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The valuation of credit default swaps (CDS) under the extended version of a Merton's structural model for firm's corporate liabilities is considered. The interest rate process of a money market account, the appreciation rate and the volatility of the firm's asset values have switching dynamics governed by a finite state Markov chain in continuous time. The states of the Markov chain are deemed to represent the state of an economy. The shift from one economic state to another may be attributed to certain factors that affect the profits or earnings of the firm. In this paper, the Esscher transform, which is a well-known tool in actuarial science, is employed to determine an equivalent martingale measure for the valuation problem in the incomplete market setting. A system of coupled partial differential equations satisfied by the default probabilities is derived. The consequences for the swap rate of a CDS brought about the regime-switching effect of the model's parameters are investigated via a numerical example for the case of a 2-state Markov chain. (Received September 20, 2006)