

Stochastic Risk Premiums, Stochastic Skewness in Currency Options, and Stochastic Discount Factors in International Economies

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We develop dynamic models of stochastic discount factors in international economies that produce stochastic risk premiums and stochastic skewness in currency options. The source of stochastic risk premiums and stochastic skewness can be stochastic volatility in the uncertainty of the economy or stochastic market price of the uncertainty, or both. We estimate these models using the joint time-series of option prices on dollar-yen, dollar-pound, and pound-yen exchange rates, and the underlying currency returns. The estimation reveals several results about the structure of risk premiums in the international economy. First, the average risk premium in Japan is significantly larger than the risk premium in the US or the UK. Second, the risk premium on the global risk factor is both more persistent and more volatile than the risk premiums on country-specific risks. Third, investors respond to shocks differently depending on whether the origins of the shocks are global or country-specific. The risk premium increases when the global (domestic) risk factor receives a positive (negative) shock, suggesting that investors demand a risk premium when their wealth declines relative to the global portfolio. Finally, the uncertainty in each economy contains a jump component that arrives an infinite number of times within any finite interval, but only downside jumps appear to be priced.