CAN OIL PRICES FORECAST EXCHANGE RATES?

Discussion by

Patrizio Pagano
Banca d'Italia
patrizio.pagano@bancaditalia.it

November 19, 2012
Monetary Policy and Commodity Prices Workshop

Questions

1. (Narrow) Does oil price forecast the exchange rate of oil exporting countries?
2. (Broad) Are changes in exchange rates random?

- In what follows I will
  - recap the approach and results of the paper
  - suggest a couple of alternatives/refinements

Methodology and results

- Pseudo forecasts of Canadian-US dollar exchange rate
  - rolling windows at daily, monthly and quarterly frequencies
  - either contemporaneous (realized) or lagged oil price
- oil price matters!
  - out-of-the sample predictability at higher, but not at lower frequencies
  - impressive sensitivity
    - other predictors (macro news, interest rate differential ...)
    - US dollar effect
    - sample stability
    - no asymmetries or thresholds
  - predictability fades with lagged regressor

Why the spot?

- Why not the futures? After all the ER is a jump variable that should react to news about future oil price
- I focus on daily frequencies and run the same experiments as in the paper, with a slightly different sample (Jan.1, 1986-Dec.31, 2010; roughly the same size – more than 6500 daily observations)
- out-of-the sample pseudo-forecasts with rolling window=1/2

Estimates of the basic model

$$\Delta s_t = \alpha + \beta \Delta p_t$$

	spot	futures(3)	futures(9)
α	-.000 (-0.86)	-.000 (-0.81)	-.000 (-0.75)
β	-.032 (-7.35)	-.045 (-7.22)	-.058 (-7.15)
R^2	0.034	0.041	0.046

HAC $t - stat$ in parentheses

Sample: Jan.1, 1986-Dec.31, 2010

Estimates of the basic model

$$\Delta s_t = \alpha + \beta \Delta p_t + \gamma \Delta f$$

	spot	spot & futures(3)	spot & futures(9)
α	-.000 (-0.86)	-.000 (-0.81)	-.000 (-0.76)
β	-.032 (-7.35)	-.009 (-1.88)	-.008 (-1.97)
γ		-.036 (-4.45)	-.049 (-4.91)
R^2	0.034	0.042	0.047

HAC $t - stat$ in parentheses

Sample: Jan.1, 1986-Dec.31, 2010

Mean Squared Forecast Errors 1

out-of-the sample pseudo-forecasts for rolling window=1/2

	MSFE	ratio
RW	$3.41 \cdot 10^{-5}$	
spot	$3.19 \cdot 10^{-5}$	0.94
futures(3)	$3.15 \cdot 10^{-5}$	0.92
futures(9)	$3.11 \cdot 10^{-5}$	0.91

Verdelhan (2012)

- Common risk factors are key drivers of bilateral exchange rates
- Extract information from currency markets using portfolios
  - Sort countries by interest rates, build portfolios of currency excess returns (excluding the one under study)
  - **Carry Factor**: is the average change in exchange rates of all currencies in the first portfolio minus the average change in exchange rates of all currencies in the last portfolio.
  - I put [AUD, NZD, NOK] in the first (high i) and [CHF, JPY, EUR] in the last. (Unit of currencies for 1 USD; USD-neutral)
  - **Dollar Factor**: average change in exchange rates across all portfolios
  - I use average change in 10 exchange rates (6 above + DAN, HK, SEK, GBP) against the USD.

$$\Delta s_t = \alpha + \beta \Delta p_t + \gamma Carry_t + \theta Dollar_t + u_t$$

	spot	Carry	Dollar	all
α	-.000 (-0.86)	-.000 (-1.31)	-.000 (-0.57)	-.000 (-0.89)
β	-.032 (-7.35)			-.016 (-7.17)
γ		.274 (12.35)		.263 (18.10)
θ			.399 (12.95)	.388 (19.12)
R^2	0.034	0.12	0.16	0.29

HAC $t - stat$ in parentheses

Sample: Jan.1, 1986-Dec.31, 2010

Mean Squared Forecast Errors 2

out-of-the sample pseudo-forecasts for rolling window=1/2

	MSFE	ratio
RW	$3.41 \cdot 10^{-5}$	
spot	$3.19 \cdot 10^{-5}$	0.94
Carry	$2.76 \cdot 10^{-5}$	0.81
Dollar	$2.53 \cdot 10^{-5}$	0.74

Mean Squared Forecast Errors 3

out-of-the sample pseudo-forecasts for rolling window=1/2 with lagged regressors

	MSFE	ratio
RW	$3.41 \cdot 10^{-5}$	
spot[-1]	$3.41 \cdot 10^{-5}$	0.999
futures(9)[-1]	$3.41 \cdot 10^{-5}$	0.999
Carry[-1]	$3.41 \cdot 10^{-5}$	1.001
Dollar[-1]	$3.41 \cdot 10^{-5}$	1.001

Is there a common factor driving both oil prices and exchange rates?

Gains from combining? Fair and Shiller (1990)

$$\Delta s_t = \alpha + \beta \widehat{\Delta s\left(p_t\right)} + \gamma \widehat{\Delta s\left(x_t\right)} \qquad x = [futures, Carry, Dollar]$$

	futures(3)	futures(9)	Carry	Dollar
α	-.000 (-1.15)	-.000 (-1.19)	-.000 (-1.14)	-.000 (-0.97)
β	.950 (1.57)	.876 (1.93)	1.632 (5.84)	1.490 (6.48)
γ	2.387 (3.70)	2.241 (5.04)	1.579 (17.14)	1.603 (17.29)

HAC $t - stat$ in parentheses

Concluding remarks

- Do oil prices predict exchange rates?
- Probably yes, but it seems that futures are more useful than spot prices
- More in general, it seems that other (global) factors play an important role in predicting exchange rates
- For the case of the Canadian dollar there may still be informative content in oil prices