We study the behavior of a large portfolio of security issuers subject to default risk. We are interested in the most likely way the pool can suffer an atypically large default loss. The defaults are correlated because names are exposed to a common risk factor process, and because a default has a contagious impact on other names in the pool.

Large deviation arguments are used to identify a variational problem which describes the way that rare losses are most likely to occur. Our results give insights into how the different sources of de-fault correlation interact to generate systemic failure.

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