

Discussion of Coeurdacier, Kollmann & Martin:
*International Portfolios, Capital Accumulation
and Foreign Asset Dynamics*

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The Model

- ▶ Standard 2x2 setup. Specialization in production.
- ▶ Consumption and final investment good are CES bundles of the home and foreign goods
- ▶ 4 assets: home and foreign bonds, home and foreign equity
- ▶ 4 shocks: home and foreign TFP and home and foreign news about investment opportunities.
- ▶ Number of shocks = number of (linearly independent) assets
→ markets complete to first order

A major advance

- ▶ Full characterization of the dynamics of country portfolios in a two country DSGE model with production using the Devereux-Sutherland method.
- ▶ En passant suggests solution to a couple of important puzzling empirical regularities
 - ▶ ...the acyclical behaviour of the terms of trade
 - ▶ ...countercyclical net exports
- ▶ The Helpman-Razin-Cole-Obstfeld ToT mechanism is key in allocating risk in this economy

A key relation

Market completeness implies that the Backus-Smith relation holds between home and foreign marginal utility:

$$-\sigma \left(\widehat{C}_{Ht} - \widehat{C}_{Ft} \right) = \widehat{RER}_t = (2a - 1)\widehat{q}_t$$

This relation gives us 'efficient' idiosyncratic consumption movements:

- ▶ Marginal utilities should equalize up to differences in local purchasing power!
- ▶ Here: only source of that difference is home bias in consumption ($a > 1/2$)

Implications for portfolio diversification

- ▶ Choose portfolio such that idiosyncratic movements in marginal utility are eliminated.
- ▶ ... well, not all of them. Only inefficient ones. High local prices should still imply high local marginal utility (low consumption) and vice versa.
- ▶ Hence, optimal portfolio choice should seek to maximise exposure to terms of trade risk (\hat{q}) and to minimize exposure to everything orthogonal to \hat{q} .

How to do that?

- ▶ Bonds (in different currencies) are a natural instrument to buy exposure to ToT risk: lend in home currency ($b_{11}, b_{22} > 0$) and borrow in foreign currency.
- ▶ This transfers resources to the foreign country when foreign prices (and home output are high) and vice versa. The ensuing income stream perfectly hedges \hat{q} .
- ▶ Note: this seems the opposite of what industrialised countries are doing. They are short in their own currency and long in foreign currency!
- ▶ Having the bond instrument for buying exposure to \hat{q} , then allows to dedicate the equity part of the portfolio to diversifying away any components of income unrelated to \hat{q}

How do the optimal portfolios look like?

Coupling the risk sharing condition with the budget constraints gives:

$$(1 - \Lambda)\left(1 - \frac{1}{\sigma}\right)(2a - 1)\hat{q}_t = (1 - \kappa)\widehat{\omega}_t l_t + (2S - 1)(\kappa - \Lambda)\hat{d}_t + 2b\hat{q}_t$$

Regressing on \hat{q}_t and subtracting the fitted values $\mu_{wl}q_t$ and $\mu_d q_t$ from this relation implies:

$$0 = (1 - \kappa)\varepsilon_t^{wl} + (2S - 1)(\kappa - \Lambda)\varepsilon_t^d$$

Taking the covariance with ε_t^d and rearranging leads to

$$S - \frac{1}{2} = -\frac{1}{2} \frac{(1 - \kappa)\text{cov}(\varepsilon_t^{wl}, \varepsilon_t^d)}{(\kappa - \Lambda)\text{var}(\varepsilon_t^d)}$$

Hence Home Bias requires a negative correlation between labour and dividend income components *orthogonal to* \hat{q}_t !

Implications for the structure of dividend and labor income risk

- ▶ Baxter-Jermann argued that human capital risk deepens the home bias puzzle: correlation between labour income and dividend income is positive in the data. Hence, home capital is a particularly bad hedge against labour income risk!
- ▶ Coeurdacier-Kollmann-Martin: what matters is the correlation between those components of labour income and dividends that is orthogonal to terms of trade risk.

$$\text{cov}(\widehat{\omega}_t l_t, \widehat{d}_t) = \text{cov}(\varepsilon_t^{wl}, \varepsilon_t^d) + \mu_{wl} \mu_d \text{var}(\widehat{q}_t)$$

where

$$\widehat{\omega}_t l_t = \mu_{wl} \widehat{q}_t + \varepsilon_t^{wl} \quad \text{and} \quad \widehat{d}_t = \mu_d \widehat{q}_t + \varepsilon_t^d$$

- ▶ CKM show that though $\text{cov}(\widehat{\omega}_t l_t, \widehat{d}_t) > 0$ it is still $\text{cov}(\varepsilon_t^{wl}, \varepsilon_t^d) < 0$ in the data. For a theoretical model to match this fact, we therefore need $\mu_{wl} \mu_d \text{var}(\widehat{q}_t)$ large enough.

How to make the conditional covariance large?

How to make $\mu_w \mu_d \text{var}(\hat{q}_t)$ large?

- ▶ Drive $\text{var}(\hat{q}_t)$ up. *Question: does the model $\text{var}(\hat{q}_t)$ match the data?*
- ▶ Make $\text{cov}(\widehat{\omega}_t | t, \hat{d}_t)$ low. But not much leeway against the data where it is close to one.
- ▶ Make $\mu_w \times \mu_d$ large and positive.

- ▶ Note that making bond portfolios more realistic points in the direction of making $\mu_{wl} \times \mu_d$ large:

Consider again the projection of the RS-condition on \hat{q}_t :

$$(1 - \Lambda)\left(1 - \frac{1}{\sigma}\right)(2a - 1)\hat{q}_t = (1 - \kappa)\mu_{wl}\hat{q}_t + (2S - 1)(\kappa - \Lambda)\mu_d\hat{q}_t + 2b\hat{q}_t$$

so that

$$b = \frac{1}{2} \left[(1 - \Lambda)\left(1 - \frac{1}{\sigma}\right)(2a - 1) - \gamma \right]$$

with

$$\gamma = (1 - \kappa)\mu_{wl} + (2S - 1)(\kappa - \Lambda)\mu_d$$

With μ_{wl}, μ_d high, could actually make b negative.

Currently, model rather works through the first two channels.

The role of investment technology (news) shocks in generating home bias

- ▶ News shock increases home price through effect on investment. Effectively a demand shock.
- ▶ This Increases correlation of labour income with \hat{q}_t and therefore, μ_{wI} .
- ▶ Helps drive the unconditional correlation $cov(\widehat{\omega}_t I_t, \hat{d}_t)$ down from unity (in the model, possibly too much) because it affects the labour share. (Recall: firms finance investment from retained earnings).
- ▶ As an additional shocks with near zero correlation with TFP , 'news' increases the volatility of \hat{q}_t .

Additional Issues

- ▶ CKM might over-rationalize HB:
 - ▶ In CKM, HB has nothing to do with financial frictions. So financial integration is not likely to remove HB! But HB *has* come down and seems associated with better international risk sharing. Maybe not much further to go?
 - ▶ HB puzzle typically pertains also to public equity. HB in CKM is in ownership of the entire capital stock. Given that $>1/2$ of the capital stock are in small, owner-run businesses (and therefore 'home-biased' anyway), might still expect the public equity base to be much better diversified than it actually is!
- ▶ 'Redistributive' effect of investment technology shocks generated by assuming that investment is financed from retained earnings. This is key for getting the covariance (net of \hat{q}) between labor income and dividends right. Is it an innocuous assumption?

Additional Issues (cont'd)

- ▶ Do actual equity portfolios line up with predicted ones?
Would like to see an econometric implementation of

$$S - \frac{1}{2} = -\frac{1}{2} \frac{(1 - \kappa) \text{cov}(\varepsilon_t^{wl}, \varepsilon_t^d)}{(\kappa - \Lambda) \text{var}(\varepsilon_t^d)}$$

How much would the covariance term do, how much $(1 - \kappa)/(\kappa - \Lambda)$?

- ▶ Model generates anticyclical NX . Since $CA = 0 = NX + NFI$ to first order, NFI must be procyclical. This seems at odds with the data. Decline in HB seems associated with increasingly anticyclical behaviour also of NFI . What is the relative role of valuation effects and net factor income flows in allocating risk?
- ▶ International correlations? Can you match them? (Investment maybe a fairer test than consumption)

Additional Issues (cont'd)

- ▶ Dynamic predictions:
 - ▶ Would we be nice to have IRs for portfolio weights etc.
 - ▶ What's the intuition behind the portfolio responses given in the model?
 - ▶ Both TFP and investment shock increase equity holdings (roughly in equal proportions!) and decrease net bond holdings (lower F holdings by more than they increase H holdings).
 - ▶ That would suggest that the share of the net bond position in net (total) wealth decreases after a positive home shock.

A simple characterization of portfolio dynamics

$$\Delta NFA_t^k = \Delta NFB_t^k + \Delta NFE_t^k$$

Run regressions inspired by Kraay and Ventura (QJE 2000):

$$\frac{\Delta NFB_t^k}{Y_t^k} = \mu^k + \underset{(\beta=1: t=0.44)}{1.14} \times \left[\frac{NFB_t^k}{A^k} \right] \times \left[\frac{S_t^k}{Y_t^k} \right] + \varepsilon_t^k$$
$$\frac{\Delta NFE_t^k}{Y_t^k} = \mu^k + \underset{(\beta=1: t=2.23)}{1.62} \times \left[\frac{NFE_t^k}{A^k} \right] \times \left[\frac{S_t^k}{Y_t^k} \right] + \varepsilon_t^k$$

In CKM, holdings of home and foreign equity rise in roughly equal proportions, whereas holdings of foreign bonds seem to decrease after home shocks. Here we seem to see the opposite.

Conclusion

- ▶ Very impressive paper with loads of important results
- ▶ Some implications seem counterfactual though: maybe because the paper trying to push the argument that HB in consumption (and investment) can rationalize HB in portfolios just a bit too far?
- ▶ Would be nice to see a fuller discussions of the dynamics of the model and to develop some intuition on it.