

Online Appendix: Tables A1-A5

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Table A1. Data source of risk reversal

Economy	Currency	USD-based		Euro-based	
		Source	Data label or ticker	Source	Data label or ticker
Australia	Australian dollar	JPM	AUD/USD	JPM	AUD/EUR
Brazil	Brazilian real	JPM	BRL/USD	JPM	BRL/EUR
Canada	Canadian dollar	JPM	CAD/USD	JPM	CAD/EUR
China CNY	Onshore renminbi	JPM	CNY/USD	BBG	EURCNY25R3M Curncy
China CNH	Offshore renminbi	JPM	CNH/USD	BBG	EURCNH25R3M Curncy
Eurozone	Euro	JPM	EUR/USD	NA	NA
Hong Kong	Hong Kong dollar	JPM	HKD/USD	JPM	HKD/EUR
India	Indian rupee	JPM	INR/USD	JPM	INR/EUR
Japan	Japanese yen	JPM	JPY/USD	JPM	JPY/EUR
Mexico	Mexican peso	JPM	MXN/USD	JPM	MXN/EUR
New Zealand	New Zealand dollar	JPM	NZD/USD	JPM	NZD/EUR
Norway	Norwegian krone	JPM	NOK/USD	JPM	NOK/EUR
Russia	Russian ruble	JPM	RUB/USD	JPM	RUB/EUR
Singapore	Singapore dollar	JPM	SGD/USD	JPM	SGD/EUR
South Africa	South African rand	JPM	ZAR/USD	JPM	ZAR/EUR
South Korea	Korean won	JPM	KRW/USD	JPM	KRW/EUR
Sweden	Swedish krona	JPM	SEK/USD	JPM	SEK/EUR
Switzerland	Swiss franc	JPM	CHF/USD	JPM	CHF/EUR
Turkey	Turkish lira	JPM	TRY/USD	JPM	TRY/EUR
UK	British pound	JPM	GBP/USD	JPM	GBP/EUR
US	US dollar	NA	NA	JPM	USD/EUR
Gold		JPM	GLD/USD	JPM	GLD/EUR

Note: “JPM”, “BBG” and “TR” refer to databases of JP Morgan Chase, Bloomberg, and Thomson Reuters
Respectively

Table A2. Descriptive statistics of risk reversals vis-à-vis US dollar

Economy	Currency	Full sample period						Appreciation phase						Depreciation phase					
		Mean	Med.	Max.	Min.	SD	Size	Mean	Med.	Max.	Min.	SD	Size	Mean	Med.	Max.	Min.	SD	Size
Australia	Australian dollar	-2.04	-1.73	-0.40	-7.50	1.10	1609	-2.89	-2.50	-1.32	-7.50	1.32	608	-1.52	-1.55	-0.40	-2.85	0.42	1001
Brazil	Brazilian real	-3.48	-3.00	-1.75	-11.75	1.60	1609	-4.56	-4.00	-1.75	-11.75	2.11	608	-2.82	-2.75	-1.75	-5.25	0.55	1001
Canada	Canadian dollar	-1.15	-1.04	-0.12	-4.18	0.64	1609	-1.64	-1.44	-0.75	-4.18	0.71	608	-0.85	-0.80	-0.12	-1.55	0.33	1001
China (CNY)	Onshore renminbi	-0.98	-0.65	-0.03	-4.94	0.95	1609	-0.40	-0.30	-0.03	-2.25	0.36	608	-1.34	-0.95	-0.04	-4.94	1.03	1001
China (CNH)	Offshore renminbi	-1.11	-0.85	0.03	-4.50	0.92	1609	-0.63	-0.45	-0.05	-3.50	0.56	608	-1.40	-1.15	0.03	-4.50	0.98	1001
Eurozone	Euro	-1.28	-1.10	0.73	-4.35	0.94	1609	-1.76	-1.50	-0.25	-4.35	1.04	608	-0.98	-0.90	0.73	-3.10	0.73	1001
Hong Kong	Hong Kong dollar	0.35	0.35	1.30	-2.13	0.45	1609	0.55	0.55	1.25	0.25	0.18	608	0.22	0.29	1.30	-2.13	0.52	1001
India	Indian rupee	-1.71	-1.55	-0.35	-5.47	0.79	1609	-2.05	-2.29	-0.35	-5.47	1.06	608	-1.51	-1.48	-0.49	-3.13	0.45	1001
Japan	Japanese yen	0.57	0.56	2.74	-1.50	0.83	1609	0.13	-0.02	2.43	-1.50	0.78	608	0.83	0.84	2.74	-0.90	0.75	1001
Mexico	Mexican peso	-2.84	-2.50	-1.15	-9.50	1.19	1609	-3.79	-3.40	-1.95	-9.50	1.37	608	-2.27	-2.24	-1.15	-5.07	0.50	1001
New Zealand	New Zealand dollar	-1.95	-1.66	-0.44	-7.42	1.08	1609	-2.74	-2.30	-1.12	-7.42	1.35	608	-1.47	-1.47	-0.44	-2.68	0.41	1001
Norway	Norwegian krone	-1.37	-1.13	0.00	-4.35	0.92	1609	-1.77	-1.50	-0.25	-4.35	1.04	608	-1.13	-0.99	0.00	-4.18	0.75	1001
Russia	Russian ruble	-4.09	-3.21	-1.35	-19.45	2.96	1609	-2.96	-2.59	-1.35	-7.64	1.33	608	-4.77	-3.43	-1.44	-19.45	3.43	1001
Singapore	Singapore dollar	-1.20	-1.11	-0.19	-4.47	0.55	1609	-1.56	-1.37	-0.59	-4.47	0.65	608	-0.98	-1.00	-0.19	-1.70	0.32	1001
South Africa	South African rand	-3.66	-3.40	-2.11	-8.57	1.07	1609	-4.14	-3.77	-2.11	-8.57	1.42	608	-3.36	-3.22	-2.24	-5.99	0.62	1001
South Korea	Korean won	-2.43	-2.05	-0.69	-10.50	1.23	1609	-3.26	-2.90	-0.70	-10.50	1.58	608	-1.92	-1.88	-0.69	-4.35	0.51	1001
Sweden	Swedish krona	-1.31	-1.00	0.12	-4.35	0.91	1609	-1.76	-1.50	-0.25	-4.35	1.04	608	-1.03	-0.87	0.12	-3.00	0.68	1001
Switzerland	Swiss franc	-0.29	-0.50	3.10	-2.40	0.86	1609	-0.96	-0.95	2.00	-2.40	0.67	608	0.12	0.20	3.10	-1.35	0.70	1001
Turkey	Turkish lira	-3.51	-3.41	-1.05	-7.33	1.00	1609	-3.49	-3.46	-1.05	-7.33	1.36	608	-3.53	-3.37	-2.32	-5.60	0.70	1001
UK	British pound	-1.23	-1.01	-0.10	-6.40	0.94	1609	-1.27	-1.20	-0.30	-2.85	0.60	608	-1.20	-0.87	-0.10	-6.40	1.10	1001
Gold		-0.31	-0.10	4.00	-5.50	1.58	1609	-0.66	-0.10	4.00	-5.50	1.81	608	-0.09	-0.15	3.30	-2.85	1.37	1001

Table A3. Descriptive statistics of risk reversals vis-à-vis euro

Economy	Currency	Full sample period						Appreciation phase						Depreciation phase					
		Mean	Med.	Max.	Min.	SD	Size	Mean	Med.	Max.	Min.	SD	Size	Mean	Med.	Max.	Min.	SD	Size
Australia	Australian dollar	-0.91	-0.87	1.52	-3.06	0.57	1609	-1.05	-1.05	0.19	-2.81	0.47	608	-0.83	-0.81	1.52	-3.06	0.60	1001
Brazil	Brazilian real	-3.38	-2.75	-1.25	-12.00	1.70	1609	-4.60	-4.25	-1.75	-12.00	2.17	608	-2.64	-2.50	-1.25	-5.09	0.59	1001
Canada	Canadian dollar	0.09	0.09	2.19	-1.85	0.57	1609	0.39	0.22	2.19	-0.43	0.53	608	-0.10	-0.07	1.78	-1.85	0.52	1001
CHINA (CNY)	Onshore renminbi	0.39	0.35	3.70	-32.96	1.37	1609	1.24	0.92	3.70	-0.45	0.97	608	-0.12	-0.13	1.75	-32.96	1.31	1001
CHINA (CNH)	Offshore renminbi	0.32	0.18	4.30	-3.66	1.26	1609	1.18	0.79	4.30	-0.65	1.26	608	-0.21	-0.13	1.96	-3.66	0.93	1001
Hong Kong	Hong Kong dollar	1.38	1.23	4.53	-0.59	0.92	1609	1.90	1.62	4.53	0.36	1.01	608	1.06	1.08	3.12	-0.59	0.69	1001
India	Indian rupee	-0.52	-0.42	2.05	-2.72	0.72	1609	-0.45	-0.26	2.05	-2.72	0.87	608	-0.55	-0.49	1.53	-2.11	0.61	1001
Japan	Japanese yen	1.87	1.54	7.06	-0.37	1.25	1609	2.31	1.96	7.06	-0.37	1.68	608	1.61	1.36	5.59	0.23	0.77	1001
Mexico	Mexican peso	-2.23	-2.00	-0.70	-8.70	1.04	1609	-2.76	-2.50	-0.85	-8.70	1.42	608	-1.91	-1.85	-0.70	-4.29	0.50	1001
New Zealand	New Zealand dollar	-0.89	-0.84	1.40	-2.95	0.55	1609	-0.98	-0.95	0.19	-2.53	0.46	608	-0.83	-0.77	1.40	-2.95	0.60	1001
Norway	Norwegian krone	-0.88	-0.78	0.13	-3.62	0.50	1609	-0.68	-0.72	0.13	-1.42	0.38	608	-0.99	-0.85	-0.30	-3.62	0.52	1001
Russia	Russian ruble	-3.66	-2.80	-0.56	-19.59	3.17	1609	-1.90	-1.67	-0.56	-6.04	0.90	608	-4.72	-3.18	-1.06	-19.59	3.56	1001
South Africa	South African rand	-2.87	-2.69	-1.46	-7.01	0.76	1609	-3.07	-2.82	-1.46	-7.01	1.01	608	-2.75	-2.64	-1.56	-5.05	0.53	1001
South Korea	Korean won	-1.15	-1.14	0.78	-5.00	0.75	1609	-1.25	-1.18	0.36	-5.00	0.80	608	-1.09	-1.12	0.78	-3.47	0.72	1001
Singapore	Singapore dollar	0.20	0.10	2.66	-1.18	0.63	1609	0.55	0.35	2.66	-0.30	0.63	608	-0.01	0.04	1.73	-1.18	0.52	1001
Sweden	Swedish krona	-0.67	-0.61	-0.08	-1.79	0.31	1609	-0.69	-0.65	-0.20	-1.37	0.33	608	-0.66	-0.60	-0.08	-1.79	0.31	1001
Switzerland	Swiss franc	0.81	0.87	5.47	-2.20	1.54	1609	0.28	0.19	5.16	-2.20	1.90	608	1.14	1.10	5.47	-1.10	1.16	1001
Turkey	Turkish lira	-2.72	-2.72	-0.88	-5.41	0.82	1609	-2.48	-2.24	-0.88	-5.41	1.04	608	-2.87	-2.77	-1.70	-4.87	0.60	1001
UK	British pound	0.07	0.27	2.17	-5.49	1.04	1609	0.61	0.44	2.17	-0.45	0.66	608	-0.26	-0.03	1.86	-5.49	1.09	1001
US	US dollar	1.28	1.10	4.35	-0.73	0.94	1609	1.76	1.50	4.35	0.25	1.04	608	0.98	0.90	3.10	-0.73	0.73	1001
GOLD		0.23	0.46	4.51	-5.40	1.47	1609	-0.17	0.44	4.51	-5.40	1.82	608	0.47	0.48	3.26	-2.37	1.14	1001

Table A4. Descriptive statistics of stock volatility indices

Stock market	Volatility index	Mean	Med.	Max.	Min.	SD	Size
<i>Full sample</i>							
S&P 500	VIX	16.12	14.44	48.00	9.14	5.77	1609
Dow Jones	VXD	15.27	13.84	41.45	7.58	5.02	1609
NASDAQ	VXN	17.83	16.36	46.61	10.31	5.33	1609
Euro Stoxx 50	V2X	21.88	20.41	53.55	10.68	7.11	1609
DAX	V1X	20.85	19.26	50.74	10.98	6.86	1609
CAC 40	VCAC	20.50	19.25	55.59	0.43	6.73	1609
FTSE 100	VFTSE	16.10	14.73	43.61	6.19	5.73	1609
NIKKEI 225	VNKY	22.94	21.65	49.84	12.19	5.99	1609
Hang Seng	VHSI	19.29	17.53	51.97	11.36	6.13	1609
1st principal component		0.00	-0.66	12.79	-3.80	2.81	1609
<i>Appreciation phase</i>							
S&P 500	VIX	18.88	16.49	48.00	11.30	7.11	608
Dow Jones	VXD	17.27	15.01	41.45	10.08	6.36	608
NASDAQ	VXN	19.82	17.78	46.61	12.03	6.67	608
Euro Stoxx 50	V2X	24.74	22.14	53.55	14.12	8.46	608
DAX	V1X	22.92	19.93	50.74	12.96	8.55	608
CAC 40	VCAC	22.97	20.56	55.59	12.98	7.88	608
FTSE 100	VFTSE	18.46	16.14	43.61	10.50	6.84	608
NIKKEI 225	VNKY	24.83	23.65	46.19	16.71	5.69	608
Hang Seng	VHSI	21.15	18.84	51.97	12.28	7.14	608
1st principal component		0.00	-0.97	9.67	-2.95	2.81	608
<i>Depreciation phase</i>							
S&P 500	VIX	14.44	13.55	40.74	9.14	3.91	1001
Dow Jones	VXD	14.06	13.37	34.51	7.58	3.47	1001
NASDAQ	VXN	16.62	15.66	42.95	10.31	3.86	1001
Euro Stoxx 50	V2X	20.14	19.43	40.80	10.68	5.47	1001
DAX	V1X	19.60	18.96	38.29	10.98	5.22	1001
CAC 40	VCAC	18.99	18.45	39.27	0.43	5.40	1001
FTSE 100	VFTSE	14.67	13.76	32.48	6.19	4.36	1001
NIKKEI 225	VNKY	21.80	20.55	49.84	12.19	5.87	1001
Hang Seng	VHSI	18.16	17.02	41.01	11.36	5.11	1001
1st principal component		0.00	-0.38	13.57	-4.05	2.79	1001

Table A5. Data source of one-month short-term interest rates

Economy/ Currency	Description	CEIC series code	Bloomberg ticker	Source
Australia	Australia Bank Bill 1 Month		ADBB1M Curncy	Bloomberg
Brazil	Brazil Selic Target Rate		BZSTSETA Index	Bloomberg
Canada	Canada Bankers Acceptances 1 M		CDOR01 Index	Bloomberg
China (CNH)	CNH HIBOR: TMA: 1 Month	299608204 (HDOCAD)		Treasury Markets Association
China (CNY)	China Interbank Offered Rate (CHIBOR): NIBFC: WA Rate: 30 Day	3796701 (CDOBE)		National Interbank Funding Center
Euro	LIBOR: ICE: Euro: 1 Month	15692001 (GDOMA)		ICE Benchmark Administration Limited
Gold (rate proxied by USD)	LIBOR: ICE: USD: 1 Month	15675801 (GDOAA)		ICE Benchmark Administration Limited
Hong Kong	HIBOR: Hong Kong Association of Banks: 1 Month	16761701 (HDOBA)		Hong Kong Association of Banks
India	Mumbai Interbank Offer Rate: FIMMDA-NSE: 1 Month: Offer & Mumbai Interbank Outright Rate: FBIL: 1 Month	19315201 (IDOBC) & 370012307 (IDOT0012A AAAAD)		National Stock Exchange of India Limited & The Clearing Corporation of India Limited
Japan	Tokyo Interbank Offered Rate: FBAJ: Fixing: 1 Month	23681501 (JDOAA)		JBA TIBOR Administration
Mexico	Equilibrium Interest Rate (TIIE): 28 Days	32816901 (MXDOA)		Bank of Mexico
New Zealand	NZD Bank Bill 1 Month		NDBB1M Index	Bloomberg
Norway	Norwegian Interbank Offered Rate: Oslo Bors: Nominal: 1 Month	107358708		Oslo Stock Exchange
Russia	Interbank Rate (MIACR): Moscow Market Avg: Actual: 8 to 30 Days	105704901		The Central Bank of the Russian Federation
Singapore	ABS: SIBOR-Deposit: SGD: 1 Month	35971801 (SDOBA)		The Association of Banks in Singapore
South Africa	JIBAR: 1 Month	346999302		Johannesburg Stock Exchange
South Korea	Korea Interbank Offered Rate: Yonhapinfomax Inc: 1 Month	69852901 (KDOBAAA C)		Yonhapinfomax Inc.
Sweden	Stockholm Interbank Offered Rate: Riksbank: Middle: 1 Month	109171308		The Riksbank
Switzerland	LIBOR: ICE: CHF: 1 Month	15680001 (GDODA)		ICE Benchmark Administration Limited
Turkey	Banks Association: TRLIBOR: Bid: 1 Month	53868302 (TRDOAC)		The Banks Association of Turkey
UK	LIBOR: ICE: GBP: 1 Month	15677301 (GDOBA)		ICE Benchmark Administration Limited
US	LIBOR: ICE: USD: 1 Month	15675801 (GDOAA)		ICE Benchmark Administration Limited