

**Semester:** Spring 2010  
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**Thesis title:** ANALYSIS OF DEFAULT PROBABILITY OF CORPORATE BONDS WHEN THE INTEREST RATES ARE STOCHASTIC

**Abstract:**

In this work, mainly following Collin-Duffresne and Goldstein (2001) and Longstaff and Schwartz (1995), we take a close theoretical look at pricing a risky discount bond  $P^T(r_0, m_0)$  with respect to  $Q^T(r_0, m_0, T)$  which is defined to be the time zero probability under the forward measure that default occurs before the bond maturity  $T$ . In this method, linear Vasicek (1977) risk free bond price  $D^T(r_0)$  and the coordinate free approach to forward measure of Davis (1998) are used. In addition, numerical results to find the time zero probability under the forward measure that default occurs before the bond maturity  $T$ ,  $Q^T(r_0, m_0, T)$ , and the graphs with respect to  $Q^T(r_0, m_0, T)$  and the maturity  $T$  by considering the changes in the quantities  $\rho$ ,  $\eta$ ,  $\sigma$ ,  $\theta$  and  $r_0$  are given. These results indicate that  $Q^T(r_0, m_0, T)$  has monotonic behavior with respect to the correlation constant  $\rho$ , the constant  $\theta$  and the initial rate  $r_0$ . The volatility terms  $\eta$  and  $\sigma$  do not yield a monotonic behavior of  $Q^T(r_0, m_0, T)$ .