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Michael Powers, Wei-Shi Yang and Sheng Xiong* (sheng@temple.edu), Department of Mathematics, Temple University, 1805 North Broad St., Philadelphia, PA 19122. *Lanchester SDEs and the probability of the target destruction — a stochastic model of terrorism risk*. Preliminary report.

In this study, we propose a system of Lanchester stochastic differential equations

$$\begin{cases} dp = -k_1 q^\alpha dt + \sigma_1(p, q) dZ_1(t) \\ dq = -k_2 p^\beta dt + \sigma_2(p, q) dZ_2(t) \end{cases}$$

to model the terrorism war between the attackers p and the defenders q . We investigate the ruin probability and the probability of win of either side by using martingale approach. Our result shows that the ruin occurs almost surely, and for fixed size of attackers, the probability of the target destruction exponentially decays as the size of the defenders approaches infinity. We also explore the possible applications of these results from the insurance perspective. (Received September 11, 2009)