The Impact of Risk measures on Long term investment

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Executive Summary

A risk measure is defined over a specified period over which risk arises. In the case of a regulatory risk measure, this period usually coincides with the annual performance reporting cycle for a company. For a company with longer term liabilities, risk emerges over a longer period, thus an annual risk measure focusing on short term risk measurement and management does not aid longer term decision making. Constraining companies to invest over shorter time horizons, creating an assetliability mismatch, can lead to a shortfall in investment performance. During economic crises, companies also tend to disinvest in the same way leading to fire sales of assets (also known as procyclicality). This further depresses asset prices and destabilizes the market, creating systemic risk. This article looks at how regulatory risk measures impact risk management and is based on the experience to date of the UK insurance industry in the context of the recently introduced Solvency II regulations. Some alternative ideas for risk measures are also suggested.

Background

The Risk Measures Working Party of the Institute & Faculty of Actuaries is researching the impact of risk measurement approaches on long term investment in insurance. This theme was inspired by a paper by the Bank of England in 2014 titled ***"Procyclicality and Structural Trends in Investment Allocation by Insurance Companies and Pension Funds"***.

This topic is also of relevance to the Indian insurance market, as the regulator in India (the IRDA) contemplates a move to risk-based regulation.

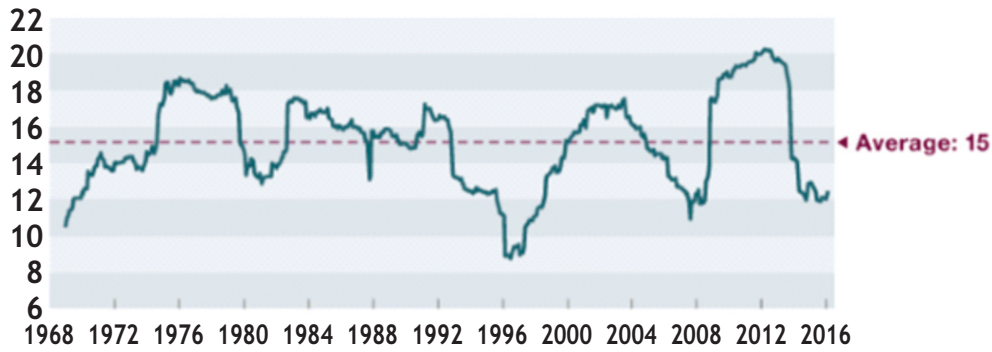
Before moving on to the main discussion, some themes which are referred to later in the article are discussed briefly here.

Short term volatility vs long term horizon trend

Short term swings in share price can be large but this does not necessarily mean that volatility over longer periods has increased. A long term investor, such as an insurance company, would need to keep this in mind as its investment mandate would seek to align its investment horizon with the long term exposure to insurance risk. While life insurers can take a long term view to match long term liabilities, general insurers might have additional shorter term considerations leading them to avoid short term volatility. Short term volatility is also relevant to liquidity needs for both.

To illustrate this, we examine the volatility (or standard deviation) of returns on the S&P500 index from 1968-2016.[1]

S&P 500 annualized 5-year volatility of daily returns,[1] %



Source: Analysis of data provided by McKinsey Corporate Performance Analytics, a McKinsey Solution

[1]Volatility for each month is calculated based on standard deviation of last 60 monthly returns.

Monthly prices are annualized for 12 months; returns are calculated by taking price as on 30th of each month – eg. For Apr, returns are calculated as price on (Apr 30/Mar 30) – 1.

As seen from the above figure, volatility over longer periods hovers around a more stable value. This helps investors, especially those with long term liabilities, to take long term investment decisions without being distracted by short term volatility.

Source: The Long & Short of Stock market volatility by Goedhart and Mehta,2016

VaR as a Risk Measure

Value-at-Risk (VaR) is defined as the maximum loss which is not exceeded with a given high probability over a given period of time.

Some shortcomings of VaR of relevance to this discussion are:

- Regulatory use of VaR may encourage 'herding', whereby investors tend to invest in a similar manner leading to an increase of systemic risk. Herding may increase in response to a need to adhere to regulatory VaR requirements based on a defined time horizon and confidence level, whilst exposure and short term volatility could lead to losses greater than the VaR. This is discussed further later.
- A backward-looking VaR based on past data would be sensitive to this data, for example, calibrations of VaR based on data from the 2008 financial crisis.

Solvency II

Solvency II rules which came into force from 2016 require insurers across the EU to make economic risk-based solvency assessments. There is a requirement to hold capital against market risk (including equity risk), credit risk, operational risk and underwriting (life, non-life and health) risk.

The broader stated goals of Solvency II include protection of policyholders and financial stability. One of the ways of achieving financial stability is by promoting long term investment by insurance companies and pension funds.

Solvency II has been derived from Basel II regulations for banking which are based on the use of VaR as a risk measure. Under Solvency II, VaR is based on a short (one-year) time horizon which is appropriate for projected solvency assessments when liabilities involved are short term, as for banks. It does not capture the emergence of risk for liabilities of longer duration.

Design of Solvency II equity risk module and mitigants for procyclicality

Under Solvency II rules, the factor-based (or standard formula) stress to equities may be penal to long term investors in terms of capital required in a bear market phase, depending upon the nature and duration of liabilities. The reason behind this is that the equity stress has been calibrated using historical data including the 2008 financial crisis resulting in a high capital charge for equity. Furthermore, as financial correlations typically increase in a crisis, high correlations have been used and this has possibly increased the capital charge.

The applicable capital charge has reduced the popularity of equities as an asset class and narrowed investors' asset choices.

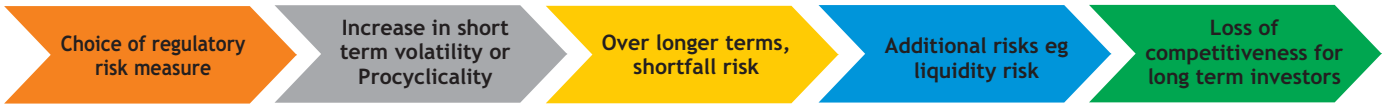
However, Solvency II also has some existing mitigants for procyclicality which tend to be operationally complex and expensive to ultimate customers. Examples are:

- Symmetric adjustment mechanism which determines capital requirements according to the market environment. It reduces procyclicality by adjusting the standard equity capital charge to increase when equity markets rise, and decrease when markets have dropped in the previous months.
- Special treatment of duration-based equity risk applies to insurers providing occupational or other retirement benefits where the typical holding period of equity investments is long term (around twelve years) and therefore a lower capital charge may apply. The rationale for this is that short term volatility should not be considered for long term equity investment, and therefore lead to a lower capital requirement.

Risk measures and risk

Regulatory risk measurement approaches such as VaR as defined under Solvency II rules may exacerbate short or mediumterm volatility in markets leading to procyclicality/asset price contagion risk, a systemic risk. Over the long term, other secondary risks such as liquidity risk and investment shortfall risk may arise.

This is broadly represented by the diagram below:



What is Procyclicality?

The BoE Procyclicality Working Group published research in the paper ***"Procyclicality and Structural Trends in Investment Allocation by Insurance Companies and Pension Funds"*** in which procyclicality is defined as:

investing in the short term in a way that could exacerbate market movements and contribute to asset price volatility, or

investing in the medium term in a way that might exaggerate the peaks and troughs of asset price or economic cycles.

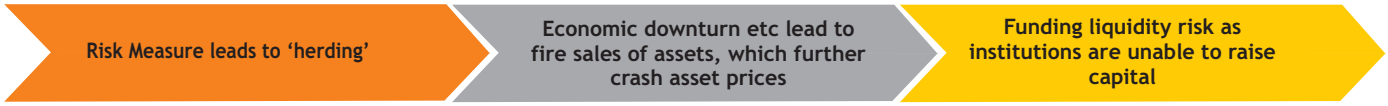
Cause of procyclicality

Some reasons for procyclicality have been identified as:

- under Solvency II, the use of Value-at-Risk (VaR) resulting in investment 'herding'.
- another example of procyclical behaviour is the build up in high sales of products that expose the entity to significant risks in a downturn or fire sales of assets during a crisis.

In this article, we focus on the first cause above.

Anatomy of a procyclical event



Investment 'herding' or the correlation of investment activities across insurers may arise due to reasons such as:

- regulatory risk measures defined for a particular class of investors are applied to other classes that have different investment horizons. For example, a one-year risk measure suitable for a bank which has short term deposits would not reflect the long term risks of an insurer

- capital charges imposed on different asset classes by regulation; if these are viewed as being penal, insurers would move away from investing in these assets

- assets viewed as a good match for liabilities e.g. corporate bonds for annuity books

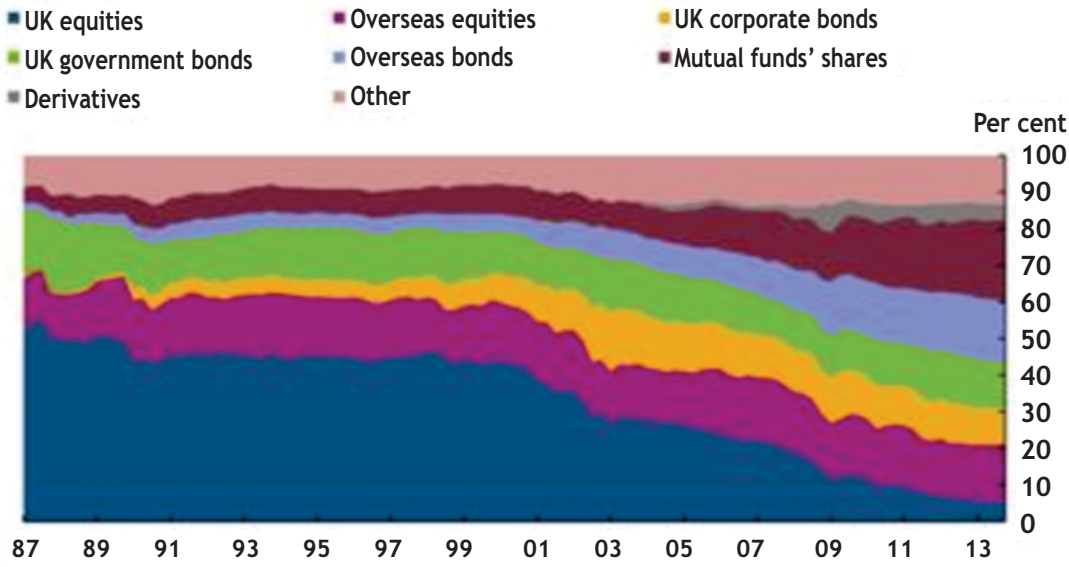
- regulatory requirements involving huge and expensive data collection e.g. Solvency II 'look-through' to underlying assets for certain asset classes such as collectives, would lead insurers to rethink their investment strategy

When regulatory constraints force simultaneous behaviour, insurers could become a source of systemic risk due to the investment of large funds at their disposal. In the event of an economic downturn, insurers tend to disinvest in the same manner, thereby further depressing asset prices. Due to this, the insurer may need to raise additional capital in order to avoid funding liquidity risk (risk of not meeting current liabilities).

Potential impacts of procyclicality

These are:
- How insurance companies and pension funds bear risk across the cycle and thereby contribute to financial stability and long term economic growth: There has been a marked decline in the willingness of these companies to take on investment risk, with much lower equity holdings in recent years. (refer to figure)

Allocation of UK ICPF assets to different asset classes (nominal)



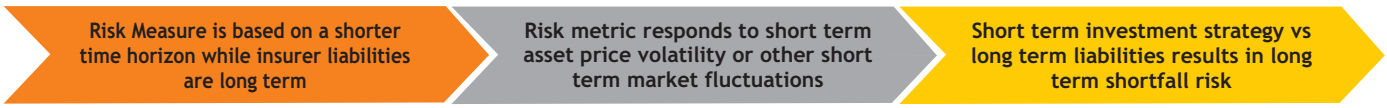
Source: ONS and Bank calculations
(a) Bonds includes money market instruments, medium-and long-term bonds. The split of overseas bonds by issuer is not available.
(b) Other includes currency, deposits, loans, other accounts receivable and insurance technical reserves.
(c) Derivatives data are shown seperately from 2004, but prior to this are included in corporate bonds.

Source: Bank of England ***"Procyclicality and Structural Trends in Investment Allocation by Insurance Companies and Pension Funds"*** (2014)

- Asset price volatility (resulting in fire sales of assets when prices fall) can decrease the resilience of the financial system, and thereby

- Lead to systemic asset contagion risk and funding liquidity risk and require the insurer to raise additional capital

Shortfall risk



When the chosen risk measure assesses risk over a time horizon (typically a year) that is shorter than the period over which risk is held, it addresses short term volatility and encourages the choice of risk management options that are suitable over a shorter time horizon. However, it does not help in long term decision-making for long term investments. As risk metrics are related to performance metrics over the annual performance cycle, longer term investment performance goals are not addressed and may result in investment shortfall risk.

Alternative ideas for risk measures

Solvency II is an extensive and complex piece of legislation covering numerous aspects of risk controls. The overall Solvency II framework does contain some mitigating adjustments such as volatility adjustment, symmetric adjustment, duration-based equity risk and so on but space does not permit a full discussion of all of these aspects here.

Alternative calibration approaches such as non-market methods

The market consistent approach adopted under Solvency II rules makes the balance sheet volatile due to short term volatility and can increase procyclical tendencies. It is possible to introduce counter-cyclical buffers that are top-down assessments of risk applied to asset, liability or capital components of the balance sheet.

Longer projection periods such as runoff approaches

Liability runoff risk measures support long term decision making by measuring risk over the period that it is held. An

assessment is made of the level of total initial assets, less some measure of reserves for liabilities, required to pay all future policyholder benefits at the chosen confidence level. This contrasts with the one-year mark-to-market approach used under Solvency II. A runoff approach results in more stable capital requirements as economic assumptions are not affected by short term volatility.

Other risk measures

Numerous other risk measures exist to deal with other aspects of financial risk, both microprudential and macroprudential. For example, in banking, Basel III has expanded upon Basel II to include, among other things, systemic and liquidity risks. Some of these approaches and metrics might be able to be appropriately adapted for insurers.

The way forward

Solvency II is based on a capital risk measure but not designed to avoid systemic risk. Furthermore, liquidity risk is not treated as a risk to capital and requires separate metrics and management. The Own Risk and Solvency Assessment (or 'ORSA') process under Solvency II addresses liquidity risk from the perspective of the entity.

Overall, a way forward would be to use existing and alternative risk measures to address risks such as asset price contagion, investment shortfall, systemic and liquidity risks.

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