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An Empirical Analysis of the Pricing of Mortgage-Backed Securities: Discussion

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DISCUSSION

S. M. TURNBULL*: Dunn and Singleton argue that previous work on the pricing of GNMA pass through securities such as Dunn and McConnell (1981), make various restrictive assumptions about the stochastic processes describing the term structure of interest rates and preferences. The objective of this paper is to test a consumption based asset pricing model and to identify the parameters of the representative agent's utility function, without imposing restrictive assumptions on the probability distributions describing the relevant economic variables.

Consider the Dunn and McConnell (1981) paper. The key assumptions of that paper are: the instantaneous rate of interest can be described by a mean reverting process, and individuals have logarithmic utility functions. The assumption that individuals have logarithmic utility is very strong and is unlikely to hold. Given the work of Brennan and Schwartz (1980), the assumption that interest rates follow a mean reverting process can certainly be questioned. Does this imply that the Dunn and McConnell paper is worthless? Not necessarily. Whether the model is of any use, depends upon the accuracy of its predictions.

The authors argue that by using a discrete time consumption model, it is possible to price securities without imposing restrictive assumptions on preference and the stochastic processes describing asset prices. The first order conditions hold for any asset. Hence, in testing this model, one can pick any type of security, as the results should be the same if the model is well specified.

There are a number of difficulties with this paper.

In common with all asset pricing models is the problem of aggregation. The conditions for aggregation are quite restrictive, as the authors note. This does impose some restrictions on the family of utility functions that can be used, given that it is necessary to estimate the parameters characterizing the utility function. In a multigood economy, what is the appropriate price index? This issue, and the type of econometric biases introduced by using an inappropriate index, are not addressed by the authors. Given that individuals consume from after tax income, the effects of taxation on the pricing of assets and the econometric biases introduced by neglecting taxation need to be considered. The basic form of the model requires aggregate consumption at a particular point in time. Empirically, there are always lags in measuring consumption and this introduces biases in the estimation. These effects may be particularly important when the utility function depends upon past levels of consumption. The magnitude of the biases introduced by this errors in variables problem needs to be considered. Given that the model holds for any security, the empirical estimation of the parameters of the utility

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function should not depend upon the particular asset chosen; that is, one could use common stocks or bonds, or some combination and the estimated parameters of the utility function should not be statistically different. Looking at Table 1, this does not appear to be the case with the value of the γ parameter ranging from -1.910 to -3.755 , suggesting that the model is misspecified in some way. It should also be noted that these values seem to be quite different from those reported in Hansen and Singleton (1982) where γ ranged from $-.67$ to $-.96$, though these estimates pertain to a slightly different time period.

The authors have presented evidence that the assumption of logarithmic utility may be violated. Given that the authors are using a general asset pricing model, how does this model compare to the results from the Dunn and McConnell paper? Unfortunately, the authors do not address this issue.

In order not to leave the incorrect impression, this is an interesting paper and a paper that is certainly worth reading. Drawing on the statistical methodology described in Hansen and Singleton (1982), the authors present an interesting menu of possible applied extensions. Hopefully, more comprehensive empirical results will be available in the near future.

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DISCUSSION

CLIFFORD W. SMITH, Jr*: It has been noted that the term structure for tax exempt municipal bonds appears to differ significantly from that of taxable corporates. Much of the theoretical literature related to this question is framed in a Fisher world with no uncertainty to highlight the implications of the tax code. Skelton (1983) compares the risk characteristics of tax exempt municipal bonds with those of comparable taxable corporate bonds in an effort to explain the observed differences. After offering reasons why the value of the tax advantage of municipals would be dependent on the interest rate for financial institutions and individuals, he examines a sample of twenty actively traded municipal bonds.

This work represents a welcome addition to the literature. I think that to date, theoretical speculation has far exceeded empirical confirmation in this area. This paper helps to close the gap. Since the paper is generally well done, my comments focus on where profitable additional work might be directed.

First, the hypotheses offered to explain the differences in the term structures of corporate and municipal bond rates can be expanded and extended. The arguments about the relation between changes in interest rates and the value of

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