The aim of this work is to explore the existence and properties of a generic market model for joint dynamics of forward swap rates and forward CDS spreads. Several attempts have been made in the past to search for a market model for forward swap rates (see, for instance, Galluccio et al. [3], Jamshidian [5] or Pietersz and Van Regenmortel [6]). The related problem of modeling forward CDS rates has attracted less attention. Our research was inspired, in particular, by recent papers by Brigo [1-2], Ho and Wu [4], and Schlögl [7] in which, under certain simplifying assumptions, the dynamics of certain families of forward CDS spreads were derived and the construction of the model was studied. We will attempt to remove some of the simplifying assumptions and to give necessary and sufficient conditions for the existence of a generic market model from this class.

To this end, the dynamics of a family of forward CDS spreads under the terminal CDS measure is derived under the assumption that the spread processes are semi-martingales and the predictable representation property holds. The dynamics of forward CDS spreads is subsequently combined with the dynamics of default-free forward swap rates. The issue of existence of a default time consistent with the dynamics of forward CDS spreads is also examined.

References