Ron Anderson, October 2006

Report on Anna Racheva's thesis "Essays on the Default of California Non-Rated Land Secured Bonds"

Chapter II: "A Default Study of the Non-Rated Land Secured Market in California"

This chapter is an introduction to a particular segment of the California municipal bond market which came into existence as a result of the landmark Proposition 13 of 1978 which attempted to put a cap on local taxes. It describes the emergence of this market in some detail. The main contribution is the presentation of a data set on these bonds including information about defaults and recovery rates on defaulted bonds. I found this informative. It would appear that most previous studies within this sphere have been undertaken ratings companies and by participants in the muni bond market and that this is the first few academic study if this market (and one of the relatively small number of academic studies of muni bonds).

The efforts that went into the composition of the data set appear to be considerable and are described in some detail. I would assume that these were the author's efforts and therefore constitute part of the originality of this research. This would not be the case if the data set had been given to (or purchased by) the author, for example, by a participant in the muni bond market. Clarification of this point would be useful.

There are a lot of abbreviations of unfamiliar institutions in this chapter. It would be useful to collect all the abbreviations onto a list (e.g., CFD, PFA, CDIAC, AD etc.)

The motivation for the chapter is briefly given on p.3 which it is stated that, the results "provide an important contribution to the fair valuation of the credit risk associated with Mello-Roos and Assessment District bonds and the overall credit quality of the non-rated land-secured market in California". Thus it attempts to tell the reader how to judge whether a particular bond of the type covered is fairly priced. I think that it would be useful to refine this statement of purpose somewhat by considering the problem faced by an investor in this sector. As in any risky bond valuation problem the key is to understand the stochastic processes that will determine whether a bond will default over the life of the bond and the payoffs that will occur in the case of default (see e.g., Duffie and Singleton Credit Risk Princeton U P). The approach taken here is to try to infer something about these processes from historical data. In order to approach the data intelligently some basic questions should be addressed:

- Are these stationary processes?
- If they are not stationary processes, can the be made stationary through conditioning upon appropriate covariates? Which covariates?
- Are there pure age effects?
- Are there important cross-sectional differences that need to be taken into account? How? "County effects". Indicators of local public finances? Indicators of local property markets?

I believe it is implicit in the summary statistics provided in this chapter that the author has taken the view that the CFD and AD represent homogeneous groups, that there are no pure age effects and that the probability of default in a given year depend upon

"macro" conditions in that year and are independent of previous years. I have some doubts about such assumptions, especially, regarding whether CFD and AD represent homogenous pools. Other readers may have other doubts. However, to be make much sense of the data it would be useful to try to be clearer what question a given calculation (or table or figure) is meant to address.

I think the most important statistics provided concern the default rates, for example as in Table 2 on p. 29. It is stated that this follows "mortality rate methodology" and superficially it looks something like a mortality table but I think in fact the calculation performed is different that the usual mortality methodology. In a mortality table in the life insurance world provides answers to the question of the type "what proportion of individuals of a given type (e.g., white, male, non-smokers, manual workers…) who have survived to age 50 years die before reaching age 51 years." The answer is given by the 51 year marginal mortality rate.

I don't think this is what is done in table 2. Instead, Y7 refers to a calendar year, 1991, and the MMR for that year gives the proportion of all CFD bonds issued prior to 1991 and still outstanding at the beginning of the year which defaulted in the course of 1991. Notice in that calculation bonds of many different ages are being pooled, and hence my conclusion that the author thinks there are no pure age effects. Second, all CFD's are commingled, and hence my conclusion that the firm thinks CDF's represent a homogenous pool. However, defaults refer only to those occurring in 1991, reflect in no way any defaults that may have occurred (or could have occurred) earlier, and hence my inference that the author believes the probability of default varies over time but is independent from year to year.

These comments apply as well to Tables 5, 6 and 7.

I have my doubts about whether a comparable methodology has been employed by S&P in producing the figures reported in Table 8. I have been unable to clarify this because I could not obtain a copy of the S&P reported cited on p. 39. However, I would have expected S&P to use a methodology similar to that which they employ for calculating default frequencies on corporate bonds. This answers the question conditional on being rated in a given category at a point in time what is the probability that the bond will have defaulted within n years later. Thus according to this methodology in Table 8 the Y9 CFD for B of 9.65 means that for bonds rated B in year 1985 or 1986 or…or 1994(=2003-9) the proportion which default over the subsequent 9 years is 9.65%. In contrast with the implicit assumptions above, here the assumption is that the process does not vary over time, i.e., there is no year effect. Furthermore, by grouping into the various ratings categories (AAA, AA etc) they have attempted to control for cross-sectional differences in the processes.

Thus I am not sure the various interpretive statements made on pp. 41-42 are really appropriate because they are based on cumulative default rates. It would seem that the comparison should be made (if at all) in terms of MDR's. For example, the 1 year MDR of a BB rated bond is 0.29 %. Then with reference to Table 7 we could say that in 1996 (i.e., Y11) the default rate for AD's and CFD's combined was similar to historical experience on BB rated muni bonds.

These methodological points on default frequencies should be clarified.

I found the discussion of recovery rates extremely sketchy. I think that it would be interesting to discuss what determines what the recovery rate will be on these bonds. This would involve a discussion of how financial distress is resolved in this sector including how collateral can be accessed by investors.

Chapter III: "Curing Default: A Theoretical Model"

This chapter studies the microeconomics underlying the California land-secured bonds described statistically in chapter II. It consists of a description of the normal context in which CFD bonds are issued as well as the circumstances surrounding defaults and their remedies. Then in the latter part of the chapter, this description is represented as an extensive form game involving property developers.

I found the description of the process giving rise to CDF bond issuance and of the circumstances of a typical default very helpful. It cleared up much that had been left unclear in chapter II, at least for me. In particular, it made it clear how land can provide a security for the bond, namely, that owners of property failing to pay their specially assessment which provide the revenues to support the CDF bond are exposed to possible foreclosure. It also makes clear that land parcels that underlie a given CDF are likely to be concentrated in a few hands, thus implying that agents may behave strategically.

The theoretical model in the latter half of the chapter, represents this in still more stylised terms. As is often the case with such models, a variety of non-cooperative equilibria are possible, depending upon the specific values of the variables affecting payoffs. I think that the reader might hope that the author could use the model to deliver the promise of the chapter title. Specifically, what are the "good" equilibria from a social point of view? Are there possible public policy actions that would affect parameters of the model so as to push outcomes toward good equilibria?

Chapter IV: "Determinants of the Default and Redemption of Non-Rated Community Facilities (Mello-Roos) Bonds in California"

This chapter uses the data set described in Chapter II to estimate a statistical model of the determinants of outcomes in this segment of the muni bond market. It uses the familiar multinomial logit model that has been used for other credit risk applications. The explanatory variables are used that control for time variation and cross sectional variation in the market. It also allows for age effects. Thus the methodology takes a big step toward meeting the criticisms I levelled at the presentation of descriptive statistics in chapter II.

This appears to have been properly implemented, the specification of explanatory variable seems reasonable, and the results plausible. I should imagine investors in the sector would find the results quite helpful. Thus I find the chapter quite good. My only suggestion is that the author might discuss the reason why the Real Debt variable turns out to be insignificant and what happens to the model when it is omitted.