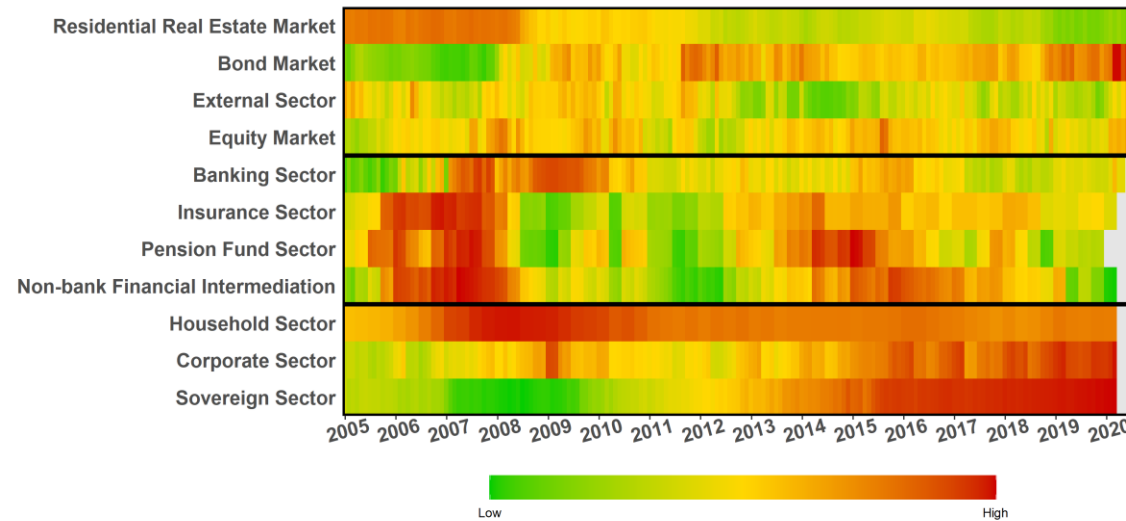


Financial Stability Heat map



- The South African Reserve Bank (SARB) monitors a wide range of sectors, asset markets and financial intermediaries for signs of financial stability risk. A heat map is a diagram with data values represented by colours. It provides a compact and easy-to-grasp depiction of a large amount of data, making it easier to identify patterns and trends.¹ The heat map is a useful tool for financial stability risk analysis, as it provides a broad overview of the build-up of risks in the financial system over time.
- The SARB relies on best practice for transforming data into a visual depiction of risk. Following the methodology of Arbatli and Johansen (2017),² raw indicators are transformed so that the increases in each indicator can be interpreted as an increase in risk. This entails normalising each indicator so that all the observations are in the range of 0-1.³ If a normalised indicator equals 0.6, for example, it means that 60% of the historical values of the indicator are less than or equal to the most recent observed value. Indicators are aggregated into categories. The category average is then mapped to a continuous colour bar, where 0 is green and 1 is red.

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- The heat map is an important input into the SARB's financial stability monitoring process. Its relative simplicity provides a broad, consistent view of changes in certain financial variables over time. It only includes a subset of financial variables, and it aggregates these variables without assigning weights to them. It is important to use the heat map alongside various other risk identification tools. The heat map is a 'living' indicator and is updated from time to time in line with international best practice.
- During the current period the heat map suggests rising risk in the household, corporate and sovereign sectors. In the sovereign category, this reflects a persistent increase in debt (as a share of GDP) over the past decade. In the household and corporate categories, slow income growth has given rise to fragility among certain categories of borrowers. Meanwhile, the banking and insurance sectors appear less at risk in the heat map because of their relatively high profitability ratios (despite these having come down in recent years) as well as substantial capital, solvency and liquidity buffers. The residential real estate market also seem to be indicating lower risk than some of the other sectors.

1. L Wilkinson, and M Friendly, 2009, 'The history of the cluster heat map', The American Statistician 63(2), pp 179–184.

2. E C Arbatli and R M Johansen, 2017, 'A heat map for monitoring systemic risk in Norway', Norges Bank staff memo 10.

3. This normalisation is done on the basis of each indicator's empirical cumulative distribution function

