

Global Foreign Exchange Derivatives Analytics Package

For Business: Monday April 27, 2020

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Global FX Strategy

FX G10 Volatility Snapshot

Currency Pair	Current Implied Vols							2-year Average Implied Vols							2-year Z-Score of Implied Vols							2-year Max of Implied Vols							2-year Min of Implied Vols							Realized Vols		
	1M	3M	6M	1Y	2Y	3Y	5Y	1M	3M	6M	12M	2Y	3Y	5Y	1M	3M	6M	12M	2Y	3Y	5Y	1M	3M	6M	12M	2Y	3Y	5Y	1M	3M	6M	12M	2Y	3Y	5Y	1M	3M	1Y
AUDCAD	9.6	9.7	9.5	9.3	9.4	9.6	9.9	6.6	6.7	6.8	6.9	7.2	7.5	8.0	1.4	1.7	1.8	2.0	1.9	1.9	1.8	22.2	18.7	16.6	14.4	13.7	14.0	14.5	4.7	5.1	5.4	5.6	5.7	5.9	6.4	12.6	12.9	8.0
AUDCHF	12.2	12.2	12.1	12.0	12.1	12.3	12.6	8.0	8.2	8.5	8.9	9.2	9.5	10.1	1.5	1.7	1.9	2.0	2.0	2.0	2.0	27.1	25.0	22.6	19.8	18.6	18.2	17.7	5.6	6.2	6.5	7.1	7.4	7.8	8.4	11.9	15.5	9.8
AUDJPY	13.6	13.7	13.7	13.5	13.2	13.0	12.7	9.9	10.1	10.3	10.7	11.1	11.6	12.5	1.1	1.4	1.6	1.7	1.5	1.1	0.1	33.8	28.1	25.1	22.1	20.1	19.2	18.1	6.4	7.3	7.7	8.3	8.9	9.4	10.0	13.4	18.3	11.5
AUDNZD	6.0	6.0	6.2	6.2	6.3	6.3	6.2	5.3	5.4	5.6	5.8	6.0	6.3	6.7	0.8	0.7	0.9	0.6	0.4	0.1	-0.8	11.7	10.8	9.9	9.1	9.6	10.0	10.3	3.8	4.3	4.5	4.7	5.0	5.2	5.6	7.8	7.6	5.4
AUDUSD	13.4	12.8	12.3	11.9	12.1	12.1	12.2	8.3	8.3	8.5	8.8	9.3	9.5	10.0	1.7	2.0	2.0	2.1	2.0	1.9	1.8	29.2	24.2	21.1	18.5	17.8	17.8	17.5	5.1	5.8	6.2	6.7	7.1	7.4	7.8	15.2	18.2	10.5
CADJPY	11.6	11.6	11.4	11.2	10.5	10.6	11.1	8.7	8.9	9.1	9.4	9.6	9.8	10.5	1.0	1.3	1.4	1.3	0.7	0.7	0.5	27.0	21.5	18.4	15.8	14.4	14.0	14.1	5.5	6.0	6.4	7.0	7.4	7.8	8.6	11.7	14.8	9.5
CADNZD	10.0	9.8	9.6	9.4	9.7	10.1	10.5	7.2	7.3	7.5	7.7	7.9	8.2	8.6	1.5	1.6	1.7	1.7	1.8	1.9	1.8	23.0	20.5	18.4	15.9	15.1	15.0	15.0	5.5	6.0	6.2	6.4	6.6	6.8	7.1	10.5	12.2	8.1
CHFJPY	7.8	7.7	7.5	7.5	7.7	7.9	8.2	6.1	6.4	6.6	6.9	7.2	7.5	8.0	1.1	1.1	0.9	0.6	0.5	0.5	0.3	16.3	13.6	11.6	9.6	9.2	9.4	10.2	3.9	4.5	4.9	5.3	5.6	5.9	6.5	7.2	9.2	6.2
EURAUD	11.0	11.0	10.9	10.7	10.9	11.2	11.4	7.1	7.3	7.4	7.7	8.0	8.3	8.7	1.5	1.8	1.9	2.1	2.3	2.3	2.1	25.7	23.2	20.6	17.7	16.6	16.3	16.3	4.5	5.1	5.6	6.0	6.3	6.6	7.0	12.1	14.9	8.9
EURCAD	8.7	8.7	8.4	8.3	8.7	9.2	9.9	6.3	6.4	6.6	6.8	7.3	7.7	8.3	1.3	1.5	1.4	1.3	1.3	1.6	1.7	17.8	16.5	14.8	13.2	13.0	12.1	13.0	3.7	4.1	4.4	4.8	5.3	5.7	6.5	8.1	10.6	6.5
EURCHF	5.4	5.7	5.9	6.2	6.5	6.7	7.2	4.8	5.0	5.2	5.4	5.8	6.1	6.7	0.7	1.0	1.1	1.2	1.2	1.1	1.0	8.4	8.1	7.8	7.6	7.9	8.2	8.6	3.5	4.0	4.1	4.3	4.6	5.0	5.8	3.1	3.3	3.8
EURGBP	8.2	9.1	9.1	9.4	9.5	9.7	10.1	7.9	8.3	8.3	8.2	8.3	8.5	8.9	0.1	0.4	0.5	1.0	1.1	1.2	1.3	18.0	16.2	14.1	11.6	11.5	11.8	12.1	4.7	5.1	5.4	5.9	6.1	6.4	7.1	9.6	12.6	9.1
EURJPY	9.6	10.1	10.2	10.3	9.9	9.6	9.6	7.4	7.7	7.9	8.3	8.6	8.9	9.4	1.1	1.5	1.7	1.7	1.2	0.7	0.3	21.7	16.8	14.2	12.2	11.2	10.9	11.1	4.3	5.2	5.7	6.3	6.6	6.9	7.5	8.2	9.9	7.2
EURNOK	14.7	14.0	13.4	12.7	12.7	12.6	12.6	7.0	6.9	7.0	7.1	7.3	7.6	8.1	2.0	2.5	3.0	3.8	3.9	3.8	3.7	39.0	28.6	23.0	18.5	18.1	18.5	18.5	4.7	5.3	5.6	5.8	6.2	6.5	7.0	16.8	22.0	12.0
EURNZD	11.2	10.8	10.8	10.6	10.8	11.1	11.3	7.3	7.5	7.7	8.0	8.4	8.7	9.1	1.6	1.7	1.9	2.0	2.0	2.0	1.9	25.2	23.0	20.6	17.9	16.7	16.4	16.3	5.0	5.7	6.0	6.4	6.7	7.0	7.5	11.3	13.5	8.5
EURSEK	7.0	7.4	7.5	7.6	7.7	7.8	8.1	6.1	6.2	6.2	6.4	6.6	6.9	7.4	0.7	1.1	1.3	1.5	1.4	1.2	1.0	16.8	14.6	13.1	11.7	11.7	11.9	12.2	4.4	4.8	5.0	5.1	5.5	5.8	6.4	9.1	10.0	6.7
EURUSD	7.7	8.1	8.2	8.4	8.8	9.2	9.6	6.1	6.3	6.5	6.8	7.2	7.6	8.2	1.0	1.3	1.4	1.6	1.6	1.8	1.8	14.2	13.0	12.1	11.5	11.5	11.6	11.8	3.7	4.2	4.4	4.9	5.3	5.8	6.6	6.9	9.8	6.1
GBPAUD	11.1	11.8	11.6	11.8	12.2	12.8	13.3	9.3	9.8	9.8	9.8	10.0	10.3	10.6	0.7	0.9	1.0	1.4	1.7	2.1	2.5	26.7	24.1	21.2	17.9	17.1	17.4	17.6	5.8	6.4	6.6	7.0	7.5	8.0	8.6	9.2	11.5	9.4
GBPCAD	10.3	11.0	10.7	10.8	11.1	11.6	12.0	8.9	9.2	9.2	9.1	9.2	9.4	9.8	0.6	0.8	0.9	1.4	1.8	2.1	2.3	21.3	19.3	17.1	14.6	14.0	14.2	14.6	5.4	5.8	6.1	6.5	7.0	7.4	7.9	10.9	11.8	9.1
GBPCHF	8.5	9.3	9.3	9.7	10.0	10.2	10.7	8.4	8.9	8.9	8.9	9.0	9.2	9.6	0.0	0.2	0.3	0.8	1.0	1.2	1.4	18.2	16.7	14.8	12.6	12.1	12.3	12.9	5.1	6.1	6.3	6.7	7.0	7.3	7.8	8.4	12.4	10.1
GBPJPY	10.8	11.6	11.6	11.8	11.9	12.0	12.5	10.4	10.8	10.7	10.8	10.9	11.1	11.5	0.2	0.4	0.5	0.8	0.8	0.8	1.0	23.4	19.7	17.5	15.1	15.5	15.9	15.7	6.6	6.9	7.3	7.8	8.3	8.7	9.2	8.7	14.5	11.3
GBPNOK	14.8	15.2	14.7	14.7	14.1	13.7	13.4	9.5	9.9	9.8	9.7	9.6	9.7	9.9	1.6	2.0	2.4	3.3	3.4	3.4	3.2	35.2	26.3	23.3	19.7	18.4	18.3	18.4	5.6	7.0	7.2	7.5	7.7	7.8	8.2	19.2	23.5	14.1
GBPNZD	11.2	11.7	11.6	11.8	12.2	12.7	13.2	9.5	10.0	10.0	10.0	10.2	10.5	10.8	0.7	0.7	0.9	1.3	1.6	2.0	2.3	27.2	24.2	21.4	17.8	17.1	17.4	17.7	6.2	6.7	7.0	7.4	7.9	8.4	9.0	9.8	12.1	9.9
GBPUSD	10.4	11.1	10.8	11.2	11.5	11.8	12.3	9.3	9.6	9.5	9.4	9.5	9.8	10.3	0.4	0.6	0.8	1.4	1.7	1.7	1.9	22.0	19.1	16.6	14.0	14.1	14.2	14.5	5.5	5.7	6.1	6.7	7.0	7.3	8.0	11.2	15.7	10.8
NOKSEK	12.7	12.3	11.9	11.5	11.1	10.8	10.5	6.2	6.2	6.3	6.3	6.5	6.8	7.1	2.2	2.7	3.1	4.0	4.2	4.0	3.6	30.3	23.5	19.5	15.5	14.7	14.9	15.3	4.0	4.5	4.9	5.1	5.5	5.8	6.1	14.8	17.8	9.8
NZDCHF	12.3	12.0	12.0	11.9	12.1	12.4	12.8	8.1	8.4	8.7	9.1	9.6	10.1	10.6	1.7	1.8	1.9	2.0	2.0	1.9	1.9	27.1	25.3	22.9	20.0	18.9	18.4	18.0	6.1	6.5	6.9	7.3	7.9	8.4	9.0	10.9	13.8	9.1
NZDJPY	13.5	13.4	13.4	13.3	13.0	12.9	12.8	9.9	10.1	10.3	10.7	11.1	11.5	12.3	1.1	1.4	1.5	1.6	1.5	1.2	0.5	34.0	28.0	25.0	22.1	20.4	19.5	18.4	6.8	7.8	8.0	8.6	9.1	9.6	10.3	13.6	16.9	10.8
NZDUSD	13.3	12.4	12.1	11.8	11.9	12.0	12.1	8.4	8.5	8.7	9.1	9.5	9.8	10.3	2.0	2.0	2.1	2.0	2.0	1.8	1.6	29.2	24.0	21.0	18.4	17.8	17.7	17.5	5.4	6.4	6.8	7.2	7.6	8.0	8.5	13.9	17.6	10.6
USDCAD	9.3	8.6	8.0	7.7	8.0	8.4	9.1	6.2	6.2	6.3	6.6	6.9	7.4	8.1	1.7	1.7	1.4	1.1	1.1	1.1	1.2	15.8	13.1	11.9	10.9	10.9	11.4	12.1	3.7	4.0	4.1	4.5	4.9	5.5	6.4	9.4	10.9	6.5
USDCHF	7.0	7.6	7.7	7.9	8.2	8.6	9.0	5.9	6.2	6.4	6.8	7.2	7.6	8.2	0.9	1.4	1.4	1.4	1.3	1.3	1.1	12.9	12.1	11.4	11.0	11.2	11.5	11.8	3.9	4.6	4.9	5.4	5.7	6.0	6.7	7.1	9.3	6.6
USDJPY	7.8	8.3	8.5	8.6	8.2	8.1	8.0	6.8	7.0	7.2	7.6	7.8	8.0	8.3	0.4	0.8	1.0	1.1	0.5	0.2	-0.3	21.7	16.9	14.2	11.8	10.6	9.7	9.5	4.0	4.8	5.2	5.9	6.2	6.5	6.9	7.1	12.5	7.8
USDNOK	16.7	16.1	15.4	14.7	14.6	14.8	15.0	9.0	9.1	9.2	9.3	9.7	10.1	10.7	1.9	2.3	2.6	3.3	3.5	3.5	3.3	38.4	30.0	25.1	20.8	19.7	20.2	20.9	6.0	6.5	6.9	7.4	7.9	8.5	9.2	18.7	26.4	14.5
USDSEK	9.8	10.4	10.5	10.8	11.2	11.6	12.0	8.4	8.6	8.8	9.0	9.4	9.8	10.3	0.7	1.1	1.2	1.5	1.7	1.8	1.8	20.6	19.1	17.5	16.0	15.7	16.0	16.3	6.0	6.3	6.5	7.0	7.5	8.1	8.8	11.7	14.8	9.2

Global FX Strategy

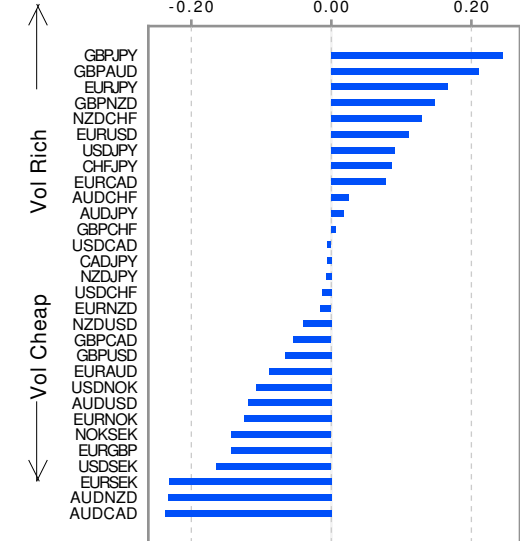
FX EM Volatility Snapshot

Currency Pair	Current Implied Vols							2-year Average Implied Vols							2-year Z-Score of Implied Vols							2-year Max of Implied Vols							2-year Min of Implied Vols							Realized Vols		
	1M	3M	6M	1Y	2Y	3Y	5Y	1M	3M	6M	12M	2Y	3Y	5Y	1M	3M	6M	12M	2Y	3Y	5Y	1M	3M	6M	12M	2Y	3Y	5Y	1M	3M	6M	12M	2Y	3Y	5Y	1M	3M	1Y
CADMXN	19.6	18.2	17.2	16.6	16.5	16.7	16.9	11.4	11.3	11.3	11.5	12.1	12.6	13.2	1.6	1.9	2.0	2.3	2.2	2.1	1.9	37.6	28.4	22.8	18.6	17.8	18.4	19.1	5.6	6.4	6.8	7.3	8.0	8.6	9.2	25.0	24.1	14.2
EURBRL	26.0	22.7	20.8	19.2	19.2	19.7	20.6	14.8	14.5	14.3	14.1	14.5	15.1	16.2	2.4	2.3	2.4	0.6	0.4	0.1	2.2	36.2	27.7	23.6	19.7	19.8	19.7	20.6	9.3	9.7	10.0	10.5	10.9	11.5	12.3	15.1	22.0	14.7
EURMXN	21.6	20.0	18.7	18.0	18.8	19.4	19.8	12.2	12.0	12.2	12.6	13.1	13.6	14.5	1.6	2.0	2.1	2.2	2.3	2.4	2.4	41.7	28.9	24.1	21.1	21.1	21.8	22.5	6.3	6.9	7.4	8.0	8.5	9.0	10.3	24.4	27.6	16.0
MXNJPY	23.2	21.9	21.1	20.7	20.3	20.2	20.9	13.9	13.7	13.9	14.3	14.9	15.4	16.4	1.5	1.9	2.1	2.5	2.4	2.2	2.1	44.8	33.6	28.3	23.6	22.3	22.4	23.3	7.4	8.5	9.1	10.1	10.6	11.1	12.3	28.3	32.1	18.9
USDBRL	26.7	23.3	21.1	19.2	19.4	19.6	20.7	15.0	14.7	14.5	14.3	14.8	15.3	16.6	2.5	2.4	2.5	2.4	2.3	2.2	2.2	34.9	25.1	21.2	19.2	19.4	19.6	20.7	9.2	9.8	10.0	10.4	10.8	11.4	12.5	17.5	20.4	14.0
USDCLP	15.4	14.8	14.1	13.4	13.6	13.9	15.2	11.2	11.0	10.8	10.8	11.3	11.5	12.8	1.8	2.1	2.1	2.1	1.9	1.9	1.8	19.8	17.2	15.5	15.0	15.5	15.6	16.8	8.2	8.4	8.7	9.1	9.6	9.7	10.9	13.4	15.9	13.6
USDCOP	18.9	17.8	16.2	14.6	14.8	14.9	15.4	12.5	12.3	12.3	12.3	12.9	13.3	14.1	2.0	2.2	2.1	1.7	1.5	1.2	0.8	28.0	23.2	20.2	17.5	17.9	18.3	18.6	9.1	9.6	10.0	10.7	11.2	11.4	11.9	16.0	23.9	15.1
USDMXN	21.7	20.2	19.0	18.3	18.5	18.6	19.0	12.5	12.2	12.3	12.7	13.2	13.7	14.7	1.6	2.1	2.2	2.3	2.3	2.2	2.0	41.0	27.3	23.1	20.5	20.5	20.7	21.5	6.4	6.8	7.3	8.0	8.5	9.1	10.1	27.3	27.8	15.9
EURCZK	9.0	7.7	6.9	6.2	6.3	6.2	6.2	4.0	4.0	4.1	4.2	4.5	4.6	4.9	2.6	2.7	2.9	3.2	3.3	3.0	2.5	13.6	10.6	8.8	7.4	7.4	7.4	7.4	2.2	2.8	3.1	3.6	3.9	4.0	4.3	8.7	12.6	6.4
EURHUF	8.6	8.0	7.5	7.2	7.2	7.3	7.5	5.3	5.3	5.4	5.5	5.7	6.1	6.9	2.3	2.6	2.6	2.4	2.1	1.8	0.9	12.1	9.8	8.6	7.8	7.8	7.9	8.2	3.6	3.9	4.2	4.5	4.8	5.2	5.6	10.8	9.9	6.2
EURPLN	7.4	6.9	6.5	6.2	6.2	6.1	6.2	4.8	4.8	5.0	5.2	5.3	5.6	6.3	1.8	1.8	1.6	1.2	1.0	0.6	-0.1	12.3	9.5	8.0	6.9	6.9	7.3	8.5	2.9	3.2	3.5	3.9	4.2	4.4	4.9	5.9	8.3	5.0
EURRUB	20.7	19.1	17.8	16.6	16.9	17.4	18.4	11.6	11.7	12.1	12.5	13.3	14.0	15.2	2.0	2.1	2.1	1.9	1.9	1.8	1.7	36.8	27.8	23.5	19.8	20.3	20.8	21.8	6.2	7.4	8.4	9.2	9.9	10.7	12.0	25.8	31.2	18.0
EURTRY	22.0	23.2	23.7	24.3	25.2	26.0	27.4	18.7	18.9	19.4	20.1	21.3	22.3	23.8	0.4	0.7	0.9	1.0	1.0	1.0	1.1	62.1	48.3	41.1	35.7	35.2	35.5	35.6	7.2	9.2	11.2	13.2	15.2	16.5	18.4	14.8	15.9	16.7
EURZAR	22.2	20.1	18.8	17.5	17.8	17.9	18.4	15.1	15.1	15.2	15.4	16.0	16.6	17.7	2.0	2.0	1.8	1.4	1.3	1.0	0.6	30.3	25.4	22.2	20.6	20.5	21.1	22.5	9.8	11.5	12.4	13.3	14.0	14.7	16.1	19.4	19.7	14.7
USDCZK	12.2	11.9	11.4	10.9	10.9	11.1	11.3	7.7	7.8	8.0	8.4	8.8	9.1	9.4	1.8	2.1	2.1	2.1	2.1	2.0	2.0	21.0	18.0	16.0	14.2	13.6	13.7	13.8	4.9	5.3	5.7	6.3	6.9	7.4	7.8	14.1	17.5	9.5
USDHUF	11.7	11.5	11.3	11.3	11.4	11.7	12.1	8.8	8.9	9.1	9.5	9.8	10.4	11.1	1.6	1.7	1.7	1.6	1.5	1.3	1.0	17.3	15.6	14.6	14.0	14.5	14.8	15.0	6.0	6.5	7.2	7.7	8.0	8.5	9.1	16.6	16.4	10.2
USDILS	9.0	8.4	7.7	7.0	7.1	7.3	7.8	5.8	5.8	5.8	5.9	6.3	6.8	7.4	1.7	2.0	1.9	1.5	1.1	0.8	0.6	17.6	13.3	11.0	9.4	9.7	10.2	10.8	3.7	4.1	4.4	4.8	5.2	5.7	6.3	11.3	17.0	9.3
USDPLN	10.6	10.6	10.5	10.4	10.5	10.7	11.1	8.3	8.5	8.8	9.2	9.6	10.0	10.4	1.2	1.3	1.1	0.9	0.8	0.7	0.7	17.3	15.1	13.8	12.9	13.4	14.0	14.4	5.4	5.9	6.4	7.0	7.3	7.7	8.9	11.8	14.9	8.9
USDRUB	20.4	19.0	17.7	16.5	16.6	17.0	18.1	11.7	11.8	12.1	12.6	13.3	14.0	15.3	1.9	2.2	2.1	1.9	1.7	1.6	1.6	35.9	26.7	22.5	19.2	19.5	20.0	21.1	6.1	7.5	8.4	9.3	10.2	10.9	12.3	26.1	30.8	17.8
USDTRY	21.8	23.4	24.1	24.3	25.2	26.1	27.6	18.9	19.0	19.5	20.3	21.5	22.5	24.0	0.4	0.7	0.9	1.0	1.0	1.0	1.1	63.4	47.6	40.7	35.9	35.7	35.9	35.9	7.1	9.1	11.0	13.4	15.5	16.7	18.6	18.0	16.9	16.8
USDZAR	22.5	20.5	19.1	17.7	18.0	18.3	19.3	16.0	16.0	16.1	16.3	17.1	17.7	18.9	1.9	1.9	1.6	0.9	0.7	0.4	0.4	29.2	23.9	22.4	21.5	21.9	22.6	24.0	10.4	12.4	13.4	14.2	15.1	15.8	17.2	22.2	20.1	14.8
AUDSGD	10.2	9.8	9.3	8.7	8.8	9.0	9.3	5.9	6.0	6.1	6.3	6.5	6.7	7.0	1.9	2.2	2.2	2.1	2.1	2.1	2.2	22.3	17.7	15.6	14.4	13.6	13.5	13.6	3.8	4.2	4.5	4.7	4.9	5.1	5.3	13.0	16.2	9.4
EURINR	11.9	11.9	11.7	11.8	12.2	12.5	12.7	7.8	8.0	8.2	8.4	8.8	9.2	9.7	2.0	2.3	2.5	2.8	2.9	3.0	3.0	19.3	16.7	15.3	14.4	14.5	14.4	14.5	5.3	5.8	6.2	6.7	7.2	7.6	8.1	7.8	13.0	8.4
EURKRW	12.0	12.2	12.2	12.3	12.8	13.3	13.7	7.7	7.9	8.1	8.4	8.9	9.4	10.2	1.6	1.9	2.1	2.3	2.4	2.4	2.2	27.5	23.8	21.6	20.1	19.8	20.0	19.9	4.7	5.5	6.0	6.6	7.2	7.7	8.3	9.5	15.2	9.6
EURSGD	6.5	6.8	6.9	7.1	7.5	7.8	8.1	4.7	4.9	5.0	5.3	5.7	6.1	6.8	1.4	1.7	1.9	2.1	2.1	2.0	1.6	12.0	10.9	10.3	9.9	9.8	9.9	10.1	3.1	3.4	3.7	4.0	4.4	4.7	5.3	6.8	9.3	5.9
JPYKRW	13.3	13.5	13.6	13.7	13.7	13.8	13.5	10.0	10.1	10.3	10.6	10.9	11.2	11.6	1.0	1.4	1.7	2.0	2.0	1.8	1.4	32.4	26.2	23.2	21.2	20.3	20.3	19.7	6.5	7.2	7.8	8.5	9.1	9.1	9.4	11.0	19.0	11.9
JPYSGD	8.3	8.8	9.0	9.2	9.0	8.9	8.6	6.9	7.0	7.2	7.5	7.8	8.0	8.2	0.6	1.0	1.3	1.7	1.5	1.1	0.5	23.8	17.8	14.9	12.8	11.8	11.4	11.1	4.4	5.1	5.6	6.2	6.4	6.6	6.8	8.0	12.6	8.1
SGDINR	8.7	8.7	8.3	8.0	7.9	7.9	7.9	6.3	6.5	6.6	6.7	6.9	7.1	7.3	1.6	1.6	1.6	1.5	1.3	1.1	0.8	13.3	12.3	11.2	9.8	9.6	9.7	9.9	4.2	4.5	4.8	5.2	5.5	5.6	5.8	7.4	9.0	6.1
USDCNH	4.9	5.3	5.4	5.5	5.7	5.8	6.0	5.3	5.4	5.5	5.7	6.0	6.2	6.5	-0.4	-0.2	-0.2	-0.3	-0.4	-0.5	-0.7	9.4	8.4	7.9	7.6	7.7	7.9	8.4	3.2	3.7	4.0	4.4	4.7	4.9	5.1	2.8	4.8	4.7
USDCNY	4.5	4.9	5.0	5.1	5.5	5.7	5.8	5.0	5.1	5.3	5.5	5.8	6.0	6.3	-0.5	-0.3	-0.4	-0.5	-0.4	-0.5	-0.7	8.9	8.0</															

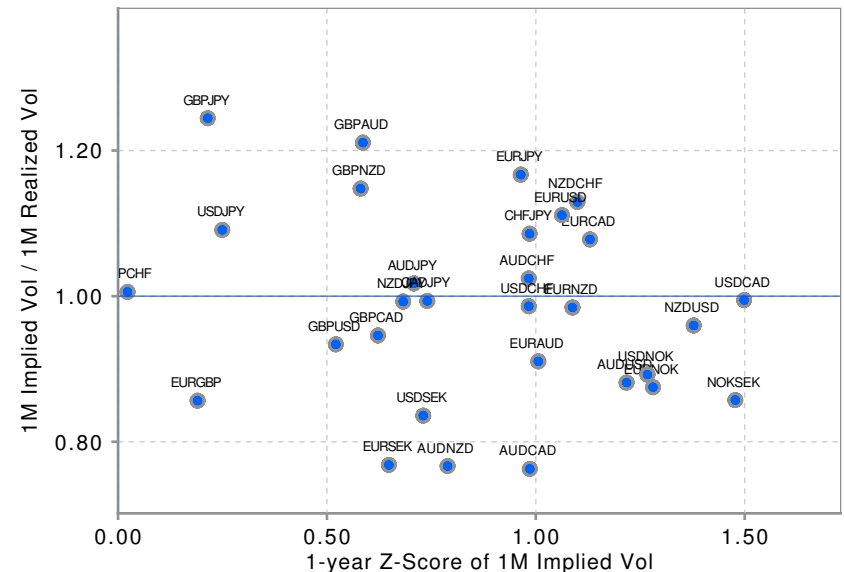
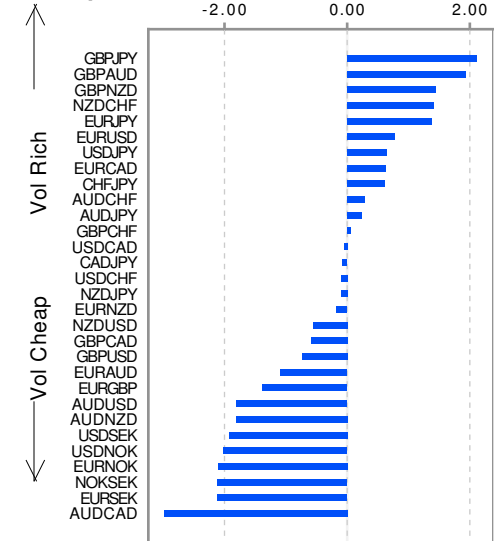
Global FX Strategy

Short-Dated Vol Rankings

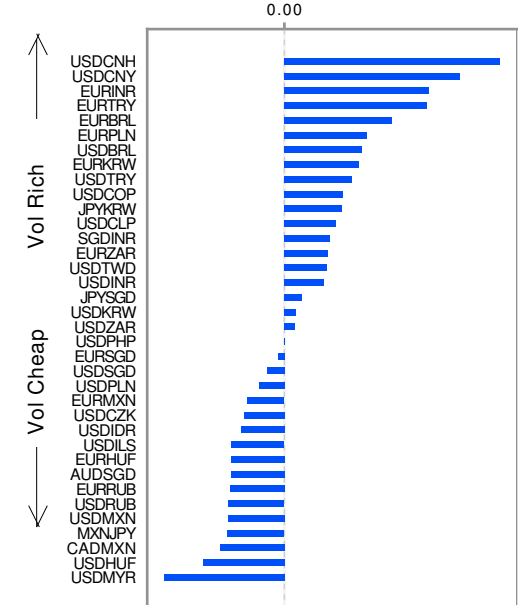
1M Normalized Volatility Risk Premium (G10)*



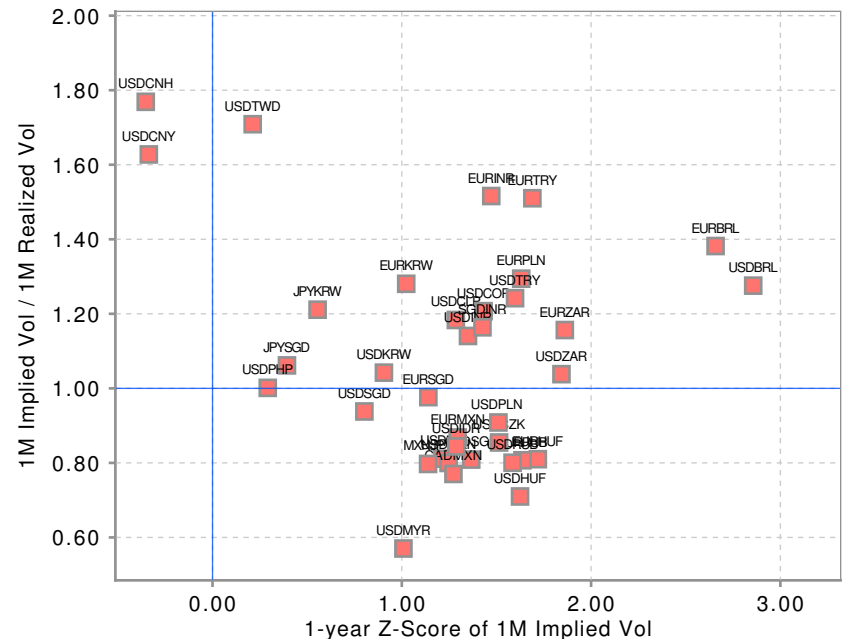
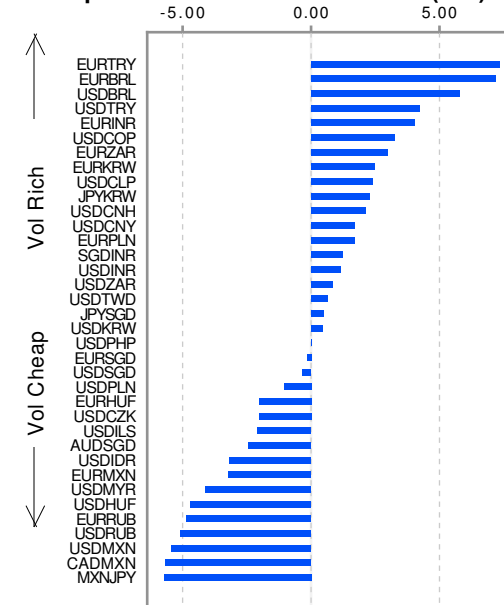
1M Implied Vol - 1M Realized Vol (G10)



1M Normalized Volatility Risk Premium (EM)*



1M Implied Vol - 1M Realized Vol (EM)



*1M Normalized Volatility Risk Premium = 1M Implied Vol / 1M Realized Vol -1

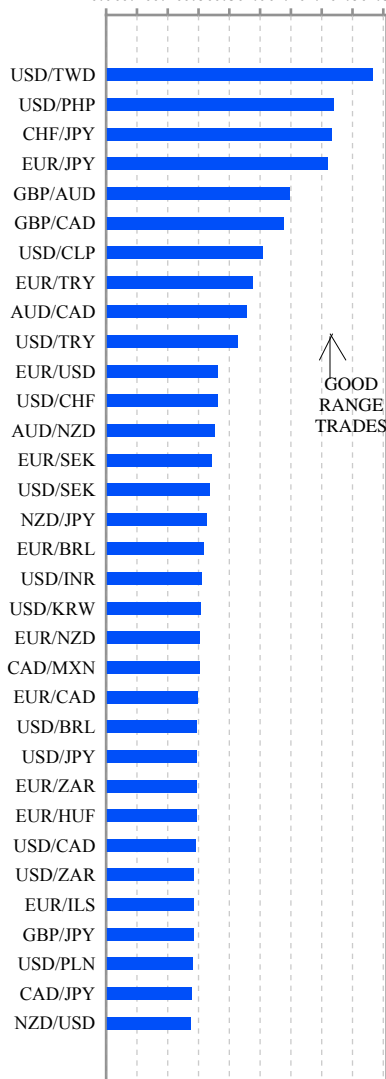
Global FX Strategy

3M Range Binary Report

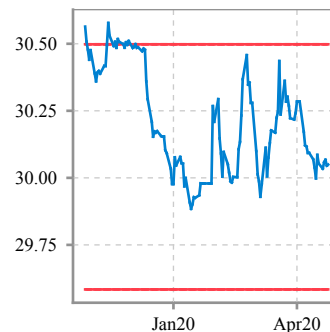
Ccy Pair	Spot	Tenor	Lower Barrier	Upper Barrier	3M Spot Low	3M Spot High	Binary Range / Trading Range
USD/TWD	30.05	3M	29.58	30.50	29.93	30.46	1.73
EUR/CHF	1.0529	3M	1.0372	1.0687	1.0513	1.0725	1.49
USD/PHP	50.80	3M	50.12	51.56	50.50	51.47	1.48
CHF/JPY	110.33	3M	107.50	113.17	110.30	114.17	1.47
EUR/JPY	116.16	3M	112.54	119.82	116.16	121.22	1.44
GBP/AUD	1.9347	3M	1.8578	2.0117	1.9190	2.0478	1.19
GBP/CAD	1.7379	3M	1.6733	1.8018	1.6705	1.7819	1.15
USD/CLP	860.37	3M	813.79	903.21	778.84	866.67	1.02
EUR/TRY	7.5476	3M	7.0566	8.0364	6.5525	7.5835	0.95
AUD/CAD	0.8983	3M	0.8691	0.9270	0.8368	0.9004	0.91
USD/TRY	6.9804	3M	6.5362	7.4210	5.9588	6.9980	0.85
EUR/USD	1.0813	3M	1.0549	1.1079	1.0689	1.1419	0.73
USD/CHF	0.9738	3M	0.9532	0.9942	0.9297	0.9861	0.73
AUD/NZD	1.0635	3M	1.0418	1.0848	1.0025	1.0635	0.71
EUR/SEK	10.88	3M	10.66	11.09	10.48	11.11	0.68
USD/SEK	10.06	3M	9.72	10.40	9.36	10.38	0.67
NZD/JPY	64.42	3M	61.64	67.22	62.67	71.20	0.65
EUR/BRL	6.1507	3M	5.6674	6.6263	4.6360	6.1507	0.63
USD/INR	76.45	3M	74.63	78.15	71.20	76.86	0.62
USD/KRW	1235.45	3M	1202.38	1268.62	1177.25	1285.70	0.61
EUR/NZD	1.8031	3M	1.7378	1.8687	1.6814	1.8975	0.61
CAD/MXN	17.64	3M	16.67	18.87	14.00	17.64	0.60
EUR/CAD	1.5231	3M	1.4799	1.5662	1.4285	1.5743	0.59
USD/BRL	5.6885	3M	5.2492	6.1192	4.2152	5.6885	0.59
USD/JPY	107.44	3M	104.63	110.24	102.55	112.09	0.59
EUR/ZAR	20.52	3M	19.18	21.86	16.06	20.63	0.59
EUR/HUF	356.37	3M	347.23	365.69	334.58	366.04	0.59
USD/CAD	1.4086	3M	1.3696	1.4472	1.3205	1.4539	0.58
USD/ZAR	18.98	3M	17.73	20.23	14.61	18.99	0.57
EUR/ILS	3.8081	3M	3.6657	3.9502	3.6982	4.2004	0.57
GBP/JPY	132.55	3M	127.69	137.39	127.62	144.76	0.57
USD/PLN	4.1979	3M	4.0536	4.3425	3.7812	4.2971	0.56
CAD/JPY	76.27	3M	73.48	79.08	74.66	84.71	0.56

3M range binaries ranked by Barrier Range/Trading Range

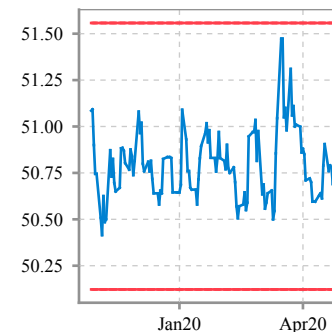
Barrier Range/Trading Range
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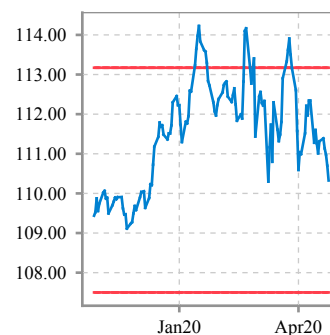
USD/TWD



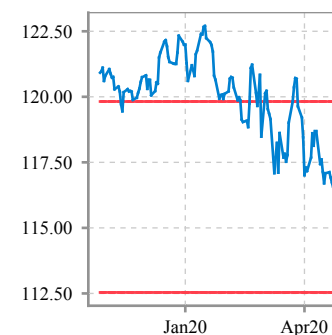
USD/PHP



CHF/JPY



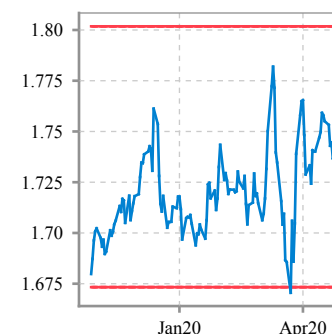
EUR/JPY



GBP/AUD



GBP/CAD



Note:

1. All range binaries are selected such that their barriers are equidistant from spot on either side, and cost 20% TV (w/o bid-offer) i.e. a 5:1 payout ratio. Range binaries with high barrier range/trading range ratio have barriers that subsume a large fraction of the recent historical trading range of spot, and should therefore count as better range binary candidates than the rest.

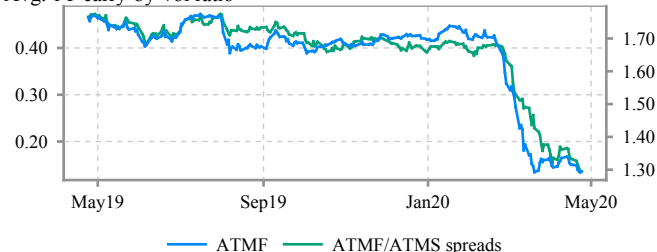
2. Note that the range barriers are agnostic i.e. they assume no view on spot, nor do they take into account any historical trend in spot till today. A dealable range binary trade may therefore need a tweak of the barriers higher or lower depending on the investor's view on spot.

Global FX Strategy

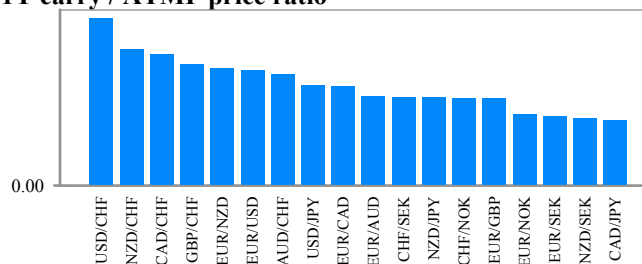
Option-based carry report (ATMF, ATMF / ATMS)

G10

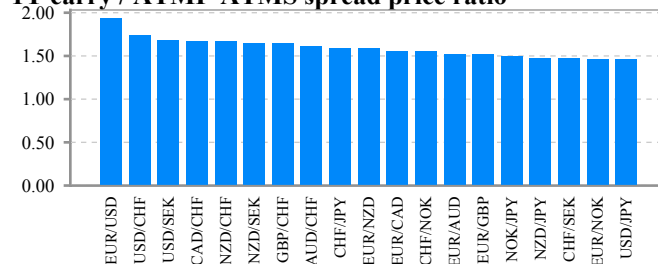
Avg. 1Y carry-by-vol ratio



1Y carry / ATMF price ratio

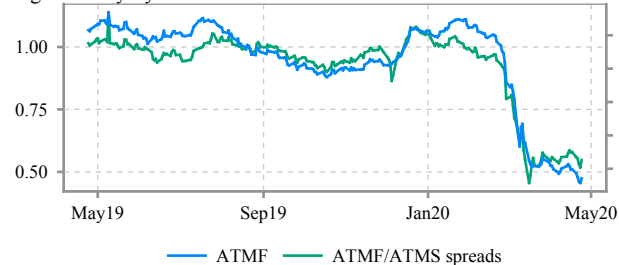


1Y carry / ATMF-ATMS spread price ratio

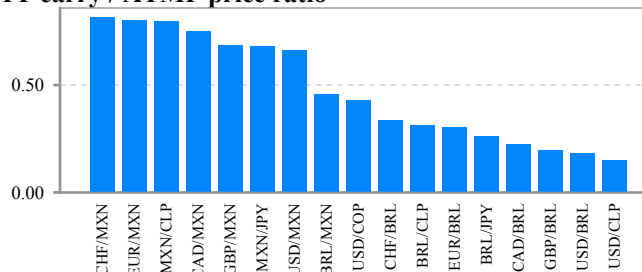


LatAm

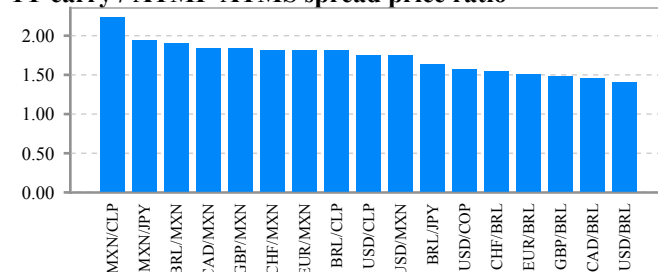
Avg. 1Y carry-by-vol ratio



1Y carry / ATMF price ratio

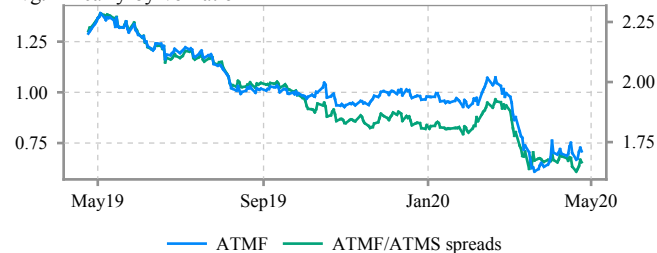


1Y carry / ATMF-ATMS spread price ratio

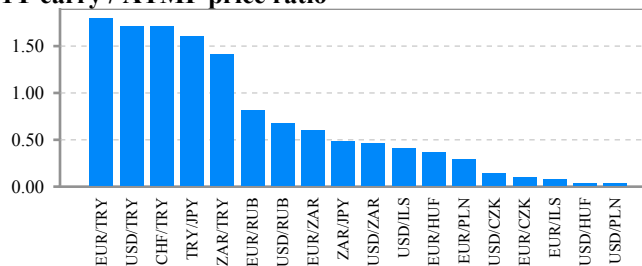


Ceemea

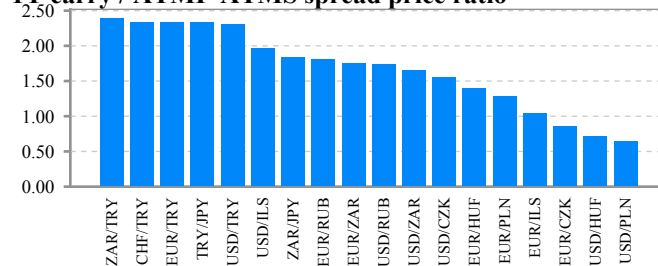
Avg. 1Y carry-by-vol ratio



1Y carry / ATMF price ratio

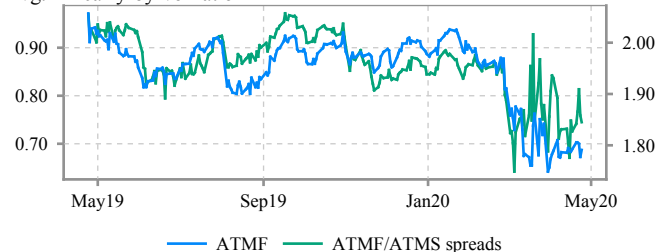


1Y carry / ATMF-ATMS spread price ratio

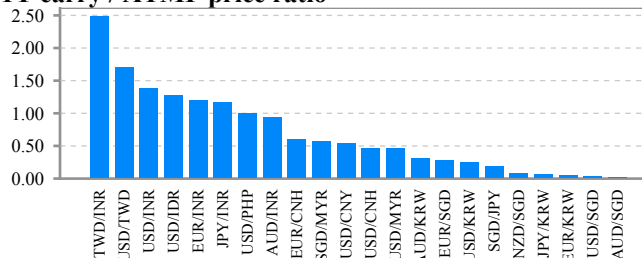


Asia

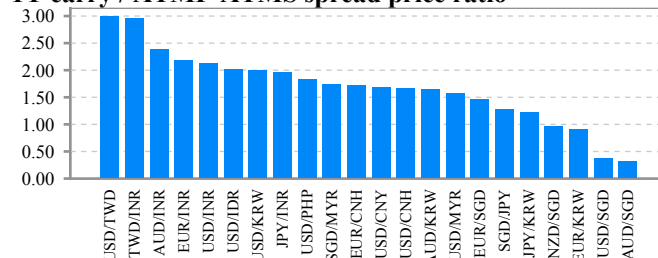
Avg. 1Y carry-by-vol ratio



1Y carry / ATMF price ratio



1Y carry / ATMF-ATMS spread price ratio



Global FX Strategy

G10 One Touch Report

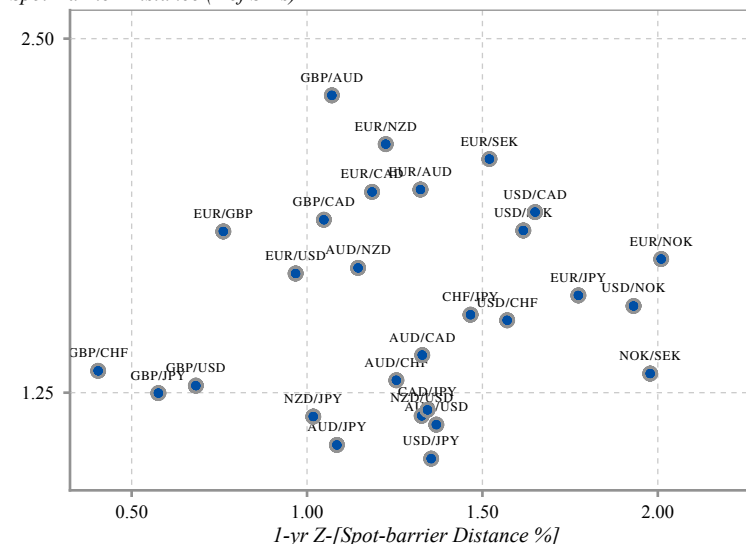
CALLS							PUTS						
Ccy Pair	Spot	Upside Barrier	Spot to Barrier Distance (%)	1- yr Barrier Distance (%)	3M Real Vol	Spot to Barrier distance (# of SDs)	Ccy Pair	Spot	Down side Barrier	Spot to Barrier Distance (%)	1- yr Barrier Distance (%)	3M Real Vol	Spot to Barrier distance (# of SDs)
USD/JPY	107.435	117.1252	9.02	1.4	12.5	1.02	USD/NOK	10.6607	8.9032	16.49	1.8	26.4	0.88
AUD/JPY	68.506	77.9731	13.82	1.1	18.3	1.07	EUR/NOK	11.5285	9.9046	14.09	2.0	22.0	0.91
AUD/USD	0.6376	0.7309	14.63	1.4	18.2	1.14	EUR/AUD	1.6959	1.5018	11.45	1.4	14.9	1.08
NZD/JPY	64.429	73.4142	13.95	1.0	16.9	1.17	USD/SEK	10.0596	8.8838	11.69	0.8	14.8	1.12
NZD/USD	0.5997	0.6868	14.52	1.3	17.6	1.17	EUR/SEK	10.8785	10.0084	8.00	1.1	10.0	1.13
CAD/JPY	76.282	85.7860	12.46	1.3	14.8	1.19	USD/CAD	1.4084	1.2843	8.81	1.5	10.9	1.14
GBP/JPY	132.543	149.5667	12.84	0.6	14.5	1.25	EUR/GBP	0.8766	0.7856	10.38	0.9	12.6	1.16
GBP/USD	1.2337	1.4084	14.16	0.7	15.7	1.27	EUR/NZD	1.8032	1.6027	11.12	1.3	13.5	1.17
AUD/CHF	0.6209	0.7088	14.16	1.3	15.5	1.29	NOK/SEK	0.9436	0.7956	15.68	2.2	17.8	1.25
NOK/SEK	0.9436	1.1001	16.59	2.0	17.8	1.32	EUR/CAD	1.523	1.3786	9.48	1.5	10.6	1.27
GBP/CHF	1.2013	1.3410	11.63	0.4	12.4	1.33	GBP/USD	1.2337	1.0369	15.95	1.3	15.7	1.44
AUD/CAD	0.8981	1.0115	12.63	1.3	12.9	1.38	AUD/CAD	0.8981	0.7793	13.23	1.5	12.9	1.45
USD/CHF	0.9737	1.0702	9.91	1.6	9.3	1.51	AUD/USD	0.6376	0.5185	18.68	1.8	18.2	1.45
CHF/JPY	110.340	121.2589	9.90	1.5	9.2	1.53	NZD/USD	0.5997	0.4896	18.36	1.8	17.6	1.48
USD/NOK	10.6607	13.7617	29.09	1.9	26.4	1.56	AUD/NZD	1.0633	0.9779	8.03	1.3	7.6	1.50
EUR/JPY	116.183	129.1942	11.20	1.8	9.9	1.59	USD/JPY	107.435	92.3892	14.00	0.9	12.5	1.58
EUR/USD	1.0814	1.2067	11.59	1.0	9.8	1.67	GBP/CHF	1.2013	1.0329	14.02	0.5	12.4	1.60
AUD/NZD	1.0633	1.1593	9.03	1.1	7.6	1.69	AUD/JPY	68.506	53.9445	21.26	1.4	18.3	1.64
EUR/NOK	11.5285	14.6136	26.76	2.0	22.0	1.72	GBP/CAD	1.7375	1.5000	13.67	1.0	11.8	1.64
EUR/GBP	0.8766	1.0190	16.24	0.8	12.6	1.82	EUR/USD	1.0814	0.9563	11.57	2.0	9.8	1.67
USD/SEK	10.0596	11.9725	19.02	1.6	14.8	1.82	AUD/CHF	0.6209	0.5070	18.34	1.5	15.5	1.68
GBP/CAD	1.7375	2.0064	15.48	1.0	11.8	1.86	CHF/JPY	110.340	98.2699	10.94	1.3	9.2	1.69
USD/CAD	1.4084	1.6137	14.58	1.7	10.9	1.89	CAD/JPY	76.282	62.5375	18.02	1.3	14.8	1.72
EUR/CAD	1.523	1.7460	14.64	1.2	10.6	1.96	GBP/AUD	1.9348	1.6646	13.97	0.8	11.5	1.72
EUR/AUD	1.6959	2.0484	20.79	1.3	14.9	1.97	NZD/JPY	64.429	50.9472	20.92	1.2	16.9	1.75
EUR/SEK	10.8785	12.4694	14.62	1.5	10.0	2.08	GBP/JPY	132.543	108.4475	18.18	0.8	14.5	1.77
EUR/NZD	1.8032	2.1692	20.30	1.2	13.5	2.13	USD/CHF	0.9737	0.8564	12.05	1.3	9.3	1.83
GBP/AUD	1.9348	2.2961	18.67	1.1	11.5	2.30	EUR/JPY	116.183	97.1160	16.41	1.9	9.9	2.34
EUR/CHF	1.053	1.1328	7.58	2.3	3.3	3.28	EUR/CHF	1.053	0.9440	10.35	2.6	3.3	4.48

Note:

1. All one touches are 6M in tenor, and constrained to have a TV of 10%
2. Currency pairs are ranked in order of the distance of barrier from spot - closer the barrier to spot, the easier it is to trigger the barrier. The unit of measurement of the spot-to-barrier distance is standard deviations (SDs). 1 SD move over a 6-month period is computed as $3M \text{ Realized Vol} / \sqrt{2}$.

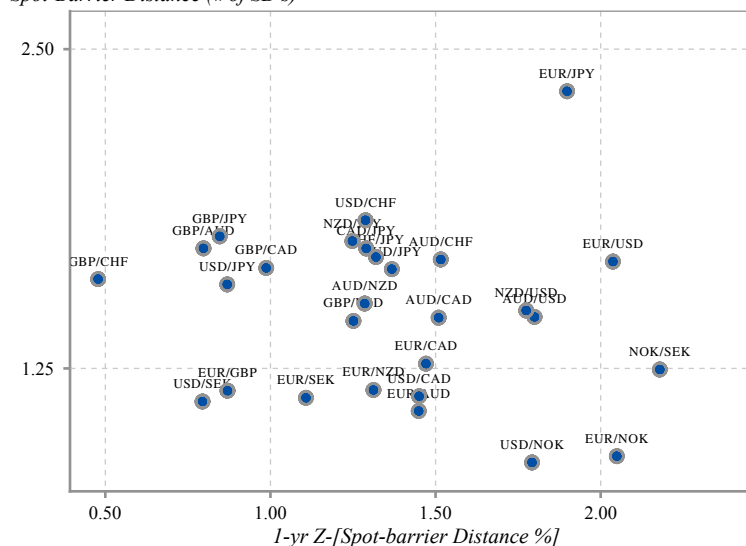
Calls

Spot-Barrier Distance (# of SD's)



Puts

Spot-Barrier Distance (# of SD's)



Global FX Strategy

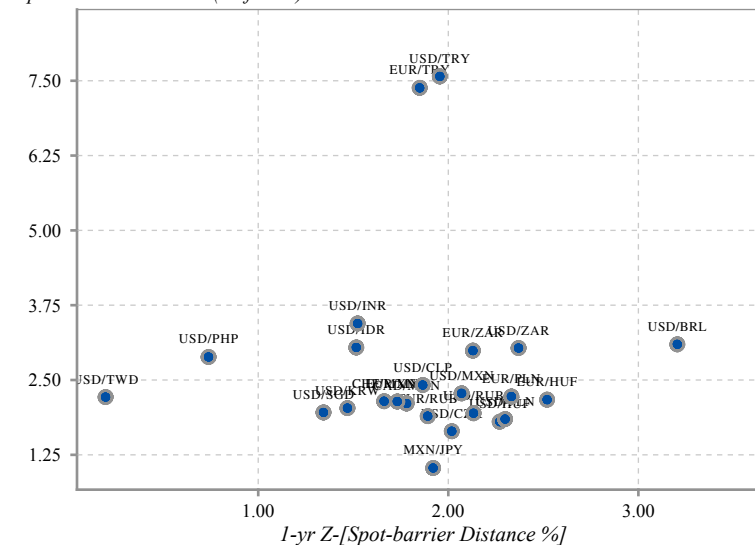
EM One Touch Report

CALLS

Ccy Pair	Spot	Upside Barrier	Spot to Barrier Distance (%)	1-yr Z-[Spot to Barrier Distance (%)	3M Real Vol	Spot to Barrier distance (# of SDs)	Ccy Pair	Spot	Down side Barrier	Spot to Barrier Distance (%)	1-yr Z-[Spot to Barrier Distance (%)	3M Real Vol	Spot to Barrier distance (# of SDs)
MXN/JPY	4.291	5.2786	23.02	1.9	31.6	1.03	EUR/RUB	80.5901	68.1809	15.40	2.1	30.2	0.72
USD/CZK	25.2395	30.4033	20.46	2.0	17.6	1.64	EUR/MXN	27.0712	23.0794	14.75	1.9	27.3	0.76
USD/HUF	329.625	398.8781	21.01	2.3	16.5	1.80	USD/RUB	74.525	62.4788	16.16	2.4	29.9	0.76
USD/PLN	4.1981	5.0175	19.52	2.3	14.9	1.85	USD/IDR	15565	14159.9872	9.03	1.2	16.2	0.79
EUR/RUB	80.5901	113.2557	40.53	1.9	30.2	1.90	CHF/MXN	25.7096	21.5848	16.04	1.8	28.0	0.81
USD/RUB	74.525	105.2009	41.16	2.1	29.9	1.94	USD/MXN	25.0335	21.0393	15.96	2.1	27.7	0.81
USD/SGD	1.4252	1.5464	8.50	1.3	6.1	1.96	CAD/MXN	17.7744	15.0845	15.13	1.8	23.8	0.90
USD/KRW	1235.5	1493.4113	20.88	1.5	14.5	2.03	USD/CZK	25.2395	22.0182	12.76	1.8	17.6	1.03
CAD/MXN	17.7744	24.0720	35.43	1.8	23.8	2.11	USD/HUF	329.625	288.5825	12.45	1.6	16.5	1.07
EUR/MXN	27.0712	38.2771	41.39	1.7	27.3	2.14	USD/PLN	4.1981	3.7147	11.51	1.8	14.9	1.09
CHF/MXN	25.7096	36.6207	42.44	1.7	28.0	2.15	EUR/HUF	356.4565	328.3226	7.89	2.0	9.9	1.13
EUR/HUF	356.4565	410.3735	15.13	2.5	9.9	2.17	USD/KRW	1235.5	1090.5296	11.73	1.6	14.5	1.14
USD/TWD	30.041	32.0113	6.56	0.2	4.2	2.22	USD/BRL	5.6842	4.6260	18.62	4.0	21.5	1.23
EUR/PLN	4.5398	5.1149	12.67	2.3	8.1	2.22	EUR/PLN	4.5398	4.2195	7.06	2.3	8.1	1.24
USD/MXN	25.0335	36.1987	44.60	2.1	27.7	2.28	EUR/ZAR	20.5226	16.9621	17.35	2.2	19.4	1.26
USD/CLP	858.5	1086.7689	26.59	1.9	15.6	2.42	USD/ZAR	18.9779	15.5925	17.84	2.5	19.8	1.27
USD/PHP	50.84	56.1301	10.41	0.7	5.1	2.88	USD/CLP	858.5	738.1894	14.01	1.6	15.6	1.27
EUR/ZAR	20.5226	28.9510	41.07	2.1	19.4	2.99	USD/PHP	50.84	48.4913	4.62	-1.3	5.1	1.28
USD/ZAR	18.9779	27.0553	42.56	2.4	19.8	3.03	USD/INR	76.39	71.2689	6.70	2.3	7.4	1.29
USD/IDR	15565	20991.6323	34.86	1.5	16.2	3.04	MXN/JPY	4.291	3.0306	29.37	1.7	31.6	1.31
USD/BRL	5.6842	8.3568	47.02	3.2	21.5	3.10	EUR/TRY	7.5466	6.4580	14.43	1.5	14.0	1.46
USD/INR	76.39	90.0936	17.94	1.5	7.4	3.44	USD/SGD	1.4252	1.3341	6.39	1.5	6.1	1.47
EUR/TRY	7.5466	13.0666	73.15	1.8	14.0	7.38	USD/TRY	6.9786	5.8571	16.07	1.7	14.2	1.60
USD/TRY	6.9786	12.2770	75.92	2.0	14.2	7.57	USD/TWD	30.041	27.7458	7.64	1.7	4.2	2.58

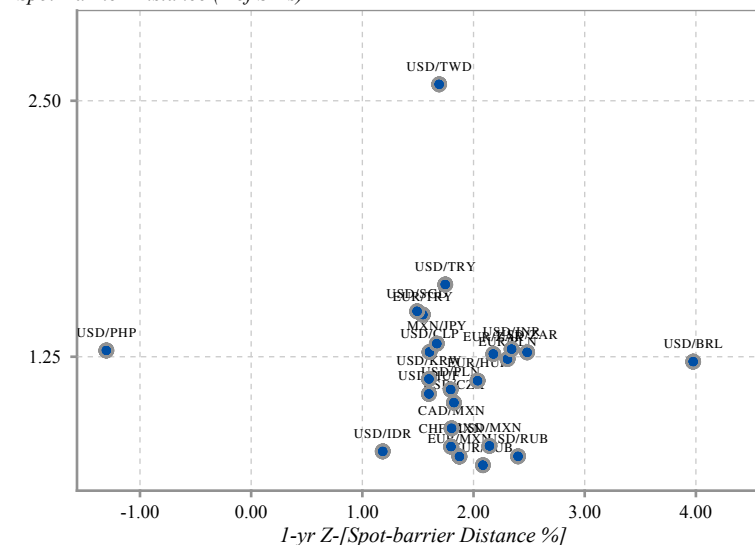
Calls

Spot-Barrier Distance (# of SD's)



Puts

Spot-Barrier Distance (# of SD's)



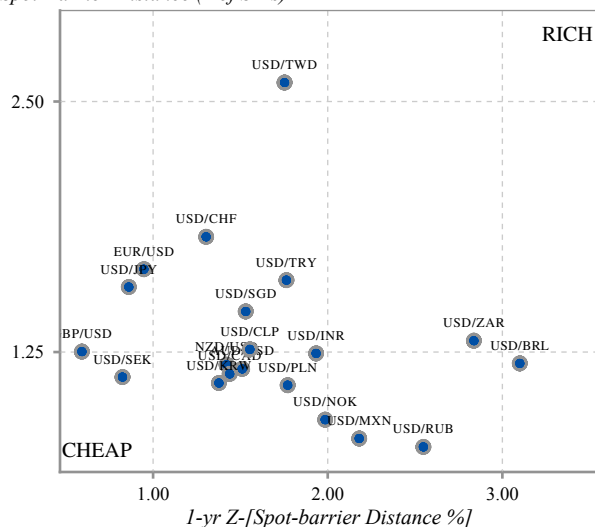
Note:

1. All one touches are 6M in tenor, and constrained to have a TV of 10%
2. Currency pairs are ranked in order of the distance of barrier from spot - closer the barrier to spot, the easier it is to trigger the barrier. The unit of measurement of the spot-to-barrier distance is standard deviations (SDs). 1 SD move over a 6-month period is computed as 3M Realized Vol / sqrt(2).

Thematic One Touch Report

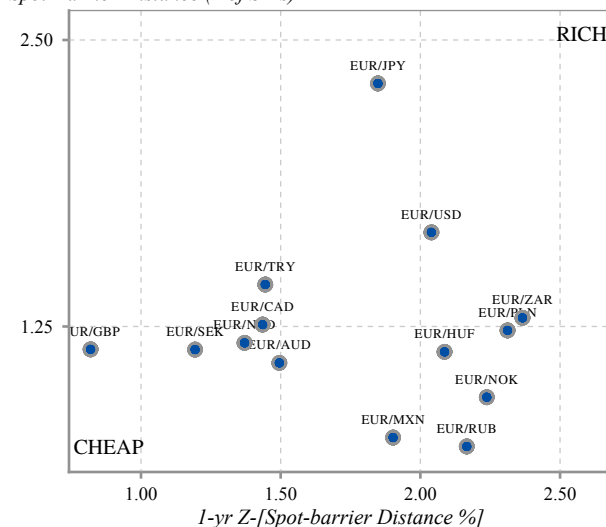
USD-Bearish Vehicles

Spot-Barrier Distance (# of SD's)



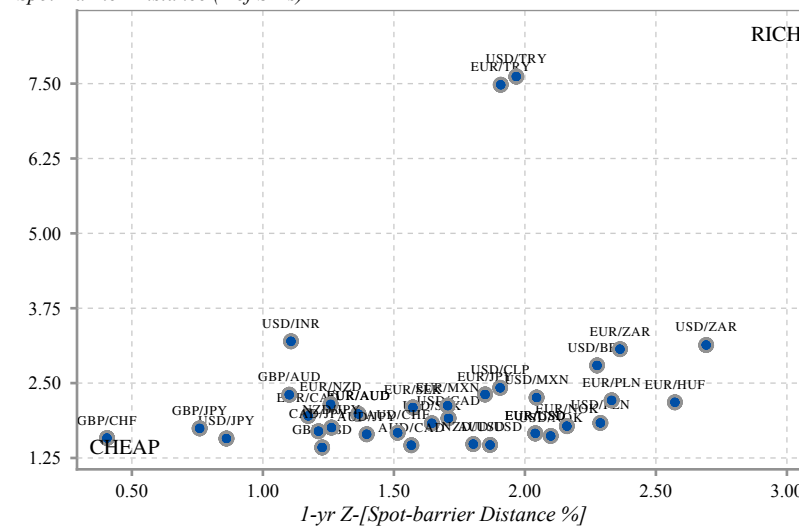
EUR-Bearish Vehicles

Spot-Barrier Distance (# of SD's)



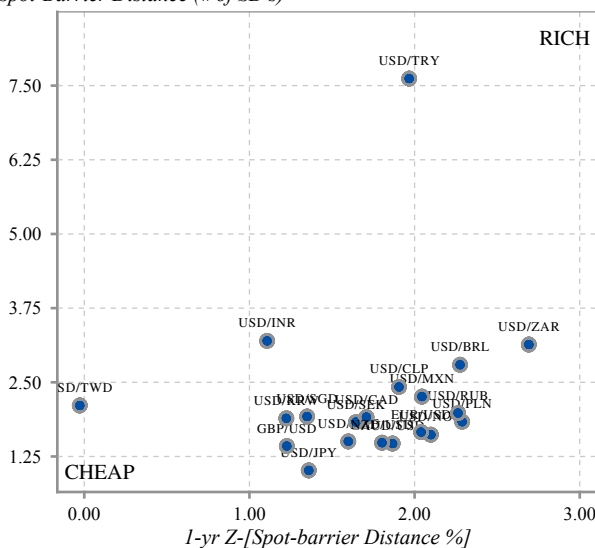
Risk-Bearish Vehicles

Spot-Barrier Distance (# of SD's)



USD-Bullish Vehicles

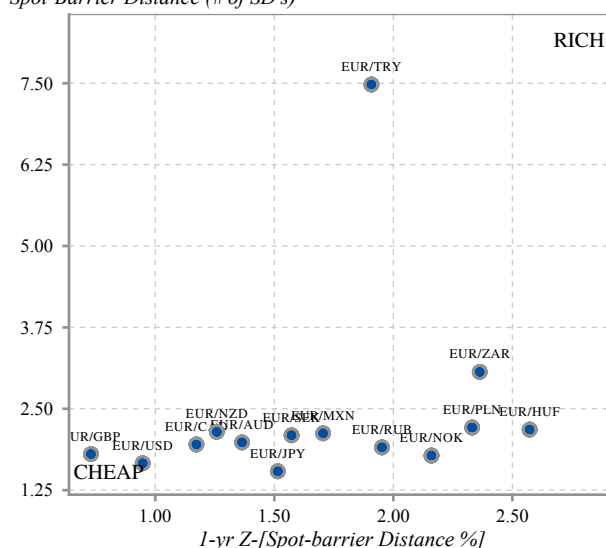
Spot-Barrier Distance (# of SD's)



EUR-Bullish Vehicles

EUR-Bullish Vehicles

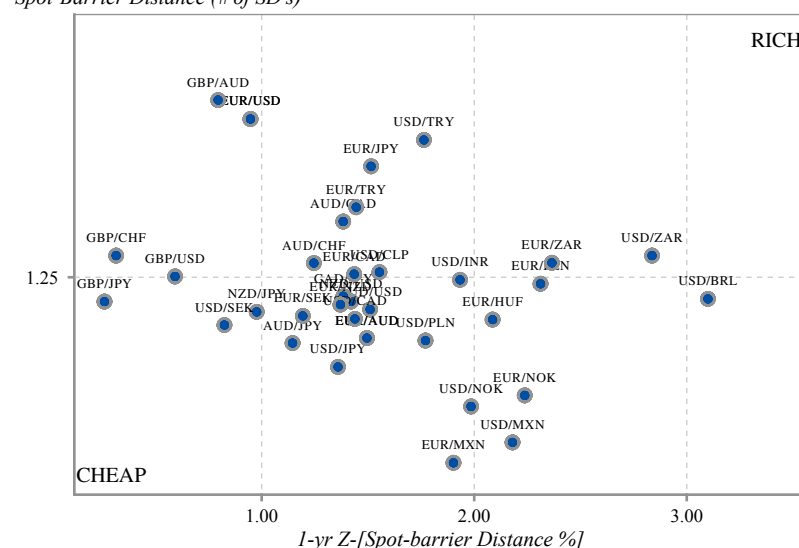
Spot-Barrier Distance (# of SD's)



Risk-Bullish Vehicles

Risk-Bullish Vehicles

Spot-Barrier Distance (# of SD's)



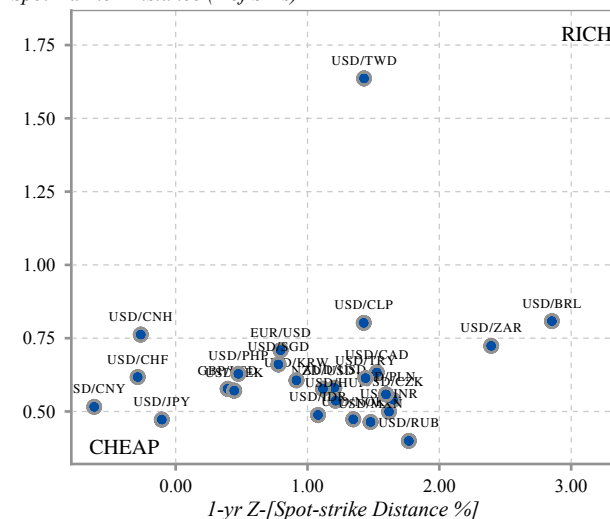
1. All one touches (OTs) are 6M in tenor, and constrained to have a TV of 10%.
2. The X-axis plots the historical rich/cheap of OT prices as a rolling 1-yr z-score of their spot-barrier distance. The Y-axis plots the distance of spot to barrier in number of standard deviations (SDs), where 1 SD move over a 6-month period is computed as 3M Realized Vol / sqrt(2). This is a performance metric, and combined with the historical measure, provides a more complete picture of value within the OT universe
3. The direction of one touches is selected to conform to the themes displayed. For instance, USD-bearish (bullish) OTs map USD puts (calls)/CCY calls (puts) only across the G10/EM universe. Ditto for the EUR charts. For the risk charts, the direction of calls/puts are selected based on the direction of currency moves to a typical vol event e.g. puts on yen-cross, calls on USD/EM etc are entries in the bearish risk plot, and their mirror images (calls on yen-crosses, puts on USD/EM etc) on the bullish risk plot.

Global FX Strategy

Thematic At-expiry Digital Option Report

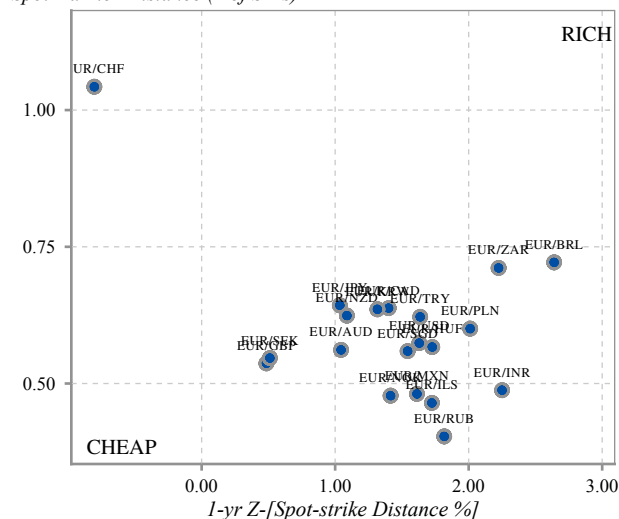
USD-Bearish Vehicles

Spot-Barrier Distance (# of SD's)



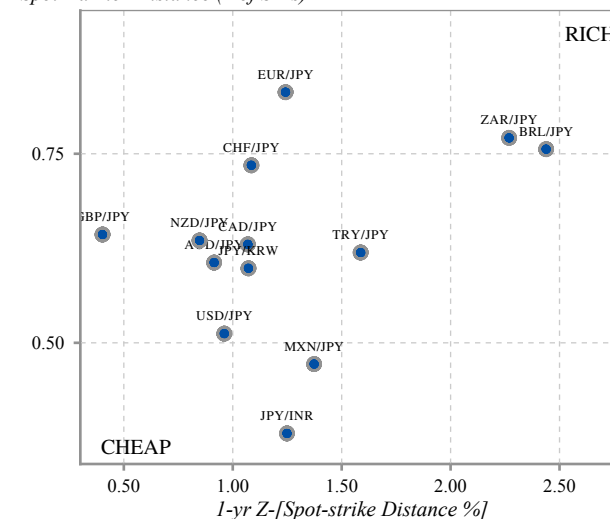
EUR-Bearish Vehicles

Spot-Barrier Distance (# of SD's)



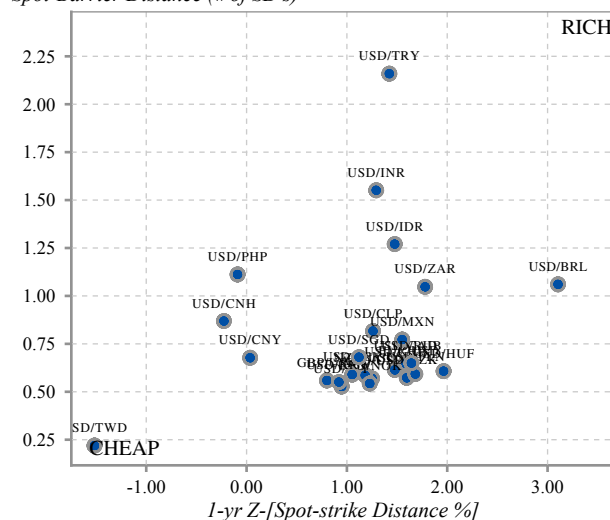
JPY-Bearish Vehicles

Spot-Barrier Distance (# of SD's)



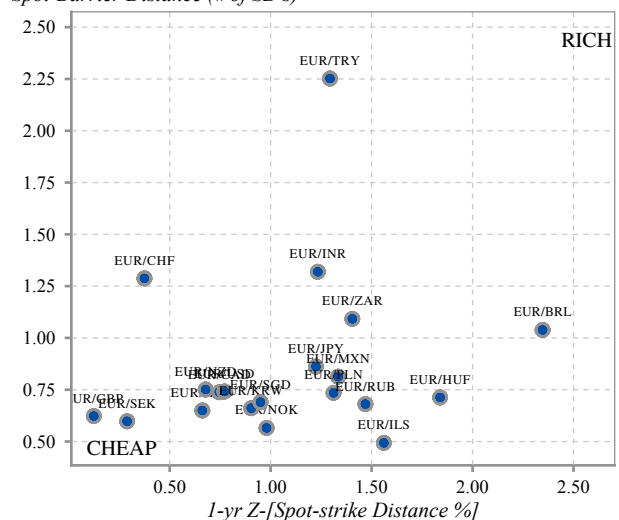
USD-Bullish Vehicles

Spot-Barrier Distance (# of SD's)



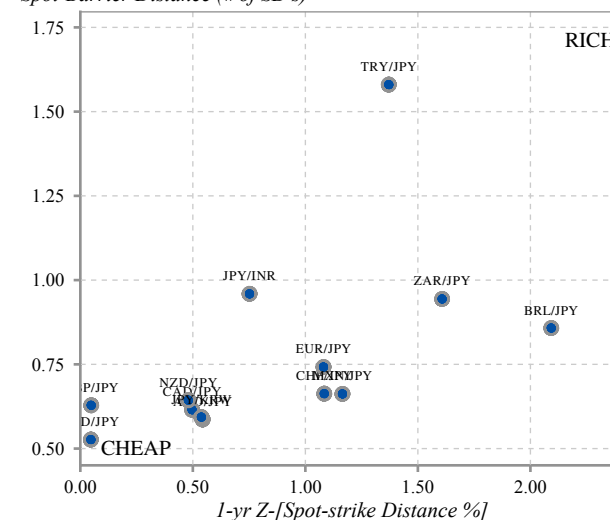
EUR-Bullish Vehicles

Spot-Barrier Distance (# of SD's)



JPY-Bullish Vehicles

Spot-Barrier Distance (# of SD's)



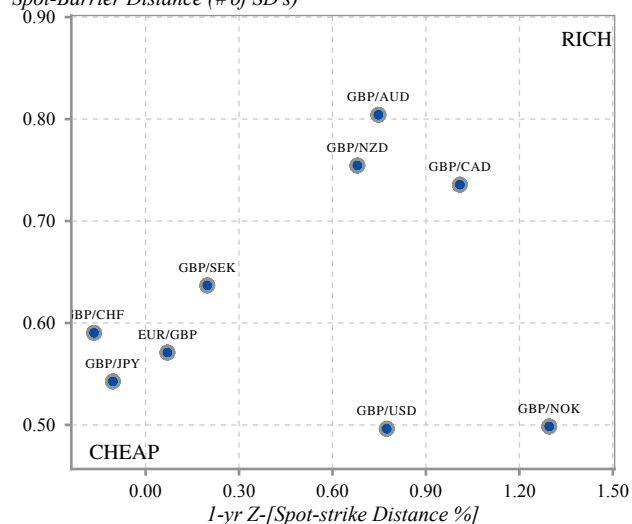
1. All at-expiry digital options (AEDs) are 3M in tenor, and constrained to have a TV of 20% i.e. 5:1 gearing
2. The X-axis plots the historical rich/cheap of AED prices in the form of a rolling 1-yr z-score of their spot-strike distance. The Y-axis plots the distance of spot-to-strike in number of standard deviations (SDs), where 1 SD move over a 3-month period is computed as 3M Realized Vol * sqrt(3/12). This is a performance metric, and combined with the historical measure, provides a more complete picture of value within the AED universe
3. The direction of digital options is selected to conform to the themes displayed. For instance, USD-bearish (bullish) AEDs map USD puts (calls)/CCY calls (puts) only across the G10/EM universe. Ditto for the EUR and the JPY charts..

Global FX Strategy

Thematic At-expiry Digital Option Report

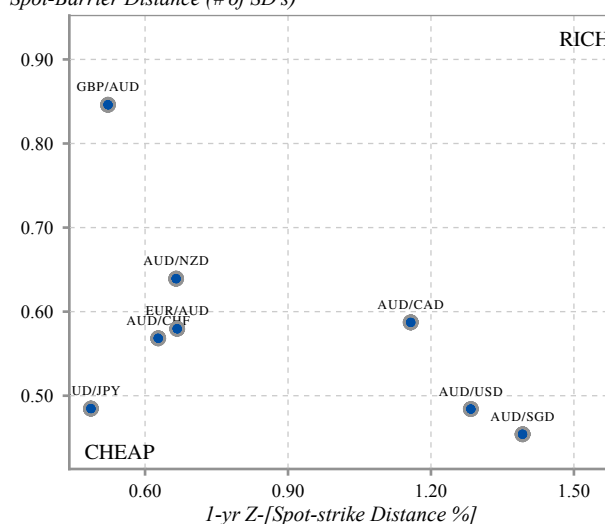
GBP-Bearish Vehicles

Spot-Barrier Distance (# of SD's)



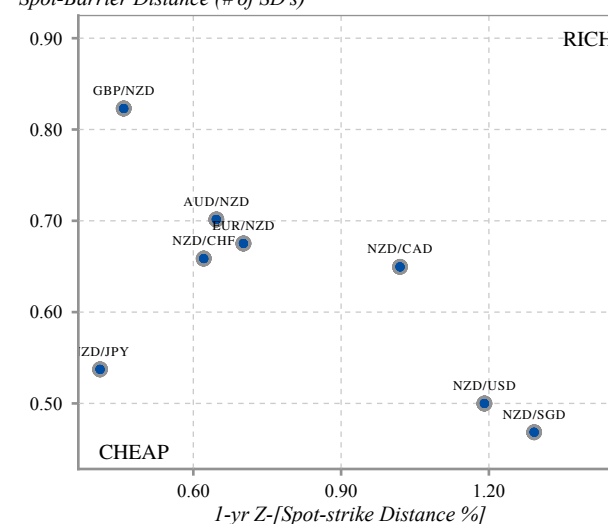
AUD-Bearish Vehicles

Spot-Barrier Distance (# of SD's)



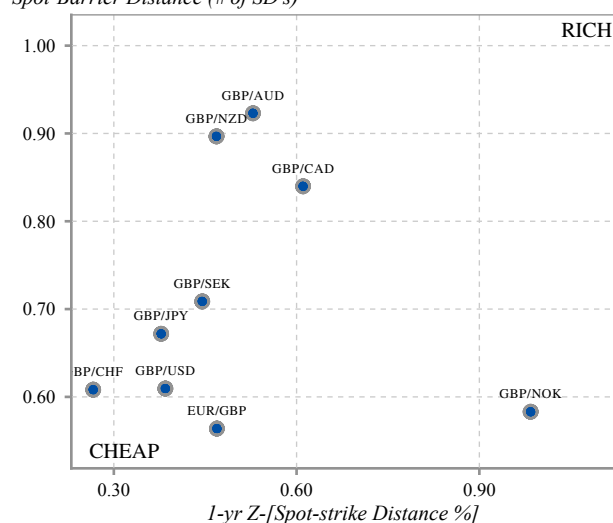
NZD-Bearish Vehicles

Spot-Barrier Distance (# of SD's)



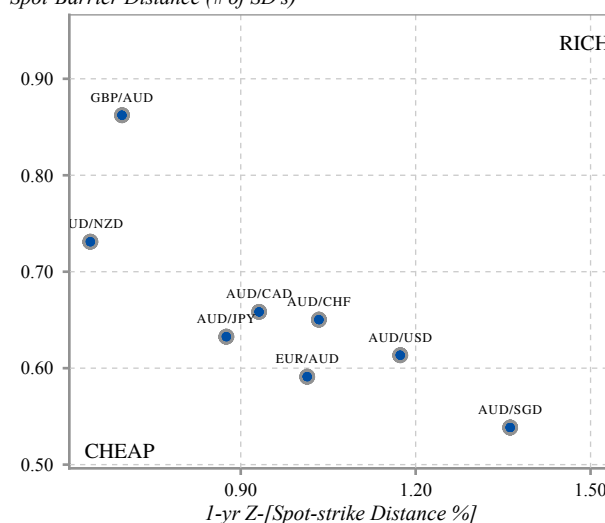
GBP-Bullish Vehicles

Spot-Barrier Distance (# of SD's)



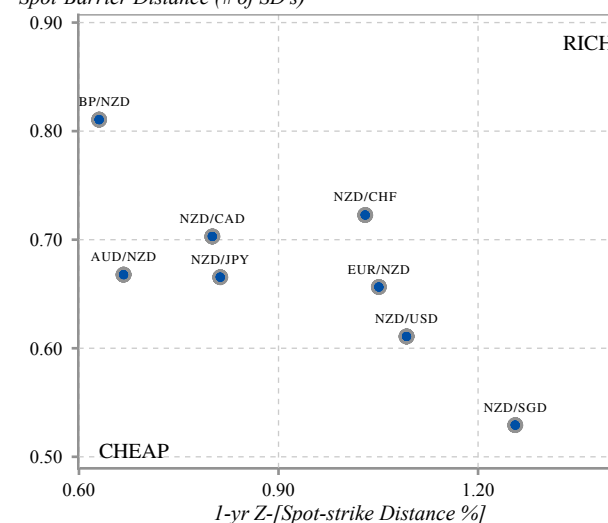
AUD-Bullish Vehicles

Spot-Barrier Distance (# of SD's)



NZD-Bullish Vehicles

Spot-Barrier Distance (# of SD's)



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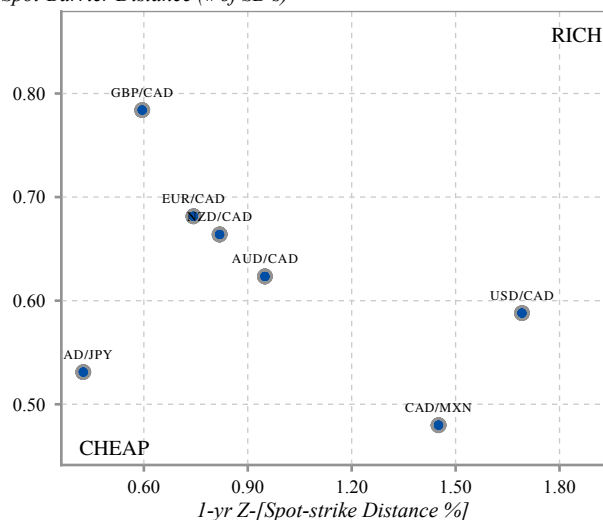
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Global FX Strategy

Thematic At-expiry Digital Option Report

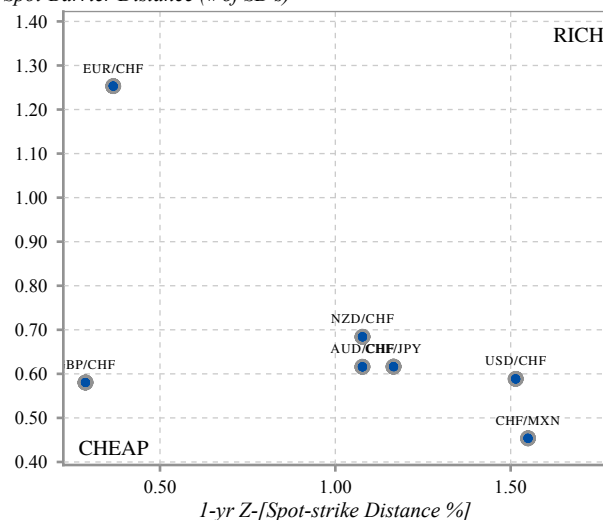
CAD-Bearish Vehicles

Spot-Barrier Distance (# of SD's)



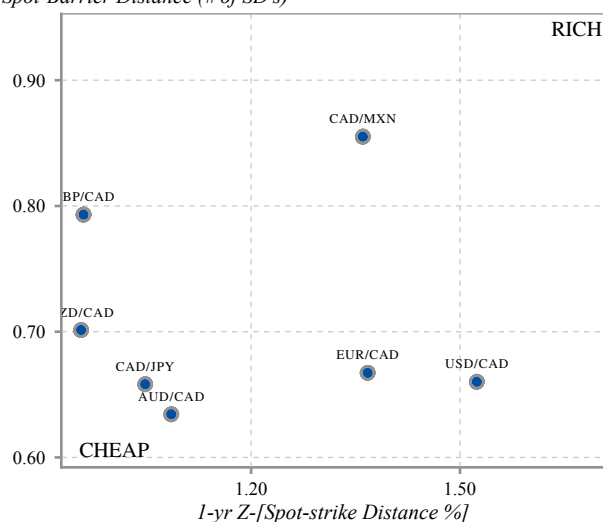
CHF-Bearish Vehicles

Spot-Barrier Distance (# of SD's)



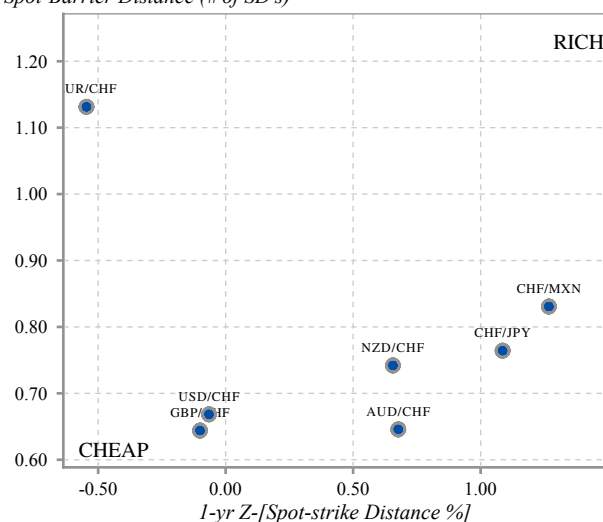
CAD-Bullish Vehicles

Spot-Barrier Distance (# of SD's)



CHF-Bullish Vehicles

Spot-Barrier Distance (# of SD's)



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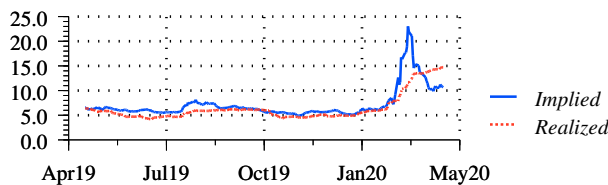
3.The direction of digital options is selected to conform to the themes displayed. For instance, USD-bearish (bullish) AEDs map USD puts (calls)/CCY calls (puts) only across the G10/EM universe. Ditto for the EUR and the JPY charts..

Relative Value 3M Gamma G10 Trades

Buy	Sell	Weight Buy	Weight Sell	R-squared (%)	Mispricing (Vol pts)	Z-Residual	Half-Life (Days)	Wtd. Implied Spread	Wtd. 2W Realized Vol Spread	Wtd. 1M Realized Vol Spread	Wtd. 3M Realized Vol Spread	% of time Subsequent 3M Wtd Realized Vol Spread > Wtd Implied Vol Spread
EURAUD	EURJPY	1.0	0.0	66	4.0	2.1	10	10.7	11.6	12.2	14.7	40
EURAUD	USDEUR	1.0	0.1	66	3.9	2.1	10	10.3	11.2	11.9	14.2	40
AUDUSD	USDJPY	1.0	0.3	73	2.7	1.8	8	10.2	13.5	13.4	14.5	23
EURAUD	SEKEUR	1.0	0.6	66	2.6	1.9	8	6.8	8.1	7.1	9.3	28
EURAUD	EURCAD	1.0	0.7	65	2.4	2.2	7	5.1	5.7	6.8	7.8	52
NOKEUR	SEKEUR	1.0	1.0	78	2.2	1.9	6	6.6	13.4	7.8	12.0	50
AUDUSD	USDEUR	1.0	0.9	71	2.2	2.0	7	5.5	9.1	9.2	9.4	39
USDNOK	NZDUSD	1.0	0.8	76	2.0	2.2	6	5.9	7.9	7.3	12.0	48
AUDUSD	GBPAUD	1.0	0.5	68	1.8	1.2	14	7.4	11.5	11.3	13.0	23
USDNOK	USDSEK	1.0	1.1	81	1.7	2.2	5	4.3	12.8	5.5	9.7	65
AUDUSD	USDCAD	1.0	1.0	66	1.5	1.8	5	3.8	2.3	5.4	6.9	51
USDCAD	GBPCAD	1.0	0.1	64	1.5	1.3	9	8.0	11.5	9.2	10.4	13
AUDUSD	USDSEK	1.0	0.7	74	1.2	1.2	6	5.3	8.7	6.9	7.6	31

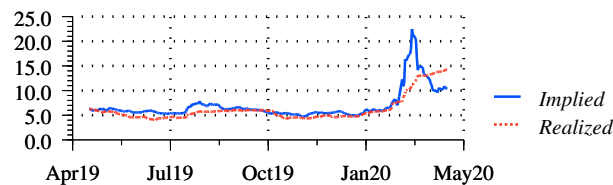
EURAUD vs EURJPY

Weighted Vol Spread



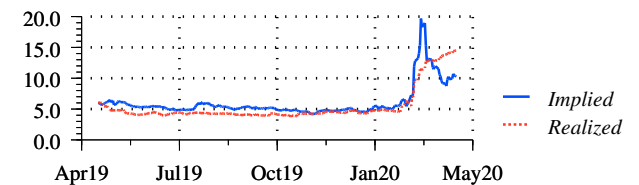
EURAUD vs USDEUR

Weighted Vol Spread



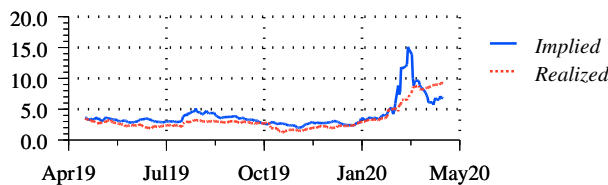
AUDUSD vs USDJPY

Weighted Vol Spread



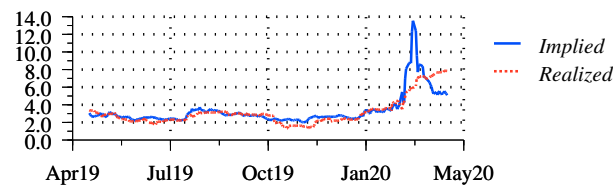
EURAUD vs SEKEUR

Weighted Vol Spread



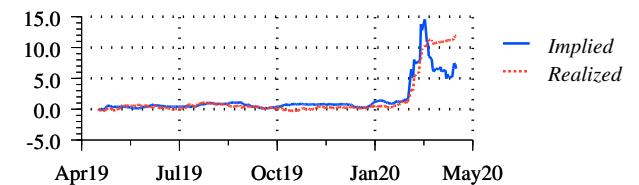
EURAUD vs EURCAD

Weighted Vol Spread



NOKEUR vs SEKEUR

Weighted Vol Spread



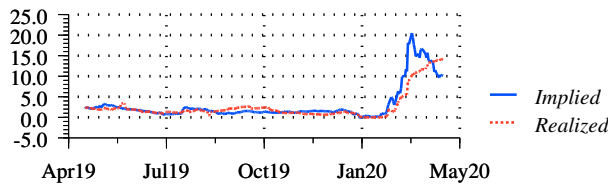
- Note:
1. The report tries to identify 3M vol spreads that are substantially mispriced relative to their realized vol spread based on a linear regression.
 2. Weight Buy and Weight Sell are vega weights. The corrective trade requires the investor to buy and sell the two vols in vega ratio of Weight Buy:Weight Sell
 3. The mispricing denotes the absolute value of the regression residual in vol pts.
 4. Current Weighted Implied Vol Spread = Weight_Buy * 3M Implied Vol_Buy - Weight_Sell * 3M Implied Vol_Sell
 5. Current Weighted 3M Realized Vol Spread = Weight_Buy * 3M Realized Vol_Buy - Weight_Sell * 3M Realized Vol_Sell

Relative Value 3M Gamma EM Trades

Buy	Sell	Weight Buy	Weight Sell	R-squared (%)	Mispricing (Vol pts)	Z-Residual	Half-Life (Days)	Wtd. Implied Spread	Wtd. 2W Realized Vol Spread	Wtd. 1M Realized Vol Spread	Wtd. 3M Realized Vol Spread	% of time Subsequent 3M Wtd Realized Vol Spread > Wtd Implied Vol Spread
USDIDR	USDTHB	1.0	1.0	82	5.8	3.1	12	10.1	10.3	15.7	14.1	40
MXNEUR	TRYEUR	1.0	0.3	67	4.8	1.7	11	13.7	11.7	20.3	20.3	58
USDMXN	USDTRY	1.0	0.3	67	4.6	1.6	9	12.7	13.4	20.9	21.3	48
USDMXN	USDPHP	1.0	0.2	73	4.4	1.5	9	19.0	18.5	26.4	25.5	37
USDMXN	USDCLP	1.0	0.2	73	3.9	1.4	9	16.6	17.5	24.1	23.0	39
USDMXN	USDINR	1.0	0.4	71	3.9	1.3	9	16.9	15.9	24.3	23.1	39
USDMXN	USDTHB	1.0	0.6	71	3.8	1.3	10	17.1	18.4	26.2	24.3	39
MXNEUR	HUFEUR	1.0	0.4	69	3.8	1.2	11	16.8	12.9	20.4	20.7	45
RUBEUR	TRYEUR	1.0	0.4	85	3.7	2.1	13	8.9	18.2	18.2	24.0	63
USDMXN	USDZAR	1.0	0.4	68	3.7	1.3	9	11.5	12.2	18.0	18.3	39
USDMXN	USDTHB	1.0	0.6	68	3.6	1.3	9	16.2	16.5	23.6	21.6	37
MXNEUR	ZAREUR	1.0	0.4	66	3.6	1.2	11	12.2	9.5	17.3	17.1	49
USDRUB	USDTRY	1.0	0.4	84	3.3	1.8	15	9.1	18.8	17.1	23.5	62
USDMXN	USDHUF	1.0	0.5	68	3.2	1.2	10	14.1	13.6	18.6	18.1	39
USDMXN	USDKRW	1.0	0.5	72	3.1	1.2	8	15.0	15.6	22.5	20.2	35

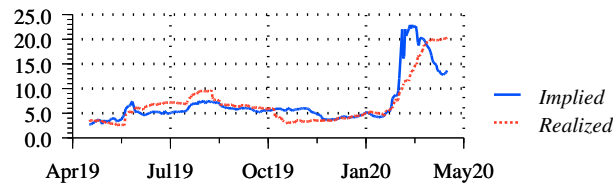
USDIDR vs USDTHB

Weighted Vol Spread



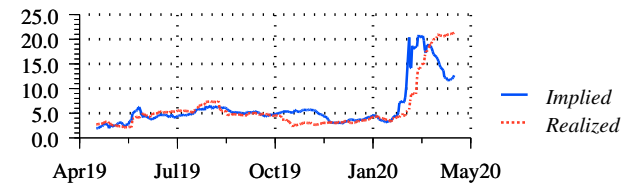
MXNEUR vs TRYEUR

Weighted Vol Spread



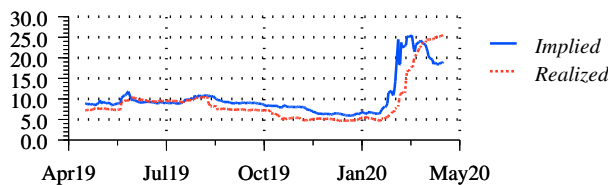
USDMXN vs USDTRY

Weighted Vol Spread



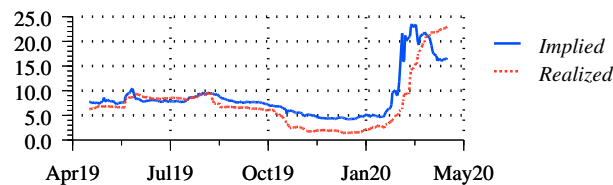
USDMXN vs USDPHP

Weighted Vol Spread



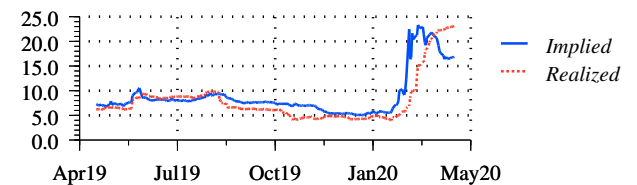
USDMXN vs USDCLP

Weighted Vol Spread



USDMXN vs USDINR

Weighted Vol Spread



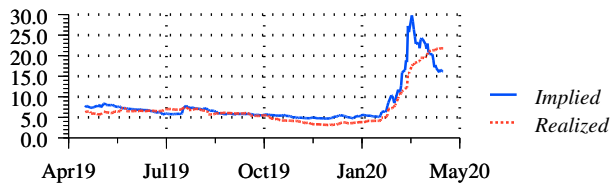
- Note:
1. The report tries to identify 3M vol spreads that are substantially mispriced relative to their realized vol spread based on a linear regression.
 2. Weight Buy and Weight Sell are vega weights. The corrective trade requires the investor to buy and sell the two vols in vega ratio of Weight Buy:Weight Sell
 3. The mispricing denotes the absolute value of the regression residual in vol pts.
 4. Current Weighted Implied Vol Spread = Weight_Buy * 3M Implied Vol_Buy - Weight_Sell * 3M Implied Vol_Sell
 5. Current Weighted 3M Realized Vol Spread = Weight_Buy * 3M Realized Vol_Buy - Weight_Sell * 3M Realized Vol_Sell

Relative Value 3M Gamma EM vs G10 Trades

Buy	Sell	Weight Buy	Weight Sell	R-squared (%)	Mispricing (Vol pts)	Z-Residual	Half-Life (Days)	Wtd. Implied Spread	Wtd. 2W Realized Vol Spread	Wtd. 1M Realized Vol Spread	Wtd. 3M Realized Vol Spread	% of time Subsequent 3M Wtd Realized Vol Spread > Wtd Implied Vol Spread
USDIDR	USDJPY	1.0	0.1	83	6.6	3.1	11	16.2	14.6	21.3	21.8	19
USDIDR	USDCHF	1.0	0.3	84	6.5	3.2	11	14.7	13.2	19.9	20.1	19
USDIDR	USDEUR	1.0	0.4	83	6.2	3.1	11	13.5	12.4	18.9	18.6	27
USDIDR	NZDUSD	1.0	0.3	83	5.6	3.0	11	13.1	9.8	17.5	17.4	21
USDIDR	USDCAD	1.0	0.6	81	5.4	2.8	10	11.5	7.7	15.9	15.9	44
USDIDR	USDNOK	1.0	0.2	82	5.4	2.9	12	13.0	9.6	17.3	16.4	21
USDIDR	USDSEK	1.0	0.5	83	5.2	2.8	11	11.7	10.9	15.9	15.3	31
USDIDR	GBPUSD	1.0	0.4	77	5.0	2.1	17	12.7	10.6	17.6	16.9	33
USDIDR	AUDUSD	1.0	0.4	81	5.0	2.8	11	11.5	8.9	15.4	15.1	36
MXNEUR	EURJPY	1.0	0.0	71	4.6	1.4	11	19.9	15.7	24.6	24.6	43
MXNEUR	EURCHF	1.0	0.2	72	4.5	1.4	11	18.7	15.4	24.0	23.9	44
MXNCHF	EURCHF	1.0	1.2	70	4.5	1.5	13	13.5	14.4	21.9	21.0	60
MXNCHF	CHFJPY	1.0	0.1	66	4.4	1.2	14	19.7	15.7	24.9	24.1	59
USDMXN	USDCHF	1.0	0.4	74	4.1	1.6	9	16.8	16.6	24.0	22.6	35
MXNCHF	USDCHF	1.0	0.5	67	4.0	1.3	14	16.3	12.9	21.6	19.8	58

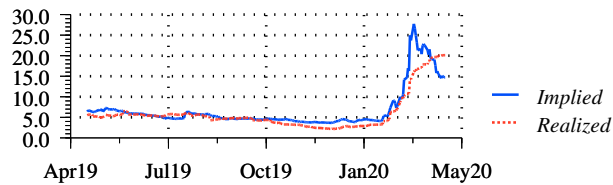
USDIDR vs USDJPY

Weighted Vol Spread



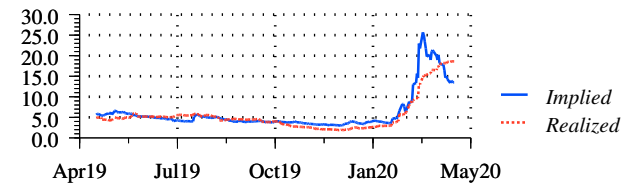
USDIDR vs USDCHF

Weighted Vol Spread



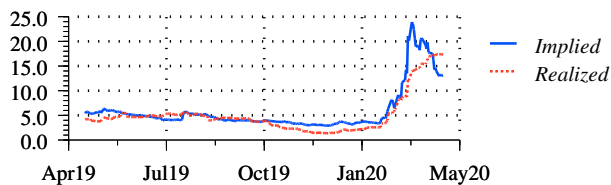
USDIDR vs USDEUR

Weighted Vol Spread



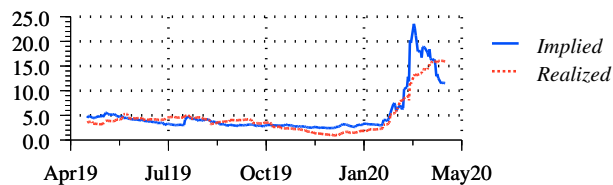
USDIDR vs NZDUSD

Weighted Vol Spread



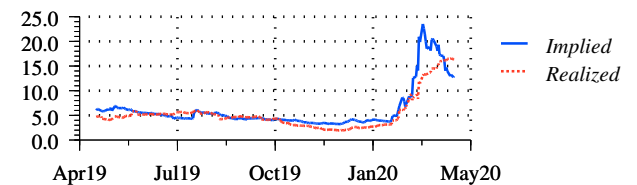
USDIDR vs USDCAD

Weighted Vol Spread



USDIDR vs USDNOK

Weighted Vol Spread



- Note:
1. The report tries to identify 3M vol spreads that are substantially mispriced relative to their realized vol spread based on a linear regression.
 2. Weight Buy and Weight Sell are vega weights. The corrective trade requires the investor to buy and sell the two vols in vega ratio of Weight Buy:Weight Sell
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Global FX Strategy

Long-Dated G10 Vol Rankings

Implied and Realized Volatility Snapshot

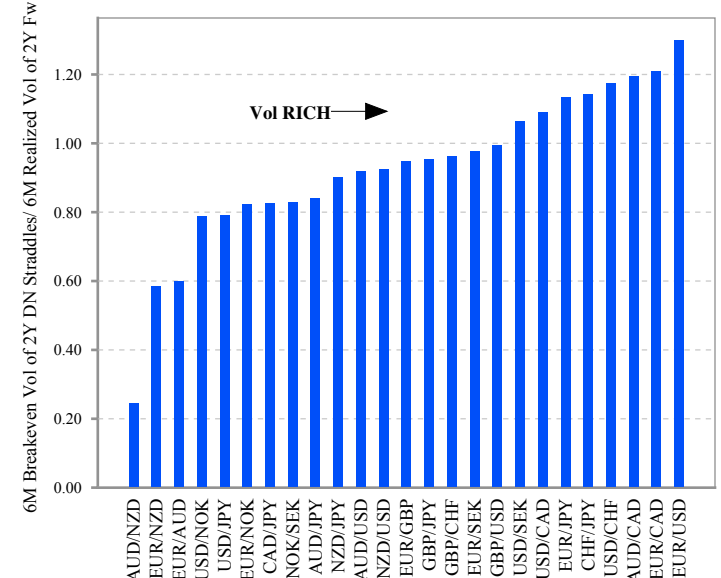
	Implied Volatilities				Realized Vol of Spot (3M)	Realized Vol of 1Y Fwd				Realized Vol of 3Y Fwd				Realized Vol of 5Y Fwd				Realized Vol of 10Y Fwd			
	2Y	3Y	5Y	10Y	3M	1M	3M	6M	1Y	1M	3M	6M	1Y	1M	3M	6M	1Y	1M	3M	6M	1Y
AUD/JPY	13.2	13.0	12.7	13.1	18.3	13.1	18.5	14.0	11.3	13.0	18.7	14.1	11.3	12.6	19.1	14.3	11.3	18.0	23.1	20.1	16.9
AUD/USD	12.1	12.1	12.2	12.3	18.2	15.2	18.4	13.6	10.4	15.3	18.6	13.8	10.5	15.5	19.1	14.1	10.7	20.6	23.5	19.9	16.7
AUD/CAD	9.4	9.6	9.9	10.2	12.9	12.5	13.1	10.0	7.8	12.6	13.3	10.0	7.8	13.4	14.4	10.7	8.3	22.7	21.2	18.5	15.7
CAD/JPY	10.5	10.6	11.1	11.5	14.8	11.4	14.4	10.8	9.0	11.2	14.3	10.7	8.9	11.5	14.6	10.8	8.8	12.8	15.7	11.9	9.5
CHF/JPY	7.7	7.9	8.2	8.7	9.2	6.8	9.0	7.0	6.1	6.8	9.0	7.0	6.1	6.9	9.6	7.4	6.3	8.8	11.9	9.1	7.6
EUR/AUD	10.9	11.2	11.4	11.8	14.9	11.8	15.1	11.3	8.8	11.7	15.3	11.3	8.8	11.4	15.5	11.4	8.8	18.0	19.4	17.7	15.3
EUR/CAD	8.7	9.2	9.9	10.8	10.6	8.2	10.2	7.6	6.2	8.0	10.0	7.5	6.1	8.4	9.7	7.3	6.0	11.2	10.9	8.2	6.8
EUR/CHF	6.5	6.7	7.2	8.4	3.3	3.2	3.3	3.4	3.9	3.2	3.4	3.4	3.9	3.2	3.4	3.5	4.0	2.8	3.6	3.8	4.4
EUR/JPY	9.9	9.6	9.6	10.1	9.9	7.8	10.0	7.9	7.1	7.7	10.1	7.9	7.1	7.5	10.4	8.1	7.1	8.6	12.0	9.3	7.8
EUR/NZD	10.8	11.1	11.3	11.7	13.5	11.5	13.4	10.2	8.2	11.6	13.3	10.0	8.1	12.0	13.4	10.1	8.0	14.0	16.5	12.9	10.2
EUR/USD	8.8	9.2	9.6	9.9	9.8	7.4	9.6	7.3	5.9	7.6	9.8	7.4	6.0	8.3	10.3	7.8	6.4	11.8	12.5	9.5	7.8
EUR/GBP	9.5	9.7	10.1	10.6	12.6	9.4	12.5	10.2	8.9	9.1	12.3	10.1	8.7	8.8	11.7	9.7	8.4	8.7	11.3	9.5	8.3
EUR/NOK	12.7	12.6	12.6	12.4	22.0	16.6	21.2	15.5	11.6	16.7	20.9	15.3	11.5	16.9	20.5	15.1	11.3	17.1	20.0	14.9	11.3
EUR/SEK	7.7	7.8	8.1	8.6	10.0	9.0	10.1	7.8	6.6	9.0	10.1	7.8	6.6	8.9	9.8	7.7	6.5	9.3	9.4	7.6	6.4
GBP/AUD	12.2	12.8	13.3	13.1	11.5	9.0	11.6	10.3	9.1	9.1	11.6	10.2	9.0	9.0	12.0	10.3	9.0	16.7	16.8	16.8	15.8
GBP/CHF	10.0	10.2	10.7	11.8	12.4	8.3	12.4	10.3	9.9	8.1	12.2	10.1	9.7	7.8	11.5	9.6	9.3	8.4	11.1	9.6	9.2
GBP/JPY	11.9	12.0	12.5	13.7	14.5	8.6	14.5	11.9	11.1	8.6	14.5	11.8	10.9	8.6	14.5	11.9	10.6	8.8	15.4	12.6	10.7
GBP/NZD	12.2	12.7	13.2	13.8	12.1	9.6	12.3	10.5	9.6	9.6	12.3	10.5	9.5	9.5	12.8	10.9	9.6	10.4	15.9	13.8	11.8
GBP/USD	11.5	11.8	12.3	12.9	15.7	11.1	15.6	12.3	10.6	11.0	15.6	12.3	10.6	11.1	15.9	12.5	10.6	13.1	17.6	13.6	11.3
NOK/SEK	11.1	10.8	10.5	9.8	17.8	14.8	17.2	12.6	9.5	14.9	17.0	12.4	9.4	15.5	17.1	12.5	9.4	15.8	17.9	13.1	10.0
NZD/JPY	13.0	12.9	12.8	13.7	16.9	13.5	16.8	12.8	10.6	13.6	16.7	12.8	10.5	13.9	16.9	13.0	10.6	15.4	19.8	15.5	12.3
NZD/USD	11.9	12.0	12.1	12.2	17.6	14.2	17.8	13.3	10.4	14.4	18.0	13.4	10.5	15.2	18.8	14.1	10.9	18.4	23.6	18.1	14.0
USD/CAD	8.0	8.4	9.1	10.2	10.9	9.4	10.7	8.0	6.3	9.4	10.6	7.9	6.3	10.3	10.8	8.1	6.4	11.8	11.8	8.8	7.2
USD/CHF	8.2	8.6	9.0	9.3	9.3	7.5	9.1	7.1	6.2	7.5	9.1	7.0	6.1	7.8	9.4	7.3	6.2	11.2	12.0	9.3	7.7
USD/JPY	8.2	8.1	8.0	8.8	12.5	7.0	12.3	9.1	7.3	6.9	12.4	9.1	7.2	6.8	12.8	9.4	7.2	10.6	15.2	11.4	8.9
USD/NOK	14.6	14.8	15.0	14.9	26.4	18.5	25.9	18.9	14.2	18.7	25.9	18.9	14.2	19.4	26.1	19.1	14.5	22.0	27.4	20.3	15.6
USD/SEK	11.2	11.6	12.0	12.0	14.8	11.7	14.8	11.2	9.2	11.8	15.0	11.3	9.3	12.6	15.6	11.8	9.7	15.5	17.4	13.3	11.0
AUD/CHF	12.1	12.3	12.6	13.5	15.5	11.7	15.7	12.0	9.8	11.7	15.9	12.1	9.8	11.5	16.1	12.2	9.7	18.6	20.2	18.4	15.7
NZD/CHF	12.1	12.4	12.8	13.3	13.8	10.9	13.8	10.7	8.9	11.0	13.7	10.6	8.8	11.5	14.1	11.0	9.0	14.0	17.2	13.8	11.2
NZD/CAD	9.7	10.1	10.5	10.7	12.2	10.9	12.3	9.6	7.8	11.2	12.6	9.7	7.8	12.5	14.3	10.9	8.5	16.2	20.5	15.7	12.1

G10 Currency Pairs Ranked By 6M Breakeven Vol of 2Y DN Straddles/ 6M Realized Vol of 2Y Forward

Breakeven vol is the value of realized vol R that satisfies:

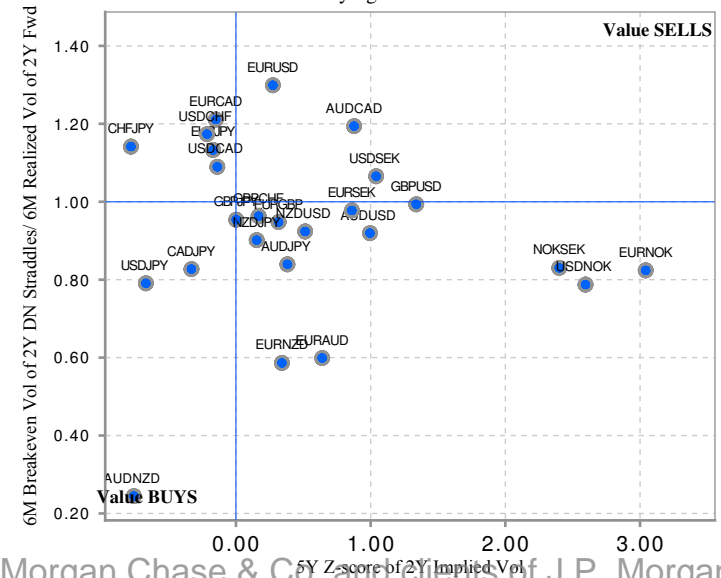
$$(t/T)*R^2 + (1-t/T)*I_{T-t|t}^2 - I_{T|t=0}^2 = 0$$

$I_{T-t|t}$ = Implied Vol of tenor T-t at time t ; $I_{T|t=0}$ = Implied Vol of tenor T at time t = 0



Long-Dated Vol Matrix

X-axis denotes historical richness/cheapness of implied vol, while Y-axis denotes the performance of forward gamma. Forward gamma performance is measured as the ratio of 6M realized vol of decaying forwards / 6M breakeven vol



Global FX Strategy

Long-Dated EM Vol Rankings

Implied and Realized Volatility Snapshot

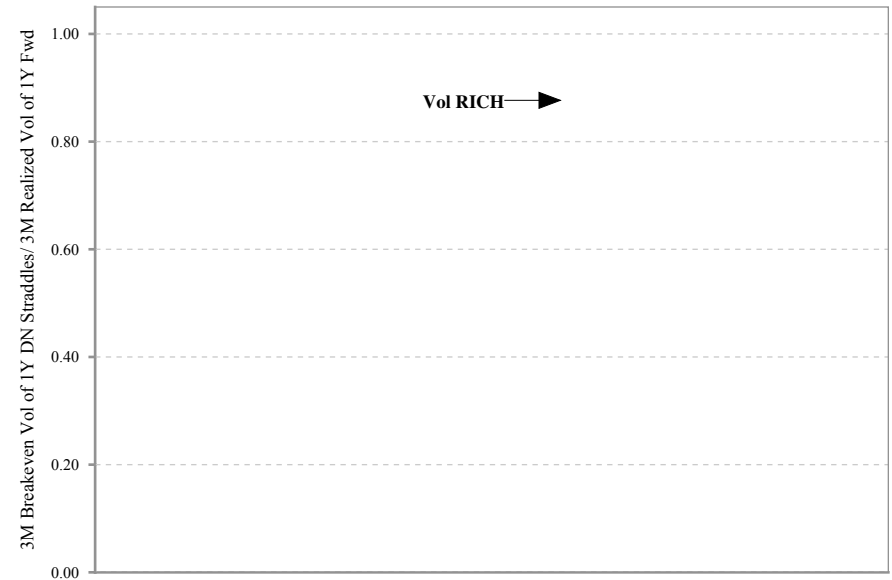
	Implied Volatilities			Realized Vol of Spot (3M)	Realized Vol of 1Y Fwd				Realized Vol of 2Y Fwd				Realized Vol of 5Y Fwd			
	1Y	2Y	5Y	3M	1M	3M	6M	1Y	1M	3M	6M	1Y	1M	3M	6M	1Y
USD/BRL	19.2	19.4	20.7	21.5	21.5	21.7	16.8	14.4	23.9	25.9	19.6	16.4	38.5	44.3	32.5	25.4
EUR/BRL	19.2	19.2	20.6	22.9	19.7	23.0	17.7	15.1	22.6	26.1	19.8	16.6	37.3	42.7	31.4	24.5
USD/CLP	13.4	13.6	15.2	15.6	13.2	15.9	16.7	13.5	13.0	16.3	17.4	14.0	14.1	19.8	20.8	16.3
USD/MXN	18.3	18.5	19.0	27.7	26.9	26.4	19.1	15.2	26.6	27.1	19.7	15.8	27.2	32.0	23.4	18.9
EUR/MXN	18.0	18.8	19.8	27.3	24.2	24.3	17.8	14.6	23.8	24.9	18.2	15.0	24.1	29.2	21.4	17.5
EUR/CZK	6.2	6.3	6.2	12.5	9.0	12.1	8.7	6.4	9.3	11.8	8.5	6.5	19.5	15.5	11.2	9.3
EUR/HUF	7.2	7.2	7.5	9.9	10.8	9.9	7.7	6.2	12.3	10.4	8.1	6.5	16.2	13.7	10.6	8.4
EUR/PLN	6.2	6.2	6.2	8.1	5.7	7.8	6.1	5.0	5.9	7.0	5.6	4.7	6.8	7.1	6.0	5.2
USD/PLN	10.4	10.5	11.1	14.9	11.6	14.3	10.9	8.9	11.8	14.1	10.7	8.7	13.1	14.7	11.2	9.0
USD/TRY	24.3	25.2	27.6	14.2	25.6	21.6	16.1	16.8	32.9	27.9	20.7	21.6	51.8	44.0	33.0	34.4
EUR/TRY	24.3	25.2	27.4	14.0	21.9	20.6	15.5	16.7	29.2	26.8	20.1	21.4	48.4	42.7	32.3	34.0
USD/ZAR	17.7	18.0	19.3	19.8	22.8	20.2	16.1	14.8	24.1	21.4	16.9	15.4	41.8	35.9	26.9	22.1
EUR/ZAR	17.5	17.8	18.4	19.4	19.6	19.7	15.8	14.6	20.7	20.9	16.6	15.1	38.3	34.4	25.7	21.1
USD/INR	8.4	8.4	8.4	7.4	8.6	10.3	7.8	6.8	9.2	10.6	8.1	7.2	12.7	15.3	11.8	10.4
USD/KRW	10.8	11.1	11.7	14.5	9.9	12.2	9.7	8.3	9.8	11.6	9.4	8.1	11.0	11.9	9.8	8.9
USD/SGD	5.3	5.6	6.1	6.1	5.3	6.2	4.6	4.0	5.7	6.8	5.1	4.5	7.8	10.0	7.5	6.5
USD/RUB	16.5	16.6	18.1	29.9	26.2	32.6	23.6	17.7	27.5	35.8	25.9	19.4	33.5	47.9	34.5	25.6
USD/TWD	5.2	5.5	6.0	4.2	2.1	4.1	3.3	3.4	3.1	4.6	3.7	3.9	6.2	8.5	6.9	6.5
USD/IDR	14.5	14.3	14.1	16.2	21.3	22.9	16.5	12.7	20.0	21.0	15.2	11.8	25.4	27.1	19.8	15.4
USD/PHP	5.1	5.3	5.4	5.1	3.7	5.6	4.8	5.0	4.3	5.8	5.2	5.4	7.0	11.1	9.3	8.8
USD/MYR	6.0	6.1	6.1	8.3	9.3	10.4	7.8	6.0	7.2	8.3	6.5	5.1	9.1	9.8	8.2	6.8
EUR/SGD	7.1	7.5	8.1	13.6	6.9	9.2	7.0	5.9	7.3	9.4	7.2	6.0	8.7	9.6	7.3	6.2
EUR/CNY	8.0	8.3	8.9	10.2	6.5	9.8	8.0	7.5	6.3	10.4	8.5	8.0	7.2	11.3	9.1	8.4
USD/CNY	5.1	5.5	5.8	6.1	2.8	5.1	4.5	5.0	3.6	6.8	5.7	5.9	4.9	7.7	6.7	7.0
EUR/KRW	12.3	12.8	13.7	15.4	9.5	14.0	11.1	9.5	9.7	13.8	10.9	9.4	10.6	13.8	10.9	9.4
GBP/KRW	13.8	14.2	15.0	16.9	10.3	16.2	13.4	11.6	10.0	16.0	13.3	11.5	9.8	16.5	13.6	11.7
EUR/INR	11.8	12.2	12.7	11.2	8.8	13.0	9.9	8.4	9.4	12.8	9.8	8.4	11.8	15.2	11.8	10.0
EUR/RUB	16.6	16.9	18.4	30.2	26.2	33.0	24.0	17.9	27.3	36.1	26.1	19.4	33.2	47.8	34.4	25.3
EUR/ILS	9.6	9.1	8.5	19.2	11.9	18.7	13.7	10.5	11.9	19.2	14.0	10.7	11.9	20.2	14.8	11.4
USD/ILS	7.0	7.1	7.8	17.1	11.2	16.7	12.1	9.3	10.9	17.3	12.5	9.5	11.8	19.6	14.2	10.8
CHF/ZAR	18.1	17.8	18.9	23.5	21.1	20.5	16.7	15.6	22.8	21.7	17.4	16.1	38.6	34.7	26.1	21.7
CHF/PLN	9.1	9.3	9.6	23.3	6.1	8.4	6.8	6.4	6.6	7.7	6.4	6.0	7.8	8.6	7.0	6.4

EM Currency Pairs Ranked By 3M Breakeven Vol of 1Y DN Straddles/ 3M Realized Vol of 1Y Forward

Breakeven vol is the value of realized vol R that satisfies:

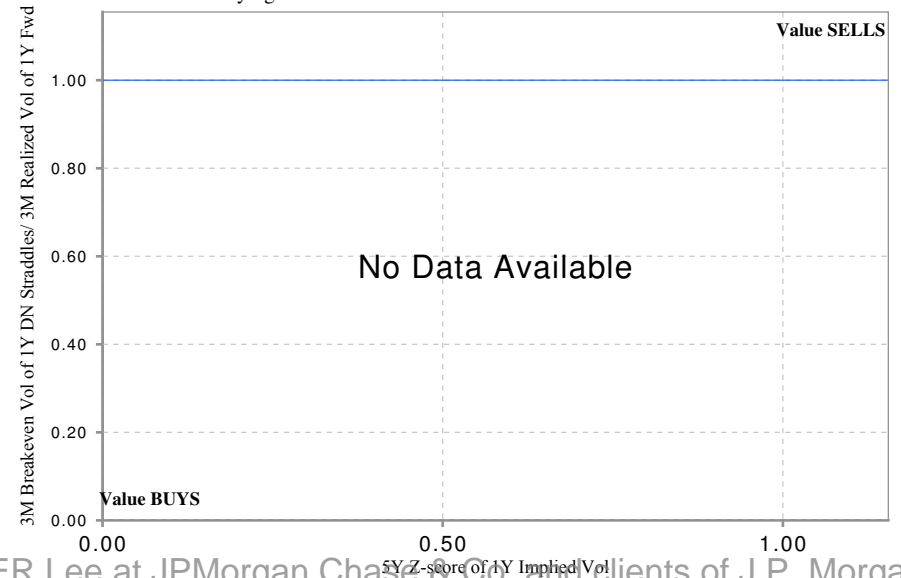
$$(t/T)*R^2 + (1-t/T)*I_{T-t|t}^2 - I_{T|t=0}^2 = 0$$

$I_{T-t|t}$ = Implied Vol of tenor T-t at time t ; $I_{T|t=0}$ = Implied Vol of tenor T at time t = 0



Long-Dated Vol Matrix

X-axis denotes historical richness/cheapness of implied vol, while Y-axis denotes the performance of forward gamma. Forward gamma performance is measured as the ratio of 3M realized vol of decaying forwards / 3M breakeven vol



Implied and Realized Volatility Snapshot

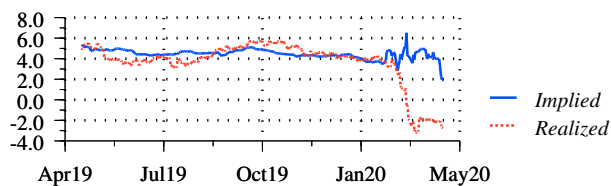
	Implied Volatilities			Realized Vol of Spot (3M)	Realized Vol of 1Y Fwd				Realized Vol of 2Y Fwd				Realized Vol of 5Y Fwd			
	1Y	2Y	5Y	3M	1M	3M	6M	1Y	1M	3M	6M	1Y	1M	3M	6M	1Y
CHF/ILS	8.5	8.7	9.4	19.9	13.0	19.0	13.9	10.9	13.0	19.1	14.0	11.0	12.3	19.7	14.4	11.4
CHF/HUF	10.1	10.1	10.1	24.5	11.9	10.8	8.7	7.5	13.7	11.7	9.2	7.7	17.4	15.1	11.6	9.4
CHF/TRY	26.1	27.4	29.9	18.9	23.6	21.5	16.3	17.2	31.0	27.5	20.6	21.8	48.6	42.5	32.2	34.0
CHF/ZAR	18.1	17.8	18.9	23.5	21.1	20.5	16.7	15.6	22.8	21.7	17.4	16.1	38.6	34.7	26.1	21.7
CHF/RUB	16.7	16.2	17.6	31.8	27.4	33.6	24.5	18.7	28.6	36.5	26.5	20.1	33.6	47.9	34.5	25.8
USD/COP	14.6	14.8	15.4	23.6	15.4	23.9	18.4	15.0	16.7	26.9	20.5	16.7	20.3	36.5	27.3	21.5

Relative Value 1Y Vega G10 Trades

Buy	Sell	Weight Buy	Weight Sell	R-squared (%)	Mispricing (Vol pts)	Z-Residual	Half-Life (Days)	Current Wtd. Implied Spread	Average Wtd. Implied Spread	Current 3M Wtd. Realized Spread	Average Wtd. Realized Spread	% of time Subsequent 3M Wtd Realized Vol Spread > Wtd Implied Vol Spread
SEKEUR	NOKEUR	1.9	1.0	95	2.5	5.3	3	1.9	4.4	-2.7	3.6	27
AUDJPY	EURJPY	1.0	1.9	88	2.1	2.6	11	-6.1	-4.0	-0.5	-3.1	0
USDSEK	USDNOK	1.5	1.0	96	1.9	4.4	3	1.8	3.8	-4.0	2.5	23
EURAUD	NOKEUR	1.0	0.9	92	1.7	2.9	3	-0.7	1.0	-4.7	0.0	0
NZDUSD	USDNOK	1.2	1.0	93	1.7	2.9	5	-0.7	1.0	-5.6	0.6	43
EURAUD	EURJPY	1.0	1.7	88	1.5	2.1	15	-6.8	-5.3	-1.8	-4.4	0
NZDJPY	EURJPY	0.5	1.0	86	1.4	3.4	10	-4.1	-2.6	-2.0	-2.3	78
CADJPY	EURJPY	1.0	1.4	94	1.4	3.5	5	-3.3	-1.9	0.9	-1.3	0
USDJPY	EURJPY	1.0	1.0	90	1.4	3.9	7	-1.8	-0.4	2.6	-0.3	42
SEKEUR	EURJPY	0.9	1.0	83	1.3	2.8	7	-3.3	-2.0	-0.7	-1.2	87
EURCAD	EURJPY	1.0	1.2	89	1.2	2.5	8	-3.7	-2.5	-0.9	-2.4	0
AUDUSD	USDNOK	1.0	0.8	94	1.1	2.2	4	-0.6	0.5	-4.3	-0.3	0
USDJPY	AUDUSD	1.7	1.0	86	1.1	1.4	11	2.7	3.8	3.2	3.2	41

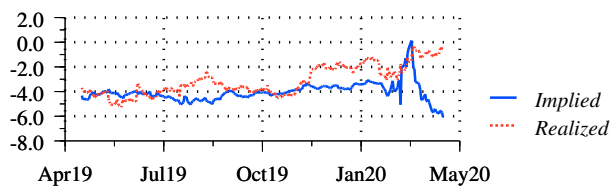
SEKEUR vs NOKEUR

Weighted Vol Spread



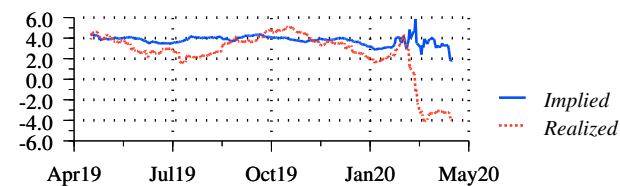
AUDJPY vs EURJPY

Weighted Vol Spread



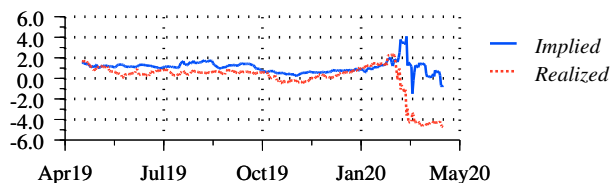
USDSEK vs USDNOK

Weighted Vol Spread



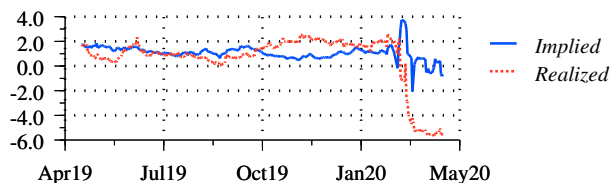
EURAUD vs NOKEUR

Weighted Vol Spread



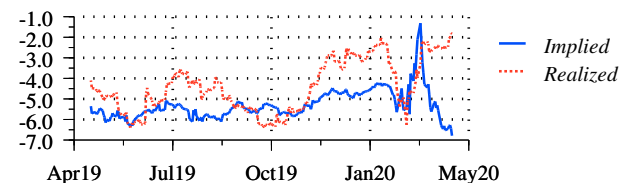
NZDUSD vs USDNOK

Weighted Vol Spread



EURAUD vs EURJPY

Weighted Vol Spread



Note:

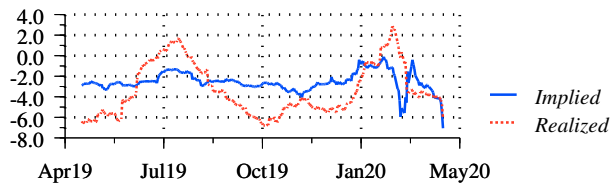
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6. Weighted Realized Vol Spread. > Weighted Implied Vol Spread. means that the investor is being compensated in relative gamma terms to wait for a correction in relative vega

Relative Value 1Y Vega EM Trades

Buy	Sell	Weight Buy	Weight Sell	R-squared (%)	Mispricing (Vol pts)	Z-Residual	Half-Life (Days)	Current Wtd. Implied Spread	Average Wtd. Implied Spread	Current 3M Wtd. Realized Spread	Average Wtd. Realized Spread	% of time Subsequent 3M Wtd Realized Vol Spread > Wtd Implied Vol Spread
USDTHB	USDBRL	1.9	1.0	74	4.5	4.7	11	-7.1	-2.5	-6.2	-3.2	35
USDPHP	USDBRL	3.7	1.0	71	4.1	4.0	6	-0.4	3.7	-1.3	5.5	78
USDTHB	USDMXN	3.0	1.0	75	4.0	2.6	12	1.2	5.3	-1.5	4.2	22
USDSGD	USDBRL	2.2	1.0	80	3.5	4.1	5	-7.5	-4.0	-8.2	-4.9	32
USDIDR	USDBRL	0.5	1.0	78	3.2	3.6	5	-11.8	-8.6	-9.9	-8.1	67
USDTHB	USDRUB	2.2	1.0	75	3.1	2.8	15	-2.1	1.1	-14.2	-0.3	38
USDINR	USDBRL	1.9	1.0	84	3.1	4.1	5	-3.7	-0.6	-2.7	-1.5	23
USDTHB	USDIDR	3.3	1.0	79	2.8	1.9	22	7.1	10.0	4.7	8.1	25
USDHUF	USDBRL	1.5	1.0	78	2.5	2.8	7	-2.7	-0.2	2.2	-0.6	49
USDPLN	USDBRL	1.7	1.0	79	2.3	2.6	9	-1.5	0.8	2.6	-0.5	27
USDSGD	USDMXN	3.6	1.0	86	2.3	2.0	6	1.1	3.4	-4.0	1.9	17
USDRUB	USDBRL	0.8	1.0	84	2.2	3.0	7	-6.4	-4.2	3.6	-3.7	38
MXNEUR	BRLEUR	0.6	1.0	93	2.2	4.2	4	-8.0	-5.8	-7.9	-6.2	37
USDMXN	USDBRL	0.6	1.0	91	2.2	3.9	4	-8.3	-6.1	-5.9	-6.1	48
USDZAR	USDBRL	1.8	1.0	79	2.2	2.5	6	12.2	14.4	14.1	11.4	4

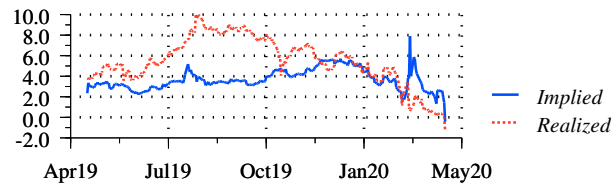
USDTHB vs USDBRL

Weighted Vol Spread



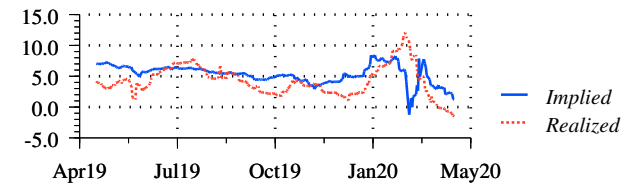
USDPHP vs USDBRL

Weighted Vol Spread



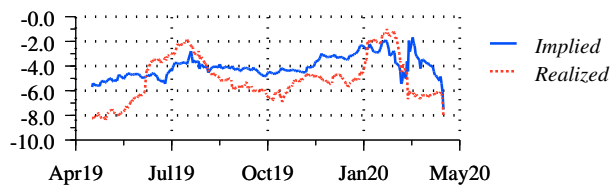
USDTHB vs USDMXN

Weighted Vol Spread



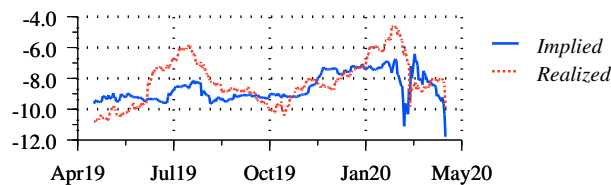
USDSGD vs USDBRL

Weighted Vol Spread



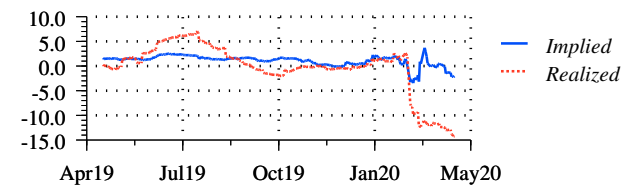
USDIDR vs USDBRL

Weighted Vol Spread



USDTHB vs USDRUB

Weighted Vol Spread



Note:

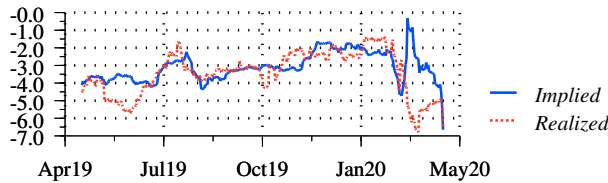
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Relative Value 1Y Vega EM vs G10 Trades

Buy	Sell	Weight Buy	Weight Sell	R-squared (%)	Mispricing (Vol pts)	Z-Residual	Half-Life (Days)	Current Wtd. Implied Spread	Average Wtd. Implied Spread	Current 3M Wtd. Realized Spread	Average Wtd. Realized Spread	% of time Subsequent 3M Wtd Realized Vol Spread > Wtd Implied Vol Spread
SEKEUR	BRLEUR	1.6	1.0	83	3.6	4.3	7	-6.7	-3.1	-6.4	-3.4	58
EURCAD	BRLEUR	1.3	1.0	84	3.4	4.3	8	-8.2	-4.7	-8.9	-6.0	24
EURAUD	BRLEUR	0.9	1.0	81	3.3	3.8	8	-9.7	-6.4	-9.7	-6.9	45
NZDJPY	MXNJPY	1.3	1.0	81	3.3	2.3	14	-3.1	0.2	-3.6	-0.7	46
USDCAD	USDBRL	1.6	1.0	85	3.3	4.5	6	-7.2	-3.9	-4.5	-4.8	37
USDJPY	MXNJPY	2.8	1.0	87	3.0	2.6	11	3.5	6.5	9.6	4.9	19
USDJPY	USDMXN	2.5	1.0	82	3.0	2.3	11	3.4	6.5	5.5	5.4	27
USDEUR	USDBRL	1.5	1.0	80	2.8	3.4	6	-6.5	-3.6	-6.7	-4.8	31
AUDJPY	MXNJPY	1.3	1.0	84	2.8	2.2	14	-3.0	-0.2	-1.9	-0.5	56
USDEUR	BRLEUR	1.7	1.0	87	2.5	3.5	6	-5.0	-2.5	-6.4	-4.5	10
EURCHF	BRLEUR	3.3	1.0	80	2.4	2.7	11	1.4	3.7	-12.4	-0.5	3
SEKEUR	MXNEUR	2.6	1.0	84	2.4	1.9	8	1.6	4.0	1.6	4.1	57
CADJPY	MXNJPY	1.9	1.0	90	2.3	2.3	11	0.5	2.8	2.3	2.3	45
USDJPY	USDRUB	1.9	1.0	87	2.3	2.8	11	0.0	2.3	-8.3	0.9	43
USDSEK	USDMXN	1.9	1.0	84	2.3	1.9	6	2.3	4.6	1.8	4.0	52

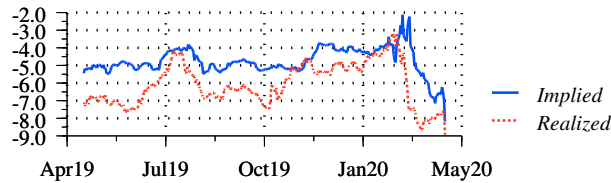
SEKEUR vs BRLEUR

Weighted Vol Spread



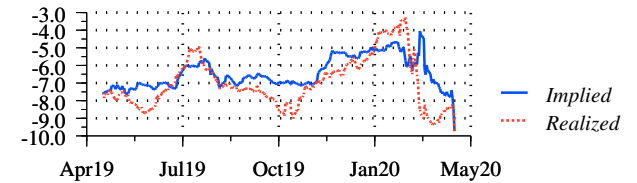
EURCAD vs BRLEUR

Weighted Vol Spread



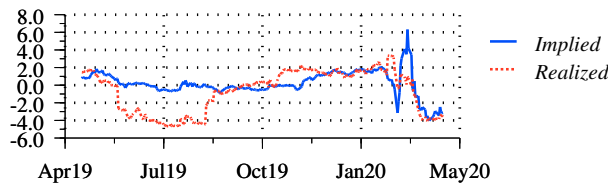
EURAUD vs BRLEUR

Weighted Vol Spread



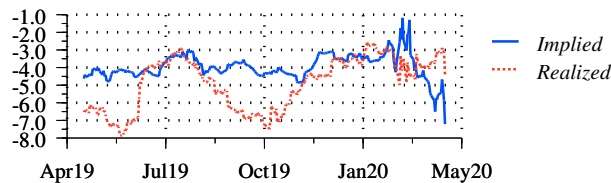
NZDJPY vs MXNJPY

Weighted Vol Spread



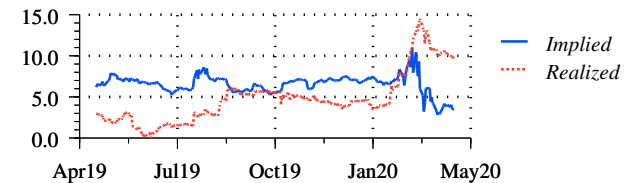
USDCAD vs USDBRL

Weighted Vol Spread



USDJPY vs MXNJPY

Weighted Vol Spread



Note:

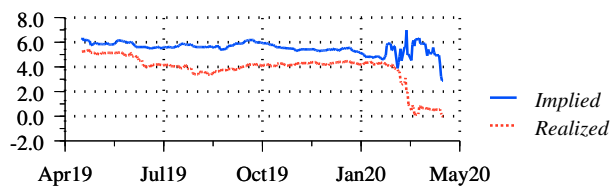
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Relative Value 5Y Vega G10 Trades

Buy	Sell	Weight Buy	Weight Sell	R-squared (%)	Mispricing (Vol pts)	Z-Residual	Half-Life (Days)	Current Wtd. Implied Spread	Average Wtd. Implied Spread	Current 3M Wtd. Realized Spread	Average Wtd. Realized Spread	% of time Subsequent 3M Wtd Realized Vol Spread > Wtd Implied Vol Spread
SEKEUR	NOKEUR	1.9	1.0	93	2.6	0.0	3	2.9	5.5	-0.0	3.8	0
NZDUSD	USDNOK	1.2	1.0	89	1.6	0.0	5	-0.7	0.9	-1.7	0.3	10
USDSEK	USDNOK	1.5	1.0	95	1.5	0.0	3	2.7	4.2	-1.5	2.5	0
SEKEUR	EURAUD	1.8	1.0	92	1.3	0.0	4	3.3	4.7	2.3	3.4	0
AUDJPY	GBPAUD	1.0	0.8	81	1.2	2.2	9	2.4	3.6	6.8	2.5	14
GBPJPY	GBPCAD	0.9	1.0	87	1.1	0.0	11	-0.3	0.7	1.0	0.8	49
AUDJPY	CHFAUD	1.0	0.7	82	1.0	1.9	8	3.9	4.9	6.1	3.5	16
AUDJPY	EURAUD	1.0	0.7	82	1.0	1.9	7	4.9	6.0	6.8	4.5	15
AUDUSD	USDNOK	1.0	0.9	89	1.0	1.9	5	-0.6	0.4	-1.3	0.1	13

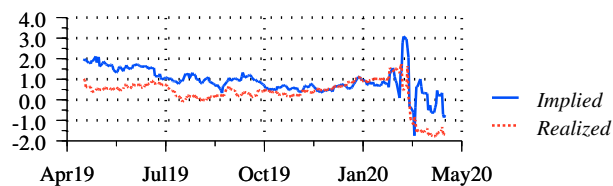
SEKEUR vs NOKEUR

Weighted Vol Spread



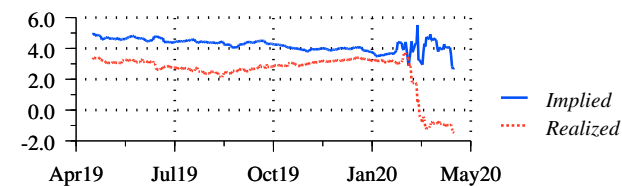
NZDUSD vs USDNOK

Weighted Vol Spread



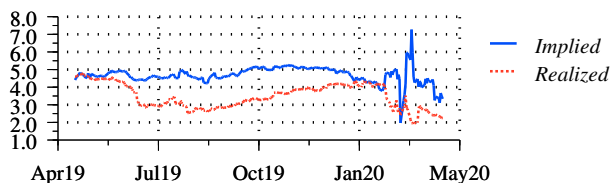
USDSEK vs USDNOK

Weighted Vol Spread



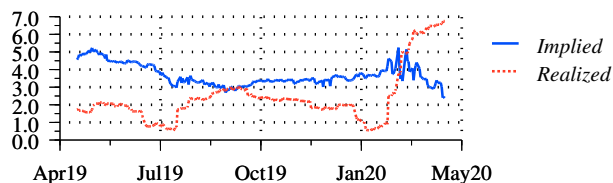
SEKEUR vs EURAUD

Weighted Vol Spread



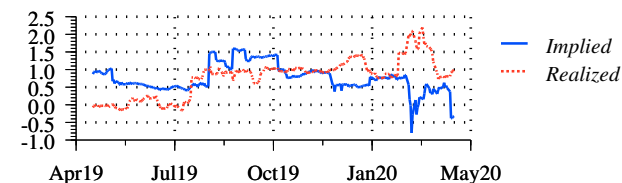
AUDJPY vs GBPAUD

Weighted Vol Spread



GBPJPY vs GBPCAD

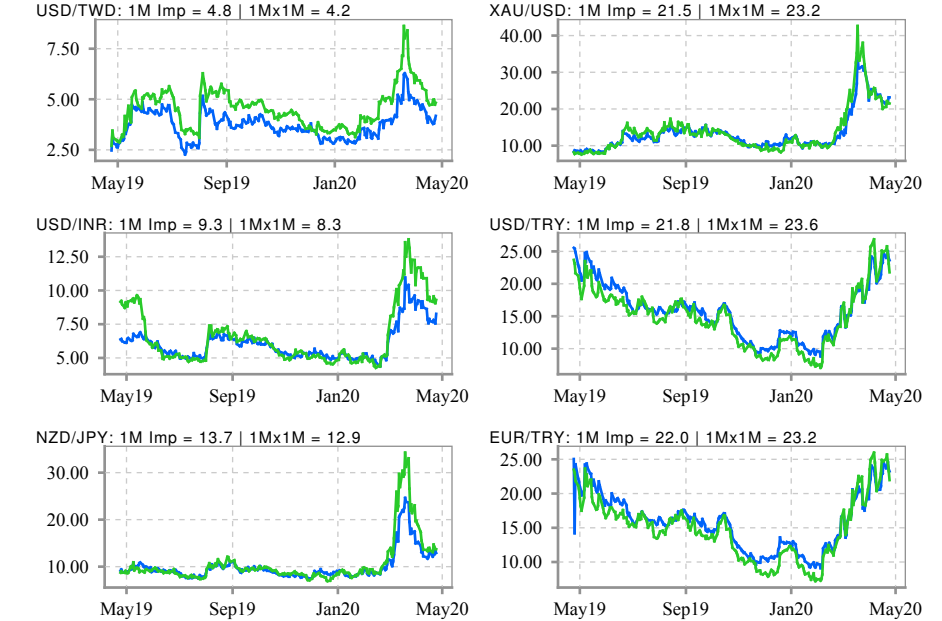
Weighted Vol Spread



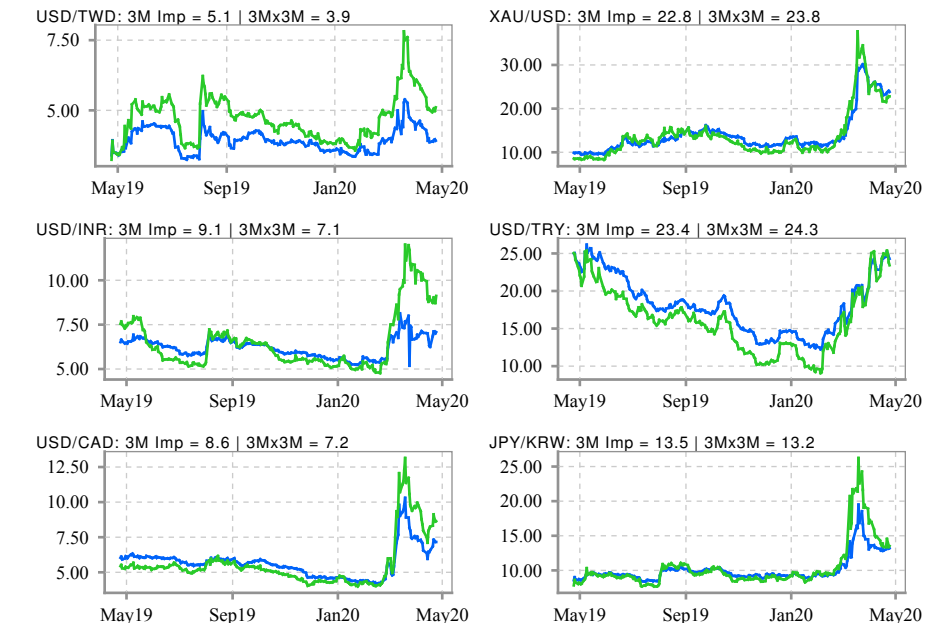
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Top 3 1Mx1M Forward Vol Sells

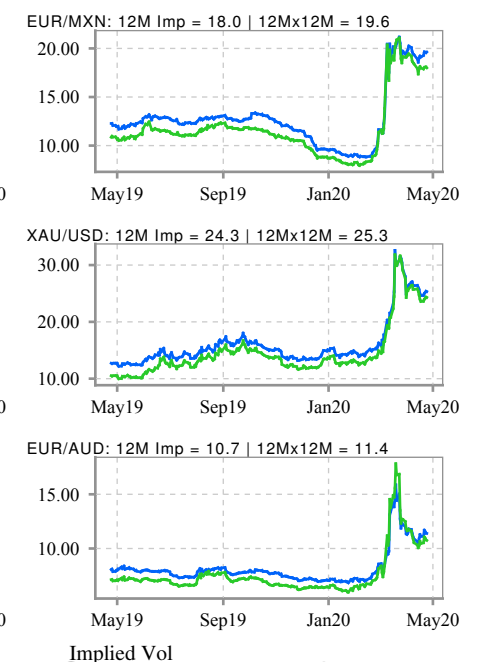
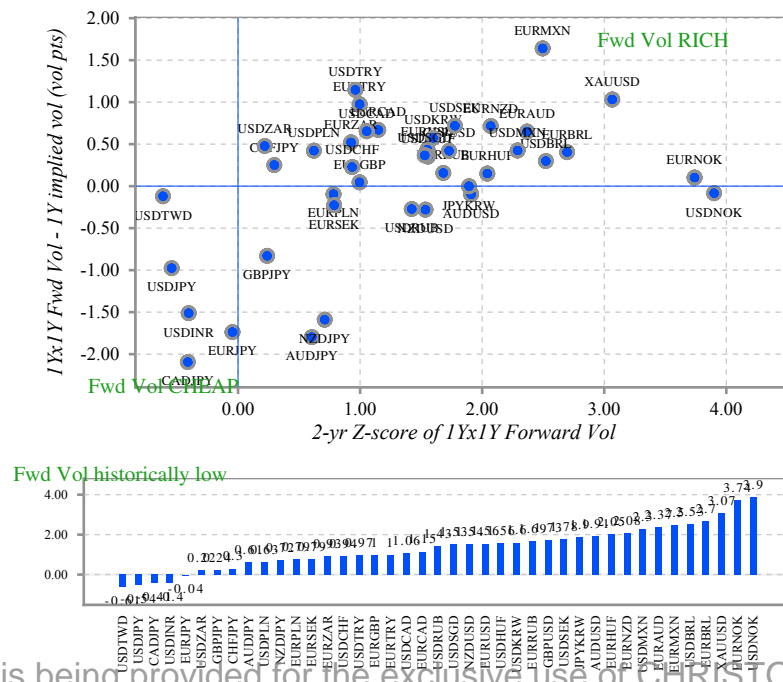


Top 3 3Mx3M Forward Vol Sells



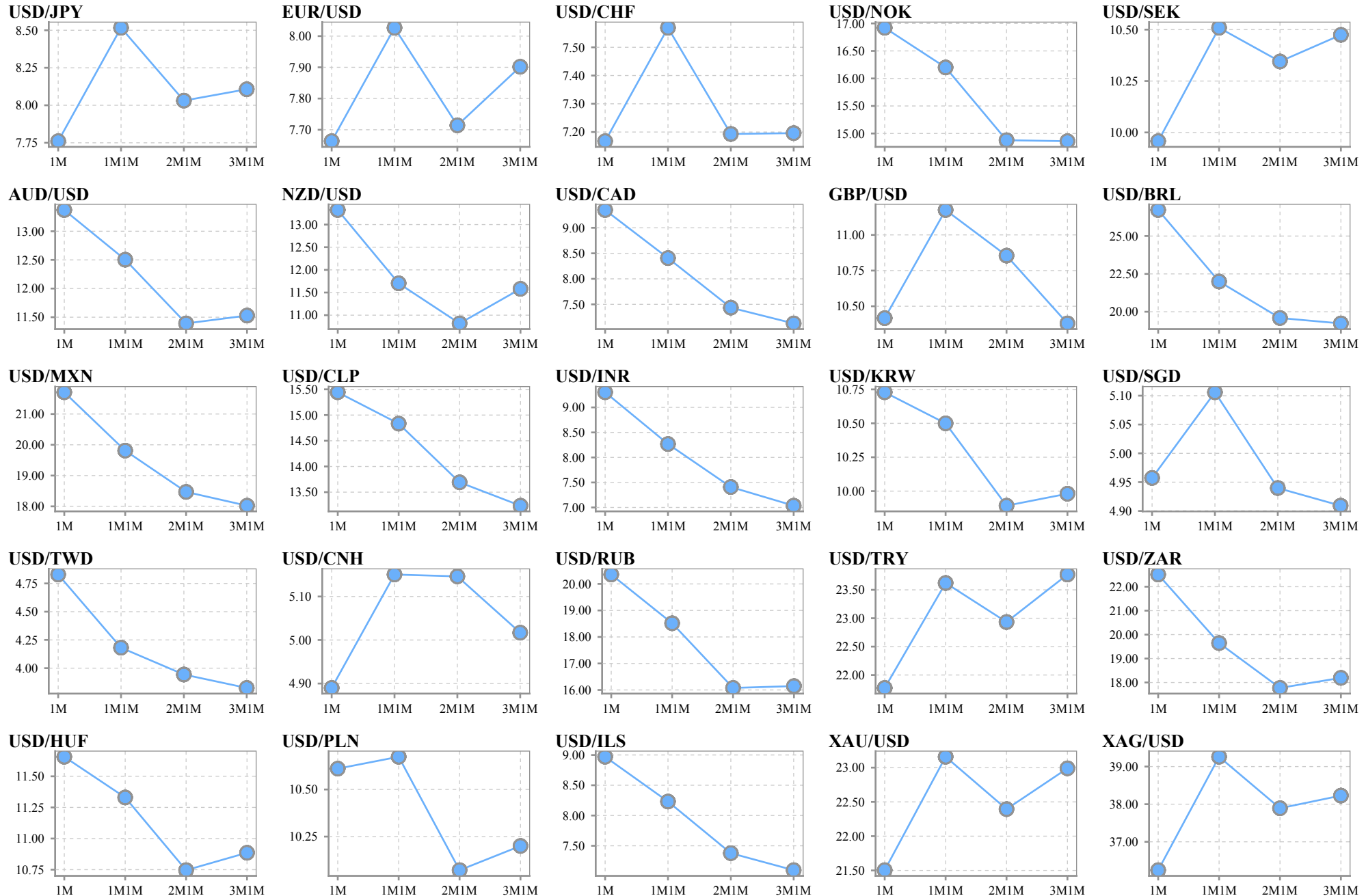
Implied Vol

Page 24



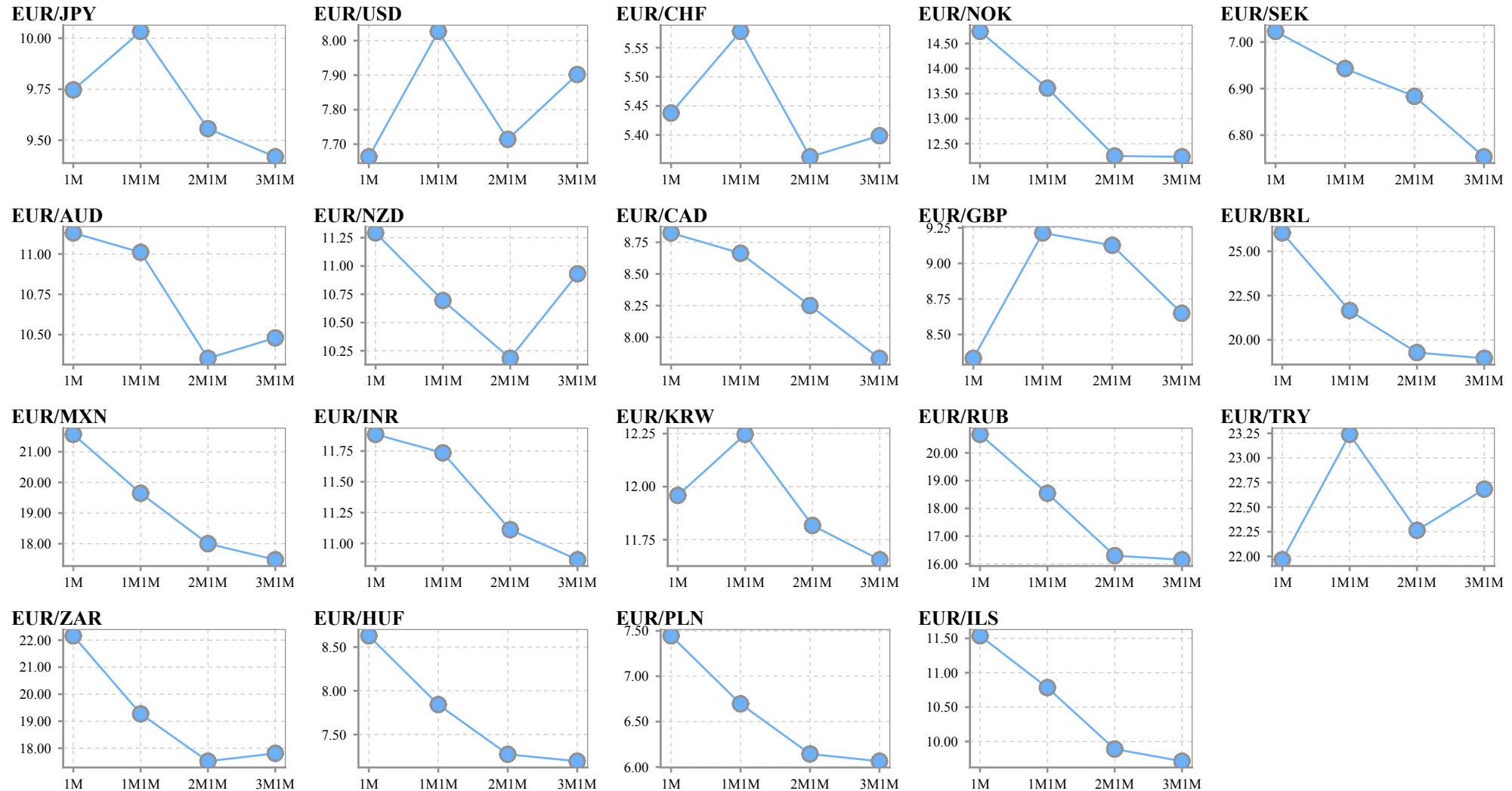
Global FX Strategy

Term structures of 1M vol N-months forward: USD pairs



Global FX Strategy

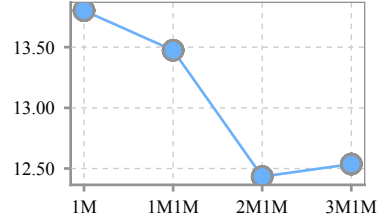
Term structures of 1M vol N-months forward: EUR crosses



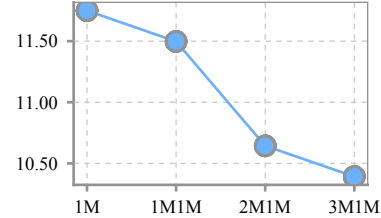
Global FX Strategy

Term structures of 1M vol N-months forward: JPY crosses

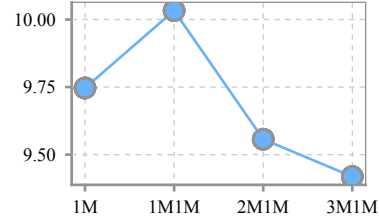
AUD/JPY



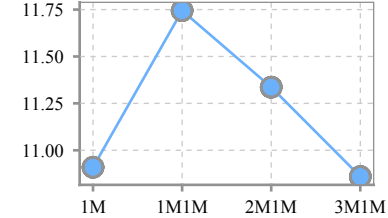
CAD/JPY



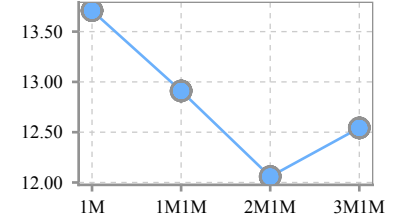
EUR/JPY



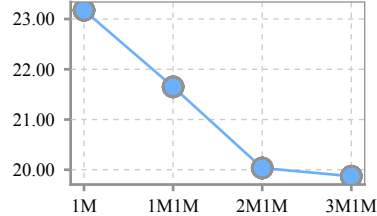
GBP/JPY



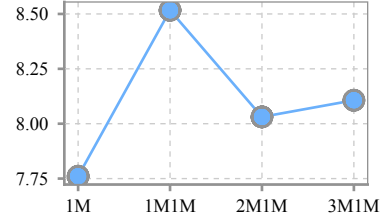
NZD/JPY



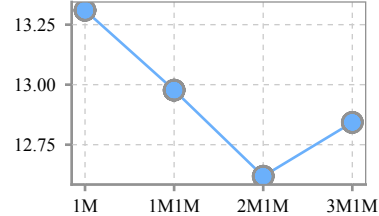
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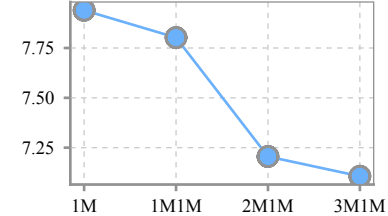
USD/JPY



JPY/KRW



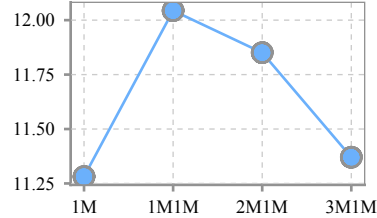
CHF/JPY



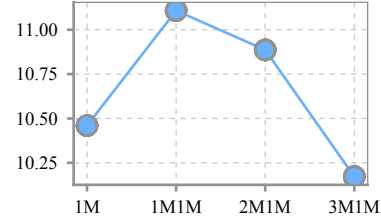
Global FX Strategy

Term structures of 1M vol N-months forward: GBP crosses

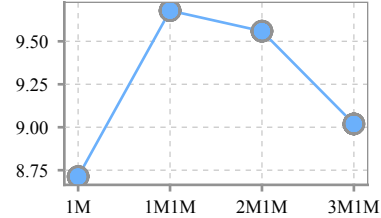
GBP/AUD



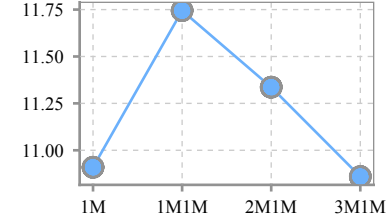
GBP/CAD



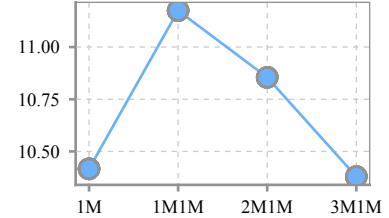
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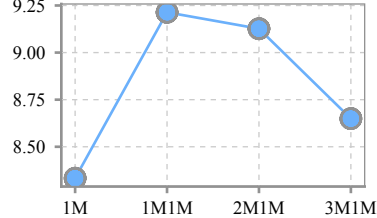
GBP/JPY



GBP/USD

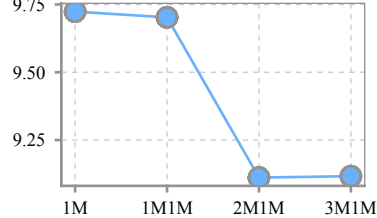


EUR/GBP

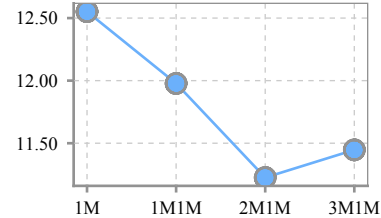


Term structures of 1M vol N-months forward: AUD crosses

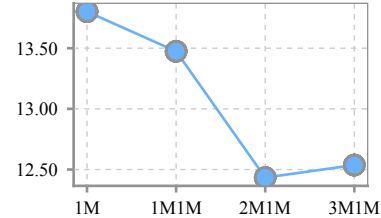
AUD/CAD



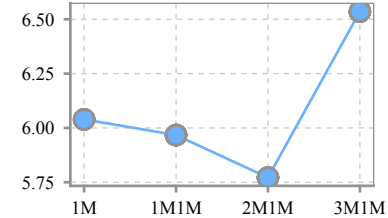
AUD/CHF



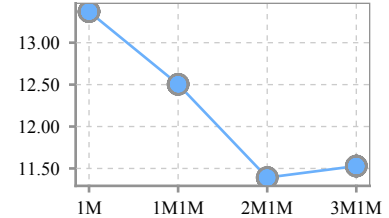
AUD/JPY



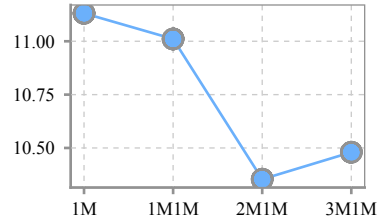
AUD/NZD



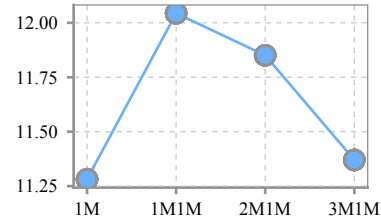
AUD/USD



EUR/AUD

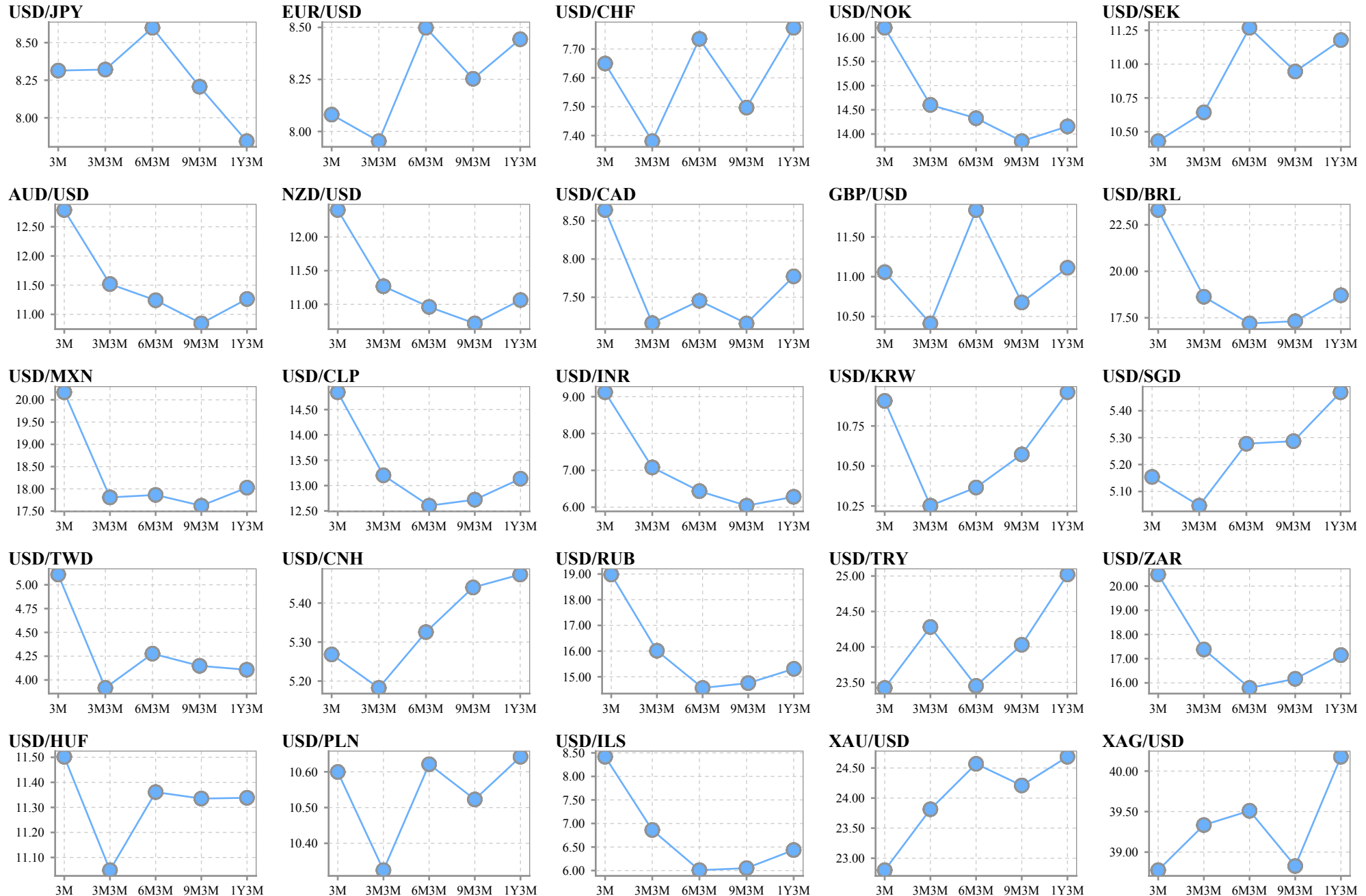


GBP/AUD



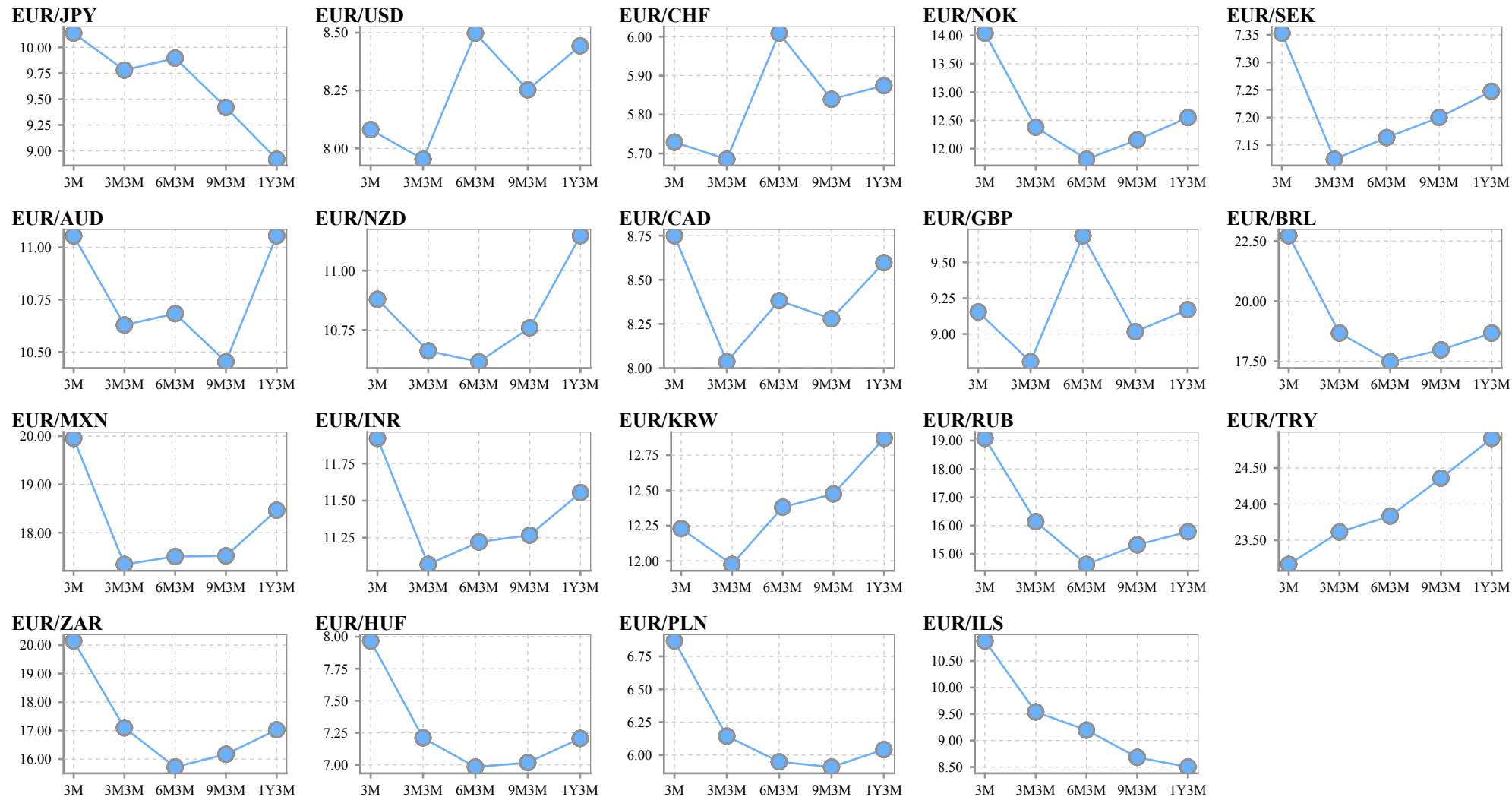
Global FX Strategy

Term structures of 3M vol N-months forward: USD pairs



Global FX Strategy

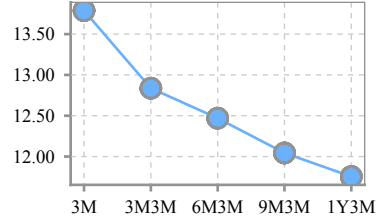
Term structures of 3M vol N-months forward: EUR crosses



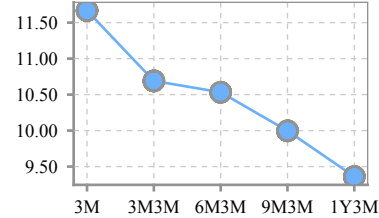
Global FX Strategy

Term structures of 3M vol N-months forward: JPY crosses

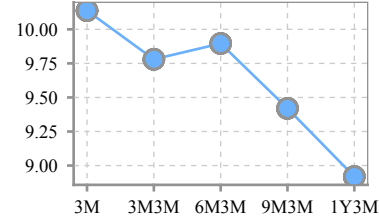
AUD/JPY



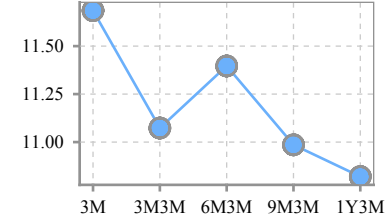
CAD/JPY



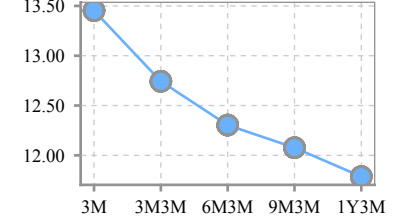
EUR/JPY



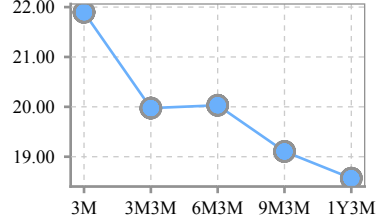
GBP/JPY



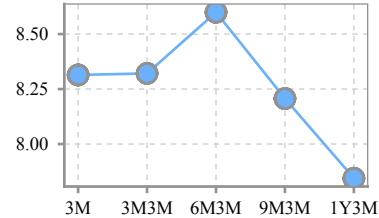
NZD/JPY



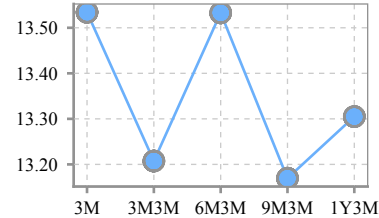
MXN/JPY



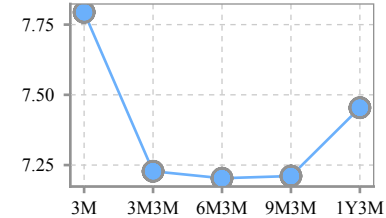
USD/JPY



JPY/KRW



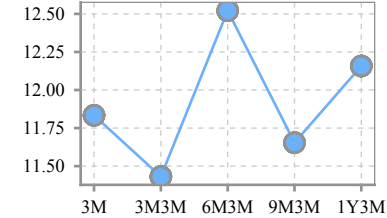
CHF/JPY



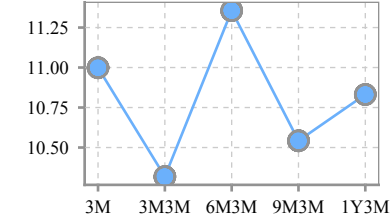
Global FX Strategy

Term structures of 3M vol N-months forward: GBP crosses

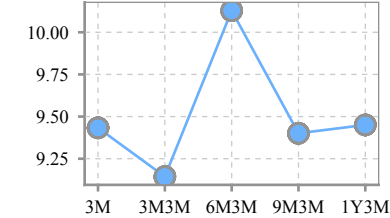
GBP/AUD



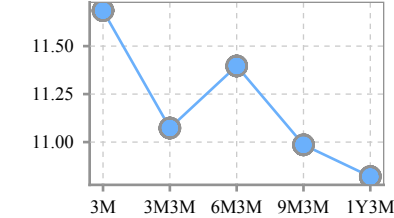
GBP/CAD



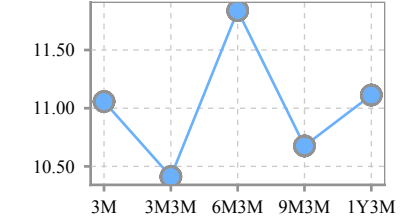
GBP/CHF



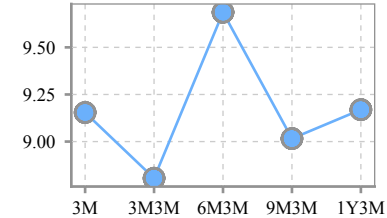
GBP/JPY



GBP/USD

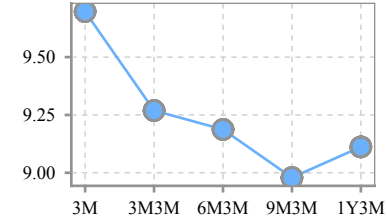


EUR/GBP

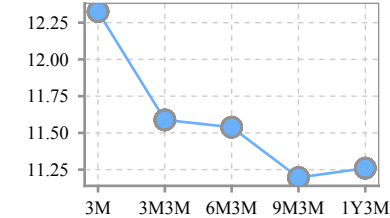


Term structures of 3M vol N-months forward: AUD crosses

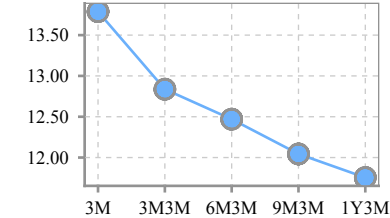
AUD/CAD



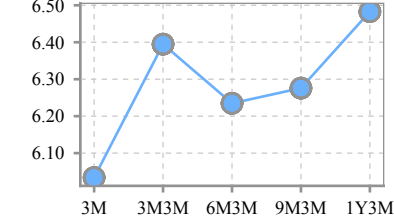
AUD/CHF



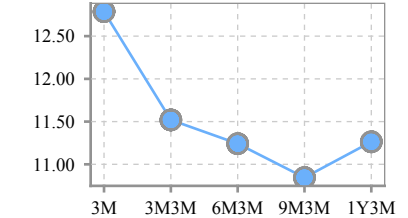
AUD/JPY



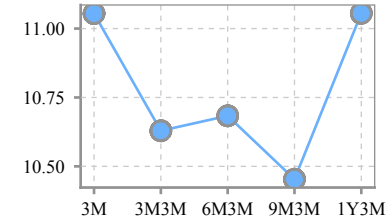
AUD/NZD



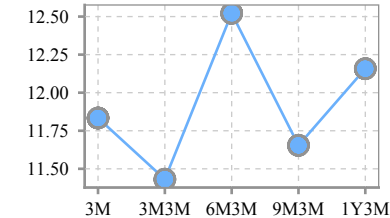
AUD/USD



EUR/AUD

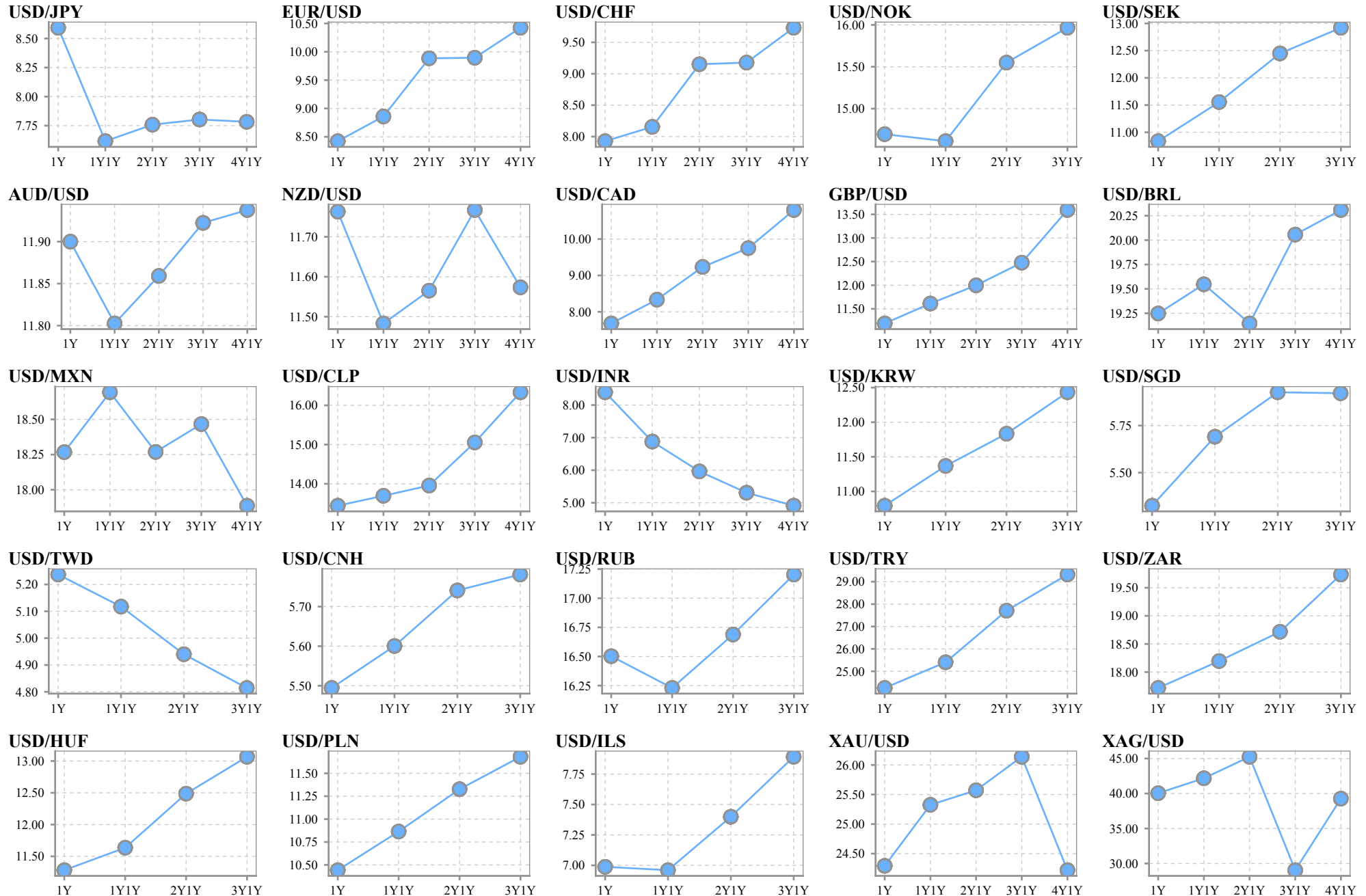


GBP/AUD



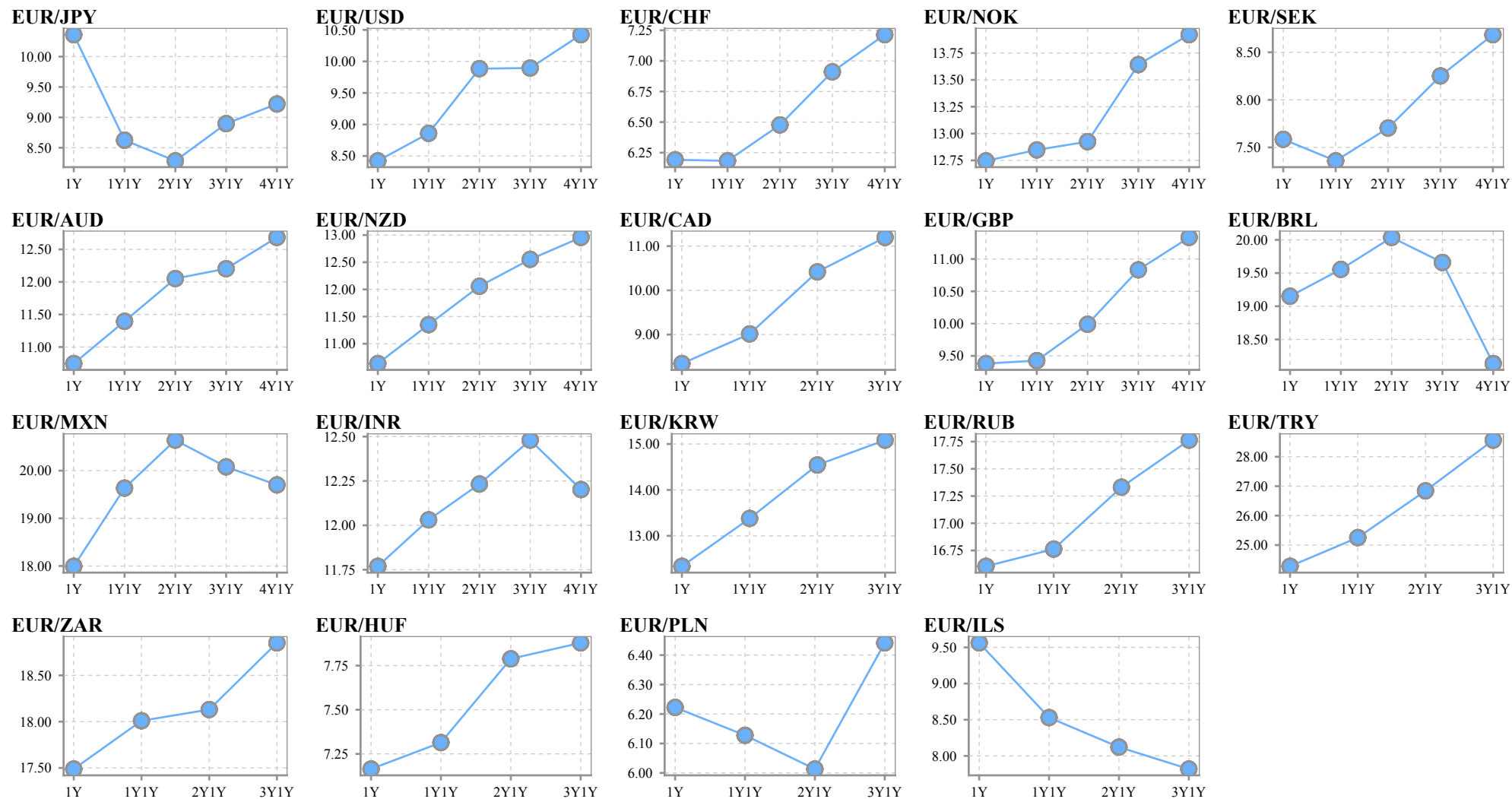
Global FX Strategy

Term structures of 1Y vol N-months forward: USD pairs



Global FX Strategy

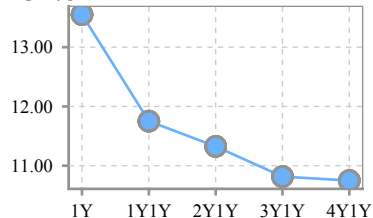
Term structures of 1Y vol N-months forward: EUR crosses



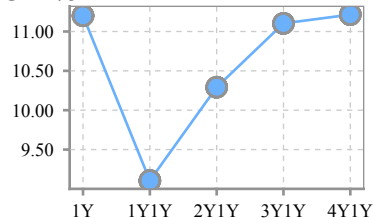
Global FX Strategy

Term structures of 1Y vol N-months forward: JPY crosses

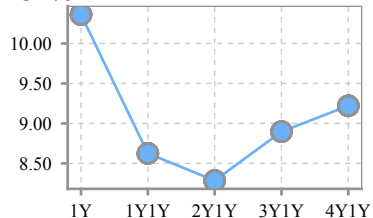
AUD/JPY



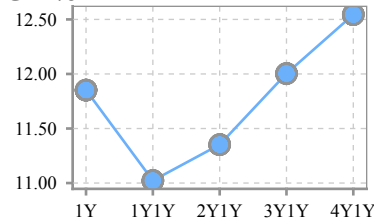
CAD/JPY



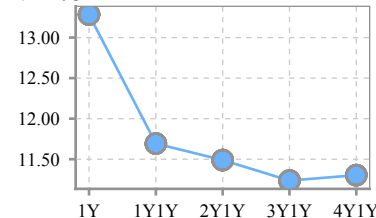
EUR/JPY



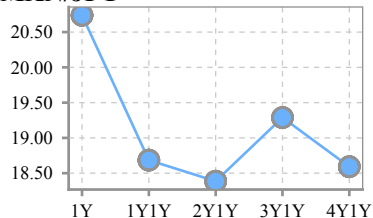
GBP/JPY



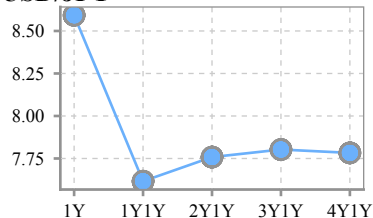
NZD/JPY



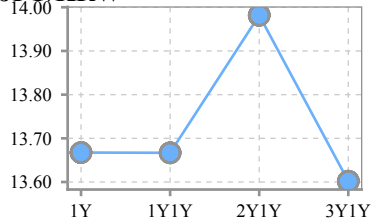
MXN/JPY



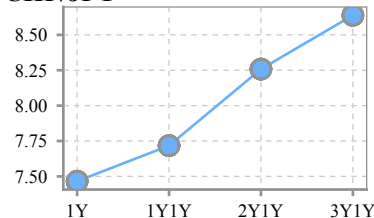
USD/JPY



JPY/KRW



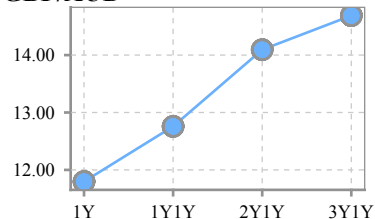
CHF/JPY



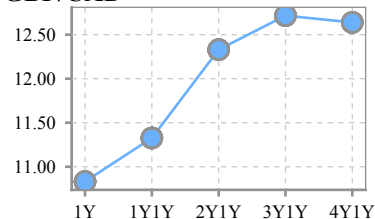
Global FX Strategy

Term structures of 1Y vol N-months forward: GBP crosses

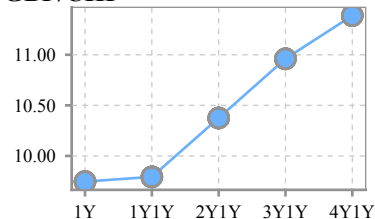
GBP/AUD



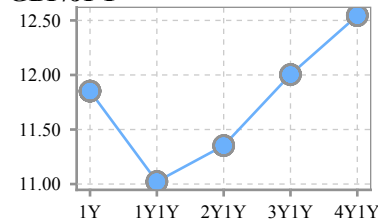
GBP/CAD



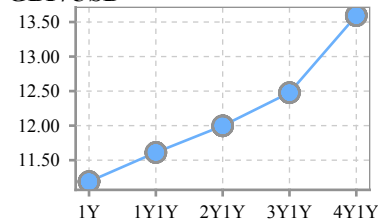
GBP/CHF



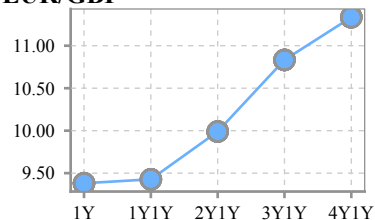
GBP/JPY



GBP/USD

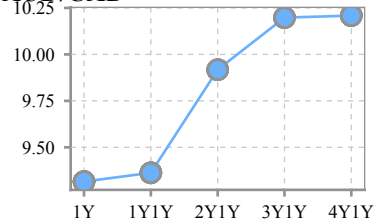


EUR/GBP

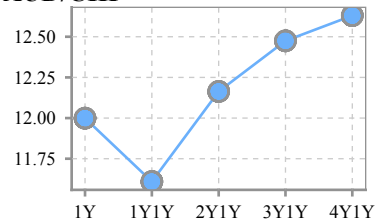


Term structures of 1Y vol N-months forward: AUD crosses

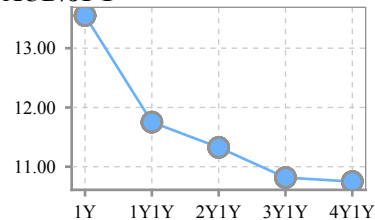
AUD/CAD



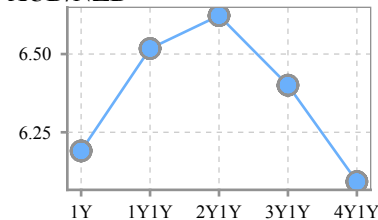
AUD/CHF



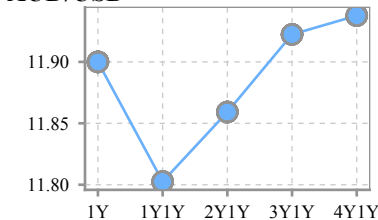
AUD/JPY



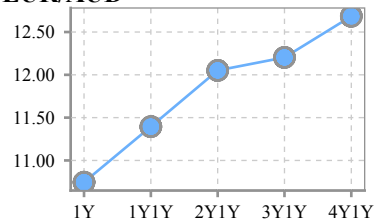
AUD/NZD



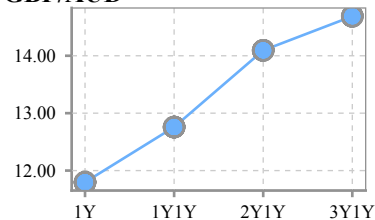
AUD/USD



EUR/AUD



GBP/AUD



FX G10 Gamma vs Forward Vol Report *

Currency Pair	Gamma Stance	Gamma Tenor	Implied Vol	2W	Realized Vol			Vol Carry	Forward Vol Stance	Forward Vol Trade	Forward Vol Level	Implied Vol	2-Yr Min	2-Yr Max	2-Yr Avg	2-Yr Z-score	Vol Carry	2-Yr Zscore of	
					1M	2M	3M											Total Vol Carry	Total Vol Carry
GBP/USD	Long	2M	10.85	11.63	11.48	18.50	15.81	-7.65	Short	1M in 2M	11.05	10.42	5.45	22.00	9.28	0.43	-0.64	-8.29	-0.49
GBP/USD	Long	2M	10.85	11.63	11.48	18.50	15.81	-7.65	Short	2M in 2M	10.87	10.85	5.67	20.20	9.52	0.54	-0.01	-7.66	-0.39
EUR/GBP	Long	2M	8.85	9.17	9.88	14.67	12.71	-5.82	Short	1M in 2M	9.23	8.33	4.74	18.50	8.03	0.13	-0.90	-6.72	-0.78
EUR/GBP	Long	2M	8.85	9.17	9.88	14.67	12.71	-5.82	Short	2M in 2M	9.12	8.85	5.07	17.24	8.28	0.26	-0.27	-6.09	-0.67
GBP/USD	Long	3M	11.06	11.63	11.48	18.50	15.81	-4.75	Short	1M in 3M	11.05	10.42	5.45	22.00	9.28	0.43	-0.63	-5.38	-0.48
EUR/GBP	Long	3M	9.15	9.17	9.88	14.67	12.71	-3.55	Short	1M in 3M	9.24	8.33	4.74	18.50	8.03	0.13	-0.91	-4.46	-0.75
EUR/GBP	Long	3M	9.15	9.17	9.88	14.67	12.71	-3.55	Short	2M in 3M	9.13	8.85	5.07	17.24	8.28	0.26	-0.28	-3.84	-0.64
AUD/NZD	Long	2M	6.12	6.66	7.99	9.06	7.68	-2.94	Short	3M in 2M	6.41	6.03	4.27	10.88	5.47	0.68	-0.38	-3.32	-1.89
AUD/NZD	Long	2M	6.12	6.66	7.99	9.06	7.68	-2.94	Short	2M in 2M	6.15	6.12	3.99	11.42	5.43	0.75	-0.03	-2.97	-1.53
EUR/CHF	Short	1M	5.44	1.37	3.04	3.49	3.20	2.40	Long	3M in 1M	5.40	5.73	3.95	8.11	5.00	1.01	0.33	2.73	2.34
EUR/CHF	Short	1M	5.44	1.37	3.04	3.49	3.20	2.40	Long	2M in 1M	5.36	5.64	3.76	8.22	4.93	0.94	0.28	2.67	2.08
EUR/CHF	Short	3M	5.73	1.37	3.04	3.49	3.20	2.53	Long	3M in 3M	5.69	5.73	3.95	8.11	5.00	1.01	0.04	2.57	2.43
AUD/NZD	Long	1M	6.04	6.66	7.99	9.06	7.68	-1.95	Short	3M in 1M	6.54	6.03	4.27	10.88	5.47	0.68	-0.50	-2.45	-1.95
EUR/GBP	Long	1M	8.33	9.17	9.88	14.67	12.71	-1.55	Short	1M in 1M	9.21	8.33	4.74	18.50	8.03	0.13	-0.88	-2.43	-0.81
EUR/CHF	Short	2M	5.64	1.37	3.04	3.49	3.20	2.15	Long	3M in 2M	5.64	5.73	3.95	8.11	5.00	1.01	0.09	2.24	2.34
EUR/CHF	Short	2M	5.64	1.37	3.04	3.49	3.20	2.15	Long	2M in 2M	5.55	5.64	3.76	8.22	4.93	0.94	0.09	2.24	2.28
AUD/NZD	Long	3M	6.03	6.66	7.99	9.06	7.68	-1.64	Short	3M in 3M	6.39	6.03	4.27	10.88	5.47	0.68	-0.36	-2.00	-2.00

*Theoretical Black-Scholes, not a dealing level

In general, subdued (heightened) realized vols relative to implieds should sponsor front-end implied vol weakness (firmness) and a consequent dis-inversion (inversion) of vol curves. Term structure dynamics in the currency pairs listed above have however decoupled from gamma performance in recent times - this means that one can buy(sell) forward vol at a discount to spot implied vol while simultaneously selling (buying) gamma, and earn positive vol carry on both legs of the trade. If vols maintain their status quo over the trade horizon, the investor simply pockets the total vol carry; if the short vol leg suffers from heightened volatility going forward, the long vol trade should be able to recoup most of that loss.

FX EM Gamma vs Forward Vol Report *

Currency Pair	Gamma Stance	Gamma Tenor	Implied Vol	2W	Realized Vol			Vol Carry	Forward Vol Stance	Forward Vol Trade	Forward Vol Level	Implied Vol	2-Yr Min	2-Yr Max	2-Yr Avg	2-Yr Z-score	Vol Carry	2-Yr Zscore of	
					1M	2M	3M											Total Vol Carry	Total Vol Carry
USD/BRL	Short	1M	26.72	24.09	20.94	25.52	21.47	5.78	Long	2M in 1M	19.59	24.58	9.59	28.56	14.91	2.32	4.99	10.77	1.48
USD/BRL	Short	1M	26.72	24.09	20.94	25.52	21.47	5.78	Long	1M in 1M	22.00	26.72	9.23	34.92	15.02	2.51	4.72	10.50	1.64
USD/BRL	Short	1M	26.72	24.09	20.94	25.52	21.47	5.78	Long	3M in 1M	19.23	23.30	9.76	25.11	14.74	2.44	4.07	9.84	1.41
USD/TRY	Short	1M	21.77	16.12	17.79	18.23	15.12	3.98	Long	2M in 1M	22.93	23.01	8.25	53.10	18.90	0.63	0.07	4.05	0.38
USD/TWF	Short	1M	4.83	1.71	2.83	4.50	4.81	2.00	Long	3M in 1M	3.82	5.11	3.09	7.81	4.83	0.37	1.28	3.29	1.70
USD/TWF	Short	1M	4.83	1.71	2.83	4.50	4.81	2.00	Long	2M in 1M	3.94	5.01	2.90	8.07	4.74	0.33	1.07	3.07	1.39
USD/TWF	Short	1M	4.83	1.71	2.83	4.50	4.81	2.00	Long	1M in 1M	4.18	4.83	2.50	8.62	4.56	0.28	0.65	2.65	1.27

*Theoretical Black-Scholes, not a dealing level

In general, subdued (heightened) realized vols relative to implieds should sponsor front-end implied vol weakness (firmness) and a consequent dis-inversion (inversion) of vol curves. Term structure dynamics in the currency pairs listed above have however decoupled from gamma performance in recent times - this means that one can buy(sell) forward vol at a discount to spot implied vol while simultaneously selling (buying) gamma, and earn positive vol carry on both legs of the trade. If vols maintain their status quo over the trade horizon, the investor simply pockets the total vol carry; if the short vol leg suffers from heightened volatility going forward, the long vol trade should be able to recoup most of that loss.

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Tracking VXY using ATM spreads

Weighted Forward Vol Spread	Tenor	Current Level of Weighted ATM Vol Spread	2-yr Z-score	Weighted Realized Vol Spread			Weighted 3-mo vol curve slide	Net Vol Carry	R Sqr vs VXY over past 2yrs	R Sqr vs VXY in vol spikes	Reg residual vs VXY
				1M	2M	3M					

Note: The report shortlists weighted combinations of ATM vol spreads (3M, 6M and 1Y tenors) that faithfully track the VXY (JPMorgan’s index of 3M ATM volatility) in episodes of systemic stress, and yet cost little by way of vol carry vis-à-vis recent realized vol spreads. Hence they are decay-efficient ways of positioning long volatility. All trades satisfy the following properties:

The weights are vega weights, constrained to have absolute values adding up to 2; this makes them consistent with the more commonly traded 1:1 weighted spreads. Net vol carry > 0.00. Net vol carry is calculated as follows: i) weighted ATM vol spread = w1*ATM vol1 + w2*ATM vol2; ii) weighted realized vol spread = w1*realized vol1 + w2*realized vol2; iii) weighted 3-mo curve slide as w1*3-mo vol curve rolldown1 + w2*3-mo vol curve rolldown2, where vol curve rolldown = (6M ATM vol – 3M ATM vol) for 6M vols and (1Y ATM vol – 9M ATM vol) for 1Y vols; iv) for 3M vols, net vol carry = wtd. realized vol spread – wtd. ATM vol spread; for 6M vols, net vol carry = 0.5*wtd. realized vol spread + 0.5*wtd. vol curve slide – wtd. ATM vol spread; for 1Y vols, net vol carry = 0.25*wtd. realized vol spread + 0.75*wtd. vol curve slide – wtd. ATM vol spread. Different weights applied to realized vol and curve slide variables reflect their relative contributions to P/Ls of options of different tenors.

Positive slope of weighted ATM vol spread with respect to VXY, unconditional (full sample) regression R2 >= 25%, R2 conditional on episodes of vol spikes >= 50%. Weighted ATM vol spread cheap relative to VXY on a 2-yr regression basis i.e. regression residual vs. VXY < 0.

Global FX Strategy

Tracking VXY using FVA spreads

Weighted Forward Vol Spread	Tenor	Current Level of Weighted Forward Vol Spread	2-yr Z-score	Current level of weighted spot vol spread	Static slide into weighted spot vol spread	R Sqr vs VXY over past 2yrs	R Sqr vs VXY in vol spikes	Reg residual vs VXY
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Note: The report shortlists weighted combinations of forward vol spreads across tenors (1M1M, 3M3M, 6M6M and 1Y1Y) that faithfully track the VXY (JPMorgan’s index of 3M ATM volatility) in episodes of systemic stress, and yet cost little by way of static slide into spot vol spreads. Hence they are decay-efficient ways of positioning long volatility. All trades satisfy the following properties:

- The weights are vega weights, constrained to have absolute values adding up to 2; this makes them consistent with the more commonly traded 1:1 weighted spreads.
- Static slide from weighted forward vol spread ($= w1*ForwardVol1 + w2*ForwardVol2$) into weighted spot implied vol spread ($= w1*ImpliedVol1 + w2*ImpliedVol2$) is > 0.00 .
- Positive slope of weighted forward vol spread with respect to VXY, unconditional (full sample) regression $R2 \geq 25\%$, $R2$ conditional on episodes of vol spikes $\geq 50\%$.
- Weighted forward vol spread cheap relative to VXY on a 2-yr regression basis i.e. regression residual vs. $VXY < 0$.

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Global FX Strategy

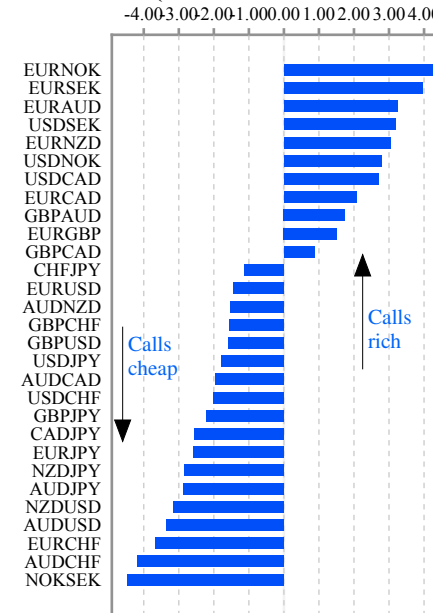
G10 FX Vol Skews Report

Ccy Pairs	25D Risk Reversal (Vol Pts.)*				25D Risk Reversal / ATM Ratio				2yr Z-score (25D Risk Reversal/ATM Ratio)				Realized Vol. Skew (Vol. Pts.)**			
	1M	3M	6M	1Y	1M	3M	6M	1Y	1M	3M	6M	1Y	1M	3M	6M	1Y
AUDCAD	-0.8	-1.1	-1.4	-1.6	-0.08	-0.11	-0.14	-0.17	-1.3	-2.0	-2.5	-2.7	-3.2	-0.6	0.2	0.6
AUDCHF	-3.3	-3.4	-3.6	-4.0	-0.26	-0.28	-0.30	-0.33	-3.9	-4.2	-4.4	-4.7	-1.5	-1.2	-1.0	-1.2
AUDJPY	-4.7	-5.4	-5.9	-6.6	-0.34	-0.39	-0.43	-0.49	-2.7	-2.9	-3.0	-3.1	1.0	-2.4	-1.9	-1.7
AUDNZD	0.0	-0.1	-0.1	-0.1	-0.01	-0.02	-0.01	-0.01	-0.4	-1.5	-1.9	-1.5	1.7	-1.4	-1.0	-0.4
AUDUSD	-3.5	-3.8	-4.0	-4.2	-0.27	-0.30	-0.33	-0.35	-3.2	-3.3	-3.3	-3.1	0.0	-4.9	-3.1	-2.4
CADJPY	-3.2	-4.0	-4.4	-4.7	-0.27	-0.34	-0.39	-0.42	-2.1	-2.5	-2.9	-3.3	1.0	-3.2	-2.9	-2.3
CHFJPY	-1.0	-1.3	-1.4	-1.4	-0.13	-0.17	-0.19	-0.19	-0.4	-1.1	-1.5	-1.7	-1.9	-1.9	-1.5	-0.9
EURAUD	2.5	2.5	2.6	2.6	0.22	0.23	0.24	0.24	3.4	3.2	3.1	2.9	1.9	0.9	0.9	0.9
EURCAD	1.5	1.4	1.4	1.5	0.17	0.16	0.16	0.18	2.2	2.1	2.0	2.1	-1.4	1.9	1.6	1.7
EURCHF	-1.9	-2.1	-2.2	-2.4	-0.35	-0.36	-0.38	-0.39	-3.2	-3.7	-4.3	-5.0	-0.1	0.1	-0.1	0.0
EURGBP	1.4	1.6	1.6	1.9	0.17	0.17	0.18	0.20	2.4	1.5	1.2	1.2	2.8	2.4	2.2	0.0
EURJPY	-3.1	-3.8	-4.3	-4.6	-0.32	-0.38	-0.42	-0.45	-2.1	-2.6	-2.8	-3.0	-1.5	-1.5	-1.0	-0.7
EURNOK	3.2	3.4	3.5	3.5	0.22	0.24	0.26	0.27	4.2	4.2	3.9	3.3	-0.5	6.4	4.9	3.5
EURNZD	2.2	2.3	2.4	2.7	0.20	0.21	0.23	0.25	3.0	3.0	3.2	3.5	1.2	0.4	0.5	0.8
EURSEK	2.0	2.3	2.5	2.7	0.28	0.31	0.34	0.36	3.7	4.0	4.0	4.1	-4.5	1.0	0.8	0.6
EURUSD	-1.1	-1.2	-1.3	-1.4	-0.14	-0.15	-0.16	-0.17	-1.6	-1.4	-1.5	-1.5	3.0	0.6	0.6	0.3
GBPAUD	0.8	0.6	0.6	0.3	0.07	0.05	0.05	0.02	1.8	1.7	1.8	1.4	-1.3	0.5	1.0	1.6
GBPCAD	-0.1	-0.4	-0.5	-0.6	-0.01	-0.04	-0.05	-0.06	0.5	0.9	1.1	1.1	-0.4	1.3	0.7	1.5
GBPCHF	-1.6	-1.9	-2.1	-2.5	-0.19	-0.20	-0.22	-0.26	-2.3	-1.6	-1.6	-2.3	-2.0	-1.2	-1.3	0.9
GBPJPY	-3.2	-4.0	-4.4	-4.8	-0.29	-0.34	-0.37	-0.40	-2.2	-2.2	-2.3	-2.2	-4.4	-4.2	-3.0	0.1
GBPUSD	-2.3	-2.5	-2.6	-2.8	-0.23	-0.23	-0.24	-0.25	-2.4	-1.6	-1.3	-1.3	-4.5	-0.3	-0.4	0.8
NOKSEK	-1.4	-1.3	-1.3	-1.2	-0.11	-0.11	-0.10	-0.10	-4.1	-4.5	-4.8	-5.6	0.5	-0.6	-1.3	-1.0
NZDJPY	-4.4	-5.1	-5.6	-6.3	-0.32	-0.38	-0.42	-0.47	-2.4	-2.8	-2.9	-3.0	0.9	-2.3	-2.3	-2.1
NZDUSD	-3.4	-3.6	-3.9	-4.1	-0.25	-0.29	-0.32	-0.35	-2.9	-3.1	-3.2	-3.1	0.2	-4.1	-3.3	-2.2
USDCAD	1.9	2.0	2.1	2.2	0.20	0.23	0.26	0.29	2.4	2.7	3.0	3.3	1.7	1.8	1.4	1.2
USDCHF	-1.5	-1.7	-1.8	-1.9	-0.21	-0.22	-0.23	-0.24	-2.0	-2.0	-2.0	-2.0	-1.6	0.6	0.1	-0.5
USDJPY	-2.1	-3.0	-3.3	-3.5	-0.27	-0.36	-0.39	-0.41	-1.0	-1.8	-1.9	-1.9	0.4	-2.3	-1.6	-1.2
USDNOK	2.9	2.9	2.9	2.8	0.17	0.18	0.19	0.19	3.2	2.8	2.6	2.1	-0.4	4.4	3.5	2.5
USDSEK	1.7	2.0	2.2	2.4	0.18	0.19	0.21	0.22	3.2	3.2	3.2	3.0	-3.4	1.8	1.3	0.7

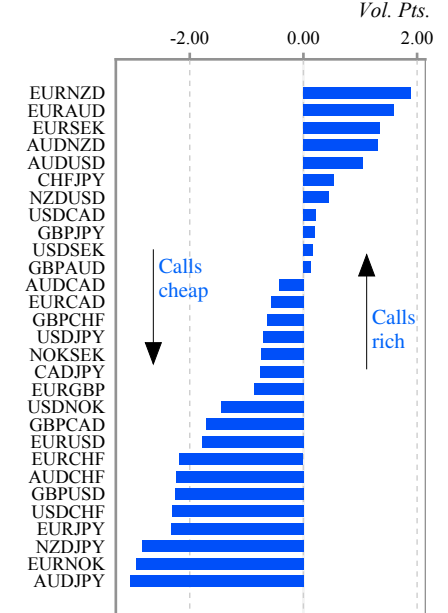
* Risk-reversals are quoted for currency pairs exactly as stated. In other words, USD/JPY risk- reversal = 25D USD Call/JPY Put vol - 25D USD Put/JPY Call Vol.

** Realized vol skew is defined as stdev. of positive log returns - stdev. of negative log returns over a given lookback window

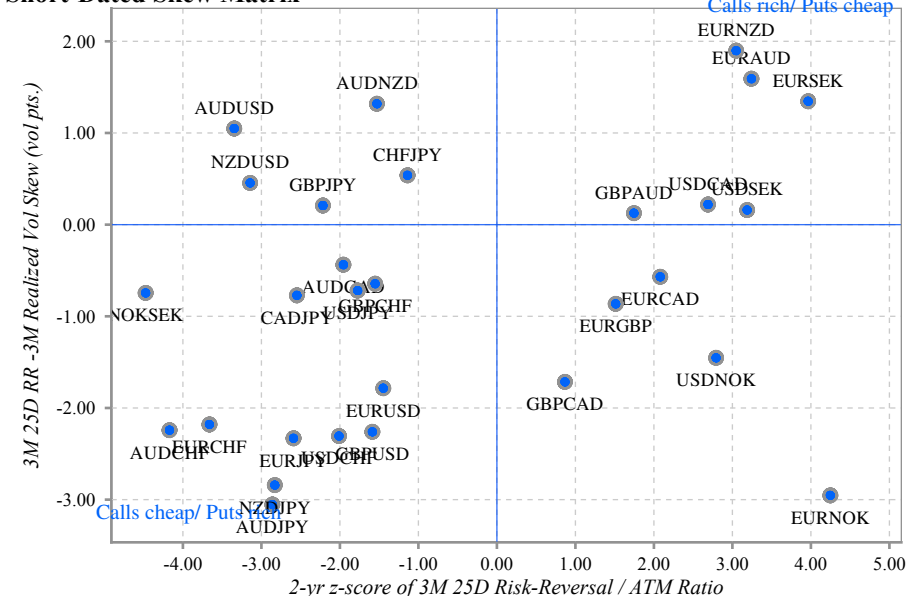
2Yr Z-Score (3M 25D RR/ATM Ratio)



3M 25D RR - 3M Realized Skew



Short-Dated Skew Matrix



Global FX Strategy

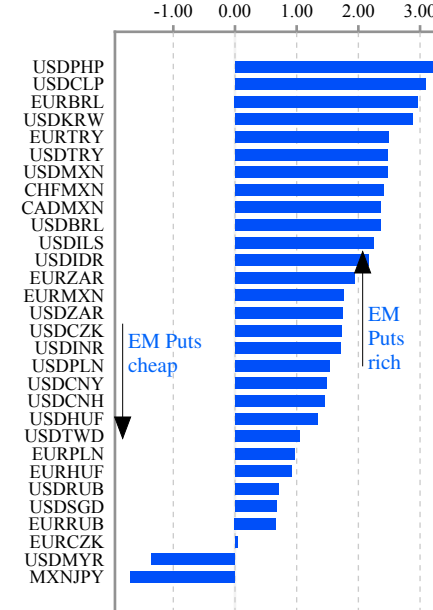
EM FX Vol Skews Report

Ccy Pairs	25D Risk Reversal (Vol Pts.)*				25D Risk Reversal / ATM Ratio				2yr Z-score (25D Risk Reversal/ATM Ratio)				Realized Vol. Skew (Vol. Pts.)**			
	1M	3M	6M	1Y	1M	3M	6M	1Y	1M	3M	6M	1Y	1M	3M	6M	1Y
CADMN	3.9	3.9	3.9	4.1	0.20	0.21	0.22	0.25	2.1	2.4	2.5	2.0	3.5	2.2	3.5	3.2
CHFMN	5.2	5.0	5.1	5.6	0.24	0.25	0.26	0.30	2.5	2.4	2.6	2.8	1.1	1.8	3.8	4.1
EURBRL	6.5	6.1	6.0	6.0	0.25	0.27	0.29	0.32	2.9	3.0	2.7	2.6	7.6	1.8	3.1	3.2
EURCZK	1.6	1.5	1.5	1.5	0.17	0.20	0.22	0.24	-0.2	0.0	0.3	0.4	-1.7	6.5	4.9	2.9
EURHUF	1.8	2.0	2.2	2.4	0.21	0.25	0.30	0.34	0.5	0.9	1.9	2.8	-4.7	-1.2	-0.7	-0.3
EURMXN	5.4	5.1	5.1	5.5	0.25	0.26	0.27	0.30	1.9	1.8	2.0	2.2	2.2	3.7	5.4	4.9
EURPLN	1.7	1.8	1.9	2.0	0.23	0.26	0.29	0.32	0.6	1.0	1.5	2.0	-2.1	2.4	1.5	1.0
EURRUB	4.9	5.1	5.2	5.5	0.24	0.27	0.29	0.33	0.6	0.7	0.8	1.2	4.3	15.8	11.9	9.1
EURTRY	9.0	9.4	9.4	9.6	0.41	0.41	0.40	0.40	2.7	2.5	2.1	1.7	0.5	-3.0	-1.7	-2.5
EURZAR	4.8	4.7	4.7	4.7	0.22	0.23	0.25	0.27	2.2	1.9	1.5	0.9	3.6	3.9	4.5	3.9
MXNJPY	-5.7	-5.7	-5.8	-6.2	-0.25	-0.26	-0.28	-0.30	-2.0	-1.7	-1.7	-1.7	-1.6	-2.6	-4.7	-4.6
USDBRL	6.5	6.2	6.1	6.0	0.24	0.27	0.29	0.31	2.4	2.4	2.3	2.4	7.7	5.4	5.2	4.1
USDCLP	3.8	3.8	3.8	3.8	0.24	0.26	0.27	0.28	3.0	3.1	2.9	2.4	2.7	1.5	2.9	2.0
USDCNH	0.9	1.3	1.6	1.9	0.19	0.25	0.30	0.34	1.1	1.4	1.8	1.9	-1.1	0.4	0.2	1.2
USDCNY	0.9	1.3	1.6	1.9	0.20	0.27	0.33	0.36	1.1	1.5	1.8	2.0	-0.3	0.0	0.3	1.5
USDCZK	1.9	2.1	2.2	2.4	0.16	0.18	0.20	0.22	1.7	1.7	1.8	1.8	-2.5	3.4	2.5	1.8
USDHUF	2.0	2.2	2.3	2.4	0.17	0.19	0.21	0.21	1.3	1.3	1.5	1.5	-9.7	1.2	0.8	0.6
USDIDR	5.2	5.5	5.6	5.7	0.30	0.33	0.36	0.40	2.1	2.2	2.2	2.2	-3.4	4.1	4.6	4.3
USDILS	1.5	1.5	1.5	1.5	0.16	0.18	0.20	0.22	2.1	2.2	2.3	2.4	3.7	3.4	2.4	1.9
USDINR	2.2	2.3	2.4	2.6	0.23	0.25	0.28	0.31	1.8	1.7	1.6	1.3	-0.7	2.4	2.0	1.9
USDKRW	3.0	3.3	3.4	3.5	0.28	0.30	0.31	0.33	3.1	2.9	2.5	2.0	2.0	-2.2	-1.5	-0.6
USDMXN	6.2	5.9	5.7	5.7	0.29	0.29	0.30	0.31	2.7	2.5	2.4	1.9	5.0	1.9	4.2	3.9
USDMYR	0.2	0.4	0.6	0.8	0.04	0.07	0.10	0.13	-1.1	-1.4	-1.3	-0.9	2.0	0.1	0.8	0.4
USDPHP	1.4	1.5	1.6	1.6	0.26	0.28	0.29	0.29	3.4	3.2	2.9	2.3	0.6	2.0	1.7	1.1
USDPLN	2.0	2.2	2.3	2.5	0.19	0.20	0.22	0.24	1.6	1.5	1.6	1.5	-5.5	1.6	0.7	0.9
USDRUB	5.1	5.4	5.5	5.7	0.25	0.28	0.31	0.35	0.7	0.7	0.8	1.1	6.3	15.6	11.7	9.3
USDSGD	0.6	0.7	0.8	0.9	0.11	0.14	0.16	0.18	0.9	0.7	0.5	0.1	1.4	1.9	1.5	0.8
USDTRY	9.7	10.1	9.8	9.6	0.45	0.43	0.41	0.40	2.8	2.5	2.0	1.5	-1.8	-3.7	-1.6	-1.8
USDTWD	0.7	0.8	0.9	0.9	0.14	0.16	0.17	0.17	1.2	1.0	0.7	0.3	0.1	0.3	-0.2	-0.2
USDZAR	4.9	5.0	5.1	5.2	0.22	0.24	0.27	0.29	1.8	1.8	1.6	1.5	2.1	2.0	2.9	2.8

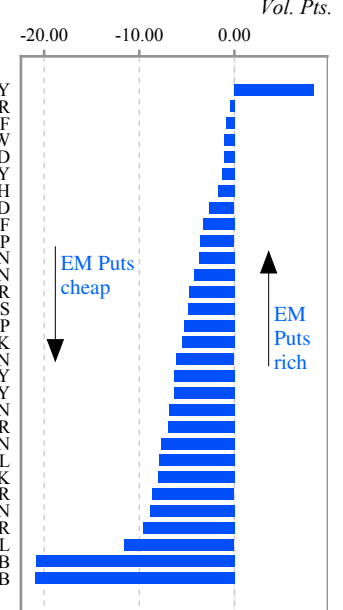
* Risk-reversals are quoted for currency pairs exactly as stated. In other words, USD/JPY risk- reversal = 25D USD Call/JPY Put vol - 25D USD Put/JPY Call Vol.

** Realized vol skew is defined as stdev. of positive log returns - stdev. of negative log returns over a given lookback window

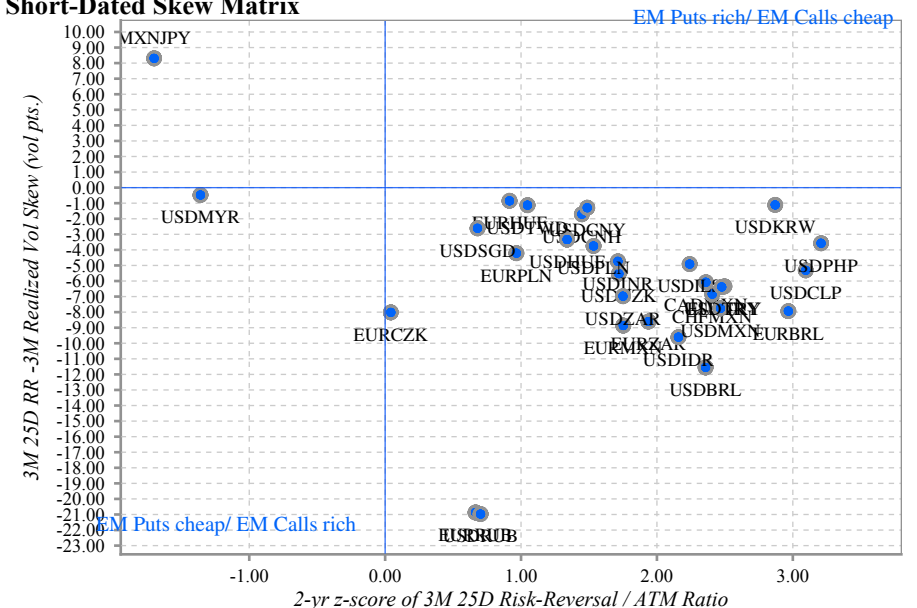
2Yr Z-Score (3M 25D RR/ATM Ratio)



3M 25D RR - 3M Realized Skew



Short-Dated Skew Matrix

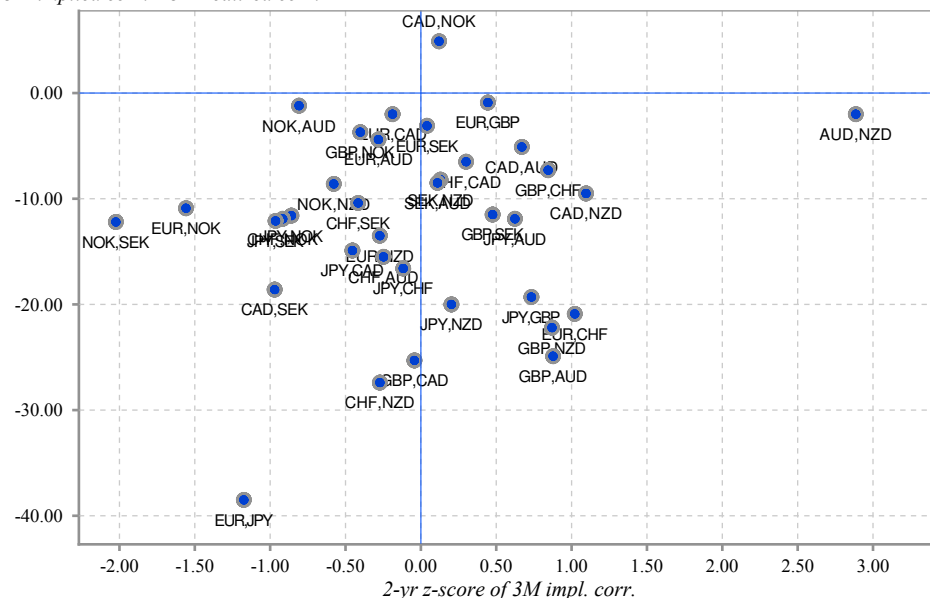


Derivatives Strategy

FX Correlation Rankings: 3M

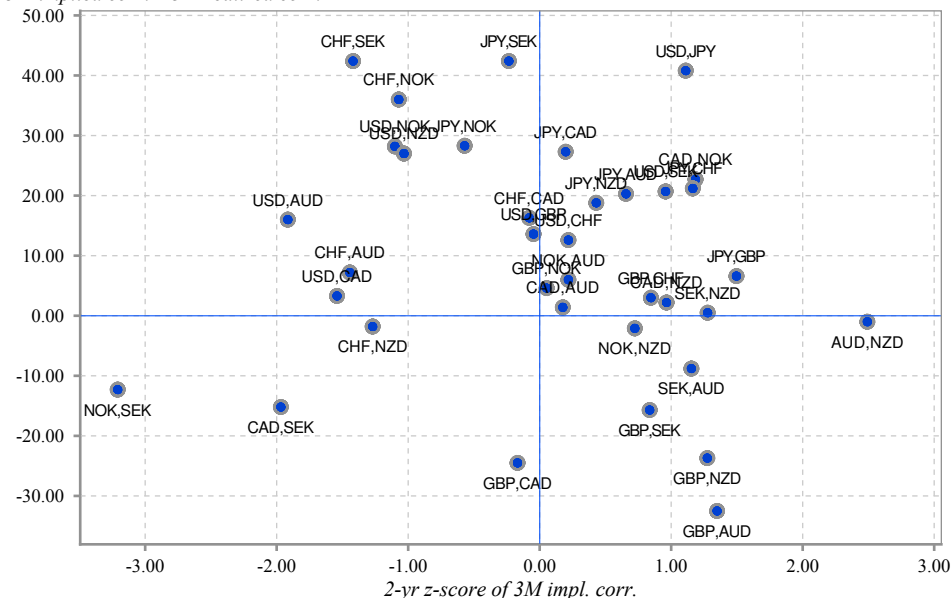
USD-based correlations

3M implied corr. – 3M realized corr.



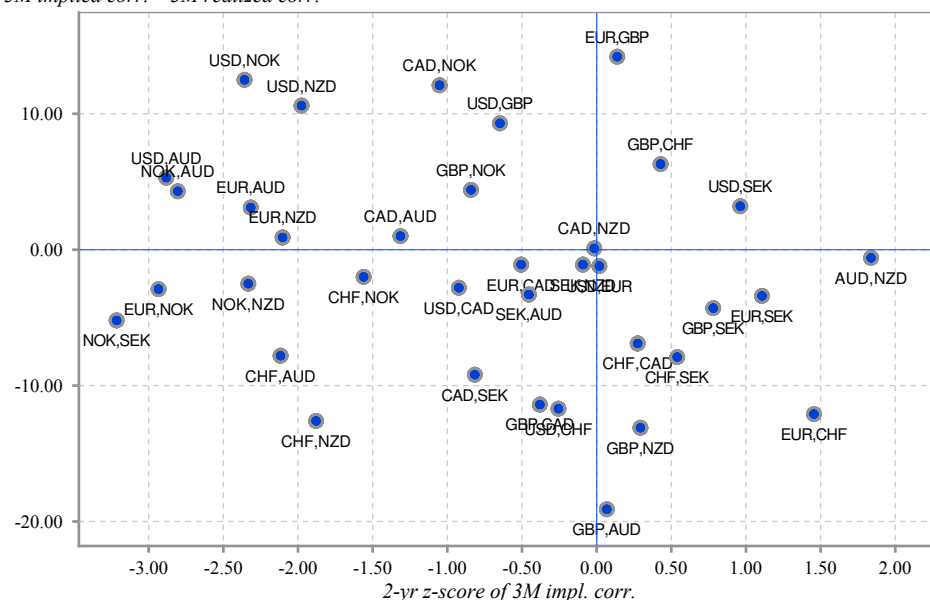
EUR-based correlations

3M implied corr. – 3M realized corr.



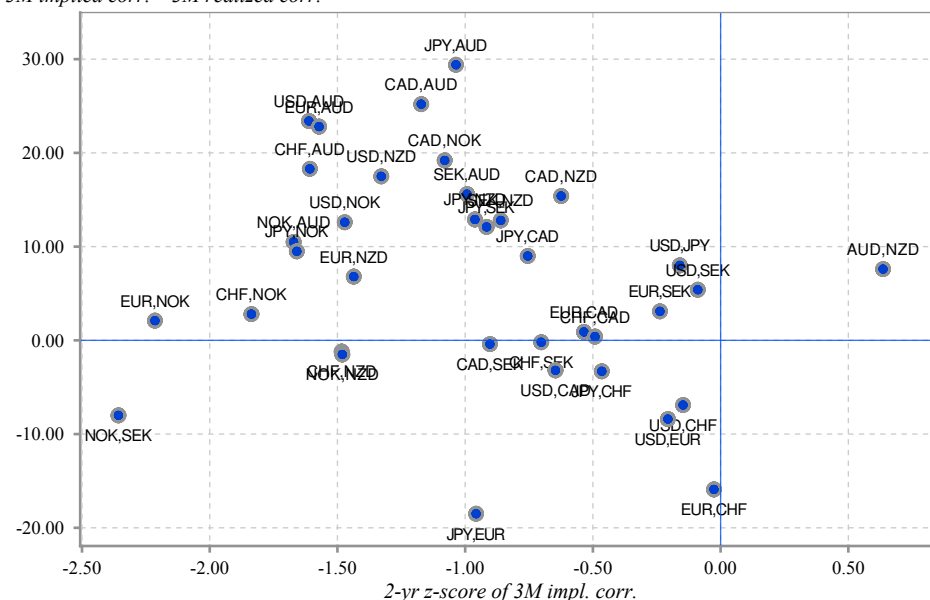
JPY-based correlations

3M implied corr. – 3M realized corr.



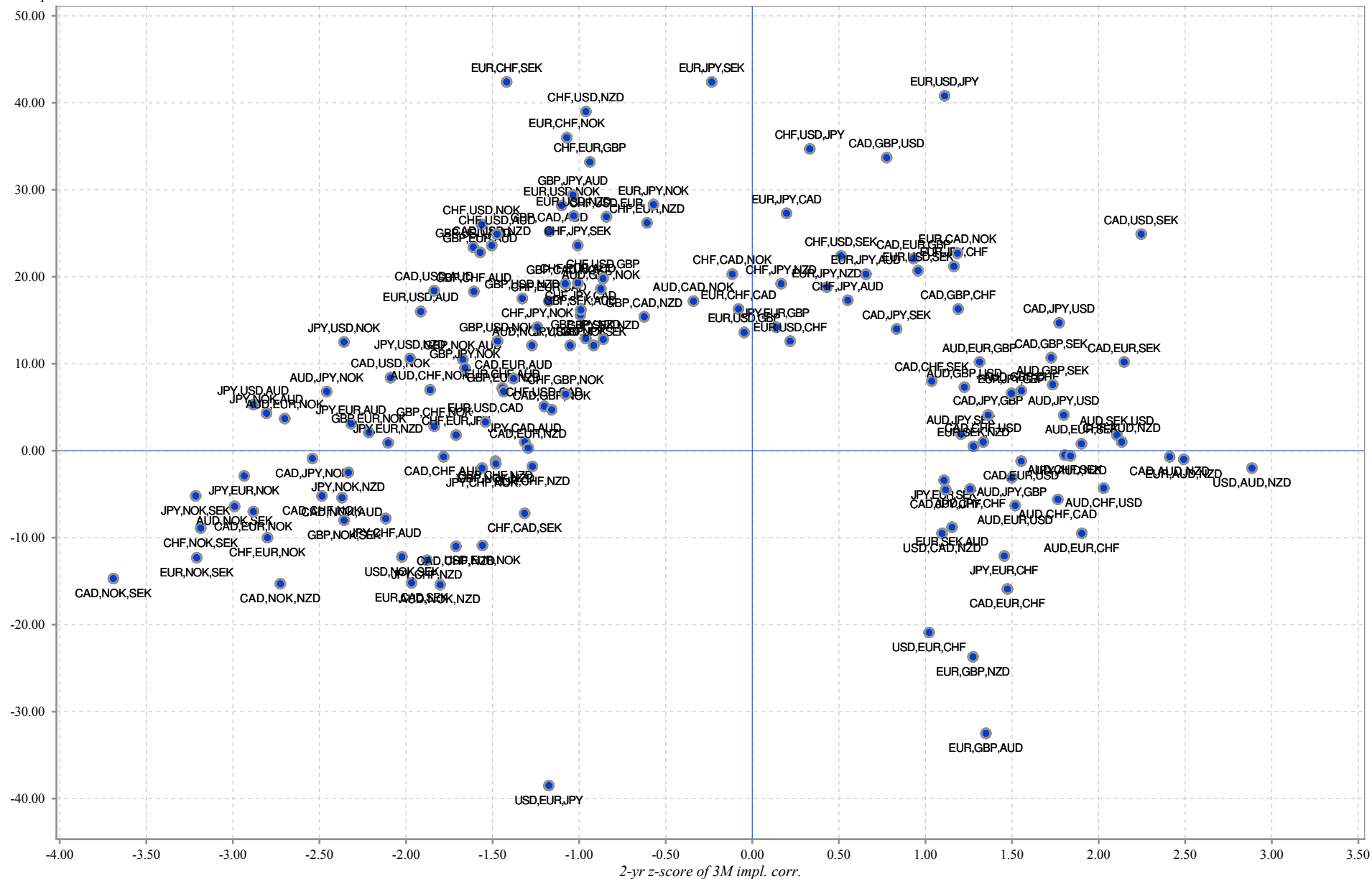
GBP-based correlations

3M implied corr. – 3M realized corr.



FX Correlation Rankings: 3M

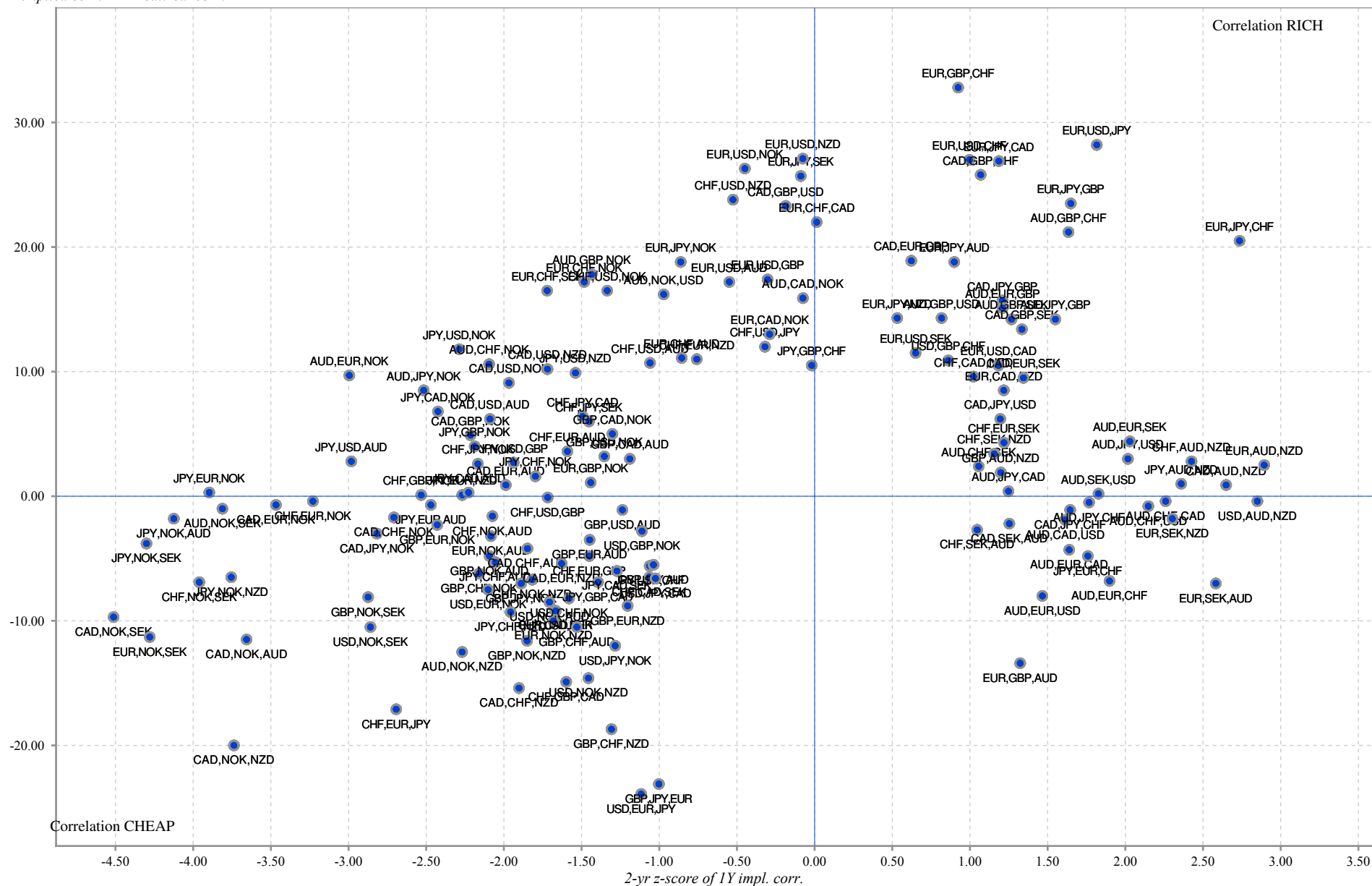
3M implied corr. – 3M realized corr.



Derivatives Strategy

FX Correlation Rankings: 1Y

1Y implied corr. – 1Y realized corr.

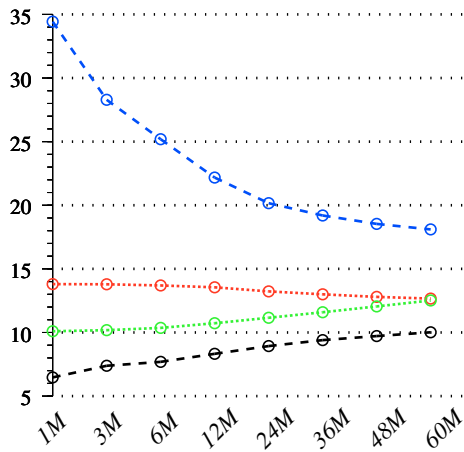


FX Implied Vol Cones

- Max (2 Years)
- - - Current
- - - Avg (2 Years)
- Min (2 Years)

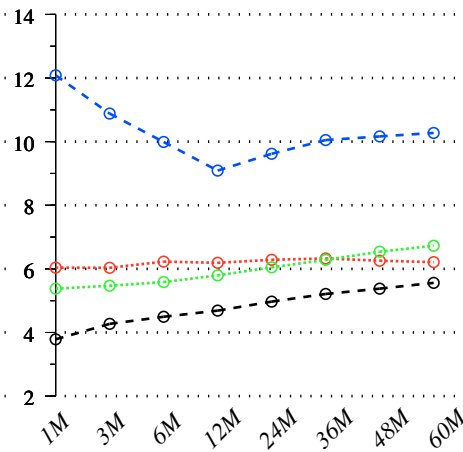
AUDJPY

Implied Vol



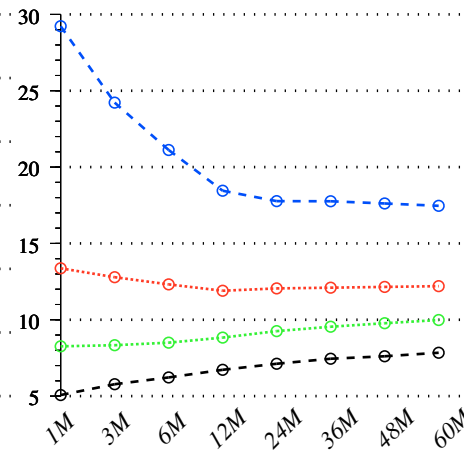
AUDNZD

Implied Vol



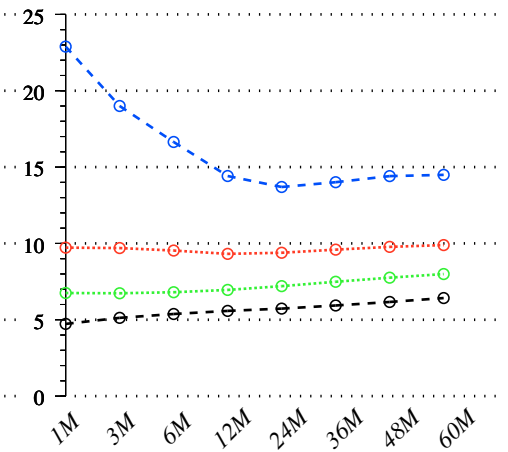
AUDUSD

Implied Vol



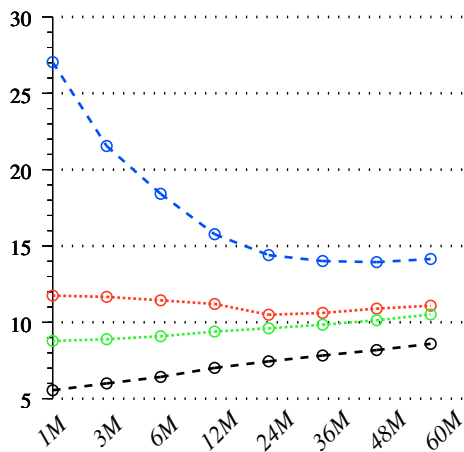
AUDCAD

Implied Vol



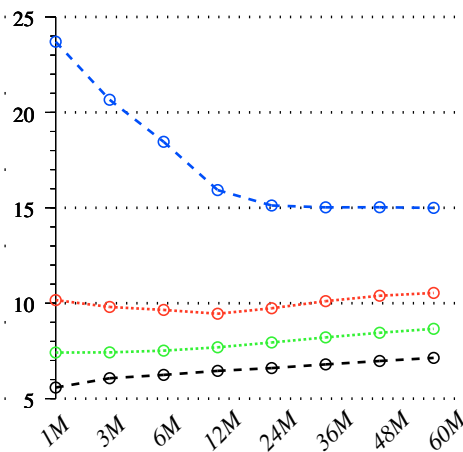
CADJPY

Implied Vol



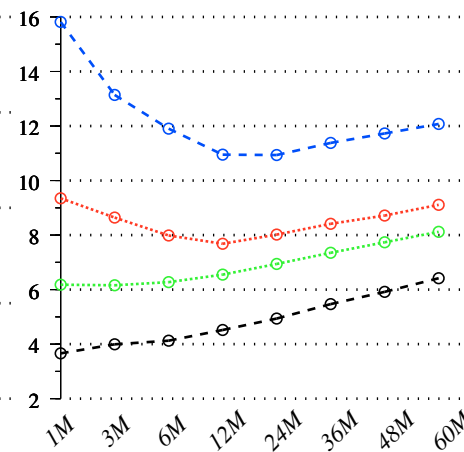
CADNZD

Implied Vol



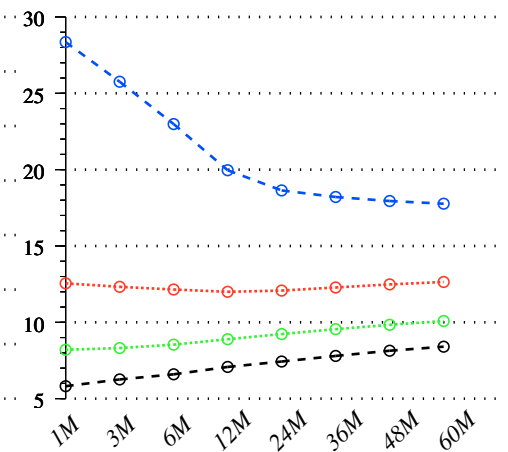
USDCAD

Implied Vol



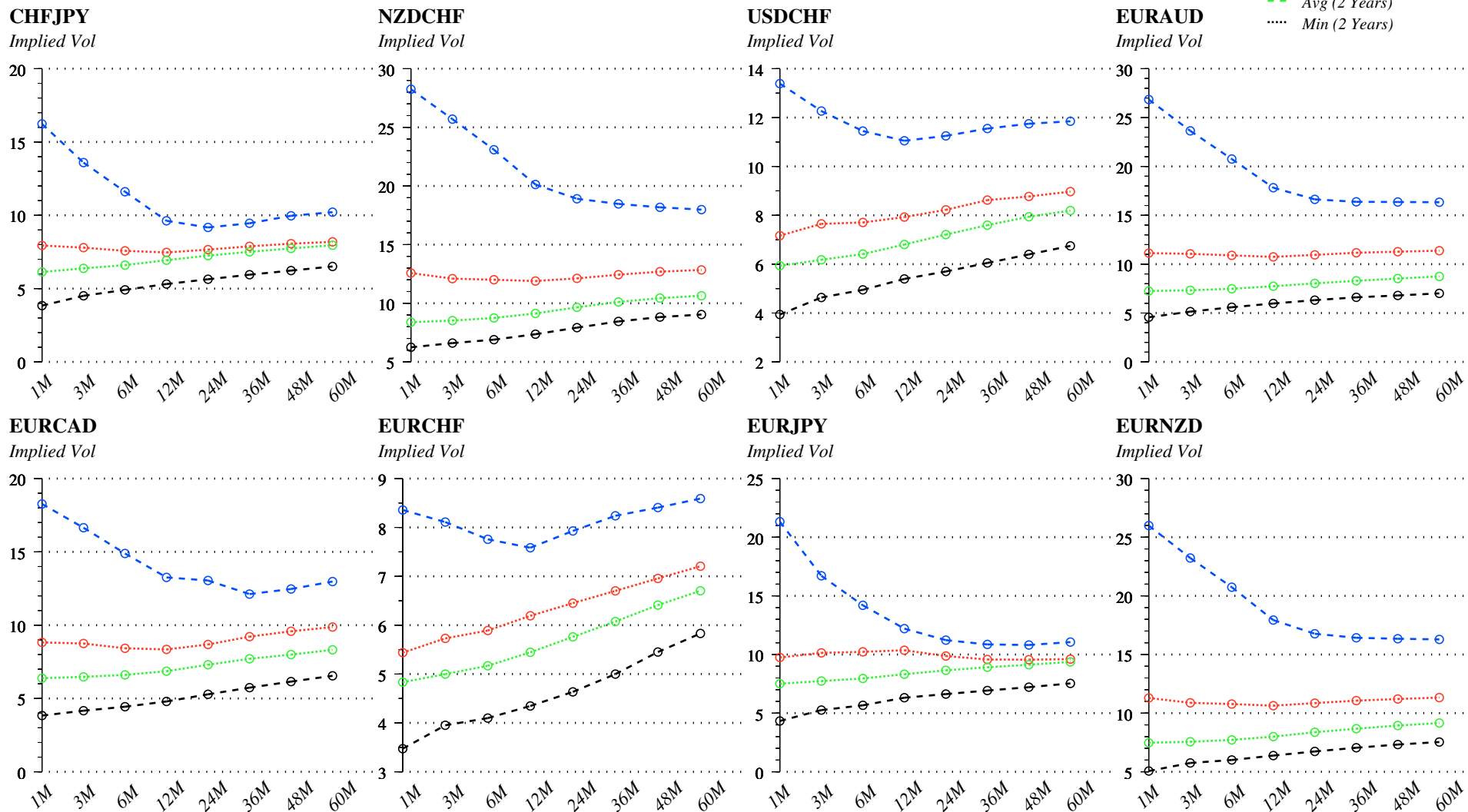
AUDCHF

Implied Vol



FX Implied Vol Cones

..... Max (2 Years)
 - - - Current
 - - - Avg (2 Years)
 Min (2 Years)

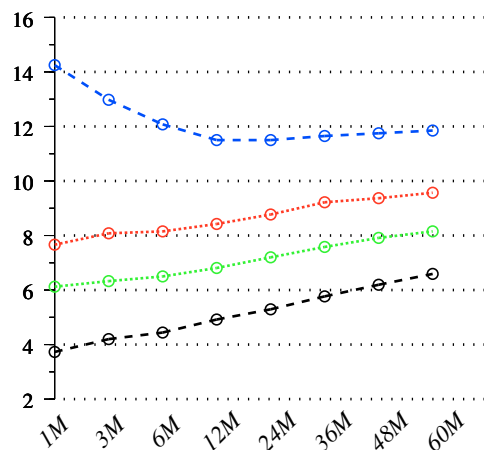


FX Implied Vol Cones

..... Max (2 Years)
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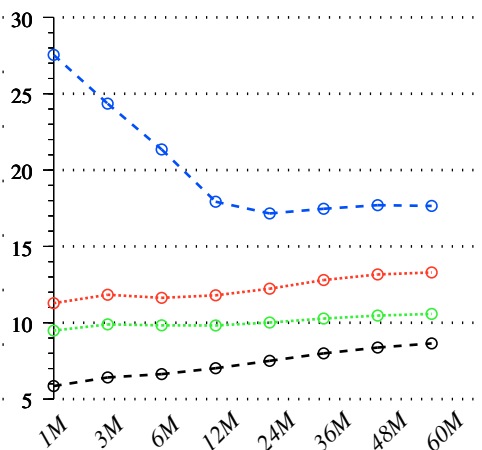
EURUSD

Implied Vol



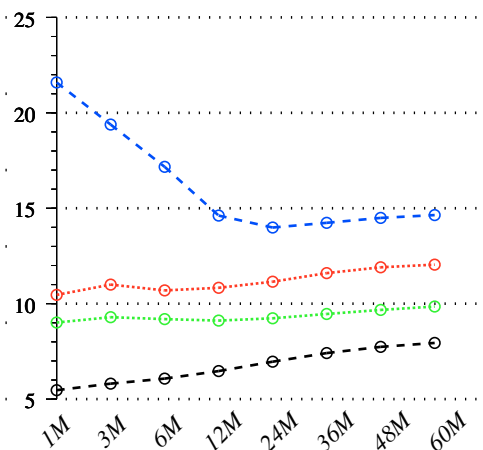
GBPAUD

Implied Vol



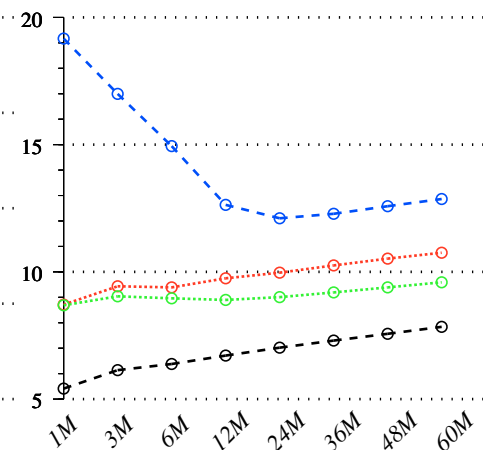
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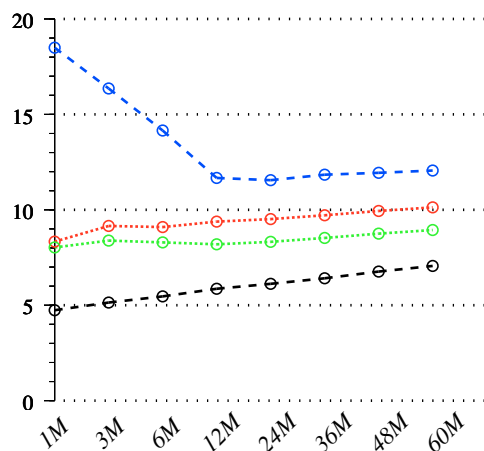
GBPCHF

Implied Vol



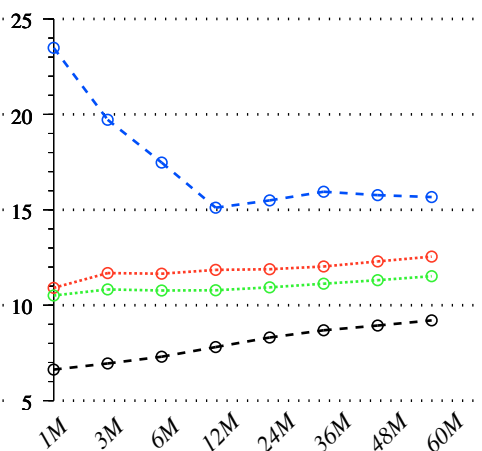
EURGBP

Implied Vol



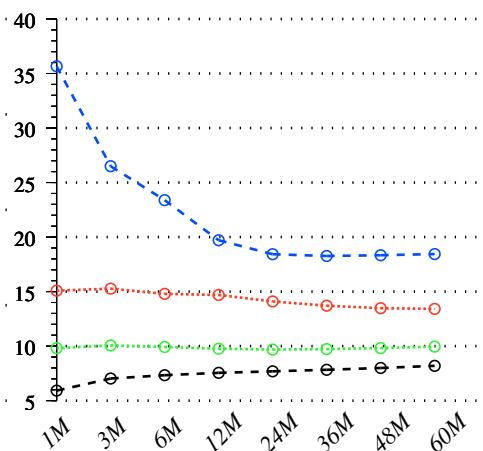
GBPJPY

Implied Vol



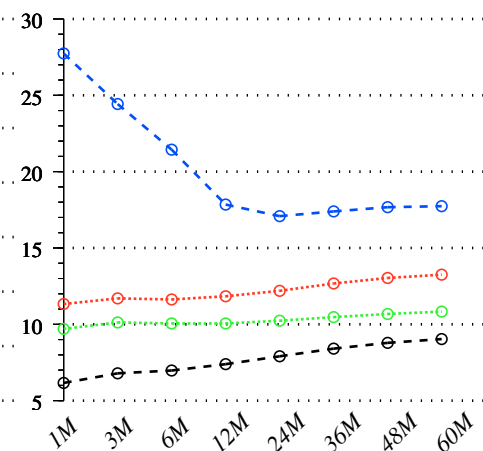
GBPNOK

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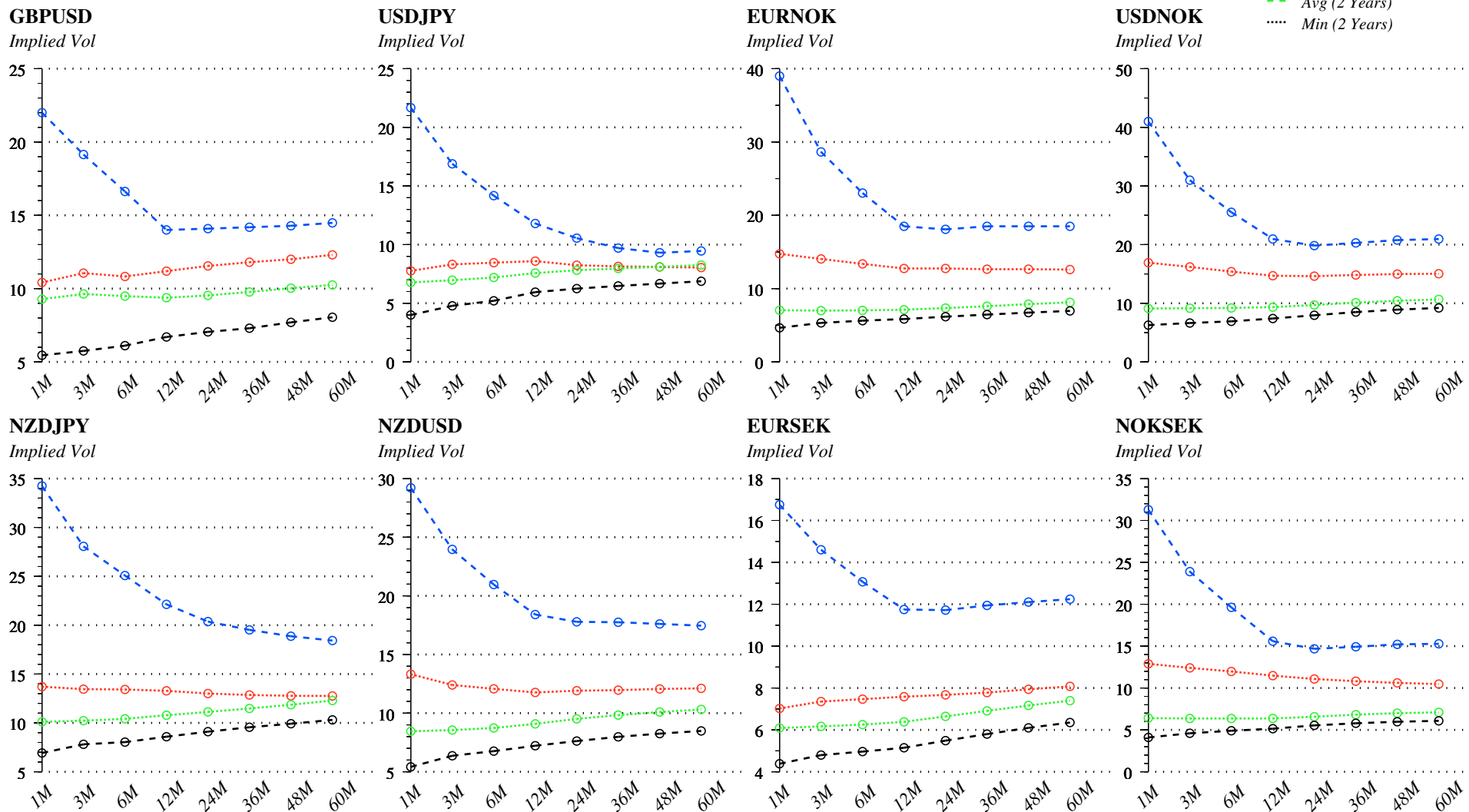
GBPNZD

Implied Vol



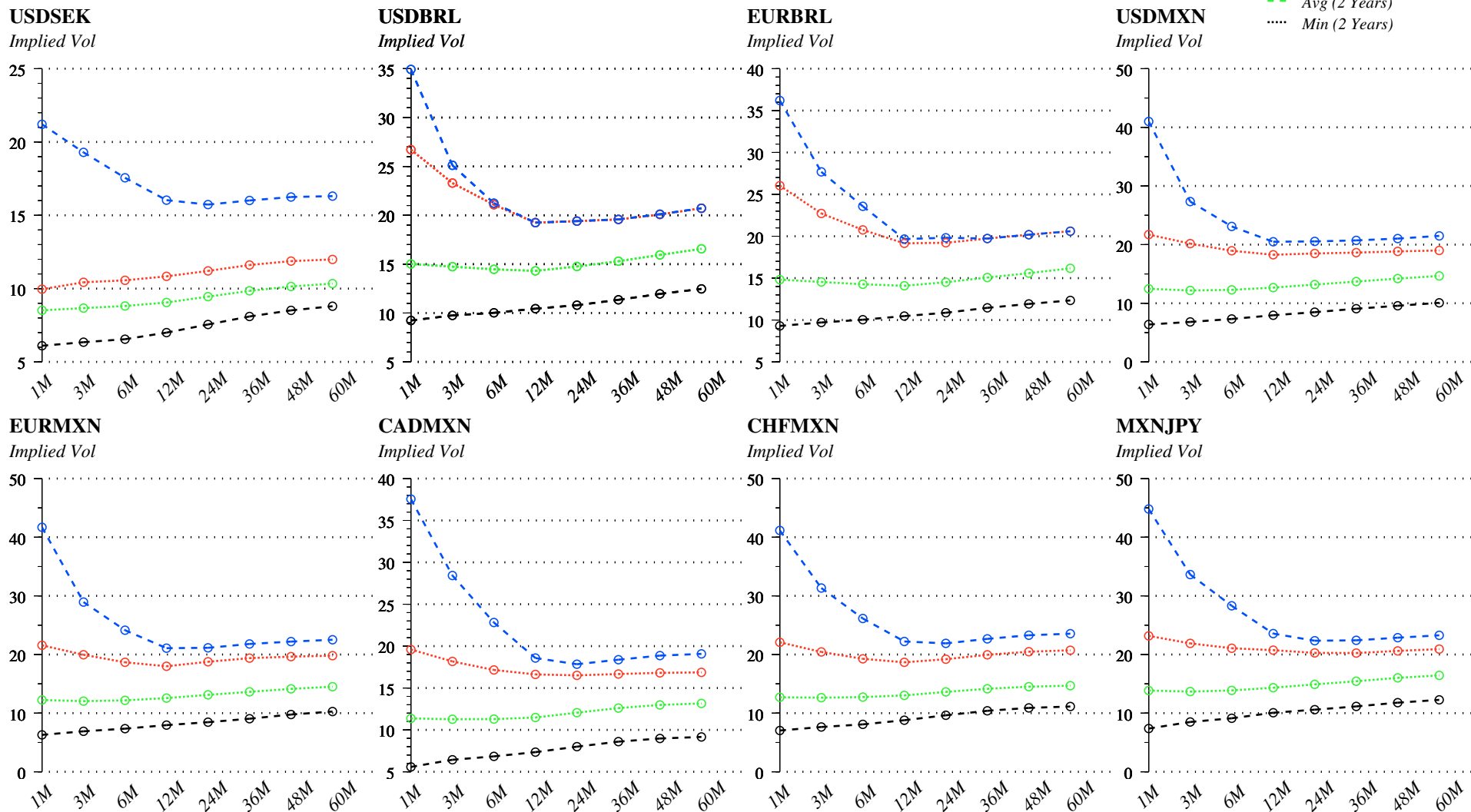
FX Implied Vol Cones

..... Max (2 Years)
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 Min (2 Years)



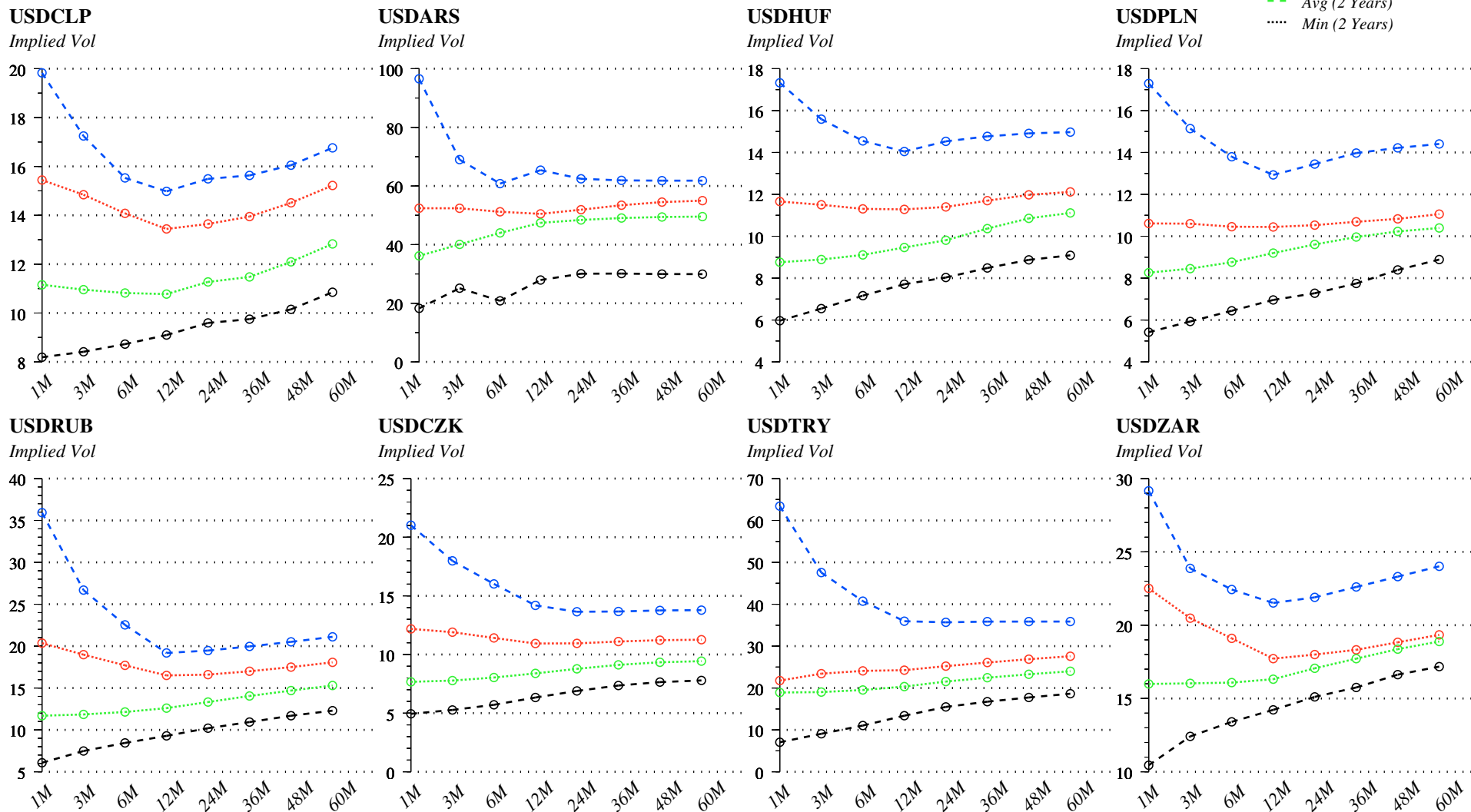
FX Implied Vol Cones

- Max (2 Years)
- - - Current
- - - Avg (2 Years)
- Min (2 Years)



FX Implied Vol Cones

..... Max (2 Years)
 --- Current
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 Min (2 Years)

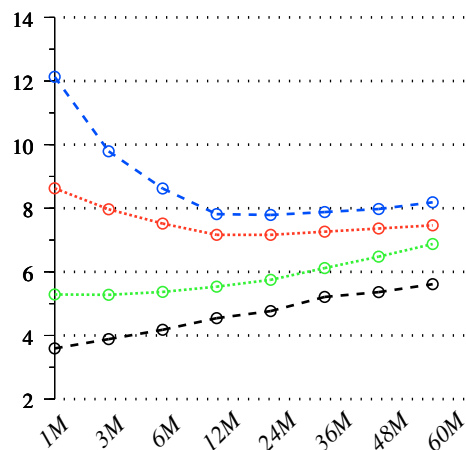


FX Implied Vol Cones

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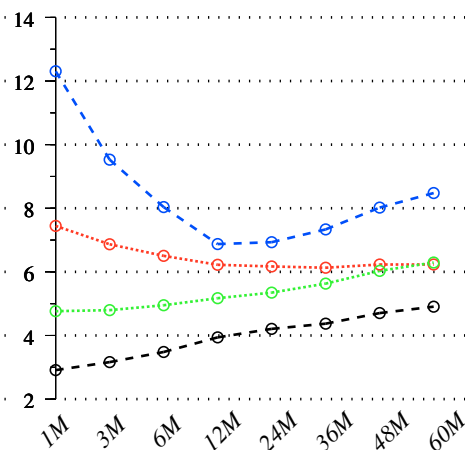
EURHUF

Implied Vol



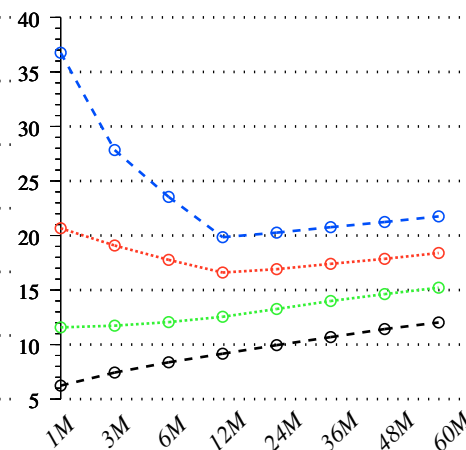
EURPLN

Implied Vol



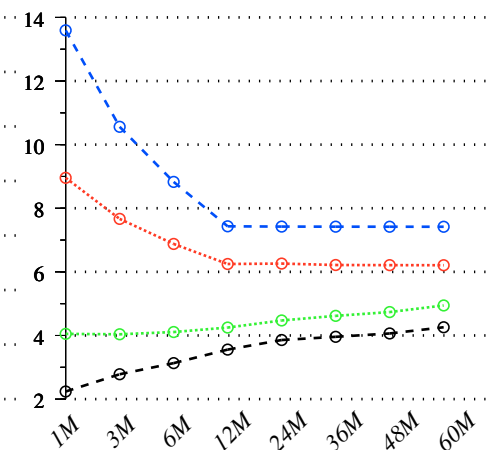
EURRUB

Implied Vol



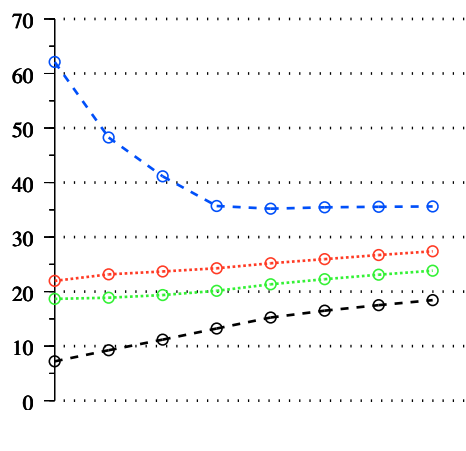
EURCZK

Implied Vol



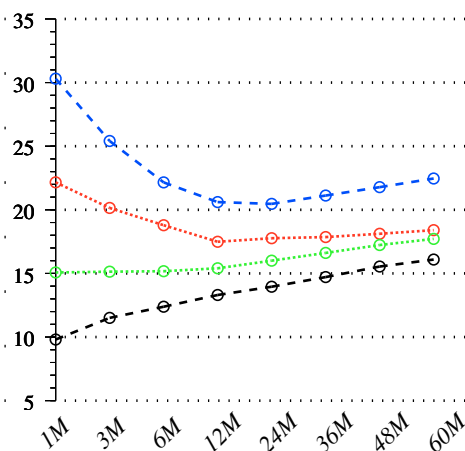
EURTRY

Implied Vol



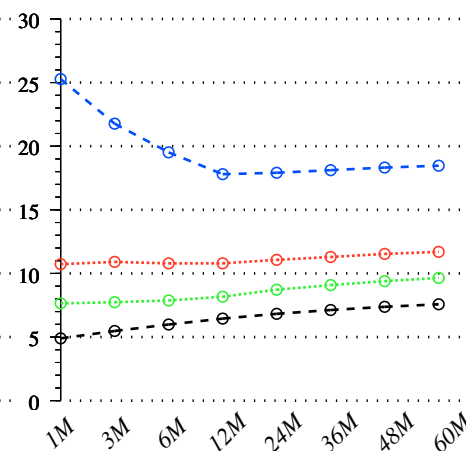
EURZAR

Implied Vol



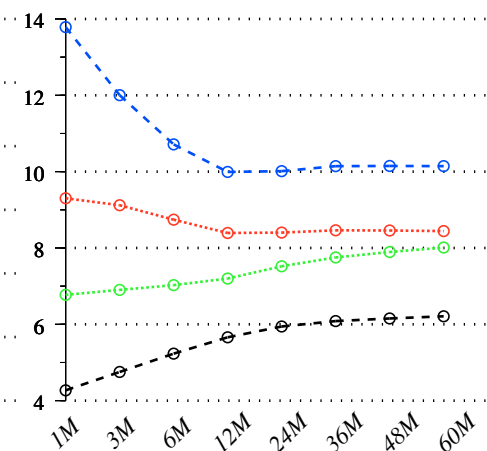
USDKRW

Implied Vol

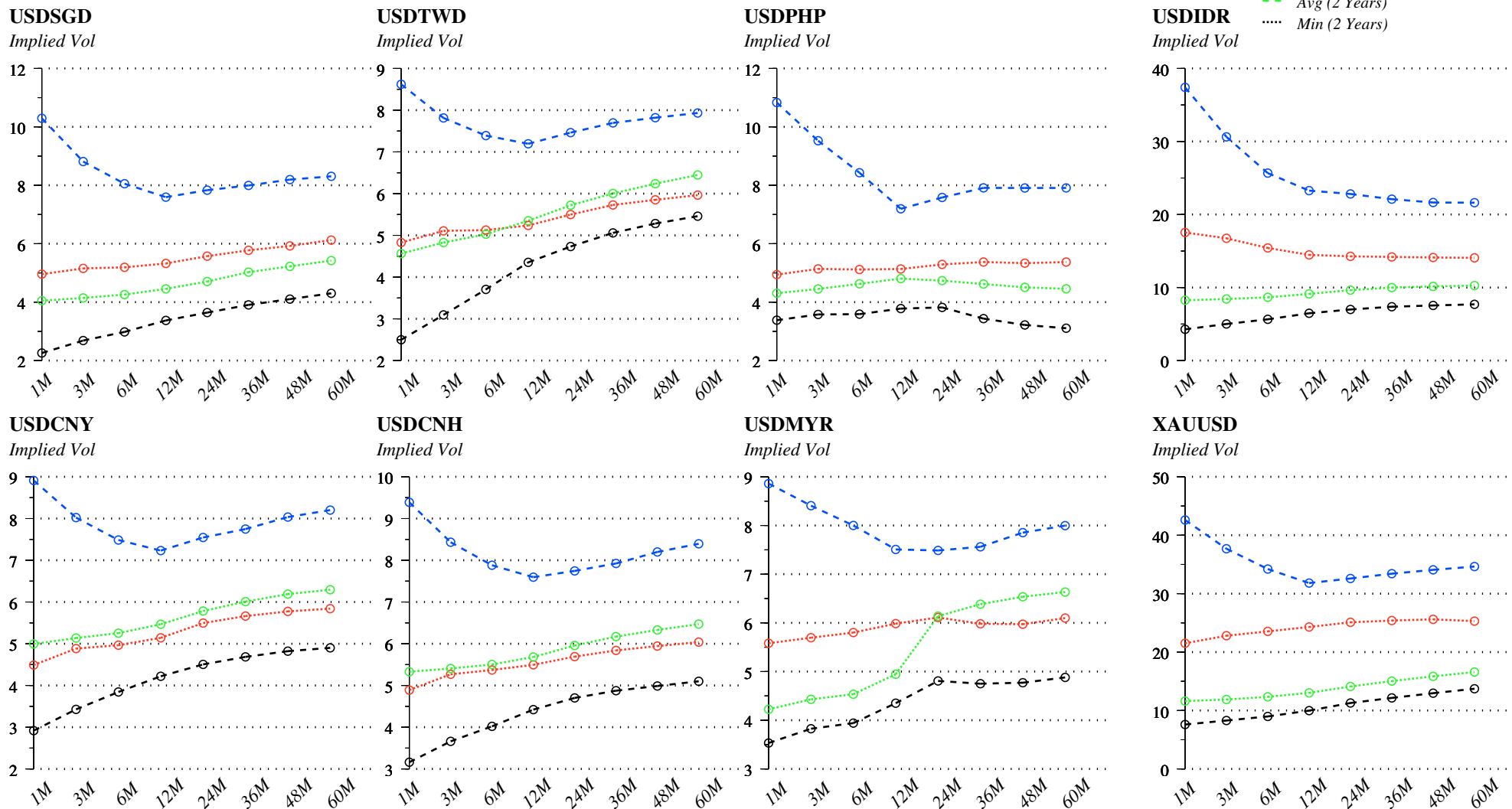


USDINR

Implied Vol



FX Implied Vol Cones



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