

# The Readability of Australian Superannuation Disclosures

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## **Abstract**

Australian superannuation funds are required to produce annual reports providing key information to investors as part of a regime of ongoing disclosure. Each year, the annual report provides context around the financial performance of the investment fund that year. Prior readability studies have found that for firms, unreadable annual reports are associated with poor performance. One explanation put forward is that of managerial obfuscation, where managers manipulate the annual report's language in an attempt to hide poor performance. In this thesis, I examine the relationship between the readability of Australian superannuation fund annual reports and fund performance for a sample period of 2005 to 2018. Results indicate that the superannuation fund annual report is not associated with fund performance, contrary to firm annual report studies. When paired with the extant literature on other forms of superannuation fund disclosure, it seems there is no evidence of managerial obfuscation in the Australian superannuation market. However, fund characteristics such as small size and large net fund flows are associated with more readable annual reports. Additionally, I find retail superannuation fund annual reports are, on average, harder to read than industry superannuation fund annual reports.

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## **Attestation of Authorship**

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signature:

Date: 28/10/2020

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# 1. Introduction

Readability can be defined as “the ease of understanding or comprehension due to the style of writing” (George, 1963). Or stated differently, readability is related to the *writing style* of the text but not to the *information* being presented. Given the critical role written communications have in providing information, studies across a wide range of disciplines have looked at the readability of documents, including news media (Anderson, 1966; John & Wheat, 1984; Dalecki et al., 2009), medicine (Davis et al., 1990; DuBay, 2004; Linden et al., 2009; Badarudeen & Sabharwal, 2010), legal documents (Charrow & Charrow, 1979) and financial disclosures (Loughran and McDonald, 2014; among others). For the latter, the U.S. Securities and Exchange Commission (SEC) *A Plain English Handbook* (1998) advises that readable documents do not require omitting complex information, but rather using everyday words to replace jargon and legalese so information is ordered and clear (SEC, 1998).

An ever-growing body of research in finance has considered whether financial documents and disclosures can be easily understood by their target audiences. However, to date, much of the literature has focused on company disclosures and the implications of disclosure on the firm. Studies have found that annual reports (or US 10-K's) are generally difficult to read, requiring the audience to be knowledgeable and educated to access the information contained within them. The consequences of unreadable annual reports are an increase in information asymmetry, resulting in greater perceived risk leading to higher risk premiums, agency costs and lower prices (Li et al., 2009; Hwang & Kim, 2017; Garel, Gilbert, & Scott, 2018; Luo, Li & Chen, 2018). More recently, researchers have begun to examine the readability of key disclosure documents for those investment products that target retail or ‘everyday’ investors. Here, an everyday investor is someone who trades directly in financial products like stocks, bonds or funds infrequently, if at all. Recent examples of studies considering everyday products include the prospectus of retirement saving products<sup>1</sup>, such as New Zealand KiwiSaver (Gilbert & Scott, 2017) and Australian Superannuation (Peng, 2017). Producing readable disclosure documents is extremely important as these documents, in theory at least, should be the key source of information to help investors make the right decision<sup>2</sup>. However,

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<sup>1</sup> In NZ and Australia, the prospectus was replaced with the Product Disclosure Statement in 2014 for NZ and 2004 for Australia, following reforms to address the complexity and length of prospectus documents.

<sup>2</sup> The readability of other financial product disclosures has also been discussed, for example, Elliott points out in *Forbes* that insurance policies are sometimes impossible to read. See <https://www.forbes.com/advisor/car-insurance/insurance-policies-impossible-to-read/>



both studies conclude that the level of education required to read the prospectuses for these everyday financial products is high.

Compounding the problem of unreadable financial documents is the poor financial knowledge and engagement of the general public. Poor financial literacy is a problem in many countries; the Organisation for Economic Co-operation and Development International Network on Financial Education (OECD INFE) (2011) defined financial literacy as a combination of awareness, knowledge, skill, attitude and behavior necessary to make sound financial decisions and ultimately achieve financial wellbeing. For instance, Australian financial literacy and attitudes surveys report that more than half of Australians do not have basic financial knowledge (Wilkins & Lass, 2018)<sup>3</sup>, and more than 60% of Australians do not know the exact value of their superannuation account (ASIC, 2018). The surveys indicate that the public, on average, has limited financial literacy, and most superannuation investors are not engaged with their investment. Regulators have suggested that providing plain language disclosures may help to increase investors engagement with their superannuation (ATO, 2010; AGPC, 2018). Superannuation products target ‘everyday’ investors; it is essential to write financial statements in plain language because many investors have limited financial knowledge and different experience.

The lack of general financial literacy and capability of many people places increased importance on disclosure documents, both in terms of providing information to make an initial investment decision and in keeping investors informed about the performance of their investment over time. Managers, who often earn their income based on Assets Under Management (AUM) size and membership (Courtis, 2004; Souza et al., 2019), may have an incentive to hide their poor performance to avoid scrutiny of poor performance or attribution of poor performance to their management (Bloomfield, 2008), and avoid losing members. One way they can do this is by making writing less readable in the annual report, particularly in the narrative disclosure (which is the part of a corporate financial document where management interprets events and performance (Aerts, 2015)) to keep investors from noticing their failures (Courtis, 2004). So-called managerial obfuscation suggests managers may intentionally make negative news complex and difficult to read (Courtis, 1998, 2004; Bloomfield, 2002, 2008; Souza et al., 2019). An interesting aspect of narrative disclosure is that while managers are

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<sup>3</sup> The measurement of basic financial literacy includes five questions, covering numeracy, inflation, portfolio diversification, risk versus return, and money illusion.

required to explain and interpret recent events and performance, and regulators require them to tell the truth, they are not required to make this disclosure easy to read<sup>4</sup>. This affords managers an opportunity to try to hide poor performance behind complex and difficult to read narrative disclosures.

Prior research finds that poor firm performance leads to unreadable annual reports (Li, 2008; Dempsey et al., 2010; Wang et al., 2018; Asay et al., 2018; Souza et al., 2019). However, to date, there has been limited attention given to disclosure documents for managed funds. Fund annual reports are equivalent to the firm's version, as they both exist to provide investors with an understanding of the fund's/firm's performance and enable investors to make an informed decision about staying with the investment or exiting. Therefore, it stands to reason that the relationship between firm performance and readability of firm narrative annual reports may also apply to the Australian fund performance and readability of fund annual reports. However, Australian superannuation is compulsory for almost all Australian workers, in contrast to conventional managed funds where investment is voluntary. Given the evidence on the disengagement of members in superannuation funds, it is an open question whether prior research on firm and (the limited) managed fund annual report readability is applicable in this case. To the best of my knowledge, the only evidence on the relationship between performance and the readability of Australian superannuation fund disclosures is Peng (2017), who examined Australian superannuation fund product disclosure statements (PDSs). Peng (2017) finds that PDS's are generally hard to read, but that there is no significant relationship between the readability of PDS and the fund performance. However, Peng's finding does not necessarily translate directly to annual reports, as they play a different role to the PDS. The PDS is an introduction to an investment product and so spends limited time discussing fund performance, whereas the annual report discloses the company's information, activities, strategies, and, most importantly, their annual performance to the fund members and general public. I extend Peng's (2017) study, by examining the relationship between the readability of the narrative component of Australian superannuation annual reports and fund performance.

In line with current readability studies, the Bog index (Bonsall et al., 2017) is used to measure the readability of fund annual reports. Although the Bog index is not straightforward to calculate due to its formula being proprietary information, StyleWriter, a commercially available software package, calculates the Bog index. The Bog scores a piece of text based on

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<sup>4</sup> Section 2 'The Australian Context' includes the legislation of Australian financial disclosure statements.

the complexity of the words used, the sentence length, and presence of aspects of good writing. Text is scored between 0 and 1000+, with higher Bog index scores indicating a less readable text. I collect Australian superannuation annual reports and fund returns from 2005 to 2018. The sample includes 42 superannuation funds, 13 industry funds and 29 retail funds. To test the hypothesis that *the readability of the superannuation fund annual report is positively associated with superannuation fund performance*; I regress the Bog score for fund annual reports against the annual fund performance, measured by the past years' return. Based on previous studies of firm annual report and performance, it is expected poor readability of the annual report is associated with poor fund performance. Following Peng (2017), I control for other factors that may impact annual report readability such as fund size (net asset value), net fund flow, PDS readability, fund type (retail or industry), investment option, operating expenses, and the number of new members.

Results show that, on average, the superannuation fund annual reports sit around the border between 'fair' and 'poor' as measured by the Bog index (scores sit around 66). Retail fund annual reports' language are generally more complex than industry annual reports, suggesting there may be differences in the relationship between performance and readability depending on fund type. However, the key finding is that there is no significant association between the readability of annual report and superannuation fund performance. Prior research states that managers may have the intention to confuse the information in the annual report when they explain bad news to their investors (Courtis, 1998, 2004; Bloomfield, 2008; Guay, Samuels, & Taylor, 2016; Rennekamp, 2012; Souza et al., 2019). The results presented in this thesis do not support managerial obfuscation. Specifically, Australian superannuation fund managers do not appear to manipulate annual reports' language in an attempt to hide poor fund performance. It is possible that superannuation funds use annual reports more as a compliance tool, instead of a communication tool to inform investors. However, fund characteristics including smaller fund size, large net fund flows, more investment options, and an easy-to-read PDS are associated with more readable annual reports. By digging deeper into specific elements of writing style, I also find that superannuation fund performance is not associated with more frequent use of technical jargon, boring writing, and passive voice in the annual report.

The thesis contributes to the literature in three ways. First, I add to the body of evidence that financial disclosures are on average hard to read, and 'everyday' investors are likely to

find them difficult to read. Such evidence is important for regulators, as it suggests there is more work to be done toward readable disclosures. Second, I add to the body of readability research on whether firm/fund performance affects annual report readability (Li, 2008; Dempsey et al., 2010; Wang et al., 2018; Asay et al., 2018; Souza et al., 2019). Specifically, I extend Peng (2017), and consider Australian superannuation fund performance and its impact on superannuation fund annual report readability, confirming Peng's finding (in the PDS context) that there is no relationship. Finally, I point toward future research directions on superannuation annual report readability and investment-option-level performance, as additional fund-level tests suggest that less readable annual reports are also associated with the worst performing and value-weighted fund risk-adjusted return.

## 2. The Australian Context

The Australian Superannuation scheme is an individual savings program designed to ensure the sustainability of Australia's state-provided retirement pension (ATO, 2017). The Superannuation Guarantee (SG) requires employers to make contributions into an employee's fund of (at a minimum) 9.5% of their wage or salary (ATO, 2020).<sup>5</sup> The SG rate is scheduled to incrementally increase from its current level of 9.5% to 12% by 1 July 2025 (ATO, 2017; 2020). Australians can withdraw their superannuation fund when they retire or turn 65-years-old (except for those born before 1 July 1964<sup>6</sup>), or they can access the money earlier in certain circumstances, such as financial hardship, a terminal medical condition or permanent disability<sup>7</sup> (ATO, 2020; Moneysmart, 2020). The Australian government also make additional contributions to some eligible superannuation account holders up to a maximum of \$500 per year, called the co-contribution<sup>8</sup> (ATO, 2019).

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<sup>5</sup> Introduced in 1992, the superannuation guarantee has increased over time from an original 3% to its current level.

<sup>6</sup> Australians born before 1 July 1964 can access their superannuation fund when they reach their "preservation age", more detail of the "preservation age" can be found at <https://moneysmart.gov.au/how-super-works/getting-your-super>

<sup>7</sup> COVID-19 early release of super: Eligible superannuation account members can apply once in the 2020-2021 financial year for up to \$10,000 of their superannuation (ATO, 2020). However, the sample used in this study ends in 2018, therefore, the Covid-19 pandemic does not impact the results or factor in the discussion.

<sup>8</sup> Superannuation account holders with a low or middle-income can receive the co-contribution, to see more information, please visit the website <https://www.ato.gov.au/individuals/super/growing-your-super/adding-to-your-super/government-super-contributions/>. For more information about Super co-contribution amounts and personal super contribution please visit the website <https://www.ato.gov.au/Individuals/Super/In-detail/Growing-your-super/Super-co-contribution/?anchor=Supercococontributionamounts#Supercococontributionamounts>

Superannuation contributes to the Australian economy in a meaningful way. In 1996, the total value of superannuation assets was about \$245.3 billion. By 2007, total assets had accumulated to \$1 trillion, which was also the first time that superannuation assets were greater than the gross domestic product (GDP) of Australia (APRA, 2020). At the end of March 2019, the Australian superannuation totalled assets of \$2.78 trillion, 1.5 times Australia's GDP (APRA, 2020), and by the end of 2019, 78% of Australians had a superannuation account.

In general, investors superannuation savings can be managed in one of three ways. If Australian workers do not select a superannuation fund themselves, their money will be invested in MySuper, which is a default superannuation fund option. Investors can also self manage their, and up to three other people's, money called Self-Managed Super Funds (SMSF<sup>9</sup>). Finally, and a more common option, is choosing to use a professionally managed fund (APRA-regulated<sup>10</sup>).

Managed superannuation funds fall under one of four categories. The first is retail superannuation funds. Retail funds are open to the public and generally run by banks and investment institutions. They usually offer the widest range of fund options. Administration of the fund is part of their funds' management business and is done on a for-profit basis. The second category is the industry superannuation funds. Industry funds are restricted to employees of a particular industry.<sup>11</sup> For example, an electrician can join the electrical industry superannuation fund (Energy Super), or opt for any of the retail funds. Industry funds are predominantly managed by a trade union (or industry association) rather than a financial institution, although they are still managed by professional fund managers. The third category is public sector superannuation funds, which are only open to government employees.<sup>12</sup> The last category, corporate superannuation funds, are created by an employer for their employees.

Industry, public sector, and corporate funds are classed as not-for-profit funds, meaning they put any profits back into the fund. At the end of 2019 financial year, there were a total of

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<sup>9</sup> SMSFs is a private superannuation fund that mainly regulated by the Australian Taxation Office (ATO) and the Australian Securities & Investments Commission (ASIC) but not the Australian Prudential Regulation Authority (APRA); SMSFs data are not open to the public; therefore, they are excluded from this study. To see more information, please visit the website <https://www.ato.gov.au/Super/Self-managed-super-funds/Administering-and-reporting/How-we-help-and-regulate-SMSFs/How-your-SMSF-is-regulated/>.

<sup>10</sup> The Australian Prudential Regulation Authority (APRA) supervises institutions across banking, insurance and superannuation in Australia.

<sup>11</sup> Some larger industry funds are also open to everyone to join now, but this is the exception rather than the rule.

<sup>12</sup> There are superannuation funds start as a public sector but now open to the public, for example, funds under QSuper, but my samples do not include this superannuation fund.

112 retail funds with \$625.9 billion total assets (21.74% of total superannuation assets), 37 industry funds holding \$718.6 billion total assets (24.96%), 37 public sector superannuation funds with total assets \$668.5 billion (23.22%), and Small<sup>13</sup> superannuation funds with the most assets at \$749.7 billion.<sup>14</sup> In terms of the number of member accounts, retail and industry superannuation funds are the two most common investment choices with more than 11 million members each.<sup>15</sup>

The Australian superannuation market is heavily regulated, as are their disclosures. Funds are regulated by the Australian Taxation Office (ATO), the Australian Securities & Investments Commission (ASIC), and the Australian Prudential Regulation Authority (APRA) under the Superannuation Industry (Supervision) Act 1993. Regulators oversee the superannuation industry, ensuring fund managers comply with regulatory requirements, including financial disclosures. Under the Financial Service Reform (FSR) Act 2001 and Corporations Act 2001, all financial institutions need to provide a Product Disclosure Statement (PDS) before potential investors can invest in their financial products. The purpose of the PDS is to help investors compare investment products and make informed decisions. All companies operating in Australia are required by the Corporations Act 2001 to prepare and lodge financial reports with ASIC at the end of the financial year, called annual financial reports (annual reports). The PDS and the annual report are designed to be the two main sources of information for investors and potential investors who are interested in investing in superannuation funds. Unlike the equity market, membership in Australian superannuation is compulsory for all eligible Australians, including people with a limited financial background. If the information is conveyed in simple language, it has a better chance of being understood and used by the public.

When discussing the readability of financial documents, the capability of the target audience is a relevant issue; in this case, the level of financial knowledge of the average Australian. In 2018, *The Household, Income and Labour Dynamics in Australia (HILDA)*<sup>16</sup> Survey reported Australians' "financial literacy and attitudes to finances" as part of the 13<sup>th</sup> Annual Statistical Report of the HILDA Survey (Wilkins & Lass, 2018). They test financial

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<sup>13</sup> Small entities include SMSF, small APRA funds, and single-member approved deposit funds.

<sup>14</sup> Corporate entities hold \$58.1 billion, and Balance of life office statutory funds hold \$57.9 billion.

<sup>15</sup> Public sector funds have 3.6 million members, corporate funds have 286,000 million members, and Small funds have 1.128 million members.

<sup>16</sup> HILDA Survey is a household-based panel study founded by the Australian Government Department of Social Services and organizes by Melbourne Institute (Applied Economic & Social Research).

literacy by employing five questions that respectively cover numeracy, inflation, diversification, risk-return, and money illusion. The results suggest that less than half (42.5%) of the Australians (aged 15-years old and above) can answer all five questions correctly, and about 2.3% people cannot answer any questions correctly (Wilkins & Lass, 2018). The survey's findings show that many Australian have limited understanding of financial literacy, especially the younger generation.

Further, Australians appear to have low engagement with their superannuation. According to the survey of Australians' financial attitudes and behaviours, only 35% of Australians know the exact value of their superannuation account, with even fewer young people able to identify the value of their superannuation savings (ASIC, 2018). Regulators have identified that funds providing "better" information in simple language may help to increase engagement with superannuation (ATO, 2010; AGPC, 2018). Given superannuation is a compulsory financial product for everyday Australians, the readability of superannuation financial disclosures is important for both the conveyance of important information and investor engagement.

### **3. Background and Hypothesis**

Early readability researchers focused on the use of plain language in general reading material such as newspaper articles (Anderson, 1966; John & Wheat, 1984). More recently, however, readability measures have been used to examine the accessibility of information in more specialised fields, particularly fields noted for complex language such as medical education materials, and legal documents. For instance, Davis et al. (1990) note that the average patients' reading level is more than five years below the readability level of the patient education material (forms, and letters). Linden et al. (2009) mention that simplifying the text used in patient education material is particularly important for patients who are illiterate or for whom English is not their native language. Charrow and Charrow (1979) not only demonstrate that jury instructions were not fully understood, but they also analyzed the hard-to-read characteristics of the legal language and rewrote some parts of a jury instruction in plain language to address these hard-to-read issues.

Another widely studied area of readability is that of financial documents from publicly listed companies, such as annual reports or disclosure-related documents like prospectuses,

which present financial information about a business. Policymakers and regulators require companies to lodge financial reports to disclose their operations and information to enable investors to make informed decisions (ASIC, 2014). Littleton and Zimmerman (1962) proposed the function of financial documents is the communication of critical information to investors. Poor disclosures fail to communicate the information and are less helpful for decision making and monitoring purposes (Cheung & Lau, 2016). Loughran and McDonald (2014) define readability in financial disclosures as “the effective communication of valuation-relevant information”. In *A Plain English Handbook*, Levitt (1998) states that it is essential to start writing financial disclosure in plain language because most investors have zero or limit experience in finance, accounting, or the law. It is worth noting that plain language does not mean deleting complex information but rather the use everyday words to replace jargon and legalese, and transfer information orderly and clearly (SEC, 1998). However, despite the focus from policymakers and regulators to encourage simple language in financial documents, a growing body of research has identified that financial documents remain hard to read (Smith & Smith, 1971; Li, 2008; Dempsey et al., 2010; Loughran & McDonald, 2014; Gilbert & Scott, 2017; Peng, 2017; Garel, Gilbert, & Scott, 2018).

Prior research has found that hard to read disclosures may have a negative impact on firms. For example, Li et al. (2009) find that firms with hard to read documents receive less accurate earnings forecast from analysts, indicating analysts struggled to understand the information contained. Hwang and Kim (2017) show that firms with less readable financial reports are more likely to trade at a substantial discount to their fundamental value, while Garel, Gilbert, & Scott (2018) observe that less readable annual reports are associated with a higher cost of capital. Additionally, Luo, Li and Chen (2018) show that firms with less readable annual reports have higher agency costs. These studies suggest that hard to read disclosures increase information asymmetry, resulting in greater perceived risk leading to higher risk premiums, agency costs and lower prices. Additionally, from the firms’ perspective, there is rich research on the association between the readability of firm (as opposed to fund manager) annual reports and firm performance.

The readability of financial disclosures also affects investors' trading behaviour. Small investors trade less when financial disclosures are less readable. One explanation is that investors are unable to make informed decisions from unreadable disclosures (Miller, 2008; 2010). Rennekamp (2012) found that when financial documents are easier to read, investors



read the text more smoothly, which then makes investors more willing to rely on the information they received. As a result, Rennekamp (2012) showed that small investors have a stronger reaction, both to good and bad news, when financial disclosures are more readable. Lawrence (2013) states that individual investors, especially those who trade infrequently and have low financial literacy, invest more in companies with more readable financial disclosure. In a further study, Asay, Elliott, & Rennekamp (2017) found that investors' valuation judgments are affected more by external information when the financial disclosures are hard-to-read from the firm. Tan, Wang, and Zhou (2014) suggest that investors' rely on the tone of a document rather than the information contained when a document is hard to read. However, sophisticated investors were less likely to rely on tone. The findings suggest less sophisticated investors, that is those investors with a limited financial background, can be manipulated into making investment decisions when they face unreadable financial documents. Kuang, Lee, and Qin (2019) also find that the negative effect of the readability of disclosures can be reduced by investor sophistication, supporting the idea that whether a document effectively transfers the useful information not only depends on the disclosure itself but also the capacity of the users (Dale & Chall, 1949).

To counter less readable disclosure, policymakers and regulators have emphasized the use of everyday, plain language across financial disclosures in recent years, to encourage investors to read financial disclosures. The Australian Government, for instance, introduced the "Shorter Product Disclosure Statements" regime (Shorter PDS regime) under the Corporations Amendment Regulations 2010 (No.5), which requires that superannuation (and other products') PDS should be shorter and simpler to read (ASIC, 2014). Matveeva, Moosally, and Willerton (2017) suggest that the purpose of the 'plain language movement' is to ensure everyone can understand the material they are required to read. However, while these regulations intend to make documents easier to read, they have tended to focus on the length of the document. The accessibility of the information within the document has not been explicitly dealt within the new regime.

Prior literature provides evidence that firms with poor performance tend to produce more complicated and harder to read financial reports than firms with relatively higher performance (Li, 2008; Dempsey et al., 2010; Wang et al., 2018; Asay et al., 2018; Souza et al., 2019). Further, firms with better performance have annual reports that are easier to read than the firms with lower performance (Subramanian, Insley, & Blackwell, 1993). Managers may

deliberately make their narrative disclosure less readable when performance has been poor in an attempt to hide their poor performance, referred to as managerial obfuscation (Courtis, 1998, 2004; Souza et al., 2019). Guay, Samuels, and Taylor (2016) state that managers can deliberately increase the complexity of the narrative disclosure if it is in their personal interest. Asay, Libby, and Rennekamp (2018) support this by saying that when managers have a self-enhancement motive, bad news disclosures are more complex than good news disclosures. Bloomfield (2008) explains that managers have the incentive to produce complex annual reports when they are performing poorly, either to avoid scrutiny for the poor performance (investors cannot understand the firm performed poorly) or to attribute bad performance to others (hide the real reason for the poor performance without outright lying). However, Asay, Elliott, & Rennekamp (2017) provide evidence that managers may not benefit from strategically releasing less readable financial disclosure to obscure poor performance, as investors rely more on external sources when managers are unable to provide readable disclosures. Equally, Verrecchia (2001), Dye (2001), Boubakri and Mishra (2017), Hwang and Kim, (2017) and Garel et al. (2018) find that firms with less readable annual reports are viewed as riskier, resulting in a higher cost of capital. However, they also note that obfuscation is most prominent when managers have a personal incentive to obfuscate, specifically when their bonuses are less equity-based and therefore, more driven by earnings targets than firm value.

It is worth noting that there are strong incentives for fund managers to obfuscate. The obvious reason is that managers make information hard to access for their personal benefit (Guay et al., 2016). Theoretically, fund managers' fee is based on the size of the assets they manage. Therefore, investors leaving the fund ('switching' in the superannuation market) has a direct financial consequence for the manager when performing poorly; it is expected that the fund manager obfuscates information to hide their failures (Courtis, 1998). Courtis (1998) states that unreadable information can reduce readers' desire to investigate more closely, thus achieving the purpose of obfuscation.

There have been few studies considering the readability of fund disclosure documents and its relationship with performance. Peng (2017) considers the impact of the readability of Australian superannuation PDSs and fund performance, finding no relationship between them. The apparent lack of a relationship may be driven by the purpose of the PDS. The PDS (equivalent to a prospectus) is to provide investors with information relevant to entering an investment product (for instance, disclosure of risk, fees and insurance information). As a result,

disclosure of performance makes up a smaller component of the PDS than it would in an annual report. Given that fund annual reports should be equivalent to the firm annual report, the relationship between firm performance and readability of firm narrative annual reports may also apply to the fund performance and readability of the fund narrative annual reports. That is, a superannuation fund with low financial year return will, on average, generate a more complex annual report.

## 4. Methodology

### 4.1 Readability Measures

There are many readability measures available in the extant literature, predominantly based on the premise that readable text contains simple words in short sentences. For instance, within the finance literature, many researchers have utilised the Gunning Fog index, or Fog index<sup>17</sup>, (Gunning, 1952) to measure the readability for financial statements (Li, 2008; Miller, 2008; Loughran & McDonald, 2009; Peng, 2017; Garel, Gilbert, & Scott, 2018; Wang, Hsieh, & Sarkis, 2018). The metric captures readability based on the average words per sentence and the percentage of complex words, where a complex word is defined as having more than two syllables. The higher the Fog index, the less readable the document is, and the higher the educational level required to read the text. An acceptable level based on the Fog score is between 10-12, while a Fog score higher than 18 indicates that the text is generally unreadable. Many studies have found that for annual reports, the average Fog is above 18. A number of variations of the Fog index exist, such as the Flesch Reading Ease Score, or Flesch Score<sup>18</sup> (Flesch, 1948) and the Flesch-Kincaid Grade Level, or Grade level<sup>19</sup> (Kincaid et al., 1975). However, all these measures are driven by the same underlying premise, that readability is based on short sentences and simple language.

The premise of measuring readability based on short sentences and simple language is problematic when applied to financial documents (Loughran & McDonald, 2014). Loughran and McDonald (2014) note that financial disclosures and reports have a high percentage of complex words which would be easily understood by most business people and investors.

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<sup>17</sup> Fog Index =  $0.4 * (\text{WordsPerSentence} + \%ComplexWords * 100)$

<sup>18</sup> Flesch Score =  $206.835 - 1.015 * \left( \frac{\text{Total words}}{\text{Total sentences}} \right) - 84.6 \left( \frac{\text{Total syllables}}{\text{Total words}} \right)$

<sup>19</sup> Grade Level =  $0.39 * \frac{\text{Total words}}{\text{Total sentences}} + 11.8 * \frac{\text{Total syllables}}{\text{Total words}} - 15.59$

Additionally, the average words per sentence is more easily calculated for traditional prose than within a financial context where documents contain a lot of lists and none standard forming (Loughran & McDonald, 2014). To attempt to combat the shortcomings of traditional measures, a new readability metric has been developed, the Bog index (Bonsall et al., 2017). This study will use the Bog index to measure the readability of text.

The Bog index was developed based on the recommendations of the U.S. Securities and Exchange Commission (SEC) *A Plain English Handbook* (1998) regarding plain English writing attributes. The SEC recommendations consider the aspect of writing such as passive verbs, hidden verbs, redundant phrases, and specialist terms (SEC, 1998; Bonsall et al., 2017). Unlike other measures, the Bog index is not straightforward to calculate due to its formula being proprietary information. However, a software packaged from the Editor Software called StyleWriter, is available that computes the Bog index of documents. The use of StyleWriter software in readability studies has become relatively common; researchers have used component pieces of the plain English attributes from StyleWriter to build their own readability formula (see e.g., Miller, 2010; Hwang & Kim, 2017).

As noted above, Loughran and McDonald (2014) raised concerns that many familiar business terms contain more than three syllables, and some short words may be unfamiliar. In short, word familiarity is more important than syllable counts. To overcome this problem, Bog index measures difficulty of words not only by how many syllables a word has but more importantly focuses on its frequency and complexity (Wright, 2009; Bonsall et al., 2017). Each word has a grade based on the frequency of use and how easily the word would be understood, and is categorized. Categorizations include: easy or difficult, formal or informal, jargon or non-jargon, poor style or good style, technical or non-technical, and common or unusual (Wright, 2009). The Bog index then uses a dictionary of over 200,000-words to identify word difficulty (Bonsall et al., 2017). This overcomes one of the key criticisms of the more traditional readability measures.

The Bog Index then measures readability by combining three components (Wright, 2009):

$$Bog\ Index = Sentence\ Bog + Word\ Bog - Pep$$

Where:

$$\text{Sentence Bog} = \frac{(\text{average sentence length})^2}{\text{long sentence limit}}$$

$$\text{Word Bog} = \frac{(\text{style problems} + \text{heavy words} + \text{abbreviations} + \text{specialist}) \times 250}{\text{number of words}}$$

$$\text{Pep} = \frac{(\text{names} + \text{interest words} + \text{conversational}) \times 25}{\text{number of words}} + \text{sentence variety}$$

The higher its Bog index, the less readable a given passage of text is. Wright (2010) states that a document with a Bog score below 20 is excellent; 21- 40 (good); 41-70 (fair); 71-100 (poor); 131-1000 (Dreadful); and above 1000 is Gobbledygook (with writing task set to ‘general writing’ and ‘public’ as audience<sup>20</sup>). *Sentence Bog* indicates that longer sentences can lead to a higher Bog index. The standard long sentence upper limit is 35 words per sentence. *Word Bog* calculates plain English style problems and difficulty of the words, such as passive verbs, hidden verbs, wordy phrases, and abstract words that are highlighted in the SEC’s *A Plain English Handbook* (1998) (Bonsall et al., 2017). The last component of the Bog index is *Pep*, which measures characteristics of a good style of writing, such as interest words and conversational tone. *Pep* can reduce the Bog index as good writing habits can make writing more interesting and reading easier (Wright, 2009; Bonsall et al., 2017).

Although one of the newest readability metrics, the Bog index is being increasingly applied in accounting and finance studies (Bonsall et al., 2017; Bonsall & Miller, 2017; Amel-Zadeh, Scherf, & Soltes, 2019). Bonsall et al. (2017) recommend using the Bog index in studies of financial text as they found that it had the highest association with future stock market volatility than other readability proxies (including the Fog index). Bonsall et al. (2017) provide experimental support that the Bog index can successfully capture readers’ internal evaluation of readability from financial statements. They also point out that researchers can take advantage of the Bog index as it uses pre-programmed algorithms, and it provides more comprehensive factors about plain English (Bonsall et al., 2017). Compared to previous versions of StyleWriter, when researchers needed to extract readability proxies from StyleWriter and establish their own readability formula; the current version of StyleWriter provides the Bog index as a direct readability score.

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<sup>20</sup> StyleWriter allows users to assign writing tasks and the audience for a different type of documents.

Before running the StyleWriter software on a given piece of text, the original financial documents are cleaned to identify the narrative disclosure component (the textual component in documents) and converted into a plain text file. To complete this process, financial documents are downloaded from websites as a PDF version; documents usually contain pictures, text, tables, special formatting, not all text is in paragraph form, and a table of contents, headings, and notes. In order to clean the documents to be ready-to-use for textual analysis, the PDF is converted to a Microsoft Word document. The table of contents, symbols, headings, bullet points, and images are deleted, and complete sentences transferred from tables to full sentences in each document. For some sentences without a full stop, full stops are added manually (usually in the case of bullet point sentences). Spelling mistakes are corrected (an occasional side-effect of conversion from PDF to MS Word). The MS Word documents are then exported as TXT files<sup>21</sup>. The text file is then run in StyleWriter and the readability summary recorded (including the Bog index).

## 4.2 Regression Model

The OLS regression shown in equation 1 is used to assess the relationship between the readability of superannuation annual reports and the superannuation fund performance, following Peng (2017).

$$BogAR_{i,t} = \alpha_{i,t} + \beta_1 Return_{i,t-1} + \beta_2 Ln(NAV)_{i,t} + \beta_3 NetFlow_{i,t} + \beta_4 InvOpt_{i,t} + \beta_5 OpE_{i,t} + \beta_6 NewMem_{i,t} + \beta_7 BogPDS_{i,t} + \beta_8 Industry_{i,t} + \epsilon_{i,t} \quad (1)$$

Where

$BogAR_{i,t}$  = Bog index of the annual report at time  $t$  for fund  $i$ ;

$Return_{i,t-1}$  = the superannuation fund financial year return at time  $t - 1$  for fund  $i$ ;

$Ln(NAV)_{i,t}$  = the natural logarithm of net assets value at time  $t$  for fund  $i$ ;

$NetFlow_{i,t}$  = the net fund flow at time  $t$  for fund  $i$ ;

$InvOpt_{i,t}$  = the number of the investment options at time  $t$  for fund  $i$ ;

$OpE_{i,t}$  = the total operating expense of at time  $t$  for fund  $i$ ;

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<sup>21</sup> The MS Word document can be run in the StyleWriter; however, this last step ensures a final check that all formatting has been removed.

$NewMem_{i,t}$  = the number of new members at time  $t$  for fund  $i$ ;

$BogPDS_{i,t}$  = the Bog index of the currently available PDS at time  $t$  for fund  $i$ ;

$Industry_{i,t}$  = 1 when superannuation fund is industry fund, otherwise = 0 at time  $t$  for fund  $i$ .

The dependent variable is the readability of the annual report ( $BogAR$ ), which is measured by the Bog index. As discussed above, the higher its Bog index, the less readable a document is. The variable of interest is the superannuation fund performance ( $Return$ ), which is proxied by the rate of return for the last financial year. Return is measured as the net earnings after tax, divided by the cash flow adjusted total net assets. If the coefficient is significantly different from 0, fund performance influences readability. Previous research suggests a negative relationship is expected between fund performance and the Bog index of the annual report, as managers may have an incentive to obfuscate the information in the annual report when they suffer poor returns (Courtis, 2004; Bloomfield, 2008; Guay, Samuels, & Taylor, 2016; Rennekamp, 2018; Souza et al., 2019).

Size of fund ( $LN(NAV)$ ) is calculated as the logarithm of the total net assets of the superannuation fund. As the size of the fund increases, it may need more words to discuss the fund position and performance in the last financial year, and this may increase the overall size of discussion and therefore potentially impact *Word Bog* and *Sentence Bog*. Therefore, I expect that larger fund will have longer and more complex annual reports.

Net fund flow to the fund ( $NetFlow$ ) is equal to  $net\ assets\ value_{i,t} - net\ assets\ value_{i,t-1} \times (1 + return_{i,t})$ . A potential limitation of the net fund flow measure is that it fails to distinguish between member initiated fund flows that are relevant to disclosure decisions and funds flows attributable to general superannuation scheme structure. Therefore, no prior expectation on the direction of the relationship between  $NetFlow$  and the Bog index of the annual report is made.

The number of different investment options offered by a fund ( $InvOpt$ ) can affect the complexity of the financial disclosure; more investment options may increase the difficulty of the language. Additionally, more investment options may lengthen the document, which may potentially impact *Word Bog* and *Sentence Bog*. Therefore, a positive relation is expected

between the number of investment options offered by a fund and the Bog index of the annual report.

Total operating expenses (*OpE*) can be a proxy of marketing efforts (Peng, 2017). Higher marketing expenses may lead to a more readable annual report; therefore, a positive association is expected.

The number of new members (*NewMem*), calculated as  $Total\ number\ of\ members_t - Total\ number\ of\ members_{t-1}$ , is another proxy of the size of the fund. It is expected to have a negative association with the readability of the annual report, in line with the net asset value discussion above.

I also calculate the Bog index score for the most recent version of the superannuation fund Product Disclosure Statement (*BogPDS*). As funds are likely to have the same team writing both the PDS and their annual report, the two documents may have a similar readability level. Hence, it is expected that the readability of the annual report and the readability of the PDS will be correlated.

*Industry* is a dummy variable, equal to one when a superannuation fund is an industry fund, and equal to zero when a fund is a retail superannuation fund. Peng (2017) finds the readability of retail PDSs to be slightly lower than the readability of PDSs from industry funds. As mentioned earlier, there are some differences between retail superannuation and industry superannuation. For example, retail superannuation funds are for-profit funds and commonly offer more investment products, while industry superannuation funds are not-for-profit, run to benefit members. Often, they are operated on behalf of trade unions or industry bodies rather than financial institutions. It is therefore expected that the readability of an industry annual report may be more readable than the annual report from a retail superannuation fund. All control variables are summarised in Appendix C.

In addition to testing the association in levels, the regression is also run to test the relationship in terms of the change in annual report readability ( $\Delta BogAR_{i,t}$ ) and the change in fund performance ( $\Delta Return_{i,t-1}$ ), as per the OLS regression model shown in equation 2. The additional test reflects whether the change in readability is sensitive to the change in performance. Li (2008) found that the positive relationship between firms' annual report readability and firm performance holds in the change specification. Given that fund annual



reports are comparable to the firm equivalent, a negative relation between  $\Delta BogAR_{i,t}$  (positive for annual report readability) and  $\Delta Return_{i,t-1}$  is expected. That is, a decrease in the change in fund return will cause a decrease in the change in the annual report readability (increase in  $\Delta BogAR$ ).

$$\Delta BogAR_{i,t} = \alpha_{i,t} + \beta_1 \Delta Return_{i,t-1} + \beta_2 \Delta NAV_{i,t} + \beta_3 \Delta NetFlow_{i,t} + \beta_4 \Delta InvOpt_{i,t} + \beta_5 \Delta OpE_{i,t} + \beta_6 \Delta NewMem_{i,t} + \beta_7 \Delta BogPDS_{i,t} + \beta_8 Industry_{i,t} + \epsilon_{i,t} \quad (2)$$

Where

$\Delta BogAR_{i,t}$  = the change of the Bog index of annual report at time  $t$  for fund  $i$ ;

$\Delta Return_{i,t-1}$  = the change of the superannuation financial year return at time  $t - 1$  for fund  $i$ ;

$\Delta NAV_{i,t}$  = the change of the net assets value at time  $t$  for fund  $i$ ;

$\Delta NetFlow_{i,t}$  = the change of the net fund flow at time  $t$  for fund  $i$ ;

$\Delta InvOpt_{i,t}$  = the change of the investment options at time  $t$  for fund  $i$ ;

$\Delta OpE_{i,t}$  = the change of total operating expense at time  $t$  for fund  $i$ ;

$\Delta NewMem_{i,t}$  = the change of the number of new members at time  $t$  for fund  $i$ ;

$\Delta BogPDS_{i,t}$  = the change of the Bog index of the currently available PDS at time  $t$  for fund  $i$ ;

$Industry_{i,t} = 1$  when superannuation fund is industry fund, otherwise = 0 at time  $t$  for fund  $i$ .

## 5. Data

### 5.1 Sample

To examine the association between superannuation fund performance and the readability of the superannuation fund annual reports, I collect Australian superannuation fund annual reports and Product Disclosure Statements (PDSs) from 2005 to 2018 for retail and industry funds. My sample consists of 42 funds from 26 parent brands; among them, there are 13 industry funds and 29 retail funds (see Appendix B for a full list). Superannuation fund disclosures are prepared at the fund level rather than at the individual investment option level.

Therefore, one annual report is prepared per financial year to capture the entire fund, and their various investment options. Superannuation fund annual reports and PDSs were hand-collected from multiple sources, including fund parent brands' websites for more recent annual reports and the current PDS, and from internet archived webpages for historical annual reports and PDSs, where possible. I obtain the fund return, net assets value, number of investment option, total operating expenses, and number of new members from the Australian Prudential Regulation Authority (APRA) website based on the Australian financial year (beginning the 1<sup>st</sup> July to the following year's 30<sup>th</sup> June).

## 5.2 Summary Statistics

Table 1 presents the summary statistics of the non-binary variables. The variables have been winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles. The mean and median Bog index of the annual report are both 66, which sits at the 'fair' range for writing<sup>22</sup>. Nearly 25% of annual reports fall into the 'poor' category (Bog score above 70). The minimum annual report Bog index is 45, which indicates that there is no sample annual report classified at the 'good' readability level.

The Bog index of the PDS, with a range from 36 to 83, are on average more readable than annual reports. About 15% of PDS fall into the 'poor' category. A reason why PDSs are on average more readable than the annual report may be that the PDS content is mandated, in both content and form. Since 2011 there has also been a focus on shorter and simpler PDS documents<sup>23</sup>, while an equivalent requirement for the annual report does not exist. Additionally, PDSs and annual reports set out to cover different information. The PDS provides simple information designed to allow investors to compare funds. In contrast, the annual report is designed to discuss past investment performance, and is not designed for comparison between funds.

The summary statistics for the funds included in our sample are presented in Table 1. The average return of the superannuation funds in the sample is 6.04% per year in the period 2005 to 2018, with a median return of 8.30% per year. Fund returns range from -13.62% per year to 18.42% per year. The size and net fund flow of the funds vary relatively widely, with fund size (measured by  $Ln(NAV)$ ) varying enormously from \$9 million to \$140.13 billion, with

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<sup>22</sup> A Bog score below 20 is Excellent; 21-40 (Good); 41-70 (Fair); 71-100 (Poor); 131-1000 (Dreadful); and above 1000 (Gobbledygook).

<sup>23</sup> The Shorter PDS regime set up the maximum page limit (8 A4 pages or equivalent) and minimum font size (9 points for body text and 8 points for others) for superannuation and other financial products.

an average of \$8.54 billion and a median of \$2.21 billion. The average net fund flow of fund is \$456 million per year, with a median of \$30 million, which indicates that a few funds have large net fund flows per year.

The range of the operating expenses is from \$0.02 million to \$0.23 billion, with an average of \$31.4 million and a median of \$8.8 million. The average investment options is 69 per fund; however, the total number of products of industry and retail fund varies greatly. The average investment options for industry funds is 14; in contrast, retail funds have 101 products on average with a maximum of 1,919 products. The retail fund with the maximum number of products was *MLC Superannuation Fund* in 2014, resulting in a net assets value of \$15.8 billion and a return of 11.3%. The number of new members, which also determines the size of the fund to some extent, ranges from 130,101 members lost to 200,647 new members joining. The two biggest number of new members have come from the same industry fund, *AustralianSuper*, in 2006 and 2011.

**Table 1: Summary Statistics**

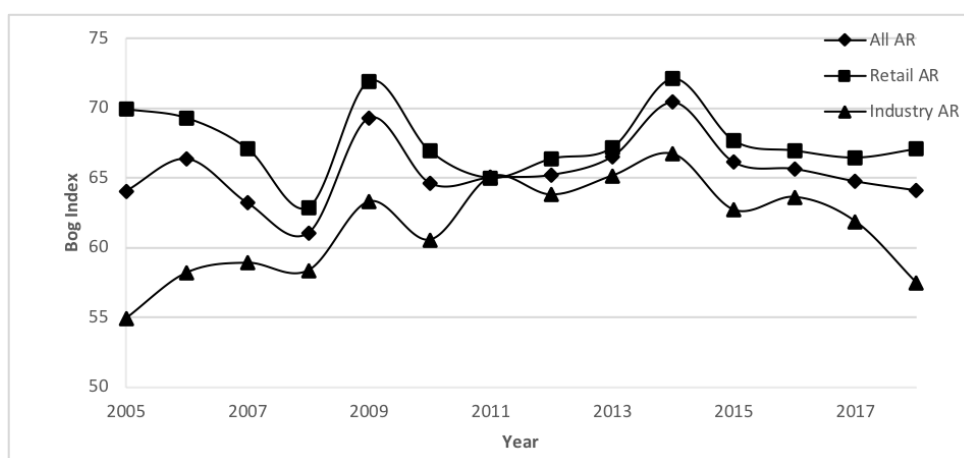
This table reports the summary statistics of the non-binary variables. They are *BogAR*, *Return*, *BogPDS*, *NAV(\$m)*, *InvOpt*, *Operating(\$m)*, *MemCon(\$m)*, and *NewMem(,000)*. *BogAR* is the Bog score of superannuation fund annual report, the higher the Bog score, the less readable it is. *Return* is the financial year return for superannuation funds. *BogPDS* is the Bog Score of the superannuation fund Product Disclosure Statement (PDS). *NAV(\$m)* is the net assets value of superannuation fund in million Australian dollars, calculated as net assets value/1,000,000. *NetFlow(\$m)* is the net fund flow in million Australian dollars, calculated as  $(\text{net assets value}_{i,t} - \text{net assets value}_{i,t-1} \times (1 + \text{return}_{i,t}))/1,000,000$ . *InvOpt* is the number of investment option of the fund. *OpE(\$m)* is the total operating expenses of the fund in million Australian dollars, calculated as total operating expenses/1,000,000. *NewMem(,000)* is the number of new members of the fund in thousands, calculated as  $(\text{Total number of members}_t - \text{Total number of members}_{t-1})/1,000$ . 1% winsorization apply to all data.

	<i>Bog AR</i>	<i>Return</i>	<i>Bog PDS</i>	<i>NAV (\$m)</i>	<i>NetFlow (\$m)</i>	<i>OpE (\$m)</i>	<i>InvOpt</i>	<i>NewMem (,000)</i>
Mean	66	6.04%	59	8,541	456	31.40	69	7.68
Median	66	8.30%	59	2,205	30	8.80	16	-0.04
99th	88	18.42%	83	140,131	7,943	232.54	1,919	200.65
1st	45	-13.62%	36	9	-4,611	0.02	1	-130.10
Std.Dev	8.05	0.08	10.95	16408.29	1493.95	48	232.61	37.58
N	478	442	478	416	414	446	423	394

To get a better sense of how the readability of the Australian superannuation fund annual reports may have changed over time, Figure 1 presents the plot of the average Bog index scores for annual reports each financial year from 2005 to 2018, for the entire sample, retail funds, and industry funds respectively. The overall average readability of annual reports has not improved over time, from 2005 to 2018, and industry fund annual reports are on average

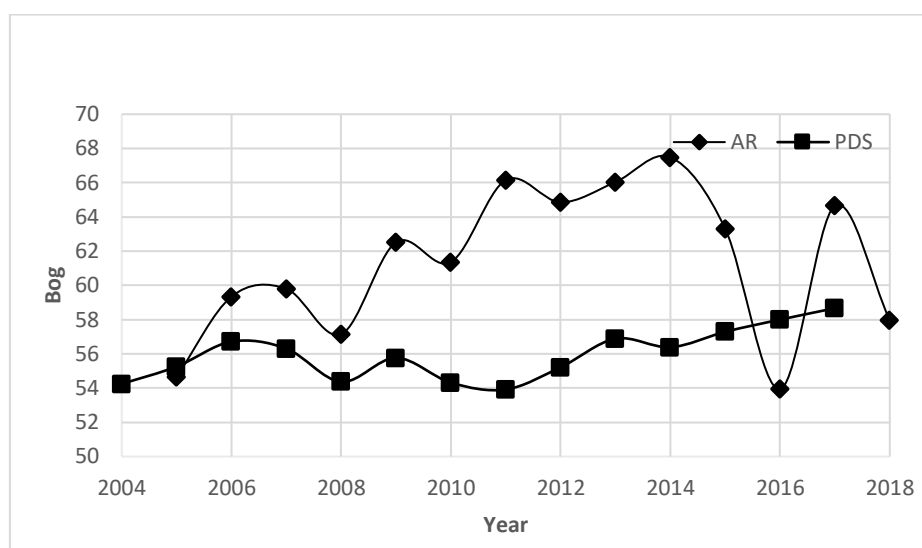
more readable than retail funds. The average annual report Bog index slightly decreased (became more readable) from 2005 to 2008, followed by a spike in 2009. Annual report readability increased (decrease in Bog index) again until about 2013, before the trend reversed. However, the standard deviation has generally decreased over time, suggesting the differences between annual reports have become smaller in terms of their readability. The overall trend of average annual report Bog index over the years is primarily driven by the pattern of the retail superannuation funds, which make up roughly 65% of the sample.

**Figure 1: Plot of average Bog score for annual report**

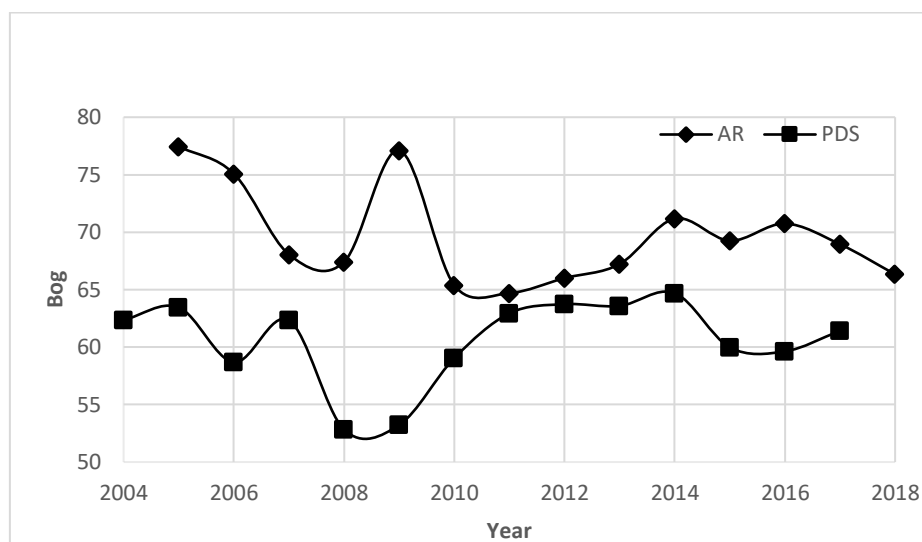


In contrast, industry superannuation fund annual report readability worsens from 2005 until 2014 then appears to improve. The average Bog score increased from 2008 to 2009 in both industry funds and retail funds, indicating annual reports became harder to read during this period. A likely reason for this may have been the 2008 Global Financial Crisis (GFC), as the GFC caused an investment loss of more than \$200 billion for Australian superannuation funds (APRA, 2020). The readability reduction of the industry annual reports in 2009 appears smaller than the retail annual reports, likely because industry fund performance was relatively less affected by the GFC compared to retail funds (APRA, 2014). The total assets of retail superannuation funds decreased 12.19% during the GFC, in contrast, the total assets of industry superannuation decreased only 3% over the same period (APRA, 2009). As discussed above, managers may use more complex language to disclose bad news, possibly to paint the best possible picture of the economic prospects in the annual report to give investors hope for the next investment period (Li, 2008; Huang, Teoh, & Zhang, 2014; Hwang & Kim, 2017; Rennekamp, 2018). By extension, it is reasonable that during the GFC annual reports were harder to read.

**Figure 2: Plot of average Bog score for annual report and PDS (Industry sample)**



**Figure 3: Plot of average Bog score for annual report and PDS (Retail sample)**



Figures 2 and 3 plot the average Bog index of annual reports and PDSs, for industry and retail superannuation funds, from the financial year 2005 to 2018. PDSs from retail superannuation funds are on average more difficult to read than PDSs from industry superannuation funds, with the mean *BogPDS* for retail funds (61) being slightly higher than the *BogPDS* for industry samples (56). This finding is consistent with Peng's (2017) study. She used the Fog index and Flesch Kincaid Reading Ease Score (Flesch Score) to measure the readability of superannuation PDSs, finding that retail superannuation fund PDSs are more complex to read than the overall sample. As mentioned above, retail superannuation funds are for-profit funds and commonly offer more investment options, and therefore more information needs to be disclosed. Complex products may increase the complexity of language; also the length of the disclosure may also impact on the *Word Bog* and *Sentence Bog*. In contrast,

industry superannuation funds are not-for-profit funds, run to benefit members, and generally have fewer investment options.

Surprisingly, the industry PDS did not become more readable (*BogPDS* decrease) after the Shorter PDS regime applied in 2011 and after. In contrast, the readability of retail fund PDSs improved between 2011 and 2013. Although the Shorter PDS regime limits the PDS to 8 pages length, it does not appear to help improve the readability of the text, especially for industry funds. To avoid jargon and technical terms in the financial disclosures, managers normally need more words, not less; so the limitation of 8 pages of PDS might be a reason for harder language in the shorter PDS.

**Table 2: Correlation Matrix**

This table reports the correlations matrix between the variables in the lower diagonal. *Industry* is a dummy that equals 1 if it is industry superannuation fund and 0 otherwise. Other variables are defined in Table 1. The correlations reported in bold are significant at the 10% level and above.

	<i>BogAR</i>	<i>Return</i>	<i>Ln (NAV)</i>	<i>NetFlow</i>	<i>InvOpt</i>	<i>OpE</i>	<i>NewMem</i>	<i>BogPDS</i>	<i>Industry</i>
<i>BogAR</i>	1								
<i>Return</i>	0.027	1							
<i>Ln(NAV)</i>	-0.028	<b>0.156</b>	1						
<i>NetFlow</i>	<b>-0.174</b>	0.060	<b>0.430</b>	1					
<i>InvOpt</i>	-0.005	0.010	<b>0.182</b>	-0.032	1				
<i>OpE</i>	-0.011	<b>0.124</b>	<b>0.725</b>	<b>0.571</b>	-0.001	1			
<i>NewMem</i>	<b>-0.159</b>	0.003	<b>0.249</b>	<b>0.652</b>	-0.033	<b>0.279</b>	1		
<i>BogPDS</i>	<b>0.185</b>	-0.070	<b>-0.314</b>	<b>-0.239</b>	-0.072	<b>-0.313</b>	<b>-0.231</b>	1	
<i>Industry</i>	<b>-0.344</b>	0.076	<b>0.353</b>	<b>0.348</b>	<b>-0.212</b>	<b>0.294</b>	<b>0.266</b>	<b>-0.340</b>	1

Table 2 presents the correlations matrix between the variables. All correlation coefficients are less than 0.8 (Franke, 2010), so there is no multicollinearity issue. *BogAR* is statistically significantly correlated with net fund flow (*NetFlow*), the number of new members (*NewMem*), readability of PDS (*BogPDS*), and dummy variable *Industry*, although the correlations are relatively weak. The correlation between annual report readability and the control variables indicate that a readable annual report is related to a large net fund flow, a large number of new members, a more readable PDS, and being an industry superannuation fund. The correlation between *BogAR* and *BogPDS* suggests that PDS and annual report readability changes in the same direction. This supports the idea that financial disclosures may be prepared by the same department, and therefore it is not surprising they have a similar readability trend.

There is no significant correlation found between the readability of the annual reports and fund performance. This finding is similar to Peng's (2017) correlation matrix table, where the Flesch Score of PDS is not significantly correlated with performance. However, the result is contrary to studies on firm readability and performance such as Li (2008) and Dempsey et al. (2010) who find that annual report readability is positively correlated with firm performance. In addition, return is correlated with size and operating expenses; fund size is correlated with all variables except annual report Bog index. Peng (2017) suggests that operating expenses is a proxy of marketing effects; therefore, it is expected to be positively associated with readability. From the correlation matrix, operating expenses are correlated with all variables except *BogAR*. The negative correlation between *OpE* and *BogPDS* states that the high expenditure on operating activities is positively related to more readable PDS's. However, the same relationship does not apply to annual report readability. The *BogPDS* is also negatively correlated with large size, high net fund flow, and an increase in the number of members.

## 6. Results

### 6.1 Baseline Regression Results

Table 3 presents the results of the baseline regression, shown in equation 1, for superannuation annual report readability (*BogAR*) on fund performance (*Return*).

The results from Table 3 are contrary to my hypothesis. Specifically, the readability of narrative disclosures in the annual report is not significantly associated with superannuation fund performance, which is in line with Peng's (2017) superannuation PDS study. However, the results contrast with existing readability studies of company documents, where annual report readability is associated with firm performance (Li, 2008; Dempsey et al., 2012; Wang, Hsieh, & Sarkis, 2018; Asay, Libby, & Rennekamp, 2018; Souza et al., 2019).

The fund size ( $\ln(\text{NAV})$ ) is statistically positively associated with annual report Bog index in all columns, which indicates a larger superannuation fund has a relatively more difficult to read the annual report. The coefficient on size increased when controlling for both year and fund fixed effects in columns [2], [4], and [6]. The readability of the PDS is positively correlated with the readability of annual report in columns [1], [3], and [4], which suggests that fund with hard-to-read PDSs also have less readable annual reports, a likely outcome from being prepared by the same writing team. However, the inclusion of the fund fixed effects

removes the significance of the *BogPDS*, suggesting there may be an underlying ‘constant’ readability driven by the same writing team between years (a reasonable conjecture). The negative association between *Industry* and *BogAR* indicates that industry superannuation funds’ annual reports are more readable than retail annual reports, as predicted.

**Table 3: Superannuation fund performance and annual report readability**

This table presents the results of OLS regressions where the dependent variable is *Bog annual report* and the independent variable is *Return*. *BogAR* is the Bog score of superannuation fund annual report, the higher the Bog score, the less readable it is. *Return* is the financial year return for superannuation fund. *BogPDS* is the Bog Score of the superannuation fund Product Disclosure Statement (PDS), the higher the Bog score, the less readable it is. *LN(NAV)* is the nature logarithm of net assets value of superannuation fund. *NetFlow* is the net fund flow in million Australian dollars, calculated as  $\text{net assets value}_{i,t} - \text{net assets value}_{i,t-1} \times (1 + \text{return}_{i,t})$ . *InvOpt* is the number of investment option. *OpE* is the total operating expenses of the fund in million Australian dollars, calculated as  $\text{total operating expenses}/1,000,000$ . *NewMem* is the number of new members of the fund in thousands, calculated as  $(\text{Total number of members}_t - \text{Total number of members}_{t-1})/1,000$ . *Industry* is a dummy that equals 1 if it is industry superannuation fund and 0 otherwise. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% level, respectively.

Dependent Variable	<i>BogAR</i>					
	[1]	[2]	[3]	[4]	[5]	[6]
<i>Return</i>	-0.557 (0.958)	-8.500 (0.426)	-6.381 (0.567)	-13.180 (0.231)	-0.833 (0.950)	-5.604 (0.672)
<i>BogPDS</i>	0.137*** (0.002)	0.021 (0.744)	0.118*** (0.010)	-0.025 (0.699)	0.110** (0.036)	0.041 (0.628)
<i>LN(NAV)</i>	0.9029*** (0.000)	3.911*** (0.000)	0.793** (0.011)	4.138*** (0.000)	1.015*** (0.004)	4.501*** (0.000)
<i>NetFlow</i>	-0.001 (0.138)	-0.001 (0.121)	-0.001** (0.048)	-0.001** (0.047)	-0.001 (0.168)	-0.001 (0.185)
<i>InvOpt</i>			-0.004** (0.036)	-0.004 (0.151)	-0.004** (0.044)	-0.004 (0.199)
<i>OpE</i>			0.013 (0.335)	0.028 (0.303)	0.009 (0.573)	0.025 (0.437)
<i>NewMem</i>					-0.003 (0.853)	-0.007 (0.672)
<i>Industry</i>	-5.487*** (0.000)		-5.787*** (0.000)		-6.048*** (0.000)	
<b>Year Fixed Effects</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Fund Fixed Effects</b>	No	Yes	No	Yes	No	Yes
<b>Adjusted R-squared</b>	0.186	0.323	0.166	0.336	0.149	0.306
<b>Observations</b>	356	356	347	347	290	290

Surprisingly, the number of investment options (*InvOpt*) is negatively associated with *BogAR* at the 5% level in columns [3] and [5], contrary to the predicted relationship between them. The result suggests that funds with fewer investment options have annual reports that are harder to read; however, the coefficient is small in magnitude and economically insignificant.



The fund net fund flow (*NetFlow*) is negatively associated with annual report Bog index in columns [3] and [4], but again with small coefficients. By adding the number of new members (*NewMem*) in columns [5] and [6], net fund flow is no longer important in determining the readability of annual report. The operating expenses (*OpE*) and the number of new members are not associated with the annual report Bog index.

In summary, the above results show that the readability of Australian superannuation fund annual reports is not associated with fund performance; there is no evidence to support that superannuation managers tend to write a harder-to-read annual report in years when they have poor financial performance. A smaller, industry superannuation fund with high net fund flow, more investment options, and an easy-to-read PDS appear to have, on average, a more readable annual report, as measured by the Bog index. The above findings are important for regulators seeking to encourage better readability of financial disclosures.

To dig deeper into the differences between industry and retail superannuation funds, the sample is split and the baseline regression rerun. The results are presented in Table 4. Overall, no significant difference between the annual report Bog index and fund performance was evident for either retail or industry superannuation funds.

The Bog index of the retail fund PDS is statistically positively significant with annual report Bog index in column [1], fund size is positively significant with annual report Bog index in columns [1] to [3]; the inclusion of the number of investment options, operating expenses, and the number of new members remove the significance on *BogPDS* in columns [2] and [3]. However, the coefficients on size in columns [2] and [3] have increased compared with column [1], suggesting the operating expenses and the number of new members are important proxies for size, especially the operating expenses. In column [5], annual report Bog index is negatively associated with industry fund performance at the 10% level, with a coefficient of -64.391. The result is in line with Peng's (2017) finding, PDS Flesch Score (the higher the score, the easier to read) is positively associated with industry fund performance with a coefficient of 40.800. This provides some evidence for the hypothesis that poor fund performance is associated with a less readable annual report. The readability of PDS is also associated with industry annual report readability at the 5% level. Other variables, including size, net fund flow, the number of investment options, the number of new members, and operating expenses do not have a significant influence on industry fund annual report readability.

**Table 4: Superannuation fund performance and annual report readability by fund type**

This table presents the results of OLS regressions by fund type where the dependent variable is *Bog annual report* and the independent variable is *Return*. Columns [1] to [3] report the regression results for retail superannuation fund samples, columns [4] to [6] report the regression results for industry superannuation fund samples. All the variables are defined in Table 3. P-values are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% level, respectively.

Dependent Variable	<i>BogAR</i>					
	Retail			Industry		
	[1]	[2]	[3]	[4]	[5]	[6]
<i>Return</i>	3.714 (0.789)	-7.598 (0.565)	-1.665 (0.917)	-36.641 (0.128)	-64.391* (0.051)	-54.142 (0.150)
<i>BogPDS</i>	0.116** (0.045)	-0.127 (0.119)	-0.085 (0.439)	0.192** (0.033)	0.187 (0.106)	0.195 (0.155)
<i>LN(NAV)</i>	1.032*** (0.001)	3.503** (0.031)	3.801** (0.029)	0.586 (0.141)	2.222 (0.413)	1.686 (0.577)
<i>NetFlow</i>	-0.001 (0.298)	-0.001 (0.135)	-0.001 (0.165)	0.000 (0.918)	0.000 (0.910)	0.000 (0.672)
<i>InvOpt</i>		-0.003 (0.249)	-0.004 (0.265)		-0.035 (0.703)	-0.025 (0.822)
<i>OpE</i>		-0.006 0.920	0.003 (0.957)		0.021 (0.512)	0.007 (0.862)
<i>NewMem</i>			0.011 (0.718)			-0.012 (0.548)
<b>Year Fixed Effects</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Fund Fixed Effects</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Adjusted R-squared</b>	0.076	0.307	0.294	0.206	0.342	0.251
<b>Observations</b>	191	188	157	165	159	133

Table 5 presents the change specification regression (equation 2) results for the entire sample, retail fund and industry fund subsamples. Overall, no variables are statistically significant in relation to annual report readability, with the exception of the change in the operating expenses for industry fund. It is negatively associated with the annual report Bog index for the industry fund subsample, but lacks economic magnitude.

In conclusion, no significant relationship was evident between annual report readability and superannuation fund performance. Although previous research has shown that companies managers complicate the language of annual reports to hide their poor performance, the Australian superannuation fund sample does not support a similar conclusion. The readability of Australian superannuation annual reports is not associated with how the fund performed; however, the results show that less readable annual reports are associated with larger fund size, lower net fund flow, hard-to-read PDS, and fewer investment products.

**Table 5: Superannuation fund performance and annual report readability (change specification<sup>24</sup>)**

This table presents the results of OLS regressions where the dependent variable is change in *Bog annual report* ( $\Delta BogAR$ ) and the independent variable is change in *Return* ( $\Delta Return$ ). All the variables are first-differenced. All the variables are defined in Tables 1 and 3. P-values are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% level, respectively.

Dependent Variable	$\Delta BogAR$				
		ALL		Retail	Industry
	[1]	[2]	[3]	[4]	[5]
$\Delta Return$	-2.328 (0.813)	-1.939 (0.860)	-0.825 (0.947)	0.387 (0.981)	-20.784 (0.531)
$\Delta BogPDS$	-0.037 (0.703)	-0.054 (0.593)	0.003 (0.981)	-0.017 (0.931)	0.090 (0.622)
$\Delta NAV$	0.000 (0.857)	0.000 (0.311)	0.000 (0.540)	-0.001 (0.792)	0.000 (0.432)
$\Delta NetFlow$	0.000 (0.497)	0.000 (0.811)	0.000 (0.526)	0.000 (0.749)	0.001 (0.182)
$\Delta InvOpt$		-0.006 (0.726)	-0.018 (0.416)	-0.015 (0.565)	-0.416 (0.122)
$\Delta OpE$		0.000 (0.537)	0.000 (0.604)	0.000 (0.443)	-0.0002* (0.080)
$\Delta NewMem$			0.015 (0.356)	-0.011 (0.759)	0.008 (0.680)
<i>Industry</i>	0.492 (0.589)				
<b>Year Fixed Effects</b>	Yes	Yes	Yes	Yes	Yes
<b>Fund Fixed Effects</b>	No	Yes	Yes	Yes	Yes
<b>Adjusted R-squared</b>	0.045	-0.004	-0.039	-0.076	0.066
<b>Observations</b>	299	288	236	119	117

## 6.2 Further Analysis: Fund performance and annual report readability

To further explore the impact of well-performing and poorly-performing fund on the readability of annual reports, I add a dummy variable to my baseline regression in equation 1, *Bottom40*, equal to one when the fund has a performance in the worst 40% of returns, and equal to zero when the fund performance is in the best 40% group of returns in each financial year. The middle 20% group of funds are not included in this regression test.

<sup>24</sup>  $\Delta BogAR_{i,t} = \alpha_{i,t} + \beta_1 \Delta Return_{i,t-1} + \beta_2 \Delta NAV_{i,t} + \beta_3 \Delta NetFlow_{i,t} + \beta_4 \Delta InvOpt_{i,t} + \beta_5 \Delta OpE_{i,t-1} + \beta_6 \Delta NewMem_{i,t} + \beta_7 \Delta BogPDS_{i,t} + \beta_8 Industry_{i,t} + \epsilon_{i,t}$

**Table 6: Superannuation fund performance and annual report readability with dummy variable *Bottom40*<sup>25</sup>**

This table presents the results of OLS regressions by fund type where the dependent variable is *Bog annual report* and the independent variable is *Return*. *Bottom40* is a dummy variable, equal to one when the fund has a performance in the bottom 40% of return this year, and equal to zero when the fund has a performance in the top 40% of return this year. All the variables are defined in Table 3. P-values are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% level, respectively.

Dependent Variable	<i>BogAR</i>			
	[1]	[2]	[3]	[4]
<i>Return</i>	7.262 (0.289)	8.261 (0.221)	6.779 (0.674)	8.509 (0.587)
<i>BogPDS</i>	0.203*** (0.000)	0.180*** (0.001)	0.141** (0.012)	-0.070 (0.385)
<i>LN(NAV)</i>	0.787*** (0.002)	0.110 (0.746)	0.630* (0.077)	4.777*** (0.000)
<i>NetFlow</i>	-0.001** (0.027)	-0.001*** (0.002)	-0.001* (0.052)	-0.001* (0.082)
<i>InvOpt</i>		-0.001 (0.496)	-0.004* (0.077)	0.001 (0.738)
<i>OpE</i>		0.039*** (0.009)	0.002 (0.188)	0.031 (0.310)
<i>Bottom40</i>	2.784** (0.016)	3.292*** (0.005)	2.104 (0.165)	3.434** (0.026)
<i>Industry</i>			-4.418*** (0.001)	
<b>Year Fixed Effects</b>	No	No	Yes	Yes
<b>Fund Fixed Effects</b>	No	No	No	Yes
<b>Adjusted R-squared</b>	0.088	0.081	0.139	0.329
<b>Observations</b>	267	259	259	259

Table 6 presents the regression result of including *Bottom40* dummy variable. In general, *Bottom40* is positively associated with annual report Bog index, which indicates that funds with performance in the lowest 40% return group have a higher Bog index, suggesting that they are relatively less readable than funds with performance in the top 40% range. This finding is robust to the various controls described above, and year and fund fixed effects, however, the inclusion of the *Industry* dummy (Column 3) removes the significance of *Bottom40*. Linking back to the sample characteristics, there are less industry funds in the group of *Bottom40*, and more in the group of well-performing funds, and *Bottom40* is correlated with industry at the 1% level. A possible explanation is that being an industry superannuation appears to supersede any performance relationship with readability, the coefficient is also larger in magnitude compared with *Bottom40*. In general, the results are

<sup>25</sup> 
$$BogAR_{i,t} = \alpha_{i,t} + \beta_1 Return_{i,t-1} + \beta_2 Ln(NAV)_{i,t} + \beta_3 NetFlow_{i,t} + \beta_4 InvOpt_{i,t} + \beta_5 OpE_{i,t} + \beta_6 NewMem_{i,t} + \beta_7 BogPDS_{i,t} + \beta_8 Industry_{i,t} + \beta_8 Bottom40_{i,t} + \epsilon_{i,t}$$

consistent with the earlier results. Table 6 sends an interesting message that the annual reports from relatively poorly performing funds are harder to read than those with better performance, although the previous tables conclude that there was no association between annual report readability and fund return on average. However, another possible explanation of the association between the *Bottom40* and the *BogAR* is that there are more retail funds under the group of poorly performing funds; earlier results suggest that retail funds' annual reports are on average harder to read than an industry fund report.

From the above regression results, size ( $\ln(\text{NAV})$ ) is positively associated with *BogAR*, which raises a question as to whether annual report readability is mainly affected by the performance of the large investment options' in a given fund. The reasoning is that for a fund, their larger investment options are relatively more important. A fund is concerned with losing members, especially when their big investment options are performing relatively poorly. Peng, Alpert, and Hsu (2020) find that investors withdraw their money to punish funds with poor performance. Therefore, it is reasonable to assume the fear of losing members may in turn influence how they write their narrative disclosure. To test this conjecture, I download 1,229 superannuation fund-year investment options (based on the fund sample) from the MorningStar database based on the Australian financial year (a year which runs from the 1<sup>st</sup> July to the following year's 30<sup>th</sup> June). The list of the Australian superannuation funds' investment options are located under Australian domiciled and superannuation funds (under insurance and pension funds category) from MorningStar. Then I calculated the value-weighted Sharpe ratio (*VWSR*) for each fund as the independent variable (instead of *Return*), that is the sum of each investment option's value-weighted Sharpe ratio from each funds. The Sharpe ratio measures risk-adjusted return and is calculated as the investment option return divided by the investment option risk<sup>26</sup>; a value-weighted Sharpe ratio is weighted according to the individual fund's net assets value<sup>27</sup>. It is expected that the value-weighted Sharpe ratio will be negatively associated with annual report *Bog* index. That is, the annual reports of funds with worse value-weighted performance may be harder to read.

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<sup>26</sup> Risk of the investment options is calculated as the standard deviation of 12-month (financial year period) daily unit price.

<sup>27</sup>  $\text{Net Assets Value}_{\text{Investment option } i} / \text{Net Assets Value}_{\text{Fund } i}$

**Table 7: Superannuation fund value-weighted Sharpe ratio and annual report readability<sup>28</sup>**

This table presents the results of OLS regressions by fund type where the dependent variable is *Bog annual report* and the independent variable is *VWSR*. *VWSR* is the value-weighted Sharpe ratio for superannuation fund, calculated as the sum of the net assets value weighted Sharpe ratio of each investment options from each funds. Other variables are defined in Table 3. P-values are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% level, respectively.

Dependent Variable	<i>BogAR</i>					
	All		Retail		Industry	
	[1]	[2]	[3]	[4]	[5]	[6]
<i>VWSR</i>	1.775*** (0.001)	1.458** (0.039)	0.797* (0.073)	1.387 (0.109)	0.945 (0.143)	1.408 (0.315)
<i>BogPDS</i>	0.242*** (0.000)	0.050 (0.631)	0.265*** (0.001)	-0.027 (0.824)	-0.142 (0.420)	0.612* (0.076)
<i>LN(NAV)</i>	1.290** (0.018)	5.839*** (0.001)	1.271** (0.038)	5.328*** (0.006)	-2.650* (0.076)	16.492 (0.496)
<i>NetFlow</i>	-0.001* (0.064)	-0.064 (0.143)	-0.002** (0.045)	-0.001 (0.118)	-0.002* (0.056)	-0.002 (0.325)
<i>InvOpt</i>	0.033 (0.946)	-0.001 (0.406)	-0.142 (0.792)	-0.581 (0.405)	2.209 (0.169)	8.760 (0.175)
<i>OpE</i>	0.021 (0.199)	-0.512 (0.123)	0.016 (0.452)	-0.005 (0.929)	0.114*** (0.004)	-0.118 (0.295)
<i>NewMem</i>	0.001 (0.947)	-0.011 (0.578)	0.033 (0.279)	0.017 (0.574)	-0.015 (0.540)	-0.005 (0.864)
<i>Industry</i>	-4.777*** (0.004)					
<b>Year Fixed Effects</b>	Yes	Yes	No	Yes	No	Yes
<b>Fund Fixed Effects</b>	No	Yes	No	Yes	No	Yes
<b>Adjusted R-squared</b>	0.197	0.369	0.144	0.349	0.155	0.298
<b>Observations</b>	188	188	130	130	58	58

Table 7 presents the regression results of the value-weighted Sharpe ratio on the annual report Bog index for the entire sample, retail fund and industry fund subsamples. Overall, *VWSR* is positively associated with *BogAR* for the entire sample, suggesting that an increase in the value-weighted fund risk-adjusted return is associated with a less readable annual report, contrary to the predicted relationship between them. The same relationship is held in the column [3] for the retail superannuation funds, but not for the industry subsamples, and is not robust to the inclusion of year and fund fixed effects. Overall, there is little evidence to support the hypothesis that worse performing funds make their annual reports harder to read.

Size is positively associated with annual report Bog index in columns [1] to [4], for the entire sample and retail funds, consistent with Tables 3 and 4. In contrast, size is negatively

<sup>28</sup> 
$$BogAR_{i,t} = \alpha_{i,t} + \beta_1 VWSR_{i,t-1} + \beta_2 Ln(NAV)_{i,t} + \beta_3 NetFlow_{i,t} + \beta_4 InvOpt_{i,t} + \beta_5 OpE_{i,t} + \beta_6 NewMem_{i,t} + \beta_7 BogPDS_{i,t} + \beta_8 Industry_{i,t} + \epsilon_{i,t}$$

associated with *BogAR* in column [5] for the industry subsample, whereas industry fund size has no impact on *BogAR* in Table 4. The Bog index of annual reports is also associated with net fund flow (negatively) and PDS Bog index (positively), consistent with the main regression results. Moreover, a relatively more readable annual report is associated with less operating expenses for industry funds.

Overall, it appears there is no evidence to support the association between the readability of superannuation fund annual reports and poor (or good) superannuation fund performance. Although there is rich research on company managers obfuscating annual reports when they perform poorly, the sample of Australian superannuation funds does not have the same results. Adding a dummy in the baseline regression test, *Bottom40*<sup>29</sup>, suggests that poorly performing funds (with financial yearly return in the lowest 40% group) have annual reports that are relatively harder to read than well-performing funds (with financial yearly return in the highest 40% group). To further unpack the (lack of) relationship between annual report readability and performance, a value-weighted Sharpe ratio of fund was calculated to discover the relationship between the fund risk-adjusted return and the annual report readability. Table 7 presented weak evidence to suggest that annual report readability is driven by value-weighted fund performance, however, the relationship was the opposite to the predicted direction. Specifically, the increase in the value-weighted fund risk-adjusted return results in a less readable annual report. However, once the sample is separated into industry and retail funds, and year and fund fixed effects are included, the relationship disappears.

The nature of the investors into superannuation funds may explain the lack of obfuscation. Previous literature expounds that company managers may manipulate the readability of their annual reports to hide their bad performance from investors and analysts. While there is limited evidence related to fund managers on this issue, fund managers may also have incentives to obfuscate poor performance, specifically to avoid losing members. However, whether superannuation members switch investment options or funds based on fund performance is questionable. Peng, Alpert, and Hsu (2020) show that superannuation members switching funds do not chase after short-term performance, but they do withdraw their money to punish funds with poor performance. Their finding is contrary to prior conventional managed funds studies of investors chasing recent winners (Gruber, 1996; Chevalier & Ellison, 1997;

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<sup>29</sup> *Bottom40* equal to one when the fund has a performance in the bottom 40% of return this year, and equal to zero when the fund has a performance in the top 40% of return this year.

Goetzmann & Peles, 1997; Lynch & Musto, 2003; Huang, Wei, & Yan, 2007). They explain that due to the fundamental and natural differences between superannuation funds and conventional managed funds, investors act in different ways. Australian superannuation is mandatory to almost all Australian workers; this results in superannuation members who are relatively less knowledgeable and engaged in their investment. However, conventional managed funds with a large number of investments, where investors join voluntarily, have relatively more financial knowledge, and importantly, are more engaged, may incentivise managers to manipulate annual reports, or obfuscate. This may explain why superannuation annual report readability is not driven by performance in the main regression tests, unlike other corporate readability studies.

### 6.3 Additional Tests: Components of Writing Style

In addition to the readability metric, Bog index, StyleWriter provides other writing metrics, allowing further analysis. Namely, three StyleWriter variables; jargon, passive verb index, and pep (used to calculate the Bog index), are available. Therefore, I test whether there is a relationship between each style metric and superannuation fund performance.

*Word Bog* captures jargon and passive index, both increase language complexity and add difficulty for readers. The SEC's *A Plain English Handbook* (1998) suggests that managers should avoid technical jargon, passive verb index, weak or hidden verbs and other writing constructs in plain language writing. StyleWriter counts abbreviations, difficult words, jargon phrases, unusual words and unknown words as jargon (Wright, 2009; Bonsall et al., 2017). The high percentage of jargon makes reading more difficult as readers may not be familiar with legal and financial terms; and too many passive verbs make the text boring, vague, and lengthy. Pep is the last component of the Bog index formula; the first two components, *Sentence Bog* and *Word Bog*, measure poor writing habits, whereas pep measures the positive writing style. Pep index captures interesting words, conversational expressions, and variation in sentence lengths (Wright, 2009; Bonsall et al., 2017). High pep index means the text more interesting to read, and therefore decreases the Bog index. With writing task set to 'general writing' and 'public' as audience, an excellent level of pep index, jargon and passive index is above 13, under 1%, and under 10, respectively. Annual report with low pep score, high jargon, and the high passive index will add complexity to the language and readers may find it hard to read.



Table 8 presents the summary statistics of the three writing issue components, *Pep*, *Jargon*, and *Passive*. Overall, superannuation funds' annual reports do not meet the excellent level of StyleWriter, but understandably, financial disclosure statements are generally harder to read than average public documents – even those written for a general audience. A few annual reports (about 15%) reach a level of *Pep* 14, but it is perhaps unsurprising most annual reports lack interesting writing. In line with previous findings, readers will find the industry annual reports slightly more interesting than the retail annual reports.

The average percentage of jargon for the entire sample of superannuation funds, retail and industry annual reports are 3.6%, 3.84%, and 3.14%, respectively. The frequency of jargon usage in the industry annual report is relatively lower than the retail funds' annual report. For the entire sample, none of the annual reports contains less than 1% of jargon; the minimum percentage of jargon is 1.3%, which may point to the fact it is difficult to avoid using some jargon in financial documents.

The average passive index of all superannuation fund annual reports is 26.3, meaning that an average sentence contains slightly more than one passive verb in every four words. The highest passive index is 53.31, showing that some sentences in the retail fund annual reports' subsample are written in a passive voice, potentially confusing readers. Generally, industry fund annual reports convey relatively less passive voice than retail fund annual reports.

Overall, the average pep index, jargon, and passive index of annual reports are all below the excellent writing level. The superannuation annual reports contain above the moderate amount of jargon and passive verbs, and do not have much interesting and attractive writing style that can improve readability. Additionally, compared with the industry funds' annual reports, retail annual reports have more writing problems, containing more jargon, stronger passive voice and less enjoyable writing style. The findings are consistent with the above results that retail annual reports are relatively harder to read than industry.

**Table 8: Summary Statistics of Pep, Jargon, and Passive**

This table presents the summary statistics of *Pep*, *Jargon*, and *Passive* for all superannuation funds, retail funds, and industry funds separately. *Pep* is the Pep score of superannuation fund annual report, text with high Pep score means the writing is more interesting to read.  $Pep = \frac{(names+interest\ words+conversational) \times 25}{number\ of\ words} + sentence\ variety$ . *Jargon* is the percentage of jargon of superannuation fund annual report, the higher the *Jargon*, the more jargon words in the annual report it is. *Passive* is the passive verb index of superannuation fund annual report, the higher the *Passive*, the more passive verbs in the annual report it is.  $Passive\ Index = \frac{Number\ of\ Passive\ Verbs}{Number\ of\ Sentences} \times 100$ . 1% winsorization apply to all data.

	All			Retail			Industry		
	<i>Pep</i>	<i>Jargon</i>	<i>Passive</i>	<i>Pep</i>	<i>Jargon</i>	<i>Passive</i>	<i>Pep</i>	<i>Jargon</i>	<i>Passive</i>
Mean	11.23	3.60%	26.30	11.10	3.84%	28.26	11.50	3.14%	22.74
Median	11.00	3.60%	26.00	11.00	4.00%	29.00	11.00	3.2%	23.00
99 <sup>th</sup>	16.00	8.01%	53.31	16.00	8.50%	58.20	16.00	5.83%	33.00
1 <sup>st</sup>	6.00	1.30%	12.00	6.00	1.3%	13.56	7.00	1.17%	10.17
Std.Dev	2.40	0.01	7.36	2.61	0.01	7.72	1.93	0.01	5.48
N	473	473	473	306	306	306	167	167	167

To test whether the superannuation fund return is associated with pep, jargon and passive index, I replace the dependent variable (formerly the Bog index) with each of the three variables. The results of regression equations 3 to 5 are presented in Table 9.

$$Pep_{i,t} = \alpha_{i,t} + \beta_1 Return_{i,t-1} + \beta_2 Ln(NAV)_{i,t} + \beta_3 NetFlow_{i,t} + \beta_4 InvOpt_{i,t} + \beta_5 OpE_{i,t} + \beta_6 NewMem_{i,t} + \beta_7 BogPDS_{i,t-1} + \beta_8 Industry_{i,t} + \epsilon_{i,t} \quad (3)$$

$$Jargon_{i,t} = \alpha_{i,t} + \beta_1 Return_{i,t-1} + \beta_2 Ln(NAV)_{i,t} + \beta_3 NetFlow_{i,t} + \beta_4 InvOpt_{i,t} + \beta_5 OpE_{i,t} + \beta_6 NewMem_{i,t} + \beta_7 BogPDS_{i,t-1} + \beta_8 Industry_{i,t} + \epsilon_{i,t} \quad (4)$$

$$Passive_{i,t} = \alpha_{i,t} + \beta_1 Return_{i,t-1} + \beta_2 Ln(NAV)_{i,t} + \beta_3 NetFlow_{i,t} + \beta_4 InvOpt_{i,t} + \beta_5 OpE_{i,t} + \beta_6 NewMem_{i,t} + \beta_7 BogPDS_{i,t-1} + \beta_8 Industry_{i,t} + \epsilon_{i,t} \quad (5)$$

Overall, the *Pep*, *Jargon*, and *Passive* are not associated with superannuation fund performance for the entire superannuation sample and retail subsample. However, the passive index is negatively associated with industry fund performance, which is consistent with the regression results for industry annual report Bog index (Table 4), suggesting that industry funds with poor performance have annual reports containing a stronger passive voice.

**Table 9: Regression of the relation on superannuation fund performance**

This table presents the results of OLS regressions for superannuation fund, where the dependent variable is *Pep*, *Jargon*, and *Passive*; and the independent variable is *Return*. Columns [1] to [3] report the regression results for all superannuation fund samples, columns [4] and [6] report the regression results for retail superannuation funds, and columns [7] and [9] report the regression results for industry superannuation funds. All the variables are defined in Tables 3 and 9. P-values are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% level, respectively.

Dependent Variable	<i>Pep</i>	<i>Jargon</i>	<i>Passive</i>	<i>Pep</i>	<i>Jargon</i>	<i>Passive</i>	<i>Pep</i>	<i>Jargon</i>	<i>Passive</i>
	All			Retail			Industry		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
<i>Return</i>	-2.704 (0.407)	0.005 (0.713)	-12.052 (0.254)	-4.341 (0.256)	-0.001 (0.977)	-7.452 (0.579)	1.593 (0.867)	-0.040 (0.321)	-55.502** (0.049)
<i>BogPDS</i>	-0.041** (0.049)	0.000 (0.394)	-0.129* (0.055)	-0.045* (0.086)	0.000 (0.819)	-0.236** (0.012)	0.017 (0.624)	0.0003** (0.023)	-0.047 (0.641)
<i>LN(NAV)</i>	-0.415 (0.182)	0.006*** (0.000)	2.884*** (0.004)	0.195 (0.640)	0.009*** (0.000)	4.247*** (0.005)	-1.120 (0.145)	-0.002 (0.624)	1.530 (0.497)
<i>NetFlow</i>	0.000 (0.572)	0.000 (0.171)	-0.001 (0.183)	0.000 (0.619)	-0.000* <sup>30</sup> (0.053)	-0.001 (0.331)	0.000 (0.991)	0.000* (0.058)	-0.001 (0.373)
<i>InvOpt</i> <sup>31</sup>	0.001 (0.326)	-0.000** (0.029)	0.001 (0.519)	0.000 (0.646)	-0.000** (0.010)	-0.001 (0.758)	-0.020 (0.490)	0.000 (0.407)	-0.214** (0.012)
<i>OpE</i>	-0.032*** (0.000)	-0.0001*** (0.000)	0.002 (0.940)	-0.023 (0.176)	-0.0002** (0.022)	0.028 (0.629)	-0.029*** (0.008)	-0.0001*** (0.002)	0.001 (0.969)
<i>NewMem</i>	0.006 (0.166)	0.000 (0.206)	-0.024* (0.089)	0.000 (0.967)	0.000 (0.374)	-0.002 (0.940)	0.011* (0.044)	0.000 (0.365)	-0.026* (0.099)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.445	0.514	0.531	0.462	0.550	0.556	0.432	0.43	0.378
N	289	289	289	156	156	156	133	133	133

The annual report pep index (high pep index makes the text more interesting to read) is associated with an easy-to-read PDS and less operating expenses for the entire superannuation sample. For retail funds, only *BogPDS* is associated with *Pep*; for industry funds, interesting writing is associated with less operating expenses and an increase in the number of new members. The percentage of jargon for the annual report is associated with size, the number of investment options, the operating expenses, net fund flow, and PDS Bog index, but all the coefficients are too small to be meaningful.

Passive voice of the annual reports is associated with an easy-to-read PDS, bigger size, decrease in the number of new members, for the entire superannuation sample. Retail annual reports with more passive index have a bigger fund size and more readable PDS, whereas

<sup>30</sup> -0.0000019

<sup>31</sup> The coefficient on *InvOpt* in columns [2] and [5] are -0.000007 and -0.00001, respectively.

industry annual reports with a higher passive index are poor performers, have fewer investment options, and less new members.

Although there is no evidence to support the relationship between the pep, jargon, and passive index of the annual report with fund performance from columns [1] to [5]; in column [6], the passive index is negatively associated with industry fund performance, which is consistent with the industry Bog index tests in column [5] of Table 4. However, from the table, we can conclude that industry annual reports on average have less jargon and a lower passive index, and more interesting writing style than retail annual reports. Large fund size, and fewer investment options are related to how frequently jargon is used in the annual report. The readability of PDS is also associated with pep index, jargon, and passive voice, which can be explained as PDS and annual reports prepared by the same department, have the similar writing style.

## **7. Conclusion**

In this study, I investigate how annual report readability relates to the Australian superannuation fund performance. I argue that poor fund performance may be associated with poorer annual report readability. Managers may make the information hard to read for investors when the fund performs poorly, referred to as obfuscation. Using a sample of 42 superannuation funds, 29 retail and 13 industry funds, from the 2005 to 2018 financial year; the results show that, most superannuation annual reports are hard to read, and retail annual reports are generally more complex than industry annual reports. Following Peng's (2017) study of the Australian superannuation PDS readability and fund performance, OLS regression tests were used to test the relationship between annual report readability and performance. The results show that there is no significant association between annual report readability and superannuation fund performance. In other words, the phenomenon that companies managers manipulate readability to hide their bad performance has not been shown in the Australian superannuation fund market. The reason behind that might be the difference between companies and superannuation funds. For instance, Australian superannuation is mandatory, however, as a result, superannuation investors are relatively less engaged and do not have sufficient financial knowledge, and have been shown to react differently in the light of poor short-term performance, compared to conventional managed fund investors (Peng, Alpert, &

Hsu, 2020). It is also possible that superannuation funds use annual reports more as a compliance tool, instead of a communication tool to inform investors.

Further testing suggests weak evidence that annual report readability is negatively associated with the worst performing funds. Assuming funds care more about the performance of their larger investment option offerings, a value-weighted Sharpe ratio measure of performance is used. This value-weighted fund risk-adjusted return is significantly associated with the readability of the annual report, however, the relationship is contrary to the hypothesis and disappeared when I used retail and industry subsamples separately and control for year and fund fixed effects. Lastly, the superannuation annual reports' writing style, the frequency of using jargon and passive verbs are also not associated with fund performance. But the size of the fund, net fund flow, the number of investment options, the operating expenses, and the PDS readability have influenced on the readability of annual report.

The findings suggest that there is no strong evidence of the annual reports readability is driven by the performance of the Australian superannuation fund. However, the additional tests' results also suggest that less readable annual report is related to the worst performing funds and value-weighted fund risk-adjusted returns. Further research is required to determine the relationship between the superannuation annual report readability and the investment-option-level performance, as individual investors may pay more attention to their own investment product, rather than the fund it sits within.

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# **Appendices**

## **Appendix A. Procedures for cleaning annual reports and PDSs**

1. Convert downloaded PDF version documents to Word Doc.
2. Remove all the contents, symbols, headings, bullet points, phrases (not considered as complete sentences) and images.
3. Transfer full sentences from tables, and remove tables.
4. For some sentences without a full stop, full stops are added manually (usually in the case of bullet point sentences).
5. Check on the spelling.
6. Convert from Word Doc. to TXT files, then they are ready to run in the StyleWriter for getting the Bog Index (The Word Doc. can be run in the StyleWriter but in order to ensure that all editing is eliminated, it is better to convert all files to TXT).

## Appendix B. List of superannuation fund

	List of superannuation fund	Retail/Industry Fund
1	AMP Personal Employer Sponsored Superannuation Fund	Retail
2	AMP Personal Superannuation Fund	Retail
3	AMP Self Employed Persons Superannuation Fund	Retail
4	AMP Superannuation Savings Trust	Retail
5	AMP Retirement Trust	Retail
6	Australian Ethical Retail Superannuation Fund	Retail
7	BT ADF Investment Fund	Retail
8	BT Classic Lifetime	Retail
9	BT Lifetime Super	Retail
10	BT Lifetime Super - Employer Plan	Retail
11	BT Retirement Selection	Retail
12	BT Superannuation Investment Fund	Retail
13	BT Superannuation Savings Fund	Retail
14	Commonwealth Bank Approved Deposit Fund	Retail
15	ING Superannuation Fund	Retail
16	MLC Superannuation Fund	Retail
17	MLCS Superannuation Trust	Retail
18	Zurich Master Superannuation Fund	Retail
19	Westpac Mastertrust - Superannuation Division	Retail
20	Westpac Personal Superannuation Fund	Retail
21	Perpetual WealthFocus Superannuation Fund	Retail
22	Perpetual's Select Superannuation Fund	Retail
23	The Bendigo Superannuation Plan	Retail
24	Fiducian Superannuation Fund	Retail
25	Suncorp Easy Super	Retail
26	Suncorp Master Trust	Retail
27	Suncorp Personal Superannuation Fund	Retail
28	Suncorp Secure Preservation Plan	Retail
29	Suncorp Superplan	Retail
30	Australian Catholic Superannuation and Retirement Fund	Industry

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31	AustralianSuper	Industry
32	Care Super	industry
33	CUBS Superannuation Fund	Industry
34	Christian Super	Industry
35	Energy Super	Industry
36	First Super	Industry
37	Health Employees Superannuation Trust Australia	Industry
38	HOSTPLUS Superannuation Fund	Industry
39	Rei Super	Industry
40	Sunsuper Superannuation Fund	Industry
41	Victorian Superannuation Fund	Industry
42	Retail Employees Superannuation Trust	Industry

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## Appendix C. Variable definitions

Variable	Definition
BogAR	The Bog index score of superannuation annual report, as collected from StyleWriter 4 - Standard Edition.
Return	Superannuation fund financial yearly rate of return.
BogPDS	The Bog index score of superannuation Product Disclosure statement, as collected from StyleWriter 4 - Standard Edition.
Ln(NAV)	The logarithm of the total net assets of the superannuation fund.
NetFlow	The net fund flow is equal to net assets value <sub>i,t</sub> – net assets value <sub>i,t-1</sub> × (1 + return <sub>i,t</sub> ).
InvOpt	The number of investment option of the fund.
OpE	The total operating expenses of the fund in million Australian dollars.
NewMem	The number of new members of the fund in thousands, calculated as (Total number of members <sub>t</sub> – Total number of members <sub>t-1</sub> )/1,000.
Risk	The standard deviation of 12-month (financial year period) daily unit price of investment option.
Industry	A dummy variable equals 1 if fund is industry superannuation and 0 otherwise.
VWSR	Value-weighted Sharpe ratio of superannuation fund, calculated as the sum of the value weighted Sharpe ratio of investment options for each fund.
Value weighted	The value-weighted index is calculated as $NAV_{\text{Investment option } i} / NAV_{\text{Fund } I}$
Sharpe ratio	The Sharpe ratio is calculated as investment options' Return divided by fund investment options' Risk.
Pep	Pep score of superannuation fund annual report, text with high Pep score means the writing is more interesting to read.
Jargon	Percentage of jargon of superannuation fund annual report, the higher the jargon, the more jargon words in the annual report it is.
Passive	The passive verb index of superannuation fund annual report, the higher the passive index, the more passive verbs in the annual report it is.

## **Appendix D. The length and font requirements for Superannuation PDS from Shorter PDS regime**

Corporations Amendment Regulations 2010 (No.5) Schedule 10D Clause 1- Length and font size for Product Disclosure Statement for superannuation product

This clause ensures that the superannuation product PDS does not exceed a maximum page limit, while providing for alternative formats which deliver the equivalent content. Requirements relating to font sizes also are included to ensure that the PDS is readable.

The total length of the PDS (not including any information incorporated by reference) must not exceed:

- (a) 8 A4 pages of content; or
- (b) 16 A5 pages of content; or
- (c) 24 DL pages of content; or
- (d) if in any other format, as long as it fits into 8 A4 pages.

The font size must not be less than:

- (a) for the name, address, ABN and/or ACN and AFSL—8 points;
- (b) for body text—9 points.

Further, the standard requirements under subsection 1013C(3) of the Act still apply requiring that the PDS must be worded and presented in a clear, concise and effective manner.