
Modelling systemic risk in the South African Banking Sector Using CoVaR

By Mathias Manguzvane and John W Muteba Mwamba

The current paper models system risk in the South African banking sector and identifies the most vulnerable banks to system risk. Modelling systemic risk enables policy makers and regulators to monitor the build-up of imbalances and vulnerabilities of the financial system. Failure to model system risk can lead to disastrous economic consequences as it was the case in South Africa during global financial crisis that emanated from the US housing market and impaired the private and public sector to easily access financing: South African economy lost almost a million jobs.

The current paper contributes to existing literature by not only using value at risk (VaR) and CoVaR techniques to calibrate systemic risk in the South African banking sector but, also by simultaneously back-testing and stress-testing these risk measures in order to identify the most systemically vulnerable banks. To our best knowledge this is the first time such a robust study is carried out in modelling system risk especially in the South African context.

The study derives a novel VaR and CoVaR based quantile regression methodology and applies it to stock market return, market volatility and yield spread data in order to investigate system risk in six South African banks namely *Barclays Africa Limited*, the holding company of ABSA; *First Rand Bank Limited*, the holding company of FNB; *Nedbank Limited*, *Capitec Bank*; *Standard Bank of South Africa Limited* and the *African Bank* during the period between June 2007 and April 2016.

The main findings of the study show that in South Africa larger banks contribute more to system risk than the smaller ones with the four larger banks contributing more to systemic risk than the two smaller banks. Hence the First Rand Bank is found to be the largest contributor to the banking sector's systemic risk while the African Bank has the smallest impact on the system. This finding would imply that greater market instability is to be expected when any larger banks are in distress than when the smaller banks suffer the same fate. Individual contribution to systemic risk is found to increase during times of financial crises. From a practitioners' point of view; this finding is crucial as it can help regulators and policy makers impose a commensurate level of surcharges, as suggested in the Basel III framework in order to curb system risk and promote market confidence and financial stability in South Africa.