

to underestimate “very badly” how much more uncertain is a real world gamble on the state of the future world’s economy, when compared with a safe investment in a near-money sure thing.

Of course, what is being presented here is just one illustrative example of the economic consequences of such a tail-fattening effect. Other examples with other probability distributions may have less (or more) dramatic consequences, but I believe that it is very difficult to get around the moral of this story. For any given value of  $n$ , however large, the effects of Bayesian tail-fattening will cause the equity premium to be highly sensitive to seemingly innocuous and negligible changes in the assumed prior of the precision – within a very broad class of reasonable probability distributions obeying standard regularity conditions.<sup>5</sup> The driving statistical-economic force is that seemingly thin-tailed probability distributions, which actually are only thin-tailed *conditional* on known structural parameters of the model, tend to become thick-tailed after integrating out the prior parameter uncertainty. Furthermore, such thick-tailed subjective posterior distributions are decisively important in influencing behavior towards risk (as embodied in expected utility calculations). When investors are modeled as perceiving and acting upon these thick-tailed subjective posterior distributions, a fully-rational general-equilibrium interpretation then has sufficient explanatory power to be able to weave together a unified Bayesian theory of the entire family of equity ‘puzzles,’ as the next three sections of the paper will show in turn.

### 5. The Bayesian Risk-Free Rate

We can use the same mathematical-statistical apparatus to calculate the Bayesian risk-free interest rate. For fixed  $m$  and  $n$ , let  $\Phi(\delta)$  be the value of  $r_f$  as a function of  $\delta$  that comes out of formulas (12) or (20) when the probability density function is given by equation (33), which is the Bayesian posterior distribution that is consistent with the rest of the model. Plugging (33) into the right hand side of equation (12), the result is

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<sup>5</sup> The results in Schwarz (2000) can be interpreted as essentially characterizing the class of such fat-tailed posterior distributions under minimally restrictive assumptions on the prior.