We analyze portfolio credit risk with a stochastic intensity model involving dynamic frailty, by which the credit qualities of different firms depend on common unobservable time-varying default covariates. Frailty is estimated to have a large impact on estimated conditional mean default rates, above and beyond those predicted by observable factors, and to cause a large increase in the likelihood of large default losses for portfolios of U.S. corporate bonds during 1980-2004.