

# Currency Carry Trade

## Financial Markets, Day 2, Class 5

**Jun Pan**

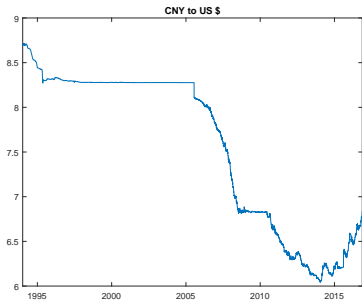
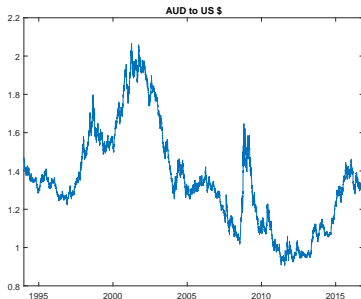
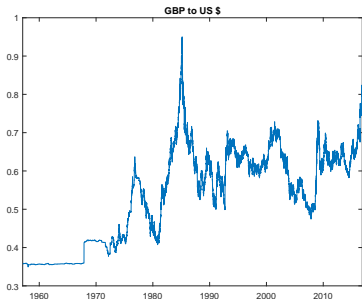
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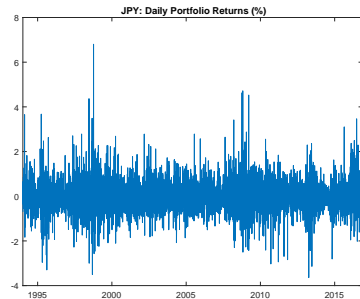
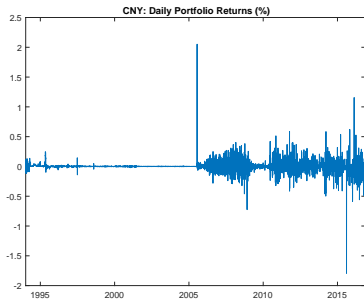
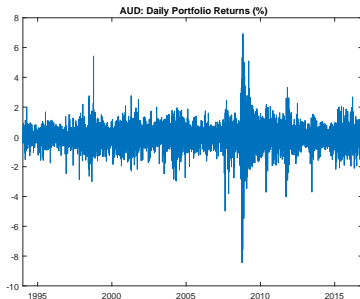
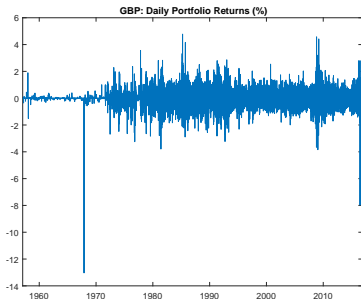
# Outline

- Calculating Currency Returns.
- Currency Carry Trade.
- Currency Options.

# Foreign Currency per US Dollar



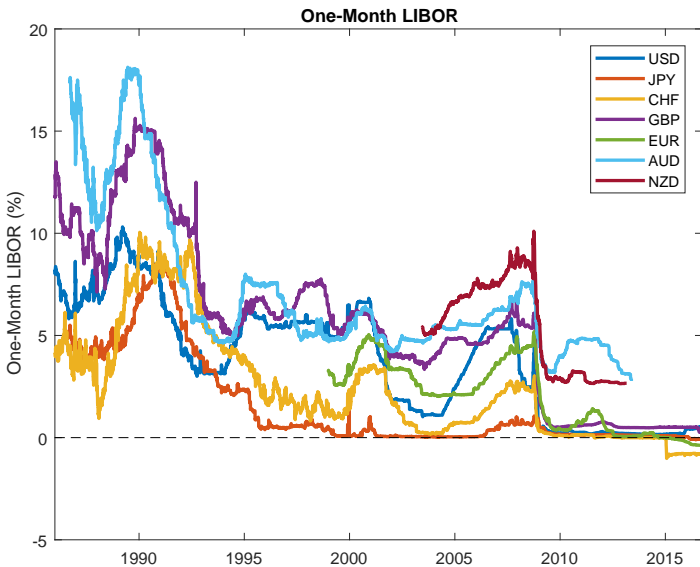
# Daily Currency Returns



## Daily Returns from 2000 through 2016

std (%)	GBP	EUR	AUD	CAD	CNY	INR	JPY	CHF	THB	RUB
	0.60	0.63	0.82	0.59	0.10	0.38	0.64	0.70	0.36	0.77
corr (%)	GBP	EUR	AUD	CAD	CNY	INR	JPY	CHF	THB	RUB
GBP		64.4	53.1	45.3	12.9	25.2	12.3	49.7	18.6	23.9
EUR	64.4		55.3	46.0	10.4	23.3	27.5	78.2	21.1	25.7
AUD	53.1	55.3		62.3	12.8	33.9	2.9	39.2	23.4	32.8
CAD	45.3	46.0	62.3		9.4	27.0	1.0	32.7	19.9	33.3
CNY	12.9	10.4	12.8	9.4		16.8	5.6	8.8	16.1	10.7
INR	25.2	23.3	33.9	27.0	16.8		-4.0	15.1	25.5	26.6
JPY	12.3	27.5	2.9	1.0	5.6	-4.0		37.5	17.6	-1.1
CHF	49.7	78.2	39.2	32.7	8.8	15.1	37.5		17.7	19.3
THB	18.6	21.1	23.4	19.9	16.1	25.5	17.6	17.7		15.9
RUB	23.9	25.7	32.8	33.3	10.7	26.6	-1.1	19.3	15.9	

# One-Month LIBOR Rates



# Currency Carry Trade

- Take long position on “asset/target” currencies with high interest rates.
- Borrow from “funding” currencies with low interest rates.
- The Japanese Yen is the most often used funding currency (Yen Carry).
- Two drivers for returns:
  - ▶ The interest rate differential (positive carry).
  - ▶ Gain/loss in the spot market when unwind the trade.
- On average, currency carry trade is a profitable trading strategy, but is sensitive to the liquidity condition of the global markets.
- Large losses in currency carry were often incurred during global sell-off of risky assets (flight to quality). Accompanied with the large losses in currency carry is the sudden strengthening in Yen (or other funding currencies) as carry traders seek to unwind their trades.

## A Portfolio Approach to Currency Carry

- Let's use USD as an anchor and calculate portfolio returns from the perspective of a US investor: in month  $t$ , borrow in USD and buy the foreign currency; in month  $t+1$ , unwind the trade.
- Let  $i^*$  and  $i$  be the foreign and US one-month risk-free rates. At month  $t$ , sort all currencies by interest rate differentials  $i^* - i$  into 6 groups:
  - ▶ group 6: funding currencies with the lowest interest rates
  - ▶ group 1: target currencies with the highest interest rates.
- Calculate the realized return in month  $t+1$ , and equal weight all currencies within each of the 6 groups.
- The number of available currencies varies over time. For the period from 1987 through 2011, the sample starts with 17 currencies and reaches a maximum of 34 currencies. Since the launch of Euro in January 1999, the sample covers 24 currencies.



## Portfolio Returns of Currency Carry

	Portfolio Rank	exret (%)	CAPM	
			beta	alpha (%)
"target" currency	1	0.79 [4.56]	0.19 [3.08]	0.69 [3.22]
	2	0.35 [2.39]	0.17 [3.64]	0.26 [1.55]
	3	0.28 [2.14]	0.12 [2.36]	0.22 [1.39]
	4	0.15 [1.21]	0.08 [1.91]	0.11 [0.77]
	5	-0.05 [-0.38]	0.07 [1.53]	-0.08 [-0.58]
"funding" currency	6	-0.18 [-1.37]	0.01 [0.24]	-0.18 [-1.30]

Monthly Data from January 1987 through December 2011

# Principal Component Analysis on Currency Returns

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The first three PC's of currency returns

	PC 1	PC 2	PC3
E/sum(E)	54.03%	20.25%	10.10%
GBP	0.3748	-0.0312	0.2595
EUR	0.4538	0.1878	0.2925
AUD	0.5621	-0.4869	-0.4163
CAD	0.3324	-0.2946	-0.1879
JPY	0.1499	0.6699	-0.7030
CHF	0.4524	0.4371	0.3799

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# Currency Option Implied Smile

