Melbourne
Casselden Place
Level 39, 2 Lonsdale St,
Melbourne, VIC 3000
P: (03) 9657 4321

Canberra
Dialogue
GF, 4 National Circuit
Barton, ACT 2600
P: (02) 6269 5710

29 March 2018

Karen Chester, Deputy Chair
Angela MacCrae, Commissioner
Productivity Commission

By email: super@pc.gov.au

Superannuation Inquiry: new research

Dear Commissioners

I am writing to provide the Commission with copies of two new research paper by Dr Wilson Sy of importance to the work of the Commission's Inquiry into the Efficiency and Competitiveness of the Superannuation System.

Dr Sy is a former manager of APRA's research unit from 2009-2013 and was senior technical adviser to the Cooper Review in 2009-10.

Copies of the two papers are enclosed. They include the following key points, all of which are vital to understanding some of the main sources of inefficiency in the superannuation system:

Paper 1 'Financial Performance Trends of Australian Superannuation: System and Sectors'

The first paper by Dr Sy outlines key trends and dynamics across the superannuation system using APRA data for the 19 year period from 1997 to 2016. This provides context for assessing the efficiency and competitiveness of the system and identifying where key inefficiencies arise from.

Superannuation system growth in net assets to $2 trillion in 2016 has been largely due to the role of compulsory contributions, the quantum of which has amounted cumulatively to $1.7 trillion since 1997.

However, system investment performance has been lacklustre, compared to a range of market indices (see Table 6). So far this lacklustre performance has been masked by large contribution flows into the system (see Figure 3). But, in recent years, the system has been rapidly approaching the 'withdrawal phase' – defined by negative net contributions (see Figures 6 and 7). In this phase, the future sustainability and efficiency of the system will increasingly depend on net earnings from investment performance to fund future payouts.

This raises the question of where investment underperformance arises from. Drawing on his detailed analysis of 19 years of audited APRA performance and flow of fund data, Dr Sy offers a clear set of findings:

> The inefficiency of the superannuation system can be attributed significantly to the consistent and persistent under-performance…of the *Retail* sector compared to the *Industry* sector or to the rest of the system respectively. At March 2017, *Retail* sector assets was $577 billion; if the *Retail* sector had

performed in line with the rest of the system, then the outcome of the whole system would have improved by about $10 billion per annum. (p. 3)

Paper 2 'Impact of Asset Allocation and Operational Structure on Investment Performance of Australian Superannuation'

Dr Sy's first paper established the increasing importance of investment performance as the superannuation system matures, and that inefficiency can be shown to come significantly from the persistent under-performance of the *Retail* sector.

The second paper explains this persistent underperformance via an assessment of the relative impact of factors including asset allocation, operational structure and scale on long-term trends in investment performance. Using APRA data Dr Sy conclusions include the following:

i) For the three years to September 2016, the *Industry* sector outperformed the *Retail* sector by 2.7 per cent per annum in measured investment performance (see Table 14).

ii) Breaking down this 2.7 per cent outperformance, 1.1 per cent can explained by asset allocation and 1.6 per cent by operational structure and costs (i.e. the for-profit and not-for-profit business models and how these determine the differential costs that members may for related services) (see Table 16).

iii) Retail members faced additional costs from: (i) choice of asset allocation and portfolio construction costs amounting to 1.1 per cent per annum, or $6.3 billion; (ii) indirect investment costs from trading, financial advice and other activities amounting to 1.2 per cent per annum, or $7.5 billion; and (iii) increased complexity of administration and operation costs amounting to 0.3 per cent per annum, or $1.7 billion.

The reasons for these additional costs can be traced back to the different business models at work. Dr Sy concludes:

> 'Trustees of *Non-profit* funds mostly accept the tasks of asset allocation and portfolio construction as their fiduciary duty and they offer and encourage members to select optimised portfolio options. In contrast, trustees of *Retail* funds eschew those important tasks and encourage their members to construct their own portfolios, thus making them bear additional costs which often involve the services of financial advisers' (p. 38).

iv) Analysis of quarterly data from 2004 to 2016 shows that the risk aversion of *Retail* funds, evident from more conservative asset allocation data, had failed to achieve benefits because the lower returns and higher cost of *Retail* funds did not benefit members with lower risk. Once costs are included in analysis (which many academic studies ignore because they assume frictionless equilibrium) then lower *Retail* returns came with higher volatility – not less (see Figure 4).

v) The benefits of scale for members apply only to *Industry* funds and other *Non-profit* funds, and not to *Retail* funds (see Table 15), because *Industry* and other *Non-profit* funds have substantial direct investments in long-term illiquid assets leading to higher fixed cost and lower variable cost in their operational structures.

vi) At March 2017, with *Retail* assets of $577 billion, the 2.7 per cent return deficit relative to *Industry* funds represents about $15.5 billion per annum in additional costs to *Retail* members.

Dr Sy concludes:

> '…the dominant factor which explains most of the persistent performance differences observed are the costs associated with the operational structures of two distinctly different types of trustees: *For-profit* shareholder-oriented retail trustees, and *Non-profit* member-oriented mutual trustees' (p. 4).

v) To further illustrate his findings that *Retail* funds operate as sources of significant but largely opaque sources of profit for their corporate parents, Dr Sy offers a case study of the CBA Wealth management arm (see pp. 32-35 of the paper). This study suggests that in addition to direct costs to CBA superannuation members such as declared investment fees, indirect costs (such as stockbroking commissions, margin lending and financial advice) are a significant source of profit for the corporation.

We would welcome the opportunity to arrange a meeting between the Commission and Dr Sy to discuss his findings and their implications for your Inquiry.

Thank you for considering this new research and we look forward to meeting with you soon.

Yours sincerely

Zachary May
Director of Policy

Financial Performance Trends of Australian Superannuation: System and Sectors[1]

Wilson Sy

Investment Analytics Research

1 March 2018

Report to
Industry Super Australia

[1] The author thanks Matt Linden and Carole Sladen for comments. The author is responsible for analysing the data, for establishing the facts and for any opinion expressed in this report.

Abstract

This paper provides an overview of the financial performance trends of the Australian superannuation system in the period 1997-2016, based on audited accounting data. Strong contribution flows have allowed total assets to grow at an average annual rate of about ten percent to $2 trillion by June 2016. However, the system is rapidly approaching the withdrawal phase due to demographic and policy factors when net contributions to the system may be negative, in which case investment performance will be critical to sustain the system. Historically, the lacklustre performance of the system, at about 1.3 percent per annum over cash return, may be attributed significantly to *Retail* funds which underperform other *Public offer* funds, on long-term averages, by about two percent per annum.

Executive summary

Using official data which are publicly available, applying international professional standards of financial analysis, and using scientifically replicable methods, a review is presented here of the main financial performance trends of the Australian superannuation system emerging over the 19-year period 1997-2016, in order to establish significant facts.

The major findings are summarized below. The terms in italics have their suggestive and intuitive meanings, but are defined more precisely in the text and in the Appendix. References to tables and figures are for those contained in the main text.

- The growth in *Net assets* of the superannuation system (to $2 trillion in 2016) was largely due to contributions which totalled cumulatively to $1.7 trillion since 1997 (see Figure 2). The fact that investment performance of the system has been lacklustre, compared to a range of market indices (Table 6), has been masked by large contribution flows into the system. *Net earnings* from investments which provided about 4.1 percent *Net return* per annum have been cancelled out by *Net payouts* to beneficiaries (see Table 1 and Figure 3).
- In recent years, the system has been approaching rapidly the withdrawal phase, defined by negative *Net contributions* (Figures 6 and 7). In this phase, the sustainability of the system will increasingly depend on *Net earnings* from investment performance to fund future payouts.
- Of institutional funds, the *Retail* sector has always been the largest sector by asset share with 35 to 45 percent of system assets. It has captured the highest share (39 percent) of cumulative *Total contributions* into the system (see Table 7). *Retail* share of cumulative *Net contributions,* at 45 percent, is only about the same as that of the *Industry* sector, due to increasing *Retail* payouts, but the payouts are much less in relative terms than those of the *Public* and *Corporate* sectors. Despite its relatively large size and substantial contribution flows, the *Retail* sector's share of the whole system has been limited by its long-term under-performance in investing (Table 9).
- The inefficiency of the superannuation system can be attributed significantly to the consistent and persistent under-performance by an average of 2.1 or 1.7 percent per annum (after all costs but before taxes) of the *Retail* sector (at 4.6 percent, Table 9) compared to the *Industry* sector (at 6.7 percent) or to the rest of the system (at 6.3 percent, Table 11) respectively. At March 2017, *Retail* sector assets was $577 billion; if the *Retail* sector had performed in line with the rest of the system, then the outcome of the whole system would have improved by about $10 billion per annum.
- The lower volatilities of *Retail* funds have inadequately compensated for their lower returns. The risk-return trade-off achieved has been inefficient, with half a percent reduction in volatility costing about one percent loss in return (Figure 19).

These significant facts provide a sound basis for assessing the competitiveness and efficiency of the Australian superannuation system. A second paper will use performance attribution and analysis to propose potential explanations for the long-term trends observed here.

Introduction

This report was triggered by the current Productivity Commission (PC) inquiry into "*How to Assess the Competitiveness and Efficiency of the Superannuation System*" (PC, 2016). The implication of this public inquiry is that we do not yet know how to properly assess the system, let alone having anything approaching an authoritative assessment. It is as though all previous official inquiries into the system have achieved nothing trustworthy by way of reliable assessment frameworks. This fact alone suggests management inefficiency.

Apart from tinkering with tax-related issues and contribution rules in nearly every annual budget, the Australian Government has had three major inquiries or reviews, including the current one, since 2009. That is, no sooner had one major inquiry or review finished, another one began. Judging by the volume of submissions from the public in each of these undertakings, there has been enormous waste of public and Government resources, with each review seemingly ignoring or rejecting previous recommendations.

The impact on ordinary citizens is even greater. With such rapid rate of change in Australian superannuation it has been difficult to understand the legislative changes, let alone comply with them. Typically, there is insufficient time to collect and analyse data to assess the impact of previous legislative changes before new ones are introduced. Increasingly, new reforms are based more on the opinions of stakeholders or interested parties than on any authoritative facts, resulting in progressive decline in the quality of reforms.

To cut the Gordian knot of perpetual reform, there needs to be a greater emphasis to have reforms based on agreed facts. The Government's practice of accepting and acting on propriety data and secret submissions (PC, 2016, p.166) must stop because it is unscientific and potentially corrupt. Any claim or evidence which cannot be openly scrutinized is unacceptable in any court of law and should be ignored. Secret information cannot be the basis for establishing agreed facts.

It is the purpose of this report to enlarge the set of agreed facts about broad features of the Australian superannuation system, particularly in relation to financial performance trends. The approach taken is strictly scientific, in the sense that the data, the methods and the conclusions are verifiable by the reader, without having to make unarticulated or unproven theoretical assumptions. The method of assessment of the system should be based on a science of facts rather than a politics of opinions.

The data used in this report are non-proprietary and easily available from official sources. The methods used are based on international accounting and performance measurement standards. No unproven assumptions or untested models from economic or finance theory are used in analysing the data. All conclusions drawn in this report are replicable. Most business or academic research reports are based on data, methods or analyses which do not satisfy these scientific criteria (see discussion below). Many studies use theory to prove theory, with theories and facts highly confused and often contradictory.

Since its inception in 1998, the Australian Prudential Regulation Authority (APRA) has collected and published audited accounting data from superannuation funds at system and sector levels. Other APRA publications, including quarterly data, have been added since

2004. To the extent that regulators and auditors are trustworthy, these official data are as trustworthy and complete as it is possible to get, with minimal potential conflicts of interest in the collection.

The official aggregate data on the superannuation system and on individual sectors (defined by APRA) provide an accurate, but broad, overview of the financial performance of Australian superannuation entities. Not only are the broad facts essential for informing Government policy deliberations, they are also useful for individual members wishing to make decisions about superannuation funds.

In "*A Scandal in Bohemia*" (Doyle, 1892, p.5), responding to Watson's invitation to speculate on the meaning of a mystery, Sherlock Holmes replied:

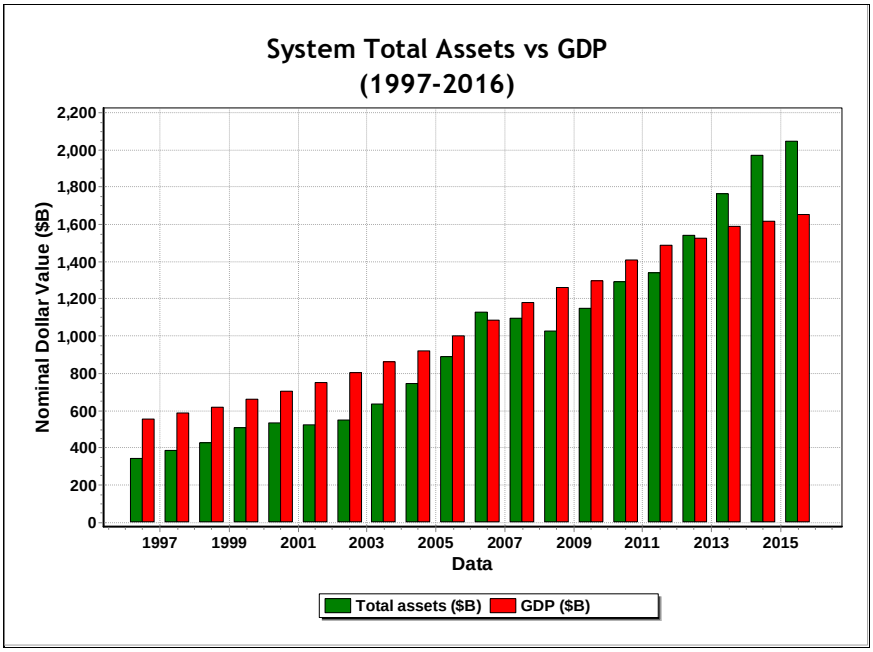
> *I have no data yet. It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts.*

As a first step to developing theories to fit those facts, this report will convert trustworthy data into significant facts which should form the factual basis for system assessment. It is emphasized that, unlike others, we delay theorizing for as long as possible – leaving this task for future reports.

Growth in Total Assets

For this report, details about the exact location of the data sources are either described immediately or are located in the Appendix. The longest period of available and reliable data, covering 19 years from 1997 to 2016, is based on the published collection by APRA referred to above. Important data quantities are italicized in the report and are defined, together with accounting identities, in the Appendix (where references to equations are A1, A2, etc.). The growth of the Australian superannuation system is shown in Figure 1.

Figure 1

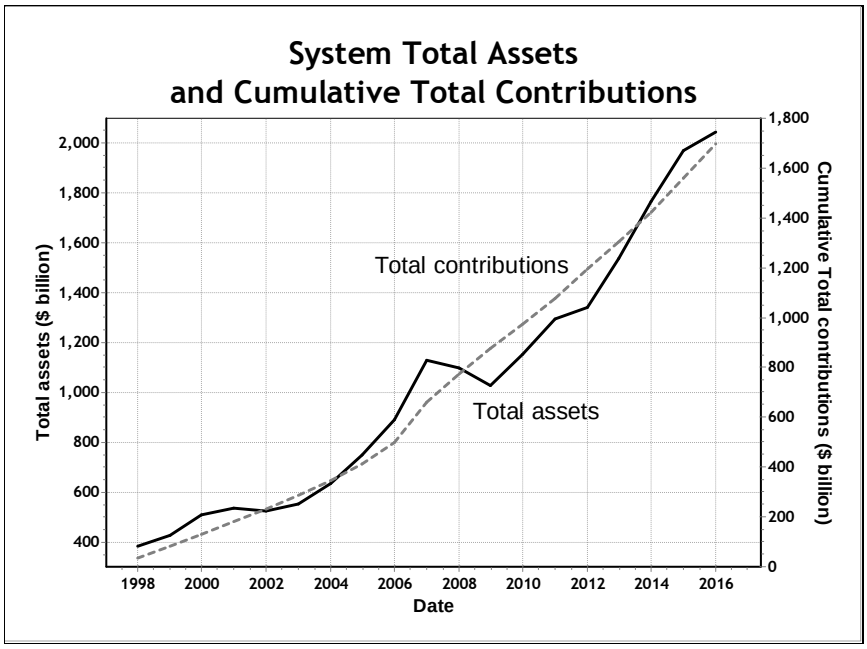


In a global comparison (Willis Tower Watson, 2017), Australian superannuation *Total assets* relative to gross domestic product (GDP) is second only to the Netherlands. From $344 billion, or 62 percent of GDP, in June 1997, Australian superannuation *Total assets* grew to $2.05 trillion, or 124 percent of GDP, in June 2016. Over the 19-year period, the annual compound growth rate of *Total assets* averaged 9.8 percent, compared with the nominal GDP growth rate of 5.9 percent (see Figure 1).

The Superannuation Guarantee levy is a compulsory contribution to superannuation assets, currently running at 9.5 percent of wages and salaries. Any assessment of the efficiency of the Australian superannuation system must take into account the impact of such substantial money flows, which can mask the system's performance.

It is very useful to get a feel for the relative magnitude of the money flows in the superannuation system by simply adding up the various types of money flows over the 19-year period, even without allowing for inflation of the currency. As indicated above, superannuation assets grew by $1,702 billion from 1997 to 2016. Interestingly, this increase in *Total assets* almost exactly equals the cumulative *Total contributions* flowing into the system over the period (see Figure 2).

Figure 2



The manner in which total superannuation assets grew is much more volatile than the way contributions accumulated. Note that Figure 2, the scaling of the left and right axes are the same, with only the left axis off-set by $300 billion (which was about the same order as the total superannuation assets starting in 1997).

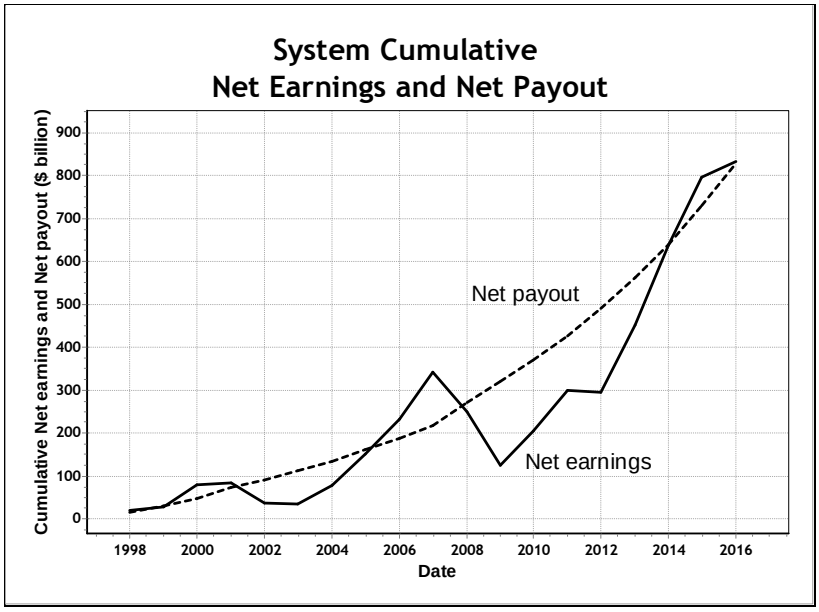
Obviously, there are several other important money flows into and out of the system, but they have more or less cancelled out each other over time (see Table 1). Table 1 shows that the increase in *Total assets* is equal to *Total contributions* minus *Net payout* plus *Net earnings* (see A9).

Table 1

Flow Quantity	Aggregates over 1997-2016 ($ billion)
Increase in total assets	1,702
Total contributions	1,697
Net payout	828
Net earnings	833

These aggregate values show how different components affect the growth in total assets of the superannuation system. For example, superannuation contributions are significant, totalling $1,697 billion – almost the size of the increase in *Total assets* of the superannuation system. But about half of incoming contributions, on average, immediately flow out as benefit payments totalling $828 billion. *Net payout* (defined in the Appendix) is benefit payments adjusted for rollovers from insurance flows. Hence the cumulative increase in *Total assets* equals *Total contributions*, because *Net payout* has so far been roughly matched by *Net earnings* from investments (see Figure 3).

Figure 3



Hence over the 19-year period (1997-2016) the Australian superannuation system was behaving, on average, like an ordinary savings account, where savings deposits are accumulated to increase the account balance, but the interest earnings are withdrawn and spent. The few years of deficits in bear markets have been followed by several years of surpluses to restore the account balance.

This is a statement of fact of the past, rather than a prediction of how the system will behave in the future. Indeed, the situation is expected to change as the rate of payouts increases while the rate of contributions declines, due to changing demographic trends and government policy. Using the accounting identity that *Net contributions = Total contributions – Net payout*, (see A2), Table 1 can be converted to Table 2 below (see A9).

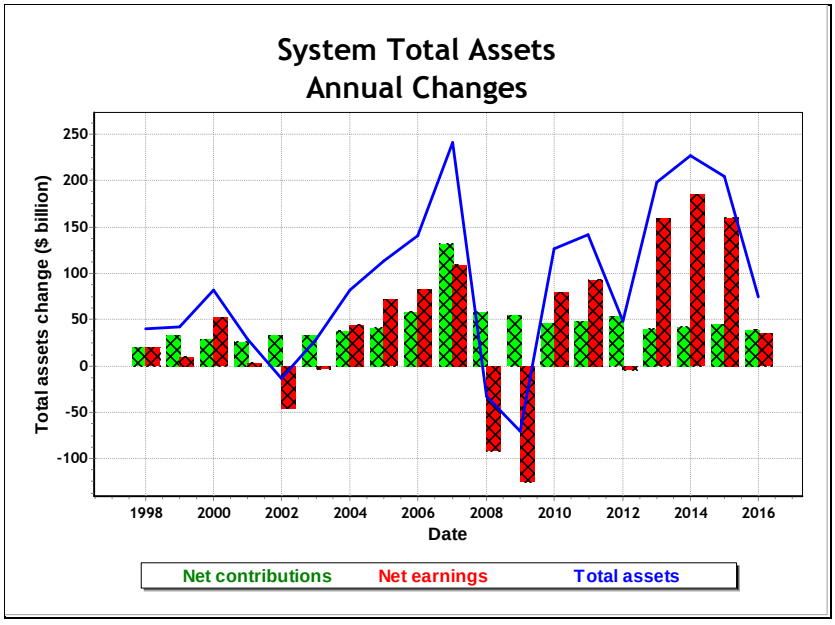
Table 2

Flow Quantity	Aggregates over 1997-2016 ($ billion)
Increase in total assets	1,702
Net contributions	869
Net earnings	833

About half of the increase in total assets of the system is due to $869 billion worth of *Net contributions*. Somewhat less than half, $833 billion, comes from *Net earnings* from investments, after fees and tax. Hence it is observed that the growth in *Total assets* depends nearly equally on the growth in *Net contributions* and *Net earnings* in the past, but this situation may change in the future.

It is instructive to analyse separately the two main components which determine the growth in the *Total assets* of the superannuation system (see A9). Their impacts on asset accumulation annually are shown in Figure 4.

Figure 4



Evidently, *Net contribution* flows are less volatile and much more predictable than *Net earnings* flows.

Net Contributions and Payout Flows

Total contributions are largely determined by Government mandate, with some voluntary contributions added to the compulsory Superannuation Guarantee. From *Total contributions*, a substantial proportion leaves the superannuation system as *Net payout* (see A3) which consists of retirement incomes and other net benefit payments from life and disability insurance (see Table 3). Thus the superannuation system has already paid out,

over the period, $828 billion to beneficiaries for whom the superannuation system is designed and expected to provide such income streams.

Table 3

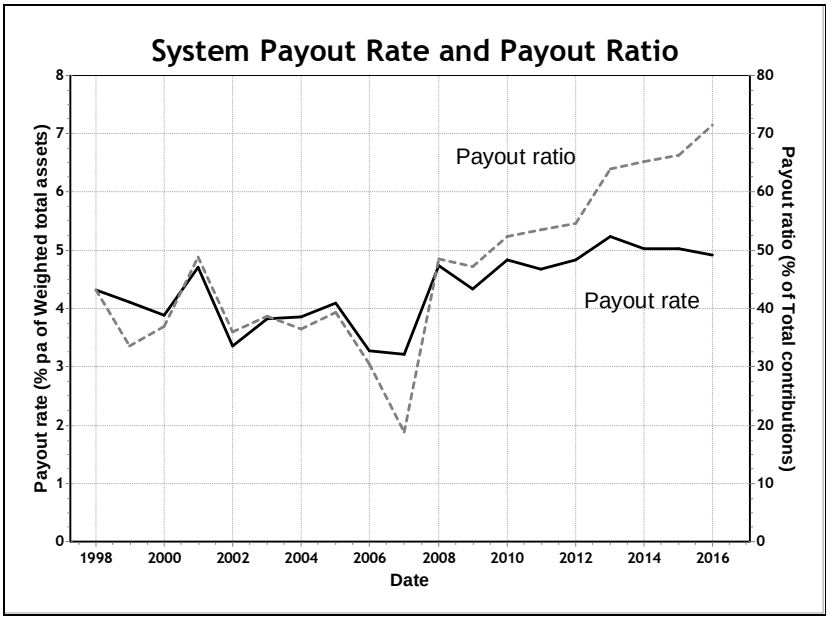
Flow Quantity	Aggregates over 1997-2016 ($ billion)
Net payout	828
Benefit payments	992
Net rollovers	164

Although *Total assets* of the superannuation system increase at the same rate as *Total contributions*, yet the system has been able to pay out $828 billion in benefits over the 19-year period. The data suggest another view of the performance of the superannuation system as a provider of income. A useful analogy is a landlord with a property which produces rental income. The realized benefits of owning the asset are the rents received, while the asset value of the property, which determines unrealized capital appreciation, is left to the vagaries of price fluctuations of the property market.

Thus *Net payout* plays two significant parts in the superannuation system: income provision and asset accumulation. On income provision, *Net payout* can be seen as similar to the dividend yield of a common stock. The income yield of superannuation can be measured by a *Net payout rate* which is defined here by *Net payout* as a percentage of weighted total assets of the system: *Payout rate = Net payout / Weighted total assets* (see below).

Net payout also reduces asset accumulation in the system. Its negative impact can be measured by Net payout ratio which is defined here as a percentage of total contributions: *Payout ratio = Net payout / Total contributions.* *Payout rate* and *Payout ratio* are shown in Figure 5.

Figure 5



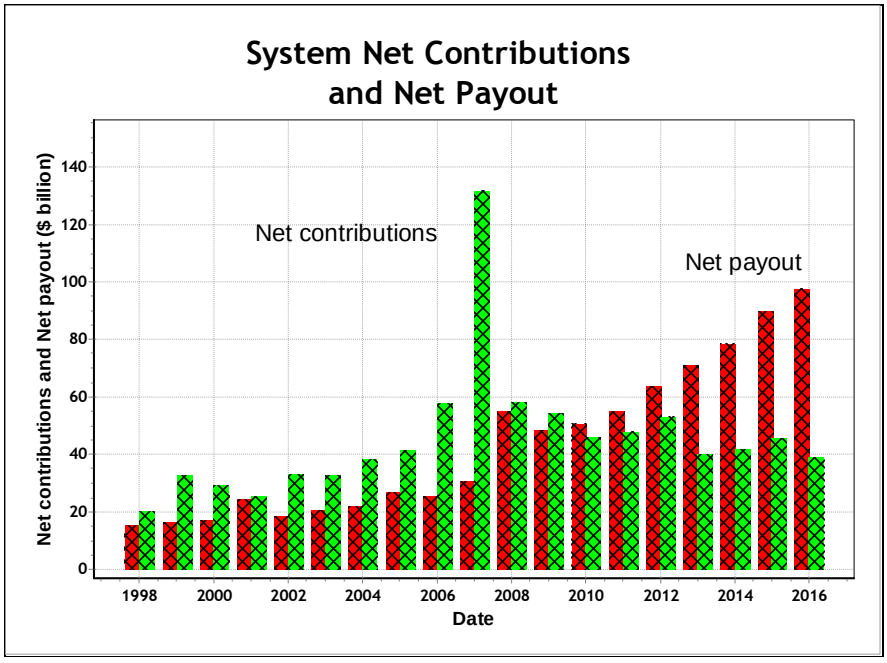
The data show that the net *Payout rate* as a percentage of weighted total assets is quite constant, between 3.5 percent and five percent per annum. For the past several years, *Net payout* has been quite steady at five percent of weighted *Total Assets*. As will be shown below (see Figure 13), *Public sector* and *Corporate* funds have higher payout rates than *Industry* and *Retail* sectors.

The Government requires retirees to withdraw a minimum of four percent of their account balances per year. Since retirees are only a minority of members (but with a larger proportion of assets), the data suggest the rate of spending from retirement accounts is substantially higher, on average, than the minimum rate. That is, retirees generally withdraw much more than four percent of total assets per annum.

Figure 5 shows that the payout ratio as a percentage of total contributions is more volatile, with a significant dip in 2007 due a spike in total contributions arising from a one-off contribution window when the government allowed a maximum contribution limit of $1 million paying standard 15 percent contribution tax. Apart from this, the payout ratio would have been quite steady at about 40 percent of total contributions until around 2009.

The *Net payout ratio* started to trend upwards from 2010 due to increased *Net payout*, both absolutely in dollar terms and relatively to net contributions, as shown in Figure 6.

Figure 6

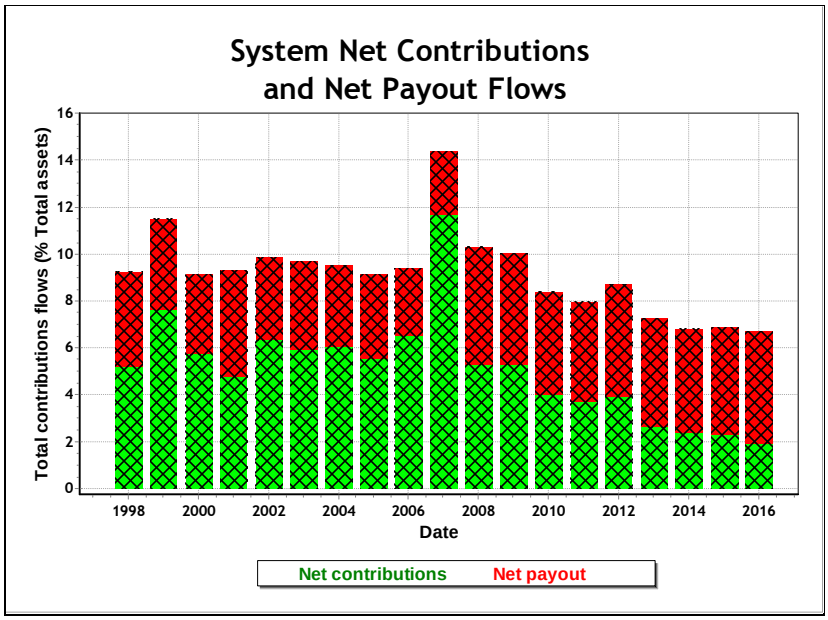


Since payout ratio is trending upwards (see Figure 5), now above 70 percent of *Total contributions*, unless total contributions increase sufficiently rapidly, then *Net contributions* can potentially decline in absolute dollar terms. This is already evident from Figure 6, which shows *Net contributions* falling from $59 billion in 2008 to $39 billion in 2016.

The same information as a percentage of *Total assets* is shown in Figure 7, which also indicates clearly that *Total contributions* (sum of *Net contributions* and *Net payout*) as a

percentage of *Total assets* is in secular decline. This is due to *Total assets* growing faster than *Total contributions* since 2007.

Figure 7



Net payout has started to exceed *Net contributions* from 2010. Clearly this is an important emerging trend because *Net contributions* are one of the two major sources of growth in *Total assets* of the system (see A9).

From an analysis of the money flows in the superannuation system, it is evident that the impact of contributions on the growth of *Total assets* will likely diminish in the foreseeable future. Much depends on whether the recently lowered caps for concessional and non-concessional contributions will be moderated by any increases in the Superannuation Guarantee levy. The current Government policy is likely to lead to reduced *Total contributions* flows in the future, at a greater rate than in the past. At the same time, the demographic trend of increasing cohorts of retirees implies greater *Net payout*.

At the current rate of decline, it is projected that *Net contributions* could be negative by 2032, when *Net payout* could exceed *Total contributions.* Defining negative *Net contributions* as the withdrawal phase of the system, this is likely to occur earlier than 2032, because of recent changes in Government policy on contributions.

The combination of accelerated reduction in *Total contributions* and greater *Net payout* to more retirees would lead to a rapid decline in *Net contributions*, moving the whole superannuation system quickly to the withdrawal phase. The sustainability of the Australian superannuation system in the withdrawal phase will depend critically on *Net earnings* from *Total assets* to pay retirement incomes. Any faltering of financial markets will lead to a much greater dependence on Government Age Pension for the income of the retirees.

The major conclusion from an analysis of money flows in the superannuation system can be summarised as follows:

The Australian superannuation system is moving quickly toward the withdrawal phase when *Net contributions* will be negative. Sustainability of the system will then depend critically on *Net earnings* from *Total assets* to pay retirement incomes.

Net Earning Flows

The Australian superannuation system will depend more and more critically on *Net earnings,* which is defined as gross investment earnings minus all costs and taxes. Due to the multi-layered and multi-intermediary arrangement of the Australian investment industry, gross investment earnings cannot be reported to the superannuation regulator. Except for direct investments, only *Net investment income* is delivered by investment managers to superannuation funds. Hence only *Net investment income* is reported and no audited investment cost data are available in the official data.

Various estimates suggest that overall investment cost, including manager fees and expenses, broking commissions, trading slippages, soft-dollar commissions and so on can be quite significant in their total cost effect, particularly when a superannuation fund invests indirectly through layers of investment managers. The actual investment cost is difficult to report and making such estimates requires substantial effort in research and calculation, which will be performed in the next publication.

The reported money flows leading from *Net investment income* to *Net earnings* for the superannuation system are displayed on a cumulative basis in Table 4.

Table 4

Flow Quantity	Aggregates over 1997-2016 ($ billion)
Net investment income	1,143
Operating expenses	104
Pre-tax earnings	1,039
Total tax	206
Net earnings	833

Pre-tax earnings in the present context is defined as earnings after all costs, but before taxes paid at the superannuation fund level. Pre-tax earnings of $1,039 billion, rather than Net earnings of $833 billion may better reflect the investment performance of the superannuation system. After investment costs, net investment income accrued to the superannuation system was $1,143 billion, which reduces to the *Net earnings* figure of $833 billion, after $104 billion was paid for operating expenses and $206 billion was paid for total tax, including contribution tax and tax on earnings. Most of the taxes paid by the superannuation funds are contribution taxes.

Note also that the $206 billion tax recorded in the APRA data represents a lower bound that the government collects from the superannuation system, because taxes are also levied during the investment processes undertaken by intermediaries. For example, some

investment funds, such as investment trusts, may pay tax on behalf of their investors. Therefore the cost of investing may include additional taxes paid by investment managers, particularly by those who are active traders.

It is difficult to be accurate about the precise amount of these taxes, or costs of investing superannuation assets, which impacts ultimately on the *Net investment income* reported. The investment expenses reported to APRA do not include many imbedded costs in the investment process. Various estimates tend to suggest investing expenses are substantially higher than operating expenses. If investment expenses were double that of operating expenses, then total expenses before tax is $312 billion, implying a gross investment income, before expenses and tax, of $1,351 billion.

The conjectured investment cost implies that, averaged over the data period, *Net earnings* of superannuation members was about 62 percent of total gross investment income, where operating expenses subtracted 23 percent and taxes subtracted 15 percent. The reason why superannuation members get only about 62 percent of gross investment earnings is due to the cost structure of the superannuation industry, which has high variable cost from many service providers charging asset based fees, and also high taxes on contributions and earnings.

System Net Return

In its final report on "*How to Assess the Competitiveness and Efficiency of the Superannuation System*", the Productivity Commission stated that the most important criterion to assess efficiency is *Net return* of the system (PC, 2016, p.7):

> *Maximising net returns (after fees and taxes) is the most important way in which the superannuation system contributes to adequate and sustainable retirement incomes.*

The *Net return* of the system is defined by its *Net earnings* from its *Total assets* weighted by, or adjusted for fund flows (see Appendix).

For individual members also, the Productivity Commission states (PC, 2016, p.112):

> *Maximising long-term net returns (after all fees and taxes) on a given account balance, including by taking account of the risks associated with investment, is the most important way in which the superannuation system contributes to adequate and sustainable retirement incomes.*

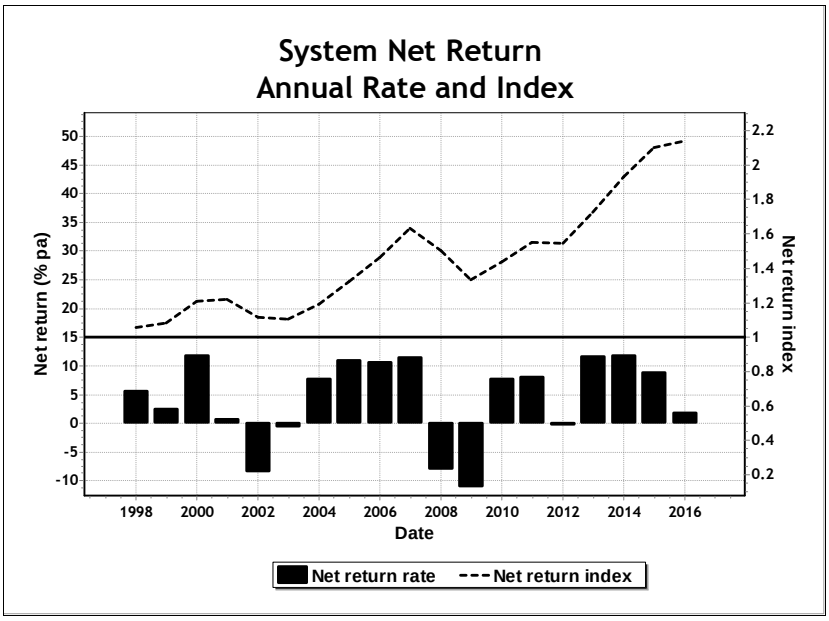
It can be proved mathematically that the asset-weighted average *Net returns* of all individual account balances is equal to the *Net return* of the whole superannuation system. Therefore, maximizing the *Net return* of the system is maximizing the average *Net returns* of *all* individuals.

Retirement incomes paid from *Net earnings* of the system are determined by the investment performance of superannuation assets. The above empirical observation about the approximate balance between *Net payout* and *Net earnings* in the system so far implies

that the *Net return* on superannuation investments to date must equal, on average, the *Payout rate* of the system. From Figure 5, it is evident that the *Net return* of the system must be between four and five percent per annum over the 1997-2016 data period.

The lower half of Figure 8 shows the annual *Net return* of the superannuation system is volatile, ranging between -11.1 percent in 2009 to 11.9 percent in 2014. A *Net return index* can be constructed from annual returns, showing how one dollar invested in June 1997 would have accumulated, net of all costs and taxes, to $2.14 by June 2016. The value of the *Net return index* is shown in the upper part of Figure 8.

Figure 8



The data show that *Net earnings* in the system would have more than doubled an investment over the 19-year period, implying a compound annual geometric return (CAGR) of 4.1 percent. Due to the effect of return volatility, the CAGR *Net return* is less than the arithmetic average *Net return* of 4.3 percent per annum.

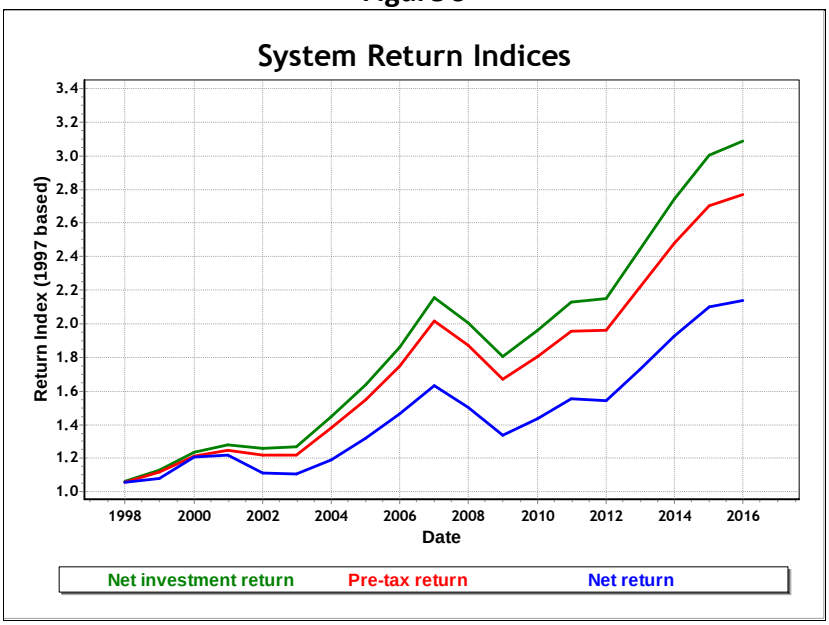
Analysis of System Net Return

Even though *Net return* is ultimately the most important determinant of superannuation efficiency for retirement income, *Net return* of the system is complicated by tax collection complexities. Not only do tax expenses depend on how the trustee structures its fund operations, but they depend also on Government tax policy, on individual investment decisions, and on how they impact on income and capital gains tax liabilities. Superannuation tax and *Net return* are complicated by the involvement of many parties.

In terms of the efficiency of a trustee in operating a superannuation fund, clearer measures may be either the *Net investment return,* which is the return after all investment costs, or *the Pre-tax return,* which is the return after all costs. The impact of operating expenses and

superannuation tax over the 19-year period is shown cumulatively in Figure 9, which shows *Net investment return* index, *Pre-tax return* index and *Net return* index.

Figure 9



One dollar invested in June 1997 would have accumulated by June 2016 to $3.09, $2.77 and $2.14 respectively from *Net investment return*, *Pre-tax return* and *Net return*. That is, operating expenses and superannuation taxes reduce *Net investment return* by 30 percent over the period. The results expressed in terms of annual rates are analysed in Table 5.

Table 5: System Returns (1997-2016)

Flow Quantity	Rate (% pa)	Method
[1] Gross investment return	7.1*	Calculated [2]+[3]
[2] Investment cost rate	1.0*	Estimated[2]
[3] Net investment return	6.1	Data given
[4] Operating expenses rate	0.6	Data given
[5] Pre-tax return	5.5	Calculated [3]-[4]
[6] Superannuation tax rate	1.4	Calculated [5]-[7]
[7] Net return	4.1	Data given

Note: Quantities with asterisks are given as a guide only, as they are not calculated from official data.

[2] Rice-Warner (2014) estimates investment expenses to be about the same as operating expenses. These under estimates do not pass tests from simple cross-checks. For example, CBA in 2017 reported wealth management, broking and trading income or revenue of about $6 billion (fees and commissions), which would be similar to those of Westpac (BT), NAB (MLC) and ANZ, but less than AMP. Hence total fees from all areas of wealth management (investment expenses) by the five major vertically integrated conglomerates could be as high as $30 billion, which is 1.5 percent of total assets of the superannuation system. Sy and Liu (2010) calculated a total asset-weighted cost (excluding explicit taxes) from data for 115 largest APRA funds to be about 1.7 percent.

Over the 19-year period, substantial contribution flows attracted substantial superannuation contribution taxes, reducing the system *Net return* by 1.4 percent per annum. As superannuation contributions diminish relative to *Total assets* in future, the superannuation tax rate should decline.

Note that the non-tax expenses, estimated at 1.6 percent, are an historical average over 19 years. Since investment and operating expenses have been falling slowly over time, it is likely that current non-tax expense would be less than 1.6 percent. If the total fees collected from the superannuation system were $20 billion, as suggested by the Financial System Review in 2014, then starting from 2013 *Total assets* of $1,540 billion in the system, the non-tax expense could be about 1.3 percent in 2014. This may indicate a decline in non-tax expenses over time.

Evidently, about 42 percent of *Gross investment returns* goes to the payment of tax and expenses (out of 100 percent, 20 percent goes tax, 8.5 percent to operating expenses and 13.5 percent to investing costs; the remaining 58 percent are retained as Net earnings in the superannuation system). Judgements on whether gross or net investment returns are efficient or otherwise depend on the benchmarks and other criteria used in the assessment.

Assessment of System Net Return

The detailed analysis of investment and operational efficiency is postponed to a future study. However, some indication can be obtained from a comparison to a few standard benchmarks, such as inflation rate, cash rate, total returns of the stock and bond markets in Table 6.

Table 6: Comparison Returns and Rates (1997-2016)

Quantity	Rate (% pa)	Source
System gross investment return	7.1*	Estimated (above)
System Pre-tax return	5.5	Data (net of all costs)
System net return	4.1	Super system data
Balanced fund net return	6.5	SuperRatings median[3]
Stock market gross return	8.0	ASX 200 accumulation index
Fixed income gross return	6.5	Bloomberg AusBond Composite Index
Cash rate	4.8	Bloomberg AusBond Bank Bill Index
Cash net return[4]	4.2	RBA cash rate (after 12% tax)
Inflation rate	2.6	Consumer price index

Note: The quantity with an asterisk is given as a guide only, as it is not calculated from official data.

The balanced fund net return of 6.5 percent quoted above from SuperRatings may be an over-estimate due to selection bias. Many smaller funds with poor performances may self-exclude from the sample by not submitting data, but if they were included then the median

[3] The data are sourced from http://www.netactuary.com.au/_ref/ref20.aspx?ID=manageyoursuper
[4] This is the CAGR from compounding 88 percent of monthly official cash rates.

return would be significantly lower. Hence the median of the selected sample may not be representative of what most superannuation members are likely to get.

Also, a large fund with large *Total assets* has many more members, but is counted only as one data point. Hypothetically, if more than half of all superannuation members were to belong to a large fund which has a *Net return* of four percent, for example, then superannuation members are more likely to get net returns of four percent rather than 6.5 percent. There are intrinsic problems in using medians of selected samples to represent the average of the population (see below).

The low *Net return* of the system, averaging close to the *Net return* of cash, is affected substantially by contribution tax which is paid at the superannuation fund level. It is therefore not indicative of the financial performance of the system, which may be better measured by the average *Pre-tax return* of 5.5 percent, which exceeds the cash net return of 4.2 percent. Nevertheless, given that the performance of the Australian superannuation system has suffered high volatility, the question arises as to whether the additional 1.3 percent in performance is adequate compensation for the risk taken.

To the casual observer, *Total assets* of Australian superannuation have grown impressively at an annual compound rate of about 10 percent. This growth, which is in line with the growth of *Total contributions,* may have masked the underlying performance of the superannuation system. This apparently lacklustre performance over a long period of time is noticed by most people except the presstitute.

In commenting on the Australian property bubble, the former leader of the Federal Liberal Party, John Hewson (2017), recently observed in passing about property investments:

> *…you would probably do better than you would in terms of investing in your superannuation which is generally pretty poorly managed in this country.*

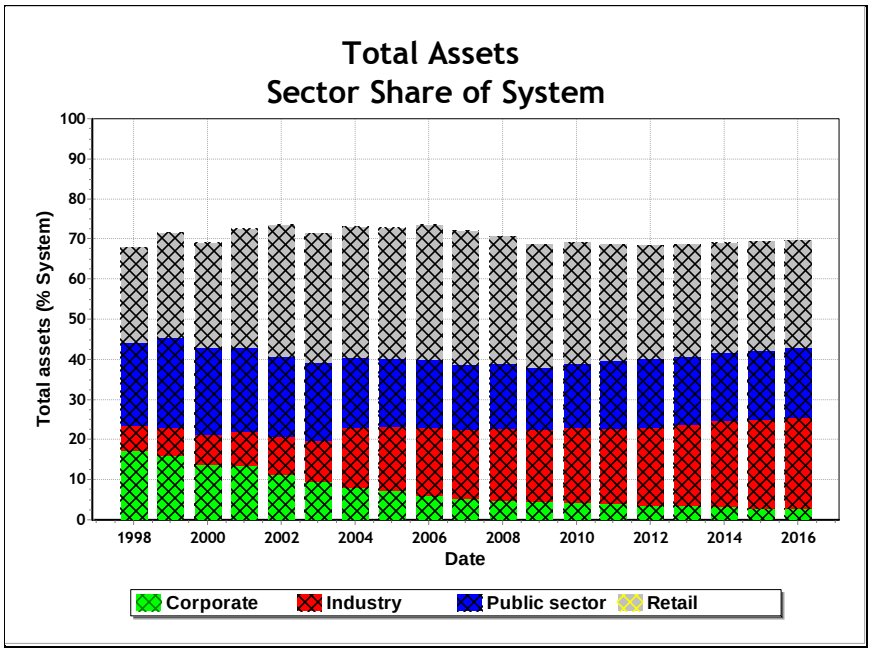
In order to investigate further the apparently disappointing perception of the Australian superannuation system, we analyse more of the official data from APRA which classify components of the system data into well-defined sectors. Who or which sector(s) or segment(s) are responsible for the perceived poor performance of Australian superannuation?

Analysis by Sectors

According to APRA's classification, the superannuation system consists of five main sectors: four sectors of institutional or Large APRA funds, with five or more members in each fund, plus a sector for the rest of the funds, mainly comprising small funds with four or fewer members, predominately self-managed superannuation funds (SMSF).

The sector composition of the system as it evolved over time is shown in Figure 10 which shows, remarkably, that institutional funds account stably for about 70 percent of the superannuation system.

Figure 10: Sector structure of the System



The sectors are defined by the APRA classification. Funds with more than 4 members are called large funds, regulated by APRA. The aggregate of the four main sectors of large funds are called here the *Large APRA* segment. The cumulative money flows of the individual sectors are shown in Table 7.

Table 7: Cumulative sector fund flows ($ billion) 1997-2016

Quantity	Corporate	Industry	Public sector	Retail	Large APRA
Total assets (1997)	62	20	71	78	231
Total assets (2016)	55	466	356	545	1,422
Increase in total assets	-8	446	285	467	1,191
Growth Rate (% pa)	-1	18	9	11	10
Total contributions	73	350	371	503	1,299
Net payout	103	90	276	246	725
Net contributions	-30	260	95	257	573
Net earnings	22	186	190	210	618
Operating expenses	60	211	203	242	716
Superannuation tax	4	15	8	44	71

Percentage shares of the various sectors contributing to the growth of the *Large APRA* funds segment are shown in Table 8 below. Some observations on superannuation sector evolution, which may confirm current perceptions, are as follow:

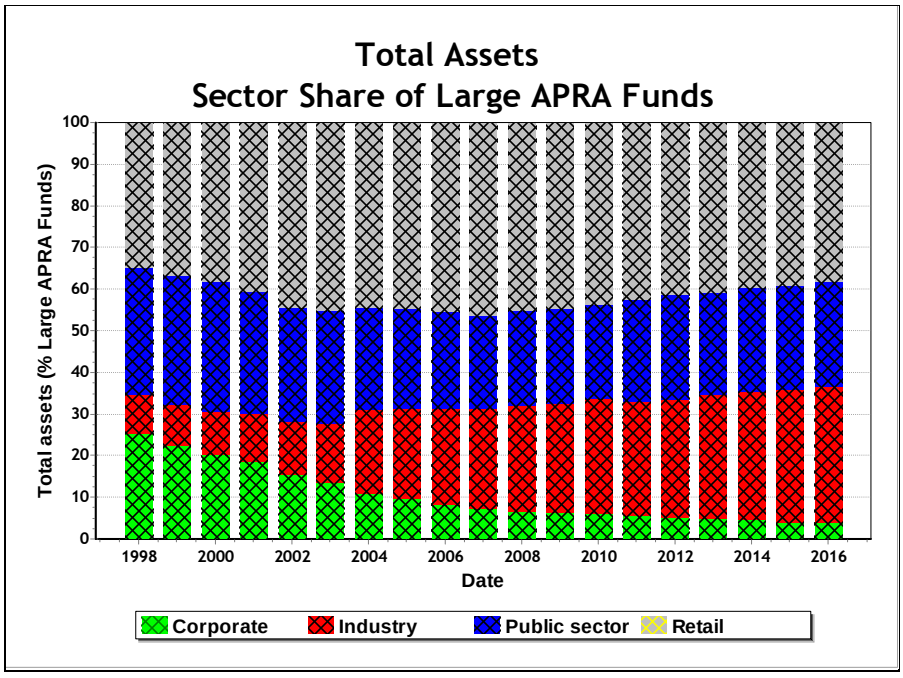
- The *Corporate* sector has been contracting (due to the winding up of many defined benefit plans), but only at about negative 1 percent per annum, on average in absolute terms.

- Strongest asset growths occur in the *Industry* and *Retail* sectors, which are the *Public offer* segment of Australian superannuation.
- The *Industry* sector has the highest asset growth rate, at 18 percent per annum, starting from a low base in 1997. The rate of growth is seven percent higher than the nearest rate of 11 percent from the *Retail* sector.
- The *Retail* sector attracted the highest cumulative total superannuation contributions of $503 billion, which was 39 percent of all *Large APRA* funds, while the *Industry* sector had $350 billion, or 27 percent of the total.
- The *Public sector* has the highest *Net payout* to fund the retirement of public sector beneficiaries. The high *Net payout* leads to low cumulative *Net contributions* of only $95 billion in that sector. The nine percent per annum growth in *Total assets* of the *Public sector* was achieved through significant *Net earnings* of $190 billion.
- Cumulative *Net earnings* are lowest for the *Corporate* sector due to contracting *Total assets*, probably due to liquidity preference during contraction and higher tax payments. The remaining sectors have achieved approximately the same *Net earnings* in absolute terms.
- The *Public sector* paid the least tax through its superannuation funds, while having the highest *Net payouts.* Perhaps the payouts are pensions with tax deferral, i.e. with significant taxable components in the hands of the beneficiaries.

Sector Structure of Large Funds

Percentage shares of the various sectors of the *Large APRA* segment are shown in Figure 11.

Figure 11: Sector structure of Large Funds



- The *Retail* sector remains the largest component, fluctuating slowly between about 35 to 45 percent of the segment. It started at 35 percent in 1997, increased to about 45 percent in 2003 and has since drifted lower to 39 percent in 2016.
- The major shift in sector structure has come from the *Corporate* sector, declining from 27 percent in 1997 to 4 percent in 2016, having halved rapidly within the first six years and then declining gradually thereafter.
- The *Public sector* also contracted in relative terms, falling moderately from 31 percent to 25 percent of the segment over the 19-year period.
- The major gainer from the shift in sector structure is the *Industry* sector, improving from 9 percent to 33 percent of the segment in a steady fashion.

Some of the fund flow dynamics responsible for the evolution of sector structure of large funds are analysed on a sector share basis in Table 8.

Table 8: Sector share (%) of *Large APRA* segment growth 1997-2016

Quantity	Corporate	Industry	Public sector	Retail
Total assets (1997)	27	9	31	34
Total assets (2016)	4	33	25	38
Increase in total assets	-1	37	24	39
Total contributions	6	27	29	39
Net payouts	14	12	38	34
Net contributions	-5	45	17	45
Net earnings	4	30	31	34
Operating expenses	8	29	28	34
Superannuation tax	6	21	11	62

- The *Retail* sector had 39 percent of the increase in *Total assets* of the segment, while the share of *Industry* sector was 37 percent.
- The *Retail* sector accounted for 39 percent of superannuation contributions (the highest share), while the *Public sector* and the *Industry* sector accounted for significantly lower shares of 29 percent and 27 percent respectively.
- *Net payouts* share was greatest for the *Public sector* and smallest for the *Industry* sector, reflecting the evolving history of Australian superannuation and demographics.
- *Net contributions* share of the *Corporate* sector is negative at -5 percent, reflecting low *Total contributions* but high *Net payouts*. Many *Corporate* funds have wound up over time.
- Despite having the smallest share of *Total assets* in 1997 (9 percent) and a modest share of *Total contributions* flows (27 percent), the *Industry* sector achieved 30

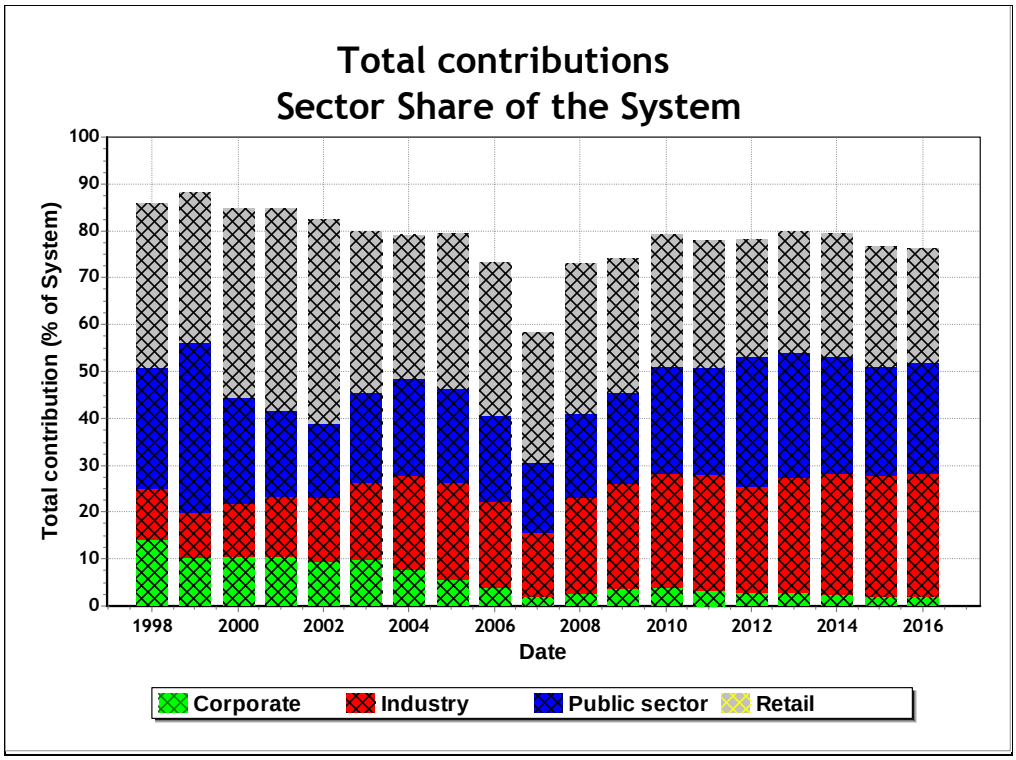
percent of *Net earnings*, comparable to 31 percent by the *Public sector* and 34 percent by the *Retail* sector.

Contribution Flows

The broad statistics in Table 8 suggest that contribution flows are not the main factor driving the evolving sector structure of institutional funds because, historically, the *Retail* sector has had the lion's share of fund flow from superannuation contributions, totalling 39 percent of cumulative flows over the period.

The sector contribution flows in the superannuation system are displayed in Figure 12, showing institutional funds receiving about 80 percent of all superannuation contributions. The dip in 2007 was a one-off anomaly, when a million-dollar concessional contribution window was opened temporarily and fund flows were largely directed to small funds (with less than five members).

Figure 12

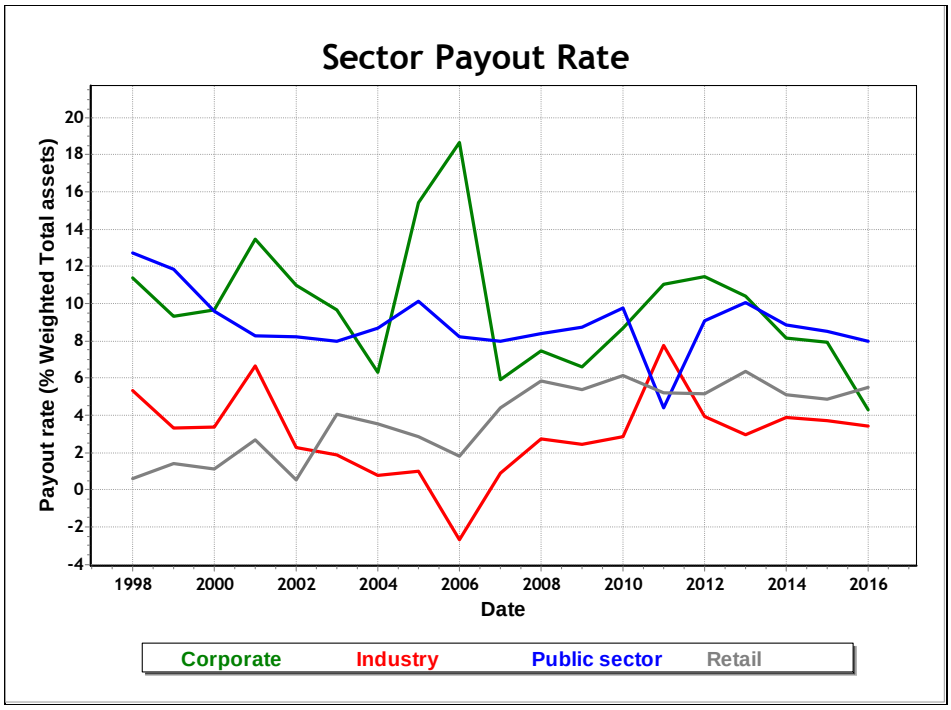


The government policy to transition from defined benefit schemes to defined contribution schemes over the past few decades has led to the relative rise in *Public offer* funds and a relative decline in *Non-public offer* funds. In particular, the policy caused the relative secular decline of the *Corporate* sector. *Public offer* funds are defined in this report as funds in the *Industry* and *Retail* sectors, ignoring a few exceptions of *Public offer* funds operating

in the other sectors. By definition, superannuation funds which are not *Public offer* are classified as *Non-public offer*. *Public offer* funds are increasingly dominating the institutional sector, with 71 percent share of its *Total assets* in 2016.

The changes in sector sizes from money flows depend not only on inflows from *Net contributions* but also on outflows from *Net payouts*. The trends for *Net payouts* measured as the Payout rate (as a percentage of weighted total assets) are shown historically in Figure 13.

Figure 13

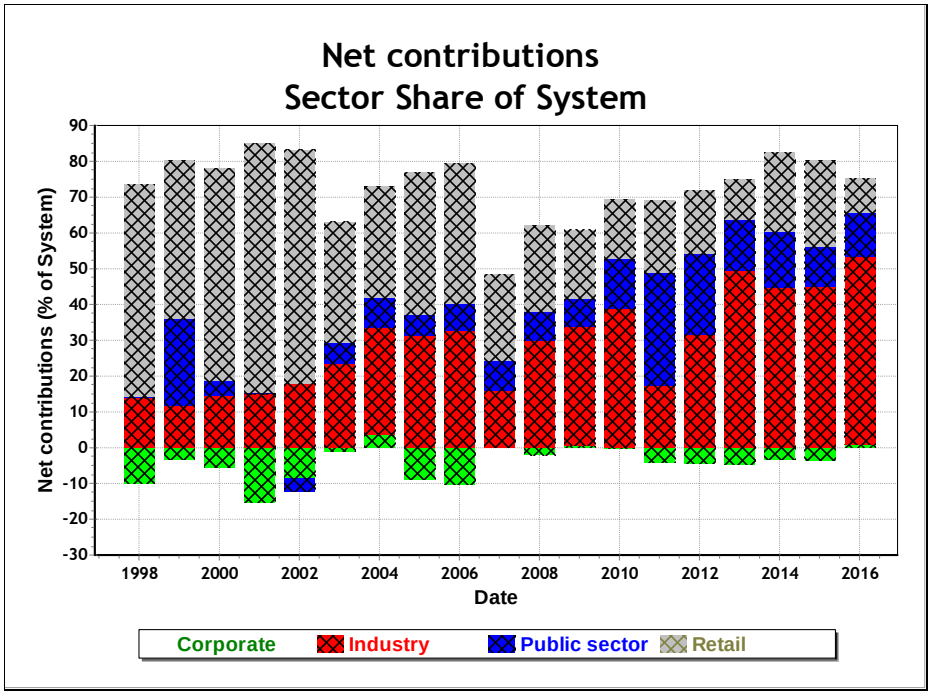


Public sector and *Corporate* funds have higher payout rates (as a percentage of weighted total assets) than those in *Industry* and *Retail* sectors.

Net Contributions Flow

Clearly the fund flow impact on sector sizes depends not only on inflows from *Net contributions* but also on outflows from *Net payouts*. The relative decline of fund flow impact on *Non-public offer* and *Retail* funds is due to increasingly high P*ayout* ratios rather than low *Total contributions*. The overall impact of relatively large payouts in these sectors is a relative decline in the system share of *Net contributions*, as Figure 14 shows.

Figure 14



From the point of view of superannuation fund flows, the *Industry* sector was taking about 55 percent of the system's net flows in 2016, *Retail* and *Public sector* taking 20 percent combined, *Corporate* sector took no share, with the remaining 25 percent taken by SMSF and others. That is, in 2016 dollar terms, the Large APRA segment took $29.5 billion of *Net contributions* of the superannuation system, while the Small and other segments took $9.6 billion.

The sector shares of *Net contributions* of the superannuation system are an important determinant of the sector structure changes of the system, because sector growth or increase in *Total assets* is the sum of *Net contributions* and *Net earnings*. Evidently, the data show that *Net contributions* flows of the system strongly favour the *Industry* sector.

> The Industry sector has a high share of the Net contribution of the system, not because it has high share of contribution inflows, but because it has low share of payout flows.

The empirical data certainly support *Net contributions* factor as an explanation for the stronger growth of the *Industry* sector, but this factor has to be weighed against the *Net earnings* factor, which is even more important for investors and for the approaching withdrawal phase of the superannuation system.

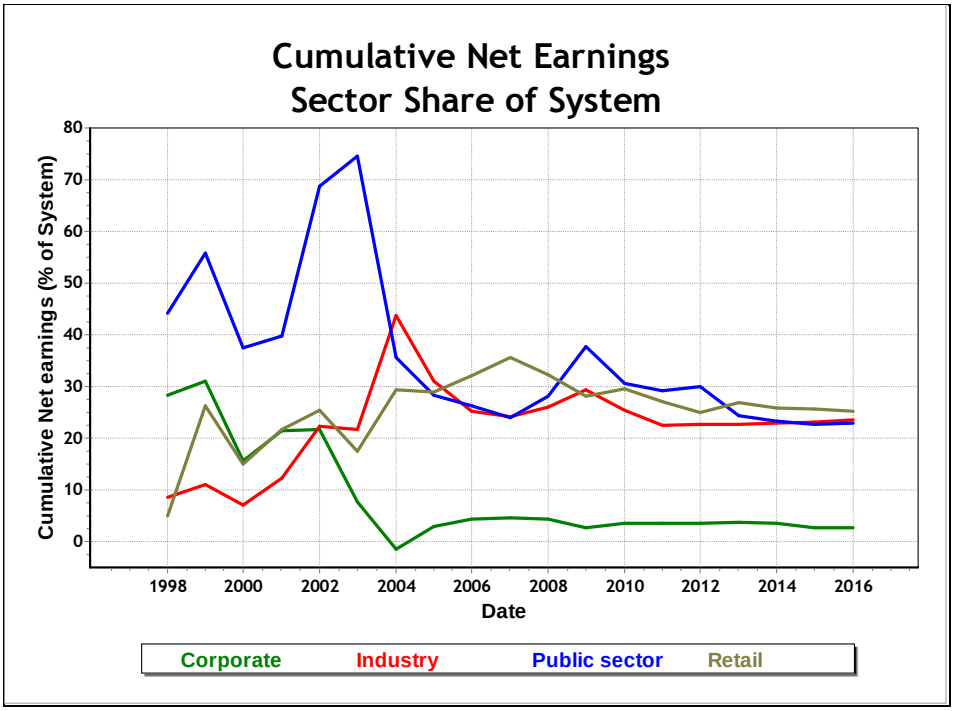
Net Earnings Flow

Indeed, *Net contributions* may well be correlated with *Net earnings* in the sense that higher *Net earnings* from better net investment performance may well attract *and retain* a greater

share of contribution flows, possibly resulting in higher *Net contributions*. It is obviously important to investigate *Net earnings* and *Net returns* for different sectors.

The sector share of cumulative *Net earnings* responsible for cumulative *Net growth* of the system is shown in Figure 15.

Figure 15: Sector share of *System*'s cumulative *Net earnings*



Note that there is volatility in the data for *Net earnings* over the period between 2000 and 2004, probably due to timing of tax losses following the bear market associated with bursting of the technology bubble. While this could lead to inaccuracies in short-term estimates of *Net returns*, the long-term average should remain accurate due to cancellation of over and under tax assessments over time.

Until 2016, the *Retail* sector accounted for about 25 percent of the system's cumulative *Net earnings*; the *Industry* sector and *Public sector* each accounted for 22 percent, the *Corporate* sector four percent, while the remaining 27 percent came from the *Small* and other sectors. Note that taxation may have a significant impact on *Net earnings* and it may be responsible for the volatility of sector *Net earnings* between 2001 and 2004. The volatility is apparently attenuated in the cumulative data over time, but actual volatility of *Net earnings* is even greater in 2008-2009.

The fact that cumulative *Net earnings* are not significantly different between the sectors may suggest that *Net earnings* are not a significant explanatory factor for the different growths in *Total assets* of the sectors. Perhaps, not only investment performance, but also taxation, has a significant impact on *Net earnings*. The cumulative *Net earnings* are *not* simply indicative of the investment performance of the sectors. For example, Figure 10 and Table 7 show that *Industry* funds have lower, or substantially lower, *Total assets* than *Retail* funds, throughout the data period.

Since the average *Total assets* over the 19-year period of the *Industry* sector was substantially lower than that of the *Retail* sector, and yet has accumulated the same *Net earnings*, it follows therefore that the average *Industry Net return* must be substantially higher than that of the *Retail* sector.

This conclusion will be verified with greater detail below. Investment performance should influence contribution flows, but other structural and regulatory factors may have greater impact on the relative growth of the sectors. Currently, *Public offer* funds are structurally divided into *Industry* funds, which have captured large numbers of blue-collar workers and *Retail* funds which have attracted a smaller number of white-collar professionals. While *Retail* funds still capture most of the contribution flows, they have large out flows, due to high payout rates.

Analysis of Sector Returns

Net returns defined as asset-weighted *Net earnings*, after all costs and taxes, are a useful measure for account balance growth, but are significantly affected by taxes which are controlled by Government policy. Better measures of investment performance are *Net investment return,* which is a return delivered by investment managers net of all investment expenses, or *Pre-tax return,* which is a return after all costs but before taxes.

The compound average geometric rates (CAGR) of sector returns over the 19-year period are shown with implied expenses rates and tax rates in Table 9.

Table 9: Average net returns for sectors (CAGR) 1997-2016

	Corporate	Industry	Public sector	Retail	Large APRA
Net investment return (after costs)	6.1	7.2	6.6	5.4	6.1
Operating expenses rate	0.4	0.6	0.3	0.9	0.6
Pre-tax return (net of all costs)	5.7	6.7	6.3	4.6	5.6
Super tax rate	3.6*	0.4	0.6	1.0	0.9
Net return (net of all costs and taxes)	2.1*	6.3	5.8	3.6	4.6

Note: the asterisks indicate potential inaccuracies due to special circumstances discussed below. See also a discussion on the complexity of tax in the Appendix.

- For the *Large APRA* funds segment, on average, the *Retail* sector has lowest *Net investment return*, being 0.7 percent below segment average. *Retail* funds have also the highest *Operating expenses*, being 0.3 percent above segment average, resulting in a Pre-tax return (net of all costs) one percent below average.
- The *Retail* sector has the lowest *Pre-tax return* (net of all costs) at 4.6 percent per annum compared with the *Industry* sector which has the highest at 6.7 percent per annum, being 2.1 percent higher than the *Retail* sector.
- On average, the *Corporate* sector paid the highest rates of superannuation tax at 3.6 percent, presumably due to wind-ups and the triggering capital gain taxes. The

Industry sector paid the lowest taxes at 0.4 percent per annum, consistent with a low *Payout ratio* (deferring capital gains tax) or transitioning to tax-free benefit payment in retirement pension mode.

- The *Retail* sector has the second highest tax rate at one percent, which may be due to relatively higher taxes before 2004, potentially related to high market volatilities and active investing. Most of the *Net return* gap relative to the *Industry* sector was due to 1.8 percent under-performance by the *Retail* sector in *Net investment returns*, even before costs and taxes were incurred at the superannuation fund level.

The *Net return* gap between the *Industry* and *Retail* sectors, while subject to some uncertainty on tax before 2004, appears consistent with an estimate of similar situations in the US context for "all-in" cost of active investing (Bogle, 2014, Table 3).

Another way of looking at the cumulative impact of the investment performances of different sector returns is to show what would have happened with one dollar of Superannuation Guarantee contribution from gross salaries deposited in an account in 1997. The account balances achieved by June 2016 are shown in Table 10.

Table 10: Accumulation of One Dollar Starting Account Balance 1997-2016

	Corporate	Industry	Public sector	Retail	Large APRA	Non-profit
Net investment balance ($)	3.07	3.77	3.36	2.74	3.11	3.40
Admin costs ($)	0.19	0.37	0.17	0.39	0.31	0.23
Pre-tax balance ($)	2.88	3.40	3.19	2.35	2.79	3.17
Tax costs ($)	1.39	0.20	0.30	0.37	0.43	0.52
Net balance ($)	1.50	3.20	2.90	1.97	2.36	2.65

- Despite the misleading impression created by superb performances of a few small-size funds, the asset-weighted performance of the *Corporate* sector has been quite ordinary even on a *Net investment return* basis. Many funds winding up may have triggered substantial capital gain taxes, to result in the lowest net balance.
- The *Retail* sector has the lowest balance from *Net investment return*. Most of the damage to a member account balance has already occurred before investment earnings are collected by the superannuation fund. Higher administrative costs and higher taxes further diminish the final net balance to $1.97, 68 cents less than the average *Non-profit* fund and $1.23 less than the average *Industry* fund.

Analysis of Segment Returns

Higher levels of aggregation into segments provide potential insights into the various factors which may influence investment performance and ultimately *Net returns*. Equivalent data to Table 9 for sectors are presented for segments in Table 11 below.

Table 11: Average net returns for segments (CAGR) 1997-2016

	Large APRA	Small and other	System	Public offer	Non-public offer	Non-Profit
Net investment return (after costs)	6.1	6.1	6.1	6.0	6.3	6.7
Operating expenses rate	0.6	0.7	0.6	0.8	0.5	0.4
Pre-tax return (net of all costs)	5.6	5.5	5.5	5.2	5.8	6.3
Super tax rate	0.9	2.4	1.4	0.7	2.1	1.0
Net return (net of all costs and taxes)	4.6	3.1	4.1	4.5	3.7	5.3

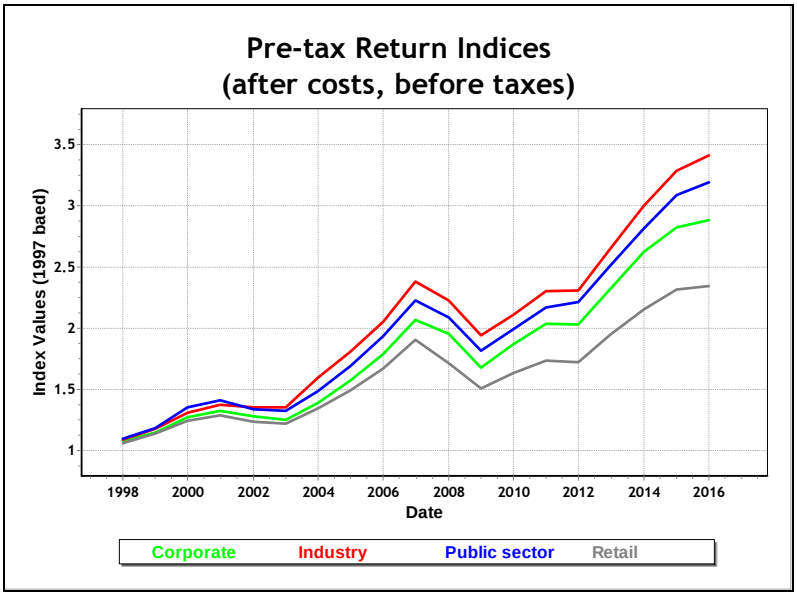
- While *Net investment returns* at 6.1 percent per annum are the same for both institutional and non-institutional funds, institutional funds have only marginally lower operating expenses rates, as the benefits of economies of scale are offset by higher administration costs of larger memberships.
- Institutional funds are more tax efficient in neutralizing capital gains and losses within the funds and also, by having on average a lower *Payout rate,* have benefitted from a substantially lower effective tax rate.
- *Non-public offer* funds have superior *Pre-tax returns* at 5.8 percent per annum relative to those of *Public offer* funds at 5.2 percent per annum. This fact may be due to simpler and more direct investment strategies and simpler administration.
- *Non-public offer* funds attracted on average much higher tax rates, detracting their *Net returns* to 0.8 percent per annum below *Public offer* funds, allowing the *Public offer* segment to become an increasingly larger segment of the superannuation system.
- The *Non-profit* or *Not-for-profit* segment is defined as the segment comprising funds outside the *Retail* sector. Considering that the *Non-profit* segment has 1.3 percent higher *Net investment returns*, 0.5 percent lower *Operating expense rate* and the same superannuation tax rate as the *For-profit* segment (*Retail* sector), one observes that profit making of *For-profit* funds in various ways may cost members as much as 1.8 percent per annum in either *Pre-tax returns* or *Net returns*.

In general, most of the differences in investment performance between various sectors and segments have occurred at the level of *Net investment return*, before any costs and taxes at the superannuation fund level are considered. This does not mean that costs and taxes incurred at the superannuation fund level are unimportant, as Figure 9 shows that they are indeed important for long-term accumulation. What it means is that the differences in *Net investment return* provide much of the explanation for the differences in end results.

Sector Return Trends

The consequences of investing one dollar in 1997 in an average fund in each of the sectors are shown Figure 16.

Figure 16

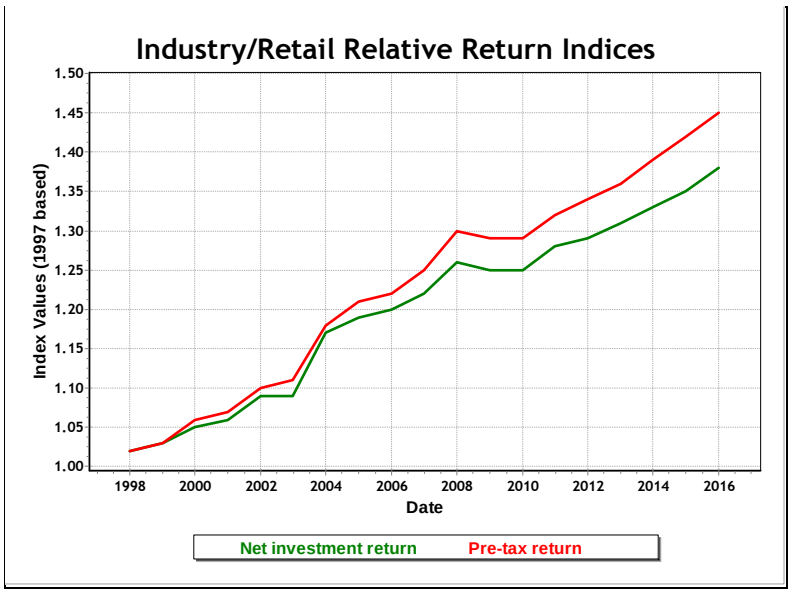


That is, on average, the one dollar in 1997 grew to $3.40 in the *Industry* sector, $3.19 in the *Public sector,* $2.88 in the *Corporate* sector and $2.35 in the *Retail* sector. The fluctuations in the return indices are all correlated with the market fluctuations.

Relative Performance

The noises from market fluctuations can be removed by creating relative return indices between two sectors simply by dividing one index time series by another. The relative return index then shows the cumulative performance of one index relative to the other. Figure 17 shows the performance of the *Industry* sector relative to the *Retail* sector both for *Net investment return* indices and *Pre-tax return* indices.

Figure 17



The steadily rising lines in the figure demonstrate consistent (low volatility) and persistent (almost monotonic) out-performance of *Industry* funds against *Retail* funds. The bottom curve is due to sector differences in average *Net investment return,* whereas the top curve is due to sector differences in average *Pre-tax return (*net of all costs). The gap between the top and bottom curves is determined by 0.3 percent per annum in differential *Operating expenses* (see Table 9).

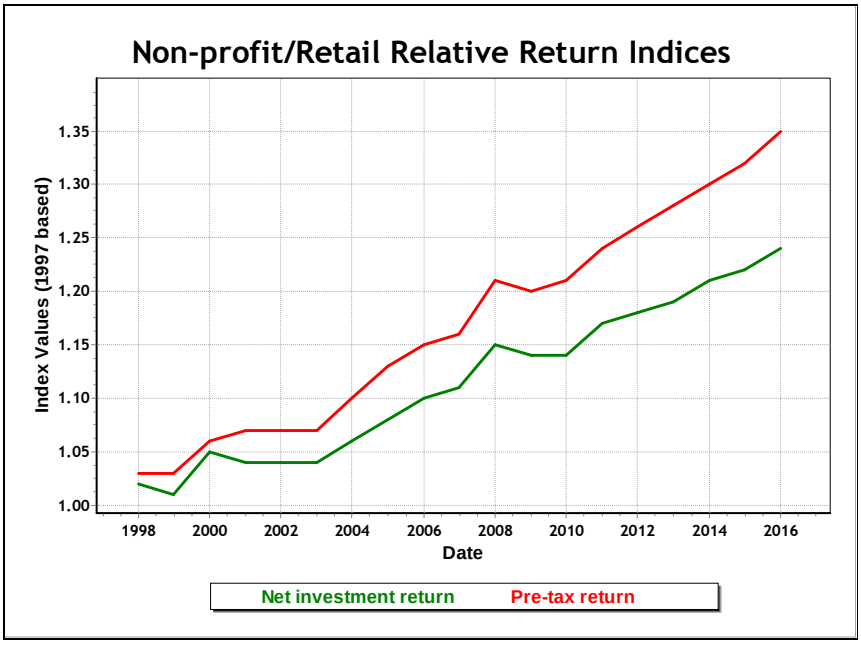
After the 19-year period, the average *Industry* fund has performed cumulatively 45 percent better than the average *Retail* fund. Most of that superior performance has come from 37 percent increment in *Net investment return* and the remaining 8 percent of increase has come from greater operational efficiency.

In order to show what might be the principal factor behind this consistent and persistent investment performance difference, the for-profit factor is examined by creating *Non-profit* or *Not-for-profit return* indices, which represent the performance of all funds in the superannuation system outside the *Retail* sector.

The *Non-profit* sector contains all sorts of funds – *Public offer* or *Non-public offer*, large or small, high or low *Payout ratios* and mixed demographic profiles. For example, the average *Payout ratio* of *Non-profit* funds is 64 percent (largely due to the *Public* sector), versus 44 percent for *Retail* funds. The only common element is that the *Non-profit* funds do not seek to make profits for shareholders of the companies which manage the funds.

The performances of *Non-profit* funds relative to for-profit *Retail* funds are shown in Figure 18.

Figure 18



Again, the steadily rising lines in the figure demonstrate consistent (low volatility) and persistent (almost monotonic) out-performance of *Non-profit* funds against *Retail* funds. After the 19-year period, the average *Non-profit* fund has performed cumulatively 35 percent better than the average *Retail* fund. Most of that superior performance of *Non-profit* funds has come from 24 percent increment in *Net investment return* and the remaining 11 percent has come from operational efficiency.

> The often-cited claim that *Retail* funds out-perform in bear markets is supported only weakly by the evidence, because the relative out-performance of *Retail* funds in those periods has not been very significant.

Comparing Figures 17 and 18, the main differences between *Industry* funds and *Non-profit* funds in their relative out-performance against *Retail* funds are: *Industry* funds add more out-performance through *Net investment returns*, but add less out-performance through *Operating expenses* due to their higher *Public-offer* costs.

Figures 17 and 18 provide clear evidence that:

> The relative investment performances between the *Retail* sector and other sectors are highly persistent and predictable.

A reasonable interpretation of this consistency is that:

> *Retail* fund members, on average over all options, paid through fees and trustee policy on operations 1.6 percent per annum more than *Non-profit* fund members for investment choices and other services.

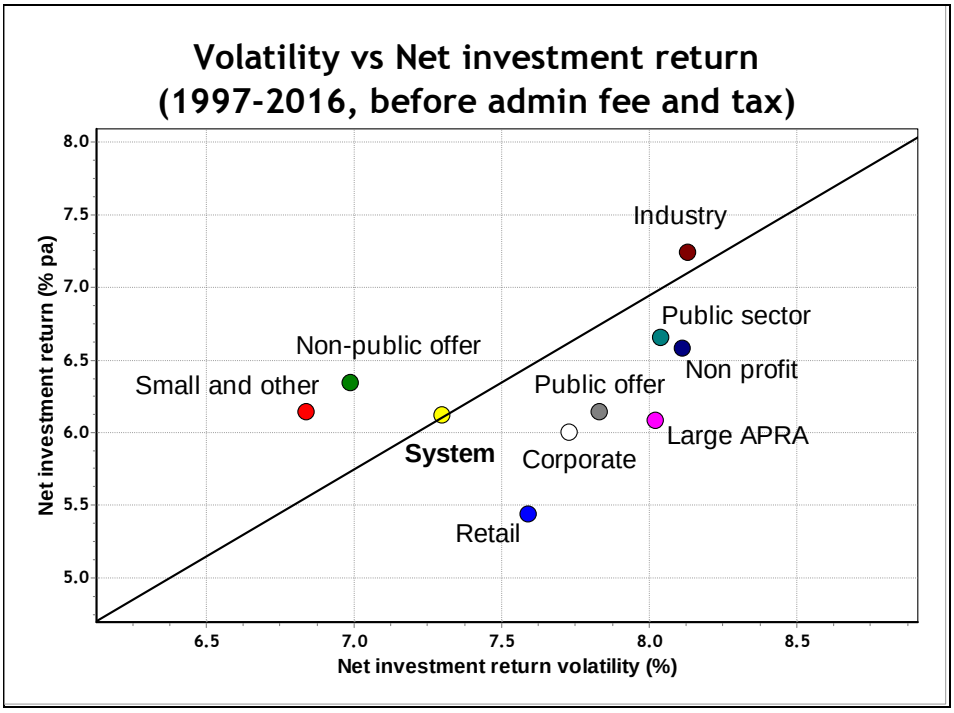
The financial conglomerates do not, and cannot, usually deny this fact of higher costs to their members as supporting data are available in their company annual reports in the wealth management sections, where the revenues reported also include fees from other investment services related to superannuation. At 2016 *Total assets*, the additional revenue collected from operating *Retail* superannuation funds alone would be approximately $8.7 billion per annum.

The usual explanation for this additional cost to *Retail* members is that *Retail* funds provide more choices, more options and more financial advisors to make better investment decisions for members. One explanation often given for these additional activities is the benefit of risk management from dynamic asset allocation. A measure of such investment efficiency is the trade-off in efficiency between risk and return.

Risk Return Efficiency

Higher *Net investment returns* are assumed to come with higher volatilities, which is a common measure for risk. For *Net investment return* performance, the risk-return characteristics of the sectors and segments are shown in Figure 19.

Figure 19



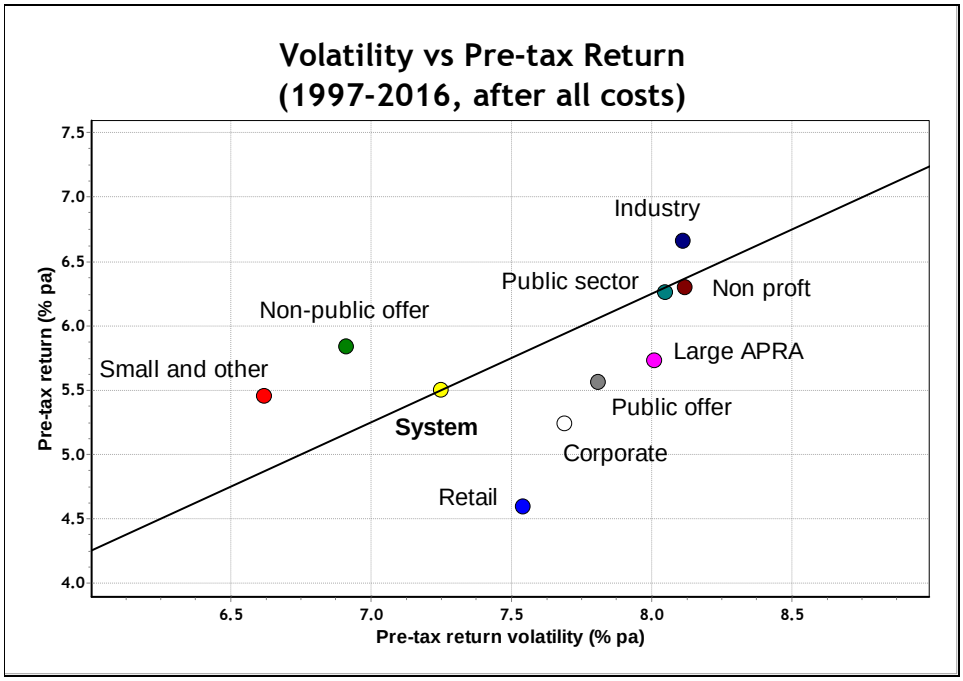
The diagonal line is a 45-degree line (distorted by the aspect ratio of the chart) representing equal increments in volatility and *Net investment return*, representing risk-return trade-off. The line is drawn through the point for the whole superannuation system, which is taken to be the benchmark for peer comparison. All points along the reference line represent equal risk-return efficiency to the system as a whole.

The points above the line are more risk-return efficient relative to the system, whereas the points below the line are less risk-return inefficient relative to the system. In approximate descending order of risk-return efficiency, the data suggest: *Non-public offer*, *Small and other*, *Industry*, *System*, *Public sector*, *Non-profit*, *Public offer*, *Corporate*, *Large APRA* then *Retail*. The first three sectors or segments are risk-return efficient, while the last six are risk-return inefficient compared to the system average.

> Figure 19 shows that *Retail* funds do have lower investment volatility (averaged over the 19-year period) than other institutional funds, but they also have substantially lower average returns. The resulting risk-return inefficiency indicates poor trade-offs for *Retail* members.

With the subtraction of *Operating expenses*, the risk-return characteristics of *Pre-tax return* performances of the sectors and segments would still be very similar to that shown in Figure 18, because *Operating expenses* are relatively constant and not very large compared to *Net investment returns*. The overall effect would be a lower and left-ward shift, to a greater or lesser extent, of the data points in Figure 19, as shown in Figure 20.

Figure 20



It is interesting to note that the *Industry* sector and the *Small and other* sector are both risk-return efficient, but are at the opposite ends of the risk spectrum. It is well-known (ATO, 2015) that funds in the SMSF sector have generally high asset allocation to cash. The sector has achieved a similar *Pre-tax return,* at close to 5.5 percent per annum of the system or *Public offer* funds, but has lower volatility.

The *Small and other* sector has nearly one percent higher return and one percent lower volatility than the *Retail* sector. From Figure 14, the share of *Net contributions* flows for small funds at about 25 percent is higher than that of the *Retail* sector at about 20 percent. There were high *Net rollovers* into the *Small and other* sector in the several years following the start of the global financial crisis (GFC). The loss of *Retail* share in *Net contributions* flows (see Figure 14) is unlikely to lead to a gain in *Industry* share, which has dissimilar demographics and is more likely to lead to a gain for the *SMSF* sector which has similar demographics to the *Retail* sector.

Sampling Bias

Note that many of the above trends have already been demonstrated in published papers several years ago (Sy and Liu, 2010; Sy, 2011). Based on fund level data between 2002 and 2006, Sy and Liu (2010) estimated *Retail* funds to have high active indirect costs, which appear to explain their low *Net investment returns*. Sy (2011) indicated the lacklustre performance to 2009 of the superannuation system as a whole and suggested that the lack of competition in the system may be caused by too many choices, particularly in *Retail* funds. This report has confirmed and updated those findings, but the importance and robustness of previous conclusions have not been widely appreciated.

In the interim, business and academic research, without a full understanding of the data, has added a lot of noise to confuse the facts, as discussed below. This is evident from the observation that inquiries and reviews are based on canvassing a variety of inconsistent opinions, rather than based only on authoritative agreed facts. There needs to be a set of agreed facts, which are important as a basis for research, policy and reform.

The conclusive research here is based on a macro or top-down approach (using audited financial data), whereas most of the inconclusive research elsewhere has been based on a micro or bottom-up approach, in the false belief that those other approaches are more relevant to individual decisions because "people invest in options or products, and not funds or sectors" ignoring the significance of quality data. This will be discussed in the next section.

Most research is based on statistical techniques taught at universities, which are *invalid* in general real-life applications, because of the false assumptions used. Essentially, the equilibrium assumption of normal distributions in textbooks has not been understood as significant or has been conveniently ignored. The fact that the distributions of actual data are often *far from normal* means that many of the conclusions using textbook techniques are invalid or not robust. Therefore the substantial body of research has led to random or contradictory conclusions.

Importantly, the implication of *non-normal* distributions is that conclusions drawn from standard techniques are invalid or unstable, being susceptible to:

- Sampling bias
- Survivorship bias
- Selection bias
- Unstable averages
- Unstable regression models.

The simple mean and median are widely and almost exclusively used for averaging in business and academic research, but they lead to invalid or unstable averages if the distribution of the population data is non-normal. In the context of investment research, the best and most convenient way of overcoming sampling bias for non-normal distributions is to use the data of full population and to use asset weighted averages, as is done in this report.

To illustrate the point, consider a very simple, but hypothetical example. Consider a population of 11 superannuation funds – five with $100 million assets with returns of 10 percent, one also with $100 million assets but a return of five percent, and the other five funds with only $10 million assets and also with returns of five percent.

The example happens to have a scale bias where large funds perform better than small funds, reflecting somewhat the reality, but the actual numbers and the scale bias do not affect or invalidate the points being made. What is the average return of the population of funds? The possible answers are shown in Table 12.

Table 12: Different Samplings and Averages

	Asset Weighted	Mean	Median
Population	**8.8**	7.3	5.0
Top 9 (by size or return)	9.0	7.8	10.0
Top 8 (by size and return)	9.0	8.1	10.0
Missing middle fund	9.5	7.5	7.5
Bottom 9 (by size and return)	8.6	6.7	5.0

The correct answer is 8.8 percent (in bold and green), being the asset-weighted return for the whole population, because that is the most probable return for any investor. Note that for the given non-normal distribution of returns, the mean and median are very far from accurate or useful. In making an investment performance comparison between sectors, Rowell (2015) has used misleadingly the median, like many other researchers in common practice.

Most leagues tables published by consultants and research houses do not include the whole population and the averages used are either the simple mean or the median, which are invalid because the return to the dollar is not normally distributed. Moreover, the averages are unstable to sampling errors.

In the above example, just by dropping two funds at the bottom, the median shot up from five percent to 10 percent, highlighted in yellow. Selectively dropping a poorly performing large fund from the sample would have the median rising to 7.5 percent, highlighted in aqua. This is the likely type of errors in the statistics of published research, because the samples generally include most large funds and exclude many small funds.

The mean is less often used because, unless only the best returns are selected, the under-estimation by the average increases as the sample size increases, as seen in the example above. Thus, using the mean, and including a large number of poorly performing small funds would be unflattering to the superannuation system, whereas the median could be manipulated to provide a more positive picture.

Just in case the above example is still too complicated for most to grasp easily, consider a very crude and simplified example of a population with just three funds: two funds with $1 million returning 10 percent and one fund with $100 million returning five percent. In this case, the asset-weighted return is 5.1 percent, the mean is 8.3 percent and the median is 10 percent. Which average captures the truth best? This report has used sound and robust statistical methods, free from unwarranted or false assumptions, such as normality of distributions in the data, widely and routinely assumed in business and academic research.

Comparison of Aggregates

The summary dismissal of sector comparisons by most researchers, based on perceived "usefulness" is unwarranted and is detrimental to the policy and reform of the superannuation system. The above remarks show why there is widespread ignorance about the significance in the statistical comparisons of aggregates as presented in this report. Quite apart from investment performance comparisons at the sector level, even comparisons at the fund level have been deprecated, as Rowell (2015) stated:

> *On a number of occasions in the last few years I have noted that comparisons of investment performance at fund level is [sic] not comparing apples with apples.*

The problem with this view is that no two apples are exactly alike, no two stocks are alike, no two investment options are alike, and no two funds are alike and so on, implying ultimately that all comparisons are invalid which leads to an absurd conclusion.

It is all very well to say one should make comparisons only between individual options and products, but which comparison out of literally millions of possible comparisons is useful or valid? For example, Colonial First State *FirstChoice* Super Trust alone has several hundred investment options. What should be compared with what? What could be learnt? In fact, most comparisons on the option or product level are statistically insignificant for reasons cited in the previous section and specifically:

- Nearly every product is in constant change, from manager and strategy changes to fund flow and membership turnover, as switching is often encouraged as a sign of "engagement".
- Selecting options and products in a comparison is inherently biased, leading to arbitrary conclusions from selection bias.
- Limited data are often insufficient to draw statistically significant conclusions, given the weak power of standard techniques.

Investment-option comparisons are generally statistical noise due to idiosyncrasies of individual options, limited data and the limited power of statistical techniques to draw valid conclusions. Indeed, the performance comparison of individual options is plagued by the effects of survivorship bias, market volatility and transient, non-permanent or unstable features of the products, not to mention that data reported to commercial agencies are not audit quality with varying inclusions or exclusions of tax and other costs.

Instead, many of these problems, such as survivorship bias, idiosyncrasy and transiency, are eliminated by aggregation or cross-sectional averaging. What are learnt from a comparison of aggregates may be significant facts which are stable, persistent and non-transient. For example, the management and operating structure of a fund is less likely to change than individual investment options. Also there are more data available, such as the actual investment strategy of a whole fund, whereas there is none for options or products, only indications from marketing.

It is important to note that sector comparisons are free from survivorship bias, free from sampling bias and relevant to every individual investor of a sector, because:

The performance of a sector is the asset-weighted average performance of every individual account balance in the sector. It represents unbiased and complete assessment of all investments in the sector.

Sector comparisons have shown that there are small but persistent effects due to different operational structures between sectors, such as fund size, *Public offer* status, *Profit* status and so on, which have powerful, cumulative consequences on the savings of individual superannuation members *regardless* of their particular investment options. These powerful and persistent effects are observable and quantifiable over the long-term, when short-term market fluctuations and idiosyncratic noises have cancelled themselves out. These effects have *predictable* impacts, on average, on *all* investments of superannuation fund members.

This report has proved that apple and orange comparisons are useful and valid, provided the comparisons are done intelligently, rather than routinely and thoughtlessly, and provided the conclusions drawn are proportionate to the weight of the evidence and the soundness of the method. The superannuation industry has powerful vested interests and conflicts of interests. The glib dismissal of unflattering comparisons is a way of avoiding competition, which should be challenged and not emulated by the regulator (Rowell, 2015).

Conclusion

The purpose of this report is to establish a set of agreed facts which are important for Government policy and for decisions of individual superannuation members. These facts are based on research using complete official data, unbiased statistics and replicable scientific methods, without untested or unproven assumptions of academic theories.

The financial performance results obtained in this report provide population statistics for the aggregate system and sectors against which all other sample statistics for selected funds and options must be compared for validation and interpretation.

The main facts collected are the broad features of the Australian superannuation system and sectors, which are both long-term (1997-2016) and also total cross-sectional (all funds) averages of the whole system and its sectors. The main findings are as follows (references are to tables and figures occurring in the main text):

- Up until 2016, the growth in *Net assets* of the superannuation system was largely matched by *Total contributions* growth at about 10 percent per annum (see Figure 2). The *Net return* of the system at about 4.1 percent per annum, has been cancelled out by *Net payout* to beneficiaries (see Table 1 and Figure 3).
- The trends in money flows show that the withdrawal phase of the system, defined by negative *Net contributions*, will approach faster than in the past, possibly arriving within the next ten years (see Figure 7). Sustainability of the system will depend more and more on *Net earnings* and *Net returns* to fund future payouts.
- Averaged over significant sectoral variations, the investment return of the system as a whole, net of all costs but before taxes, was 5.5 percent per annum (see Table 5). Compared with gross returns of the Australian stock market of 8 percent, fixed

income market of 6.5 percent and cash market of 4.8 percent, the system performance is lacklustre at best and is probably under-performing against reasonable benchmarks (adjusted for notional costs).

- Of institutional funds, the *Retail* sector has had the highest share (39 percent) of cumulative *Total contributions* into the system (see Table 7). However, its share of *Net contributions* has been declining due to increasing payouts (see Figure 14).
- *Public sector* and *Corporate* funds also have large payouts restricting growth in *Net contributions*; with the remaining *Industry* sector gaining in relative share of *Net contributions* of the system due to a lower *Payout ratio* (see Figure 14).
- In *Total contributions*, the *Industry* sector with $36 billion flow in 2016 has only just surpassed, for the first time in history, *Retail* flows of $34 billion. The higher *Net contributions* share has helped partially to boost relative *Industry* sector growth.
- The strong 18 percent per annum growth of the *Industry* sector is due importantly to investment performance rather than contribution flows (see Table 7). Starting from much smaller *Total assets* in 1997 (about a quarter of *Retail*, see Table 7), the *Industry* sector has accumulated *Net earnings* approaching that of the *Retail* sector, but with lower weighted *Total assets* and similar cumulative *Net contributions*.
- The main cause of the differences in relative sector growth is confirmed by comparisons of investment performance, which show that *Net investment return* (after investment costs) averaged 7.2 percent for the *Industry* sector, 6.6 percent for *Public sector* and 5.4 percent for *Retail* sector (see Table 9). The *Industry* minus *Retail* gap of 1.8 percent per annum over a 19-year period cannot be explained entirely by high payouts, because the *Public sector* has even higher payouts (see Table 7). The *Net return* gap may increase when *Operating expenses* and taxes are also included (see Table 9).
- Comparing *Retail* funds to the rest of the system's *Non-profit* funds shows (see Tables 9 and 11) the *Retail* sector has under-performed the rest of the system by 1.3 percent per annum in *Net investment return* and by 1.7 percent per annum in *Pre-tax return* (after all costs).
- Therefore, as at March 2017, with assets of $577 billion, *Retail* trustee directors, through their operational structure with additional services and profit making, have cost their members about $10 billion per annum more in additional fees and taxes, leading to reduced *Net investment income* relative to those in *Non-profit* funds.
- However, the additional services – including sophisticated financial advice needed for members to understand several hundred investment options – have not improved investment performance for *Retail* members (see Table 9). The claim that *Retail* funds out-perform in bear markets may be true, but not supported in any significant way by the evidence (see Figure 18).
- Even though *Retail* funds exhibited lower volatility than other institutional funds, over the 19-year period, the risk-return trade-off has been inefficient (see Figures 19 and 20), costing *Retail* members significant reductions (about one percent per annum) in investment returns for about half a percent lower volatility achieved.

To assess the competitiveness and efficiency of the superannuation system, the method should be based on a science of facts rather than a politics of opinions. The above set of facts provides a sound basis for this assessment. Efficiency, as defined (PC, 2016) by the *Net return* of the system as a whole, has been lacklustre at best. Competitiveness defined as a way of achieving higher efficiency of the system has been sluggish, hampered by misinformation from the media and by the ambiguity of most published research.

> *Competitiveness of the system has worked very slowly because the Retail sector has had the largest share of the system, while having the worst long-term performance, with lowest investment returns (4.6 percent per annum before tax since 1997) and least efficient volatility-return trade-off.*

Therefore the drag on efficiency of the superannuation system can be attributed substantially to the *Retail* sector which has high-cost structures for providing additional services to members. Highly engaged members are encouraged by advisors to switch and churn between many choices in their portfolios to increase corporate revenues and profits. Some scandals have occasionally been big enough to be reported by newspapers and they are subjects for a Royal Commission in 2018. It raises the questions of whether high-cost service structures are necessary and whether *Retail* directors have achieved the best results for their members.

In future, investment efficiency of the system measured against benchmarks will be assessed and published separately with substantial details in the next report.

References

Bogle, J.C. (2014), "The arithmetic of all-in investment expenses", *The Financial Analysts Journal*, Vol. 70, Issue 1 (Jan/Feb), pp.13-21.

CFA Institute (2005): "Global investment performance standards", *Chartered Financial Analyst Institute publications*, February 2005.

Doyle, A.C. (1892), *The Adventures of Sherlock Holmes,* The complete Sherlock Holmes Canon; also available at: https://sherlock-holm.es/stories/pdf/a4/1-sided/advs.pdf

Hewson J. (2017), *ABC Lateline Special on Housing Affordability*, 21 March 2017; available at: http://www.abc.net.au/lateline/content/2016/s4640164.htm

PC (2016), "How to assess the competitiveness and efficiency of the superannuation system", Productivity Commission Research Report, November 2016; available at: http://www.pc.gov.au/inquiries/current/superannuation/competitiveness-efficiency/report/superannuation-competitiveness-efficiency.pdf

Rowell, H. (2015), "Governing superannuation in 2015 and beyond: facts, fallacies and the future", *Speech delivered at the AIST Governance Ideas Exchange Forum*, Melbourne, 20 October 2015; available at: http://www.apra.gov.au/Speeches/Pages/Governing-Superannuation-in-2015-and-beyond.aspx

Sy, W. (2008), "Pension governance in Australia: An anatomy and an interpretation", *Rotman International Journal of Pension Management*, Volume 1, Issue 1, pp30-37; available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1290628

Sy, W. (2009): "A note on investment returns and returns on asset of managed funds", APRA Working Paper; available at: http://www.apra.gov.au/AboutAPRA/Documents/SA_WP_IRRAMF_082009_ex.pdf

Sy, W. (2011), "Redesigning choice and competition in the Australian superannuation", *Rotman International Journal of Pension Management*, Vol. 4, Issue 1, Spring, pp.52-61; available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1829333

Sy, W. and Liu, K. (2010), "Improving the cost efficiency of Australian pension management". *Rotman International Journal of Pension Management*, Vol. 3, Issue 1, Spring, pp.38-47; available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1618830

Willis Tower Watson (2017), *Global Pension Assets Study 2017*, Willis Tower Watson; available at: https://www.willistowerswatson.com/en/insights/2017/01/global-pensions-asset-study-2017

Appendix

Data Sources

The financial flows of the superannuation system collected by APRA data are contained in the data of *Annual Superannuation Bulletins*. APRA was created as a result of the recommendations of the Wallis Enquiry in 1996. Under the APRA Act (1998), the first snapshot of the superannuation system was published in 1998 and the most recent one was for 2016, providing 19 years of annual snapshots. Data before 1998 may not be as reliable due to the rearrangements of regulators.

The total system assets are obtained by adding the total assets of APRA regulated funds to the total asset of self-managed superannuation funds (SMSF) regulated by the Australian Tax Office (ATO). At times, APRA statistics report total assets including pooled superannuation trusts (PST); at other times, they are excluded. In this report, PSTs are excluded, because as components of the portfolio of many superannuation funds, it would be double counting to include PST in total assets. The flows of balance of life insurance funds which are not part of normal superannuation portfolios are captured in the data on rollovers.

Australian Prudential Regulation Authority (APRA) databases are used with the sector classification defined by APRA, reflecting the historical evolution of Australian superannuation. There are four main sectors: *Corporate, Industry, Public Sector* and *Retail* which constitute the segment of *Large APRA* funds. The segment outside, consisting of self-managed superannuation funds (SMSF), small APRA funds (SAF) and balance of life insurance funds is called the *Small and other* segment in this paper.

APRA calculates total superannuation assets by summing the total assets of five main sectors: *Corporate, Industry, Public Sector, Retail* and SMSF and adding APRA small funds and balance of life insurance funds, but excluding PST.

The main sources of data for the system come from two APRA files:

- Annual Superannuation Bulletin June 2013 (revised 5 February 2014): Table 7.
- Annual Superannuation Bulletin June 2016 (Issued 1 February 2017); Table 4a.

The main sources of data for sectors come from the two APRA files:

- Superannuation Trends September 2004 (issued 11 January 2005): Table 3, 4a-4d.
- Annual Superannuation Bulletin June 2016 (issued 1 February 2017); Table 4a.

It should be made absolutely clear at the outset that the database for this report has been manually constructed from the above files. The data cannot be, and have *not* been, downloaded from a single source file. There are three distinctly different types of source files as listed separately above. Usually different file formats suggest potential inconsistencies across data boundaries, because the analysts compiling the data are not confronted with inconsistencies between sources and therefore are not obliged to resolve inconsistencies.

All data before 2004 were extracted from a single source in the "Superannuation Trends September 2004" file, which is a data summary of several years, going back incredibly as far as 1994, well before APRA was created. In this report, we accept data only as far back as 1997, since APRA was created only in 1998. The data for years from 2004 to 2013 come from 10 individual files in the same format of the "Annual Superannuation Bulletin".

The data for 2004, which is an overlap at the data boundary between the two sources, have inconsistencies between the sources. We have chosen to accept the data from later source and rejected the 2004 data from the earlier source, which however, remain the only available source for the data from 1997 to 2003. Hence there is potentially discernible data discontinuity around 2003 and 2004. It should be noted that:

> *APRA does not accept any responsibility for the accuracy, completeness or currency of the material included in this publication*.

Since the 2014-2016 file meets new reporting requirements, there is a warning issued by APRA that

> *APRA recommends that users of the statistics exercise caution in analysing and interpreting the publication, while the new superannuation data collection is still relatively new. During this early phase of a new collection, the systems and processes for collecting and reporting data in accordance with the new reporting requirements are not fully embedded across the industry.*

With this caveat, we have proceeded with system and sector analysis in this report. The statistical analysis for the whole Australian system can be presented similarly for each individual sectors and segments. Rather than doing the numerous identical analyses in this report, we just bear in mind that the information is available for potential explanations, should the need arise in future.

Method of Calculation

Imagine for a given account balance at the start of a period, deposits and withdrawals are made during the period. Then with the necessary data, it is possible to calculate the interest rate applied to the account, given the final balance at the end of the period. The interest rate applied to the savings is a measure of the financial performance of that particular financial product. In this paper, the same logic is applied to provide a measure of the financial performance of the Australian superannuation system and sectors.

The assessment of efficiency may be more complicated due to variations in risk aversion, and asset allocation e.g. determined by demographic factors, but the measurement of financial performance itself is much more straightforward. This paper concentrates mostly on financial performance but offers some provisional assessments on efficiency relative obvious benchmarks.

The main data quantities used to assess superannuation system performance are financial year end APRA records of

- **Total assets** of the superannuation system,
- **Total contributions** to the superannuation system,
- **Net rollovers** to and from insurance funds in the case of the system, an also between sectors in the case of individual sectors.
- **Benefit payments** in lump sums and pensions,
- **Net contributions**, *Total contributions* minus benefit withdrawal and net rollover,
- **Operating expenses**, including administration and costs of operation,
- **Net investment income**, all investment earnings net of all fees, commission and other direct or indirect costs associated with investing,

These are abbreviated names given to equivalent names in APRA data tables, which have explanations in a "Glossary" table. From these data quantities, the calculated quantities are defined as follows. The *Net growth* in superannuation assets is the sum of *Net contributions* flow and *Net earnings*, which is earnings of the superannuation system after all costs and taxes. *Net earnings (after all costs and taxes)* are defined (from accounting identities) by *Net growth* minus *Net contributions* flows:

$$\textit{Net earnings (after all costs and taxes)} = \textit{End of period total asset} - \textit{Start of period total asset} - \textit{Net contributions} \quad \text{(A1)}$$

Because *Total assets* and *Net contributions* flows are most accurately measured, this formula for calculating *Net earnings* is the most accurate. Moreover, any inaccuracies in measuring *Total assets* at various points will cancel out over the long term.

Net contributions flows is *Total contributions* minus *Net payout* flows which come from net benefit payments and rollovers:

$$\textit{Net contributions} = \textit{Total contributions} + \textit{Net rollovers} - \textit{Benefit payments} \quad \text{(A2)}$$

For convenience, it may be convenient to define a new quantity which can be calculated but has no direct APRA equivalent called *Net payout* by

$$\textit{Net payout} = \textit{Benefit payments} - \textit{Net rollovers} \quad \text{(A3)}$$

Net payout denotes all payments which leave the superannuation system (or sector), so that *Total contributions* is now simply a sum of a quantity which leaves the system – *Net payout*, and a quantity which remains in the system – *Net contributions*.

$$\textit{Total contributions} = \textit{Net payout} + \textit{Net contributions} \quad \text{(A4)}$$

Due to the uncertain timings of tax payments, tax data are generally inaccurate from year to year. *Total tax*, defined as contributions tax, tax on earnings and other charges can be analysed as an accounting residual from the given data on *Net investment income* by the following equation:

$$\textit{Net earnings} = \textit{Net investment income} - \textit{Operating expenses} - \textit{Total tax} \quad \text{(A5)}$$

For simplicity, *Net investment income* includes *Operating income* from such investment related activities as scrip lending when they sometimes occur, as well as the *Investment income* from investing *Total assets*, after all investment costs and taxes have been paid. The above equations are accounting identities. It is assumed that all data in the equation are more accurate than *Total tax*, even when it is sometimes available as estimates in some data.

In calculating the *Net returns* of the superannuation system, it should be remembered that the figures cannot be fully accurate on an annual basis, because of the complexity of the tax system. For example, capital gains tax incurred on holding securities can only be calculated accurately on disposal of the securities, implying inherently inaccurate estimates of tax liabilities from year to year. However, over the long-term, it is expected that these inaccuracies, being presumably random, will cancel out, yielding a reasonably accurate average long-term net return.

The GIPS or *Global investment performance standards* (CFA, 2005; Sy, 2009) provides a formula for calculating a rate of return (ROR) to assess investment performance which is used to calculate the net return of the superannuation system:

$$\textit{Net Return} = \textit{Net earnings} / \textit{Weighted total assets} \quad \text{(A6)}$$

Weighted total assets are defined as the average *Total assets* weighted by the impacts of cash flows. From the available data, it is estimated by:

$$\textit{Weighted total assets} = \textit{Current period starting total assets} + \tfrac{1}{2}\ \textit{Net contributions} \quad \text{(A7)}$$

Note that *Current period starting total assets* must equal previous period final *Total assets.* Typically *Total assets* in the data refer final *Total assets* of the current period. To use equation (A7), instead of starting *Total assets*, for example, the following accounting equations (A8) and (A9) for the current period:

$$\textit{Net growth} = \textit{Final total assets} - \textit{Starting total assets} \quad \text{(A8)}$$

In this equation, in agreement with (A1), *Net growth* is also given by:

$$\textit{Net growth} = \textit{Net contributions} + \textit{Net earnings} \quad \text{(A9)}$$

It is important to note that a common error in calculating annual returns from APRA data is to use the figures for *Net assets at the beginning of the financial year*, which may not equal the *Net assets at the end of the previous financial year* (due to unpaid liabilities) to calculate *Net earnings after tax* independently and then to calculate *Net returns* from net earnings on *Cash flow adjusted net assets*.

Those calculations may imply the *Net assets* at the end of the previous period are *not* equal to the *Net assets* at the beginning of the next period, introducing an account error. *Net assets* at the end of one period must equal *Net assets* at the beginning of the next period.

For example, Table 12 of Annual Superannuation Bulletin June 2013 provides a calculation of *Rate of return* for each year over 1999-2013. Using Equation (A5) above, it can be shown that, aggregated over the period, *Net earnings after tax* has been over-estimated by about $47 billion for large APRA regulated funds between 1999 and 2012. The aggregated *Net earnings* for large funds should have been $237 billion instead of $284 billion (as shown by the data).

As a result of mistakenly inflated *Net earnings*, over various periods, *Net returns* may have been over-estimated across the superannuation industry. We have observed that data and results have often been presented by academics and consultants without any form of independent validation or cross-checking using accounting techniques.

Investment management expenses are not accurately captured by APRA data, because the many expenses are incurred indirectly and therefore cannot be reported. It is likely that reported investment expenses are only about half of their true values, which are likely to be around one to 1.2 percent of weighted total assets per annum. That is, actual investment fees should be substantially higher than reported.

Financial conglomerates collect substantially more revenue from their front office services than from their back office services, as front office investment managers earns considerably more than back office accountants. That is, stock broking, investment management, financial advice, etc. would earn much more than custody, accounting and administration. Therefore, investment fees should be substantially higher than administration fees.

Net return after all investment costs refers to net returns provided by fund managers after all costs, including manager fees, direct transaction costs such as brokerage and commissions, indirect transaction costs such as soft dollar deals, slippages, portfolio transitions costs and taxes such as stamp duties, taxes on disposal of assets. Many investment costs are difficult to identify or to calculate accurately.

APRA data provides accurate accounting numbers on *Net investment income* even though the numbers provide no information on actual investment costs or gross returns. The formula for calculating *Net investment return* for each year is:

$$\textit{Net investment return (after all investment costs)} = \textit{Net investment income / Weighted total assets} \quad \text{(A10)}$$

When an investment manager declares investment income or a *Net investment return* for a superannuation fund, only investment expenses such as management fees, its own operating expenses, known brokerages and trading taxes are subtracted from gross return. Financial advice expenses may be subtracted from the *Net return* of investment products. The declared *Net investment return* is not the actual *Net return* in the hands of the individual members, as there are *Operating expenses* at the fund level and superannuation taxes to be paid.

The *Operating expenses* are incurred at a rate given by:

$$\textit{Operating expenses rate} = \textit{Operating expenses / Weighted total assets} \quad \text{(A11)}$$

Subtracting *Operating expenses* from the *Net investment return* gives a *Pre-tax return (after all costs)*, but before superannuation taxes:

$$\textit{Pre-tax return (after all costs)} = \textit{(Net investment income – Operating expenses) / Weighted total assets} \quad \text{(A12)}$$

Complexity of Tax

It is important to note that the tax system on Australian superannuation causes a great deal of uncertainty in the comparison of *Net returns* from different sources. Tax could be paid at various stages of the investment process by intermediaries and not just by the superannuation funds which pay substantial contribution taxes. Because of tax considerations, benchmark returns (gross of tax) may not be accurate estimates of actual returns from investing in the superannuation system.

Capital gains are taxed at 15 percent or less, which is lowered with increasing holding period of the asset and is paid to the tax office on disposal of the asset. So, at any point in time, a superannuation fund has potential tax liabilities affecting the valuation of its total assets. Accounting for tax liabilities appears to have the potential to cause the *Total assets* of a fund to be shifted from year to year, creating volatility and inaccuracies in *Net return* in any given year.

Also, tax on assets in the pension phase is substantially lower than tax in the accumulation phase. Hence, tax liabilities depend on the individual circumstances of the members. It is unclear how a superannuation fund optimizes tax liabilities for different individual members, particularly those in transition to retirement. Perhaps one of the attractions of a self-managed superannuation fund (SMSF) is better cost control and more effective tax arrangements.

The *Net earnings* numbers provided directly by APRA data, determine the growth in *Net assets* for a fund, a sector, a segment or the system. Net earnings give rise to a *Net return after all costs and taxes* calculated by the formula,

$$\textit{Net return (after all costs and taxes)} = \textit{Net earnings / Weighted total assets} \quad \text{(A13)}$$

This definition of *Net return* includes taxes paid by superannuation funds, such as contribution tax, taxes associated with fund flows and other tax adjustments relating to investments. These taxes may be reported as “other charges” and are not explicitly reported as taxes in the data due uncertain timing of payments.

It should be cautioned that before 2004, the tax data inferred from accounting identities from APRA data show substantial volatility and therefore are potentially unreliable from year to year. However, it is assumed that accumulated over nearly twenty years, the noise in the data “washes out” to give reasonable estimates of long-term averages.

Impact of Asset Allocation and Operational Structure on the Investment Performance of Australian Superannuation[1]

Wilson Sy

Investment Analytics Research

19 March 2018

Report for
Industry Super Australia

[1] The author thanks Carole Sladen, Keith Ambachtsheer and ISA staff for comments. The author is responsible for analysing the data, for establishing the facts and for any opinion expressed in this report.

Abstract

In the first paper, the lacklustre investment performance of Australian superannuation was attributed to the *Retail* sector. This second paper investigates potential explanations for this fact through an empirical attribution analysis of the impact of asset allocation, operational structure and scale on sectoral investment performance. Since 2004, relatively lower investment returns of the *Retail* sector have not been compensated by lower risk, due to unexpectedly higher return volatility. This fact can be explained by significant costs neglected in most academic theories.

Using official asset allocation data available from the Australian Prudential Regulation Authority (APRA), for the three years to September 2016, the 2.7 percent per annum difference in measured investment performance between the *Industry* and *Retail* sector has been attributed 1.1 percent to asset allocation and 1.6 percent to operational structure and costs. The high cost of *Retail* funds (incurred but not reported) is consistent with the high incomes and profits reported annually by vertically integrated conglomerates from providing superannuation and related financial services.

At March 2017 *Retail* assets of $577 billion, the 2.7 percent return deficit relative to *Industry* funds represents about $15.5 billion per annum in additional costs to *Retail* members. Empirically, but contrary to the theory of economic rationalism, the market approach to superannuation, based on competition and profit maximization of the *Retail* sector, has been detrimental to members.

Executive summary

The first paper in this series established the importance of investment performance as the system approaches rapidly toward the withdrawal phase when *Net contributions* will be negative. The observed inefficiency in investment performance of the system needs to be addressed as future payouts will have to be financed increasingly from investment earnings. The inefficiency of the system has been shown to come significantly from the consistent and persistent under-performance of the *Retail* sector.

This second paper investigates explanations for the inefficiency through a performance attribution analysis of sectors, funds and entities, based on official audited accounting data published by the Australian Prudential Regulation Authority (APRA). In addition to the annual data reported previously, quarterly data since 2004 and asset allocation data since 2014 are used here to assess the relative impact of factors including asset allocation, operational structure and scale on long-term trends in investment performance.

The major findings are summarised as follows. The terms in italics have their suggestive and intuitive meanings, but are defined more precisely in the text and in the Appendix of the first paper. References to tables and figures are for those contained in the main text.

- Twelve years of quarterly data have confirmed that, on any timespan of five years or more, *Retail* funds have consistently and persistently under-performed *Non-profit* funds (see Figure 2). The 12-year average under-performance was about two percent per annum, measured on an asset-weighted basis since 2004 (see Table 1). At $577 billion of *Retail* assets (March 2017), the additional cost to *Retail* members relative to *Non-profit* fund members is $11.5 billion per annum[2].
- The quarterly data from 2004 to 2016 show risk aversion of *Retail* funds, as evident from more conservative asset allocation data, had failed to achieve benefits, because lower returns and higher cost of *Retail* funds did not benefit members with lower risk (see Figure 4). Instead of lower volatility, the lower *Retail* returns came with higher volatility, contrary to academic theories which ignore costs. The Sharpe ratio, whenever positive, valid and understandable, shows poor risk-return trade-offs for *Retail* funds.
- In aggregates, asset allocations are not substantially different between sectors (see Figure 6) and therefore cannot explain the large performance differences in sector returns. Asset allocation accounts for 1.1 percent of the performance difference between *Industry* and *Retail* funds, while indirect costs (see Appendix) and operational structure account for another 1.6 percent (see Table 14). At March 2017 *Retail* assets ($577 billion), the three-year performance analysis to September 2016

[2] It is important to warn that comparative dollar amounts are merely guides to their significance for the superannuation system. Their estimation varies depending on what sector or segment is being compared, on the data period, on the frequency of the data and on what costs (asset allocation, investment, operating or tax) are included in particular contexts. The figures should not be quoted out of context as though they are fixed or universal.

suggests that *Retail* members are paying an additional $15.5 billion[3] per annum, relative to *Industry* members, from asset allocation ($6.3b), indirect investment ($7.5b) and operating costs ($1.7b).

- The benefits of scale for members apply only to *Industry* funds and other *Non-profit* funds, and not to *Retail* funds (see Table 15), because *Industry* and other *Non-profit* funds have substantial direct investments in long-term illiquid assets leading to higher fixed cost and lower variable cost in their operational structures. Economies of scale depend on higher fixed cost relative to variable cost. Also, the benefits of any cost savings, such as those of scale, may not be passed onto *Retail* fund members, but retained as revenue by *For-profit* funds.
- To confirm sector findings, a group of the largest *Industry* funds is compared with a group of the largest *Public-offer* conglomerate funds (AMP, ANZ, CBA, MQG, NAB and WBC) which have similar numbers of members, *Total assets*, and scale. It is evident (see Table 16) that only some types of operational structures would create scale benefits for their members and those of *Retail* funds generally do not.
- In some selected short-term periods, *Retail* funds may have lower volatilities from their more risk-averse asset allocation, but they may have higher volatilities over the longer-term (see Figure 4). At levels of sector, conglomerate group or individual funds, their risk/return trade-offs, as measured by the RAVA metric, are inefficient (see Table 20), as *Retail* funds give up typically about twice as much return performance in exchange for any reduction in volatility.
- A case study of CBA shows how a vertically integrated conglomerate may increase indirect cost for its superannuation members. The magnitudes of the numbers in the financial statements from its 2017 annual report are consistent with the general conclusion that the average cost of funds under management of *Retail* funds may be between two to three percent per annum greater than those of *Industry* funds, representing by comparison, a 40 to 50 percent reduction in retirement nest eggs for *Retail* members over their typical working lives.

The paper concludes that the dominant factor which explains most of the persistent performance differences observed are the costs associated with the operational structures of two distinctly different types of trustees:

- *For-profit* shareholder-oriented *Retail* trustees, and
- *Non-profit* member-oriented mutual trustees.

Comparisons of sectors are most statistically significant, reliable and useful for individuals because they reflect the persistent impact of fixed operational structures on investment performance of funds for members. Product comparisons are volatile, unreliable and statistically insignificant because the factors underlying their performances are idiosyncratic and in constant flux.

[3] This relative cost is higher, compared with the *Industry* sector over three years rather than with the *Non-profit* sector as a whole over 12 years, as in the first point. See the previous footnote.

Introduction

An assessment of Australian superannuation shows (Sy, 2017) that the strong growth of the system from 1997 to 2016 was primarily due to $1.7 trillion of cumulative contributions, mostly from the Superannuation Guarantee levy. The cumulative investment income of $833 billion was mostly paid out, as it was earned, as benefits to recipients. The system's average investment return (after all costs but before taxes) was 5.5 percent per annum, resulting in a *Net return* (after all costs and taxes) of 4.1 percent per annum since 1997.

Historically, the lacklustre investment performance of the system has been masked by relatively strong contribution flows, which have been attenuating over time. Due to contributions capping and demographic factors, the Australian system appears to be moving rapidly towards the withdrawal phase, when *Net contributions* may be negative in several more years, as payouts exceed contributions. The sustainability of the system will then depend critically on *Net returns* from investments to fund future payouts for retirement.

A major influence on investment performance of the superannuation system (Sy, 2017) has been due to the *Retail* sector, because it has had historically the highest share of *Total assets* and the highest share of *Total contributions*. Only recently has *Retail* sector size dominance among *Large APRA* funds begun to wane relatively to the *Industry* sector. Evidently, the competitive forces among *Public-offer* funds have worked relatively slowly, as the *Retail* sector has had the largest share of institutional funds, while having the lowest long-term investment returns (before taxes), averaging 4.6 percent per annum since 1997.

As investment performance of the system will soon become more critical, the apparent drag of the *Retail* sector on the viability of Australian superannuation needs to be investigated more fully, as done in this report. Over the 19-year period, the under-performance of the *Retail* sector versus the rest of the system was consistent and persistent (Sy, 2017), suggesting that the drag will continue predictably into the future due to enduring structural factors in the operation of *Retail* funds.

It is the purpose of this report to identify those enduring structural factors and quantify them relative to other sector performances to understand the impact of those factors on the efficiency of the system. A priori, identified factors which affect net investment performance include asset allocation, stock selection and costs. Costs include direct and indirect transaction costs, portfolio construction costs, investment manager fees and administrative costs[4], which depend persistently on the operational structures of the funds.

As mentioned in the previous report, most of the differences in investment performance between sectors are already evident in *Net investment returns*, because differences in *Operating Expenses* are relatively small and stable by comparison. Analysis of most investment costs are limited by the data collected by APRA, because only *Net investment income* (after most investment costs) delivered by investment managers to superannuation funds is reported in the audited accounts.

[4] Operating cost includes administrative cost and all other costs associated with operating a fund, but in this paper which is focussed on investment performance.

In keeping with strict scientific standards, the data, the methods and the conclusions are fully replicable by the reader, with all assumptions articulated and without making heavy reliance on unproven academic theories. Many of the technical details about the data, benchmark indices and method are explained in the Appendix.

Quarterly Investment Performance

The first report in this series was based on annual data for the 19-year period 1997-2016, which shows that the under-performance of the *Retail* sector versus the rest of the system was consistent and persistent (Sy, 2017), suggesting that the result is due to enduring structural factors in the operation of *Retail* funds.

Starting from September 2004, APRA has collected and published quarterly data on investment performance for sectors of *Large APRA* funds. With more frequent data sampling, but for about half the time period, this collection provides an opportunity to use 49 quarters of data to December 2016 to verify the consistency and persistency in relative sector performance suggested by the annual data, as reported previously.

The most recent quarterly APRA data used in this paper, published on 21 February 2017, include only entities with at least $50 million in *Total assets* which are called here *Larger APRA* funds to distinguish from *Large APRA* funds of all sizes with more than 4 members. Since only annual accounting data are audited, the impact of tax on quarterly *Net returns* is less accurate as estimated by APRA.

The compound annual geometric returns (CAGR), averaged over the full data period from September 2004 to December 2016, are shown in Table 1.

Table 1: Sector Returns (Sep 2004 to Dec 2016)

	Net investment return (% pa)	Pre-tax return (% pa)	Net return (% pa)
Larger APRA	6.7	6.2	6.1
Corporate	7.2	6.9	6.7
Industry	7.7	7.2	7.0
Public sector	7.3	7.0	6.9
Retail	5.8	5.0	5.1
Non profit	7.5	7.1	7.0

In this table, the *Non-profit* sector refers to all *Larger APRA* funds outside the *Retail* sector.

- Over this period, *Retail* funds under-performed against average *Non-profit* funds by between 1.7 to 2.1 percent per annum, across the various rates of return.
- Among *Non-profit* funds, *Industry* funds have marginally out-performed *Public sector* and *Corporate* funds, due largely to their better investment performance overcoming higher costs of *Public offer* operations (e.g. advertising).

Over time, the cumulative sector performances leading to the long-term averages in Table 1 can be shown through sector return indices. An example for *Net investment return* indices is shown in Figure 1.

Figure 1: Sector Return Indices

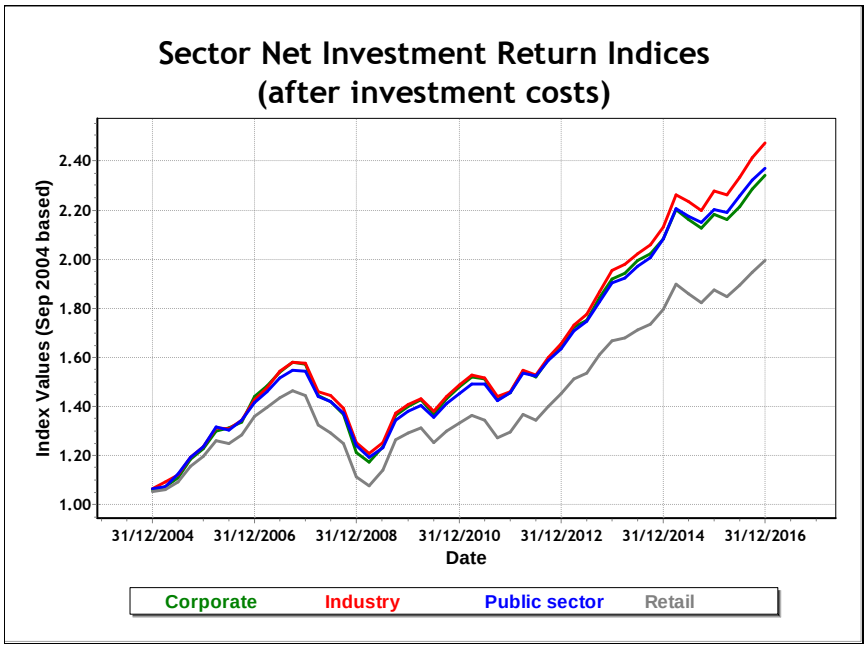
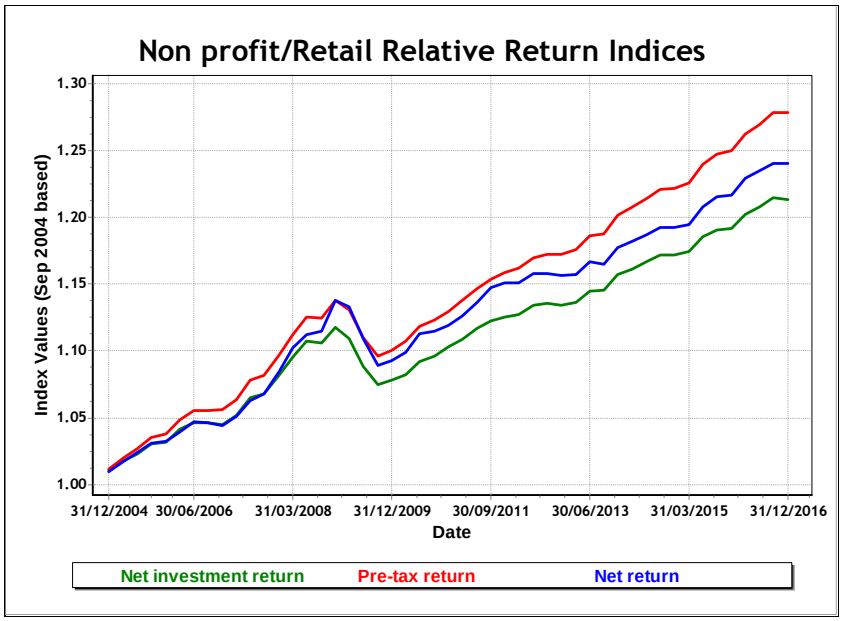


Figure 1 shows that the long-term performances of *Non-profit* funds are very similar, whereas *Retail* funds are clearly an outlier. The fluctuations in the curves of the indices are due to market volatility which makes short-term comparisons of returns noisy and inconclusive. The consistency and persistency of the performance differentials can be made clear and self-evident by calculating relative return indices as shown in Figure 2.

Figure 2: Sector Relative Return Differentials

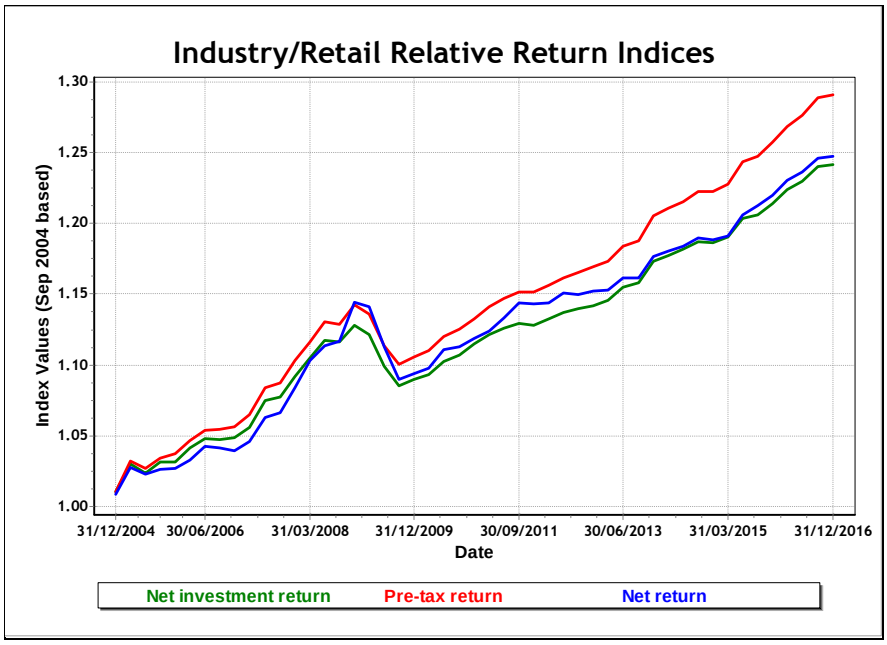


A relative return index shows the cumulative relative performance over time between two investments. Apart from the first few quarters of 2009, Figure 2 shows that the long-term performance of *Non-profit* funds relative to *Retail* funds is very consistent and persistent. The dramatic bear markets of the Global Financial Crisis (GFC) have had a noticeable short-term impact, but not sufficient to change the long-term trend due to structural factors which will be quantified below.

The fluctuations in the curves of the relative return indices have been reduced (compared to Figure 1) by removing the fluctuations which are correlated to market volatility. On any of the return performance measures, the curves show the cumulative additional returns obtained by *Non-profit* funds relative to *Retail* funds. One dollar invested in September 2004 with the average *Non-profit* funds has earned by December 2016, 21 cents to 28 cents more than the final average balances of *Retail* funds of $1.84 to $1.99 (for *Net returns* to *Net investment returns*). That is, over the period, the terminal *Non-profit* balances improved over *Retail balances* by 11 to 14 percent or $2.05 to $2.27, respectively.

As Table 1 shows, the out-performance trend of *Non-profit* funds was not caused by particularly strong performances of *Non-public-offer* funds (in the *Public* or *Corporate* sector) – rather, it was due to *Public offer* funds in the *Non-profit* sector. This is made clear by a direct comparison of *Public-offer* funds in the *Industry* and *Retail* sectors in Figure 3.

Figure 3: *Public-Offer* Funds Relative Return Differentials



Over the data period, *Retail* funds have reduced their under-performance in *Net returns* relative to other institutional funds by about 0.3 percent per annum from incurring a relatively lower effective tax rate. However, these comparisons confirm that the relative performance of *Net returns* is mainly determined by the relative performance of *Net investment returns*. For simplicity of discussion, this paper is focussed on the analysis of *Net investment returns* (after investment costs) and *Pre-tax returns* (after all costs).

Twelve years of quarterly data have confirmed that, on any timespan of five years or more, *Retail* funds have consistently and persistently under-performed *Non-profit* funds. The 12-year average under-performance was about two percent per annum, measured on an asset-weighted basis since 2004. At $577 billion of *Retail* assets (March 2017), the additional cost to *Retail* members is $11.5 billion per annum.

What are the benefits to *Retail* members from paying the additional cost?

Risk-adjusted Performance

A common explanation from modern finance theory (MFT) taught at universities is that lower returns come from taking less risk, which MFT measures with the volatility of returns. The volatilities, calculated from sample standard deviations, corresponding to return data of Table 1 is shown in Table 2.

Table 2: Sector Return Volatility (Sep 2004 to Dec 2016)

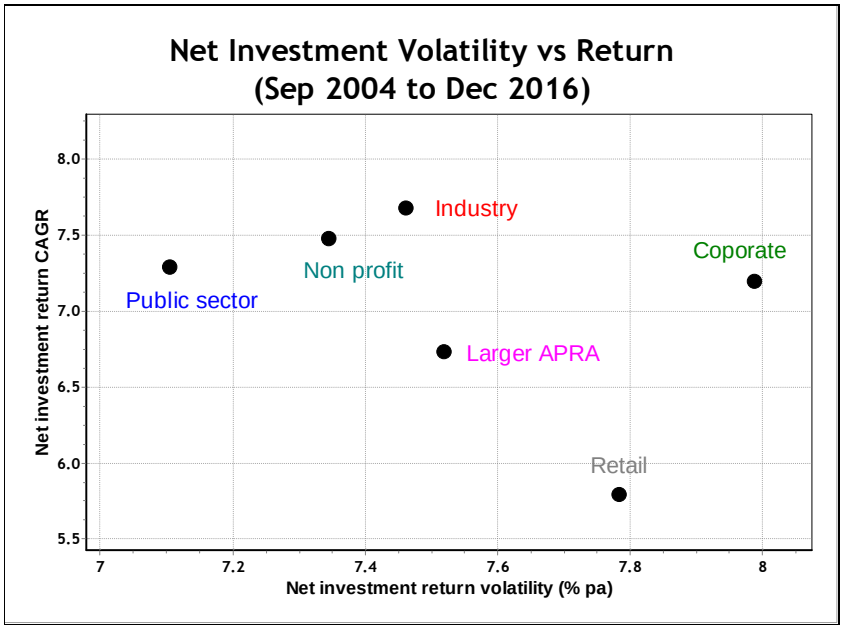
	Net investment Volatility (% pa)	Pre-tax Volatility (% pa)	Net return Volatility (% pa)
Larger APRA	7.5	7.5	7.2
Corporate	8.0	8.0	7.4
Industry	7.5	7.5	6.7
Public sector	7.1	7.1	6.8
Retail	7.8	7.8	7.6
Non profit	7.3	7.3	6.8

While measured volatilities of the sectors are not very different over 12 years, *Retail* funds have higher volatilities for any return measure compared to *Non-profit* funds and *Industry* funds, but they have also lower returns (see Table 1). This contradicts MFT. Of course, many who cite MFT do not understand or have forgotten that MFT ignores costs with its assumption of frictionless, efficient market equilibrium; cases citing empirical evidence of the significant impact of costs are treated as "anomalies" in the academic literature. Since markets are not costless or frictionless, the simple relationship of lower volatility with lower returns is empirically false. That is, the factual evidence demonstrates the importance of costs in understanding the real world.

Therefore the real world existence of significant costs may invalidate many conclusions from published academic research on investment and superannuation based on MFT. Importantly, cognitive dissonance between theory and facts alone should not imply that *a priori* theory is right and that observed facts are wrong or that the data are inaccurate. Indeed, this report shows that the reliability of audited accounting data is very critical for understanding the Australian superannuation system provided it is understood that those facts have falsified previously unproven, preconceived theories.

Even over a relatively long period of more than 12 years, Figure 4 shows that there may be no efficient trade-off between textbook risk and return. One possible reason why the market for superannuation products is inefficient, in both an economic sense and in the sense of informational inefficiency of the MFT textbook, is that investment costs are largely unknown to investors because they require considerable effort and cost to estimate.

Figure 4: Sector Risk/Return Trade-offs



Note that the sector range in volatilities is less than half the sector range in returns, indicating sector returns have greater variance than sector volatilities due significantly to investment costs, as will be shown below. Based on sectors, the superannuation market is risk-return inefficient because important information on investment costs has been difficult and costly to obtain, so that investors have remained uninformed about their significance in their risk-return decisions. It is a purpose of this report to remedy this information lacuna by providing important estimates on investment costs for investors.

> The quarterly data from 2004 to 2016 show risk aversion of *Retail* funds had failed to reduce risk, because lower returns and higher cost of *Retail* funds did not benefit members with lower risk. Instead of lower volatility, lower *Retail* returns came with higher volatility, contrary to academic theories.

The first paper (Sy, 2017), covering 19 years of annual data, showed that *Retail* funds had about 0.5 percent lower *realized* volatility than *Non-profit* funds – in contrast to the last 12 years of quarterly data which show 0.4 percent higher *realized* volatility. Empirically, return volatility is unstable being apparently variable or heteroscedastic, invalidating the constant assumption of MFT. While this apparent contradiction is relatively small, it demonstrates that realized volatility is less predictable than realized returns which have much larger consistent and persistent differences.

As a matter of academic interest, a risk-adjusted performance measure widely used is the Sharpe ratio defined by

$$Sharpe\,Ratio = \frac{Portfolio\,Return - Cash\,Return}{Portfolio\,Volatility} \quad (1)$$

Taking the riskless cash return to be given by the Australian bank-bill index, with a compound annualized geometric return (CAGR) of about 4.4 percent, the data in Tables 1 and 2 can be used to calculate the sector *Sharpe ratios* shown in Table 3.

Table 3: Sector Sharpe Ratios (Sep 2004 to Dec 2016)

	Net investment return	Pre-tax return	Net return
Larger APRA	0.31	0.24	0.24
Corporate	0.35	0.31	0.31
Industry	0.44	0.37	0.39
Public sector	0.41	0.37	0.37
Retail	0.18	0.08	0.09
Non profit	0.42	0.37	0.38

The best performing sectors are highlighted in green and worst performing sectors are highlighted in red. Whilst the results may appear to make sense in Table 3, there are a number of significant defects with the Sharpe ratio in real-world applications. Three defects, in relation to the current context, which are worth mentioning here:

- MFT assumes all investors are alike, which is not the case;
- MFT assumes that cash is the appropriate benchmark, which may not be the case for superannuation applications;
- MFT assumes efficient market equilibrium where portfolio returns from taking risk are always rewarded with statistically higher returns than the riskless cash returns.

It will be discussed below that there are different types of investors and, therefore that different types of benchmark are required. When portfolio risk-taking is not rewarded with returns exceeding cash returns, portfolio excess returns are negative and negative Sharpe ratios can produce nonsensical results (Sy and Liu, 2009) – which can be illustrated with sub-periods of the current dataset.

By taking four distinct three-year sub-periods between September 2004 and September 2016, the following sector *Net investment returns* are obtained in Table 4.

Table 4: Sector Net investment Returns (% pa, 3 Year Averages)

Period	Corporate	Industry	Public sector	Retail	Large APRA
2004-2007	16.4	16.4	15.7	13.6	14.9
2007-2010	-3.2	-3.0	-3.0	-3.9	-3.4
2010-2013	8.7	9.0	8.9	7.4	8.3
2013-2016	7.5	8.9	8.3	6.5	7.7

The highest sector returns are highlighted in green, while the lowest are highlighted in red. Not only are the results consistent with those found in the first report and with Figures 2 and 3, they are confirmed here even for short sub-periods of three years. For the most recent sub-period, *Industry* funds out-performed *Retail* funds. The corresponding volatilities calculated from 12 quarters of sector returns are shown in Table 5.

Table 5: Sector Volatility (% pa, 3 Years to Sep 2016)

Period	Corporate	Industry	Public sector	Retail	Large APRA
2004-2007	4.5	4.1	4.5	4.1	4.1
2007-2010	12.1	10.7	10.3	12.0	11.3
2010-2013	6.6	6.4	5.6	6.4	6.2
2013-2016	4.7	4.8	4.4	4.9	4.7

The highest sector volatilities are highlighted in red, while the lowest are highlighted in green. The ranges between highest and lowest sector volatilities are much narrower and less predictable than the ranges for sector returns, suggesting that the volatilities of the underlying asset classes are also less predictable than their returns. The *Sharpe Ratios* corresponding to Tables 4 and 5 are shown in Table 6.

Table 6: Sector Sharpe Ratios
Net investment Returns (3 Year Averages)

Period	Corporate	Industry	Public sector	Retail	Large APRA
2004-2007	2.31	2.54	2.15	1.86	2.16
2007-2010	-0.71	-0.78	-0.81	-0.77	-0.78
2010-2013	0.69	0.76	0.85	0.51	0.67
2013-2016	1.09	1.35	1.34	0.83	1.12

In three of the four sub-periods, the *Sharpe ratios* appear to make sense (at least for ranking) when excess returns are positive, which is an assumption of equilibrium MFT. However, in the period 2007-2010, excess returns are negative, leading to nonsensical *Sharpe ratios*. The *Corporate* sector had the highest volatility with the second worst return, but has the best *Sharpe ratio* (highlighted), while the *Retail* sector, with nearly as high volatility and the lowest return, had the second best *Sharpe ratio* (highlighted).

In this report, different types of investors are recognized and the different sectors, which cater to the needs of different types of investors, are acknowledged as operating differently. Therefore, different benchmarks are needed to measure the efficiency of their operations. A risk-adjusted performance measure called a risk-adjusted value-added (RAVA) metric, which does not assume market equilibrium of MFT, is discussed below.

In sub-periods of three years when the *Sharpe ratios* were positive and valid, the *Retail* sector achieved consistently lower risk-adjusted performances than other sectors.

Asset Allocation and Benchmark Return

The rational trade-off between risk and return expected from equilibrium MFT has been contradicted by the empirical data (see Figure 4), because the textbook assumption of negligible investment cost is incorrect. Different investment philosophy and different operational structures result in different investment costs which are not negligible in the real world. Yet the available data reported to the regulator are unreliable for measuring true investment costs which are a key to understanding the empirical observations.

The reason that investment costs cannot be reported accurately to the superannuation regulator is due to the highly intermediated arrangement of the Australian investment industry, where indirect costs (see Appendix) are incurred at many points of the investment process. What happens during the complex investment process before the *Net investment returns* are obtained and reported to superannuation funds, has to be estimated through empirical research, as done in this report. The main analytical steps in estimating investment costs are as follows:

- Estimate *Gross investment returns* from asset allocation data using the investment performance of relevant benchmark indices; and
- Calculate effective investment costs from the difference between *Gross investment returns* and *Net investment returns* (see equation (2) below) which are given or calculated accurately from audited accounting data.

This analysis provides a decomposition of *Net investment returns* into two factors: asset allocation impacting on *Gross investment returns* and operational structure impacting on effective investment costs. Because *Gross investment return* is estimated from benchmark indices, it is used synonymously with *Benchmark return* of a portfolio, while e*ffective* investment cost (or simply *Investment cost*) is defined as actual investment cost minus investment out-performance (or under-performance) net of investment costs over the *Benchmark return*.

It is widely accepted from empirical observations and analysis that asset allocation is a key determinant of investment performance (Brinson et al., 1986; Ibbotson and Kaplan, 2000). While active stock selection can perform differently from the capital-weighted benchmark of an asset class, the average result of active stock selection by investors is zero, due to cancellation of winners and losers, before costs (Sharpe, 1991; Bogle, 2014). This fact has also been proved mathematically in the *Cost Matters Theorem* (Sy, 2008a).

For a superannuation sector with large *Total assets*, its portfolio is an aggregation of many individual portfolios. The sector investment performance is the asset-weighted average performance of all its member portfolios. Since the active stock selection of many individuals largely cancel each other out in each asset class, the residual aggregate impact of stock selection for a sector is small or near zero, *before costs*.

Hence the *Gross investment return* of a sector is well approximated by its *Benchmark return*, which is defined by the returns of benchmark indices weighted by the asset allocation of the sector. The *Net investment return* of the sector is then determined by the following equation:

$$Net\ investment\ return = Benchmark\ return - Investment\ cost \quad (2)$$

Since *Net investment return* is calculated from accounting data in the previous paper (Sy, 2017), once *Benchmark return* is calculated from asset allocation data (see below), *Investment cost* can be estimated from equation (2).

Equation (2) would be exact, rather than approximate, if the definition of *Investment cost* is broadened to be *Effective investment cost*, which includes any value added in excess of benchmark performance (as mentioned above). In this case, *Investment cost* (abbreviated from *Effective investment cost* for convenience) could be negative if *Value added*, net of investment expenses, is positive (i.e. when out-performance overcomes costs). In this report, unless otherwise stated, *Investment cost* is *Effective investment cost* and it is the negative of *Value added* and vice versa. The terms are used interchangeably depending on which term is clearer in any given context.

The asset allocation data needed to calculate *Benchmark returns* for sectors are only available from APRA following the Super System Review (SSR, 2010; Cooper, 2010) which recommended improved reporting on investments, particularly for *MySuper* products. Implementation of new reporting requirements came into effect from 1 July 2013. This report uses the published quarterly asset allocation data for sectors (see details in the Appendix), covering the three-year period from September 2013 to September 2016.

Sector Asset Allocation

Asset allocation data reflect the investment philosophy, implementation and operational structure of different types of superannuation funds seeking to attract, retain and serve different types of members.

> Trustees of *Non-profit* funds mostly accept the tasks of asset allocation and portfolio construction as their fiduciary duty and they offer and encourage members to select optimized portfolio options. In contrast, trustees of *Retail* funds, for the most part, eschew those important tasks encouraging their members to construct their own portfolios, thus making them bear the additional cost of portfolio construction often involving the expensive services of financial advisors.

There are other important consequences following from these contrasting trustee philosophies. *Retail* funds emphasize choice for members who are encouraged to be *engaged* in active switching between investment options, in dynamic asset allocation or short-term market timing. Such operational structures require liquid assets with high turnovers, favouring listed, rather than unlisted, asset classes. The short-term philosophy of *Retail* funds has trustees leaving asset allocation and portfolio construction in the hands of individual members.

On the other hand, *Public sector* and *Industry* funds recognize superannuation investing is for the long-term. They take greater fiduciary responsibility in asset allocation for their members by constructing limited numbers of optimized portfolios as investment options for their members with most in default options. Because switching and trading are substantially reduced at the level of asset classes, the demand for liquid asset classes is significantly reduced. This operational structure allows *Non-profit* funds to make more direct, long-term and illiquid investments such as in infrastructure projects.

Reflecting the differences in investing and operational structure, the different uses of asset classes lead to non-homogenous reporting in the asset allocation data. Furthermore, it is relatively early days for APRA (since 2014) in collecting and publishing asset allocation data, which often have inconsistent levels of granularity, with or without data on asset sub-classes. Broad comparisons of sector asset allocation in this report use only major asset classes, while their sub-classes or component asset classes are shown in Table A1 in the Appendix.

The data for September 2016 provide a recent snapshot of how money is invested in the various asset classes by the superannuation funds regulated by APRA. Table 7 shows the dollar sizes of the investment by the various sectors in the major asset classes.

Table 7: Asset Allocation ($ billion) to Major Asset Classes, September 2016

Sector	Corporate	Industry	Public sector	Retail	Large APRA
Cash	5	49	41	84	179
Fixed income	15	81	77	126	299
Equity	27	233	164	277	701
Property	5	50	32	37	125
Infrastructure	2	42	16	9	69
Other	1	14	18	24	58
Total	56	469	348	557	1,429

In September 2016, institutional funds managed about $1.4 trillion, with the greatest allocation of about $700 billion (or about half), to the *Equity* asset class. In portfolio percentages, the sector asset allocations are shown in Table 8.

Table 8: Asset Allocation (%) to Major Asset Classes, September 2016

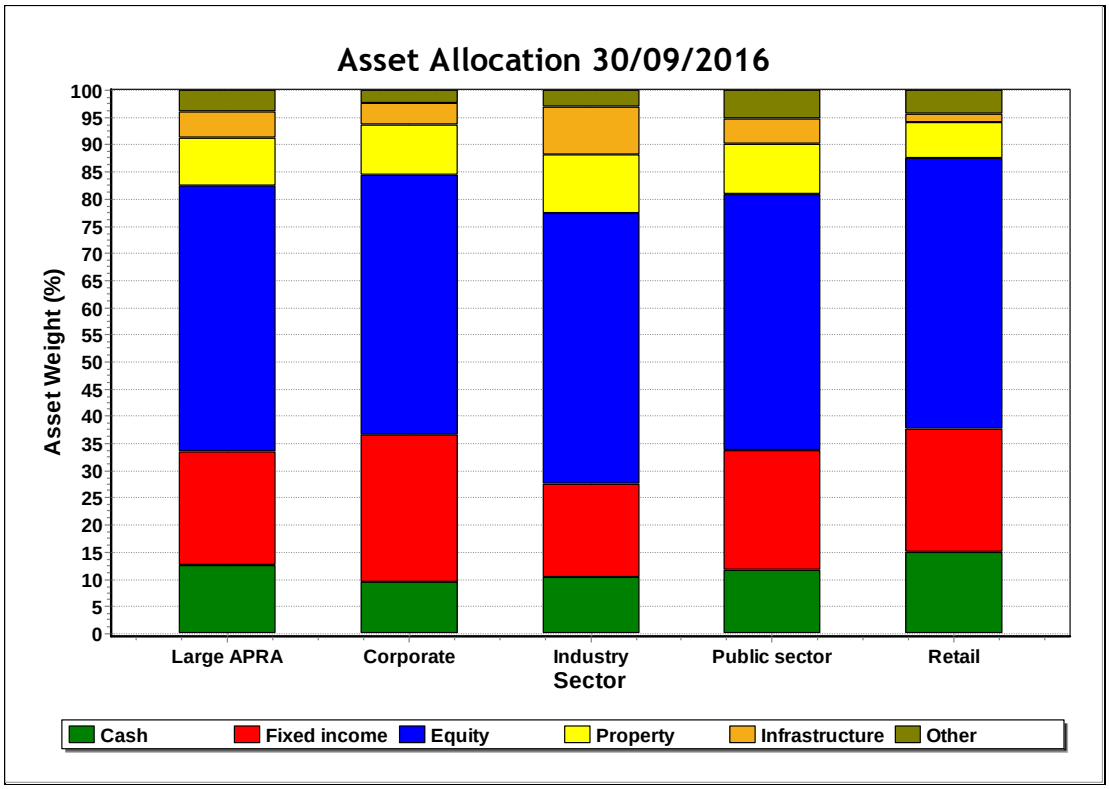
Sector	Corporate	Industry	Public sector	Retail	Large APRA
Cash	9	10	12	15	13
Fixed income	27	17	22	23	21
Equity	48	50	47	50	49
Property	9	11	9	7	9
Infrastructure	4	9	5	2	5
Other	2	3	5	4	4

It is observed that:

- *Public sector* and *Corporate* sectors have similar overall defensive assets to the *Retail* sector but earlier findings demonstrate they have consistently better *Net investment returns* than *Retail* funds (see Table 4).
- The *Industry* sector has the highest exposure to Property and Infrastructure, which are mostly unlisted and illiquid assets.

Time series snapshots (see Appendix) indicate that sector asset allocations evolve only slowly over time. The sectoral asset allocations in September 2016 (see Table 8) are shown correspondingly in Figure 5.

Figure 5: Sector Asset Allocation September 2016



The interesting observation here is the similarity in asset allocations between the *Corporate* and *Retail* sectors (see Table 8 and Figure 5), particularly in the proportions of defensive assets. From Figure 4 above, these sectors have greater similarity in volatility than in return, suggesting that asset allocation has greater impact on volatility than on return. This observation is consistent with the view that investment costs are higher for *Retail* than *Corporate* funds, and are a significant determinant for the differences in *Net investment returns*.

In other words, had it not been for higher investment costs in the *Retail* sector (to be shown below) *Retail* sector returns would be much closer to *Corporate* sector returns, shifting the data-point for the *Retail* sector upwards in Figure 4 to closer to seven percent, more than one percent greater than what was actually delivered. This is another indication of greater costs of *Retail* funds.

Operational Structures and Benchmarks

Since not all investors are alike, it is important to understand that there are potentially different benchmarks to serve different purposes. For example, an asset consultant may set a benchmark against which the performance of a hired investment manager is measured. In the context of a diversified portfolio, the benchmark may typically be a strategic asset allocation specified by the consultant with asset classes assumed to perform in line with market indices. Hence the benchmark measures the skills of the hired manager to add value through dynamic asset allocation and active stock selection.

In the superannuation fund context, the trustees of *Non-profit* funds typically hire asset consultants to set strategic asset allocations for a limited number of investment options offered to their members. In this case, the *Non-profit* funds are providing an asset allocation service for their members through portfolio optimization, by hired asset consultants, of their investment options. That is, *Non-profit* trustees under the Superannuation Industry (Supervision) Act (SIS Act) perform their fiduciary duty by providing their members with professional services of asset allocation, which is widely accepted as an important determinant of investment performance. Hence *Non-profit* trustees are responsible for, and add value through, asset allocation.

As mentioned above and in contrast, *Retail* trustees do not see asset allocation as their fiduciary duty; they operate on a commercial model where individuals are encouraged to have total freedom of choice to select their own assets and optimize their own portfolios. Default options with embedded asset allocations remain a small part of *Retail* funds. For asset allocation flexibility, *Retail* members need to have the requisite financial skills, knowledge and resources to optimize their own portfolios, or they may pay for the services of financial advisers who are assumed to be expert portfolio optimizers acting in their best interest. Hence *Retail* trustees have substantially divested responsibility for, and consequently do not add value through, asset allocation. Effectively, the cost of asset allocation is passed onto *Retail* members.

In either case, whether *Retail* or *Non-profit*, trustees are responsible for implementation of asset allocations and for actual construction of portfolios using internal or external investment managers. Of course they are responsible for administration, reporting, compliance and member service in operating their funds. However, for *Retail* funds, the operational structures are more complex in every respect because of the large number of choices in their offerings – more investment managers, more financial advisors, more documentation, more complex compliance, more requirements for member service, more complex computer systems, and so on. The increased investment and operating expenses have to be passed ultimately onto *Retail* members. Many of these costs are not declared as fees, which can lead to inaccurate reporting, and can potentially mislead members.

By design, *Retail* members are encouraged, through their own asset allocations, to quickly change asset classes, investment managers and their compositions. With the availability of hundreds if not thousands of investment options, it is claimed that they can control their

portfolio risk at a much finer granular level than *Non-profit* members who may only be able to control their portfolio risks through a finite number of discrete composite investment options.

However, such flexibility in dynamic asset allocation by *Retail* members may lead to frequent switching among numerous choices racking up high transaction costs. Moreover, to cater for short-term member switching, *Retail* funds are limited to liquid assets and they have greater difficulty investing in long-term illiquid assets, such as infrastructure, which may provide better returns than liquid assets. Empirical evidence shows that more choices and options generally work against members' best interest (Sy, 2011; ISA, 2017).

The different operational structures of superannuation funds are reflected in different asset allocation data collected by APRA, particularly at sub-class levels beneath major asset classes. The performance benchmarks which can be constructed from the available asset allocation data are necessarily quite different, reflecting the different operational structures. The benchmarks are used to estimate *Gross investment returns* largely determined by aggregate asset allocation (see equation 2) and the selection of market indices.

The selection of market indices, which determines *Gross investment returns* or benchmark returns, depends on the purpose and the type of investor. For example, an investor who understands and wants to analyse different *Industry* funds would use market indices including direct property and infrastructure because they reflect performance expectations of the investor more accurately. On the other hand, a self-managed fund (SMSF) member who wants to measure the potential value added by *Industry* funds as a sector would use simple market indices of the major asset classes, because that would be how a naïve investor would otherwise implement their own asset allocations.

In general, *Non-profit* funds would use typical benchmarks of asset consultants who include more sophisticated market indices, because those benchmarks would measure more accurately the implementation performance of the trustees. On the other hand, more appropriate for sophisticated investors of *Retail* funds would be financial adviser benchmarks which employ, for reasons of liquidity and convenience, a wider range of listed market indices including international assets and currency hedging, but without lumpy and illiquid assets such as direct property. A sensitivity analysis of how different types of benchmarks affect *Gross investment return* estimates is provided in the Appendix.

There are limitations in the asset allocation data available for comparison, particularly at the fund-level, where only allocations to major asset classes are published annually by APRA. On average, most funds have around half of their *Total assets* in equity, but the split between domestic and international equity has not been reported. Over the past few years, sector data show that most funds have significant exposures to *International equity,* at around 20 percent of *Total assets*, and their investment performance has been significantly different from domestic equity. Hence the benchmark for *Equity* should reflect the impact of allocations to *International equity*.

To reflect more accurately the reality, a composite index for the *Equity* asset class needs to be constructed to include both *domestic* and *International* equity. For most funds asset allocations have remained relatively steady over the past few years. A detailed analysis, not reported here, shows a suitable *composite equity index* consists of 60 percent domestic equity, 30 percent International equity unhedged (to currency) and 10 percent hedged. In this report, the construction of a composite equity index is based on 60 percent S&P/ASX Accumulation 200 Index (AUD), 30 percent MSCI Total Return Net World Ex-Australia USD Index (converted to AUD), and 10 percent MSCI Total Return Net World Ex-Australia Local (Currency).

The *Gross investment returns* are estimated from benchmarks which include the impact of asset allocation implemented through simple major market indices and a *composite equity index*. Therefore, *Benchmark returns* minus *Net investment returns* (given by data) are the estimated actual investment costs (direct and indirect), which are reduced by any positive value added through implementing asset allocations.

Table 9 shows the *Majors-Plus* market indices used in benchmarks, where the *Equity* index is the composite *Equity* index defined above. This approach, limited by available data, may set low performance benchmarks in some cases, against which actual performances of more sophisticated implementations may show up as greater value added.

Table 9: Majors-Plus (with Composite Equity) Indices of Benchmarks

Asset Class	Index
Cash	Bloomberg AusBond Bank Bill Index (Formerly UBS Bank Bill Index)
Fixed interest	Bloomberg AusBond Composite 0+ Year Index (Formerly UBS Composite Bond Index All Maturities)
Equity	Composite Index (60% domestic; 30% international unhedged; 10% hedged); defined above
Property	S&P/ASX 200 Accumulation A-REIT Index
Infrastructure	MSCI Australia Infrastructure Net Return Local (AUD)
Other	Australian Stock Exchange Accumulation Small Cap Ordinaries Index

The consequences of using alternative benchmarks for different sectors are briefly discussed in the Appendix, which shows that more sophisticated benchmarks have little material impact on relative performances between sectors over the last three years, but would affect how sector or fund performances are attributed to different factors.

Benchmark Performance

In this report, *Benchmark returns* are *Gross investment returns* when asset allocations are implemented through the *Majors-Plus* market indices shown in Table 9. Investment performances of the *Majors-Plus* market indices, over three years to September 2016, are shown in Table 10.

Table 10: Performance of Majors-Plus Indices (Sep 2013 to Sep 2016)

Asset Class	Volatility (% pa)	Return (% pa)
Cash	0.1	2.4
Fixed interest	3.3	6.2
Equity	8.8	8.5
Property	10.0	17.7
Infrastructure	9.3	16.5
Other	10.5	7.1

Given quarterly performances of *Majors-Plus* market indices above, and the type of asset allocation data shown in Table 8 and Figure 5 (for September quarter 2016), sector benchmark performances calculated for three years to September 2016 are shown in Table 11.

Table 11: Sector Benchmark Performance (Sep 2013 to Sep 2016)

	Volatility (% pa)	Return (% pa)
Larger APRA	5.6	8.3
Corporate	5.4	8.2
Industry	6.0	8.9
Public sector	5.5	8.4
Retail	5.4	7.8

It is important to note that the actual return and volatility of a sector are obviously different from those of its theoretical benchmarks. For example, the sector benchmark volatilities (above five percent per annum) in Table 11 are clearly higher than actual sector volatilities (below five percent per annum) as shown in the last row of Table 5. The main reason is: with only six major asset classes (even with a composite *Equity* index) in the construction of benchmark portfolios, there is more limited diversification compared with actual portfolios, which therefore results in higher benchmark portfolio volatility.

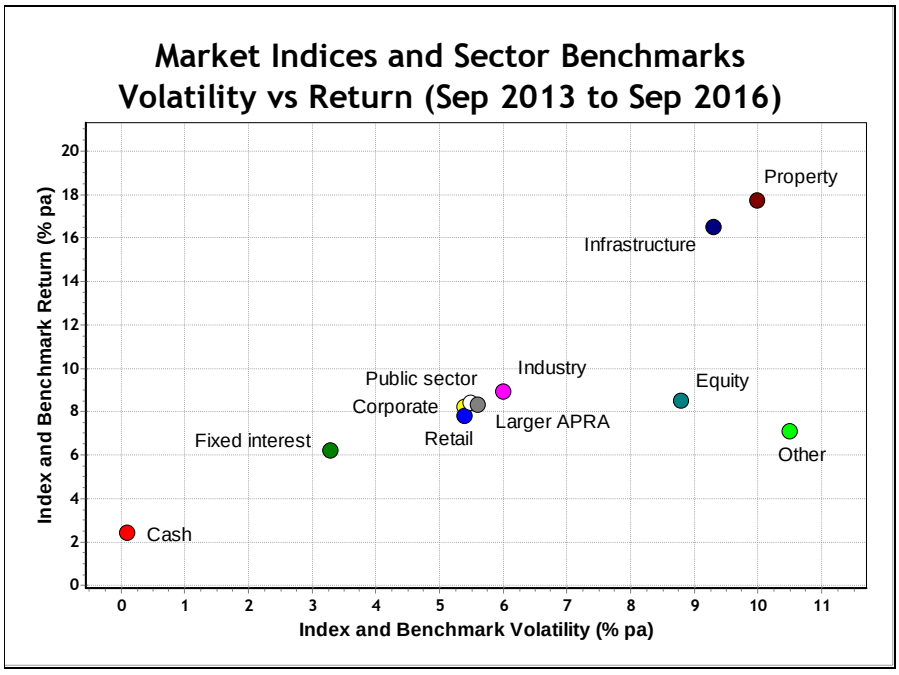
In reality, most superannuation fund portfolios have allocations to more asset classes and therefore have greater portfolio diversification and, thus, lower actual volatility. In the absence of actual portfolio volatilities, the relative differences in benchmark volatilities between sectors are useful theoretical indicators of relative risks, which are worth measuring, but should be used and interpreted with care.

As mentioned above, *Corporate* and *Retail* sectors have greater allocation to defensive assets which yield lower investment returns from major market indices, as seen in Table 10. Of *Public offer* funds, *Industry* funds have better benchmark performance with 1.1 percent per annum greater return than *Retail* funds, while conceding theoretically 0.7 percent per annum in greater volatility. Over the period, professional asset consultants have added

value through higher benchmark returns from asset allocation for *Non-profit* funds, compared to lower returns and less efficient risk-adjusted performance of *Retail* funds.

Over the three-year period to September 2016, the risk-return characteristics for both market indices and sector benchmarks, corresponding to Tables 10 and 11, are shown in Figure 6.

Figure 6: Market Indices and Sector Benchmarks
Risk/Return Trade-offs



In the grand scheme of things, sector asset allocations (see Figure 5) are not so dramatically different (being bunched together in the middle of the chart). The relatively minor differences result in similar benchmark characteristics when compared to the wide dispersion in characteristics of market indices. The *Retail* and *Corporate* benchmarks have the theoretically equal lowest volatilities of 5.4 Percent per annum compared to the highest of 6.0 percent (see Table 11), whereas actually the *Retail* sector had the highest volatility of 4.9 percent compared to the lowest of 4.4 percent (see Table 5). This confirms our earlier suggestion that relative volatilities are less predictable than relative returns.

The range in sector benchmark volatilities was less than one percent per annum and it is much less than the range in sector benchmark returns of more than two percent per annum. The similarity in benchmark performances suggests that asset allocation is unlikely to be the whole, or even the dominant, explanation for the consistent and persistent performance differences between the sectors (see Figures 2 and 3).

> In aggregates, compared to outcomes of market indices, the consequences of asset allocations on performance are not substantially different between sectors. Therefore, large performance differences in sector returns are unlikely to be explained predominately by asset allocation.

Performance Attribution

Hence the above data analysis of benchmarks casts some doubt on a common assertion in the superannuation industry (based on theory, but without empirical proof) that the superior investment performance (Sy, 2016a) of *Industry* funds over *Retail* funds is due largely to differences in asset allocation. The reason to be sceptical of this assertion is that the differences in asset allocation or benchmark volatilities appear not to be great enough to explain wholly the persistent differences in sector returns.

Therefore, according to the accounting logic stated in equation (2), the other explanation for persistent differences in sector returns is investment cost offset by value added from investing skills. To quantify the contributions from asset allocation and operational efficiency, a performance attribution of sector returns is shown in Table 12.

Table 12: Sector Value Added and *RAVA*
(% pa, 3 Years to Sept 2016)

	Corporate	Industry	Public sector	Retail	Large APRA
Net investment return	7.5	8.9	8.3	6.5	7.7
Benchmark return	8.2	8.9	8.4	7.8	8.3
Value added	-0.7	0	-0.1	-1.3	-0.6
***RAVA* (%)**	-13	0	-2	-24	-11

When reasonably chosen, gross benchmarks (before costs) normally exceed *Net investment* returns (after costs), because it is virtually impossible for large portfolios after investment costs to beat gross benchmarks (Sy, 2008a). Value added is normally negative and is a measure of indirect investment costs. *Industry* funds have minimized costs, while *Retail* funds have incurred the highest costs. Return volatility considerations can be taken into account by a risk-adjusted value added (RAVA) metric defined (Sy and Liu, 2009) by

$$RAVA(\%) = 100 \times \frac{Value\,added}{Benchmark\,volatility} \tag{3}$$

The *RAVA* metric shown in the last row of Table 12 can be used to provide a ranking criterion for risk adjusted performance. If markets were efficient and benchmarks were properly specified, then it is likely that, due to costs – typically *Value added* and hence *RAVA* – would be negative. From Table 12, the *Industry* sector evidently ranked marginally ahead of the *Public sector* at the top, while the *Retail* sector ranks at the bottom for the three year period to September 2016.

In a comparison of *Public offer* funds, the performance differences between the *Industry* sector and the *Retail* sector are attributed to the two factors of asset allocation and investment cost in Table 13.

Table 13: Public Offer Net Investment Return Attribution (% pa, 3 Years to Sept 2016)

	Industry	Retail	Difference
Benchmark return	8.9	7.8	1.1
Value added	0	-1.3	1.3
Net investment return	8.9	6.5	2.4

Much of this report has concentrated on decomposing *Net investment returns* before they come into superannuation funds as *Investment income* delivered by investment managers. Operating expenses have then to be deducted to obtain earnings after all costs but before taxes. *Operating expenses*, being largely dependent on operational structures, are quite consistent and persistent, as seen in Table 1. For *Industry* funds, *Operating expenses* subtract 0.5 percent per annum, while for *Retail* funds, they subtract 0.8 percent.

To summarize the factors which explain the performance difference between the *Industry* funds and *Retail* funds, Table 4 provides a decomposition of the *Pre-tax* returns (after all costs but before taxes).

Table 14: Public Offer Pre-tax Return Attribution (% pa, 3 Years to Sept 2016)

	Industry	Retail	Difference
Gross investment return	8.9	7.8	1.1
Value added	0	-1.3	1.3
Operational cost	0.5	0.8	0.3
Pre-tax return	8.4	5.7	2.7

Asset allocation, due to differences between asset consultant portfolios and financial planner portfolios (or other self-allocated portfolios) accounts for 1.1 percent per annum. The use of other types of long-term assets, and avoiding indirect costs, enabled *Industry* funds to off-set some costs relative to their benchmark and achieved zero effective cost. Lower investment costs account for 1.3 percent per annum improved return to *Industry* members. Simpler operational structures with fewer choices cut down operational cost accounting for another 0.3 percent of the difference of *Pre-tax* returns.

At the end of the March quarter 2017, *Retail* funds had *Total assets* of about $577 billion. If these assets were managed in the same way as *Industry* funds, then *Retail* superannuation members would be better off by about $15.5 billion per annum due to improvements in returns of 2.7 percent per annum after all cost but before taxes. This assumes the members take advantage of the asset allocation services provided inclusively through optimized diversified options of *Industry* funds. Otherwise if they do their own asset allocation, these hypothetical members would still be better off collectively by $9.2 billion per annum simply from the lower cost structures of *Industry* funds.

Based on this comparison between *Industry* and *Retail* sectors, the performance attribution shows *additional* costs (on 2017 assets) for *Retail* members come from the following sources:

- Choice of asset allocation and portfolio construction costs amount to 1.1 percent per annum or $6.3 billion;
- Indirect investment costs from trading, financial advice and other activities amount to 1.3 percent per annum or $7.5 billion;
- Increase in complexity of administration and operation costs amount to 0.3 percent per annum or $1.7 billion.

As shown in Figures 2 and 3, such savings for *Retail* members are not random or transient, applying only to the last few years, but long-term, consistent and persistent as potential savings into the future.

> In summary, asset allocation accounts for 1.1 percent of the performance difference between *Industry* and *Retail* funds, while costs and operational structure account for 1.6 percent. At March 2017 *Retail* assets, the three-year performance analysis to September 2016 suggests that *Retail* members will pay in future an additional $9.2 to $15.5 billion per annum, relative to *Industry* members, in indirect investment costs, operational costs and possibly asset allocation costs.

Summary of Attribution Analysis

To illustrate the "dollar" implications of the above performance attribution, consider a hypothetical but realistic example of what might be obtained from the annual statements of typical members in the *Industry* sector versus the *Retail* sector. In the following comparison, the performance numbers are approximate because they depend on what period is used for averaging, though the relative magnitudes are more accurate than the absolute magnitudes due to market volatility.

Assume a typical member with an opening account balance of $100K and total contributions (before tax) of $10K during one year, ignoring details in the calculation, the results before superannuation costs and taxes shown in Table 15 provide an illustrative example.

Table 15: Comparative Member Account Balances ($'000)
(Before costs and taxes)

	Industry	Retail	Difference	Comment
Opening account balance	100	100		
Total contributions	10	10		
Gross investment return	8.9	7.8	1.1	Asset allocation
Gross account balance	119.3	118.2		

Gross investment earnings are cash flow adjusted and are estimated to tally with the *Net investment earnings* known accurately from data. Given the different asset allocations, the benchmark return, or gross investment return, of the *Industry* sector exceeds that of the *Retail* sector by 1.1 percent, or $1,100 in gross account balance. *Net investment returns* for the sectors are given by APRA accounting data, which are used (with Equation 2) to deduce the Gross investment earnings from relative benchmark returns in Table 15.

Table 16: Comparative Member Account Balances ($'000)
(After costs and taxes)

	Industry	Retail	Difference	Comment
Gross account balance	119.3	118.2		
Total investment cost	0	1.3	1.3	Indirect cost
Net investment balance	119.3	116.9		Data given
Operating cost	0.5	0.8	0.3	Data given
Superannuation tax	1.4	1.4	0	Contribution tax
All costs and taxes	1.9	3.5	1.6	Cost differences
Closing account balance	117.4	114.7	2.7	After AA + cost

For any probable situation in reality (see Appendix), the total investment cost for the *Industry* sector would not be zero. With more accurate benchmarks, its actual cost would probably be similar to those for *Public sector* funds from direct costs. See the Appendix for a more accurate attribution of performance difference.

The *Retail* sector has additional indirect costs of 1.3 percent per annum, from portfolio construction, financial advice, and so on. The overall impact of asset allocation and investment costs, on *Net investment return* as reported in APRA accounting data, is an advantage of $2,400 (on average over one year) in the account balance of an Industry fund member over that of a *Retail* fund member, before operating costs and taxes are paid at the fund level.

As reported to the regulator, *Retail* funds have higher operating costs than *Industry* funds, by 0.3 percent per annum, due to more complex operation, with many investment options and more switching by members. The superannuation taxes paid by funds are mostly the 15 percent contribution tax, as other taxes appear to cancel themselves out at the sector level. Some of the indirect costs of *Retail* funds may be attributable to transaction taxes paid by investment managers external to the funds.

Comparing closing account balances of $117,400 and $114,700 of *Industry* and *Retail* fund results does not seem so alarming, but comparing 7.4 percent to 4.7 percent *Net return* or comparing $7,400 net investment earnings to $4,700, seems more dramatic. As has been observed by others, significant contribution flows to the system or to individual accounts have masked the underlying poor investment performance of many *Retail* funds.

In summary, a typical *Industry* member with an opening account balance of $100K and total contributions (before tax) of $10K in one year would have a closing account balance $2,700 higher than an equivalent *Retail* member, due to factors of asset allocation, indirect costs and operating expenses, decomposed respectively as follows:

$$\$1{,}100 + \$1{,}300 + \$300 = \$2{,}700. \quad (4)$$

Are there other qualitative explanations for these numbers?

Scale and Structural Comparison

A common, but unsubstantiated, perception is that the relatively poor performance of the *Retail* sector is due to the lack of scale of some of the smaller *Retail* funds, as there are 131 *Retail* funds versus 41 *Industry* funds in March 2017. The assumption is that *Industry* funds have performed better simply because, on average, they have an advantage of scale. The further implication is that conglomerates with their large scales would be among the better performers among *Retail* funds. It is insinuated that the relatively poor performance of the *Retail* sector is caused by the lack of scale of many smaller *Retail* funds.

The superannuation regulator has even suggested (APRA, 2017) that scale should be a criterion for evaluating the fitness of responsible superannuation entities (RSE) to be licensed to operate, and has urged smaller *Retail* funds to merge. Quite apart from the fact that this policy creates a barrier to entry for new competitors and encourages monopolies, there is little convincing empirical evidence to suggest that scale is either necessary or sufficient to benefit members (Sy, 2012; PC, 2016, pp.102-106). One simple reason given from the research (Sy, 2012) is that the Australian superannuation system operates largely on variable costs through asset-based fees – with greater assets leading mostly to greater fees to service providers. Therefore, the benefits of economies of scale are captured largely by financial service providers and not by superannuation members, though the situation may be changing in recent years in the *Industry* sector, where large funds have been increasing their levels of direct investing.

As *Industry* funds adopt direct investing and internalize more of their investment functions, variable costs fall relative to rising fixed costs. With increasing assets, their operational structures benefit from economies of scale, which ultimately lowers cost for their members. Note it is the operational structure which matters, not scale per se. Australian financial conglomerates, particularly the four major banks, have substantial scale, but their superannuation operations have high variable costs and are not structured for any cost savings from scale to benefit members.

The most recent year in our dataset, 2016, was one of low market returns. Such conditions are best for revealing the impact of costs on scale and net returns. There are 167 funds which supplied relatively complete fund level data to APRA in 2016. Categorizing funds with *Total assets* greater than $10 billion as large, funds with less than $1 billion as small and those in between as medium – and taking simple and asset weighted averages for each group – the impact of scale on 2016 *Pre-tax* returns for the *Industry* sector and *Retail* sector can be seen in Table 17.

Table 17: Impact of scale on 2016 Pre-tax Returns

Sector	Average	Large	Medium	Small
Industry	Asset weighted	4.3	3.6	2.8
	Simple	4.1	3.4	2.4
Retail	Asset weighted	1.5	1.8	2.3
	Simple	1.6	1.9	2.1

If scale is an important determinant, then asset-weighted averages would be greater than simple arithmetic averages. For the *Industry* sector, the impact of scale is evident across all size categories (see top two rows). For the *Retail* sector, the impact of scale is only evident in the small size category (see bottom two rows). For *Industry* funds, across all averages, larger sizes have greater returns, whereas for *Retail* funds it is the reverse.

> The benefits of scale for members apply only to *Industry* funds and other *Non-profit* funds, and not to *Retail* funds, because *Industry* funds have substantial direct investments in long-term illiquid assets, leading to lower components of variable cost in their operational structures.

The latter result of larger *Retail* funds having higher costs may appear counter-intuitive, but financial conglomerates have greater ability to take advantage of vertical integration to extract corporate revenues and shareholder profits, at the expense of their members (as discussed below). Also, a possible explanation may be that smaller *Retail* funds may have greater institutional flexibility to lower fees and to charge performance-based fees. Due to bureaucracy, larger funds tend to be more rigid and less discretionary in their operations. As noted previously (Sy, 2012), *Industry* funds are more likely to benefit their members through economies of scale because their operational structures have relatively higher fixed costs and lower variable costs compared to *Retail* funds, which have mostly variable costs in their operation.

Large Fund Comparison

Industry funds and *Public sector* funds have relatively large sizes, but is size the dominant factor in their better performance? Is scale the main explanation? This is unlikely to be the case, as suggested in the previous section, because many *Retail* funds have large sizes also. In this and previous reports, results have been asset-weighted and therefore have been adjusted for scale. However, it is instructive to compare more directly the performances of selected large funds, which in the *Retail* sector are dominated by financial conglomerates.

A group of conglomerates can be defined by the six major financial institutions with Australian Stock Exchange (ASX) symbols: AMP, ANZ, CBA, MQG, NAB and WBC. Official data collected by APRA show that in June 2016, they managed collectively $378 billion in superannuation assets in 30 *Public offer Retail* funds (excluding ERFs) with an average of $63 billion per conglomerate. They also managed, for their staff and employees, three *Non-Public-offer Corporate* funds which generally perform well – much better than their other *Public offer* funds.

From available fund-level data, in June 2016 there were 33 *Industry* funds, all of which are *Public-offer*, which collectively managed $386 billion in *Total assets*. Not only did the two groups, *Industry* and *Conglomerate*, manage nearly the same *Total assets*, their average fund sizes are similar with *Conglomerate* at $12.6 billion edging out *Industry* at $11.7 billion per fund. A performance comparison of these two groups of funds over the most recent three years is shown in Table 18.

Table 18: Conglomerate Performance Comparison (2014-2016)

Year	Group	Funds	Total assets ($B)	Net investment return (% pa)	Pre-tax return (% pa)	Net return (% pa)
2014	Industry	33	311	13.7	13.2	12.4
	Conglomerate	28	329	11.2	10.5	10.5
2015	Industry	33	357	10.3	9.9	9.6
	Conglomerate	32	372	8.5	7.8	7.9
2016	Industry	33	386	3.9	3.5	3.6
	Conglomerate	30	378	1.8	1.1	1.4
2014-16	Industry	33	351	9.2	8.8	8.5
	Conglomerate	30	360	7.1	6.4	6.5

Despite same scale characteristics, like-for-like, it should not be surprising that performance differences between the two groups are consistent and persistent. Averaged over all returns and periods, *Industry* funds performed better than *Conglomerate* funds by 2.1 percent per annum over this dataset.

- Over the three-year period, *Retail* members of conglomerates would have paid in total about $45 billion more in fees and in under-performance than comparable *Industry* fund members.
- Operational structure rather than scale is the important factor in reducing cost to superannuation members.

Essentially, in the performance difference between *Industry* funds and *Retail Conglomerate* funds, the two groups of funds with similar numbers and scale are used for comparison.

> Comparing the group of *Industry* funds against the group of *Public-offer Conglomerate* funds (AMP, ANZ, CBA, MQG, NAB and WBC), which have similar numbers, *Total assets*, and scale, it is evident that it is operational structure rather than scale that is more important in reducing cost and improving investment performance for superannuation fund members.

In the previous report, the demographics effect on fund flows has been eliminated as the main explanation for the observed performance differences, because *Public sector* funds have larger net fund out-flow due to withdrawals than *Retail* funds, and yet *Public sector* funds have performed better in a similar fashion to *Industry* funds.

In this report, the demographic effect on asset allocation has been shown to provide a partial, but minor, explanation for the observed performance differences because *Corporate* funds have similar asset allocations as *Retail* funds. *Corporate* funds also consistently out-performed *Retail* funds, though by a lesser amount than the other sectors. To quantify the effect of asset allocation on investment performance in the current comparison, estimates of value-added versus benchmarks need to be made and risk-adjusted metrics need to be calculated.

Sector asset allocation data used above are available quarterly for three years, enabling benchmark volatilities to be calculated directly from the fluctuations of benchmark returns. Asset allocation data for funds are available only annually for three years. Benchmark volatilities have to be estimated from the fluctuations of the underlying market indices using variance-covariance matrices, assuming the funds do not substantially alter their asset allocations over the period. Such estimates may be inaccurate at the level of individual funds if they are active in dynamic asset allocation or if they have relatively large fund flows, but the inaccuracy would diminish when aggregated over many funds.

Given the caveats about data limitations, particularly in the short-term, performance comparisons relative to benchmarks derived from asset allocation data are presented in Table 19.

Table 19: Performance Comparison vs Benchmarks (% pa)

Year	Group	Benchmark volatility	Benchmark return	Pre-tax return	Value added	RAVA (%)
2015	Industry	7.8	10.9	9.9	-1.0	-13
	Conglomerate	7.0	9.4	7.8	-1.6	-22
2016	Industry	9.1	5.7	3.5	-2.2	-24
	Conglomerate	8.2	4.5	1.1	-3.4	-41
2015-16	Industry	8.5	8.3	6.7	-1.6	-19
	Conglomerate	7.6	6.9	4.4	-2.5	-33

For 2015, asset allocation appears to have accounted for much of the performance difference between *Industry* and *Conglomerate* funds, 1.5 percent out of 2.1 percent, but asset allocation accounted for only half of the performance difference in 2016, 1.2 percent out of 2.4 percent. That is, indirect costs are even more evident in a low-return year. Note that *Value added* (negative) relative to *Pre-tax return* measures all costs. Even through short-term fluctuations, the relative performances are consistent and persistent.

On a risk-adjusted basis as measured by the RAVA metric, *Industry* funds have remained better performers than *Conglomerate* funds – less convincingly in 2015, but more convincingly in 2016. However, while the results with benchmarks are consistent with long-term results without benchmarks, one or two years of risk-adjusted results show some short-term variability.

Top 10 Comparison

To eliminate any possible "noise" from smaller funds even within large groups, the largest individual funds are checked in a large fund comparison. Among *Public offer* funds and among top ten largest funds, all with more than $30 billion in *Total assets*, five are *Industry* funds and five are *Retail* funds – one with each of the four major banks and AMP. In 2016, these top ten funds managed in combination $511 billion as shown in Table 20 below.

Table 20: Top 10 Public Offer Funds 2016

Fund name	Short name	Sector	Total assets ($B)	Directly invested (%)
AustralianSuper	AusSuper	Industry	104	73
Retail Employees Superannuation Trust	REST	Industry	42	70
Sunsuper Superannuation Fund	Sunsuper	Industry	39	64
Health Employees Superannuation Trust Australia	HESTA	Industry	36	65
Construction & Building Unions Superannuation	CBUS	Industry	34	59
Colonial First State FirstChoice Superannuation Trust	CBA	Retail	66	11
Retirement Wrap	WBC	Retail	57	17
AMP Superannuation Savings Trust	AMP	Retail	53	0
The Universal Super Scheme	NAB	Retail	46	0
OnePath Masterfund	ANZ	Retail	34	0

The *Total assets* of the top ten *Public offer* funds are split equally between *Industry* and *Retail* sectors, with about $255 billion each. However, substantially more than 50 percent of the assets of large *Industry* funds are invested directly, providing opportunities to benefit from economies of scale, while large *Retail* funds have little direct investments and thus afford themselves fewer opportunities to reap the benefits of scale.

Individual fund equivalent of Table 19 for assessing performance against benchmarks over 2015-16 is shown in Table 21.

Table 21: 2015-16 Average Performance Comparison vs Benchmarks (% pa)

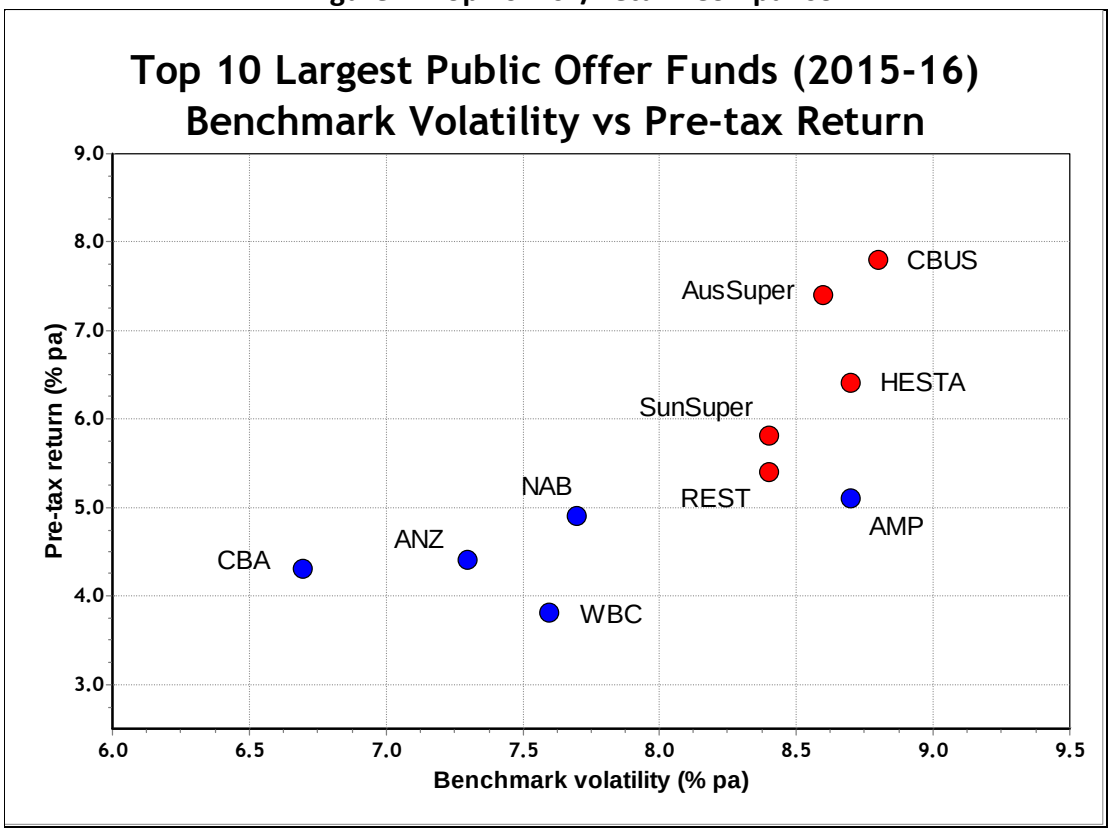
Short name	Sector	Benchmark volatility	Benchmark return	Pre-tax return	Value added	RAVA (%)
AusSuper	Industry	8.6	8.6	7.4	-1.2	-14
REST	Industry	8.4	7.8	5.4	-2.4	-29
Sunsuper	Industry	8.4	7.9	5.8	-2.1	-24
HESTA	Industry	8.7	8.1	6.4	-1.7	-20
CBUS	Industry	8.8	9.2	7.8	-1.4	-16
CBA	Retail	6.7	7.0	4.3	-2.7	-39
WBC	Retail	7.6	6.9	3.8	-3.1	-41
AMP	Retail	8.7	7.9	5.1	-2.8	-33
NAB	Retail	7.7	6.4	4.9	-1.5	-20
ANZ	Retail	7.3	6.2	4.4	-1.8	-26

The range in benchmark volatilities from 6.7 percent to 8.8 percent (2.1 percent range) was narrower than the range in benchmark returns from 6.2 percent to 9.2 percent (3.0 percent range). Values added by the funds are all negative, indicating net effective total costs (from both investing and operating). The average effective cost for the five *Industry* funds was 1.8 percent, while for the five *Retail* funds it was 2.4 percent – a difference of 0.6 percent per annum for the two-year period.

The average benchmark volatility for the five *Industry* funds was 9.7 percent, while for the five *Retail* funds, it was 8.7 percent, giving them 1.0 percent lower average volatility. On the other hand, the average benchmark and *Pre-tax return* for the five *Industry* funds were 5.8 and 3.3 percent, while for the five *Retail* funds they were 4.6 and 1.1 percent respectively, giving a Pre-tax return difference of 2.2 percent in favour of *Industry* funds. Therefore, the average RAVA score for the *Industry* funds was -26 percent, while for the *Retail* funds it was -40 percent. In 2016, as measured by the RAVA metric, the lower volatilities of *Retail* funds compared to *Industry* funds, were not efficient trade-offs for their lower returns.

The risk/return trade-offs for both 2015 and 2016 can be seen in Figure 7, where *Industry* funds are shown as red data points, while *Retail* funds are shown in blue.

Figure 7: Top 10 Risk/Return Comparison



The range in returns at four percent per annum is larger than the range in volatilities at 2.1 percent per annum. Noticeably, the range in volatilities among *Industry* funds is narrow and apparently predictable, whereas the range in volatilities in *Retail* funds is much wider and less predictable. On the other hand, the range of returns among large *Retail* funds appears to be narrow and predictable relative to each other.

A risk adjusted assessment of the top ten *Public offer* funds which Includes both 2015 and 2016 RAVA scores is shown in Table 22.

Table 22: Risk Adjusted Value Added (RAVA) Scores (%) for Pre-tax Returns

Short name	Sector	2015	2016	2015-16
AusSuper	Industry	-14	-14	-14
REST	Industry	-5	-49	-29
Sunsuper	Industry	-13	-34	-24
HESTA	Industry	-13	-25	-20
CBUS	Industry	-26	-8	-16
CBA	Retail	-28	-48	-39
WBC	Retail	-29	-51	-41
AMP	Retail	-20	-44	-33
NAB	Retail	-1	-33	-20
ANZ	Retail	-22	-29	-26

Over the two-year period, total RAVA scores were all negative, indicating that effective costs (from investing and operating) were positive, as expected. The average total RAVA score for the five *Industry* funds was -21 percent, while for the five *Retail* funds was -32 percent. Note that this difference in RAVA scores is even greater in the 2016 bear market where for the five *Industry* funds was -26 percent and for the five *Retail* funds was -41 percent. This contradicts the common claim that *Retail* funds perform better in bear markets when adjusted for risk.

The limited sampling here is consistent with the broader sampling in Table 17, where the corresponding RAVA scores are -4 percent for all *Public offer Industry* funds and -20 percent for all *Public offer* conglomerate funds.

Conglomerate Case Study

The importance of audited accounting data, at sector level or fund level, should be emphasized. It is the accuracy, certainty and integrity of data which compel serious consideration, rather than summary dismissal, of any surprising results which may contradict common prejudice and misconception. The results presented here (with substantial cross-checking) are not due to data errors, as often dismissed by those funds shown in poor light, but are, in fact, a much closer approximation to the truth. To further validate our results and their interpretation, a brief case study[5] is presented here of the largest financial conglomerate in Australia.

In its 2017 annual report, CBA announced a record net profit after tax (NPAT) of $9.9 billion, but only a small portion ($554 million) of NPAT was due to wealth management. It would be very wrong to associate (as some have done) this wealth management profit simply with investment cost to CBA funds under management (FUM) of $206 billion (including superannuation funds). Wealth management NPAT would only be 0.27 percent of FUM. More relevant is the income or revenue generated from wealth management by CBA from investment fees and costs paid by superannuation members.

[5] Disclosure: The author is a client of CommBank and CommSec, as well as a direct shareholder of CBA.

The wealth management income was about $2 billion, which was about one percent of FUM. This is a more reasonable indication of direct cost, but is still a significant under-estimate of the cost to CBA superannuation members because indirect costs are not declared in superannuation. Indirect costs of superannuation, not declared as investment fees, come from the division of institutional banking and market dealing.

Indirect costs, generating substantial bank income for CBA, include commission paid to stockbroking, margin lending, losses to principal trading revenue of the bank, financial advice and other services (see Appendix). This part of the banking business is very profitable with the ratio of operating expenses to income sitting at less than 38 percent, compared with a higher ratio of nearly 71 percent for wealth management. These sources of "other banking income" totalled $5.5 billion or about 2.7 percent of FUM. Naturally not all of this income, as costs to all investors, could be attributed entirely to CBA superannuation, but it represents the potential size of indirect costs to its superannuation members.

The information in the annual report is consistent with our research estimates, indicating that indirect cost for investing could be greater than direct cost which has been disclosed at about one percent per annum. Assuming that *Industry* funds operate at low effective cost of about 0.85 percent per annum, from the performance differentials *Retail* funds could be operating at about three percent per annum total cost (see below). If this is the case, at June 2016 *Total assets* of $255 billion, *Public-offer Retail* funds of conglomerates alone would pay $7.7 billion in costs. This would be consistent with CBA taking in about $3 billion in fees and indirect costs from superannuation. How, in what ways, are such costs extracted from investors?

Indirect costs are extracted in many ways (see Appendix). With principal trading, legal and accepted as a way to provide transactional liquidity, the stockbroking arm of a financial conglomerate can simply front-run the trades of its fund management arm. For example, with an order to buy ten million BHP shares when the price was $25, the stockbroker as principal trader could accumulate ahead the shares at an average price of $25.50 (say), but the buying pressure moved the BHP share price to well over $26 (say). The stockbroker then fills the buy order at an average price of $26, earning 50 cents per share or five million dollars in trading revenue. Such indirect cost for its fund management operation, at the expense of investors of the fund, is not easily measured and certainly not recorded anywhere as a cost to members.

Another example of indirect cost at the superannuation fund level is netting of switching within investment products or options. Suppose one member buys $100,000 worth of units in an equity fund and another sells the same amount on the same day. If the switching cost is one percent, for either purchase or sale, then the fund collects $2,000 in switching fees, but these offsetting trades have absolutely no impact, either in cost or investment performance, on the fund because the fund portfolio remains unchanged. Such transaction costs affect member balances but have no impact on the cost or performance of the fund. The unit prices of the fund give no indication of the cost to members when they are induced to trade.

There are many other ways indirect costs are borne by superannuation members which are difficult or impossible to quantify individually, and their overall impact can only be seen in audited accounting data in aggregate. This is one of many reasons why product performance data are unreliable, while fund level data are vital for assessing the true impact of costs on the overall performance of the superannuation system. Yet there has been a move by the regulator to ignore research on this important audited data, but instead collect unaudited data reported on such quantities as unit prices, fees and costs. Regulators should not publish data which they cannot check independently and take responsibility for.

Of the $9.9 billion profit made by CBA in 2017, probably $3 billion to $4 billion of the profit on revenues of $6 to $7.5 billion (as fees and trading profits) came from profits of wealth management and related activities, of which a substantial part is associated with superannuation from revenues through direct fees and indirect costs.

> In this case study of CBA, the magnitudes of the numbers in the financial statements from its 2017 annual report are consistent with the general conclusions from official data sources that the average cost of funds under management of *Retail* funds may be between two to three percent per annum greater than those of *Industry* funds.

The operational structure of *Retail* funds, particularly conglomerates such as CBA, is dictated by the imperative to generate income and make profit for their trustee companies, related-party corporations and their shareholders. The governance issues and conflicts of interest exhibited by trustee director associations and remunerations have been observed (Sy, 2008b). The general strategy of a conglomerate is to unbundle a product or service into many steps in different business units and then charge fees separately at each step through cross selling among units. This practice makes indirect costs of superannuation investing difficult to identify and quantify. The amount of revenues extracted through greater margins and greater varieties of fees can be glimpsed from sections of the annual reports of financial conglomerates, as indicated above.

Under the *For-profit* operational model of *Retail* funds, fund members are seen as clients or customers who exercise *free-choice* in investment products, much like depositors who exercise *free-choice* in purchasing saving products. The *free-market* or *neoclassical* assumption is that market competition determines the appropriate levels of fees which *fully informed* fund members are willing to pay. If fund members dislike what they are getting, they are free to take their investments elsewhere – but fund members are generally poorly informed about the costs they are paying. The *free-market* idea of competition is the competition for profits, as customer satisfaction is assumed to follow, but this is the case only in a fully informed market.

> This report has repudiated the textbook assumption that more than 90 percent of investment performance differences are explained by asset allocation. In the real-world of inefficient markets of Australian superannuation with information asymmetry and substantial friction costs, asset allocation explains less than 45 percent, while cost explains more than 55 percent of the performance differences between fund portfolios.

Attribution to asset allocation is volatile and unpredictable like the underlying markets, whereas attribution to cost is consistent and persistent like the underlying operational structures of the funds. Market volatility often masks the significant impact of cost in explaining investment performance differences.

Review of Fees and Costs

This report has shown the important impact of operational structure on net investment returns after costs, which are critical in understanding the efficiency of the Australian superannuation system. Modern finance theory (MFT) and academic research on superannuation are generally silent on cost (in the sense of this report), because they assume frictionless markets reflected in such theories as capital asset pricing models (CAPM) and efficient markets in equilibrium. The cost in MFT refers to the cost of capital, which is related to leverage or the use of debt, and not to market friction and "leakages" in the real world.

Essentially, most academic research, if it is to be accepted easily for journal publication, is precluded generally from studying friction cost. Any findings on costs are considered "anomalies" in academic literature. Many research grants, journal publications and professorships in economics, banking and finance are endowed by financial conglomerates, which are anxious to avoid public exposure that their business models have high friction costs – a focus of this report.

There has been consultant research on superannuation fees (e.g. Bonarius and Rice, 2014), but fees are not the only costs, because fees are merely direct costs declared to, and paid by, superannuation funds. The simple collation of fees data provides little clue on methodology or validation or understanding of the data. The average total fee for all funds of 1.12 percent per annum (Bonarius and Rice, 2014), does not reflect the full cost to Australian superannuation. Beauty parades on fees are not useful, but rather may actually be misleading.

Fees alone could significantly under-estimate the total cost of superannuation, because undeclared indirect costs have been shown to be substantial, as this report has estimated from a top-down approach. The method of adding up known costs can only produce lower bounds on the total cost, because the method is *limited by one's knowledge* of what are *all* the costs to be researched and reported. Recently, in a typical bottom-up approach, Rainmaker (2017) assessed some indirect costs such as insurance and financial advice. If such costs are included by Rainmaker (2017), then the 2016 overall cost (excluding tax) for superannuation increased significantly from the commonly perceived cost of the industry to $31 billion (or about 1.5 percent[6] of *Total assets*), in closer agreement with our estimates here and in the previous paper.

[6] This is based only on 2016 estimates; longer-term averages are higher at about two percent (see Table 1) and hence the system may cost members as much as $40 billion per annum at current assets.

Rainmaker (2017) estimated that financial advice alone may account for nearly $6 billion of the total cost through advice fees and transfer payments or commissions. Insurance premium may be significant, but are offset by benefit payments received from claims, so that the net impact of insurance on the overall cost of superannuation has been substantially reduced. Assuming Rainmaker's $31 billion total system cost, and assuming *Industry* funds have on average 0.85 percent investment cost and 0.5 percent operating cost with an all-in cost of 1.35 percent, then provisional estimates of system all-in cost collated from various sources attributed to various sectors are compared in Table 23.

Table 23: Sector All-in Cost Analysis (Jun 2016)

	Total assets ($B)	Total cost (% pa)	Total cost ($B)
Corporate	55	1.26	0.7
Industry	466	1.35	6.3
Public sector	356	1.26	4.5
Retail	545	2.95	16.1
SMSF	622	0.60	3.7
System	2044	1.53	31.3

Annual performance differences of over two percent of which the cost difference constitutes over 1.5 percent, between *Industry* and *Retail* funds, are consistent with similar experiences in other countries (Ambachtsheer, 2017). In estimated costs, *Retail* funds are responsible for about half of the cost of the whole system (Rainmaker, 2017), while managing only about a quarter of its *Total assets*. At 2.7 percent per annum excess cost, when all factors are taken into account, the consequence for Australian superannuation and for *Retail* members, in particular, may be quite serious.

> After 40 years of same retirement contributions, depending on reasonable assumptions, a *Retail* member may accumulate less than 60 percent of the total saving of an equivalent *Industry* fund member.

Rainmaker (2017) estimated that of the $31 billion cost to Australian superannuation in 2016, $28 billion or about 90 percent was captured by the financial services industry, of which $12.3 billion or 40 percent of all superannuation costs was captured by the *Conglomerate* group (as defined above). The case study above showed that, from the provision of superannuation operation and related services, CBA could well have captured $6 billion, or nearly half of its income, to generate the 2016 profit of about $3 billion from superannuation and related market dealings for its executives and shareholders.

Naturally, most of the $31 billion in superannuation system cost (Rainmaker, 2017) has provided jobs for propriety traders, market dealers, stock brokers, financial advisers, accountants, computer programmers, and so on, creating a class of well-paid workers. Moreover, they have also provided high bonuses for executives and dividends for shareholders. These activities cost *Retail* members (through higher indirect cost), and thus the superannuation system about $10 billion per annum more than appears necessary. The key question for the Productivity Commission (PC, 2016) and other superannuation reformers is:

> Is this structure of Australian superannuation most efficient for providing retirement income for millions of Australians?

The pension systems of Denmark and the Netherlands, which ranked higher than Australia's in the 2016 Melbourne Mercer Global Pension Index (MMPGI, 2016), have adopted models of *Non-profit* mutual trustees which avoid multiple conflicts of interest. The defined contribution system of Australian superannuation was partly an imitation of the 401(k) plan in the US, invented by Ted Benna in 1979 (Benna, 2017). By 2011, Ted Benna thought he had created a "monster"; his reported explanation (Olshan, 2016) was:

> *The plans had grown so overcomplicated and so fraught with hidden fees and opportunities for bad decisions that they were better at enriching the financial industry than the actual savers.*

In the Australian case, at current assets, hidden fees cost about $9.2 billion per year and bad decisions, in asset allocation and associated switching, cost another $6.3 billion, totalling $15.5 billion loss for *Retail* fund members. By comparison, government income support for seniors (i.e. the Age Pension) currently costs $45 billion per annum. With the ringing of this alarm bell on *Retail* cost here and overseas, do we need to wait for the United States to reform its system first before the Australian Government has the courage to act on the evidence presented here and elsewhere?

Conclusion

This report has investigated the factors which might explain the performance differences between sectors in long-term trends observed in the previous report. The factors considered for their relative impact include asset allocation, operational structure and scale.

As more financial details beyond annual audited accounting data are used in this study, the datasets become more limited in various ways. For example, quarterly sector and fund level data go back only to 2004. Asset allocation data for sectors are quarterly, and for funds only annually, starting from June 2014. Despite limitations, the available granular data confirm in detail the general findings of the first paper.

The major findings are summarized as follows. References to tables and figures are for those contained in the main text.

- Twelve years of quarterly data have confirmed that, over any timespan of five years or more, *Retail* funds have consistently and persistently under-performed *Non-profit* funds (see Figure 2). The 12-year average under-performance was about two percent per annum, measured on an asset-weighted basis since 2004. At $577 billion of *Retail* assets (March 2107), the additional cost to *Retail* members relative to *Non-profit* fund members is $11.5 billion per annum.

- The quarterly data from 2004 to 2016 show risk aversion of *Retail* funds had failed to achieve benefits, because lower returns and higher cost of *Retail* funds did not benefit members with lower risk (see Figure 4). Instead of lower volatility, the lower *Retail* returns came with higher volatility, contrary to academic theories which ignore costs.
- In sub-periods of three-year duration when the *Sharpe ratios* were positive and valid, the *Retail* sector achieved consistently lower risk-adjusted returns than other sectors (see Table 6).
- Trustees of *Non-profit* funds mostly accept the tasks of asset allocation and portfolio construction as their fiduciary duty and they offer and encourage members to select optimized portfolio options. In contrast, trustees of *Retail* funds eschew those important tasks and encourage their members to construct their own portfolios, thus making them bear additional costs which often involve the services of financial advisers.
- In aggregates, compared to outcomes of market indices, the consequences of asset allocations are not substantially different between sectors (see Figure 6). Therefore, large performance differences in sector returns are unlikely to be explained predominately by asset allocation.
- Asset allocation accounts for 1.1 percent of the performance difference between *Industry* and *Retail* funds, while indirect costs and operational structure account for another 1.6 percent (see Table 14). At current *Retail* assets, the three-year performance analysis to September 2016 suggests that *Retail* members are paying an additional $15.5 billion[7] per annum, relative to *Industry* members, from asset allocation ($6.3b), indirect investment ($7.5b) and operating costs ($1.7b).
- The benefits of scale for members apply only to *Industry* funds and other *Non-profit* funds, and not to *Retail* funds (see Table 15), because *Non-profit* funds have substantial direct investments in long-term illiquid assets leading to more fixed cost in their operational structures, as economies of scale depend on less variable cost.
- Comparing the group of *Industry* funds against the group of *Public-offer* conglomerate funds (AMP, ANZ, CBA, MQG, NAB and WBC), which have similar numbers, *Total assets*, and scale, it is evident (see Table 16) that operational structure rather than scale is important in reducing cost and improving investment performance for superannuation fund members.
- In some selected short-term periods, *Retail* funds may have lower volatilities, owing to their more risk-averse asset allocation, but at sector level or conglomerate group level or individual fund level, their risk/return trade-offs, as measured by the RAVA metric, are inefficient (see Table 20) – as they give up typically about twice return performance in exchange for any reduction in volatility.

[7] This relative cost is higher, compared with the *Industry* sector over three years rather than with the *Non-profit* sector as a whole over 12 years, as in the first point.

- A case study of CBA shows that the magnitudes of the numbers in the financial statements from its 2017 annual report are consistent with the general conclusions that the average cost of funds under management of *Retail* funds may be between two to three percent per annum greater than those of *Industry* funds.

The over-riding assumption of *economic rationalism* which underpinned the 1996 Wallis reforms is that the *free-market* produces the best long-term outcomes for members. The empirical facts observed here and in the previous report appear to contradict this assumption, probably due to flawed theories of markets. Most of the empirical observations may be explained by recognition that there are two distinct types of trustees:

- *For-profit* shareholder-oriented *Retail* trustees; and
- *Non-profit* member-oriented mutual trustees.

This leads to the fundamental question of which type of trustees is more consistent with the original intentions of the *SIS Act 1993*, even before the Wallis reforms in 1996 assumed *economic rationalism* is efficient for superannuation – which should be seriously questioned following the global financial crisis (GFC).

For-profit Retail trustees have an inherent conflict of interests, as the evidence suggests (Sy, 2008b). *For-profit Retail* trustee directors have a fiduciary duty under the *Corporations Act 2001* (Section 181) to act in the best interest of principals and shareholders. However, the same *For-profit Retail* trustee directors have also a fiduciary duty under the *SIS Act 1993* (Section 52) to act in the best interest of beneficiaries. Since the directors are rewarded by shareholders, the conflict of interests has been resolved evidently in favour of shareholders, but against the interests of beneficiaries, as the empirical evidence presented in this report has made clear.

If there were no *For-profit Retail* trustees then that part of the financial services industry related to superannuation would shrink from over $30 billion to about $20 billion per annum. In June 2016, according to the Australian Bureau of Statistics, the size of the financial services industry was $146 billion per annum. Hence without *For-profit Retail* trustees, the financial services industry would contract by less than seven percent from its current size. On the other hand, an additional $10 billion income from reduced costs for the superannuation system would increase *Net returns*, on average, by 0.5 percent per annum, which represents a significant boost in benefit for members.

The Productivity Commission has concluded (PC, 2016) that a key measure of the efficiency of the superannuation system is *Net returns* to its members. This report has indicated a way of increasing *Net returns* substantially, by simplifying a large and unnecessarily complex part of the superannuation system.

Currently, in an inherently conflicted situation, without meaningful reform on too many confusing choices, one possible palliative for the malady of unnecessary cost and low *Net returns* is to improve the information available to beneficiaries, who may then make better decisions in their own interests. The *MySuper* initiative, following a recommendation of the

Super System Review (2010), is an attempt to improve competition for default options by reducing the information asymmetry (Sy, 2011) which has caused inefficiency and dysfunction of the *free-market* in Australian superannuation.

References

Ambachtsheer, K. (2017), "The 'Canada model' for pension fund management: past, present, and future", *The Ambachtsheer Letter*, August 2017.

APRA (2017), APRA Insight, Issue One 2017; available at: http://www.apra.gov.au/Insight/Pages/insight-issue1-2017.html

Benna, T. (2017), "A brief history of 401(k), Benna 401k"; available at: http://401kbenna.com/401k-history.html

Bogle, J. (2014), "The arithmetic of all-in investment expenses", *Financial Analysts Journal*, Vol 7, No 1, pp. 1-9; available at: http://johncbogle.com/wordpress/wp-content/uploads/2010/04/FAJ-All-In-Investment-Expenses-Jan-Feb-2014.pdf

Bonarius, N. and Rice, M. (2014), "Superannuation fees: Financial System Inquiry", Rice Warner Pty Ltd.

Brinson G. P., Hood L. R. and Beebower, G. L. (1986), "Determinants of portfolio performance", *Financial Analysts Journal* (July-August), pp. 39-48.

Cooper, J. (2010), "Super for members: A new paradigm for Australia's retirement income system", *Rotman International Journal of Pension Management*, Vol. 3, Issue 2, Fall 2010, pp. 8-15. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1687693

Ibbotson, R.G. and Kaplan, P.D. (2000), "Does asset allocation policy explain 40, 90, or 100 percent of performance?", *Financial Analysts Journal*, (January/February), pp. 26-33.

ISA (2017), "Options to lose; choice and performance", *Industry Super Australia Research Report*; available at: http://www.industrysuperaustralia.com/assets/Reports/ISA-Research-Note-Options-to-Lose-Choice-and-Performance-FINAL.pdf

MMPGI (2016), *Melbourne Mercer Global Pension Index*, Mercer and Australian Centre for Financial Studies (ACFS); available at: https://www.mercer.com/our-thinking/mercer-melbourne-global-pension-index.html

Olshan, J. (2016), "The inventor of the 401(k) says he created a *monster*", Market watch, September 26, 2016; available at: http://www.marketwatch.com/story/the-inventor-of-the-401k-says-he-created-a-monster-2016-05-16

PC (2016), "How to assess the competitiveness and efficiency of the superannuation system", Productivity Commission Research Report, November 2016; available at: http://www.pc.gov.au/inquiries/current/superannuation/competitiveness-efficiency/report/superannuation-competitiveness-efficiency.pdf

Rainmaker, (2017), "Superannuation industry revenue 2016", *Rainmaker Information*, May 2017, Rainmaker Group.

Sharpe, W.F. (1991), "The arithmetic of investment expenses", Financial Analysts Journal, Vol. 47, No. 1, pp.7-9.

Super System Review (2010), *Super System Review Final Report*, Publication of the Commonwealth of Australia.

Sy, W. (2008a), "Towards a national default option for low-cost superannuation", *Accounting Research Journal,* Vol. 22, No. 1, pp. 46-67; available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2040684

Sy, W. (2008b), "Pension governance in Australia: an anatomy and an interpretation", Rotman International Journal of Pension Management, Vol. 1, No. 1, Fall 2008; available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1290628

Sy, W. and Liu, K. (2009) "Investment performance ranking of superannuation firms", *APRA Working Paper*, 23 June 2009; available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2398727

Sy, W. (2011), "Redesigning choice and competition in Australian superannuation", *Rotman International Journal of Pension Management,* Vol. 4, No. 1, pp. 52-61, 2011. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1829333

Sy, W. (2012), "Scale and competition in Australian superannuation", *Working Paper*; available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2374930

Sy, W. (2017), "Financial performance trends of Australian superannuation: system and sectors", *Report to Industry Super Australia*.

Appendix

Data Sources

In this report, the main sources of accounting data for financial performance and asset allocation for sectors come from the following Australian Prudential Regulation Authority (APRA) file:

- Quarterly Superannuation Performance December 2016 (released 21 February 2017): Tables 1a, 1d, 2a, 2d, 3a, 3d, 4a, 4d, 5a and 5d.

The data have to be merged together manually into a single database, not being downloadable from a single source file. Some simple calculations are required to put the data into values of recognizable names of the various asset classes.

Tables 1a, 2a, 3a, 4a and 5a contain end of quarter data from December 2004 to December 2016, representing 49 quarters of accounting financial positions. These data can be used to calculate quarterly *Net investment returns* and Pre-tax returns after operating expenses of the aggregate *large APRA* funds and their sectors (*Corporate, Industry, Public sector and Retail*). The calculated returns for sectors can be used to estimate the risks from investing in the sectors by computing their return volatilities for 49 quarters or four three-year sub-periods.

Tables 1d, 2d, 2d, 4d and 5d provide 14 quarterly asset allocations from September 2013 to December 2016, for the aggregate *large APRA* funds and their sectors (*Corporate, Industry, Public sector and Retail*). These asset allocation data will be used to calculate 13 quarterly benchmark returns by multiplying each asset allocation with its benchmark index returns and then adding up all component benchmark returns to create a benchmark return for a given asset allocation. Due to calculation done earlier, the data for the three-year period to September 2016 are used to present sector benchmark performances.

For Fund-level data, the main sources of annual accounting data for financial performance and asset allocation for individual funds come from the following Australian Prudential Regulation Authority (APRA) file:

- Annual Fund-level Superannuation Statistics back series (released 1 February 2017): Tables 3 and 9.

Table 3 and Table 9 provide respectively annual financial performance data and annual asset allocation data from June 2014 to June 2016. Retaining funds with 12-month duration in data, not winding-up and having non-zero *Total assets*, we obtained data for 193 funds in 2014, 192 in 2015 and 177 in 2016, the initial pass.

It should be noted that, from APRA data, the dollar sum of asset allocation to all asset classes adds up close to, but not exactly the same as, *Total investment*. So for consistency reasons, instead of accepting the published numbers for *Total investment*, we have assumed that the dollar sum of all asset classes *is* the *Total Investment*, so that all investments sum up to 100 percent of *Total Investment.*

The *Conglomerate* group is defined by all *Public-offer Retail* superannuation funds (excluding *Retail–ERF*) which belong to the six major conglomerates, with Australian Stock Exchange (ASX) symbols: AMP, ANZ, CBA, MQG, NAB and WBC. In the APRA dataset, the *Conglomerate* group had 28 funds in 2014, 32 funds in 2015 and 30 funds in 2016. Group statistics are aggregated on a dollar basis. Therefore calculated *Net investment returns*, *Pre-tax returns* and *Net returns* are all asset-weighted.

The data for *Majors-Plus* market indices (in Table 9) used to calculate benchmark returns come from Bloomberg with ticker symbols: BAUBIL, BACM0, ASA51, NDDUWXA (converted to AUD), NDDLWXA, ASA5PROP, M4AU0INF and ASA38.

Instead of APRA descriptors, for clarity and consistency for our research, we classify asset classes using familiar field names for our reports. This classification is shown in Table A1.

Table A1: Field Names of Asset Classes

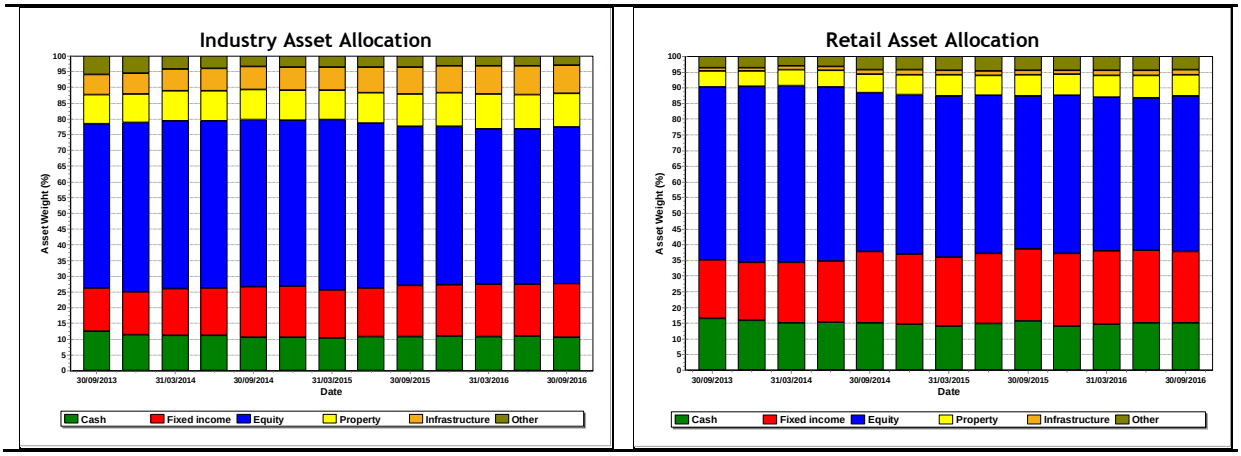
Major asset class	Component asset classes
Cash	Cash
Fixed income	
	Australian fixed income
	International fixed income hedged
	International fixed income unhedged
Equity	
	Australian listed equity
	International listed equity hedged
	International listed equity unhedged
	Unlisted equity
Property	
	Listed property
	Unlisted property
Infrastructure	
	Listed infrastructure
	Australian unlisted infrastructure
	International unlisted infrastructure hedged
	International unlisted infrastructure unhedged
Other	
	Commodities
	Hedge funds
	Other alternatives

In this report, sub-classes or component asset classes are aggregated into their major asset classes, whenever necessary. The more granular asset allocation data using sub-classes and their corresponding market indices to calculate benchmarks are useful for other applications, such as constructing financial planner or asset consultant benchmarks.

Asset Allocation Stability

The stability of sector asset allocations can be seen in the following two charts for the Industry sector and the Retail sectors.

Figure A1: Sector Asset Allocations Sep 2013 to Sep 2016



Alternative Benchmarks

For clarity, this report has used consistently the naïve benchmark which implements asset allocation using only major market indices (see Table 9). This decision has been dictated by asset allocation data availability since 2013 or 2014 at the time of this study. Detailed asset allocation data including sub-classes are available only for sectors quarterly to September 2016, while fund-level asset allocation data are available for major asset classes only annually, for three years to June 2016. Over this period, our study shows that the use of different benchmarks has only minor effects on most conclusions in this report. The differences in the analysis are briefly summarized here.

Consultant benchmarks are constructed from using the most accurate market indices available for sub-classes. For example, allocations to direct property are benchmarked against direct property indices and similarly with benchmarks for currency hedging. *Planner* benchmarks are constructed using only listed market indices. For example, even allocations to direct investments are benchmarked against listed indices and currency hedged indices are used whenever appropriate. Majors-Plus benchmarks are constructed using only the major market indices mentioned above to simulate naïve investors, for example, such as those in the SMSF sector.

The results for the different benchmarks are shown in Table A2.

Table A2: Sector Benchmark Returns (% pa, 3 years to Sep 2016)

Benchmark	Corporate	Industry	Public sector	Retail	Large APRA
Consultant	7.7	8.4	8.0	7.5	7.9
Planner	8.7	9.4	8.7	7.6	8.5
Majors-Plus	8.2	8.9	8.4	7.8	8.3

The three-year period to September 2016 has seen the *Planner* benchmarks consistently out-performing across all sectors. The aftermath of the global financial crisis (GFC) has seen unprecedented intervention by central banks buying indiscriminately listed fixed income and equity securities to create bubbles in listed markets for the "wealth effect".

Consequently, all sectors under-performed the *Planner* benchmarks but they performed better against the *Consultant* and *Majors-Plus* benchmarks, as Table A3 shows.

Table A3: Sector Value Added (% pa, 3 Years to Sep 2016)

Benchmark	Corporate	Industry	Public sector	Retail	Large APRA
Consultant	-0.2	0.6	0.3	-1.0	-0.2
Planner	-1.2	-0.4	-0.4	-1.2	-0.8
Majors-Plus	-0.7	0	-0.1	-1.3	-0.6

Here, value added is relative to *Net investment return* and therefore measures effective indirect costs. Despite varying performances against different benchmarks, the relativities in performance between sectors are maintained. Since most *Industry* funds use asset consultants for asset allocation and portfolio construction, *Consultant* benchmarks are appropriate for them.

On the other hand, *Retail* funds mostly do not use services of asset consultants, but leave asset allocation as "free choice" in the hands of their members. The analysis shows that *Retail* funds lost value though indirect costs against all benchmarks.

With the *Majors-Plus* benchmark for *Retail* sector, a performance comparison with the *Industry* sector using the *Consultant* benchmark is shown in Table A4.

Table A4: Performance Attribution (% pa, 3 Years to Sep 2016)

Sector	Value Added	Benchmark	Actual Return
Industry	0.6	8.3	8.9
Retail	-1.3	7.8	6.5
Difference	1.9	0.5	2.4

A decomposition of performance difference in *Net investment return* of 2.4 percent between sectors is now split between the factors of asset allocation of 0.5 percent and valued added or relative indirect cost of 1.9 percent. In this comparison, relative indirect costs (1.9/2.4) provide 80 percent of the explanation, while asset allocation provides only 20 percent, for explaining the performance difference in returns between the *Industry* and *Retail* sectors.

Indirect Costs in Investing

When a superannuation fund hires an external investment manager to manage a portion of the fund's assets, the manager delivers to the fund a net investment return after deducting directly an agreed and disclosed manager fee. The manager fee is a direct cost paid by the fund and reported to the regulator, but there are also undeclared indirect costs in the investment process which subtracts from the net investment performance of the fund which are difficult or impossible to measure or report.

Indirect costs are invented all the time in the financial services industry, designed to scalp money or other benefits from intermediating transactions, particularly by vertically integrated financial conglomerates without the costs appearing as fees or commissions for the buyers or sellers. These are what Ted Benna (2017) calls "hidden fees".

Australian regulators such as ASIC or APRA do not understand indirect costs, because when told about them, they attempt to collect the data by compulsion. Indirect costs are largely designed to be unreportable and therefore the regulators' attempts, to make service providers disclose the unreportable, can only be inaccurate, misleading and likely to be counter-productive.

Only some of the indirect costs such as operating costs of the investment manager, charged as expenses subtracting from net investment return delivered to the fund, potentially can be disclosed. However, there are far too many other indirect costs to describe or explain in any detail here. Even those working in the industry have to discover them by personal experience, because the industry avoids mentioning their existence. To provide an idea of the problem, a partial list, without explanation, is given as follows.

- Principal trading,
- Portfolio churning,
- Front-running trades,
- Triggering stop-loss orders,
- Soft-dollar commissions,
- Portfolio transitions cost,
- Buy/sell spreads and slippage in trading,
- Order allocation to selective portfolios.

These mechanisms or leakages could all add to indirect cost, but they are not supposed to exist and are not recorded. They generate substantial income revenue for the financial services industry – but the industry pretends they are not significant. As Upton Sinclair supposedly said:

> *It is difficult to get a man to understand something, when his salary depends on his not understanding it.*