Comment on: Exchange rates, expected returns and risk: what can we learn from Asia-Pacific currencies?

Hugo Vega

Uncovered interest rate parity (UIP) is probably the most popular component of small open economy models used for monetary policy analysis. Based on an arbitrage assumption, it predicts that nominal exchange rates respond to movements in nominal interest rates, both domestic and foreign. The intuition is simple: higher domestic (foreign) interest rates generate capital inflows (outflows) that demand domestic (foreign) currency, causing a nominal appreciation (depreciation).

As a theory, UIP is elegant, concise and intuitive. Sadly, empirical tests of its validity have failed systematically (see Engel (2013) for a literature review). Munro's paper is one of the more recent attempts to explain why this has been the case in the past and, after appropriate correction of the estimation technique, it provides renewed empirical evidence in favour of UIP.

In Munro's approach, estimation bias is the main suspect behind past failures to establish the empirical validity of UIP. The paper points out that observed interest rates are not risk-free and if risk premia associated with exchange and interest rates are correlated, reduced-form estimates of UIP will be biased.

In order to illustrate this appropriately, it is best to refer to the following risk-adjusted asset price exchange rate model:

$$\Delta q_t = -\alpha \Delta R_t - \Delta \Lambda_t^R - \Delta \Lambda_t^{FX} \quad (1)$$

$$\Delta R_t = \Delta R_t^f - \Delta \Lambda_t^R \quad (2)$$

Here, q_t stands for the real exchange rate (expressed in units of domestic good per unit of foreign good) and R_t is the infinite sum of expected relative home and foreign payoffs (the interest rate "differential").

In theory, the latter can be decomposed into its risk-free counterpart (R_t^f) and a "bond premium", Λ_t^R . The UIP condition (1) incorporates the bond premium as well but has an additional "currency premium", Λ_t^{FX} .

The parameter of interest of the model, α , should be equal to 1 if UIP holds.

Other papers have attempted to estimate the empirical validity of UIP before but they have neglected to account for the bond premium explicitly, generating biased estimates of α (changes in the bond premium generate positive co-movement between the exchange rate and the interest rate differential). They usually proposed the reduced form

$$\Delta q_t = -\alpha \Delta R_t + \text{ö}_t \quad (3)$$

But if (1) and (2) describe the correct model, then estimates of α generated from (3) will be biased because ΔR_t and ε_t are correlated. This is classic omitted-variable bias.

Once we realise this, the problem changes: the bond premium is not observable (because the risk-free interest rate differential, ΔR_t^f, isn't either) so it cannot be included in the model, nor used to remove the bond premium component from the observed interest rate differential. Classic econometrics usually deals with this problem using instrumental variables. Ideally, we would like to find a variable that is correlated with ΔR_t^f but not $\Delta\Lambda_t^R$ and use it as an instrument to estimate (3).

Such a variable is hard to come up with. Macro fundamentals (the main drivers behind risk-free rates) are intimately related to country risk premia. Thus, the paper chooses a different route: estimate (1) and (2) as a multiple equation system using Bayesian methods. A prior is imposed on α and the variances of the risk premia (they are treated as shocks and must be positive) to guarantee identification.

The paper finds that the sign restrictions help with the identification of the system. Reported estimates of the variance of the bond premium ($\Delta\Lambda_t^R$) show that it heavily biases reduced form estimations of α.

Munro's risk adjusted estimates of α are much closer to 1. Actually, looking at the posterior distributions, there is a good probability that the parameter is actually near one for several currencies. However, in some cases, posterior gain over the prior seems to be small. The identification strategy loses effectiveness on some currencies. Still, for most countries analysed the posterior mode is to the right of the prior mode, indicating the prior is not too restrictive (see Graph 3 in the paper).

Furthermore, some of the currencies studied might be subject to structural breaks, particularly in the trends. Accounting for this might improve the paper's results.

Additionally, the paper also finds that Asian currencies seem to have higher "bond premium" variances but smaller "currency premium" variances. It postulates that this trade-off is correlated with measures of exchange rate regime. Using a sample of 14 currency pairs, it finds that more managed currencies tend to have larger bond premia; and more freely floating currencies tend to have larger currency premia. The conclusion is that risk plays a role in the monetary policy trilemma trade-offs.

If this is the case, it might be interesting to submit the Swiss franc-euro exchange rate to the test proposed in the paper in order to look at what has happened in the last few years in terms of bond and currency premium given the Swiss National Bank's foreign exchange rate policy. If the variance of the bond premium increased and that of the currency premium decreased because of active intervention in the FX market by Swiss authorities, that might provide additional validation for the paper's results. Testing this would require further development of the model because currently the variances of risk premia are assumed to be constant.

The validity of UIP as a theory of exchange rate fluctuations has a long history. This paper's renewed attempt to support it empirically is largely successful and provides new insights into the implications of exchange rate intervention for

monetary policy. If further empirical support can be found for the claim that fixed exchange rate regimes generate more volatile interest rates in an economy, that would be something which policymakers should take into account when deciding whether or not to intervene in FX markets.

References

Engel, C (2013): "Exchange rates and interest parity", *Handbook of International Economics*, vol 4, Elsevier.