We show that robustness against model misspecification can account for the forward premium puzzle through a combination of an exchange rate model and a robustness model under structured uncertainty. In equilibrium, optimizing agents, who hold no misperception about the model, distort their forecasts to attain robustness against potential misspecification. This forecast distortion generates a delayed overreaction of exchange rates to interest rate differential shocks that leads to a negative unconditional correlation between exchange rate changes and interest rate differentials, i.e., a negative Fama coefficient. Using change-of-measure techniques, we derive the familiar uncovered interest rate parity condition—under distorted expectations—and the Fama coefficient in closed-form. We calibrate our model with empirical estimates of key parameters and are able to generate a negative Fama coefficient under sufficient uncertainty-aversion.