
ACTIVE MONEY - PROVIDING 20/20 VISION FOR EMBEDDED RISKS IN YOUR PORTFOLIO

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One of the criticisms resulting from the Global Financial Crisis has been the lack of transparency that investors have into the funds in which they are invested. This research paper reviews the concept of Active Money and how it can be applied in the Australian equity market to provide practitioners with a greater level of insight into the risk in Australian equity products. It tests the efficacy of Active Money as a predictor of excess returns and risk, and recommends that all investment professionals consider the level of Active Money in clients' portfolios as a means to better identify, understand and manage risk.

ACTIVE MONEY

The outlook for lower asset class returns has resulted in an increased focus on the ability of fund managers to generate returns in excess of the benchmark (alpha). Over the past several years, there has been a dramatic increase in the number of concentrated equity products being offered to and used by investors. The general contention is that more concentrated portfolios reflect higher conviction and, as a result, higher potential for excess returns. Further, following the aftermath of the Global Financial Crisis, investors are seeking more clarity regarding the actual risk levels within their portfolios and also investigating potential strategies to control risk in extreme market environments.

Active Money Definition

Active Money is a measure of how different portfolio weights are from benchmark weights. An intuitive measure would assign 0 to the benchmark and 100 to a portfolio which holds all stocks outside the benchmark. A definition that satisfies the above condition is:

$$\text{Active Money} = \frac{1}{2} \sum_{i=1}^n |w_i^P - w_i^B|$$

Where:

- N is the number of unique stocks in the portfolio and the benchmark,
- w_i^P is the weight of the ith stock in the portfolio,
- w_i^B is the weight of the ith stock in the benchmark.

Table 1: Active Money – worked example

Stock Name	Portfolio Weight	Benchmark Weight	$ w_i^p - w_i^b $
ABC Company	10%	25%	15%
DEF Company	40%	25%	15%
GHI Company	10%	0	10%
UVW Company	0%	25%	25%
XYZ Company	40%	25%	15%
Total	100%	100%	
Total Active Money			40%

Source: Russell Investments

In the absence of leverage, Active Money for a portfolio is always between 0 and 1. The Active Money computation does not distinguish stocks on any facet other than their absolute active weight. As such, there is no axiomatic connection between Active Money and expected risk or return. However, this simple metric does provide an overall sense of how active, in the benchmark relative sense, a manager is at any given point in time and is therefore intuitively related to active risk and active return. These linkages are empirically tested in this paper.

Active money across different market structures

In determining the Active Money in a given portfolio, there are two considerations driving the end result – the weight in the portfolio and the weight in the corresponding benchmark. Therefore, the construct of the corresponding benchmark is a significant contributor to the level of Active Money that is able to be achieved.

Analysis of market concentration

Australia is one of the most highly concentrated equity markets in the world and, as a result, care must be taken when extrapolating observations from more diversified markets. A commonly used measure of market concentration is the Herfindahl Index¹. This paper uses a standardised version of the Herfindahl Index to compare various markets.

$$\text{Herfindahl Index (H)} = \sum_{i=1}^N w_i^2$$

Where:

- w_i is the market-cap weight of company i in an index, and
- N is the number of companies in the index

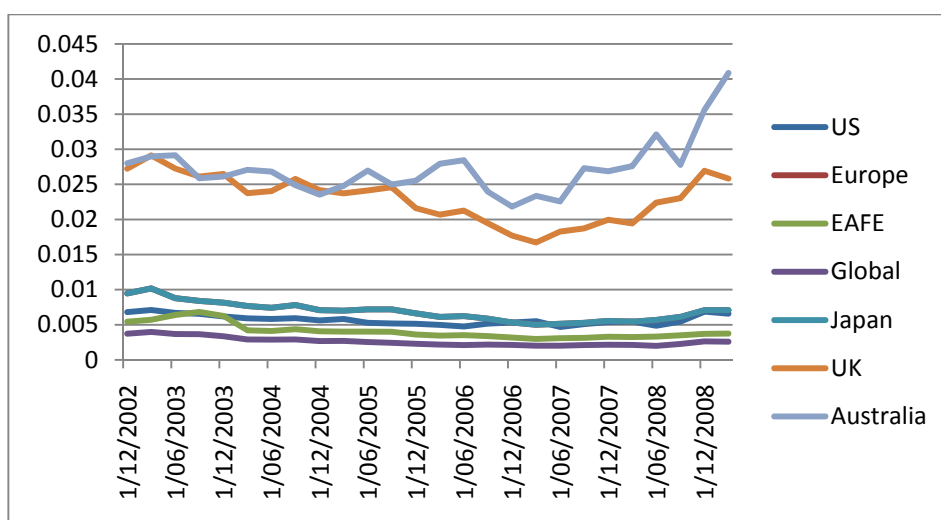
$$\text{Standardised Herfindahl Index (H}^*) = \frac{(H - 1/N)}{1 - 1/N}$$

Where:

- N is the number of companies in the index, and
- H is the Herfindahl Index, as described above.

Figure 1 shows the Standardised Herfindahl Index various equity markets around the world. The higher the Herfindahl Index, the more concentrated the market.

Figure 1: Developed market standardised Herfindahl Index comparison
(December 2002 – December 2008)



Source: Russell Investments

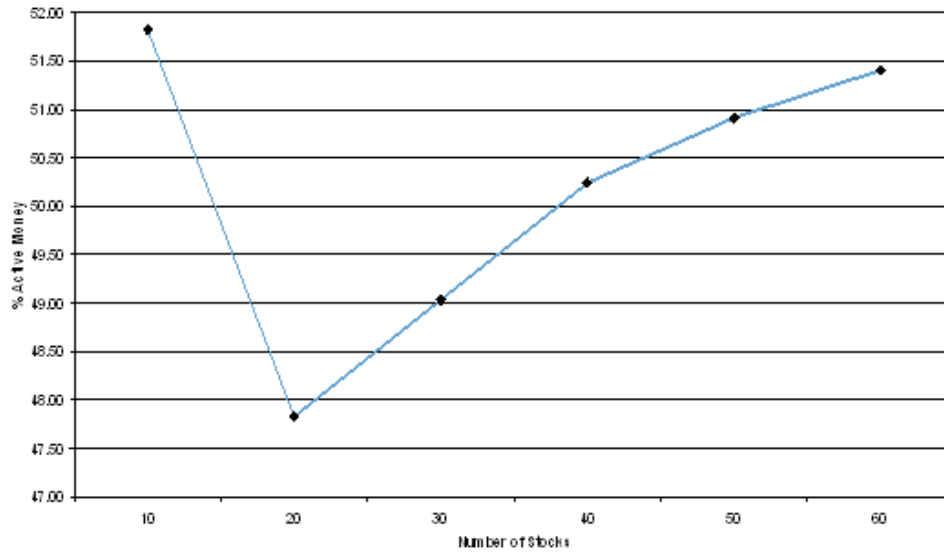
Active money in concentrated markets

In large and well diversified markets such as the US and Japan, there is typically a monotonic relationship between the number of stocks in a portfolio and the level of Active Money – that is, as the number of stocks increases, the level of Active Money decreases. However, not all markets are as diversified as the US and Japan. In other well developed markets such as the UK and Australia, there is significant index concentration in the top twenty companies. In these concentrated markets, the typical relationship between the number of shares held and Active Money can break down.

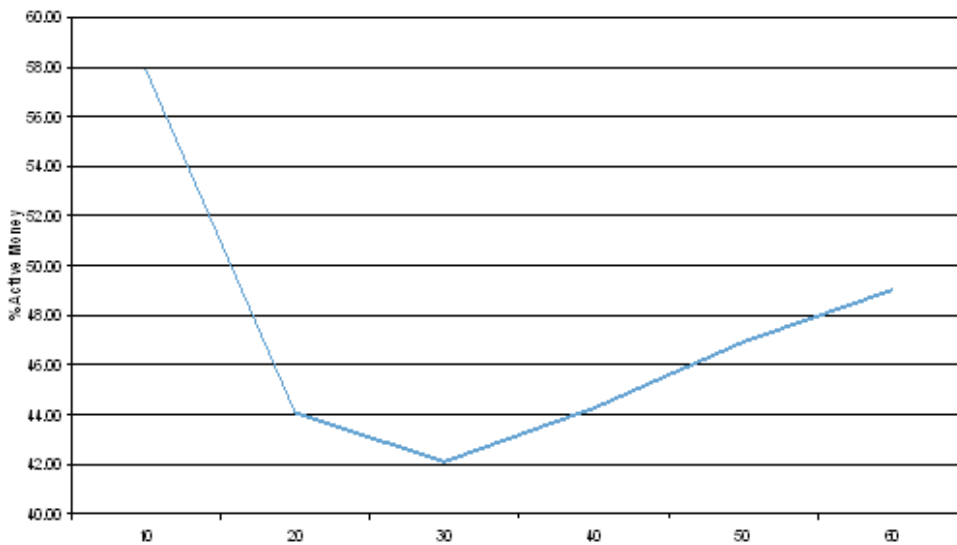
To illustrate this, Figure 2 below shows a series of naïve portfolios that equally weight the largest 10, 20, 30, 40, 50 and 60 stocks in the US, UK, Japanese and Australian markets. For the well diversified markets, US and Japan, the monotonic relationship previously alluded to holds. However, for the more concentrated markets, UK and Australia, the relationship between the number of shares held but the level of Active Money breaks down. This is an issue that both practitioners and academics need to be aware of when analysing Active Money levels in the Australian market and provides limitations to applying observations from other, more diversified markets, to Australian portfolios.

Figure 2: Active Money profiles

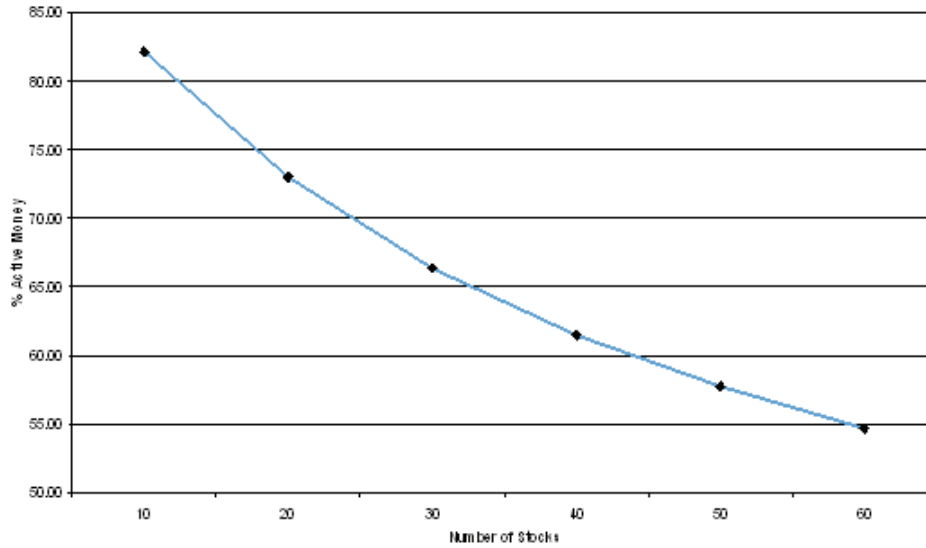
Russell Global Australia Index



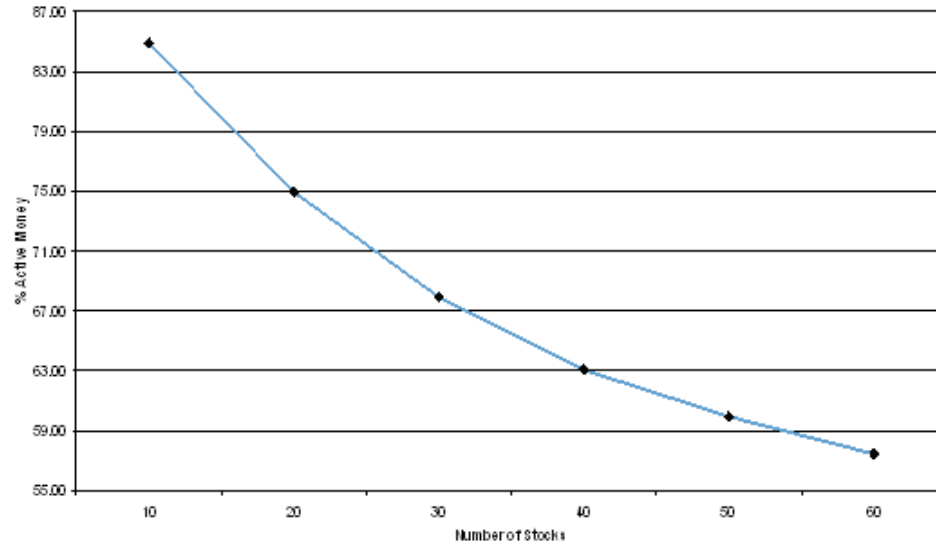
Russell Global UK Index



Russell Global Japan Index



Russell Global US Index



Source: Russell Investments

ACTIVE MONEY - EMPIRICAL STUDIES

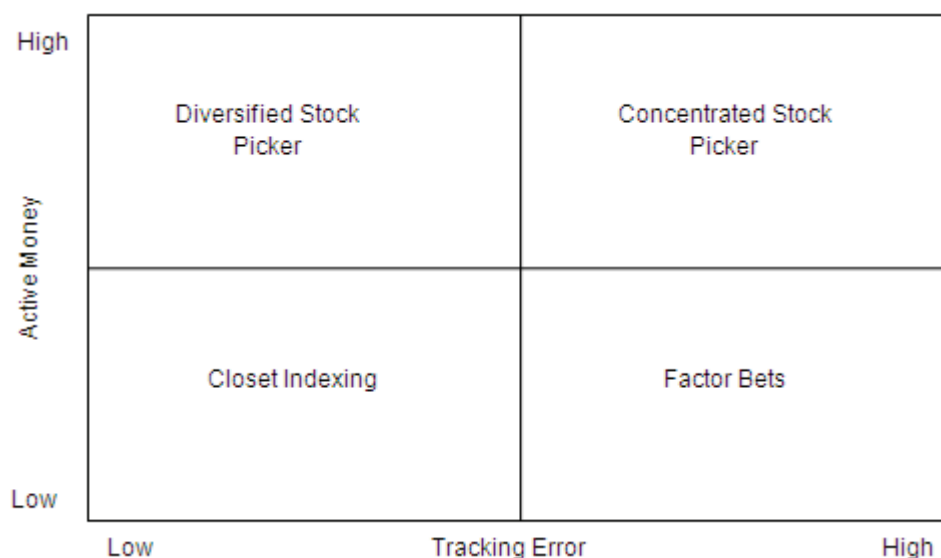
Most of the publicly available research in the area has focused on the question of whether more concentrated funds deliver better risk-adjusted performance than less concentrated funds. Researchers have used metrics that use the second moment of portfolio weights, where more emphasis is placed on larger bets, in order to study concentration.

A study by the Brandes Research Institute (2004) defined a measure of portfolio concentration as the reciprocal of the Herfindahl Index based on the portfolio weights. Brandes' Concentration Coefficient measure is not benchmark-relative and therefore not as interesting for the purpose of this research paper. However, working with Russell-Mellon data for the period 1992-2003 for US and Global manager universes, the report concluded that there was no relationship between portfolio concentration and performance or information ratios.

Kacperczyk et al (2006) investigated the relationship between sector deviation and performance of US Mutual Funds for the period 1984 to 1999. They found that funds with higher industry concentration outperformed funds with more diversified portfolios, where performance was measured in risk-adjusted terms, and that higher concentration portfolios tend to overweight growth and small-cap stocks whereas the lower concentration funds were closet index funds.

Brands et al (2005) used an analogue of the Herfindahl index for active weights at stock, industry and sector level for a portfolio. The authors termed their generic measure the Divergence Index. They examined an Australian dataset of 37 manager portfolios for the period 1995 to 2001, and found higher concentrated funds had higher risk-adjusted performance. Furthermore, they found the greatest difference in returns with respect to Stock Deviation, and that Stock Deviation's efficacy as a determinant of return increased if it was calculated after excluding large cap stocks.

While Russell Investments has been calculating and monitoring Active Money as part of its investment process since 2000, Cremers and Petajisto (2009) were the first to study Active Money in the academic context, terming the measure Active Share. They contrasted Active Money and tracking error, associating the former primarily with stock picking and the latter with factor timing. They recognised that the effects of stock picking and factor timing on a portfolio's composition and returns cannot be easily disentangled and that many managers use both methods in some degree. The authors contended that Active Money is a better gauge of the degree of active management than tracking error, as the latter understated the active management of diversified stock pickers and overstated the active management of managers who placed a few factor bets. Using US Mutual Fund data for the period 1990-2003, they found that the highest Active Money quintile outperformed the lowest quintile on both a benchmark-relative and on a risk-adjusted basis. In contrast, similar sorts on tracking error did not yield statistically significant results, and the quintile returns decreased for higher tracking error quintiles. Further, they investigated how Active Money and tracking error interact and suggested a two dimensional classification of funds as displayed in Figure 3 below. It is important to point out that the authors worked with ex-post tracking error which was calculated using 6-months of daily returns data.

Figure 3: Cremers and Petajisto classification of long-only US mutual funds


Source: Cremers and Petajisto (2009)

In double sorts, with the first sort on Active Money and the second on tracking error, the Concentrated Stock Pickers (funds with highest Active Money and tracking error) performed best, followed by Diversified Stock Pickers (funds with high Active Money but low tracking error). Closet Indexers (funds with low Active Money as well as tracking error) revealed index-like performance and Factor Bet managers (high tracking error and low Active Money) performed worst.

ACTIVE MONEY IN AUSTRALIAN EQUITIES

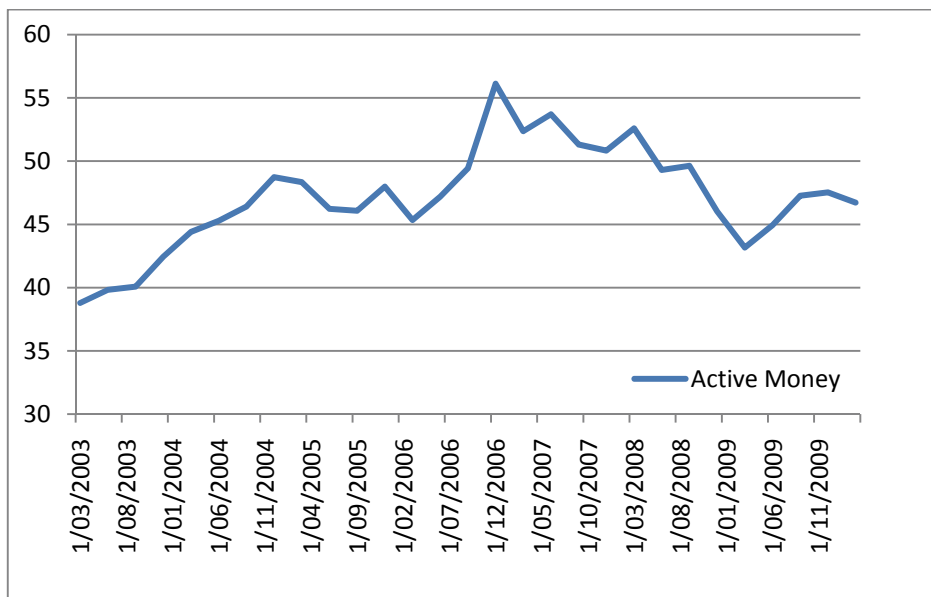
The analysis below tests the results of Cremers and Petajisto (2009) on Australian equity managers using quarterly holdings data from Russell Investments' database for the period March 2003 to March 2010. The underlying universe is controlled for survivorship bias. The benchmark for the analysis is the S&P/ASX 300 index. MSCI Barra's long term Australian equity model (AUE3L).² was used to generate the portfolio ex-ante tracking errors. Fundamental stock level data has been sourced from both Aspect and IBES.

Active Money through time

One of the several striking conclusions of Cremers and Petajisto (2009) is that, in aggregate, Active Money in active management has reduced over time. Looking at US mutual fund data for the period 1980 to 2002, they found a clear, long-term trend towards lower Active Money.

The analysis of the Australian equity universe does not reveal a linear trend over time. The results are more suggestive of conscious Active Money adjustments by Australian fund managers in response to changes in the market.

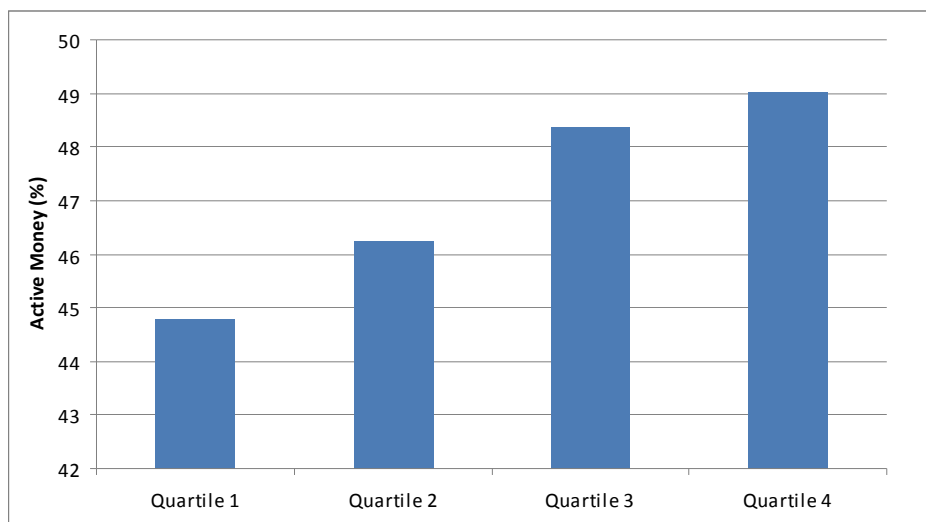
Figure 4: Median Active Money – Australian equity fund managers
(March 2003 to March 2010)



Source: Russell Investments. Quarterly holdings data from Russell Investment's proprietary database. Benchmark is S&P/ASX 300 index. MSCI Barra's long term Australian equity model (AUE3L).² was used to generate the portfolio ex-ante tracking errors. Fundamental stock level data sourced from Aspect and IBES.

Figure 5 below shows the relationship between Active Money and cross-sectional valuation dispersion (measured using a cross-sectional standard deviation of the underlying company P/E ratios at the end of each quarter, sorted into quartile buckets, with quartile 1 representing high valuation dispersion and quartile 4 representing low valuation dispersion).

Figure 5: P/E Dispersion Quartiles – Australian equity fund managers
(March 2003 – March 2010)



Source: Russell Investments. Quarterly holdings data from Russell Investment’s proprietary database. Benchmark is S&P/ASX 300 index. MSCI Barra’s long term Australian equity model (AUE3L).2 was used to generate the portfolio ex-ante tracking errors. Fundamental stock level data sourced from Aspect and IBES.

The relationship identified in Figure 5 suggests that Active Money is lowest when valuation dispersion is highest (Quartile 1) and highest when valuation dispersion is lowest (Quartile 4). Valuation dispersion is often used as a measure of future return dispersion. These results indicate that Australian fund managers reduced their Active Money levels when future return dispersion was greatest and increased Active Money when it was relatively low.

Greenwood 1999 explored the notion of guardian mentality, where active managers are more concerned with not losing than they are with winning. The results in Figure 5 above are supportive of a guardian mentality in the Australian equity fund universe, where managers have reduced the level of activeness in portfolios as risk/opportunity has increased. This could represent a significant agency cost to investors. A less sceptical interpretation of the results is that Australian equity fund managers have actively managed the level of ex-ante tracking error in portfolios to remain within stated investment guidelines.

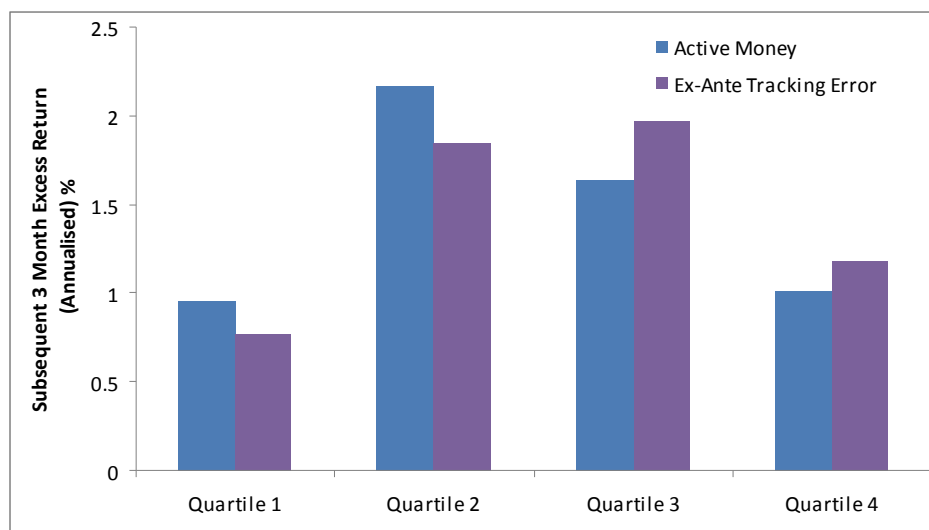
Despite the reason behind the changes in Active Money levels, this analysis supports the notion that Active Money is considered by Australian equity fund managers and is cyclical in nature. This increases the need for regular reporting of the level of Active Money for Australian equity funds to allow investors to make more informed decisions about products selected and also the amount of risk that they are willing to accept.

Active Money and returns

Cremers and Petajisto (2009), analysing US retail data and sorting by Active Money in each quarter, revealed that the highest two deciles had significantly high positive alpha while the bottom three deciles had negative alpha. Using five-by-five double sorts with Active Money and ex-post tracking error, they found that funds with high Active Money and high ex-post tracking error – the concentrated stock pickers – had the highest alpha while funds with high tracking error and low Active Money performed worst. The low Active Money and low tracking error funds were the closet indexers and produced benchmark-like performance and the high Active Money and low tracking error funds outperformed their benchmarks.

The data set used for this analysis of the Australian equity fund universe is not sufficiently large, especially for earlier periods, to create deciles or five-by-five double sorts. Instead, the analysis below shows quartiles for univariate sorts on Active Money and two-by-two sorts for the bivariate sorts with Active Money and Barra tracking error. The univariate sort results for Active Money are shown in Figure 6. Unlike Cremers and Petajisto (2009), all Australian equity managers showed positive excess returns.

Figure 6: Active Money and excess return – Australian equity fund managers
(March 2003 – March 2010)



Source: Russell Investments. Quarterly holdings data from Russell Investment’s proprietary database. Benchmark is S&P/ASX 300 index. MSCI Barra’s long term Australian equity model (AUE3L).2 was used to generate the portfolio ex-ante tracking errors. Fundamental stock level data sourced from Aspect and IBES.

Further, for Australian equity managers, there is no strong relationship between the level of Active Money or ex-ante tracking error and subsequent performance. The results in Figure 6 are contrary to a previous study by Brands et al (2005) which found a positive relationship between portfolio

concentration and future excess returns. However, the analysis in this paper uses a different data set and different time period, so the results are not directly comparable.

While it may seem somewhat intuitive that more concentrated or higher risk portfolios should result in higher excess returns, the underlying assumption is that all portfolios are built off the same insight. The results presented here for Australian equity managers are more palatable than Cremers and Petajisto (2009) and Brandes et al (2005) if you believe the biggest driver of excess returns is manager skill, not portfolio concentration. If it was possible to determine future excess returns by the level of portfolio concentration, active manager research would be a simple proposition.

That said, the same univariate analysis was performed on other Russell fund universes and similar results were found to that of Cremers and Petajisto (2009). In six of the eight markets examined, managers with the highest quartile of Active Money produced the largest subsequent three-month return. This relationship was strongest in the more diversified markets³. However, there was little evidence of a linear relationship between Active Money and subsequent returns.

Table 2: Excess return and Active Money across markets

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Australia	0.96	2.17	1.64	1.01
Europe	-0.62	-0.38	-0.49	0.45
EAFE	0.6	-0.14	0.05	1.54
Global	0.1	0.44	0.31	2.1
Japan	0.21	-0.44	0.17	0.83
US Market Oriented	0.31	0.36	0.57	1.08
US Growth	-0.33	0.61	0.44	1.54
US Value	0.49	1.36	0.92	0.63

Source: Russell Investments

Applying the framework used by Cremers and Petajisto (2009), the highest returns accrued to the factor bet managers, with diversified stock pickers marginally outperforming concentrated stock pickers during the period. Not surprisingly, the smallest excess returns accrued to the closet indexers.

Table 3A: 3-month excess returns (annualised) – first sorted by Active Money

Active Money	Ex Ante Tracking Error	
	Low	High
High	1.4	1.4
Low	0.8	1.9

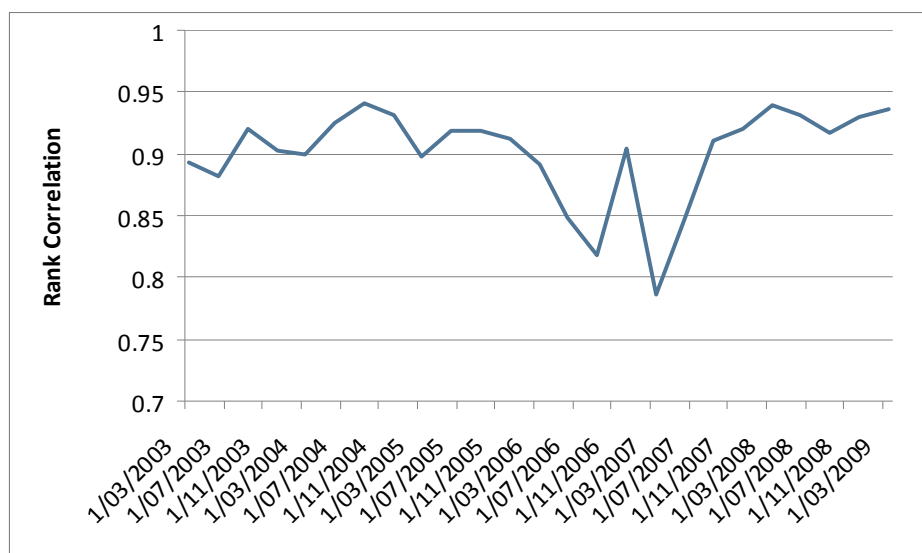
Table 3B: 3-month excess returns (annualised) – first sorted by ex-ante tracking error

Active Money	Ex Ante Tracking Error	
	Low	High
High	1.6	1.1
Low	0.7	2.0

Active Money and risk

The analysis of the Australian equity fund universe considered the rankings of managers in terms of Active Money alongside rankings based on Barra ex-ante tracking errors. Figure 7 shows the rank correlations between Active Money and Barra ex-ante tracking error, with the average rank correlation being 0.9.

Figure 7: Rank correlations of Active Money and tracking error – Australian equity fund managers (March 2003 to March 2010)



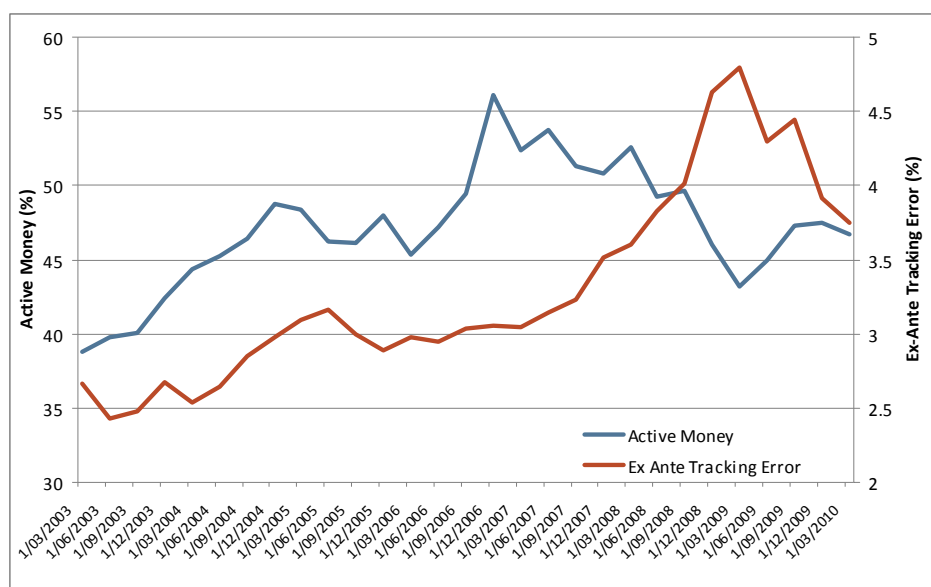
Source: Russell Investments. Quarterly holdings data from Russell Investment’s proprietary database. Benchmark is S&P/ASX 300 index. MSCI Barra’s long term Australian equity model (AUE3L).2 was used to generate the portfolio ex-ante tracking errors. Fundamental stock level data sourced from Aspect and IBES.:

Figure 7 is quite striking in the multi-manager context. In trying to understand the relative risk of manager portfolios – that is, whether Manager A is riskier than Manager B – can sometimes be as important as whether Manager A increased its risk with reference to its past. Figure 7 shows that for the former question, Active Money and tracking error give very similar relative rankings over time for the Australian universe.

Even though Active Money and tracking error yield high rank correlations, the overall levels of the two measures develop quite differently over time. In Figure 8 below, the Australian universe level Active Money peaked at the end of 2006, after which it showed a steady decline. Barra ex-ante tracking error has shown an increasing trend from September 2007 onwards.

An analysis based on Barra ex-ante tracking error alone would suggest that Australian equity managers increased the activeness of their portfolios from September 2007 to January 2009. However, a study that takes both Barra ex-ante tracking error and Active Money into account would conclude that most managers moved their portfolios closer to the benchmark and hence were aiming to manage and perhaps reduce risk.

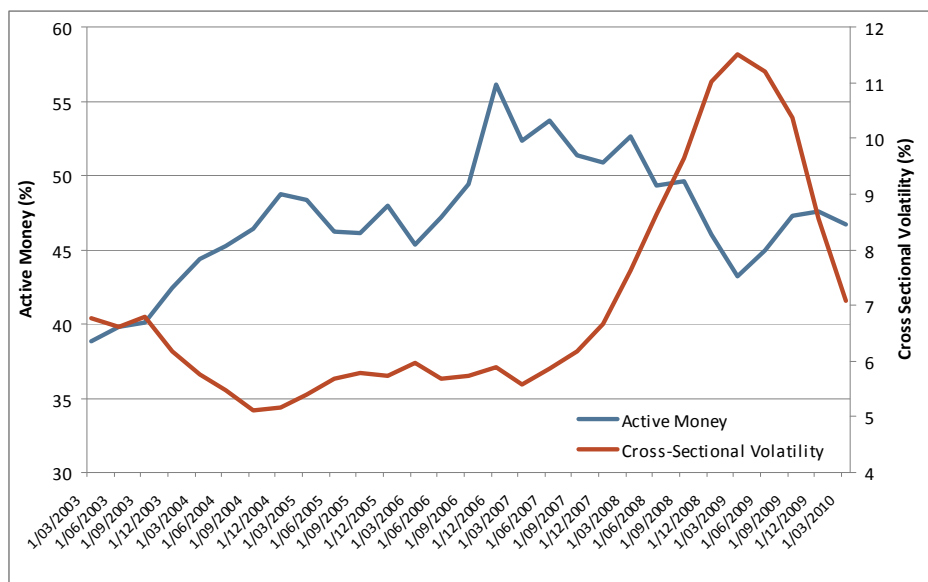
Figure 8: Active Money and Barra ex-ante tracking error – Australian equity fund managers (March 2003 – March 2010)



Source: Russell Investments. Quarterly holdings data from Russell Investment’s proprietary database. Benchmark is S&P/ASX 300 index. MSCI Barra’s long term Australian equity model (AUE3L).2 was used to generate the portfolio ex-ante tracking errors. Fundamental stock level data sourced from Aspect and IBES.

These results highlight the importance of evaluating portfolio risk using multiple metrics to get a true sense of the key drivers. Closer inspection of the results from September 2007 to January 2009, shown in Figure 9 below, shows the level of cross-sectional volatility in the Australian market increased significantly and had a significant impact on the Barra ex-ante tracking error numbers.

Figure 9: Active Money and cross-sectional volatility
(September 2007 to January 2009)



Source: Russell Investments

SUMMARY

In six of the eight markets investigated, managers with the highest quartile of Active Money produced the largest subsequent three month return. This relationship was strongest in the more diversified markets. However, there is little support for a monotonic relationship between Active Money and subsequent returns.

For Australian equity fund managers, there was no strong relationship between the level of Active Money or ex-ante Tracking Error and subsequent performance. These results are contrary to those observed in other markets, however the results support the notion that there is no axiomatic relationship between Active Money and subsequent performance.

For Australian equity fund managers, Active Money levels show a cyclical pattern through time. Interestingly, there is a hierarchical and inverse relationship between Active Money and valuation dispersion.

Active Money and Barra ex-ante tracking error most often yielded similar relative risk rankings. This was evidenced by the high rank correlations between manager Active Money and Barra ex-ante tracking error observed across time.

Active Money trends can provide risk insights distinct from industry standard risk models at the aggregate manager universe level and for comparing managers in a universe, especially when the volatility environment in a market changes suddenly.

One of the criticisms emanating from the Global Financial Crisis has been the lack of transparency that investors have into the funds that they are invested. This lack of transparency resulted in investors not being fully aware of the risks that they were exposed to. Active Money allows for increased transparency into a fund's characteristics, while also protecting the proprietary insights of the investment manager. While Active Money is not the panacea of portfolio analysis, it is a meaningful addition to the portfolio analysis framework and provides insights that are both complementary and additive to traditional portfolio analytics. The Australian funds management community would benefit from the disclosure of a fund's Active Money levels on a quarterly basis.

ACKNOWLEDGEMENTS

This research has been possible due to contributions of many colleagues. Steve Fox and Adam Goff highlighted Active Money as an important Capital Markets research topic.

ENDNOTES

1. The Herfindahl index, also known as Herfindahl-Hirschman Index, came about as a measure of the size of firms in relation to the industry and an indicator of the amount of competition among them. It is defined as the sum of the squares of the market shares of the firms, but is now used more generally to estimate the concentration of any group of entities where the weight of each entity in the group is available. The index values vary between 0 and 1 with higher values indicating higher concentration.
2. Though our choice of tracking error estimate does not allow for a like for like comparison of results with the Cremers and Petajisto (2009) paper, it is in fact more in conformation with the intuition of its authors who rightly consider tracking error as a measure predominantly of the factor bets taken by a manager; whereas ex-post tracking error is a result of both stock selection and factor bet performance, Barra's ex-ante tracking error forecast mainly focuses on factor information.
3. Though economically significant, the results are not statistically significant. Future research could investigate whether survivorship bias is enhancing the returns of the highest active money quartiles.

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