

Discussion of “Long-Run Risks and Risk Compensation in Equity Markets”

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1. SUMMARY

Bansal and his co-authors have produced a series of important and provocative papers that demonstrate how low-frequency risk can provide a justification for observed risk premia. Bansal summarizes this work and helps us understand the linkages between long-run risk in consumption and long-run risk in financial securities. Since he does such a nice job of explaining the economics of the approach, I focus on a few issues raised by Bansal’s work and by some of my own.

2. A LOW-FREQUENCY COMPONENT IN CONSUMPTION?

An important aspect of the model of Bansal and Yaron (2004) is the presence of a low-frequency component in aggregate consumption. Shocks to the level of consumption are persistent, as are shocks to volatility. A substantial and time-varying equity premium results when dividends display exposure to the shocks. It is natural to ask whether there is any empirical support for the assumed model of consumption.

As Bansal argues, one piece of evidence may come from financial markets. Agents could use the model’s structure along with signals from asset prices to detect the low-frequency component. This may take the rational expectations assumption to an untenable position, however. Unless agents directly observe the low-frequency shocks driving consumption, it is not clear how the shocks could be reflected in security prices. Appealing to the standard idea that the econometrician observes a smaller information set than agents is also a little delicate in this context. In the model of preferences considered by Bansal and Yaron (2004), the exact conditioning information of the agents is needed in order to derive the implications of the model.

An interesting way of introducing a concern for low-frequency components, even when agents have a hard time detecting those components, is provided by the recent work of Hansen and Sargent (2007). In their work the representative agent is uncertain about the probability model generating consumption. There are two alternative models: one where consumption is not predictable and one where consumption is predictable. Because the agent is worried about model uncertainty, she acts as if there is a very high probability attached to the model with predictable consumption. This model generates both the high-risk premia consistent with a low-frequency component in consumption, and consumption dynamics that are difficult to distinguish from an i.i.d. model.

There is evidence in the literature for an important predictable low-frequency component to consumption. This evidence is typically obtained using additional variables to predict consumption along with plausible economic linkages across variables. Examples include the work of Fisher (2006) and Mulligan (2002). In Hansen et al. (2006a) we consider a bivariate model for aggregate consumption and aggregate corporate earnings. We present evidence that corporate earnings are co-integrated with aggregate consumption as predicted by most models of business cycles and economic growth. Under the co-integration assumption, corporate earnings reveal important long-run shocks to consumption.

To illustrate this, Figure 1 reports the impulse response of aggregate consumption to the two shocks in the model.¹ We call the first shock a “consumption shock”; it impacts both consumption and earnings contemporaneously. In contrast, the second shock impacts earnings contemporaneously but has no immediate impact on consumption. We call this shock an “earnings shock.” Shocks to corporate earnings predict consumption over many quarters and reveal an important low-frequency component of consumption similar to the setup considered by Bansal and Yaron (2004).

3. PREFERENCES

In his work, Bansal employs the recursive specification of preferences developed by Kreps and Porteus (1978), Epstein and Zin (1989b), Weil (1990), and others. In the context of models with long-run consumption risk, this model of preferences is useful because it induces a concern for the resolution of uncertainty. In a standard model with time-additive CRRA utility, risk prices are determined by risk aversion and the one-period or instantaneous impact of shocks on consumption. With recursive preferences, the long-run impact of shocks on consumption also influences risk prices. Shocks that strongly predict future consumption have larger risk premia.

Calibration of the models considered by Bansal does run into the problem that consumption is not that volatile even in the long run. Large levels of risk aversion are typically needed to fit aggregate and cross-sectional risk premia. An advantage of the assumption of recursive preference is that the effects of high risk aversion on the level of

¹This figure is taken from Hansen et al. (2006b).

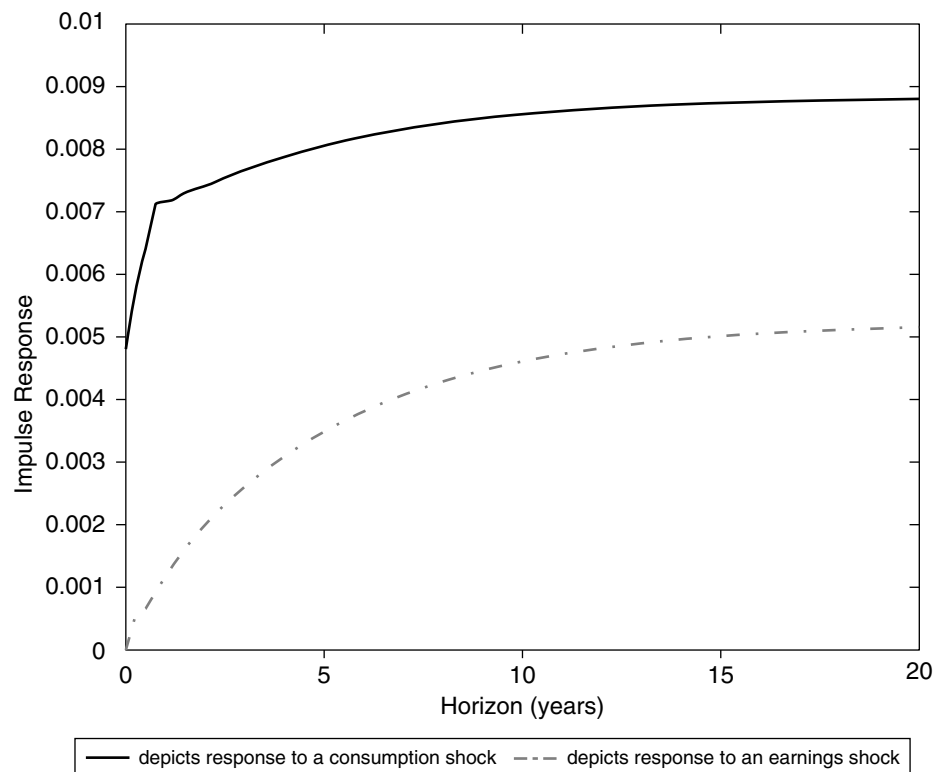


FIGURE 1 Impulse responses implied by the VAR of the Hansen–Heaton–Li model.

interest rates can be controlled by assuming the intertemporal elasticity of substitution (IES) is close to 1.

In the calibration exercise considered by Bansal and Yaron (2004), the IES parameter is assumed to be greater than 1 so that shocks that forecast increased future consumption also increase the price-to-dividend ratio or wealth-to-consumption ratio. This produces the desired effect that shocks that forecast future consumption have a magnified risk premium. In the model, this is captured by variation in the market return, which becomes part of the stochastic discount factor with recursive utility.

There is some controversy over the value of the IES parameter used by Bansal and Yaron (2004) because of other evidence in the literature. In particular, the typical assumption is that the IES parameter is less than 1. As Bansal points out, however, many of the existing estimates in the literature are sensitive to the assumption that consumption is homoskedastic. This identification problem is potentially magnified if the true underlying preferences are of the recursive form as shown by Hansen et al. (2006b).

An issue related to the assumption about the IES parameter is the solution method used by Bansal and many others in the literature. The general stochastic discount factor induced by recursive preferences has a term in consumption growth and a term in the

“continuation value” due to future consumption. Following earlier work by Epstein and Zin (1989a), shocks to the “continuation value” are replaced by shocks to the return to holding a claim on aggregate consumption (the “market” return). This generates a proper solution to the model except for the case of logarithmic intertemporal risk preferences ($IES = 1$). At this point the wealth-to-consumption ratio is constant so that the market return covaries exactly with consumption. Shocks to future consumption still matter to the consumer, but the continuation value from future consumption plans must be calculated directly. Shocks to the derived continuation value then enter the stochastic discount factor.

In Hansen et al. (2006a), we show how the continuation value can be calculated in a log-linear stochastic environment with logarithmic intertemporal utility. Further, we develop an approximation to the case of a more general value of the IES parameter that works well for values of the IES near 1. This approach is extended to an environment with stochastic volatility in Hansen et al. (2006b). An advantage of this method of solution is that it allows for the consideration of values for the IES parameter close to 1, where the more typical use of the return to the market portfolio breaks down.

4. RETURNS AND LONG-RUN CASH FLOWS

In his work with Lundblad and Dittmar, Bansal develops the idea of a “cash flow” beta where the long-run covariance between consumption and dividends is assumed to drive risk premia. Measured differences in this long-run covariance across portfolio cash flows do coincide with observed differences in average returns to the portfolios. This is an important finding because there is very little heterogeneity in the contemporaneous covariance between shocks to consumption and the returns to the portfolios considered by Bansal. This is reflected in the well-established fact that the consumption CAPM cannot explain the value premium, the size effect, and other observed risk premia.

The contrast between the cash flow beta measure of risk and the contemporaneous covariance between returns and shocks to consumption creates a tension. One potential resolution of this tension could be that the short-run dynamics of risk exposure are difficult to model or measure. For example, there could be important market frictions, behavioral biases, or general model misspecification. In these situations, the long-run covariances between returns and consumption (as in Daniel and Marshall (1997)), or between long-run shocks to consumption and portfolio cash flows may be more appropriate measures of risk.

If short-run implications are to be ignored, what do we mean by the “short run?” One way to answer this question is to specify a complete model of pricing and then examine the model’s predictions for the pricing of a portfolio’s cash flows at different frequencies. For example, the holding period returns for each future cash flow can be calculated. The one-period portfolio return is just a weighted average of these individual returns. By ignoring the contribution from short-term cash flows, a long-run return is calculated. Alternatively, the rate at which the price of future cash flows declines relative to the predicted growth in cash flows can be used to infer a long-run return. These

alternative specifications of long-run returns and their long-run limits are developed in Hansen et al. (2006a).² We apply our analysis to portfolios of growth and value stocks. Consistent with the results in Bansal et al. (2005), we find that portfolios of value stocks are predicted to have high long-run returns.

5. CONCLUSION

Bansal's paper does a nice job of summarizing his work and showing why the consideration of long-run risk can potentially help us to understand observed security prices. The paper also points the way toward the work to be done both in modeling the dynamics of consumption and in understanding how long-run risk is priced.

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²The analysis in Hansen et al. (2006a) is conducted in a log-linear environment. Hansen and Scheinkman (2006) extend this to more general environments.