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Dynamic Financial Analysis with Dependency between Motor Own Damage Insurance and Compulsory Motor Insurance - The Case of Turkey

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Insurance companies can measure their ruin probability and default risk more realistically and have strong management strategies with DFA. Inherently for nonlife insurance occurrence time and severity of claims are more uncertain than life insurance because of this reason DFA is a more important tool for nonlife insurance. In literature there is not a unique DFA model and every company can construct their own model and choose their own components. If there is any dependency between these components this structure must be taken into consideration and be integrated in to the model so more realistic result will be achieved. This has important implications for insurance companies and regulators to take right decisions.
One of the most important components in DFA is claims. Lots of insurance classify their claims data as lines of business. This necessitates investigating the dependency between the lines and integrating this dependency in to financial analysis.

In this study, the purpose is to see the effects of correlation between motor own damage insurance and compulsory motor insurance for Turkey on the insurer's risk and return profile, the default risk and the ruin probability. In accordance with this purpose we made a simulation with 100.000 iterations in MATLAB via a DFA model that includes basic components for a nonlife insurance company. The dependence structure was integrated in to the model with copula concepts owing to the usefulness of copulas. Model parameters were obtained with Turkey's market and nonlife insurance data.

Simulation results show us the dependence between motor own damage insurance and compulsory motor insurance have important effects on the insurer's risk, return and performance. So we can say insurance companies shouldn't neglect the dependence between the lines of business in their financial analysis.