

Optimal Fund Size, Funds Flows and Fund Performance in the Presence of Structural Breaks

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Abstract

The research project investigates the relationship between fund performance and fund size and funds flows of actively managed Australian funds. The data are sourced from Morningstar and include open-end fund returns and fund characteristics (size, age, fees, style, flows/inflows and other factors). The study develops a robust unbalanced panel data methodology to trace funds performance and money inflows (outflows) to (from) individual funds with as little as six months of history. Hence the research design avoids any potential survivorship bias. In order to estimate the optimal fund size, the project utilizes a flexible non-linear functional form that models fund performance (inflows/outflows) conditional on size and other controls both observed and unobserved variables.

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1. Introduction.

The aim of this research project is to investigate how fund performance is related to fund size of actively managed Australian funds over the period: 1990-2006. The project will contribute to knowledge as follows. Firstly, the study develops a new robust panel data approach to trace the performance of individual funds with as little as six months of history. This enables one to consider all existing funds within a given category and thus the research design avoids any potential survivorship bias (see Brown et al., 1992; and Brown & Goetzmann, 1995 for problems of survivorship biases in performance studies). Secondly, towards the end of our sample period, we observed a major policy change for funds in which Superannuation schemes are the main players.¹ Our empirical analysis of this structural change and the first impact of the new policy which is aiming to increase overall the industry competition will enhance our understanding of the fund (super fund) industry in Australia and will have major economic (political) significance. To best of our knowledge this is the first study to investigate the impact of the Super Choice in Australia with respect to performance which is conditional on the size, age and inflows of a particular fund. Thirdly, contrary to the use of traditional regression (OLS) techniques, the proposed project utilizes a flexible non-linear (panel data) functional form. This is extremely important, as the non-linearity will enable us to estimate the optimal fund size with regard to fund performance. Finally the study extends the current methodology of a threshold analysis using panel data (Hansen 1999) by allowing for unobserved time effects: these allow for unobserved macroeconomic effects – potentially very important with regard to fund performance over time.

One of the most controversial topics within the fund management performance literature is the debate on the interdependence between fund performance and the size of the fund. Khorana and Servaes (1999) and Chen et al. (2004) find a positive relation between the fund size and funds performance. However, Grinblatt and Titman (1994), Dahlquist et al. (2000) and Gallagher and Martin (2005) find no association between the fund's size and performance. On the other hand, small-size funds in the

¹ On 1st of July 2005, the Federal Government of Australia implemented a new legislation to the superannuation industry providing the employees with a choice to select their own superfund.

US are found to outperform a larger fund's family (Arshanapalli et al. 1998; Chevalier and Ellison, 1999). Similarly, in Australia Chan *et al.* (2004), while using 26 Australian 'flagship' funds, find that increasingly large-size funds suffer poor performance on average in comparison to the small-size funds. The latter studies argue that large open-end funds experience diseconomies of scale and hence their future performance deteriorates. Hence there is an ongoing argument about the "right amount of assets under management" (as early as Perold and Salomon, 1991). On the other hand, the literature on the mutual (hedge) funds agrees that funds that have higher returns experience higher net flows (Agarwal, Daniel, and Naik, 2004 for hedge funds, and Ippolito, 1992; Chevalier and Ellison, 1997; Goetzmann and Peles, 1997; Gruber 1996 for mutual funds). In addition, Sirri and Tufano, 1998; and Zheng 1999 find a positive convex relationship of the fund's flow-performance.

The rest of the paper is as follows. Section two introduces the methodology. Section 3 summarizes the expected outcome of the project.

2. Methodology

The project is concerned primarily with the effects fund size has on fund performance. Of course, there will be numerous factors, such as the fund's age, manager's style and the fees charged and, industry policy conditions that will also determine the fund performance. Before focusing on the performance-size (performance-inflow) relationship, it is important to "net out" the effects of these additional variables. However, in addition to such "observed heterogeneity" of the fund, there will be also undoubtedly "unobserved heterogeneity" (for example, fund manager remuneration and/or the fund manager skills: "hot hands" based on experience, education and other factors). Moreover, there will be also macroeconomic effects (market conditions, business cycles and so on) that will affect fund performance as well. Just as it is important to "net-out" the effects of the other observed variables, before turning attention to the performance-size relationship, it is also important to do the same for these "unobserved" effects. As it is well-known in the literature, this necessitates the use of *panel data* where the same economic units (here managed funds) are observed over time (for example, see Baltagi, 2001).

The data will be an unbalanced panel dataset sourced from Morningstar, from SIRCA and or Mercer. These include open-end fund returns (row and total including all the contributions), net asset values (NAVs), to measure flows and inflows - total net assets (TNAs) reported monthly through the period and fund characteristics such as size, age, fees (MER, entry loadings and exit fees), style (value, growth, GARP, neutral, others), type: wholesale or retail, and other factors (some a cross-sectional parameters or reported on quarterly or annual basis).

Recall that the literature on fund performance relative to size is conflicting. However, the literature has determined empirically the effect of size on performance, using standard linear regression techniques. In other words, the functional form of the relationship between performance and size has been imposed on the data: even if size and squared size ($size^2$) are used, this still imposes a basic quadratic – linear in the estimated coefficients form. However, this linear approach cannot deal with forms which more realistically take functional shapes such the ones driven by *j-shaped* or *u-shaped* (or inverted *j- & u-shaped*) functional relationships. Thus, it is our contention here that potentially there exists an inherently non-linear convex interdependence between size and performance. This relationship is even more complex while we examining the entire period 1990-2006 which also include the of Super Choice (post July 2005) sub-period. Hence, we are reticent to *a priori* impose the functional form of the relationship by considering a polynomial in size (*e.g.* size and $size^2$).

We utilize a novel approach by initially conditioning on all other possible explanatory variables and unobserved individual and time heterogeneity. Then we allow robust flexible form estimation for the performance-size relationship. We will do this by allowing for multiple breakpoints, or threshold effects, in the performance-size profile: within each so-defined range of fund size, fund size will be allowed to have a differing effect on fund performance. In other words, in given ranges of (empirically determined) asset sizes, the fund size will have a differing effect of fund performance. In elucidating any potential non-linearities in the relationship, we will be able to determine the optimal fund size with respect to performance.

Using panel data and conditional on unobserved individual (fund) effects, Hansen (1999) proposed a method for threshold analyses. However, our project will extend

this to additionally allow for unobserved time effects, which are likely to be extremely relevant for fund performance as they proxy macroeconomic effects. The proposed procedure will simultaneously determine: the optimal number of breakpoints; the preferred model in terms of the presence, or not, of unobserved time and/or individual effects; and the effect (or more precisely, the marginal effect) of fund size on fund performance in differing fund size ranges (estimated as the distance between the estimated threshold, or breakpoint, effects).

3. Expected outcomes of the project

- Long term relationship with the industry partner (Mercer is a likely industry partner) for joint collaborative research and consultancy
- Refereed international conference publications (articles to be submitted to leading international finance/econometric conferences held in late 2006 and or early 2007)
- Refereed journal articles. The articles will be submitted to high tier finance/econometric journals and also a practitioner type of journal such as JASSA
- Industry funding for a proposed industry Linkage ARC grant

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