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Simon joined MLC Investment Management - which last year merged with JANA - in February 2012 as Head of Investment Risk. Simon has more than 20 years of investment experience in Australia having worked in senior roles for several major domestic and international funds management and consulting firms including Ibbotson Australia (Head of Strategy), BT Investment Management (Head of Quantitative Investment Strategies), Rothschild Asset Management (Head of Quantitative Analysis) and (MSCI) BARRA (Senior Consultant). Simon has a Masters in Applied Maths from Moscow University for Railway Engineers and is a CFA Charterholder, Fellow of FINSIA and a member of The Q-Group and CQA (Chicago Quantitative Analysis).

Wolverine and the Australian equity market

Measuring market concentration and why it matters

Australian investors are aware that the local equity market is concentrated, particularly when compared to the global market. What is often less well understood is how 'concentration' is measured, whether the level of concentration is increasing or decreasing over time, and the potential implications for active managers investing in the market. This article addresses these questions, beginning by explaining a few different ways of measuring the degree of market concentration.

The impact of Wolverine on the Australian market

You would be right to ask what the movie character Wolverine (or other mutants) may have to do with the Australian equity market. Let us explain by taking a quick trip back in time to the year 2000.

Monday 17 July 2000 was a quiet day on the Australian Securities Exchange, with the overall market up 0.30%. However, as Table 1 shows, the market movement could be attributed to just one stock, News Corporation Limited (NCP), which in 2000 had two entries in the Index, both its ordinary shares, trading under the code NCP, and its preferred shares, NCPDP, with a combined weight of just under 15%.

Table 1: ASX top five stocks by weighting on Monday 17 July 2000.

Stock	Weight	Return	Contribution
NCP	14.8%	2.0%	0.29%
TLS	7.1%	0.8%	0.06%
NAB	6.9%	-1.8%	-0.12%
BHP	5.7%	-1.3%	-0.08%
CBA	5.7%	0.9%	0.05%
Index return			0.30%

Source: FactSet, JANA.

Now to the Wolverine: the only news that caused NCP to move up 2% on the day was the unexpected box office success of Fox Studios' (a subsidiary of NCP) mutant blockbuster "The X-Men", starring Australian actor Hugh Jackman as Wolverine, which opened in the US that weekend. On Monday morning in Australia the US market was still closed, so the traders rushed to buy NCP on the Australian market. The bottom line is, excessive concentration can turn markets into a rather bizarre place in which a single, in this case foreign, event in a significant stock can move the entire market.

Measuring Australian equity market concentration

It is often said the Australian equity market is concentrated, but what does this mean? Our research explores a number of simple measures as well as a more sophisticated measure of market concentration.

It is important to emphasise that market concentration is a relative concept. Without any measurement, it is easy to see that the Australian equity market is not as concentrated as, say, the Finnish equity market, where Nokia used to represent over 50% of the total capitalisation (currently about 25%). As the majority of superannuation fund members have their equity allocations via a combination of domestic and global equities, we have used the S&P / ASX 200 Index (ASX 200) for our analysis of the Australian market and the MSCI All Countries Index (MSCI AC) as a comparison for the global market.

The following are some measures of market concentration, from the simple to the more complex.

1. Number of stocks in the investable universe

The number of stocks is the simplest measure of concentration. Reflecting the relatively small size of the Australian economy, the ASX 200 consists of just 200 large, liquid stocks, compared with about 2,000 stocks in the MSCI AC.

2. Percentage of the market capitalisation concentrated in few large stocks

The relatively low number of stocks in the Australian universe, 200, means an average weight of just 0.5%. If the weights are more or less evenly distributed around the average, this doesn't create an overly concentrated market. In reality, however, the weightings are far from equal. The largest Australian stock, the Commonwealth Bank of Australia (CBA), represents about 9% of the Index, while the top 10 stocks cover over 50% of the Australian market. That compares with around 2% for the largest global stock (Apple Inc.) and less than 10% for the combined weight of the top 10 global stocks (see Chart 1).

3. Number of stocks that cover a significant part of the market

We can turn the previous point around and ask, how many stocks will it take to cover a given percentage of the market? Chart 2 illustrates the answer for two levels of coverage, 50% (nine stocks for the ASX 200, 200 stocks for the MSCI AC) and 75% (20 stocks and 600 stocks respectively).

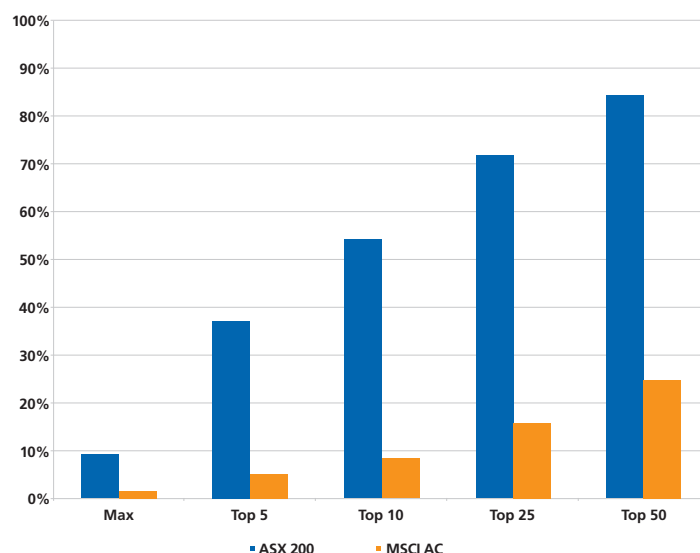
4. Herfindahl-Hirschman Index

A less widely known measure of market concentration is the Herfindahl-Hirschman Index (HHI). The HHI is a concept widely applied in competition contexts, such as when regulators are assessing market concentration to determine whether to approve a takeover. However, it is also considered one of the most efficient measures of investment portfolio concentration, as it takes into account the weighting of every stock in a portfolio as well as the number of stocks in the universe, and then calculates the portfolio concentration as a single figure.

For any portfolio, HHI is a number between 0 and 1, with values closer to 1 reflecting higher concentrations. At the extreme, a portfolio of just one stock has an HHI of 1. At the other end of the spectrum, the ASX 200 has 200 stocks so if these had equal weight the HHI would simply be $1/200$, or 0.005. This figure is the lowest possible concentration for that number of constituents.

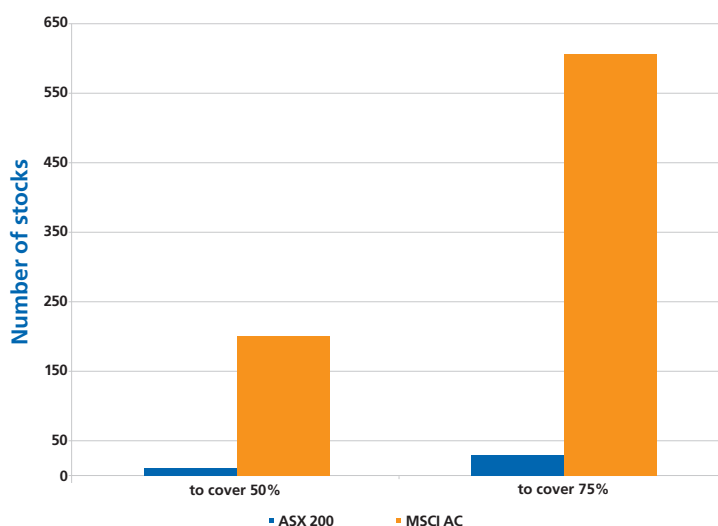
Of course, we know the ASX 200 stocks are not equally weighted and the HHI calculation takes this into account. As at 30 September 2014 the HHI for the ASX 200 was 0.038 – considerably higher than the HHI for the MSCI AC of 0.002. (Source: FactSet, JANA)

Chart 1: Combined weight of largest stocks – the Australian market is much more concentrated in a few stocks than the global market



Source: FactSet, JANA. As at 30 September 2014.

Chart 2: How many stocks cover 50% and 75% of the market?



Source: FactSet, JANA. As at 30 September 2014.

5. Sector level concentration

The Australian equity market is not only concentrated at the stock level. Table 2 summarises the GICS sector weight distributions for the ASX 200 compared with the MSCI AC. It shows that just one sector, Financials ex REITs, represents more than a third of the Australian market capitalisation (38.1%), and when combined with REITs (7.1%), it comprises over 45% of the market. Financials are the largest sector of the global index as well, but at a much lower level of 18.2% (21% if you include REITs at 3.3%).

The relative sector level concentration can also be reduced to the HHI number, calculated using sector weights. As can be seen from Table 2, the global market's sector HHI is just over half that of the ASX 200. It is also not too far away from the floor implied by the number of possible sectors, which is 0.091. This indicates the relative lack of concentration in the global market.

Table 2: Australian equity market also concentrated at the sector level

GICS	ASX 200	MSCI AC
Energy	6.5%	9.4%
Materials	16.4%	5.8%
Financials ex REITs	38.1%	18.2%
REITs	7.1%	3.3%
Industrials	7.0%	10.5%
Consumer Discretionary	3.9%	11.4%
Consumer Staples	8.0%	9.5%
Health Care	5.1%	11.3%
Information Technology	0.8%	13.4%
Telecommunications	5.5%	3.9%
Utilities	1.7%	3.3%
HH Index	0.200	0.113

Source: FactSet, JANA. As at 30 September 2014.

Is the Australian equity market becoming increasingly concentrated?

It is clear from this analysis that the Australian equity market is much more concentrated than the global market. This has been the case for a long time and armed with these quantifiable concentration measures, the analysis can be extended historically to show that the Australian market is becoming increasingly concentrated.

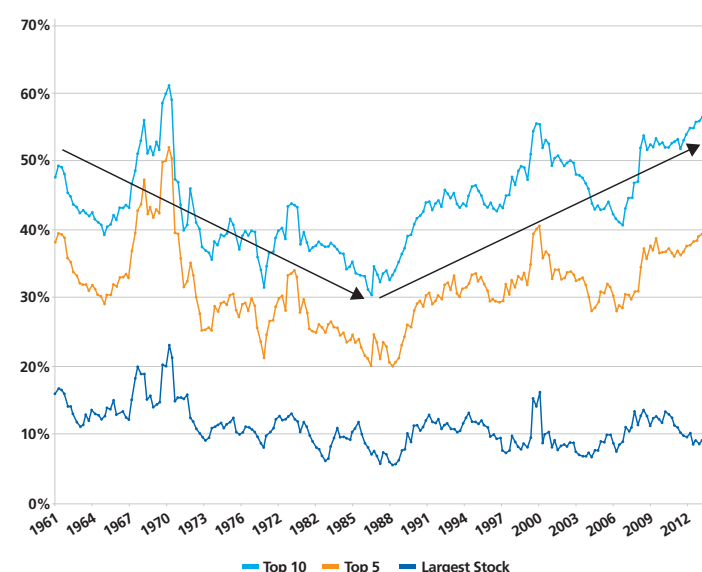
The ASX 200 was only introduced in the early 1990s, but we have been able to model the Index composition back to 1961¹.

Stock level concentration measures through time

Charts 3 to 5 show stock level concentration measures between 1961 and 2014. A fairly consistent picture emerges:

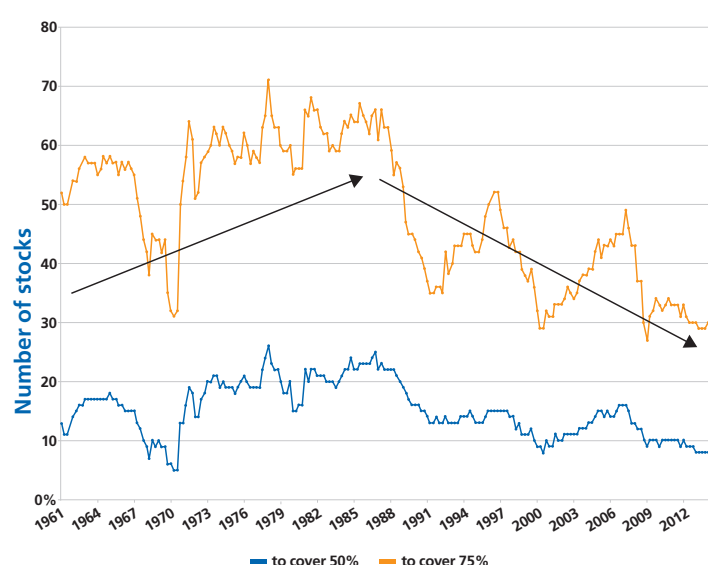
- the level of concentration fluctuated;
- it reached its historical extreme levels in the mid to late 1960s;
- the market was least concentrated in the late 1980s; and
- the market has generally become increasingly concentrated since then.

Chart 3: The weight of the largest stocks in the ASX 200 has increased



Source: FactSet, MSCI BARRA, JANA. As at 30 September 2014.

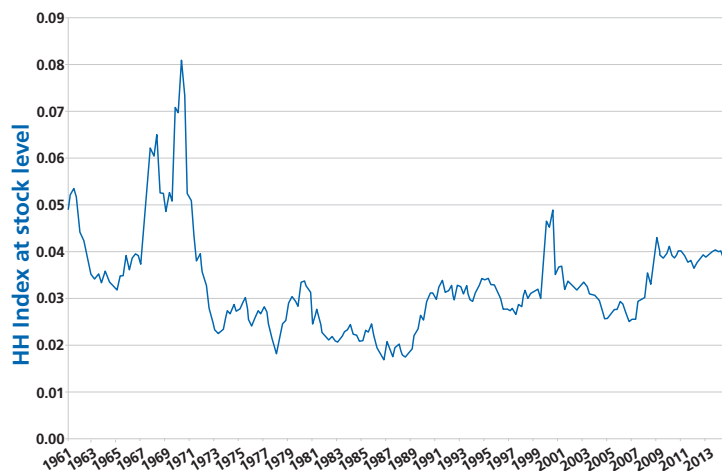
Chart 4: The number of stocks that comprise a large proportion of the ASX 200 has fallen



Source: FactSet, MSCI BARRA, JANA. As at 30 September 2014.

¹This modelling is not sufficiently precise for any performance or risk calculation but it is reasonable for the purposes of this analysis (at least as far as the stock level analysis is concerned).

Chart 5: Stock level Herfindahl-Hirschman Index has generally increased over the last few decades



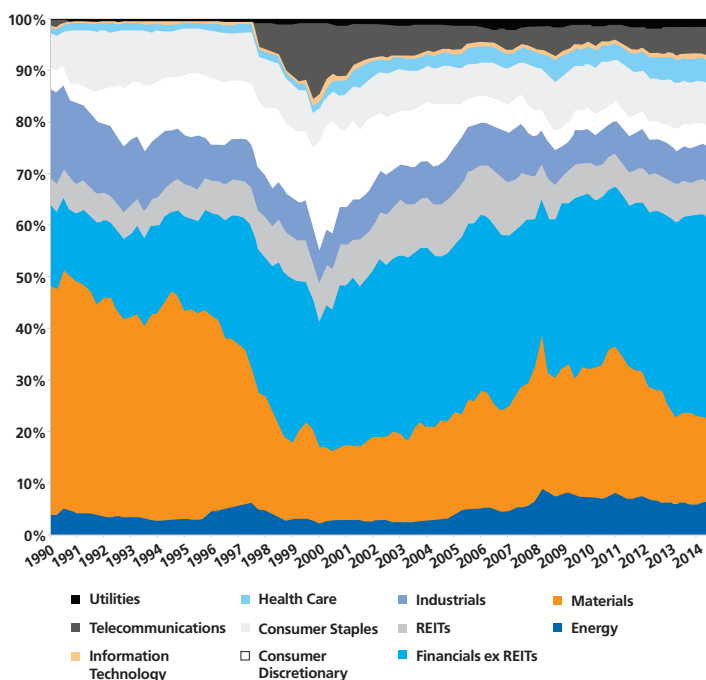
Source: FactSet, MSCI BARRA, JANA. As at 30 September 2014.

Sector level concentration measures through time

A similar analysis was undertaken at the sector level using historical official ASX 200 data from 1990. Chart 6 presents the sector weight distribution, Chart 7 combines sectors into three major sector groups and Chart 8 shows the sector level HHI.

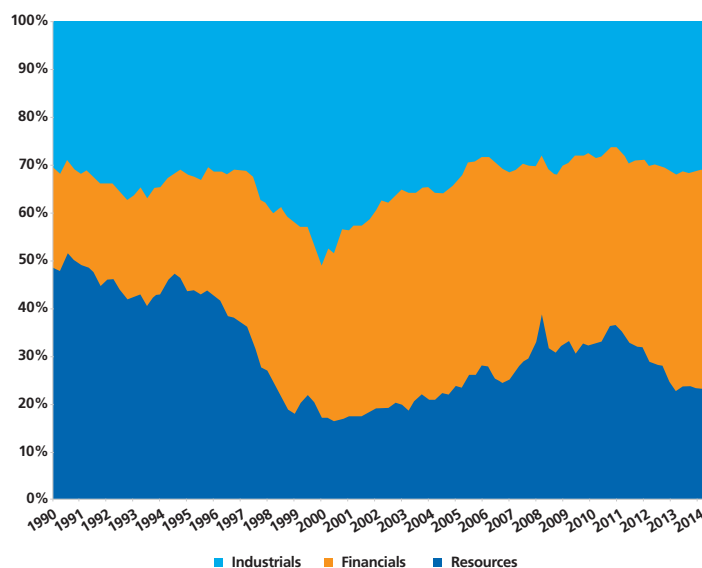
The charts show that after a period of low concentration, around the year 2000, the market has been getting more and more concentrated, with higher allocations to the Financials sector. They also show a well-known rotation in the Australian market from Resources (Materials and Energy) – which dominated the market in the 1990s – to the current period, dominated by Financials.

Chart 6: Historical sector distribution – Australian market has been increasingly dominated by the Financials sector



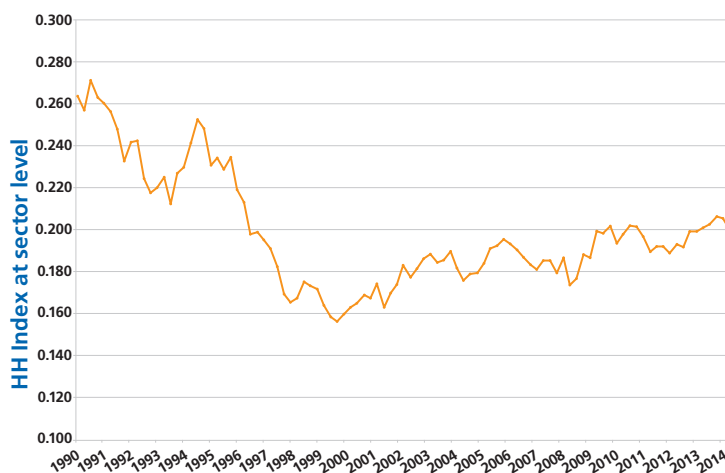
Source: FactSet, JANA. As at 30 September 2014.

Chart 7: Historical sector distribution by major sector groups – since the 1990s there has been a rotation from Resources to Financials in the Australian market



Source: FactSet, JANA. As at 30 September 2014.

Chart 8: Sector level HHI in the Australian market has generally increased since 2000



Source: FactSet, JANA. As at 30 September 2014.

Why does market concentration matter for active management?

There are two key ways market concentration can affect stock selection and portfolio construction: it can limit the risk that active managers can take, particularly relative to benchmark, and it can also restrict an active manager's ability to consistently outperform.

Effect on taking active risk

Market concentration makes it next to impossible for an active manager not to include at least some allocation to the largest stocks in the Index without exceeding their risk budget relative to the benchmark (tracking error) to levels which may be outside of their mandate.

Our research included testing the impact on tracking error, on several portfolios, of dropping one or more of the largest positions from both the ASX 200 and the MSCI AC. We also tried to compensate for the exclusion by re-optimising the residual portfolio to the lowest tracking error.

Table 3 summarises the results. It shows that global managers can exclude index stocks they see as overvalued or not fitting with their investment style without drastically affecting the tracking error of a portfolio, while Australian managers have to hold at least some allocations to the largest stocks if they are to avoid a large tracking error. The same applies to the sector allocations. For example, excluding the largest five stocks from the ASX 200 implies a tracking error of 2.68% – and that is before the manager takes any other active positions.

Table 3: Effect on Tracking Error (MSCI BARRA) of removing significant stocks from indices

PORTFOLIOS	Benchmark/Index	
	ASX 200	MSCI AC
Index less Largest stocks	1.33	0.38
Index less Largest stocks, optimised	1.21	0.35
Index less 5 Largest stocks	3.30	0.52
Index less 5 largest stocks, optimised	2.68	0.44
Index less Financials	4.09	1.03
Index less Financials, optimised	3.51	0.64

Source: MSCI BARRA, JANA. As at 31 December 2014

Effect on outperformance

Apart from reducing a manager's ability to take risk, market concentration can negatively affect their ability to convert stock selection skills into excess returns ("alpha"). It is widely accepted that alpha is a function of a manager's skill and the number of **independent** positions (i.e. positions away from the benchmark) that they take. This is sometimes referred as the "fundamental law of active management". The word **independent** is important here because, for example, overweight positions in two major Australian banks, Commonwealth Bank of Australia (CBA) and Westpac Banking Corporation (WBC), do not represent two truly independent positions as their share prices tend to go up and down together, at least to some degree, due to a set of common drivers.

The inverse of the stock or sector level HHI can be interpreted as the "effective" number of stocks or sectors respectively. For the ASX 200, $1/HHI = 1/0.036 =$ (approximately) 28 stocks and $1/0.2 = 5$ sectors. As we observed above, the Australian equity market has been steadily becoming more concentrated. This means the effective numbers of stocks and sectors have been steadily reduced, which in turn negatively affects a manager's ability to take independent positions and theoretically at least, makes generating consistent alpha more difficult.

Despite this, JANA believes active management remains feasible and indeed valuable. Our experience is that many active managers continue to be able to add value in the Australian equity market. Our observation is that this is due to several factors, including:

- The ability to alter exposures to the two largest sectors, Resources, which are inherently more cyclical in nature, and the Financials, which in the Australian context have produced relatively stable and consistent earnings streams over the past 20 years;
- The ability to manage the level of exposure to the smaller sized stocks relative to the large stocks that dominate the market capitalisation; and
- The ability to implement 'relative value' trades between the large stocks, for example between the four big banks, the two large miners and the two large retailers.

Conclusion

The Australian equity market is concentrated and is becoming increasingly so. Applying active management in such a market can be a challenge, and requires highly skilled, specialist managers with a deep understanding of the peculiarities of our market. At JANA, these are important considerations when we are selecting or reviewing investment managers for Australian share strategies.

We remain of the view that the active management can add value in the Australian equity market.

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