Online Appendix

Exchange Rates, Interest Rates, and Gradual Portfolio Adjustment

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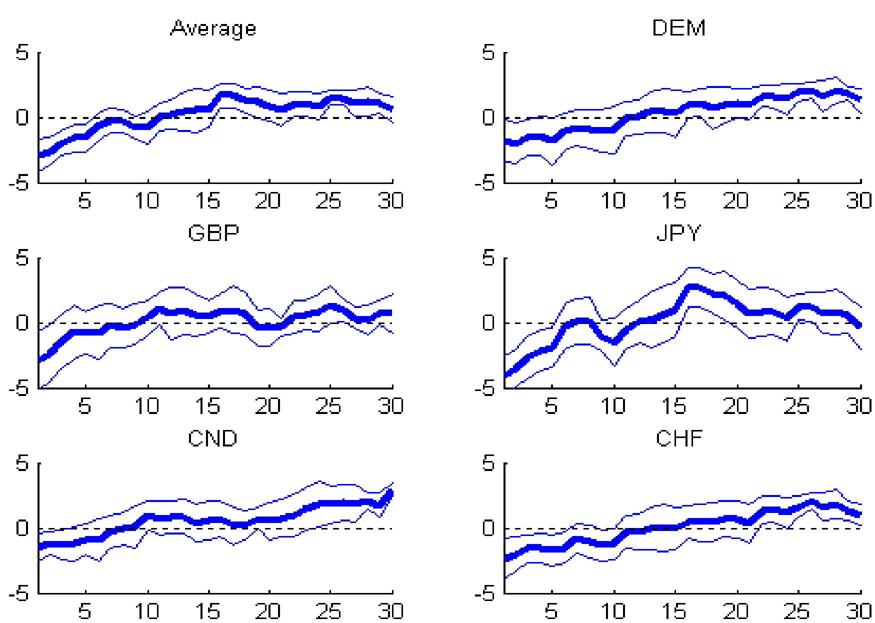
This Online Appendix reproduces some graphs from BvW and provides derivations for equations in the paper.

A Graphs BvW

Figure A-1 corresponds to Figure 1 in BvW. It shows the coefficients β_k of a regression of the excess return q_{t+k} on Foreign bonds on the interest differential $i_t - i_t^*$. This is based on data for 5 currencies from December 1978 to December 2005. Notice that it is similar to Figure 4 in Engel (2016), but with a reverse sign.

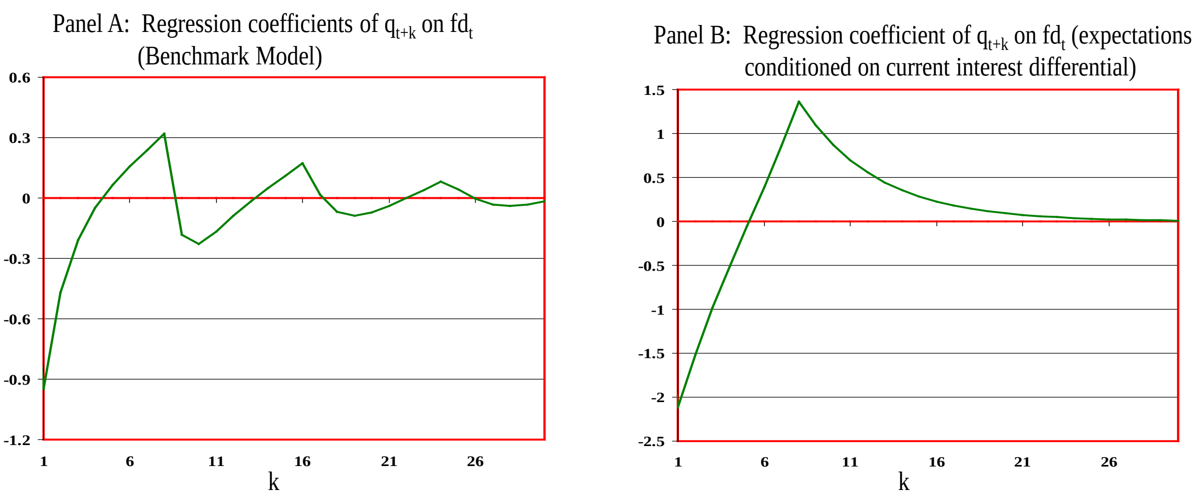
Figure A-1 Excess Return Predictability (Data)*



* The Figure shows excess return predictability coefficients β_k of the regressions $q_{t+k}=\alpha+ \beta_k (i_t-i_t^*)+\varepsilon_{t+k}$ for 5 currencies. Thin lines are standard error bands (+/- 2 SE). Regressions are based on quarterly data from December 1978 to December 2005. The average refers to the GDP-weighted average of the excess return predictability coefficients.

Figure A-2 shows two panels. Panel A corresponds to Panel A of Figure 3 in BvW. It corresponds to the benchmark model of BvW, where agents incorporate all available information to form expectations when they make a new portfolio decision. Panel B corresponds to panel B of Figure 4 in BvW, where agents form expectation about future exchange rate changes based on the current interest differential when making a new portfolio decision.

Figure A-2 Excess Return Predictability (Model)*



* Panel A corresponds to Panel A of Figure 3 in BvW. It corresponds to the benchmark model of BvW, where agents incorporate all available information to form expectations when they make a new portfolio decision. Panel B corresponds to panel B of Figure 4 in BvW, where agents form expectation about future exchange rate changes based on the current interest differential when making a new portfolio decision.

B Optimal Portfolios

The first-order condition with respect to z_t is

$$E_t C_{t+1}^{-\gamma}\left(\frac{S_{t+1}}{S_t}R_t^* - R_t\right) - \psi(z_t - z_{t-1}) = 0 \tag{B.1}$$

or

$$E_t e^{-\gamma r_{t+1}^p + s_{t+1} - s_t + i_t^*} - E_t e^{-\gamma r_{t+1}^p + i_t} - \psi(z_t - z_{t-1}) = 0 \tag{B.2}$$

Use that the first-order approximation of the log portfolio return is

$$r^p_{t+1} = z_t er_{t+1} + i_t \tag{B.3}$$

Then the first order condition becomes

$$E_t e^{(-\gamma z_t+1)er_{t+1}+(1-\gamma)i_t} - E_t e^{-\gamma z_t er_{t+1}+(1-\gamma)i_t} - \psi(z_t - z_{t-1}) = 0 \tag{B.4}$$

Using log normality and the approximation $e^x = 1 + x$, we have

$$E_t er_{t+1} + 0.5var(er_{t+1}) - \gamma z_t var(er_{t+1}) - \psi(z_t - z_{t-1}) = 0 \tag{B.5}$$

This can be rewritten as in equation 5 in the text.

C Solving for the Equilibrium Exchange Rate

First we conjecture $s_t = a_0 s_{t-1} + a_1 fd_t$. This implies

$$E_t s_{t+1} = a_0 s_t + a_1 \rho fd_t \tag{C.6}$$

Substituting this in equation (7) of the text and equating the coefficients on s_{t-1} and fd_t, we have

$$(1 + \gamma\sigma^2 b + \psi b - a_0)a_0 = \psi b \tag{C.7}$$

$$(1 + \gamma\sigma^2 b + \psi b - a_0)a_1 = a_1\rho - 1 \tag{C.8}$$

The first equation is a quadratic in a_0:

$$a_0^2 - (1 + \gamma\sigma^2 b + \psi b)a_0 + \psi b = 0 \tag{C.9}$$

The solution is

$$a_0 = \frac{(1 + \gamma\sigma^2 b + \psi b) \pm \sqrt{(1 + \gamma\sigma^2 b + \psi b)^2 - 4\psi b}}{2} \tag{C.10}$$

The term in the square root is positive. The square root is less than $1+\gamma\sigma^2 b+\psi b$. It follows that a_0 is positive. It is easily verified that the solution with a plus sign in front of the square root is explosive. Note that the square root term is larger than $1 - \psi b$, so that $a_0 > 1$ with a plus sign in front of the square root. So we have

$$a_0 = \frac{(1 + \gamma\sigma^2 b + \psi b) - \sqrt{(1 + \gamma\sigma^2 b + \psi b)^2 - 4\psi b}}{2} \tag{C.11}$$

For a_1 we have

$$a_1 = -\frac{1}{1 + \gamma\sigma^2 b + \psi b - a_0 - \rho} \tag{C.12}$$

D Fama Coefficients

The Fama coefficient for the k period ahead excess return is the regression coefficient of $s_{t+k} - s_{t+k-1} - fd_{t+k-1}$ on fd_t, which is equal to

$$\frac{cov(s_{t+k} - s_{t+k-1} - fd_{t+k-1}, fd_t)}{var(fd_t)} \tag{D.13}$$

From $s_t = a_0 s_{t-1} + a_1 fd_t$, we have

$$s_t = a_1 \left(fd_t + a_0 fd_{t-1} + a_0^2 fd_{t-2} + ... \right) \tag{D.14}$$

Therefore

$$\begin{aligned} & s_{t+k} - s_{t+k-1} - fd_{t+k-1} = \\ & a_1 fd_{t+k} + a_1(a_0 - 1) \left(fd_{t+k-1} + a_0 fd_{t+k-2} + a_0^2 fd_{t+k-2} + ... \right) - fd_{t+k-1} \end{aligned} \tag{D.15}$$

Then

$$\begin{aligned} & cov(s_{t+k} - s_{t+k-1} - fd_{t+k-1}, fd_t) = a_1 \rho^k var(fd) - \rho^{k-1} var(fd) + \\ & a_1(a_0 - 1) var(fd) \left(\rho^{k-1} + a_0 \rho^{k-2} + ... + a_0^{k-2} \rho + \frac{a_0^{k-1}}{1 - a_0 \rho} \right) \end{aligned} \tag{D.16}$$

This gives equations (12) and (13) in the text.