Carry trade and transition

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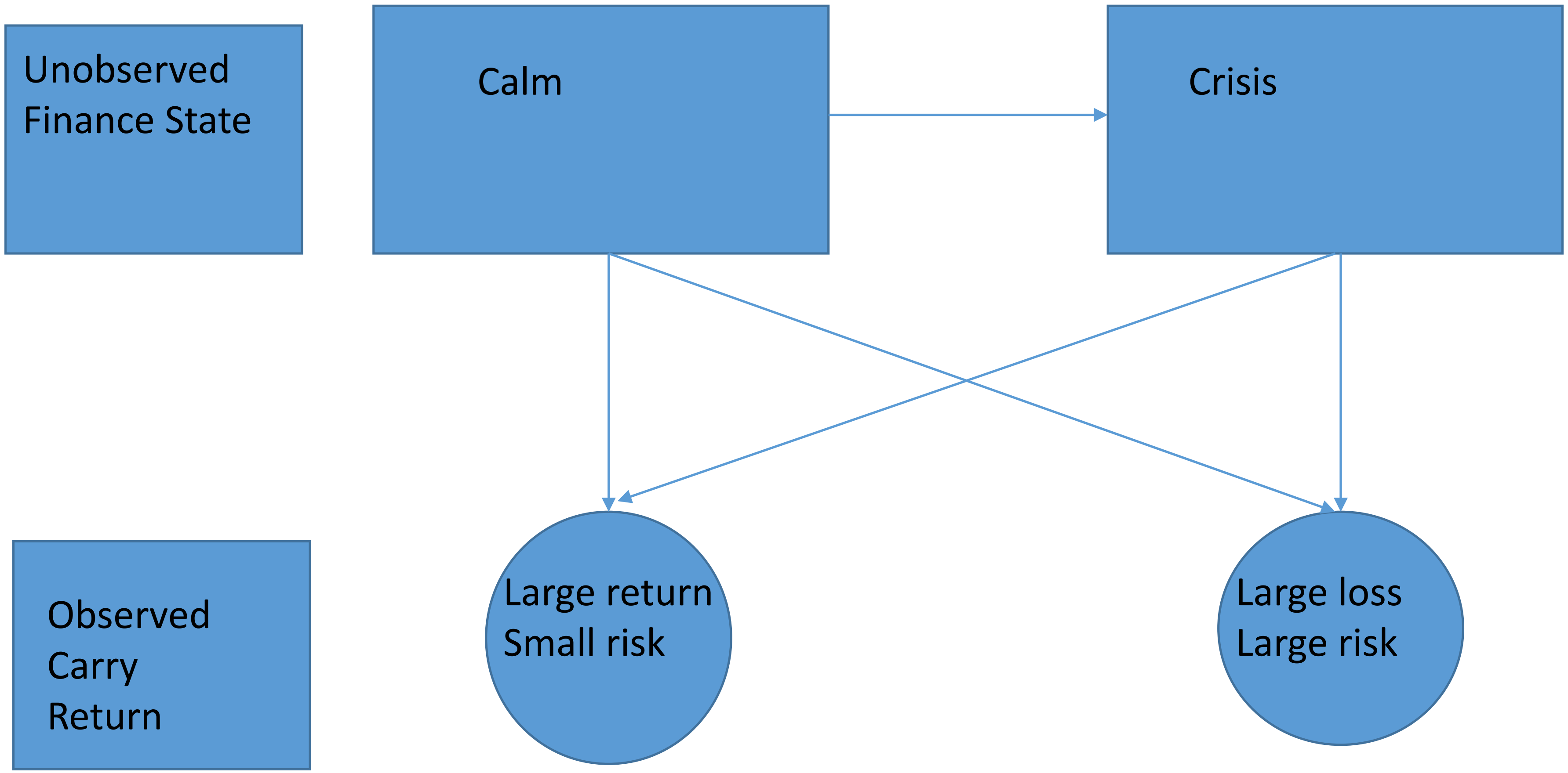
Capital flows and exchange rates

- There has been a substantial inflow of capital to economies since the 2007-08 financial crisis
- There are three factors that could encourage a reversal
  - International risk aversion
  - US monetary policy
  - International liquidity
- This research seeks to understand more about how financial instability evolves and to assess the relative importance of these three factors

Sudden stops and the regimes

- Sudden stops Calvo (1998, 1999) are composed of two regimes
  - Inflows
  - Outflows
- Renewed interest, particularly after May 2013
  - Ahmed (2014) Panel of Gross and Net capital flows
  - Baele et al. (2014) Look at causes of Flight-to-Safety
  - Ceruttie et al. (2014) Measure global liquidity

Two Regime: Hidden Markov Chain Model



The carry trade

- This is an attempt to take advantage of the breakdown in UIP

- $y_{t+1} = \frac{i^* - i}{\Delta s_{t+1}}$

- y_{t+1} are the profits from the carry trade., $i^* - i$ is the interest rate differential and Δs_{t+1} is the change in the exchange rate.

Failure of UIP

$$E[\Delta S_t] = \alpha + \beta(i^* - i) + \epsilon)$$

- $E[\Delta S_t]$ is the expected change in the exchange rate
- The domestic interest rate is I
- The overseas interest rate is i^*
- f_s is the forward rate

$$\Delta s_t = \alpha + \beta f_s + \epsilon$$

Risk

- The explanation for the breakdown in UIP assumes that there is some risk

$$\Delta S_t = i^* - i - rp$$

Where rp is the risk-premium

Three components of HMM

- The HMM has three components:
  - The prior model: $P\left(S_1 = n \middle| \theta_{prior}\right)$ (π)
  - The transition model $P(S_t||S_{t-1}, \theta_{trans})$ (A)
  - The response model $P(y_t|S_t, \theta_{resp})$ (B)

There are n states or regimes, y_t are the observed carry-trade returns, θ_{prior}, θ_{trans} and θ_{resp} are the prior, transition and response models respectively.

Response

For the simple case, the two-regime is modelled as

$$y_t = \beta_0 + \sum_{i=1}^{i=n} S_{i,t} + \epsilon_t$$

Results

Regime		HUF	PLN	CZK	RON
Calm	Mean	1.0165	1.0173	1.1029	1.0150
	S-dev	0.0519	0.0486	0.0542	0.0433
Crisis	Mean	0.9950	0.9862	0.9963	0.9969
	S-dev	0.1085	0.1025	0.0886	0.0878

Mean and standard deviation in period of calm and crisis.

Transition models

$$y_t = \beta_t + \sum_{i=1}^{i=n} (S_{i,t} | z_t) + \epsilon_t$$

Where z_t is a transition logistic model that determines the effect of risk aversion (VIX) on the probability of switching.

Results 2

	-3sd	-1sd	Mean	1sd	2sd	3sd
HUF	0.0020	0.0242	0.0807	0.2375	0.5249	0.7967
PLN	0.0004	0.0063	0.0242	0.0887	0.2766	0.6003
CZK	0.0000	0.0034	0.0717	0.6367	0.9755	0.9989
RON	0.0014	0.0131	0.0392	0.1119	0.2799	0.5453

VIX is scaled to zero mean and unit standard deviation; these are the probabilities of switching to a crash once in a state of calm.