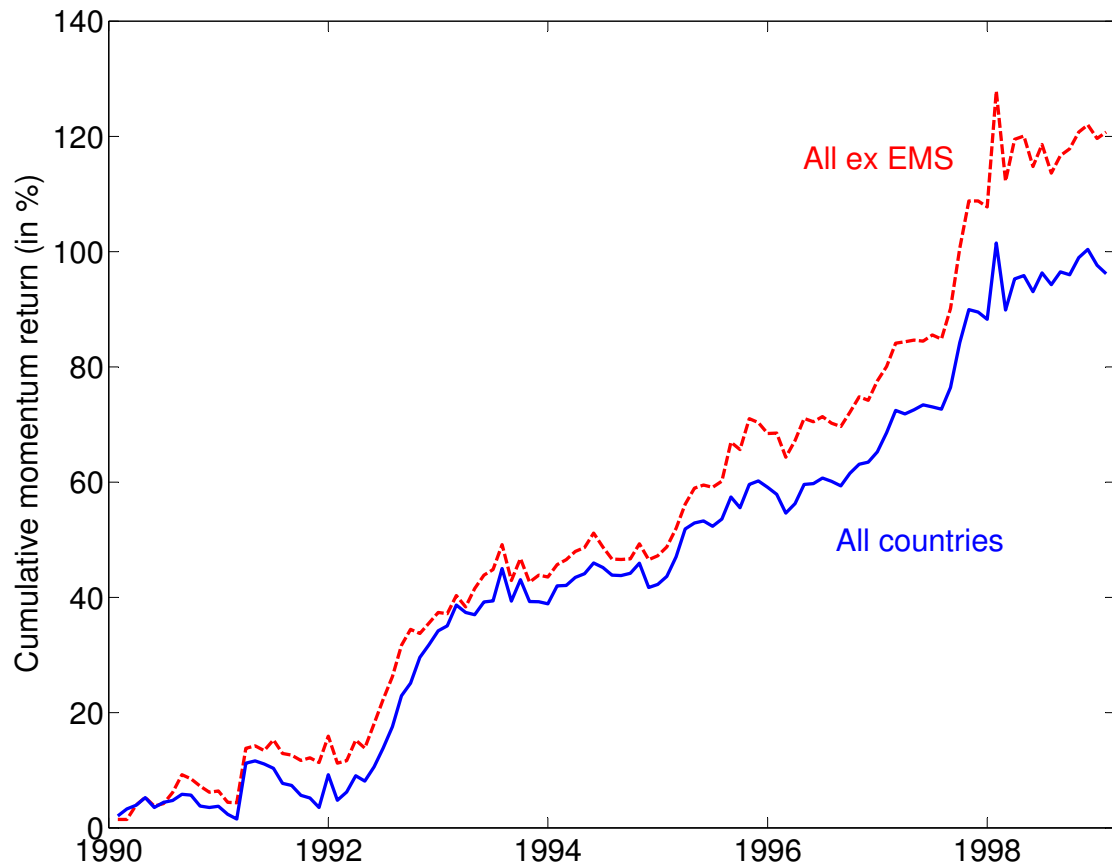
Fig. A.4. Excluding EMS member countries. This figure shows cumulative momentum excess returns (MOM(1,1)) over 1990s for the full set of countries (blue, solid line) and for a subset countries that excludes all EMS member countries except Germany.