What have we learnt from the global financial crisis?

Dennis Trewin[1]

1.   Introduction

I agreed to write this paper not from a position of great knowledge but rather from someone who had recently been appointed a Trustee (and Board Member) of a major superannuation (or pension) fund in Australia. Furthermore, I was also told that, in part, I was appointed a Trustee because "I understood probability". Therefore, I thought I should offer some preliminary thoughts on how the statistical community could assist those responsible for superannuation fund management.

What types of statistics are used by managers of superannuation funds? These are set out below, and in the following sections of the paper I will make suggestions for improvement.

a.   Not surprisingly, macroeconomic statistics are used extensively to understand probable future economic trends. They are generally used indirectly by relying on the views of trusted economic forecasters. How effective were macroeconomic statistics in understanding the current global financial crisis?

b.   One of the most important tasks of trustees is asset allocation, ie how much of the total funds available will be devoted to domestic equity, international equity, emerging markets equities, private equities, property, bonds, credit and other asset classes. Other important decisions are the extent to which hedging is used to mitigate against adverse currency fluctuations. These decisions are dependent on whether the investment strategy is to be conservative, balanced or growth. Risk analysis is a key part of the decision-making process; it involves a number of statistical constructs, particularly measures of volatility.

c.   Large funds usually make their investments through fund managers after deciding on the asset allocation. Some large investments are made directly, particularly in the property component of the portfolio, but this is a relatively small share of the investments. The choice of fund manager is important; the objective is often to seek a "top quartile" manager, but this status can depend on the investment climate. For example, a "top quartile" manager in a bull market is not necessarily one in a bear market. Statistical analysis is extensively used to make decisions on fund managers.

d.   Monitoring portfolio performance is crucial. It is always necessary to be prudent about asset allocations and fund managers so that changes can be made when necessary. We are seeking to maximise investment performance over a five to seven year period, so it is important not to overreact to short-term movements. Again, statistical analysis (eg trend analysis) is an important tool for effective monitoring.

For the rest of this paper, I will refer to the four uses of statistics described above as: (a) monitoring economic performance; (b) asset allocation; (c) choice of fund manager; and (d) monitoring performance.

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[1]   Dennis Trewin Statistical Consulting (e-mail: dennistrewin@grapevine.net.au).

Given that the target audience for this paper is statisticians, most of whom will not have a detailed knowledge of fund management, I have only described the processes at a very broad level.

It is also important to recognise that the goal for superannuation funds is to know when to change investment strategy rather than to predict changes in the economy per se. For example, should equity market exposure be increased or decreased? Equity price movements lead movements in the real economy by about six months on average, so there cannot be reliance on coincident macroeconomic statistics only.

2.   Monitoring economic performance

How effective have official statistics been in obtaining an early understanding of the global financial crisis? In terms of monitoring economic performance, it is clear that official statistics were not sufficient. Few analysts picked the start of the significant economic downturn. However, our Chief Investment Officer forecast it as highly likely towards the end of 2007, before the significance of the downturn was fully understood. What information did she use to pick this? The key information included: (i) especially high credit spreads; (ii) equity prices being more than two standard deviations above fair value based on historical price earnings ratios; (iii) increased volatility in equity markets; and (iv) decreasing *global* liquidity. None are standard macroeconomic statistics.

I also looked at the speeches of a number of economists at a Global Economic Forum held in May 2007. Very few picked the impending economic downturn and they were referred to as pessimists rather than realists. What information did they use to pick this? The most important were: (i) a significant decline in the net national savings rate; (ii) a large increase in the current account deficit; (iii) asset price bubbles (more than two standard deviations above fair price); (iv) high real interest rates; (v) higher than normal credit spreads; and (vi) reductions in *global* liquidity.

It may also be informative to look at the statistical information used by the optimists. By and large, they relied on standard macroeconomic statistics, such as GDP, the CPI, and business tendency surveys (which I believe largely reflect current sentiment). There is also a reliance on consensus, which runs the risk of "group think".

It seems to me that there are a number of important indicators that are not part of the standard set of macroeconomic indicators. These are associated with the sustainability of the economy and whether the economy can withstand the pressures that are being exerted on it.

My own view is that much more attention should be placed on indicators that highlight problems with economic sustainability such as those mentioned above (eg credit spreads, equity prices above fair value). The data is readily available even if not compiled by national statistical offices. Also, note that some of the measures should be global rather than national (eg liquidity) given the global nature of the economy.

The main response of national statistical offices has been to increase focus on short-term economic statistics. Although admirable, these will be of more use in understanding what is happening now rather than the future, and are of limited use to those associated with investment management.

The papers by Adelheid Bürgi-Schmelz and Steven Keuning for this meeting outline a number of initiatives being undertaken by the IMF and the ECB respectively to upgrade the statistical information available to monitor the economy. These do seem worthwhile and they emphasise the importance of the whole financial system.

My concern is that such statistics may be difficult to compile for most countries and, even for those countries that can compile them, they may not be very timely. Therefore, I believe that we should also put some emphasis on proxy indicators that already exist.

The compilation of the statistics I am proposing is generally not the responsibility of national statistical agencies, although they could help to increase their profile by republishing some of the more important statistics in economic indicator publications and the like. They could also assist by ensuring that their methodology is sound.

3.   Asset allocations

This is, to a large extent, a mathematical or statistical exercise to obtain a target return for the fund while minimising risk. There are other constraints, such as only expecting four negative return years out of 20. Asset classes have different expected returns and different risks (usually based on some measure of volatility). These important parameters can also change over time and with macroeconomic views.

The optimisation process also depends on the cross-correlations of movements in returns between asset classes. They can also change over time. One of the outputs is an optimal return/risk frontier. If your fund is not at the frontier, asset allocation is suboptimal and should be changed to increase the expected return for the same risk or to reduce the risk for the same expected return (or some combination of both).

In a static situation, the statistical theory and practice associated with asset allocation is very mature. Investment managers understand this very well: it is their bread and butter. It is when the dynamic nature of asset prices and risks has to be taken into account that it is less mature, although plenty of work has been done on developing methods. Sophisticated techniques such as chaos theory are used. Models have to take account of autoregression and heteroskedasticity. Monte Carlo analysis and scenario modelling are used extensively. These models and methods could no doubt be improved as a result of the lessons learnt from the global financial crisis.

Dynamic asset allocation is increasingly being used rather than the traditional once a year review. Statistical techniques are used extensively to determine whether the return/risk profile has changed significantly and whether the change is large enough to warrant the cost of an asset re-allocation. It should be kept in mind that superannuation funds are generally trying to maximise return over a five to seven year period.

Statisticians can best help to improve asset allocations by:

i.   continually developing methods for dealing with the dynamism of markets and

ii.   working as statistical advisers with fund managers.

My impression is that (i) is happening to a significant extent but (ii) does not often happen. Courses in investment science and risk management are quite popular but they do not necessarily result in a "professional" financial statistician.

4.   Choice of fund manager

Superannuation fund managers talk about two types of return – alpha and beta. It is best to use equities to describe the concept. A beta return for equities is based on Share Price Index and the equity portfolio is allocated according to the weightings in the index. If fund managers do their job, the value of the equity portfolio will go and up and down according to the index. Alpha return is when you beat the index by choosing a prudent equity portfolio. In

reality, it is done through choosing "active" managers who specialise in this and have the necessary research skills and capabilities. Alpha returns may be negative if managers perform badly.

When choosing the fund managers to actively manage an alpha return, the stated goal is to try to select top quartile managers, and considerable effort goes into their selection. I think this is the wrong strategy. Rather, it should be to avoid the bottom quartile managers.

Why do I say this? My opinion is based on experience and conjecture rather than detailed analysis.

1. The distribution of the performance of fund managers is rather unusual. Most will be clustered around an average performance – some better and some worse. The distribution for these managers would be close to normal. However, there will be some extreme (negative) tail events. Some managers may even fold and have a zero result. For these reasons, the risk is managed by having a relatively large number of "beta" managers.

2. I am not convinced, from the data I have seen, that many managers consistently perform better than their peers in a statistically significant way.

I am not a great fan of seeking beta return. I think dynamic asset allocation is likely to be a far more cost-effective way of improving returns.

Statisticians understand probability and variability. These concepts are crucial to the choice of fund manager. Qualitative judgements are often involved and statisticians "on the spot" can help investment managers to make the right decision.

5. Monitoring performance

What should be monitored? There are many aspects, but some of the more important are:

a. actual return and risk against stated return and risk

b. peer review with other superannuation funds

c. the performance of asset classes in terms of return and risk

d. the performance of fund managers compared with their peers.

Valuations are important and this is not always straightforward. There are no problems for asset classes such as listed equities where market information is plentiful. However, it is more difficult for asset classes such as private equity and property where valuations have to be taken periodically. The practices across funds are uneven, which makes comparisons among them somewhat challenging, especially in times of volatile markets.

Again, statisticians with their knowledge of probability, have an important role to play in understanding where there are real differences in performance.

6. Conclusions

Lateral thinking has to be applied to the type of indicators that are needed to assess possible changes in direction for the economy. More attention should be paid to the statistics used by financial markets to guide their actions. After all, equity markets do have a good track record of picking upturns or downturns in the economy with a lead time of about six months.

These statistics should be brought into the field of official statistics in the sense that they are accessible to the general public and the meaning of changes in values is understood by a

broader class of users, not just those familiar with financial markets. Furthermore, the official statistical community should ensure that the methods used for compiling these statistics are robust and methodologically sound.

Financial statistics is a field of statistics that is reasonably well advanced. Yet, there is no doubt that there is considerable scope for improvement in methods, as investment vehicles become more sophisticated and the risks become less obvious. There must be considerable lessons to be learnt from the recent financial crisis which can be used to improve methods.

Financial statisticians seem to have a low profile with superannuation fund managers, at least in Australia. Their role seems to be to concentrate on teaching and research. Many decisions, with considerable money at risk, are based on information which is not precise. Statisticians with knowledge of probability and variability can add considerable value. There is a need to promote our strengths: this is best done through the professional associations.

It is interesting to note that statistics associated with financial management have a very low profile with bodies such as the ISI. Yet, this is clearly a very important endeavour. It might improve with the introduction of ISBIS to the ISI family, as long as it views this as an important part of its activities. There is an opportunity to take statistical leadership. It is pleasing to see that IPM63 is dealing with statistics in finance.