This study develops two new measures of financial fragility: BRISK, which represents Baseline Risk, and PRISK, which measures systemic risk. BRISK and PRISK scores can be predicted one month ahead for both individuals firms and for the overall financial system. These scores can be used to identify the most appropriate and effective policy response, thereby allowing regulatory authorities to intervene in a timely fashion.

At present, prudential regulators commonly use stress testing to measure the financial fragility of banks and insurance companies. Each stress test focuses on an adverse scenario, assessing the impact of each adverse scenario on each financial institution. Adverse scenarios may specify changes in market values or macro-economic variables which may occur during the projection time-frame, including interest rate or credit spread movements, inflation rates, unemployment rates, changes in house prices, or changes in economic growth rates.

Stress testing relies upon the choice of scenarios: it does not allow for the possibility of other scenarios. Stress testing does not measure the likelihood that any particular scenario will actually eventuate. Nor does it provide a coherent framework for combining different scenarios.

The scenarios which are assessed in stress testing may be considered to be simulations from a stochastic model of economic variables. In this study, we assume that the market index is the key underlying factor which drives the scenarios. Market returns capture a common driver of bank returns and shortfalls. A model based on market returns permits as assessment of the risk posed to individual banks by an event such as a major market correction. By aggregating the outcomes for individual banks, it is possible to measure systemic fragility.

In this model, daily bank and market price performance is the input for a stochastic model which predicts expected future capital shortfalls over a time frame of one month.

The model separates risk into two components: BRISK (Baseline Risk) and PRISK (Systemic Risk). Regulatory decision-making requires an understanding of both types of risk, both within individual firms and across the financial system.

Baseline risk (BRISK) is related to volatility. High levels of BRISK at the individual firm level are potentially likely to make a correspondingly higher contribution to the overall level of stress. Firm-level BRISK tends to increase in line with the amount of debt that the firm is carrying. A high BRISK value shows the vulnerability of the firm to a capital shortfall and flags to regulators, such as APRA, the necessity for remedial action such as reducing debt or increasing capital. At the aggregate level, BRISK is further significant in terms of being a forward-looking indicator of the exposure of the individual firms and the system as a whole to failure.

Systemic risk (PRISK) measures the impact of a system-wide shock. While such shocks are largely unpredictable the differential impact on firms can be assessed. At the firm level, systemic risk is a function of the prevailing level of macroeconomic stress and the anticipated capital shortfall of the firm.

By separating BRISK and systemic risk factors, nuanced and more focused remedial or regulatory action can be taken either in relation to individual firms or the overall market. For an individual firm with a high level of BRISK or systemic risk, remedies such as reduced leverage or a capital injection can be applied. However, when systemic risk is elevated for all firms, macro-economic measures, such as increased regulation, are likely to be required.

Following are the specific drivers of systemic risk:

* Financial dependence between firms;
* Dependence of individual firms on common macroeconomic factors and market conditions;
* Proportionally large balance sheets of key individual firms; and
* High leverage, with debt levels many times the value of net assets.

A firm’s PRISK reading is not an indication of an imminent capital shortfall, although the contribution of the firm to total overall PRISK enables regulators to identify systemically important firms. Also, a growing level of interdependency between firms increases their individual vulnerability to shocks that impact the overall system.

A firm will typically have an elevated PRISK reading if it has a correspondingly greater anticipated capital shortfall during periods when the system is in distress. For example, a bank may record an elevated PRISK reading if it has a loan book with high loan-to-valuation ratios during a period when the labour market weakens or residential property prices fall.

A firm may record a low PRISK reading even if its BRISK reading is high. For example, a firm that sources its business largely from the overseas markets will be correspondingly less impacted by stresses confined to the local system.

This paper proposes a centralised model and assessment tool for the calculation and monitoring of baseline and systemic risks across firms. The model uses publicly available stock price returns, and makes simplified assumptions regarding capital requirements and debt, and market returns as a driver of firm stock returns.

The model may be refined by identifying and incorporating key factors, apart from market returns, and their balance sheet impact. Such factors may include: interest rates; employment; economic growth and property prices. The impact of each factor will differ according to the specific characteristics of the particular firm’s balance sheet. For example, a bank whose asset base is largely comprised of residential loans will be correspondingly more sensitive to residential property price fluctuations than another that is more exposed to commercial loans. Detailed analysis of individual balance sheet exposures, and the factors that influence them, underpins potential refinements to the modelling of baseline and systemic risk calculations.