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Chapter Author: Daron Acemoglu, Kenneth Rogoff and Michael Woodford

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Discussion

Robert Hall opened the discussion with a comparison of this model to Grossman-Stiglitz. He felt that there should be some serious discussion of trading costs. He noted the large profits that could be made by holding an optimal carry trade portfolio. However, he pointed out that the cost of maintaining the position that generates that favorable Sharpe ratio would be nontrivial since one would have to update the portfolio continuously. As he stated, "You really need to be a specialist to not be eaten alive at maintaining these positions." Markus Brunnermeier agreed that in the earlier sample, the trading costs were high, but since it is now the case that one can trade exchange traded funds (ETFs) based on interest rates, the trading costs have decreased. However, it is the case that because of a high Sharpe ratio and a low volatility, traders want to take leveraged positions on the carry trade, which does increase the cost of keeping an optimal portfolio in this particular market.

John Campbell suggested that it would be interesting to combine the conditional approach they take in this paper with the perspective of a diversified carry trade. He wondered how the weights of a diversified carry trade portfolio should be adjusted over time to get even better returns. This paper presents a number of ideas, such as varying the weights with the interest rate differential itself or seeing whether the amount of crash insurance one should buy varies with the price of crash insurance. These questions are of particular interest to hedge funds but maybe only increase the puzzle to academics. For an explanation, Campbell believed that one has to think of a world in which investors are heterogeneous and only some have the expertise to undertake the carry trade. These investors tend to be in large financial institutions which are already short volatility; for example, it is known that investment banks tend to lose money when the market volatility index, VIX, goes up. Therefore, Campbell proposed a covariance explanation between

the carry trade and the marginal utility of the specialized investors. He thought that the VIX is important because it is a good proxy for that marginal utility of these arbitrageurs.

Xavier Gabaix wondered if the results of the paper are the essence of a phenomenon or just a corrective term. He gave an example of the wheat market: because the supply and demand of food vary a lot, the price of wheat is very volatile. Arbitrageurs smooth the price of wheat to some degree and take future positions on wheat. It is surely the case that when the arbitrageurs have lost money, then the price of futures is lower or the price of puts is higher. Thus when the VIX is high, since they are part of the same diversified debt, the price of puts and calls on wheat will be higher. All of this is correction around the fundamental volatility of the price of wheat. This could also very well be the case for the currency market. Because the R^2 between the VIX and the futures positions of the currencies are all very low, Gabaix said that he does not know whether the covariance is the institutional descriptions of the corrections or of something else (as described in the paper). Nagel, in response, pointed out that since the authors' regressions use weekly data, the R^2 's of the regressions are expected to be low, as are any regressions that use short-term stock data. However, this does not exclude the possibility of Gabaix's alternative view of corrections.

John Cochrane then made a few comments. First, it seemed to him that the skewness in this case seems a lot like a peso problem where some of the floating currencies are acting like pegged currencies. If so, these peso problems should show up in standard errors and in biases. He therefore wondered how much the skewness lowers the profits and widens the standard error. Second, in response to Hall's comment of trade costs, he suggested that the trade costs are actually not very high due to the slow-moving nature of interest rates. The optimal carry trade portfolios would require putting money into high interest rate currencies. Relative interest rates last for years, and it is not something that would need to be changed on a daily or hourly basis.

Daron Acemoglu talked about the general approach to asset-pricing problems. In this context, he was uncomfortable with the standard Lucas tree approach of taking the returns process as exogenous and then examining optimal holdings and pricing behavior given this process. Andrew Atkeson agreed with Acemoglu and gave an example of why it might not make sense to model the risk as exogenous in this process. When the European Economic and Monetary Union (EMU) went to the euro, it completely eliminated the profits of the carry trade in Europe, and he guessed that if the EMU broke the euro again into

individual currencies that the profits of the carry trade would be reinstated. In this way, the carry trade risk is largely under the control of monetary arrangements so clearly not exogenous.

Kenneth Rogoff was curious about whether the empirical facts from 25 years ago would look very different than those from the present. Financial markets have deepened and monetary institutions have changed a lot, yet his intuition was that the skewness would still be found.

Olivier Blanchard was convinced by the authors' explanation of the UIP puzzle through liquidity and funding constraints. However, he felt that origin of these constraints remained unclear. While the authors mentioned agency problems, their remarks on the price of insurance implied that there may be something more at work. When investments are going well, money comes into the carry trade, and when they are going poorly, the constraints tighten. Blanchard suggested that this has the appearance of behavioral finance rather than funding constraints in the usual sense. Brunnermeier responded that it is behavioral finance in the sense that it is a story about the limits to arbitrage. However, it still can be modeled as a principal-agent problem where all the agents are behaving fully rationally.

Emmanuel Farhi wrapped up the discussion with a technical point. He said that there are actually two things to consider when thinking about these crashes as driving exchange rates. First, from one period to the next, an actual currency crash might drive the currency. Second, a change in the perception of crash risk might also drive the currency. If a trader buys one put, he hedges the first risk, but not the second one. The implication of this is that if one looks for what the predicted power of risk reversals is for the risk premium, the coefficient should be larger than one. He concluded, therefore, that the measure of skewness as associated with the risk reversals in the paper is not the correct one.

