Some economic relationships

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1 From stable differences or ratios

One set of hypothesised economic relationships arise from the belief that a difference or ratio is roughly constant in the long run.

1.1 Differences

If it is believed that

$$z = Y_t - X_t$$

is roughly constant, we can write this as

$$\begin{aligned} Y_t &= z + X_t \\ Y_t^* &= \theta_0 + \theta X_t \end{aligned}$$

treat this as a long-run equilibrium relationship in an ECM or VECM and test whether $\theta = 1$, in which case $\theta_0 = z$. Examples of these are where:

- Fisher relationship: z is the real interest rate, Y_t the nominal interest rate and X_t the rate of inflation;
- Yeild curve: z is the term spread, Y_t the long interest rate and X_t the short rate.

1.2 Ratios

In the case of a ratio, if it is believed that

$$K = \frac{Y_t}{X_t}$$

is roughly constant, we can write this

$$\ln Y^* = \theta_0 + \theta \ln X_t$$

again treating it as a long run relationship and testing whether $\theta = 1$ in which case, $\theta_0 = \ln K$.

It is not clear that such "great ratios" are really stable, but examples of them are:

- dividends-earnings as in the practicals;
- price-earnings in the stock-market;
- consumption-income; investment-income;
- money-income as in velocity of circulation,
- share of wages;
- capital-output ratio.

2 Macro models

The standard three equation, closed economy, macro model has

- Phillips Curve. Relates wage growth/inflation to unemployment/output gap/growth as measures of excess demand. Error often interpreted as supply shock. Expectations augmented Phillips Curve adds a measure of expected inflation. Variables in different forms linked because
  - inflation roughly equals wage growth minus productivity growth while
  - unemployment is linked to output through Okun's Law which links the change in unemployment to the growth rate, though it comes in various forms.
- IS curve relates output gap to real interest rate and expectations. Error often interpreted as demand shock. Other variables may be added, e.g. world output in an open economy model.
- Taylor Rule links the short, policy, interest rate positively to the rate of inflation and to the output gap usually also with lagged interest rates. Error often interpreted as a monetary policy shock.

The evidence for these three relationships is mixed, despite the fact that there may be publication bias: only papers which after much search manage to find evidence for them get published.

In open economies one may also have import demand a function of the real exchange rate and domestic income and export demand a function of real exchange rate and world income. The Marshall-Lerner condition is that a depreciation of the currency will improve the balance of payments if the sum of the price (real exchange rate) elasticities in the export and import demand functions is greater than one.

3 Finance

- Capital Asset Pricing Model, CAPM, the return on a particular stock r_t^i is related to the return on the market r_t^m by and r_t^f is the risk free rate

$$r_t^i - r_t^f = \alpha_i + \beta_i(r_t^m - r_t^f) + \varepsilon_{it}$$

  efficient market theory says $\alpha_i = 0$, hedge funds chase alpha.

- Covered interest parity says the forward premium equals the interest rate differential

$$\begin{aligned} \frac{F_{t+1}}{S_t} &= \frac{1+r_t}{1+r_t^*} \\ f_{t+1} - s_t &\approx r_t - r_t^* \end{aligned}$$

  where F_{t+1} is the forward rate, S_t the spot rate, lower case letters their logs and r_t, r_t^* home and foreign interest rates. Be careful about the units of interest rates. Here proportionate per period, usually percent per annum.

- Uncovered interest parity, under rational expectations $F_{t+1} = E_t(S_{t+1})$ so

$$s_{t+1} - s_t \approx r_t - r_t^*$$

- Purchasing power parity

$$s_t = p_t - p_t^*$$

  where p_t is log domestic prices, p_t^* log foreign prices. Be careful which way round exchange rate is measured domestic/foreign or foreign to domestic.

There is strong evidence against these relationships. In the CAPM the β are not stable. CIP largely held before 2008 but not since. UIP and PPP have been widely rejected for a long time and these rejections have been regarded as puzzles.