QUT School of Economics and Finance

Discussion Paper and Working Paper Series

Australia's Retail Superannuation Fund Industry: Structure, Conduct and Performance

Adam Clements, Gemma Dale and Michael E. Drew

Abstract:

In this analysis of Australia's superannuation arrangements it is our conjecture that the structure and conduct of the retail superannuation industry in Australia directly impacts performance, resulting in the delivery of costly funds management products which add minimal value for investors over the long term. In this study, we take the perspective of an investor faced with selecting a retail superannuation fund, and explore the extent to which various differentiating characteristics (such as style, rating and cost) provide insights into fund quality which uses a variety of asset pricing models for the period 1991 through 2003. The results of this study, suggest that investors cannot garner superior risk-adjusted returns through reliance on such characteristics.

Corresponding Author: Associate Professor Michael E. Drew, School of Economics and Finance, Queensland University of Technology, GPO Box 2434, Brisbane, Qld, 4000, Australia. Tel: +61-7-3138-1481; Fax: +61-7-3138-1500. Email: m.drew@qut.edu.au;

Introduction

After the family home, superannuation retirement savings are the most important financial asset for Australians, and, within this sector, retail superannuation funds are the fastest growing type of investment vehicle (Australian Prudential Regulation Authority [APRA], 2003).[1] The structure of Australia's system of superannuation, characterised by compulsory contribution (under the Superannuation Guarantee Levy [SGL]) and preservation, has resulted in a burgeoning marketplace for funds management services.[2] The conduct of fund managers, providing superannuation investment products to retail investors, reflects the behaviour of agents under conditions of monopolistic competition – output is characterised by relatively high costs, limited differentiation, and an emphasis on advertising and marketing.[3] The conduct of fund managers has particular relevance to the current debate surrounding member choice in superannuation, as such industry characteristics may erode the potential welfare benefits of any such policy.

It is our conjecture that the structure of Australia"s superannuation system and conducts of the retail superannuation funds management industry, directly impact performance, resulting in the delivery of costly retail products which add minimal value for investors over the long term. In this study, we take the perspective of an investor faced with selecting a retail superannuation fund, and explore the extent to which various differentiating characteristics (such as asset selection style [style], fund rating [rating], and management expense ratios [cost]) provide insights into fund quality.[4] The results of this study suggest that investors cannot garner superior risk-adjusted returns through reliance on such differentiating characteristics.

The Structure-Conduct-Performance (SCP) Paradigm

The Structure-Conduct-Performance (SCP) paradigm is a model of industrial organisation which allows for the analysis of industry performance in the light of its organisational structure and behavioural characteristics. This model has been used to examine the mutual funds industry in the United States (Davis and Steil, 2001) and Europe (Otten and Schweitzer, 2002), but is yet to be used as a framework for analysis in the Australian context. In this study, the SCP paradigm is used to analyse the unique characteristics of Australia"s highly regulated and increasingly complex superannuation system and the resultant performance of fund managers within the retail environment.[5]

---

[1] *In terms of growth in assets under management (APRA, 2003).*

[2] *The SGL requires that all employers make contributions, initially equivalent to 3% of Ordinary Time Earnings in 1992–93 and increasing to 9% in 2002–03, to superannuation on behalf of each employee. Employers are entitled to a tax deduction for these contributions, which are taxed at 15% on entry to the superannuation environment and are subject to preservation rules. An estimated 88% of all workers are covered by the SGL, with an estimated balance of AUD 70,000 per member (APRA, 2003).*

[3] *For the purposes of this study, retail investors are those who do not invest on a professional basis. The industry definition generally excludes those with less than $100,000 to invest; 'wholesale' investments are generally offered at approximately half the cost of retail investments and are generally not offered as superannuation vehicles.*

[4] *For an excellent survey of Australia's system of superannuation, see Bateman, Kingston and Piggott (2001). For a detailed analysis of the compulsory nature of the system, see Bateman and Piggott (1999).*

[5] *The number of regulatory changes made to Australia's superannuation system exceeded 2,000 in the period 1988 through 1998 (Clitheroe, 2001).*

The SCP paradigm, pioneered by Mason (1939, 1949), provides a useful tool in analysing industrial organisation, offering a rationale for the existence and profitability of an industry that fails to offer consistent value for its customers.[6] Although traditional economic models can, at times, be difficult to identify in the real world; the SCP model of industrial organisation and firm behaviour is designed to elucidate a causal relationship between an industry"s characteristics and composition, the conduct of individual firms within that industry, and their resultant performance, with associated outcomes for the consumer.

The SCP paradigm provides a useful methodology to explore the retail superannuation fund industry in Australia. Previous studies have explored the extent to which superannuation funds have delivered satisfactory investment performance[7], the skill of individual fund managers[8], and conduct-related characteristics, such as investment and administration costs.[9] The results of these studies suggest risk-adjusted returns from the retail superannuation market fail to exceed that of a passive alternative. However, while these studies provide important empirical insights into industry performance, they offer little in the way of a causal relationship between industry structure, conduct and investment performance. We commence our discussion with a stylised SCP analysis of Australia"s current superannuation arrangements presented in Table 1.

Table 1

The SCP Paradigm and the Australian Retail Superannuation Fund Industry

Australia"s Retail Superannuation Industry

Characteristic	Evidence	Citation
Structure		
Government Regulation	Highly regulated, increasingly complex.	Bateman, Kingston and Piggott (2001), Clitheroe (2001).
Taxes and Subsidies	Concessionally taxed at 15%.	Gallery, Brown and Gallery (1996), Knox (2003).
Macroeconomic Policies	Strongly encouraged.	APRA (2003).
Elasticity of Demand	Highly inelastic.	Bateman and Piggott (1999), Beaman (2003).
Rate of Growth	Strong, relatively stable growth.	Abbott (2004).
Number of Buyers and Sellers	Many buyers and a stable number of sellers.	Bateman (2002), Drew and Stanford (2003c).
Barriers to Entry	High (particularly due to regulation).	APRA (2003).

---

[6] *Mason's original theory has been developed by Bain (1959), Clarke (1961) and Caves (1972), with Scherer (1979) and Scherer and Ross (1990). The SCP approach undertaken in this study reflects the work of these more recent authors.*

[7] *Coleman, Esho and Wong (2003), for example, find that retail and industry funds have the lowest returns of the various types of superannuation fund. Drew and Stanford (2003c) undertake a multi-factor asset pricing evaluation of retail superannuation funds.*

[8] *Gallagher (2001) and Drew, Veeraghavan and Wilson (2002) report limited positive selection or timing ability for Australian superannuation fund managers.*

[9] *Clare (2001) analyses the costs associated with various types of superannuation funds. Drew (2003) and Drew and Stanford (2003) consider cost in relation to performance.*

Conduct		
Product Differentiation	Only slightly differentiated products.	Clements and Drew (2004).
Pricing Behaviour	Above marginal cost.	Clare (2001), Drew (2003).
Advertising	High levels of advertising and marketing, particularly to independent distribution channels.	Beaman (2003).
Performance		
Product Quality	Poor to average.	Gallagher (2001), Coleman, Esho and Wong (2003), Drew and Stanford (2003c).
Allocative and Productive Efficiency	Poor to average.	Gallery, Brown and Gallery (1996), Bateman (2002), Drew (2003).
Price	Above marginal cost.	Clare (2001), Drew and Stanford (2003).

The preponderance of international studies has indicated poor risk-adjusted performance by mutual funds when compared with a passive benchmark over the last fifty years.[10] As a result of this persistent poor performance, the funds management industry lends itself to an exploration using the traditional SCP paradigm. As previously discussed, this framework is utilised by Otten and Schweitzer (2002) to compare the mutual funds industries in Europe and the United States of America, and by Davis and Steil (2001) in their treatise on institutional investors. The premise of these contributions is that poor risk-adjusted performance is the direct result of specific structural and behavioural characteristics, which may be generic or industry- and country-specific.[11] Given this international evidence, it is timely to consider one of the fastest growing fund-types, namely retail funds, in light of the structure, conduct and performance of Australia"s superannuation arrangements.

Structure

Superannuation is the primary retirement savings vehicle in Australia. Pension schemes in the United States[12], the United Kingdom[13], New Zealand and the majority of European

---

[10] *Sharpe (1966), Jensen (1968), Malkiel (1995), Gruber (1996) and Wermers (2000) have found evidence to support Fama's (1970) efficient market hypothesis in analyses of fund manager performance across a number of markets and time periods. In the UK, Blake (1989) and Blake and Timmerman (1998) report similar findings.*

[11] *After being rejected several times over a six-year period, the superannuation choice legislation allowing employees to choose where their employer contributions will be invested was passed in the Senate in late June 2004. Bateman (2002), Drew and Stanford (2002, 2003b) and Clements and Drew (2004), for example, have considered the debate regarding member choice of fund. We will return to this most important of issues in the concluding remarks section of the paper.*

[12] *Baldwin (2004) provides an interesting discussion of the shift away from defined benefit pensions in the US to voluntary arrangements through the use of 401k plans.*

[13] *Johnson (1998) provides a historical guide to the changes in the UK pension system and the current environment, estimating that approximately 75% of employees in 1998 were covered by a voluntary scheme. Further analysis is provided in Blake (2003).*

nations[14] are characterised by voluntary or consensual arrangements between employers and employees; superannuation in Australia is unique in the international sphere due to the involuntary or contractual nature of membership. Although superannuation had been in existence since the 1920s[15], the introduction of the SGL in the 1991 Federal Budget required that employers provide a prescribed level of superannuation support to the vast majority of employees, resulting in the contemporary "three-pillar" approach to retirement incomes policy (age pension, compulsory superannuation and voluntary retirement income savings).

In the Australian setting, there are five types of superannuation fund.[16] Retail superannuation funds, the focus of this study, dominate the marketplace in terms of membership and investment assets; and are most accessible to those with choice. Corporate, industry and public sector funds rarely offer membership to non-employees; small funds (commonly known as "self managed" or "do-it-yourself [DIY]" funds) have ongoing costs of approximately AUD 1,500 to 2,000 per annum, and are therefore prohibitively expensive for most investors (equating to an administrative charge in excess of 2% per annum on an average balance of AUD 70,000 and excluding transaction costs associated with the investment of the monies). Within the existing structure of the superannuation industry, retail funds offer the most cost-effective and accessible vehicle for employees who are not bound to an existing employer-sponsored fund.

Table 2 - Superannuation Fund Type (as at September 2003)

Type of Fund	Number of Funds	Members (000"s)	Assets (AUD billion)
Corporate	1,759	1,107	59
Industry	104	7,691	59
Public Sector	73	3,001	111
Retail	**231**	**13,066**	**186**
Small Funds	275,523	511	118
Total	**277,690**	**25,376**	**533**

NB: Fund numbers are preliminary based upon 2001–02 returns.
Source: APRA (2003)

The domination of the retail superannuation, comprising 34% of total superannuation assets, is expected to continue, and possibly increase (APRA, 2003). Retail

---

[14] *Anderson (2004) provides a comparison of compulsory state-funded pension arrangements in Sweden with voluntary private sector arrangements in Denmark and the Netherlands; Disney (2003) provides a review of pension arrangements and structural reform in twelve European nations plus the US and New Zealand.*

[15] *The Superannuation Fund Management Board was established in 1922 under the Superannuation Act 1922 to deal with the administration and management of the first superannuation scheme for Commonwealth employees. Other voluntary arrangements between employers and employees were later established under the Act.*

[16] *Superannuation funds are defined in the following way by the regulatory authority, APRA: 1. Corporate funds which are sponsored by a single non-government employer or group of employers; 2. Industry funds which are established under an award or agreement; 3. Public sector funds which are sponsored by government employers or by government business enterprises; 4. Retail funds which are pooled super products marketed by intermediaries to the general public; they include master trusts and personal superannuation products offered by life insurance companies and other financial institutions; and, 5. Small Funds (which are commonly referred to as DIY funds) which have fewer than five members.*

superannuation funds have experienced asset growth of more than 250% and a doubling of fund membership since mid-1994, while, over the same period, members of corporate and public sector funds have decreased in number (APRA, 2003). Market commentators suggest that retail funds will experience the highest level of growth over the next decade, almost tripling in value (Abbott, 2004).[17] Retail superannuation funds form the focus of this study due to their current dominance and future growth prospects, and for their portability, cost-effectiveness and accessibility to all sectors of the investment market.

Conduct

Australia"s superannuation system places constraints upon both fund managers within the marketplace and the retail investors" funds they manage. This directly impacts the conduct of participants and the extent to which such conduct generates welfare gains to the investing public. This study gives particular emphasis to the conduct of fund managers, with particular consideration given to the various characteristics that differentiate funds – style, rating and cost – to assess the value (or otherwise) of incorporating such information into the fund selection decision.

We commence our discussion with an examination of style. In portfolio construction, fund managers face myriad choices regarding asset selection – what will be the key characteristics of each individual stock and company in which funds will be invested? In answering this question, fund managers will typically adopt criteria with which to construct a portfolio – these criteria are said to reflect the manager"s "investment style" or "investment philosophy".[18] The style of asset selection is a broadly accepted point of differentiation and has recognised implications within the financial services industry in particular. Industry wisdom recommends that investors not invest in a single manager to avoid "style bias" impacting investment returns. Financial planners suggest a strategy of diversifying across styles to minimise the impact of holding a "Value" manager when "Growth" stocks outperform the market.[19] We will test these differentiation points in the following section.

Style is frequently used by superannuation fund managers to differentiate their products and attract funds inflow; the information surrounding style, however, can be esoteric and has, in the Australian context, largely lacked empirical evidence linking investment process and performance. As investors seek to maximise the return on their capital, alternative sources of information are regularly sought as a predictor or indicator of future performance potential. As a result of this information asymmetry, the use of ratings is now common practice in industry (Beaman, 2003; Gerrans, 2004, 2006). Fund manager ratings, as provided by research houses, are the result of reviews of each manager"s capabilities in terms of criteria such as personnel, risk-management, investment processes, and business management.[20] These reviews are then distilled to a single rating (such as a ★ or alphabetical system) or ranking system (such as "Top 5 Australian

---

[17]   It is also postulated that the implementation of the employee choice of fund legislation is likely to increase the demand for retail superannuation investment services: see Drew and Clements (2004).

[18]   See Damodaran (2002) for a guide to investment styles. Varying investment styles in the portfolio may also provide opportunities for mean-variance efficient investors.

[19]   For a complete discussion on the identification and impact of mutual fund styles, see Brown and Goetzmann (1997).

[20]   Blake and Morey (2000) provide detailed discussion regarding the process of fund manager ratings.

Equity Fund Managers"), with the latter frequently published as a more user-friendly version of the former.[21,22] This study considers whether such ratings are "information-rich" regarding the quality of the manager, given the accessibility of this information, and the relatively low cost to the end user,

The final area of differentiation considered in this study relates to cost. The standard cost structure for the retail superannuation funds industry (consistent with the managed funds industry in Australia and the mutual funds industry internationally) involves the imposition of entry and/or exit loads, and an ongoing cost to the investor, termed the Management Expense Ratio (MER).[23] Entry (exit) loads are deducted from the investor"s balance at the date of investment (redemption), and in Australia can be up to 5.5%.[24] The MER is levied as a fixed percentage of funds under management, and is deducted from the investment return.[25] The MER is therefore independent of fund manager performance, and is used in this study as a determination of quality – specifically, we consider the extent to which the investor receives "value" for the cost of the fund manager"s services.[26]

Data Collection

Data for this study were provided by the independent agency, van Eyk Research (vER) Limited. vER is Australia"s largest funds management research house, providing research services to investors, financial planners and the broader financial services industry. It has been estimated that around two-thirds of financial planners in Australia utilise vER"s published research when advising their clients.[27]

Single-sector or "boutique" funds, managing portfolios of Australian equities, were selected for analysis in this study, reflecting the importance of this asset class. Australian equities are the "growth driver" of superannuation portfolios and dominate the asset selection choice of investors in Australia – accounting for over 45% of all superannuation assets (APRA 2003). The original sample included the monthly returns net of MER (but excluding entry and exit loads) of 411 funds (category specifications: "Australian Equities – Non Specialist Superannuation – Retail) for the period 1991 to 2003. The commencement of the sample period reflects the announcement of superannuation

---

[21] *Generally these ratings are available to retail investors through direct subscription, newspaper or special-interest magazines, or through a dealer group which subscribes; fund managers who receive positive ratings will also regularly cite their results in marketing and advertising material.*

[22] *See Beaman (2003) for discussions regarding the important role of research houses in Australia.*

[23] *At the retail level, the MER usually includes some form of ongoing commission, regardless of whether the client was introduced to the product by a licensed advisor. Where the product was purchased from an online broker, for example, the broking house receives this commission.*

[24] *www.irate.vaneyk.com.au provides a comprehensive listing of entry and exit loads for Australian managed funds, including those in the retail superannuation industry. Commission payable from entry and exit loads can be up to (and in rare cases, exceed) 5%.*

[25] *For example, a fund manager who generates a gross return of 8% per annum, while charging costs of 2% per annum, will credit 6% to the investor's account on an annualised basis.*

[26] *Some funds include a performance fee in addition to the MER, although these are difficult to disclose, and therefore discouraged by the regulator. None of the funds in the retail Australian equity superannuation marketplace included performance fees for the period of analysis in this study.*

[27] *Beaman (2003) reviews a recent survey of the financial planning industry and its affiliations with research houses.*

arrangements in the 1991 Federal Budget. Following Gruber (1996), to mimimise the problem of survivorship bias, all funds, including terminated funds during this observation period, were included in the data collection. The initial sample, however, included duplications and funds incorrectly specified (such as those investing purely in cash or property trusts, and diversified funds).

[28] The initial sample was reduced further through the removal of funds with limited return histories (n < 30 months), resulting in a final sample of 181 funds. Summary statistics from the final sample are provided in Table 3.

Table 3 - Summary Statistics

Fund Status	Open	68
	Closed	61
	Finalised	52
Asset Allocation	Mean Cash Holding	1.77%
	Mean Australian Equities	96.18%
	Mean Property	0.85%
Minimum Balance[29]	Mean	$2,180
	Maximum	$20,000
	Minimum	Nil

NB: Approximately 1% of the balance of the fund sample is not accounted for in asset allocation. For the purposes of this study, this discrepancy has been assumed to be invested in cash.

The style classifications used in this study have also been obtained from vER. vER do not accept style definitions from fund managers themselves, but determine such classifications independently
.[30] One of the limitations of the study is that the ratings provided by vER and the fees charged by the fund as at 2003 are assumed constant over the observation period. An interesting direction for future research would be to construct a time-series of such data.

---

[28] *The Advance Conservative Equity Fund, for example, had less than 15% of its assets invested in Australian equities, with the remainder invested in cash (30%), property (30%) and fixed interest (25%), and was therefore excluded from the data set. For the purposes of the study, funds sampled were also required to have performance data of 30 months or more. Australian Skandia Global Super Solutions and Skandia One Super, for example, are relatively recent offerings (with fourteen and five months of data respectively), and therefore the twenty-seven separate Australian equity fund options available via these mastertrusts were excluded.*

[29] *The majority of retail superannuation funds specify a minimum initial investment. Balances of less than $1,000 are legally protected against erosion through fees which provides a significant disincentive for retail funds to accept particularly small rollovers or one-off contributions. Minimum balance requirements are often waived where the investor commits to making regular contributions via a direct debit arrangement.*

[30] *The vER style definitions are described as follows: Growth: This style favours investment in companies that have the capacity to sustain future growth in earnings and are generally regarded as quality companies; Value: This style is typically less concerned about the growth component when assessing the valuation and will often include companies with less reliable prospects; GARP: Typically the GARP style is a subset of the Growth, GARP stands for Growth At a Reasonable Price; Style Neutral: Style neutral managers are those that attempt to manager their portfolios with a balance of growth and value styles; Rotational: Rotational managers are those that will shift their emphasis to/from Growth to Value companies when they see opportunity and/or risks; and, Multi-Manager: Multi-manager portfolios are built using a combination of the styles (there are none of these managers in this sample). (www.irate.vaneyk.com.au, 2004).*

Table 4 - Style Characteristics

Style	Number of Funds	Proportion (%)
Growth	21	11.6
Value	29	16.0
GARP	49	27.1
Style Neutral	23	12.7
Rotational	0	0.0
Multimanager	23	12.7
Moderately Active	3	1.7
Unspecified	17	9.4
Unknown	16	8.8
Total	**181**	**100**

Fund manager ratings are considered a significant determinant of fund flows, and are an important characteristic considered by investors when choosing where to invest their superannuation assets.[31] The following ratings included in this study for the funds were provided by vER.

Table 5 - Rating Characteristics

Rating	Number of Funds	Proportion (%)
AA Rating	1	0.6
A Rating	32	17.7
B Rating	71	39.2
H (Hold) Rating	10	5.5
FW (Fund Watch)	0	0.0
Not Rated	67	37.0
Total	**181**	**100**

For the purposes of this study, cost has been defined as the MER of the fund, which is designed to take account of ongoing fund costs and fees. The MER does not include entry or exit loads (immediate or deferred), buy-sell spreads and switching fees. It should, however, include all other anticipated ongoing costs to the fund member. Those funds

---

[31] *The vER style definitions are described as follows: AA: Very high confidence of the manager adding value relative to competitors over a full investment cycle (usually 3–5 years) within the guidelines specified by their investment style. Tracking error is actively controlled and the style should add value in most market conditions. Recommended Manager; A: High confidence in the manager adding value relative to competitors over a full investment cycle (usually 3–5 years) within the guidelines specified by their investment style. The tracking error is actively controlled; however, on a comparative basis there are some weaknesses in the process, people or organisation. Recommended Manager; B: There is less certainty that the manager would add value relative to competitors over the full investment cycle. Alternatively, in our opinion this manager is not in the top quartile of managers due to a lower rating of some key aspects of their organisation. If the client has a long-term timeframe they should consider switching to an A or AA rated manager on review. Average Manager; H (Hold): A manager under aspects of change. Keep under review, but do not add further funds. FW (Fund Watch): The fund has a poor risk return trade off and the ability to add value relative to competitors is difficult to discern. Alternatively there are problems, disruptions or uncertainties that could lead to poor investment returns in the future. Withdraw funds subject to a review of the costs of doing so. Fund Watch; and, NR: Not rated. It is important to note that vER state "…our assessment of ability to add value relative to competitors is based to a significant degree on our analysis of the managers' capabilities and specialisation and whether these will be useful in the phases of the economic cycle (original emphasis) that are ahead in the next one to five years." (www.irate.vaneyk.com.au, 2004).*

without MER information were assumed to have the same ongoing expenses as those within the same service or pool of funds.[32] Table 6 below provides summary statistics for the costs associated with the pool of funds examined in this study.

Table 6 - Cost Characteristics

Expense Type		
MER	Mean	2.1%
	Maximum	3.1%
	Minimum	0.9%
Entry Fee	Mean	3.3%
	Maximum	6.0%
	Minimum	0.0%
	With	133
	Without	48
Exit Fee	Mean	0.6%
	Maximum	5.5%
	Minimum	0.0%
Ongoing Commission	Mean	0.5%
	Maximum	1.1%
	Minimum	0.0%

NB: For comparative purposes, all entry fees have been assumed to include GST. This may not be the case, however, and also will not apply to those funds closed or finalised prior to 30 June 2000.

A number of mastertrusts differentiate between "administration fees" and "fund manager fees", and report MERs which are significantly lower than the market average, as ongoing administrative fees have not been taken into consideration. Where the fund administrator has chosen to impose several types of ongoing fees on a single account, these costs have been combined to produce a single fee representative of the normal ongoing fees levied upon the consumer account. For instance, the AMP Flexible Lifetime Super Fund charges an MER of only 0.3% for its AMP Australian Equities option; however, an additional administration fee of 1.55% is also levied upon the account. For the purposes of this study, therefore, the applicable MER for this fund is 1.85% per annum.[33]

Analysis

This study evaluates the asset selection abilities of superannuation fund managers specialising in the area of Australian equities, and the extent to which the differentiating factors of style, rating and cost can assist the retail investor in selecting a fund that offers quality over the medium to long term. The primary findings of this study are that fund

---

[32] *For example, the AXA Retirement Plan – Australian Equities had an MER of 1.95%. The AXA Retirement Plan – Australian Equities Mature fund had no reported MER. In this instance, 1.95% was taken as a proxy for the MER of the latter fund. This is a limitation of the study.*

[33] *Additionally, there is some discrepancy between those funds for which commissions are included in the MER, and those for which commissions are not. Of the 181 funds within the sample, fifteen (15) funds had no advisor commission built in to the MER, and data regarding commission payable was not available for a further fifteen of the funds. For those funds without full information, it was assumed that commission was built in to the ongoing expenses of the fund; for those funds without a commission payable, the MER was taken as reported. As advisors may add trailing commissions to the fund's expense ratio, it is possible that MERs have been under-stated for 15 of the 181 funds in the sample (approximately 8%). The mean commission paid is approximately 0.5% per annum.*

managers, on average, fail to outperform a passive alternative. While this finding supports a long line of domestic and international studies, the interesting result in the following analysis is that we report very limited evidence of differentiation across funds, with factors such as style, rating and cost providing limited information in regard to the issue of fund quality.

The study relies on three asset pricing techniques to evaluate manager performance. Jensen"s (1968) risk-adjusted single factor model is used to determine whether funds out – or under-perform the relevant benchmark index. Treynor-Mazuy"s (1966) quadratic model is then employed to determine the extent to which managers demonstrate timing ability in addition to superior (or inferior) asset selection. Finally, Ferson and Schadt"s (1996) conditional model is employed, which incorporates the dynamic asset selection decisions made by managers on the basis of public information variables (including dividend yield and bond rates), over the investment cycle. The results of these models are then juxtaposed with the differentiating factors of style, rating and cost using simple sorting techniques to elucidate relationships (if any) between these factors and alpha (as a proxy for fund manager skill). We commence our analysis with Jensen"s (1968) single index model.

Table 7 - Single Factor Model Estimates

The following table reports pooled regression estimates from Jensen"s (1968) single index model. The adjusted R-squared statistic is included to provide an indication of the predictive power of the model, and the Durbin-Watson statistic is included to detect first order serial- or autocorrelation. The All Ordinaries accumulation index is used as the benchmark, with the Reserve Bank of Australia 13-week treasury note used as a proxy for the risk-free rate of return. The sample consists of 181 retail Australian equity superannuation funds, measured over the period July 1991 to June 2003 on a monthly basis. The single index model is given by $R_{it} - R_{ft} = a_i + \beta_i(R_{mt} - R_{ft}) + \varepsilon_i$. The intercept term, a_i, provides a measure of manager ability in the area of asset selection. Standard errors were obtained by using White"s heteroskedasticity-consistent covariance matrix estimator.

Alpha (a)	-0.49% (annualised)
	(t=-0.37)
Standard Error	0.21
Beta (β)	0.88
	(t=23.84)
Standard Error	0.17
R^2 Adjusted	0.76
Durbin Watson Statistic	2.07

The funds considered in this study, on average, exhibited negative alpha of 0.4866% per annum, under-performing the passive alternative by approximately 50 basis points (bps) on a risk-adjusted basis annually. This estimate, however, is not significant even at the 10% level, and therefore the null hypothesis that alpha is equal to zero cannot be rejected. These findings are consistent with those of Malkiel (1995), Gruber (1996) and Wermers (2000) at the international level and, in the Australian funds management context, with those of Sawicki (2000), Gallagher (2001), Coleman, Esho and Wong (2003) and Drew and Stanford (2003c). Cost is particularly relevant in this discussion, as it provides some guide as to the industry"s ability to exploit superior information. Given an average MER of 2.08% per annum, and underperformance of approximately 0.5%, the performance of funds *before fees* may be considered above average by approximately

1.5% – to this extent it is possible that managers do have superior information and stock selection skills. However, the cost of obtaining and utilising this information is greater than the advantage it conveys to the investor. This is consistent with the findings of Drew and Stanford (2003c) in the Australian context and Gruber (1996, 2001) at the international level. For the retail investor, the presence of superior asset selection ability on the part of fund managers on a pre-cost basis is redundant – the various strategies employed by the fund managers in this sample, on average, do not appear to add value to investor portfolios on a net basis. Were it possible for investors to access very low-cost or wholesale managers, however, there remains the potential for value to be added by the funds management industry.

Table 8 - Distribution of Single-Factor Model Estimates

The following table reports the number of alphas that were not different from zero (Zero column), and those significantly different from zero under the Positive or Negative columns for a total number of 181 retail Australian equity superannuation funds examined in this study. The number of betas not different from one (or unity) (Unity column) and those significantly different from unity (Greater than/Less than Unity columns) are reported. These estimates are considered at the 5% and 10% significance levels. The mean alpha and beta estimates are again provided for the entire sample.

Alphas for Individual Managed Funds						
	Significance Level	Zero	Positive	Negative	Total	Mean Alpha
All Ords Accum Index	5%	159	4	18	181	**-0.49**
	10%	145	9	27	181	
Betas for Individual Managed Funds						
	Significance Level	Unity	Greater than Unity	Less than Unity	Total	Mean Beta
All Ords Accum Index	5%	5	6	170	181	**0.88**
	10%	6	6	169	181	

The existence of betas significantly less than one suggests that, as an industry, a relatively conservative approach to portfolio composition has been adopted by fund managers over this period. Managers appear to concentrate their asset selection in the larger capitalisation stocks, minimising the volatility commonly associated with smaller companies, which may account for some reduction in systematic risk.[34]
The results from the Treynor and Mazuy (1966) quadratic model are broadly similar to those of Jensen"s single-factor model above.[35] Funds are estimated to generate negative

---

[34] *This is often as a result of mandates which preclude investments outside the value-weighted All Ordinaries Accumulation Index.*

[35] *Two important corrections have been incorporated in the Treynor-Mazuy quadratic model for the purposes of this study. Firstly, the use of heteroskedasticity-consistent standard errors (and associated heteroskedasticity-adjusted t-statistics) was employed in order to minimise the possibility of rejecting the null hypothesis in the event of significant timing ability and vice versa. Secondly, as multicollinearity has been revealed in similar studies (for instance, Chapman and Pearson, 2000), the technique of orthogonal polynomials was employed, transforming the squared excess return variable with a dummy variable. The transformed equation is shown as: $R_{it} = \alpha_i + \beta_i R_{mt} + \lambda_i p_t(R_{mt})^2 + \varepsilon_i$, where $p_t(R_{mt})$ is formed as the regression residual of R_{mt}^2 and DR_{mt} onto a constant, and scaled to have a standard deviation equal to the standard*

alpha of -0.04 per month (-0.47% per annum). Again, this pooled result is not significant at the 5% or 10% level. Given these results, and their similarity to those generated using the single factor model, it provides corroborating evidence that managers, given current high fee structures, are unlikely to outperform a low-cost buy-and-hold strategy.

Table 9 - Quadratic Model Estimates

The following table reports pooled regression estimates from Treynor and Mazuy"s (1966) quadratic market model. The quadratic market model is given by $R_{it} = a_i + \beta i R_{mt} + \lambda_i R_{mt}^2 + \varepsilon_i$. The intercept term, a_i, provides a measure of manager ability in the area of asset selection, and the coefficient λ_i is a measure of market timing ability.

Alpha (α)	-0.47% (annualised) (t=-0.37)
Standard Error	0.22
Beta (β)	0.79 (t=23.59)
Standard Error	0.18
Lambda (λ)	-0.37 (t=-0.65)
Standard Error	2.08
R^2 Adjusted	0.77
Durbin Watson Statistic	2.04

Table 10 - Distribution of Quadratic Model Estimates

The following table shows the distribution of estimated alphas, betas and lambdas. These funds are examined at the 5% and 10% significance levels. The mean alpha, beta and lambda estimates are again given for the entire sample.

Alphas for Individual Managed Funds						
	Significance Level	Zero	Positive	Negative	Total	Mean Alpha
All Ords Accum Index	5%	159	4	18	181	**-0.47**
	10%	145	9	27	181	

Betas for Individual Managed Funds						
	Significance Level	Unity	Greater than Unity	Less than Unity	Total	Mean Beta
All Ords Accum Index	5%	4	6	171	181	**0.79**
	10%	6	6	169	181	

Lambdas for Individual Managed Funds						
	Significance Level	Zero	Positive	Negative	Total	Mean Lambda
All Ords Accum Index	5%	154	1	26	181	**-0.37**
	10%	135	4	42	181	

This study also finds no evidence of positive timing ability on behalf of active portfolio managers, with the pooled lambda coefficient estimated at -0.37% per annum. At the

---

deviation of the dependent variable R_{it}. This model is used to generate the parameter estimates for the Treynor-Mazuy model for this study.

individual fund level, 26 of the 181 funds (14% of the sample population) were found to have significantly perverse timing ability at the 5% level. At the international level, the results are consistent with those of Henrikkson (1984) and Coggin, Gabozzi and Rahman (1993), who fail to find evidence of superior market timing ability, and with studies in Australia by Sinclair (1990), Hallahan and Faff (1999) and Drew, Veeraraghavan and Wilson (2005).

Table 11 - Conditional Model Estimates

The following table reports pooled regression estimates from the Ferson and Schadt (1996) conditional multi-factor model. The conditional factors used are the Australian Stock Exchange (ASX) Dividend Yield and Commonwealth Government of Australia 1- and 10-year bond rates. Following Ferson and Schadt (1996) the choice of the loading on the market factor by the fund manager, at time t, is assumed to follow a linear functional form with respect to the information available at time t. The conditional multi-factor model takes the form $R_{pt+1} = a_p + \gamma_{1p} R_{rmt+1} + \gamma''_{2p}(z_{trmt+1}) + \varepsilon_{pt+1}$. The intercept term, a_i, provides a measure of manager ability in the area of asset selection. Standard errors were obtained by using White"s heteroskedasticity-consistent covariance matrix estimator.

Alpha (a)	-0.89% (annualised)
	(t=-0.52)
Standard Error	0.23
R^2 Adjusted	0.79
Durbin Watson Statistic	2.10

A model allowing systematic risk to be conditional (Ferson and Schadt, 1996) suggests greater underperformance by the industry than previous models (-89 bps per annum). This indicates that once public information variables, specifically bond rates (1- and 10-year Commonwealth Government bonds) and dividend yield, are taken into account, managers are less able to generate abnormal returns. Such results are broadly consistent with the international studies of Ferson and Schadt (1996) and the Australian samples of Sawicki and Ong (2000) and Clements and Drew (2004). Interestingly, regardless of the asset pricing model used to evaluate performance, the quantum of under–performance was consistently less than the MER charged.

The results presented thus far suggest that, as an industry, managers do not generate positive alpha using single-factor, quadratic or conditional models to estimate risk-adjusted performance. We now turn our attention to areas of potential fund differentiation – style, rating and cost – to examine whether such variables are "information rich" to the potential investor. The following tables sort Jensen"s (1968) alpha estimates across the various differentiating factors.[36]

---

[36] *In order to ensure the robustness of the tests, the alphas estimated from all of the asset pricing models used in this study were sorted across the various differentiating factors, resulting in similar results.*

Table 12 - Style and Alpha Sort

The following table sorts alpha against manager style (as defined by VER) in ascending order. It is important to note that the results reports are arithmetic averages with, for instance, the "moderately active" category having only three observations.

Manager Style	Mean Alpha (Annual)	t-Statistic
Style Neutral	-1.10	-1.47
GARP	-0.99	-0.44
Unknown	-0.88	-0.52
Growth	-0.87	-0.35
Unspecified	-0.82	-0.12
Multi-Manager	-0.78	-0.44
Moderately Active	-0.67	-0.49
Value	1.80	0.62
Mean	**-0.49**	**-0.37**

When sorted by style using alpha estimates from Jensen"s (1968) single factor model, all managers, except those employing a Value style, generated negative alpha. The Value style managers demonstrated superior asset selectivity, generating positive alpha of almost 1.8% per annum net of fees and expenses, however this alpha is not significant at either the 5 or 10 % levels. It should also be noted that these findings may be related to the period of the sample. Although the sample period covers twelve years, including a prolonged bull market followed by a significant correction, the period 2000 to 2003 was considered to be particularly favourable to "value" managers. In the tech boom of 1999 to 2000, value managers significantly under-performed the market, for instance, both the "Tyndall Australian Value Trust" and the "Maple-Brown Abbott Australian Equity Fund", two of the best performing managers over the sample period, were in the bottom quartile for this two–year period. Had this study been undertaken for the period 1990 to 2000, for example, it is quite likely that "value" managers would have demonstrated little positive out-performance.

Table 13 - Rating and Alpha Sort

The following table sorts alpha against Rating (as defined by vER) in ascending order.

Rating	Mean Alpha (Annual)	t-Statistic
AA	-1.63	-0.31
B	-1.07	-0.53
Not Rated	-0.84	-0.43
A	0.84	-0.15
H	1.89	0.45
Mean	**-0.49**	**-0.37**

As discussed previously, fund ratings are an important tool increasingly used by investors and advisors alike in the fund selection process. Both sets of funds with an "A" rating, and those on "H" (hold), generated positive alpha using the single factor model; those funds with "AA" or "B" ratings, and those that were unrated, had negative alphas. These

findings do not indicate a positive relationship between the fund rating and its potential for out-performance. However, one of the primary reasons for the "H" rating applied to funds which have out-performed may be that they are no longer open to retail investors. For instance, the Tyndall Australian Value Trust, one of the best performing funds in the sample, is now closed through various mastertrusts, and therefore cannot be purchased by new investors. These findings are somewhat consistent with those of Blake and Morey (2000), who found that low rated funds were likely to suffer from relatively poor future performance using various asset pricing techniques in the US, and with the work of Gerrans (2006) in Australia. Blake and Morey (2000) did find, however, that there was little correlation between the highest-rated, the next-to-highest, and the median-rated funds and their relative performance. Their ultimate finding was that "…ratings, at best, do only slightly better than alternative predictors in forecasting future fund performance" (p.451). To this extent, the findings of this study are consistent with this argument; however, these results must be viewed in light of sorting by the 2003 rating only.

Table 14

Cost and Alpha Sort

The following table sorts alpha against Fund Cost (or MER) (as recorded by vER) in quartiles.

Ranking	Mean MER (%)	Mean Alpha (Annual)	t-Statistic
Top Quartile	2.6158	-0.045	-0.13
Second Quartile	2.1312	-1.33	-0.64
Third Quartile	1.9138	0.15	-0.10
Bottom Quartile	1.5847	-0.73	-0.65
Mean	**2.08%**	**-0.49**	**-0.37**

Turning to the issue of fund costs, those funds with MERs in the third quartile produced positive alpha, while the remaining funds (those with the highest, above average and lowest MERs) appeared to generate inferior selection ability.[37] These findings are consistent with those of Coleman, Esho and Wong (2003) and Drew and Stanford (2003) to the extent that higher costs do not necessarily result in better performance. Investors may conclude that an increase in costs is not rewarded with a commensurate increase in performance.

Conclusion

The SCP paradigm proposes that the structural characteristics of an industry lead to specific firm behaviour which in turn influences performance and consumer outcomes. The structure of Australia"s retail superannuation fund industry is characterised by detailed regulation, increasing complexity and high demand for funds management services. Within this environment, funds managers appear to conform to a

---

[37] *To the extent that each quartile according to cost was found to have an alpha insignificant from zero, these findings were robust across each of the models. The quadratic and conditional multi-factor models, however, illustrated a more direct link between cost and performance, with the most expensive funds generating the highest level of underperformance, and the least expensive managers actually generating positive, if insignificant, alpha. Again, it is important to note that the funds are sorted on 2003 fees only.*

monopolistically competitive market structure leading to suboptimal outcomes for investors – despite a plethora of retail funds from which to choose.

The results presented in this study have immediate implications for all stakeholders in Australia"s superannuation system, the Federal Government, funds managers and investors alike. The results suggest that system structure and industry conduct in the retail fund segment, have resulted in fee structures which erode completely any alpha accretive decisions made by fund managers, to the detriment of investors. In light of these seemingly unavoidable costs, investors are best served seeking out those retail funds with the lowest cost structures when selecting a manager to invest their retirement savings with.

Turning to the characteristics which may differentiate fund alternatives –style, rating and cost – there is little hard evidence in this study that any of these characteristics is information rich regarding the quality of the fund. The results for the Australian retail superannuation setting support the findings of previous work considering the United States and European funds management industries, in linking structure and conduct to industry performance. As Australia embarks on a policy of more complete choice of superannuation fund and portability of superannuation balances, the analysis presented in this study suggests that the success of such systemic reforms will be directly linked to the impacts of such changes on placing downward pressure on the cost structure of the retail industry.

References

Abbott, B. (2004) "Super Assets to Double in Ten Years", *Money Management*, 26th February, www.moneymanagement.com.au.

Anderson, K. (2004) "Pension Politics in Three Small States: Denmark, Sweden and the Netherlands", *Canadian Journal of Sociology*, Vol. 29, No. 2, pp. 289–314.

Australian Prudential Regulation Authority (2003) *Superannuation Trends – September Quarter 2003*, www.apra.gov.au.

Bain, J. (1959) *Industrial Organisation*, Wiley, New York.

Baldwin, W. (2004) "The Pension Bomb", *Forbes*, Vol. 173, No. 6.

Bateman H. (2002) "Retirement Income Strategy in Australia", *Economic Analysis and Policy*, Vol. 32, No. 1, pp.49–70.

Bateman, H., Kingston, G. and J. Piggott (2001) *Forced Saving: Mandating Private Retirement Incomes*, Cambridge University Press, Sydney.

Bateman, H. and J. Piggott (1999) "Mandating Retirement Provision: The Australian Experience", *Geneva Papers of Risk and Insurance*, Vol. 24, No. 1, pp. 95–113.

Beaman, L. (2003) "Clients relying on advisers who outsource research", www.moneymanagement.com.au, 8 December.

Blake, C. and M. Morey (2000) "Morningstar Ratings and Mutual Fund Performance", *Journal of Financial and Quantitative Analysis*, Vol. 35, No. 3, pp. 451–483.

Blake, D. (1989) "The Investments and Returns of Private Sector Pension Funds in the UK 1963–1978", *Journal of Economic and Social Measurement*, Vol. 15, No. 3–4, pp. 181–224.

Blake, D. (2003) "The United Kingdom Pension System: Key Issues. *Pensions Institute Working Paper*.

Blake, D. and A. Timmerman (1998) "Mutual Fund Performance: Evidence from the UK", *European Finance Review*, Vol. 2, No. 1, pp. 57–77.

Brown, S. and W. Goetzmann (1997) "Mutual Fund Styles", *The Journal of Financial Economics*; Vol. 43, No. 3, pp. 373–99.

Caves, R. (1972) *American Industry: Structure, Conduct and Performance*, 3rd Ed, New Jersey: Prentice Hall.

Chapman, D. and Pearson, N. (2000) "Is the Short Rate Drift Actually Non–Linear?" *The Journal of Finance*, Vol. 55, pp. 355–388.

Clare, R. (2001) "Are administration and investment costs in the Australian superannuation industry too high?" ASFA Research Centre, www.superannuation.asn.au.

Clarke, J. (1961) *Competition as a Dynamic Process*, Brookings Institution, Washington.

Clements, A. and M. Drew (2004) "Institutional Homogeneity and Choice in Superannuation", *Accounting Research Journal*, Vol. 17, No. 2, 102–112.

Clitheroe, P. (2001) *The Road to Wealth*, Viking, Ringwood, Victoria.

Coggin, T., Fabozzi, F. and S. Rahman (1993) "The Investment Performance of US Equity Pension Fund Managers", *The Journal of Finance*, Vol. 48, pp. 1039–1056.

Coleman, A., Esho, M. and M. Wong (2003) "The Investment Performance of Australian Superannuation Funds", APRA, www.apra.gov.au.

Damodaran, A. (2002) *Investment Philosophies*, John Wiley and Sons, New York.

Davis, E. and B. Steil (2001) *Institutional Investors*, MIT Press, Cambridge (Mass).

Disney, R. (2003) "Public Pension Reform in Europe: Policies, Prospects and Evaluation", *The World Economy*, Vol.26, No. 10, pp. 1425–1445.

Drew, M. (2003) "Superannuation Funds: Fees and Performance", *Journal of the Securities Institute of Australia*, No. 3, pp. 31–36.

Drew, M. and J. Noland (2000) "EMH is Alive and Well", *JASSA Journal*, pp. 15–18.

Drew, M. and J. Stanford (2002) "The Economics of Choice of Superannuation Fund", *Accounting, Accountability and Performance*, Vol. 8, No. 1, pp. 1–20.

Drew, M. and J. Stanford (2003) "Is there a Positive Relationship between Superannuation Fund Costs and Returns?" *Economic Papers*, Vol. 22, No. 3, pp. 74–84.

Drew, M. and J. Stanford (2003b) "Principal–and–Agent Problems in Superannuation", *The Australian Economic Review*, Vol. 36, No. 1, pp. 98–107.

Drew, M. and J. Stanford (2003c) "Returns from Investing in Australian Equity Superannuation Funds, 1991–1999, *The Service Industries Journal*, Vol. 23, No. 4, pp. 12–24.

Drew, M., Stanford, J. and M. Veeraraghavan (2002) "Efficiency with Costly Information: A study of Australian Wholesale Superannuation Fund Performance", *Economic Analysis and Policy*, Vol. 32, No. 1, pp. 35–47.

Drew, M., Veeraraghavan, M. and V. Wilson (2005) "Market Timing, Selectivity and Alpha Generation: Evidence from Australian Equity Superannuation Funds". *Investment Management and Financial Innovations*, Vol. 2, No. 2, pp. 111–127.

Fama, E. (1970) "Efficient Capital Markets: A Review of Theory and Empirical Work", *The Journal of Finance*, Vol. 25, pp. 383–417.

Ferson, W. and R. Schadt (1996) "Measuring Fund Strategy and Performance in Changing Economic Conditions", *The Journal of Finance*, Vol. 51, No. 2, pp. 425–458

Gallagher, D. (2001) "Attribution of investment performance: an analysis of Australian pooled superannuation funds", *Accounting and Finance*, Vol. 41, pp. 41–62.

Gallery, N., K. Brown, and G. Gallery (1996) Privatising the pension, *Journal of Australian Political Economy,* Vol. 38, pp. 98–124.

Gerrans, P. (2004) Australian Managed Fund Ratings and Individual Investors, *Australian Journal of Management,* Vol. 29, pp. 87–107.

Gerrans, P. (2006) Morningstar Ratings and Future Performance, *Accounting and Finance*, Vol. 46, pp. 605–628.

Gruber, M. (1996) "Another Puzzle: The Growth in Actively Managed Mutual Funds", *The Journal of Finance*, Vol. 51, No. 3, pp. 783–810.

Gruber, M. (2001) "Identifying the Risk Structure of Mutual Fund Returns", *European Financial Management*, Vol. 7, No. 2, pp. 147–159.

Hallahan, T. and R. Faff (1999), "An Examination of Australian Equity Trusts for Selectivity and Market Timing Performance", *Journal of Multinational Financial Management*, Vol. 9, pp. 387–402.

Henrikkson, R. (1984) "Market Timing and Mutual Fund Performance: An Empirical Investigation", *Journal of Business*, Vol. 57, pp. 73–96.

Jensen, M. (1968) "The Performance of Mutual Funds in the Period 1945–1964", *The Journal of Finance*, Vol. 23, No. 2, pp.389–416.

Johnson, P. (1998) "The Reform of Pensions in the UK", *Annals of Public & Cooperative Economics*, Vol. 69, Issue 4, pp. 1370–4788.

Knox, D. (2003), "Is superannuation really taxed concessionally?" *Journal of the Securities Institute of Australia*, No. 3, pp. 28–30.

Malkiel, B. (1995) "Returns from Investing in Equity Mutual Funds 1971 to 1991", *The Journal of Finance*, Vol. 50, pp. 549–572.

Mason, E. (1939) "Price and Production Policies of Large–Scale Enterprise", *American Economic Review*, Vol. 29, pp. 61–74.

Mason, E. (1949) "The Current State of the Monopoly Problem in the United States", *Harvard Law Review*, Vol. 62, pp. 1265–85.

Otten, R. and M. Schweitzer (2002) "A Comparison Between the European and the US Mutual Fund Industry", *Managerial Finance*, Vol. 28, No. 1, pp. 14–34.

Sawicki, J. (2000) "Investors" Response to the Performance of Professional Fund Managers: Evidence from the Australian Wholesale Funds Market", *Australian Journal of Management*, Vol. 25, No. 1, pp. 47–66.

Sawicki, J. and F. Ong (2000) "Evaluating managed fund performance using conditional measures: Australian evidence", *Pacific–Basin Finance Journal*, Vol. 8, pp. 505–528.

Scherer, F. (1979) *Industrial Market Structure and Economic Performance*, 2nd Ed, Rand McNally, Chicago.

Scherer, F. and D. Ross (1990) *Industrial Market Structure and Economic Performance*, 3rd Ed, Boston: Houghton Mifflin Co.

Sharpe, W. (1966) "Mutual Fund Performance", *Journal of Business*, Vol. 39, pp.119–138.

Sinclair, N. (1990) "Market Timing Ability of Pooled Superannuation Funds January 1981 to December 1987", *Accounting and Finance Journal*, Vol. 30, pp. 51–65.

Treynor, J. and K. Mazuy (1966) "Can Mutual Funds Outguess the Market?" *Harvard Business Review*, Vol. 44, pp. 131–136.

Wermers, R. (2000) "Mutual Fund Performance: An Empirical Decomposition into Stock–Picking Talent, Style, Transaction Costs and Expenses", *The Journal of Finance*, Vol. 55, No. 4, pp. 1655–1695.