

# CURRENCIES AND CARRY TRADE CRASHES

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# Overview

- Predicting and understanding sudden asset price movements is a key element of financial stability and understanding asset prices in general
- For some currencies (e.g. ZAR) the sudden moves tend to be depreciations whilst for others (e.g. JPY) they tend to be appreciations
- So why do different currencies have different patterns? Can we use this pattern to help understand sudden moves?

# “Up by the stairs down by the elevator”

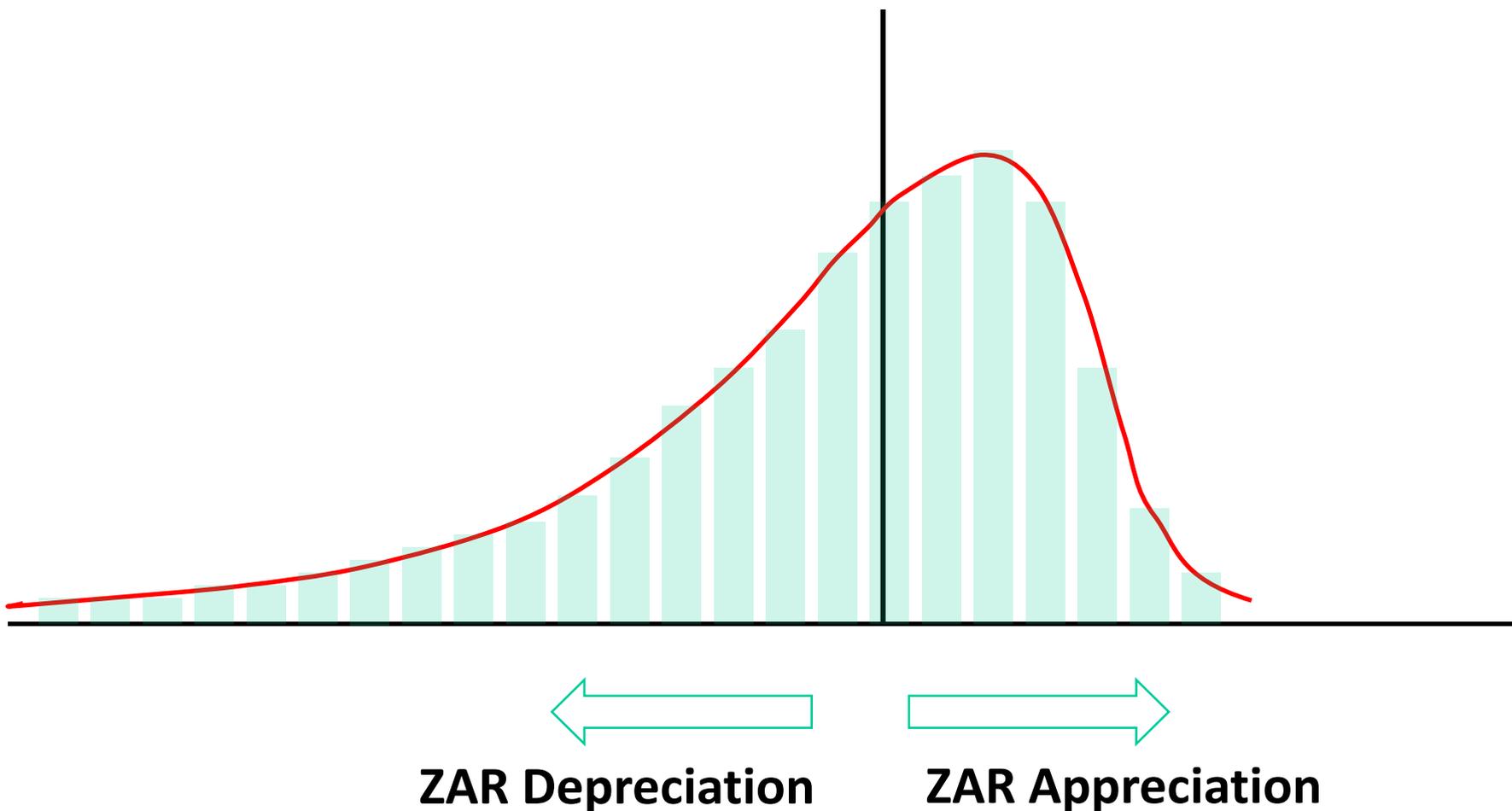
## ZAR/JPY Real Exchange Rate



# Measuring Skewness

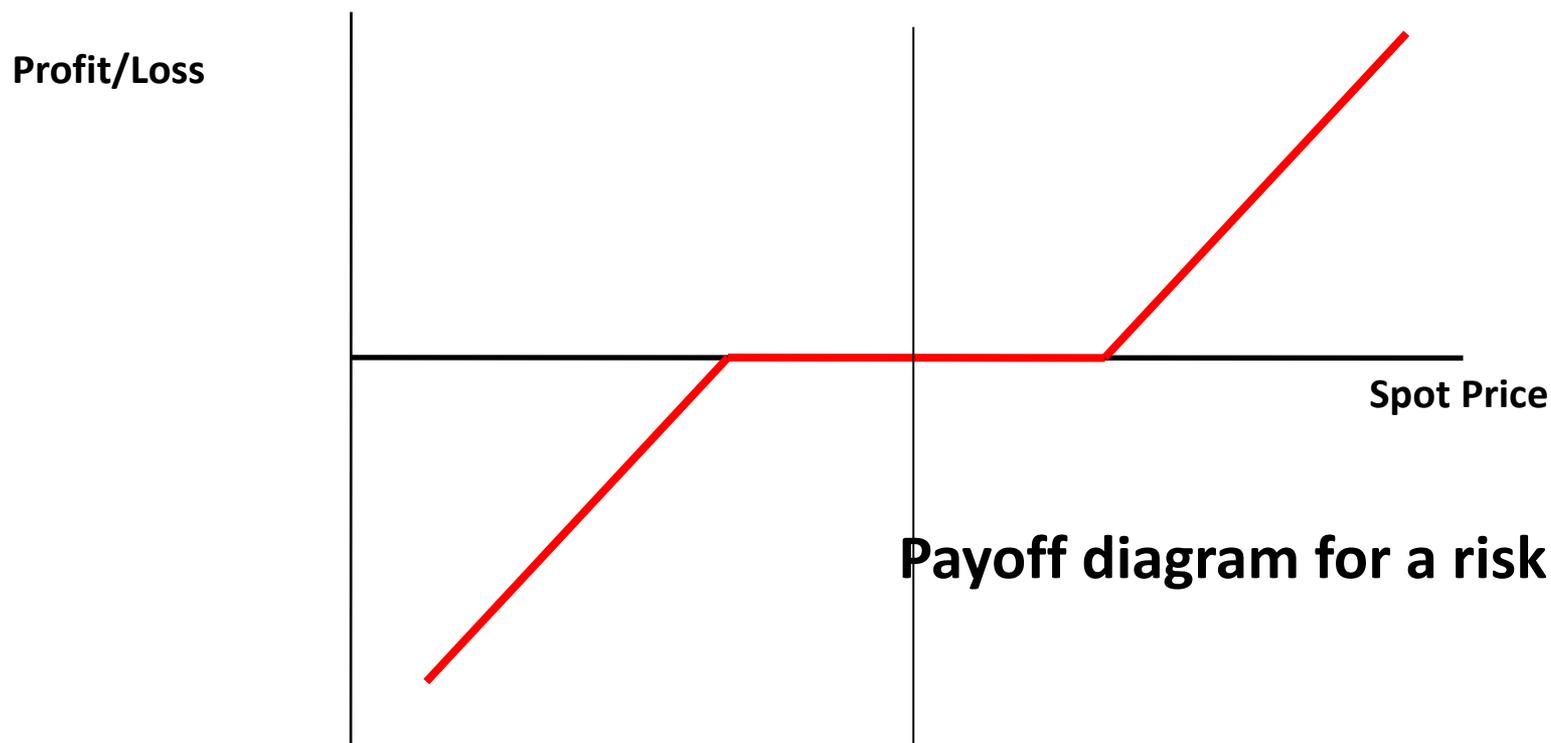
- “Up by the stairs down by the elevator”  $\Rightarrow$   
Skewness in returns
- Realised Skewness: Estimation based on historical distribution of returns
- Expected Skewness: FX options can be used to estimate the expected distribution of returns – including skewness.

# Realised Skewness in FX Returns



# A Simple measure of Expected Skewness in FX

- FX trade **risk reversals**. A combination of selling an out-of-the-money put and buying an equally out-of-the-money call of same maturity.

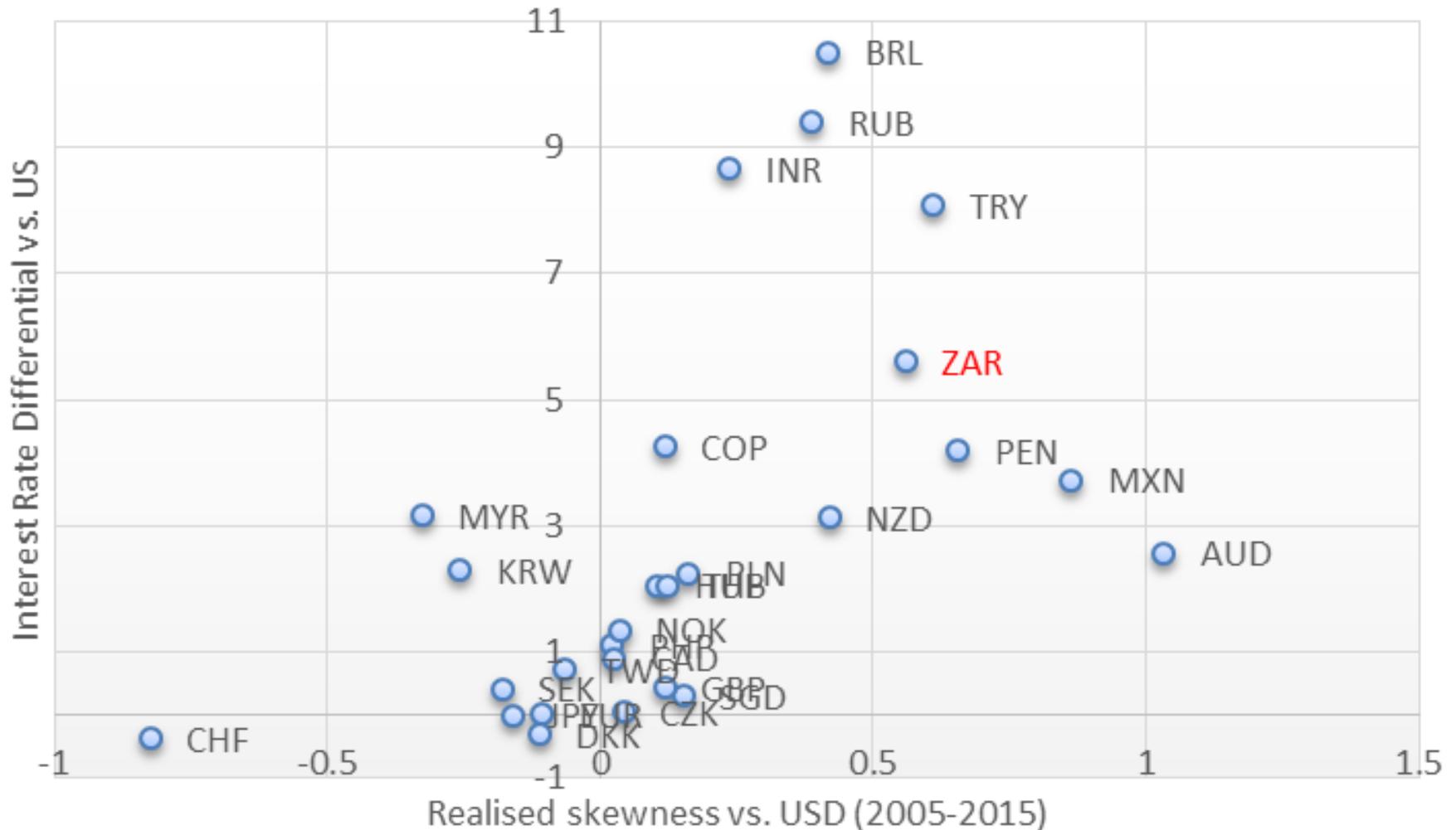


# Carry Crashes

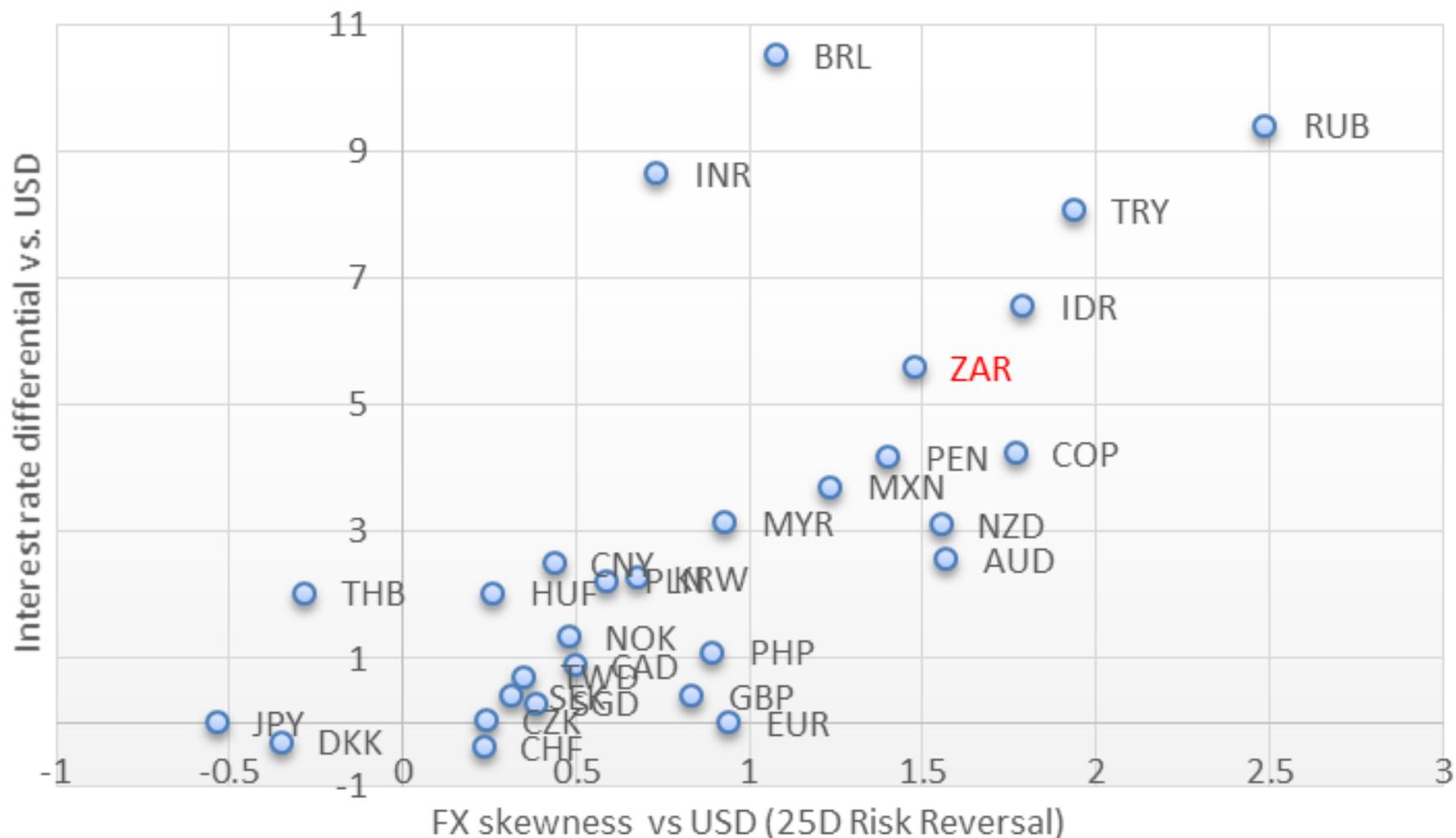
## What determines the skew?

- Clear evidence that currency skew is related to interest rate differentials
- Currencies with high interest rates tend to experience sharp depreciations (and slow appreciations) against low interest rate ones.
- i.e. positive *carry* predicts *crashes*

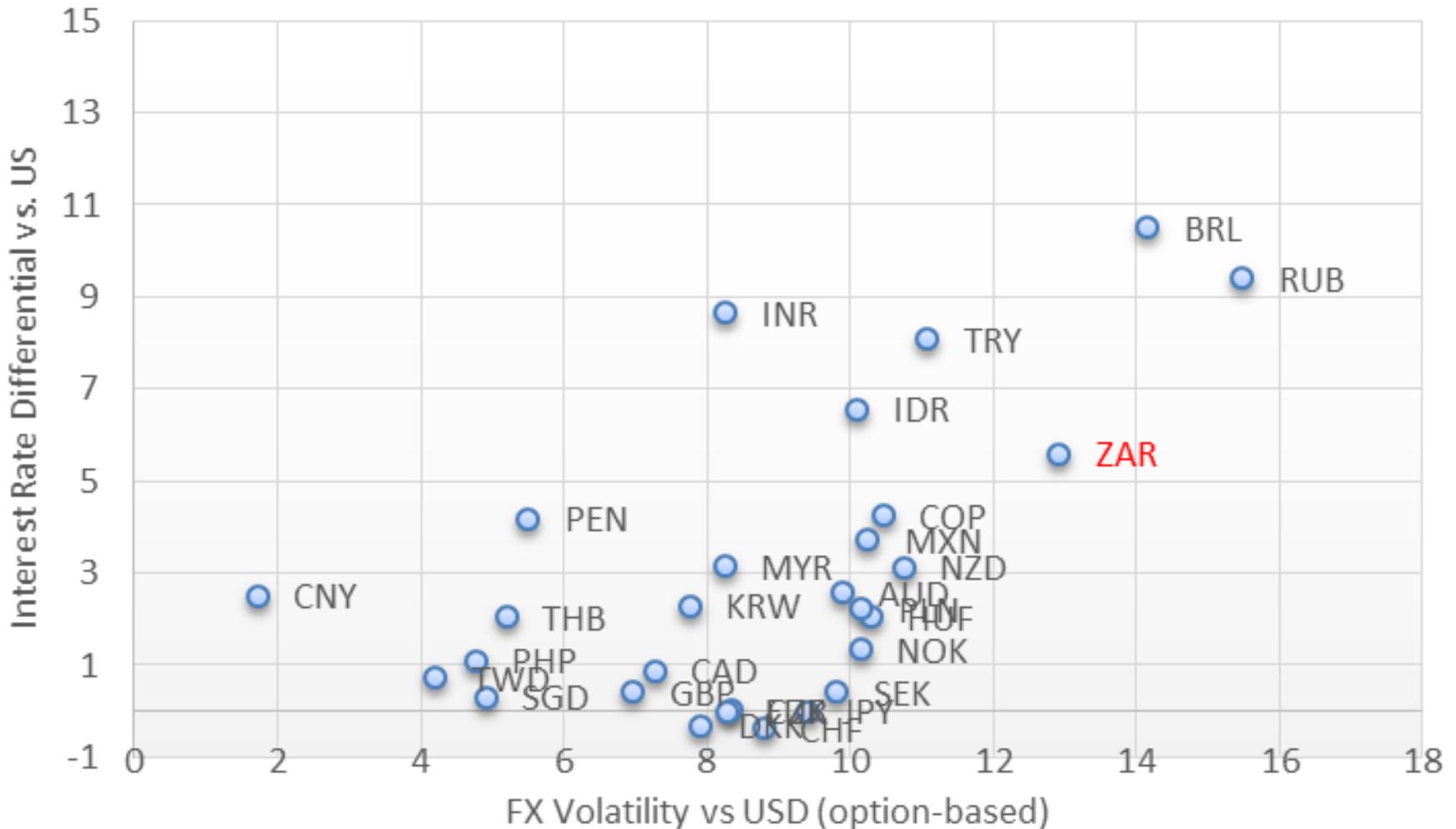
# Realised Skew and Carry



# Expected Skew and Carry



# Carry/Skew effect *arguably* an important element of overall volatility



# Carry Crashes

- Clear pattern for high interest rate currencies to have large depreciations (skew) whilst low interest rate ones do the opposite
- These sudden moves are correlated both with other assets in a given country and with other currencies with similar interest rates
- These moves are often triggered by a news/volatility event but often seem 'too large' given the information.
- So why do different currencies have different patterns? Can we use this pattern to help understand sudden moves?

# Where does the carry crash effect come from?

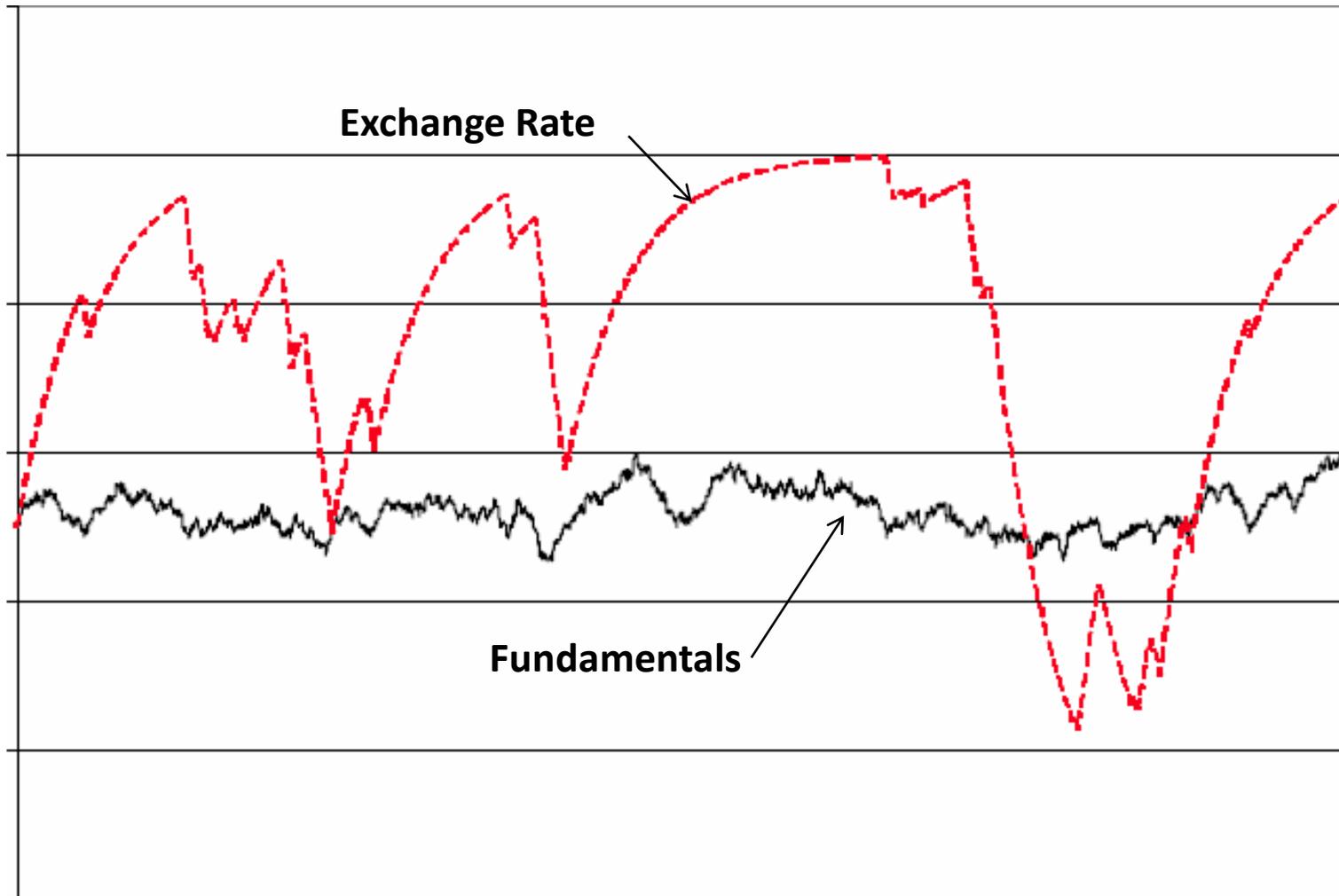
- It is hard (but not impossible) to think of a story where a currency's fundamentals creates skewness that is related to interest rate differentials
- More plausible is that this effect is created by trading behaviour – it is an microstructure effect.
- Evidence for the microstructure story:
  - Theory: Plantin Shin (2006)
  - Market Understanding
  - Empirical Evidence: Breedon, Rime & Vitale (2015)

# Plantin Shin (2006)

## Assumptions

- FX only has a weak connection to fundamentals
- Trades can influence exchange rates
- *A funding externality*, funding limits carry trade, but new entrants can raise profits and so funds available for existing carry traders.
  - Carry traders will continue buying carry currencies as long as expected profits positive
  - (Any) event can trigger large exit that will cause rapid depreciation of carry currencies (events that raise volatility most likely trigger)

# Plantin Shin (2006): Simulated relation between exchange rate and fundamentals



# Evidence from Market Commentary

- Market commentary often seems to fit the Plantin Shin story..

“The carry trade has lifted currencies linked to high interest rates to their most overvalued level in 25 years, increasing the risk of a potentially damaging sell off, industry experts warn.” WSJ

# Empirical Evidence: Breedon, Rime, Vitale (2015)

- Predicting future crashes (time series) using order flow imbalance, interest rate differentials, volatility

	USD/EUR	USD/JPY
Interest Rate differential	6.33 (0.79)	23.79 (5.91)***
Order Flow Imbalance	-4.38 (-3.00)***	-2.67 (-3.15)***
Volatility	4.60 (1.21)	6.45 (4.27)***

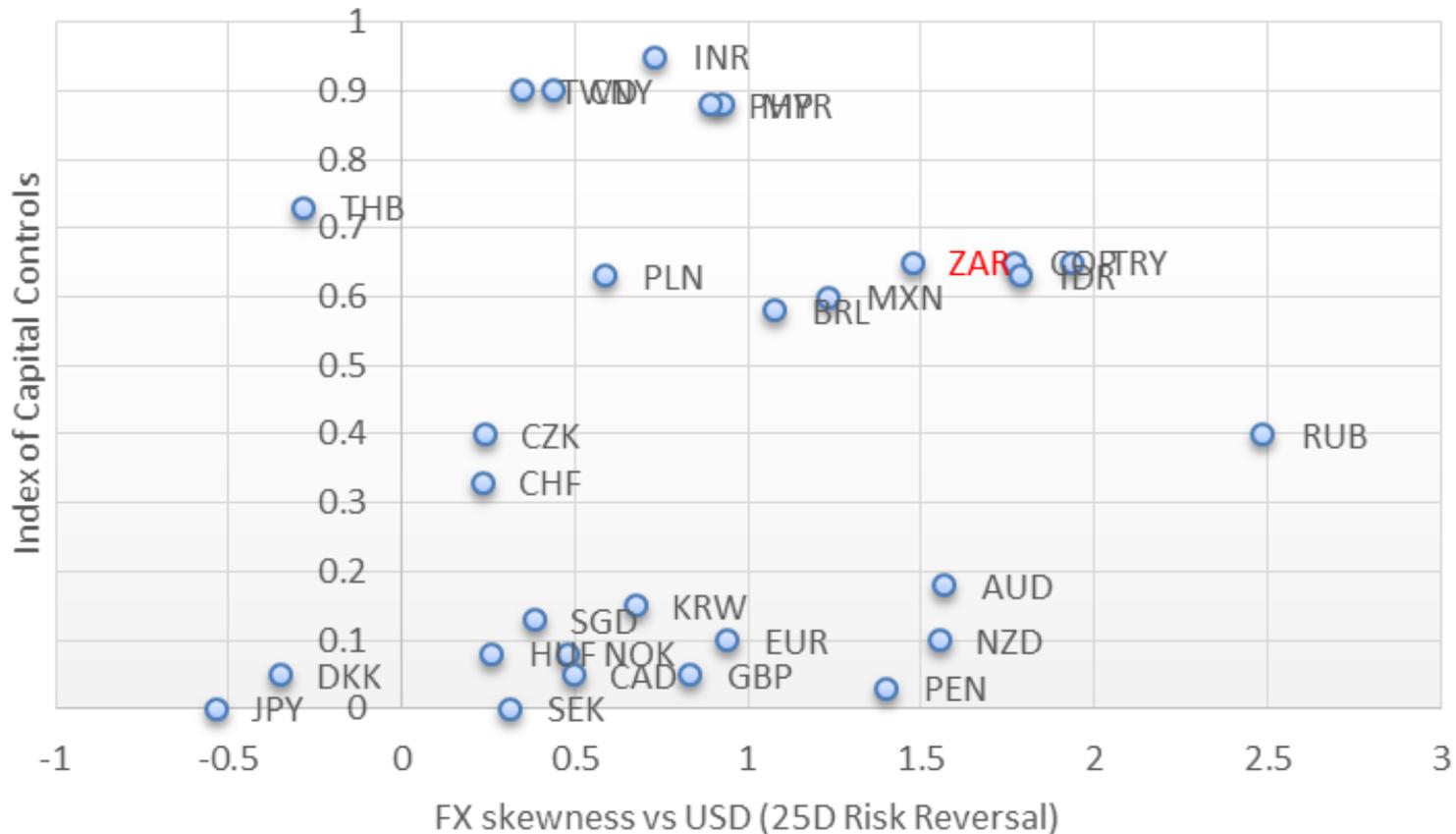
# Policy Implications

- These crashes have important financial stability implications and, arguably, stop the efficient functioning of global capital markets
- If currency crashes are a microstructure effect rather than fundamental then policy makers have an interest in
  - 1) predicting them
  - 2) stopping them!

# Policy Implications

- Do some standard policy/macro variables reduce carry crashes?
- Some standard policy choices
  - Capital Controls
  - FX regime (fixed/floating)
  - Level of FX reserves
  - Current Account Position

# Capital Controls and Expected Skew



Fernández, Klein, Rebucci, Schindler and Uribe (2015) "Capital Control Measures: A New Dataset"



# Determinants of Skew

	Realized Skew	Expected Skew
Interest Rate differential	0.07 (2.82)***	0.13 (4.68)***
Capital Controls	0.06 (0.19)	-0.03 (-0.09)
Currency Regime	-0.16 (-1.1)	0.20 (1.33)
Current Account	-0.02 (-1.3)	-0.02 (-0.78)
FX reserves	-0.00 (-0.5)	-0.02 (-0.66)
<b>R-Squared</b>	<b>0.47</b>	<b>0.60</b>

# Determinants of Volatility

	Realized Volatility	Expected Volatility
Interest Rate differential	0.46 (2.63)**	0.55 (5.32)***
Capital Controls	-3.80 (1.67)*	-2.94 (-2.18)**
Currency Regime	1.75 (1.81)*	1.71 (3.00)***
Current Account	0.04 (0.32)	-0.01 (-0.16)
FX reserves	0.20 (1.27)	-0.05 (-0.55)
<b>R-Squared</b>	<b>0.47</b>	<b>0.64</b>

# Conclusions/Conjectures

- Strong relationship between carry and crashes
- These crashes are correlated across countries and across markets
- Likely that this is largely a trading effect
- Standard FX policy measures have limited effects
- If this is a trading effect it should be predictable and reducible.
  - Counteracting intervention
  - Macroprudential measures



# Conclusions for South Africa

- Carry crashes are of particular importance for South Africa
  - Amongst the most susceptible currencies
  - Large financial sector makes impact more economically significant
  - Stable external capital flows key to South Africa economy
- Good data makes the chances of identifying conditions for crash better in South Africa