Markov chain approach to model intertemporal choices and coverages in air transport markets

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We develop a framework based on discrete-time Markov chains (MCs) to model the Brazilian air transport market networks. Our results suggest that in this market, economic activity explains the centralities of the airports and the players' choices. Periods of economic prosperity affect the air transport networks and they move from a hub-and-spoke topology towards a mixed point-to-point and hub-and-spoke topology. Furthermore, we use the MC transition and stationary probabilities to build geographical subgraphs that reveal (1) the most important routes, (2) the stability of these routes, (3) the most important flights, and (4) the airlines' specific market niches.