

The Potential Effects of Mandatory Portfolio Holdings Disclosure in Australia and New Zealand

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Abstract

Our research supports the case for introducing mandatory portfolio holdings disclosure regimes in Australia and New Zealand. Of the 22 nations (constituents of the MSCI World Index) surveyed in the 2011 Morningstar Global Investors Report, these are the only two countries that do not disclose. We examine the potential effects of mandated holdings disclosure on mutual fund returns by using the voluntary holdings disclosures which some funds make, as a proxy for mandatory disclosures. We find that following the Global Financial Crisis, New Zealand low-rank funds, with low abnormal returns in the past six months, as well as Australian low-rank funds both prior to and following the Crisis, would have improved performance with mandatory disclosure. In contrast, returns would drop for Australian high-rank funds. This suggests that disclosure is costly for high-rank funds due to front-running, while it provides benefits for low-rank funds due to the enhanced monitoring abilities of investors.

we also examine whether investors care about disclosure. We find evidence that following the Global Financial Crisis, the importance of transparency has increased for investors with holdings in high-rank New Zealand funds. Investors in Australian funds show no preference for disclosure after the Crisis, while prior to it they preferred non-disclosure for mid-rank funds. On balance, we believe the introduction of mandatory disclosure schemes in Australia and New Zealand would represent a significant advance for the industry and bring benefits to investors.

Keywords: disclosure, voluntary disclosure, mandatory disclosure, portfolio disclosure, portfolio holdings, fund performance, fund flows, front-running, agency cost, Australia, New Zealand

1. Introduction

The costs and benefits of the disclosure of portfolio holdings have been the focus of longstanding debate among practitioners, regulators, researchers and academics. In unique markets lacking mandatory disclosure but some funds voluntarily disclose, we examine the potential effects of a mandatory portfolio disclosure regime. Disclosure of portfolio holdings refers to a public release of the specific stocks, bonds and other securities which constitute the portfolios of pooled investment vehicles.¹ Australia and New Zealand are the only two nations among the 22 countries surveyed in the Morningstar Global Investor Experience 2011² study that do not require mandatory portfolio holdings disclosure. In the Morningstar study, Australia and New Zealand both received the overall grade of D-, at least partly due to lack of disclosure. Our research focuses on the Australian and New Zealand markets and addresses the following three questions for each market:

1. What factors determine whether a fund voluntarily discloses their holdings?
2. How does disclosure affect fund returns?
3. How does disclosure affect net new money flows into mutual funds?

Investors have increasingly employed professional fund managers to administer their savings over the last 30 years, driven by the government-sponsored retirement savings schemes in both New Zealand and Australia. In 2010, the Ministry of Economic Development in New Zealand announced³ that they would make changes to the governance of KiwiSaver⁴ schemes, possibly including the introduction of a mandatory portfolio holdings disclosure regulation. By 11 March 2010 the Ministry had received 65 submissions from industry members, investor advocacy groups,

¹ For the purposes of this study disclosure is defined as funds that disclose their portfolio holdings to the fund tracking firm, Morningstar Inc.

² The Global Fund Investor Experience Survey is an annual survey undertaken by Morningstar that analyses and contrasts mutual fund marketplaces, highlighting their strengths and weaknesses. The 22 countries surveyed are the constituents of the MSCI World Index at the time of the survey.

³ This change to be made to KiwiSaver was officially announced by the Officer of the Ministry of Commerce in a cabinet paper entitled "Creating a financial markets authority and enhancing KiwiSaver governance and reporting."

⁴ KiwiSaver is New Zealand's government-sponsored voluntary retirement savings scheme.

consultants and academics. Interest in introducing disclosure laws has also been raised over the past decade in Australia. The Super System Review⁵ (2010) recommends mandatory disclosure of portfolio holdings within 60 days after each six-month reporting period. There are two sides to the debate concerning mandated disclosure.

Arguments supporting mandatory disclosure include the following: first, it would provide more detailed information allowing investors, advisors and trustees to better monitor their investments delegated to professional fund managers. This would help with identification of overlaps in holdings and would improve investors' asset allocation and diversification of their overall portfolios. Second, the increased transparency would enable shareholders to better monitor the compliance of a fund with its stated investment objectives. Third, disclosure would enhance the ability to track whether funds are engaging in portfolio manipulation such as portfolio pumping.⁶ Fourth, disclosure would have the side effect of providing more extensive information in support of academic enquiry.

A selection of market participants who are concerned about the potential negatives from a portfolio disclosure regime argue the following: Firstly, it would enable increased front-running⁷ by professional investors and speculators. Secondly, it could increase free-riding,⁸ thus restricting a fund's ability to fully benefit from its research. Thirdly, there would be direct costs associated with producing and distributing timely and accurate information.

Empirical research regarding the costs of disclosure regimes has investigated the free-riding of investors in the US market by constructing copycat strategies. Frank, Poterba, Shackelford and Shoven (2004) find that disclosure is costly for funds, as copycat funds dilute the ability of the underlying fund to fully exploit their proprietary information. Verbeek and Wang (2010) find that the

⁵ The Super System Review was commissioned in May 2009 by the Australian Government to review the governance, efficiency, structure and operation of Australia's superannuation system.

⁶ Portfolio pumping is the act of bidding up the value of a fund's holdings before the end of a reporting period in order to raise the fund's performance results.

⁷ Front-running refers to the practice of outside investors buying (selling) securities in anticipation of buying (selling) trades by the fund.

⁸ Free-riding occurs when outsiders are able to observe a fund's investment strategies, allowing them to either copy a fund's holdings or to adopt the investment strategies of the fund.

cost of disclosure is higher for increased disclosure frequency because copycat funds have more information on which to free-ride. Other research based on the US market looks at the effect of disclosure on fund returns and finds that high-performing funds can have their performance impaired by disclosure (Ge and Zheng, 2006; Parida and Teo, 2010).

This study builds on the literature surrounding portfolio disclosure by considering the unique environment in Australia and New Zealand. As some funds provided voluntary disclosure of portfolio holdings during the sample period 2005 to 2010, this provides an opportunity to explore the choice of funds to voluntarily disclose and thereby the potential effects of mandatory disclosure. While this study focuses on the potential effects of mandatory disclosure, it does not examine other important facets of mandatory disclosure regulation such as the lag period allowed following the reporting period and the frequency of disclosure.⁹

The paper is organised as follows: section 2 identifies and discusses previous studies and their findings. Section 3 outlines the data and methodology used in this study. Section 4 identifies, explains and discusses the results and their comparison to previous studies. The conclusion is found in section 5, while section 6 identifies research limitations and section 7 lists references used. The results of our research have implications for policy makers, investors and fund managers.

2. Literature Review

2.1 Introduction

A great deal of literature examines the field of disclosure. Although disclosure has a long history, it has attracted considerable attention in the last few years, spanning areas from finance and accounting to healthcare and education. Two types of disclosure are examined: mandatory disclosure and voluntary disclosure. Mandatory disclosure has an important role in society and is particularly prevalent in health and safety settings. Section 3.1 of the literature review examines

⁹ For example, US regulations call for quarterly disclosure within 60 days of the end of the period.

the wider issue of whether mandatory disclosure matters. In section 3.2, models of voluntary disclosure are discussed. Section 3.3 focuses on the more specific area of portfolio holdings disclosure research.

2.2 Mandatory Disclosure

The question that is usually raised is whether mandatory disclosure matters. Mandatory disclosure matters to the extent that it raises social welfare by improving consumer choice or by sellers increasing the quality of their products. Many industries face mandatory disclosure, mainly focusing on health and safety issues and ignoring other product attributes that may affect demand. According to Fung, Graham and Weil (2007), the first signs of government-mandated disclosure in the US emerged with the introduction of the 1906 Pure Food and Drug Act, which regulated food and drug labelling. Since that time, disclosure regulations have spread to other markets.

The majority of available evidence shows that mandated disclosure causes consumers to migrate toward high-quality sellers. In an educational setting, Hastings and Weinstein (2008) discover that parents, who responded to government-mandated information about public school quality by switching their children's enrolment, chose schools scoring 0.5 standard deviations above the schools their children left behind. In the healthcare industry, a number of studies have examined health plan choices when plan report cards were introduced to federal employees in the mid-1990s. Dafny and Dranove (2008); Jin and Sorensen (2006); and Wedig and Tai-Seale (2002) all show higher ranked plans enjoying increases in market share, indicating that disclosure had the effect of improving consumer choice. Moreover, evidence has emerged that mandatory disclosure can improve overall industry quality. For example, in the food industry, Jin and Leslie (2003) use data before and after Los Angeles County assumed restaurant hygiene cards in 1998 and find that hospitalisations from food-borne diseases declined by 20%.

However, there is also considerable evidence that sellers have attempted to play the system at the expense of consumers. Matthews and Postlewaite (1985) as well as Shavell (1994) find that mandatory disclosure may encourage sellers to reduce the collection of quality information if it is costly to acquire. Dranove and Jin (2011) reason that drug companies might limit their studies of side effects if they were required to disclose all findings from such studies. Furthermore, mandatory disclosure may encourage “gaming” behavior that enhances reported quality but actually reduces the welfare of consumers. Evidence of this is found by Dranove, Kessler, McClellan and Satterthwaite (2003), who show hospital report cards in New York and Pennsylvania which encourage providers to avoid the sickest patients, decreasing both patient and social welfare. Other results show the rationing of high-quality outputs because high-quality suppliers (for example, schools and hospitals) face capacity constraints (Lizzeri & Gavazza, 2007). Furthermore, if there are multiple dimensions of product quality, mandatory disclosure on one dimension may encourage firms to invest in the disclosed dimension but cut back in other dimensions, leading to potential reduction in overall industry quality and therefore a reduction in consumer welfare (Bar-Isaac, Caruana & Cuñat, 2008).

The literature provides evidence of other circumstances in which mandatory disclosure may have no effect on consumer welfare, particularly if the ratings are difficult to understand or provide irrelevant information. Evidence of this is centred in the healthcare industry. Marshall, Shekelle, Letherman and Brook (2000) review the empirical evidence concerning public disclosure of performance data in the healthcare sector in the US. They find that consumers generally do not seek out the data and that it has only a small impact on their decisions. Physicians are about the data and only a very small proportion makes use of it. On balance, there is strong evidence that mandatory disclosure has a positive effect on social welfare; however, laws must be carefully devised to ensure they are relevant and that they limit opportunities for gaming.

2.3 Models of Corporate Voluntary Disclosure

Voluntary disclosure models attempt to explain the equilibrium between voluntary disclosure and non-disclosure. This topic has received significant attention over the past three decades. A number of voluntary disclosure models have been developed to explain corporate voluntary disclosure which is built around the central theme of information asymmetry between firm managers, who typically have superior information about their firm's future performance, and investors who wish to assess firm value. The problem is exacerbated because managers have incentives to exaggerate their firm's projected profitability.

The seminal result of early disclosure literature (Grossman & Hart, 1980; Grossman, 1981; Milgrom, 1981; Milgrom & Roberts, 1986) is that discretion will lead to a process of unravelling; in other words, every firm will disclose because investors rationally infer that the information which managers do not disclose must be bad news. These studies form a basis for subsequent research by identifying conditions under which full disclosure would occur. These conditions include: first, disclosures are costless; second, investors know that firms have private information; third, all investors interpret a firm's disclosure in the same way and firms know how investors will interpret that disclosure; fourth, managers want to maximise their firm's share price; fifth, firms can credibly disclose their private information; and sixth, firms cannot commit ex-ante to a specific disclosure policy. These early studies do not suggest that all sellers disclose their private information; they rather seek to add insight to the circumstances in which less than full disclosure is likely to occur. Full disclosure is less likely to occur when one or more of the six conditions is not met. Subsequent models have investigated the consequences of relaxing one or more of these conditions.

Dye (1986); Jovanovic (1982); Verrecchia (1983); and Lanen and Verrecchia (1987) focus on relaxing the first condition that disclosures are costless. They show that if disclosure is costly, sellers voluntarily disclose only if their information is sufficiently favourable to exceed a threshold. That is, introducing a disclosure cost causes an equilibrium to exist in which some sellers will

choose not to disclose. Importantly, these researchers' models are robust to the consideration that market agents have rational expectations about the content of disclosures and will presume that withheld information is less favourable information. However, these studies consider only the costs of disseminating information and fail to examine the costs of releasing information that may be proprietary in nature.

More recently, several papers have further explored equilibria disclosure models which include proprietary information costs. Fischer and Verrechia (2004) find that disclosure does not occur because the information withheld by the firm includes both very low and very high outcomes. Arya, Frimor and Mittendorf (2010) present a related model of disclosure costs in which a partial disclosure equilibria is reached because disclosing value-increasing information for one business segment comes at the cost of implying value-decreasing information for another business segment. Together, these models demonstrate that costs of disclosure relating to proprietary information may sometimes, but not always, prevent full disclosure.

The second condition that investors know that firms have private information is important; otherwise firms with information would not make any disclosures because they would be, from the perspective, indistinguishable from the firms without information (e.g., Dye, 1986; Jung & Kwon, 1988; Pae, 2002; Penno, 1997). Dye and Sidhar (1995) are among the researchers who examine this condition by considering the strategic timing of disclosures. They show that managers are likely to release good news earlier than bad news and that managers are likely to cluster their disclosures over time. Einhorn and Ziv (2010) demonstrate that the timing of disclosures is considered by managers because investors look at management's current disclosure policy to make assumptions about their disclosure policy in the future.

The third condition is that all investors are rational and interpret a firm's disclosure in the same way and that firms know how investors will interpret that disclosure. The impact of this assumption is examined by Dutta and Trueman (2002) who allow investors to hold private information about the demand for a firm's products. In their model, it is investors' private

information that guides how they view management's disclosures. They illustrate that uncertainty about the investors' interpretation causes management to disclose information that is sufficiently positive or sufficiently negative. The study assumes that, in order to prevent full disclosure, managers do not always have access to the investors' private information. In contrast, Suijs (2007) employs a behavioural model, maintaining all conditions of the disclosure choice except the investors' uniform response. This researcher finds that managers' uncertainty about investor response to their disclosure is enough to cause them to refrain from voluntary disclosure. Fishman and Hagerty (2003) also examine this assumption by looking at the level of sophistication of investors, finding that if the proportion of unsophisticated investors is sufficiently high, and if unsophisticated investors are suspicious of disclosure, then firms have the incentive not to disclose.

The fourth condition under which managers disclose all information is that managers have the goal of maximising the firm's value. Aboody and Kasznik (2000) find that this condition does not always hold true. They demonstrate that managers have incentives to minimise a firm's share price when stock options are awarded, and incentives to share price when management sells shares. Investors are uncertain about managements' incentives when disclosing information, thus preventing full disclosure. Einhorn (2007) demonstrates this in his model showing that in the absence of disclosure, investors price the firm at some weighted average of good news and bad news.

The fifth condition assumes that firms can only make truthful disclosures. Beyer, Cohen, Lys and Walther (2010) explain that some information sharing in capital markets is carried out in informal settings where the information provider is not legally responsible for telling the truth. Gigler (1994) and Stocken (2000) use "cheap-talk" models to determine that managers have incentives to disclose in order to convey their firm's true value. This is because both investors and competitors have access to public disclosures. These cheap-talk studies assume that there are no direct costs associated with misrepresentation. On the other hand, costly verification models

assume that while disclosures do not have to be truthful, reporting distortions are costly to managers. Beyer et al. (2010); Korn (2004); and Einhorn and Ziv (2010) show that voluntary disclosure decisions are affected by the ability of managers to issue reports that are incorrectly interpreted by investors. A large body of literature examines the role of third parties in verifying the information that has been disclosed (Lizzeri, 1999).

Voluntary disclosure models seek to explain the optimal disclosure decisions of management in cases where management possesses superior information about a firm's profitability or performance. However, they do not provide any explanation for the prevalence of mandated disclosure. Opportunities for further research in this field include looking at multi-period interaction between management and the uses of corporate disclosure as well as the further examination of disclosure decisions over a time series of share prices.

2.4 Disclosure in the Mutual Fund Industry

The mutual fund industry provides a useful platform to examine the effects of disclosure because the disclosure level and proprietary costs can be readily quantified. Academic interest in the area of disclosure of fund holdings has been prompted by an announcement by the US Securities and Exchange Commission that they would review disclosure requirements for the semi-annual and annual reports provided by mutual funds to their shareholders.¹⁰ In a move toward increased transparency, holdings disclosure regulations were reformed in 2004 after significant consultation; they required that funds report on a more frequent basis, quarterly (within 60 days after the end of the reporting period) rather than the previous requirement of semi-annual reporting. Despite the heated debate around the disclosure requirements, little empirical evidence has been documented on this issue.

¹⁰ See Paul F Royce, Director, Division of Investment Management, US securities and Exchange Commission, "Remarks Before the Securities Law Procedures Conference [of the] Investment Company Institute," December 7, 1998, p. 3 (www.sec.gov/news/speech/speecharchive/1998/spch238.htm).

2.4.1 Frequency of Reporting Research

Wermers (2001) provides a well-documented exploration of the potential effects of more frequent portfolio disclosure on mutual fund performance, concluding that the costs of more frequent disclosure would outweigh the benefits. The study cites the largest potential cost as increased opportunities to exploit information on holdings data coupled with fund flow data to “front-run” a fund’s trades as well as an increased ability for the practice of free-riding by copying a fund’s holdings.

The theory behind front-running is that investors can examine changes in fund holdings to infer which securities the fund will be purchasing and therefore purchase the stock before the fund does, thus driving up the price and causing the fund to pay more or pushing down security prices for the fund’s sales (Wermers, 2001). Furthermore, investors can couple a fund’s holdings information with fund flow data in order to speculate which holdings will be bought or sold in the event of flows of money either into or out of the fund. Such practices would decrease fund returns and harm investors. Wermers claims that more frequent reporting will enable increased front-running. The length of time over which fund managers typically build or liquidate their positions is essential to evaluate this argument; however, Wermers (2001) fails to draw any conclusions about the timing of transactions.

Frank et al. (2004) argue that most positions can be accumulated or sold in 10 days. This would suggest that front-running would not be a serious issue for either semi-annual reporting or quarterly reporting, as managers would have ample opportunity to perform their trading before or after reporting periods. Wermers, Yao and Zhao (2010) argue that, due to a 60 day delay in reporting in the US, front-running is not likely to be an issue except in cases in which funds take months to purchase or sell a position.

Wermers (2001) also discusses free-riding as a potentially significant cost of more frequent reporting requirements. Outsiders are able to either duplicate a fund’s portfolio holdings or perform “reverse engineering” to identify and adopt the proprietary investment techniques and strategies of

the fund. Reverse engineering is useful because funds often hold stocks for reasons other than stock selection. More recently, Wermers et al. (2010) developed a model using reported portfolio holdings to predict individual stock returns. They show that this strategy produced a better result than just copying a fund's holdings and is useful to investors when making stock selection decisions. With more frequent disclosure, the accuracy of both mimicking fund holdings and reverse engineering would be improved. This could harm funds by causing prices to move before a fund could fully implement its investment strategy and by encouraging less investment into the fund itself. On the other hand, Ge and Zheng (2006); Frank et al. (2004); and Verbeek and Wang (2010) suggest that funds can benefit from price movements caused by the front-running of their trades. A body of literature examines the so-called copycat funds, as discussed in section 2.4.2.

Elton, Gruber, Blake, Krasny and Ozelge (2010) take a different perspective when investigating the effect of an increased frequency of holdings information, and examine the changes from an academic perspective rather than Wermers' (2001) examination from an investor's prospective. Elton et al. (2010) revisit four well-known hypotheses in finance to determine whether the results of previous tests remain valid when repeated with monthly rather than semi-annual holdings data, using a sample of 215 US mutual funds from 1994 to 2005. They examine momentum trading, tax-motivated trading, window dressing and tournament behaviour. The study finds that many of the results of the previous studies are changed, and in some cases even reversed with the use of more frequent holdings data. The study's results show that quarterly holdings data misses, on average, 18.5% of trades that are captured by the use of monthly holdings data. These results spotlight the important impact that frequent disclosure could have on academic literature. The main shortcoming of Elton et al.'s (2010) work is that the cross section of funds which voluntarily provide monthly disclosure is a non-random sample of the entire group of mutual funds.

Following the implementation in 2004 of the requirement in the US to disclose portfolio holdings on a quarterly basis, Ge and Zheng (2006) and Parida and Teo (2010) extended

Wermer's (2001) study by performing qualitative examinations of the effects of the change in reporting frequency. Ge and Zheng (2006) examine: first, which firms choose to report quarterly; second, the effect of the frequency of portfolio holdings reporting on returns; and third, the frequency of portfolio holdings disclosure on flows of money into and out of the funds. Ge and Zheng (2006) take a sample of US equity funds from 1985-1999 and compare the funds that choose to disclose quarterly with the funds that provide only the mandatory semi-annual reporting of holdings. They find that funds with higher turnover, higher expense ratios and a higher likelihood of committing fraud tend to disclose their holdings less frequently. They find that the skilled funds (measured as the top 20% of past performers) have lower returns when they report more frequently, supporting Wermers' (2001) hypotheses of increased front-running and free-riding. However, for the bottom 20% of funds, these researchers show that fund return is higher for funds that report quarterly, possibly because of opportunities for increased monitoring of management decisions. They also find more money flowing into poor-performance funds that choose to disclose more frequently, demonstrating investors' preference to monitor those low-performing funds. This study has the same shortcoming as Elton et al. (2010), in that the cross section of funds which voluntarily provide disclosure is a non-random sample of the entire group of mutual funds. Conceivably, the sample is dominated by funds that potentially benefit the most (or suffer least) from more frequent disclosure. This should not, however, be a matter of much concern, as the bias should only make the results more conservative.

Parida and Teo (2010) address the key bias of Ge and Zheng's (2006) study by using US data before and after the 2004 change in regulation. They also investigate the impact of more frequent mandated portfolio disclosure. Parida and Teo (2010) take the performance of the funds which disclose semi-annually before 2004 and compare it to their performance after 2004 when they were required to disclose quarterly. They find that, for high performing funds, quarterly disclosure harms fund returns by 17 to 20 basis points a month. Looking further into the results, the reduction in performance is higher for funds with illiquid assets that increased their disclosure

frequency after they were compelled to do so with the 2004 regulations. A new type of bias is introduced in this study. The funds that did not disclose quarterly before 2004 are likely to be the funds that would suffer the most from disclosure. By examining only the differences in returns of these funds, the cost of more frequent disclosure is conceivably higher than from a sample of the entire industry. Although the inherent bias of Parida and Teo (2010) and the bias of Ge and Zheng (2006) are in opposite directions, they still find similar results, namely that more frequent disclosure (quarterly) is costly.

2.4.2 Copycat Studies

The theory underlying copycat funds suggests that if the research on an actively-managed fund is valuable in uncovering excess return opportunities, and the copycat fund is able to mimic the holdings of the underlying fund, then the copycat fund should earn equal returns before expenses. The copycat's potential disadvantage in timely access to research findings may be offset, however, by its lower research expenses. Frank et al. (2004) use semi-annually reported holdings of 20 high-expense actively-managed US mutual funds between 1992 and 1999 to construct hypothetical copycat portfolios, mimicking holdings of the underlying funds. Their study took into account fees by estimating the fees of expenses incurred for actively-managed funds and estimating fees for the passive copycat funds. Their work reveals that the returns of the copycat funds were statistically insignificantly different, and possibly higher, than those of the underlying disclosing funds. In examining the effects of less frequent disclosure, they find that copycat funds outperform actively-managed funds by more at the 12-month horizon than at the 6-month horizon, probably due to larger cumulative expense charges for the underlying funds. In other words, there appears to be some evidence that investors can profit by free-riding on active funds operating in the market; however, the relatively small sample size of this study should be noted.

Verbeek and Wang's (2010) study uses a larger sample, and examines how the frequency of reporting has affected free-riding. The study investigates the performance of free-riding strategies before and after new regulations called for quarterly reporting of portfolio holdings. They analyse disclosed holdings of 3,046 active US equity funds over the 1985 to 2008 period and construct hypothetical copycat funds by duplicating the active funds' disclosed portfolio holdings and rebalancing whenever new holdings are reported. They find that the average relative performance of copycat funds stabilises and increases significantly, by 0.05% per month, after the SEC in 2004 required more frequent portfolio disclosure. This implies that since 2004 it is easier for outside investors to free-ride on disclosed fund holdings, which might contradict the commission's interest in protecting fund shareholders' welfare.

There are several limitations to copycat studies. The returns of underlying funds could be understated because security purchases by the copycat fund may drive up the prices of securities held by the underlying fund. Moreover, if active managers knew that their funds were being tracked by copycats, they might act to reduce the information content of the disclosure filings. Such actions could raise the standard deviation of the differential between the return on the underlying fund and the return on the copycat. If active managers could earn positive returns as a result of their analysis and could conceal some holdings with window dressing, such trading could increase the return differential between the copycat fund and the underlying fund, although it could also increase the expenses of the underlying fund.

2.4.3 Hedge Fund Industry

Hedge funds offer another platform to determine the value of disclosing portfolio holdings. Brown and Schwartz (2011) and Shi (2010) examine free-riding by focusing on hedge funds. The proprietary costs for hedge funds are conceivably more important for hedge fund managers, as hedge funds are typically free in their ability to use leverage, derivatives and short sales across

several asset classes. This structure may attract talented managers with sophisticated trading strategies. Hedge funds often hold illiquid assets, which would be particularly vulnerable to exploitation through disclosure, making this an interesting area of research.

When the assets of a hedge fund exceed \$100 million, the hedge fund is required by the SEC to file 13F forms reporting some of their quarterly holdings within 45 days after the end of each quarter (Shi, 2010). The study uses a sample of 4,024 US hedge managers who report over the period 1977 to 2010, during which 414 managers have filed form 13F at least once. The performance of the funds in the periods they disclose is compared with their performance in the periods in which they did not disclose. Shi's (2010) research provides evidence that disclosure harms hedge fund performance by about 4% per annum. These findings are supported by Argon, Hertz and Shi (2011) and by Agarwal, Jiang, Tang and Yang (2011) who demonstrate that hedge funds request confidential treatment to delay 13F disclosure of their profitable ideas.

In contrast, Brown and Schwartz (2011) find that the filings of 13F forms are, if anything, positive for hedge funds. They perform event studies, using the filing events of US hedge fund portfolios from 1999 to 2006, and are one of the only studies to investigate whether market participants use mandatory portfolio holdings to make investment decisions. These researchers find evidence of unusual trading behaviour around the filing day, particularly that the excess returns of the disclosed securities spike on the day of filing and immediately after the filing date, indicating that investors do in fact implement a copycat strategy. They find that investors cannot profit from copying strategies in the long term; the funds themselves, however, can potentially profit from the copycat traders.

2.4.4 Australasia Research

Research from Australia and New Zealand in the field of portfolio holdings disclosure is limited. Folwer, Grieves and Singleton (2010) take a different approach and look at the accuracy of

information currently provided to investors in New Zealand. They find some evidence that mandatory disclosure may benefit investors. The study the styles of active New Zealand fund managers using fund returns from 1999 to 2006. They examine characteristics of the funds' returns to determine whether managers are investing in securities that accurately represent their stated investment objectives. Fowler, Grieves and Singleton (2010) find evidence that New Zealand fund managers are deviating from their stated investment objectives, with equity-orientated funds providing returns that are significantly different from equity returns. This, in turn suggests that opportunities for investors to appropriately diversify are impaired because of a lack of information about the asset allocation of the fund. The study's findings offer support for a mandatory requirement for New Zealand funds to disclose their holdings and thus better serve the needs of investors.

Fowler et al. (2010) provide another example of problems encountered due to the lack of disclosure regulation. This study examines the value of active management in New Zealand, which is a very important question to investors. The research is limited by the lack of data on portfolio holdings; it is confined to using less specific aggregated data because there is no requirement to disclose portfolio holdings in New Zealand. Most researchers have determined that using aggregate portfolio data may disguise important information (Engstrom, 2004), and most recent studies focus on using portfolio holdings data to determine fund trading in order to more precisely measure fund skill (e.g., Comerton-Forde, Gallagher, Nahhas & Walter, 2010; Engstrom, 2004; Wermer, 2000). Fowler et al. (2010) found that New Zealand active managers do not provide any excess returns, a significant finding for the industry. However, the viability of the conclusions is questioned due to the old-fashioned methods employed.

The availability of portfolio holdings data would provide a more balanced approach, in which both methods could be used. In addition to studies on active management, other areas in which portfolio holdings data would provide more insight include questions on whether mutual funds trade on momentum (Grinblatt, Titman, & Wermers, 1995); whether funds trade for tax

purposes (Gibson, Gjergji, & Gordon, 2007); and whether mutual funds engage in window dressing (Meier and Schaumburg, 2004; Sias, 2006).

In Australasia, Gallagher (2007) examines the case for requiring mandatory portfolio holdings disclosure in Australia in a qualitative study. This researcher also offers support for the case of mandatory disclosure of portfolio holdings, which is in line with Fowler et al. (2010) and determines that holdings data would enable suitable performance measurement by researchers and industry analysts by allowing them to analyse trading activity. Gallagher (2007) outlines the potential benefits and costs of portfolio disclosure, and focuses on encouraging a more transparent system in Australia. Although Gallagher acknowledges that the costs of more frequent disclosure, some of them significant, and which are also outlined by Wermers (2001), he nevertheless argues that more rigorous standards are required in Australia to better serve the needs of investors. To support his argument, he includes points about performance reporting becoming transparent and that investors would be better able to understand and monitor the investment activities of fund managers. In addition, Gallagher acknowledges that a mandated disclosure regime would provide regulatory authorities such as the Australian Prudential Regulation Authority and the Australian Securities and Investments Commissions with regulatory benefits.

2.5 Literature Review Conclusion

On the whole, our literature review indicates that disclosure has received much attention and encompasses a wide-ranging spectrum of various industries, focusing on mandatory and voluntary disclosure. Research shows that mandatory disclosure has important socially beneficial outcomes, particularly in the areas of health and safety. However, if not well-designed and implemented, the rules can be gamed, resulting in negative outcomes. Voluntary disclosure models centre mainly on the field of accounting; they identify the key factors that drive management's disclosure decisions. The models establish a number of insights into voluntary disclosure, including that costs are an important variable in such decisions.

Disclosure in a mutual fund setting is especially related to our research. Studies generally show that mandated requirements for more frequent disclosure (quarterly instead of semi-annually) can harm investors by decreasing a fund's returns. While frequent disclosure can harm investors, several studies in New Zealand and Australia offer support for some type of disclosure regime. The researchers argue that investors would be better informed and that academic enquiry would be improved.

Despite the heated debate in Australasia over what disclosure regulations are needed, little empirical research has been documented around the issue. While Ge and Zheng (2006) and Parida and Teo (2010) look at the US case of voluntary disclosure decisions regarding funds, it appears that no similar research has been performed in New Zealand or Australia. There are important differences about the geographical location of these countries that may affect the results. First, the US has had a mandatory requirement for quarterly disclosure since 2004 and semi-annual disclosure even before that, while in Australia and New Zealand there are no requirements to disclose holdings. Second, the market in Australasia, particularly in New Zealand, is smaller and less liquid than the US market, meaning costs of front-running could potentially be higher.

The fact that during the sample period some funds provide portfolio reporting on a voluntary basis and others do not provides a unique setting to examine the effects of disclosure. To the best of our knowledge, this is the first paper that examines the potential effects of mandatory disclosure in the New Zealand and Australia markets. This research is designed to give policy makers additional information when considering regulatory decisions about the disclosure of portfolio holdings. It also addresses a gap in front-running research. The front-running literature has focused on the agents who front-run or on profits accruing from hypothetical front-running strategies. Our study complements these models by providing some empirical evidence on the impact of front-running on mutual funds.

3. Potential Effects of Mandatory Disclosure

This study investigates the potential effects of mandatory disclosure. We conjecture that if a fund is required to disclose its portfolio holdings, it will be more exposed to activities such as front-running. This cost will lead to inferior performance compared to a fund that does not disclose. On the other hand, agency costs might decrease in funds that disclose their holdings because fund shareholders will be better able to monitor fund activities.

Ge and Zheng (2006) and Parida and Teo (2010) identify one of the potential costs of disclosure as the “information effect”. Disclosure of the securities which a fund holds exposes a fund’s proprietary information to the public, as it exposes the identity of securities held by a fund. Disclosure limits the time frame over which fund managers are able to reap the benefits of their research, because other investors may use the disclosed holdings to anticipate future trades by the fund and trade on this information. Such front-running on the research of funds can potentially lower fund returns by moving security prices before a fund can fully implement its strategy. On the other hand, free-riding activities may drive up the prices of securities the fund holds due to investors copying their holdings, thus increasing demand for the securities. This could have a positive effect on fund returns. On balance, we expect the information effect will have a negative impact on fund returns.

Another potential effect of disclosure is the “agency effect” (Ge & Zheng, 2006; Parida & Teo, 2010). More transparency could lessen agency costs by allowing regulators and investors to have more insight into fund activities; this would thus deter funds from engaging in activities that are not in the best interest of investors. In sum, the higher the costs are to the agency, the more potential benefits that will be derived from disclosure.

The effect of free-riding on fund returns, identified as the “price-effect” (Ge & Zeng, 2006), is not obvious. Free-riding will be costly if it causes the price to move before the fund can fully

benefit from its research. On the other hand, disclosure may increase demand for the securities the fund holds, driving up prices and thereby raising fund returns.

4. Hypothesis Development

The purpose of this research is to assess the potential impact of a mandatory disclosure regulation by addressing three key questions:

1. What factors determine whether a fund discloses their holdings?
2. How does disclosure affect mutual fund performance?
3. How does disclosure affect net new money into mutual funds?

In this section, hypotheses are outlined for each of the key research questions.

4.1 Characteristics of Funds that Disclose

Given that the funds which choose to disclose are likely to be the funds which suffer least from disclosure, we can make some predictions about the characteristics of funds that voluntarily disclose. With regard to a fund's net assets having an effect on its disclosure choice, there are two theories. Funds with higher net assets could cause larger price movements when they buy and sell shares due to the larger scale of their trades. Investors engaged in front-running will therefore be more interested in funds with larger net assets, leaving large funds more exposed to front-running. This would create a disincentive for funds with higher net assets to disclose. On the other hand, the economies of scale experienced by large funds may mean that on a percentage basis the direct costs of disclosure, such as the systems as dissemination costs, may be less of a burden for larger funds. This in turn suggests that larger funds would be more likely to disclose.

For the characteristic of standard deviation, if a fund's return patterns show a high standard deviation, the fund could be investing in assets outside of their stated objective and therefore would not choose to disclose holdings. The findings of Fowler et al. (2010) offer evidence that New

Zealand equity funds make investments outside of their investment objectives. They show funds which advertise that they invest in equities perform as if 16 to 33 percent of their funds were instead invested in fixed interest instruments. We expect a negative relationship between expense ratio and voluntary disclosure. Prior research indicates that expense ratio is a measure of agency costs. Del Guercio, Dann and Partch (2002) and Tufano and Sevick (1997) provide evidence that effective boards are associated with lower fund expenses. Consistent with the agency effect, funds that have higher expenses would be less likely to disclose. These proposed effects lead to the following hypotheses:

Hypothesis 1: Funds with higher net assets are less likely to voluntarily disclose.

Hypothesis 2: Funds that are older are less likely to choose to disclose.

Hypothesis 3: Funds that have returns with higher standard deviation are less likely to disclose.

Hypothesis 4: Funds with higher expense ratios are less likely to disclose.

4.2 The Effect of Disclosure on Fund Returns

The information effect suggests that disclosure is negatively related to fund performance, while the agency hypothesis is just the opposite, having the effect of increasing returns. To investigate which effect is the most powerful, the funds are categorised into high-rank, mid-rank and low-rank funds. High-rank funds are the 20 percent of funds with the highest adjusted performance over the previous six months, while low-rank funds are the 20 percent of funds with the lowest performance over the same period. Mid-rank funds are the 60 percent of the funds with middle performance over the previous six months. In line with Ge and Zheng (2006), we propose that high-rank funds have more proprietary information than the low-rank funds, therefore they will be harmed more by disclosure. The same may not be true for low-rank funds. Less monitoring by the investors owing to the lack of disclosure might lead the managers in poorly managed funds to indulge in value-destroying activities. The agency cost might outweigh some or all of the benefits

accrued from less exposure to activities such as front-running. For mid-rank funds, we suggest that both the information effect and the agency effect take place, with neither dominating. In light of these considerations, we make the following hypotheses:

Hypothesis 5: Disclosure will have a detrimental effect on the performance of successful funds.

Hypothesis 6: Disclosure will have a neutral effect on the performance of mid-rank funds.

Hypothesis 7: Disclosure will have a positive effect on the performance of unsuccessful funds.

4.3 The Effect of Disclosure on Fund Flows

Timely disclosure of portfolio information may help investors to make better investment decisions and to monitor funds more closely. As a result, some investors might attach substantial value to frequent disclosure. Since investors vote with their money, we believe that funds which voluntarily disclose will experience more inflows of money as outlined in hypothesis 8:

Hypothesis 8: Funds which disclose will attract higher flows than funds that do not disclose.

5. Data and Methodology

5.1 Data

The data was obtained from the Morningstar database. To the best of our knowledge, this is the only database that records disclosed holdings of Australian and New Zealand funds. The Morningstar database records holdings that have been voluntarily disclosed proactively by the fund. Additionally, on an ad-hoc basis, Morningstar makes holdings requests directly to selected funds. This introduces a potential bias, because there is no information from which we can determine for which funds holdings data was requested by Morningstar. Furthermore, for those funds, we cannot determine which complied with and which declined the request. Despite this bias, the disclosed

holdings reported by Morningstar is the most comprehensive record that is available in New Zealand and Australia to measure holdings disclosed to the public.

The final sample spans the period of February 2005 to December 2010. We limit the time frame because Morningstar did not carry out a complete collection of portfolio holdings prior to 2005. In total the samples encompass 1,920 Australian funds and 72 New Zealand funds. Survivorship bias is eliminated by using data from both alive and dead funds.

The sample uses equity funds by excluding funds that have the following category codes in the Morningstar database: bond funds, hedge funds, and balanced funds. The sample also excludes any index funds because they should not be exposed to the same extent by free-riding or front-running. The New Zealand sample excludes any funds that are not portfolio investment entities.¹¹ Finally, any fund in which there are less than two consecutive years of returns data is excluded. Funds that invest in international shares are included to maintain a reasonable sample size.

5.2 Methodology

This section explains the methodology adopted in this research report and how it was implemented. The methodology is based on Ge and Zheng's (2006) approach. The study addresses three important questions:

1. What factors determine whether a fund discloses their holdings?
2. How does disclosure affect mutual fund performance?
3. How does disclosure affect net new money into mutual funds?

The key methodology used in this research is a multiple regression analysis based on one sample from Australia and one sample from New Zealand. The primary reason for using a regression analysis is that it is a relatively straightforward and effective method of testing for

¹¹ A portfolio investment entity is a fund that is eligible to pay tax on investment income based on the prescribed investor rate of their investors, rather than at the entity's tax rate.

relationships between the explanatory variables and the dependant variables. Each regression is performed separately for Australian and New Zealand samples. Regressions included panel regressions in order to encompass both firm effects and time effects. Petersen (2009) warns that panel data is frequently mistreated. In the presence of both firm effects and time effects, we follow the study's advice and address each effect separately. The time effect is dealt with by including time dummies, and is mitigated by using clustered standard errors, which are White standard errors adjusted for possible correlation within a cluster. Petersen (2009) finds that White standard errors are unbiased, as they account for the residual dependence created by the firm effect. As a robustness check, the panel data regression results are checked against the regression results of 2010 data.

Our regression analysis method is aligned with the method employed by Ge and Zheng (2006). The output will loosely take the form of the following function:

$$\text{Dependant Variable (e.g., Fund Return)} = \text{Constant} + \text{Independent Variables}$$

The specifications for the regressions for each key research question will be discussed in the following sections.

5.2.1 Characteristics of Funds that Voluntarily Disclose

A logit regression is used to analyse the characteristics of funds that voluntarily disclose, in line with Ge and Zheng (2006). A logit regression was employed instead of an OLS regression to deal with the binary nature of the dependant variable. The regression equation employed is as follows:

$$\text{Prob}(\text{Voluntary Disclosure}_{it}) = \beta_0 + \beta_1 \text{Logt}na_{i,t-1} + \beta_2 \text{Logage}_{i,t-1} + \beta_3 \text{Stddev} + \beta_4 \text{Expense}_{i,t-1}$$

The dependant variable, voluntary disclosure, is defined as a dummy variable, taking the value of one if the fund provides at least one voluntary disclosure during each semi-annual time

period¹² and zero if it provides no holdings disclosure during the same period. *Logt_{na}* is the natural logarithm of the total net assets at the end of each semi-annual period. *Logage* is taken as the natural logarithm of the number of days since inception. *Stddev* is measured as the standard deviation of the previous 12 monthly adjusted fund returns. A minimum of six previous monthly market-adjusted fund returns is required for the calculation. It is prudent to use adjusted fund returns rather than raw fund returns to ensure that a like-to-like comparison is being drawn. Adjusted returns are calculated as follows:

$$\text{Adjusted fund return} = \text{monthly fund return} - \text{Morningstar benchmark return}$$

The Morningstar Benchmark was selected for use because it is the least subjective measurement available. Morningstar assigns a benchmark to a fund when it is added to the database by reviewing the fund's holdings (if available) along with its investment objective. The benchmarks are reviewed on an intermittent basis by Morningstar and are updated if the benchmark has changed due to a modification in approach by the fund manager. The database does not provide a record showing which funds have had benchmark changes over time. However, the use of the most recent Morningstar benchmark is not considered a significant bias, as this study only spans five years, and thus not a significant length of time to have changes in investment policies. Using the NZX50 as a blanket benchmark across all funds was considered; however, this approach could introduce significant bias because many funds invest in markets other than New Zealand. Ge and Zheng (2006) offer no insight into the choice of benchmark from which to calculate adjusted returns.

Expense is defined as the management expense ratio, including all operating expenses such as recordkeeping; custodial services; taxes; legal expenses; and accounting fees. A fund's trading expenses are not included in the management expense ratio. This data was only available

¹² A semi-annual time period was selected because according to the Morningstar submission to the New Zealand Ministry of Economic Development for the Periodic Reporting Regulations for Retail KiwiSaver Schemes, semi-annual disclosure is the minimum standard for global best practice disclosure regimes.

from Morningstar for 2010. A separate regression was performed using only data from 2010 so that the expense variable could be examined.

All explanatory variables were lagged by one six-month time period. Ge and Zheng (2006) considered two additional independent variables that we could not include: turnover ratios and whether the fund was being investigated for fraud. Turnover ratios indicate how often a fund trades, and can be used as a proxy for the amount of private information possessed by a fund, assuming that trades are based on information. It would be interesting to use turnover ratios as a proxy to measure whether funds with more private information are less likely to voluntarily disclose their holdings. This study does not use turnover ratios as an explanatory variable due to a lack of available data. Given that many funds do not disclose portfolio holdings, the turnover ratio is unable to be estimated.

Ge and Zheng (2006) also looked at the likelihood of committing fraud, measured as whether a fund is currently under investigation for fraud by the SEC. Unfortunately, the securities commissions in both Australia and New Zealand were unwilling to provide information about which funds are under investigation, so fraud could not be examined in this study.

A potential bias in the pooled-logit estimate is found in the possibility that funds may follow the same disclosure policy over time, which may be due to the costs of changing policy. In one regression, we include a lagged disclosure variable to control for the stickiness of the disclosure policy.

5.2.2 The Effect of Disclosure on Fund Returns

An OLS regression is used to analyse the characteristics of funds that voluntarily disclose, in line with Ge and Zheng (2006). Time dummies were used for all regressions to control for time-series trends. The regression equation is specified as follows:

*Excess Return*_{*i,t*}

$$\begin{aligned}
 &= \beta_0 + \beta_1 \text{Lowrank}_{i,t-1} + \beta_2 \text{Highrank}_{i,t-1} + \beta_3 \text{Disc} * \text{lowrank}_{i,t-1} \\
 &+ \beta_4 \text{Disc} * \text{midrank}_{i,t-1} + \beta_5 \text{Disc} * \text{highrank}_{i,t-1} + \beta_6 \text{Expense}_{i,t-1} \\
 &+ \beta_7 \text{Stddev}_{i,t-1} + \beta_8 \text{Logtna}_{i,t-1} + \beta_9 \text{Logage}_{i,t-1}
 \end{aligned}$$

The dependant variable, excess return, measures the average monthly excess return, defined as the return less the benchmark return during each semi-annual period. The benchmark is the Morningstar Benchmark. Refer to section 3.1.1 for a discussion of its selection. We do not use the Fama and French (1992) three-factor model or the Cahart (1997) four-factor model measures of return, in line with Ge and Zheng (2006) and Parida and Teo (2010) because these measures are only applicable to the US market with factors not available for Australia and New Zealand.

Disc is defined as a dummy variable, taking on the value of one if a fund provides quarterly disclosure during the semi-annual period and zero otherwise. *Lowrank*, *Midrank* and *Highrank* are dummy variables, each equal to one if a fund's adjusted performance for the semi-annual period belongs to the bottom quintile, the 2nd to the 4th quintiles, and the top quintile respectively. It otherwise takes a value of zero. Past performance is calculated for each semi-annual period based on the monthly excess return (as defined above) over the past 12 months. Ge and Zheng (2006) and Parida and Teo (2010) use alternative measures of adjusted performance, such as Fama and French's (1993) three-factor abnormal returns and the Carhart (1997) four-factor abnormal returns. These market-adjusted returns are not applicable to our sample because we include funds that invest in both domestic and international securities. For example, it would not make sense to compare a benchmark return of all Australian funds with the returns of a fund that invests in international, e.g., US, securities. The Fama and French (1993) and Carhart (1997) models cannot be used in our study, as factors are not available for New Zealand and Australia.

The control variables are *Expense*, *Std dev*, *Logtna* and *Logage* and have the same definition as in the previously-described logit model. The coefficients of interest are *Disc*lowrank*,

*Disc*midrank* and *Disc*highrank*. All independent variables are lagged by one time period and we use White's panel-corrected standard errors, which adjust for heteroskedasticity and auto correlation.

If disclosure frequency is determined by regulatory requirements exogenous to the fund, then a causal link between regulation and disclosure of could be expected. However, in this study the absence of regulation means that disclosure decisions are determined internally by the fund. Despite this, a statistical association between the two can still be expected (Ge & Zheng, 2006; Parida & Teo, 2006). In either case, the performance difference between the funds of different investment skills would provide empirical support for the potential effects of frequent disclosure.

5.2.3 The Effect of Disclosure on Fund Flows

An OLS regression is used to analyse the fund flows of funds that voluntarily disclose, in line with Ge and Zheng (2006). Time dummies were used for all regressions to control for time-series trends. The regression equation is specified as follows:

$$\begin{aligned} Fund\ Flow_{i,t} = & \beta_0 + \beta_1 Lowrank + \beta_2 Highrank_{i,t-1} + \beta_3 Disc * lowrank_{i,t-1} \\ & + \beta_4 Disc * midrank_{i,t-1} + \beta_5 Disc * highrank_{i,t-1} + \beta_6 Stddev_{i,t-1} \\ & + \beta_7 Logtna_{i,t-1} + \beta_8 Logage_{i,t-1} \end{aligned}$$

Fund flow measures the amount of money being put into a fund over a six-month horizon. Following Gruber (1996) and Zheng (1999), we calculate fund flows as a percentage of the beginning-of-period total net assets (TNA).

$$Fund\ flow = \frac{TNA_{i,t} - TNA_{i,t-1} (R + 1)}{TNA_{i,t-1}}$$

Each of the independent variables is explained in section 3.1.1 and 3.1.2, including *Lowrank* and *Highrank* in the regression acts as a control for the well-documented non-linear relationship between performance and fund flows (Chavalier & Ellison, 1997; Surri & Tufano, 1998). We include the control variables: short term volatility of a fund; fund size; age; and total expenses as

independent variables, as in Barber, Odean and Zheng (2005). The primary variable of interest is the disclosure indicator (*Disc*). If investors value disclosure, we should find a positive coefficient on *Disc*.

6. Results

6.1 The Determinants of Disclosure Decisions

In this section, we examine the relationship between fund characteristics and disclosure patterns to determine which fund characteristics are associated with voluntary disclosure. The determinants of a fund's disclosure choice provide insight into the potential effects of a mandated portfolio disclosure regime.

6.1.1 Descriptive Statistics

To examine the determinants of disclosure frequency, we begin by presenting basic descriptive statistics for the data apportioned as to whether the fund provides voluntary disclosure. Tables 1 and 2 provide a statistical comparison of funds that disclose with funds that do not disclose. In Table 2, Panels A and B represent the Australian sample, while Panels C and D represent the New Zealand sample. We report the following fund characteristics: standard deviation; total net assets; fund age; and expense ratios, and compare each of these characteristics based on a fund's disclosure choice. We report t-test results to indicate whether the differences in group means are statistically significant. Given that the expense ratio variable is only available for 2010, Panels B and D show results of regressions on 2010 data so that the expense coefficient can also be examined.

Our results for the Australian sample for the 2010 period in Panel B show a positive relationship between a fund's expense ratio and its choice to disclose portfolio holdings, significant

at less than one percent level. New Zealand funds show no significant results for expenses for the 2010 period, as seen in Panel D; this is probably due to the small sample size.

From here we will only refer to the 2005 to 2010 data set for the descriptive statistics, as it provides more reliable results with a longer time horizon than the results from the 2010 data set. Panel A shows that for Australian funds for the 2005 to 2010 dataset, funds that disclose have significantly lower standard deviation than funds that do not disclose. Results from New Zealand, as seen in Panel C, are in line with Australian findings and show that funds with lower short term variance tend to be more likely to voluntarily disclose.

The descriptive evidence shows that funds that voluntarily disclose are significantly larger than funds that do not disclose. This is the case in both Australia, as seen in Panel A, and in New Zealand, as seen in Panel C.

Lastly, Panel A shows that Australian funds which voluntarily disclose are older than funds that choose not to disclose. Panel C shows the opposite effect occurring in New Zealand, where funds that voluntarily disclose tend to be younger than funds that do not disclose.

6.1.2 Logistic Analysis

The descriptive statistics are interesting, but are insufficient to draw strong conclusions about the determinants of voluntary disclosure and to evaluate the relative importance of the various factors. Our results for the logistics analysis shown in Table 3 provide further evidence of the effect of a fund's size, age, standard deviation and expense ratio on the fund's disclosure choice.

Our evidence suggests that hypothesis 1, which states that funds with higher net assets are less likely to voluntarily disclose, cannot be accepted. On the contrary, both descriptive evidence and logit regression results in Table 3, Panel A for Australia and Panels D and F for New Zealand indicate that fund size is positively related to voluntary disclosure. The results in Panel F, using

2010 data from New Zealand, show no significant results for fund size, which is probably due to the small sample size of only 66 observations. Parida and Teo (2010) and Ge and Zheng (2006) find opposing evidence from the US that larger funds voluntarily disclose less frequently. The difference in our results may stem from the differences in the regulatory environments, while as the US requires mandatory quarterly disclosure New Zealand and Australia lack any portfolio disclosure regulations. Gallagher (2007) points out that fund managers complain about the implementation and compliance costs associated with portfolio disclosure. This suggests that funds in New Zealand and Australia may be faced with higher costs, for example system set-up costs, if they choose to disclose. The economies of scale enjoyed by larger funds could mean that it makes more economic sense for larger funds to disclose.

Evidence from the logistic analysis supports the acceptance of hypothesis 2, that funds that are older are less likely to choose to disclose. In Table 3, Panels A and B for the Australian sample and Panels D and E for the New Zealand sample show that the age of a fund, measured by days since inception, has a negative association with its decision to voluntarily disclose. Descriptive evidence offers further support for this hypothesis. Relationships between fund age and disclosure for 2010 samples, as seen in Panels C and F, show no impact, probably due to the much smaller sample size.

Our results also show some support for hypothesis 3, that funds that have returns with higher standard deviation could be less likely to disclose. Panel D shows that for the Australian sample, the higher the standard deviation of returns, the less likely it is for a fund to disclose. Funds may have incentives not to disclose if they have high standard deviation. Standard deviation is a measure of the difference between a fund's benchmark (based on the investment objective) and its actual returns, therefore high standard deviation may indicate that a fund's underlying holdings do not reflect their stated investment objectives. For this reason, fund managers with higher standard deviation have incentives not to disclose their portfolio holdings, as is reflected in

our results. However, the 2010 Australian sample in Panel C and evidence from New Zealand in Panels D, E and F contain no significant standard deviation coefficients.

The Australian market offers some evidence that hypothesis 4, stating that funds with higher expense ratios are less likely to disclose, cannot be accepted. In Table 3, Panel C, the expense ratio is showing as positive and significant for Australian funds in 2010. Unfortunately, data prior to 2010 is not available to be analysed. The evidence from Australia appears to be in contrast to the results from Ge and Zheng (2006) and Parida and Teo (2010), who find that funds which disclose more frequently than required have lower expense ratios. One reason this could be the case is the differences in regulatory environments between the US and New Zealand and Australia. Because all funds in the US must periodically provide holdings disclosures, every fund must have the systems in place to produce this disclosure. On the other hand, funds in Australia are not legally obliged to disclose; therefore, the funds that voluntarily disclose may be faced with higher expenses to cover the dissemination and systems costs of disclosure, which otherwise would not be imposed. The results for the New Zealand sample using 2010 data, as seen in Panel F, show no impact.

The possibility that funds may follow the same disclosure policy over time can potentially create a bias in the panel logit estimates. As a robustness check, we include the lagged disclosure variable in the logit regression, which is reported in Panel B for the Australia sample and Panel E for the New Zealand sample, in order to control for the stickiness of the disclosure policy. The positive coefficient of the disclosure variable for the Australian sample in Panel B provides evidence that the disclosure policy is likely to stay the same. For New Zealand, the coefficient of the lagged dependant variable in Panel E indicates a significant correlation between past and current disclosure policy. The results for both countries include the following: total net assets remain positive and significant, while reducing in magnitude; age retains the same sign although becoming significant; and standard deviation also retains the same sign but becomes insignificant. This indicates that the effects documented earlier are not entirely driven by the persistence in the

disclosure policy; however, results for fund age and standard deviation for Australia should be treated with some scepticism.

Overall, we find that that our results differ from those of Ge and Zheng (2006) and Parida and Teo (2010). This is most likely due to the unique regulatory environment in Australia and New Zealand, where there are no mandatory disclosure requirements. We find that in Australia and New Zealand, funds with larger net assets as well as funds that are younger are more likely to voluntarily disclose. Funds that disclose are conceivably the funds that suffer least from disclosure. If mandatory disclosure rules were applied, it could be the smaller and older funds that are most detrimentally affected. In Australia there is some evidence that funds with higher risk levels and higher expenses also have an increased likelihood of disclosing.

6.2 The Impact of Disclosure on Fund Returns

Risk-adjusted returns are important to investors, and the results from this section offer some insight into possible outcomes for returns if regulators were to establish a mandatory disclosure regime. The relationship between voluntary disclosure and fund performance broken down by return-rank in the previous period allows more information for differentiating between the information and agency effects in fund disclosure. Table 4 provides a summary of the regression estimate.

The results from Australia offer support for hypothesis 5, that voluntary disclosure has a detrimental effect on the performance of successful funds. In Panel A, we find a clear association between voluntary disclosure and fund performance. For the top 20 percent of funds, voluntary holdings disclosure is associated with significantly worse future fund performance. Among past winners, funds with voluntary disclosure underperform funds with no disclosure by 0.68 percent market-adjusted return per semi-annual period, or 1.36 percent per year. This finding offers support for the information effect, which is most relevant for funds with superior performance. As explained in section 3, the information effect is the cost of revealing a fund's proprietary information.

Our findings from the Australian sample suggest that hypothesis 6, that disclosure will have a neutral effect on the performance of mid-rank funds, cannot be rejected. Panel A shows that, for mid-rank Australian funds, we find no significant relationship between voluntary disclosure and fund returns. This result is consistent with the hypothesis that both the information effect and the agency effect take place for these funds and that neither of the two effects dominates.

Our evidence from Australian funds is consistent with hypothesis 7, that disclosure will have a positive effect on the performance of unsuccessful funds. For the bottom 20 percent of funds, our results show that voluntary disclosure is associated with significantly better fund performance. Among past losers, funds that disclose outperform funds that do not disclose by 0.25% per month, or 0.50% per year. This finding yields support for the agency effect as discussed in section 3.

The results from New Zealand in Table 4, Panel B, show no significant effect of disclosure on returns. The reasons for this could be the small sample size of 607 observations and/or an indication that less front-running and monitoring of investments occurs in New Zealand.

The relationships between disclosure and return documented for the Australian sample are robust to the inclusion of control variables, as seen in Table 4, Panel A. As expected, greater net assets are related to higher net return. Higher standard deviation is also related to increased net return. On the other hand, all coefficients for the New Zealand sample are insignificant.

A sub-period analysis was performed as a robustness check and revealed some interesting results. It is conceivable that the Global Financial Crisis, beginning in the second half of 2008, could have triggered a change in investors' attitudes towards disclosure. Around the same time, in December 2008, Bernie Madoff admitted to running one of the largest known Ponzi schemes in US history.¹³ The sub-period analysis segregates the data into two samples, from January 2005 to June 2008 and from January 2009 to December 2009. Results from the sub-period analysis are documented in Table 5. The sub-period analysis of Australian funds, as seen in Panel A, shows that the variable of interest, namely disclosure, did not have any significant effect on return in either

¹³ Prosecutors estimated the size of Madoff's fraud to be \$64.8 billion, affecting 4,800 clients.

period. This is surprising, as the results from the 2005 to 2010 sample showed significant effects from disclosure. The New Zealand sample shows that following the Global Financial Crisis, disclosure for low-rank funds had a positive effect on returns, significant at the 1 percent level. For the period prior to the 2008 events, we could not find significant results for disclosures' effect on returns, which is similar to the results for the entire period. This suggests that the agency effect is relatively more important after 2008, which could mean that after that time investors began to monitor funds more closely.

The two different relationships between voluntary disclosure and fund return for variously-ranked funds provide strong support for both the agency and information effect in Australia. Consistent with the agency effect, funds with poor past returns that do not disclose tend to underperform past losers who voluntarily disclose. These findings are robust to various performance measures. Findings for New Zealand in the 2005 to 2010 period show that disclosure has no impact on returns; however, the sub-period analysis suggests that disclosure has a positive association with returns following the GFC and Madoff events in late 2008.

6.3 The Effect of Disclosure on Money Flows

The results from this section offer insight into whether investors care about the disclosure of portfolio holdings, and therefore whether investors want regulation for mandatory disclosure. Ge and Zheng's (2006) research shows that the effect of disclosure on fund returns varies according to the rank of fund performance. We therefore break down the relationship between voluntary disclosure and fund money flows by return-rank, as investors may peruse and act on past performance. Table 6 provides a summary of the regression results.

The results from the Australian and New Zealand data samples provide mixed evidence for hypothesis 8, that funds which disclose will attract higher flows than funds that do not disclose. Panel A shows that, overall, voluntary disclosure for Australian funds has a negative impact on

money flows into the fund. On the other hand, money flows into funds are significantly higher for New Zealand funds that voluntarily disclose, as can be seen in Panel B. Further analysis reveals disparities between flows into high-rank funds and those into low-rank funds.

The evidence from Australian funds in Panel B shows a negative relationship between money flows into funds and disclosure for mid-rank funds. Coefficients for low-rank and high-rank funds are not significant, which may be due to a smaller sample size. While these two rankings cover only 20 percent of funds each, mid-rank funds account for 60 percent of funds. The negative relationship for mid-rank funds suggests that investors in Australian funds are concerned about opportunities for front-running, which portfolio disclosure provides, and is consistent with the information hypothesis. Results from section 4.1.3 show that Australians have reason to be concerned about front-running, but only for high-rank funds, where return is negatively affected for funds that disclose.

Panel D shows that New Zealand funds which disclose attract higher money inflows if they are high ranking. This is the opposite effect to that observed by Ge and Zheng (2006), who find that high-rank funds that disclose more frequently experience greater fund outflows. Considering the results in section 4.1.3, which indicate that fund returns are not affected by disclosure, the results begin to make sense. It is conceivable that investors in high-ranking funds are more active and/or more sophisticated; therefore, it is these investors who would be most interested in underlying holdings information. These investors would reward the disclosure by investing their money into the fund. For mid-rank and low-rank New Zealand funds, the results in Panel D show no impact on fund returns.

Results from the Australia sample are consistent with the previous research in the US market that the mutual fund flow-performance relation is highly convex (Brown, Harlow & Starks, 1996; Chevalier & Ellison, 1997; Del Guercio & Tkac, 2002). Table 6, Panel A shows that investors in Australian mutual funds flock to funds with superior past performance, yet do not punish poor performers by withdrawing assets. The coefficient for low rank is negative but not significant, while

the coefficient for high rank is positive and significant. Evidence from New Zealand in Panel B shows the opposite effect, with money being taken out of both underperforming and high-performing funds and put into mid-rank funds. This shows a significant disparity between investors' behaviour in the two countries.

The coefficient estimates on control variables in Table 6, Panels A, B, C and D are largely consistent with those documented in the literature. Total net assets, fund age and short-term fund volatility all show negative effects on fund performance, but the only statistically significant variable is fund age. The signs of the coefficients agree with Ge and Zheng's (2006) findings.

A sub-period analysis was performed as a robustness check and revealed some interesting results. Table 7, Panels A and B show that for the Australian 2005 to 2008 sample, disclosure had a negative relationship with money flows into mid-rank funds. For 2009 to 2010, the disclosure variable shows no impact for Australian funds, as seen in Panel B.

Table 7, Panel D shows that for the New Zealand sample, disclosure is more important to investors following the Global Financial Crisis (GFC) in late 2008, at least for investors into high-rank funds. Prior to the GFC, from 2005 to 2008, disclosure had a significantly negative effect on money flows into funds for low-rank and high-rank funds, as seen in Panel C. From 2009 to 2010, investors put significantly more money into funds that disclose and are defined as high-rank when compared to high-rank funds that did not disclose.

7. Conclusion

Our research was undertaken to examine the potential effects of a mandatory disclosure regime. The results have implications for: regulators for determining the potential effects of mandatory disclosure; investors, when making investment decisions into funds; and fund managers when making transparency choices. We analyse a sample of New Zealand equity funds and a

sample of Australian equity funds during the period 2005 to 2010. During this time frame, there is no requirement for mandatory disclosure of portfolio holdings and funds have the choice to voluntarily disclose. We examine the effect of voluntary disclosure to make predictions about the effect of a mandatory disclosure regime.

First, we perform a logit regression to determine the factors contributing to a fund's disclosure decision. We find that for both New Zealand and Australian funds, those with larger net assets, and funds that are younger, are more likely to voluntarily disclose. In Australia there is some evidence that funds with higher standard deviation and higher expenses also have an increased likelihood of disclosing. These results are robust to the impact of the stickiness of a fund's disclosure policy.

To examine the effect of increased transparency on fund returns, we carry out a panel regression on the datasets. Our results highlight the potential implications for performance if disclosure of holdings by funds in Australia and/or New Zealand were to become mandatory. Empirical evidence from the Australian sample demonstrates that high-rank funds (the top 20 percent of past performers) which do not disclose their holdings outperform funds that provide disclosure. This indicates that the information effect is dominating, as high-rank funds probably hold superior information which is exploited by front-running when released to the market. Therefore, investors in the top 20% of past performing funds would suffer from lower returns if disclosure was legally required.

In contrast, for low-rank funds, the agency effect seems to dominate the information effect in Australia. The bottom 20 percent of past performing funds that do not disclose are found to significantly underperform funds that offer voluntary disclosure. These results suggest that for investors who invest in the bottom 20% of performing funds, mandatory disclosure would boost returns and benefit the investors. Investigation into New Zealand funds shows that disclosure has no impact on returns, most likely due to the small sample size.

A sub-period analysis offers further insight into the potential effects of mandated disclosure. Each sample is divided into two groups: 1) before the Global Financial Crisis of late 2008; and 2) after the crisis. We find some interesting results for New Zealand, showing that after the Global Financial Crisis, disclosure has a positive effect on fund returns, while prior to this period disclosure shows no impact on returns.

we examine whether investors care about mandatory disclosure by examining the effect of disclosure on money flows into the fund. We undertake panel regressions for both the Australian and New Zealand samples. Some differences between the two countries emerge.

Our empirical evidence for the Australian sample demonstrates a negative relationship between money flows into funds and disclosure for mid-rank funds, showing that Australian investors punish mid-rank funds that disclose by removing their assets from the fund. The results show no impact on money flows for low-rank and high-rank Australian funds, probably due to smaller sample sizes. This finding suggests that investors in Australian funds are concerned about potential losses, such as those caused by front-running. For this reason they may not support a mandatory disclosure regime. However, concerns regarding the mid-rank funds appear to be misplaced, as our results show that it is only the top 20 percent of performing funds and not the mid-rank funds whose returns are harmed by disclosure. Results from the New Zealand sample show that high-rank funds that choose to disclose attract higher inflows. This shows that investors in the top 20 percent of New Zealand funds care about disclosure and reward it by investing more money into the funds.

A second sub-period analysis reveals differences in the way that disclosure influences investors' money flows following the Global Financial Crisis. The Australian sample shows that after the crisis, disclosure has had no impact on fund returns, while prior to it investors withdrew their money from mid-rank funds that chose to disclose. These findings suggest that investors in Australian funds may have not previously supported mandatory disclosure, while more recently the investors are ambivalent in this regard. Results from New Zealand offer evidence that investors in

New Zealand funds support mandatory disclosure, at least for high-rank funds. Prior to the crisis, investors removed funds from low-rank and high-rank funds that disclosed. In contrast, after the crisis, investors rewarded disclosure by high-rank funds by increasing money flows into the fund. This evidence clearly establishes that disclosure has become more important for New Zealand investors following the Global Financial Crisis.

To the best of our knowledge, this is the first paper that examines voluntary holdings disclosure in Australia and New Zealand. We believe that our results have implications for any introduction of portfolio holdings disclosure regulations. Policy makers will have to strike a balance between the potential advantages of disclosure, primarily stemming from the agency effect, with possible harmful side-effects coming from the information effect, which encourages activities such as front-running. If mandatory disclosure is introduced, the results of past studies suggest that the frequency will have to be selected carefully, as quarterly disclosure can significantly increase costs. If mandatory disclosure is introduced, the results of this study are important to investors because it is likely that the funds which choose to voluntarily disclose are the funds that will be the least harmed. For New Zealand, the funds that have chosen to disclose are younger and have larger net assets, while in Australia the funds choosing to disclose are also younger and with larger net assets; however, there is some evidence to suggest that in Australia disclosing funds have higher risk levels and greater expenses.

This study also provides insights for investors and fund managers about how to operate in the current environment. Investors and fund managers should consider that if they invest in one of the top 20 percent of Australian funds based on past returns and the fund discloses, its performance is likely to be impaired when compared to funds that do not disclose. On the other hand, if they invest in one of the bottom 20 percent of performing funds in Australia based on past returns and the fund discloses, the returns are likely to be better than for funds that do not disclose.

On balance, we believe that the introduction of a mandatory disclosure regime in Australia and New Zealand would represent a significant advancement for the industry and would benefit

investors. Our study shows that mandatory disclosure may create return benefits by allowing better monitoring of fund managers. Other important benefits are the enhanced ability for investors to improve asset allocation, monitor compliance with objectives, and track whether funds are engaging in portfolio manipulation. While there are obvious challenges and concerns such as front-running and free-riding, the potential benefits to investors outweigh these considerations. Regulators can rely on the experience of other countries such as the US as well as academic studies when considering the requirements for frequency of disclosure, lag period, and dissemination.

8. Limitations

Our research is limited by the relatively short time frame, 2005 to 2010, over which the study is conducted as well as by the small sample sizes, particularly for the New Zealand sample. We could not extend the sample window to include earlier periods, as prior to 2005 portfolio holdings data was not recorded in a centralised database. As time elapses and a larger recorded window becomes available, the accuracy of this research could potentially be enhanced by increasing the time period examined, thus extending the sample size.

Another research constraint is that the decision to disclose is an endogenous decision due to the voluntary nature of a fund's disclosure decision. It is conceivable that the funds which choose to disclose are the ones that will be the least affected by their decision. However, we still expect a statistical association between an endogenous decision to disclose and an exogenous decision to disclose, particularly if there are costs associated with switching between disclosure and non-disclosure.

9. References

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Table 1. Summary Statistics

The descriptive statistics are presented for Australian funds in Panels A and B and for New Zealand funds in Panel C and D. Panel A and C present results for the 2005 to 2010 period and Panels B and D present results for the 2010 sample. *Expense* is the fund's management expense ratio. *Stddev* is defined as the standard deviation of the previous 12 monthly market-adjusted fund returns. *Tna* is the net assets of the fund, calculated at the end of each six-month time period. *Age* is the age of the fund.

Panel A: Australian Fund Characteristics 2005-2010

Australia 2005 - 2010					
	Mean	Median	Std. Dev.	25%	75%
Expense (in %)					
Std Dev	1.58	1.20	1.37	0.72	1.94
TNA (millions)	116.18	13.26	401.99	2.96	65.7
AGE(yrs)	6.78	5.31	5.28	2.92	8.67

Panel B: Australian Fund Characteristics 2010

Australia 2010					
	Mean	Median	Std. Dev.	25%	75%
Expense (in %)	1.65	1.75	0.79	1.05	2.15
Stddev	1.19	0.85	1.03	0.54	1.41
TNA (millions)	108.65	14.65	389.58	3.61	65.7
AGE(yrs)	9.16	7.61	5.51	3.25	13.47

Panel C: New Zealand Fund Characteristics 2005 – 2010

New Zealand 2005 - 2010					
	Mean	Median	Std. Dev.	25%	75%
Stddev	2.23	1.96	1.40	1.25	2.93
TNA (in millions)	44.36	19.78	61.31	5.39	59.4
AGE (in years)	8.37	8.25	5.65	2.89	11.94

Table 1 continued

Panel D: New Zealand Fund Characteristics 2010

New Zealand 2010					
	Mean	Median	Std. Dev.	25%	75%
Expense (in %)	1.25	1.28	0.62	0.97	1.51
Std Dev	1.88	1.74	1.01	1.14	2.24
TNA (in millions)	50.31	21.86	84.15	6.76	58.0
AGE (in years)	9.25	6.46	6.11	3.25	13.57

Table 2. Voluntary Disclosure Versus No Disclosure

The descriptive statistics are presented for Australian funds in Panels A and B and for New Zealand funds in Panels C and D. Panels A and C present results for the 2005 to 2010 period. Panels B and D present results for the 2010 sample. *Expense* is the fund's management expense ratio. *Stddev* is defined as the standard deviation of the previous 12 monthly market-adjusted fund returns. *Tna* is the net assets of the fund, calculated at the end of each six-month time period. *Age* is the age of the fund.

Panel A: Descriptive Statistics for Australia Equity Funds 2005-2010

Australia 2005 - 2010				
	Disclosure (Mean)	No Disclosure (Mean)	Difference (Disclosure - no disclosure)	Two-sided p- value test
Expense (in %)				
Std Dev	1.54	1.63	-0.09	0.0000
TNA (millions)	147.80	81.26	66.53	0.0000
AGE(yrs)	6.23	6.98	-0.75	0.0000

Panel B: Descriptive Statistics for Australia Equity Funds 2010

Australia 2010				
	Disclosure (Mean)	No Disclosure (Mean)	(Disclosure - no disclosure)	Two-sided p- value test
Expense (in %)	1.77	1.66	0.11	0.0075
Std Dev	1.11	1.29	-0.18	0.0015
TNA (millions)	144.23	59.31	84.92	0.0001
AGE(yrs)	8.61	9.16	-0.55	0.0711

Table 2 continued

Panel C: Descriptive Statistics for New Zealand Equity Funds 2005-2010

New Zealand 2005 - 2010				
	Disclosure (Mean)	No Disclosure (Mean)	Difference (Disclosure - no disclosure)	value for two- sample t test*
Expense (in %)				
Std Dev	2.14	2.47	-0.33	0.0062
TNA (millions)	67.98	36.27	31.71	0.0000
AGE(yrs)	7.05	8.51	-1.46	0.0016

Panel D: Descriptive Statistics for New Zealand Equity Funds 2010

New Zealand 2010				
	Disclosure (Mean)	No Disclosure (Mean)	Difference (Disclosure - no disclosure)	Two-sided p- value test
Expense (in %)	1.07	1.38	-0.31	0.1825
Std Dev	1.62	2.03	-0.41	0.1153
TNA (millions)	84.61	30.71	53.90	0.0118
AGE(yrs)	8.43	9.37	-0.94	0.5569

Table 3. Determinants of the Decision to Provide Voluntary Disclosure

$$Prob(Voluntary\ Disclosure_{it}) = \beta_0 + \beta_1 Logtna_{i,t-1} + \beta_2 Logage_{i,t-1} + \beta_3 Stddev + \beta_4 Expense_{i,t-1}$$

This logit regression models the probability of an equity fund providing voluntary disclosure within a 6 month period. The sample consists of equity mutual funds from 2005 to 2010 and logit regression results are presented for Australian funds and New Zealand funds in Panels A and B and Panels C and D respectively. The dependant variable, *Voluntary Disclosure*, is a dummy variable and takes the value of one if a fund provides disclosure during each semi-annual time period and zero if they do not provide disclosure. *Expense* is the fund's operating expense ratio. *Logtna* is the natural logarithm of a fund's total net assets at inception. *Logage* is the natural logarithm of the age of a fund. *Standard deviation* is calculated over the previous 12 monthly market-adjusted returns. All of the independent variables are lagged by a semi-annual time period. Time dummies are included in the regression.

	Panel A: Australia 2005-2010		Panel B: Australia 2005-2010		Panel C: Australia 2010	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Lagged disclosure			3.991***	0.000		
Logtna	0.073***	0.000	0.052***	0.000	0.12***	0.000
Logage	-0.008	0.767	-0.054***	0.000	-0.02	0.862
Std Dev	-0.115***	0.000	-0.059	0.156	-0.14***	0.009
Expense					0.20**	0.024
Intercept	-1.198***	0.000	-2.850***	0.000	-1.72**	0.031
Observations	14,299		14,299		1162	
R ²	0.021		0.472		0.019	

***1 significance; **5% significance; *10% significance

	Panel D: New Zealand 2005 - 2010		Panel E: New Zealand 2005-2010		Panel F: New Zealand 2010	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Lagged disclosure			3.937***	0.000		
Logtna	0.393***	0.000	0.284***	0.005	0.687*	0.056
Logage	-0.855***	0.000	-0.732***	0.000	-0.803	0.366
Std Dev	-0.101	0.149	-0.131	0.160	-0.57	0.132
Expense					-0.381	0.663
Intercept	-3.265*	0.058	-2.284	0.250	-3.915	0.562
Observations	607		607		66	
R ²	0.156		0.48		0.177	

***1 significance; **5% significance; *10% significance

Table 4. The Impact of Voluntary Disclosure on Fund Returns

$$Excess\ Return_{i,t} = \beta_0 + \beta_1 Lowrank_{i,t-1} + \beta_2 Highrank_{i,t-1} + \beta_3 Disc * lowrank_{i,t-1} + \beta_4 Disc * midrank_{i,t-1} + \beta_5 Disc * highrank_{i,t-1} + \beta_7 Stddev_{i,t-1} + \beta_8 Logtna_{i,t-1} + \beta_9 Logage_{i,t-1}$$

This table reports the results of the panel regressions at the fund level. The sample consists of equity mutual funds from 2005 to 2010 and regression results are presented for the Australian funds dataset and the New Zealand funds dataset in Panels A and B and Panels C and D respectively. *Excess Return* measures the average monthly excess returns during the semi-annual period t using benchmark-adjusted return. *Disc* is a dummy variable, equal to one if the fund provides voluntary disclosure over the semi-annual time period and zero otherwise. *Expense* is the fund's management expense ratio. *Lowrank* is a dummy variable, equal to one if fund performance belongs to the bottom quintile and zero otherwise. *Midrank* is a dummy variable, equal to one if fund performance belongs to the 2nd to 4th quintiles and zero otherwise. *Highrank* is a dummy variable, equal to one if fund performance belongs to the highest quintile and zero otherwise. *Stddev* is the standard deviation of the past 12 monthly benchmark-adjusted returns. *Logtna* is the natural logarithm of total net assets. *Logage* is the natural logarithm of days since inception. All of the independent variables are lagged by a semi-annual time period. Time dummies are included in the regression and White's panel-corrected standard errors are used.

	Panel A: Australia		Panel B: New Zealand	
	Coefficient	P value	Coefficient	P value
Disc* lowrank	0.250***	0.003	2.260	0.147
Disc* midrank	0.050	0.585	0.510	0.500
Disc* highrank	-0.677***	0.003	-0.97	0.570
Lowrank	-0.689***	0.007	-1.35***	0.044
Midrank				
Highrank	0.643***	0.003	-0.97*	0.066
Logtna	0.044**	0.038	-0.17	0.362
Logage	0.118	0.170	-0.29	0.513
Std dev	0.289***	0.009	0.070	0.848
Intercept	-1.995***	0.001	3.680	0.417
Observations	14,282		607	
R ²	0.018		0.104	

*** 1 significance; ** 5% significance; * 10% significance

Table 5. Sub-Period Analysis: The Impact of Voluntary Disclosure on Fund Returns

$$\text{Excess Return}_{i,t} = \beta_0 + \beta_1 \text{Lowrank}_{i,t-1} + \beta_2 \text{Highrank}_{i,t-1} + \beta_3 \text{Disc} * \text{lowrank}_{i,t-1} + \beta_4 \text{Disc} * \text{midrank}_{i,t-1} + \beta_5 \text{Disc} * \text{highrank}_{i,t-1} + \beta_6 \text{Stddev}_{i,t-1} + \beta_7 \text{Logtna}_{i,t-1} + \beta_8 \text{Logage}_{i,t-1}$$

This table reports the results of the panel regressions at fund level. The sub-period analysis provides regressions for two samples from New Zealand and two samples from Australia, covering the periods January 2005 to June 2008 and January 2009 to December 2010. Excess Return measures the average monthly excess returns during the semi-annual period t using benchmark-adjusted return. *Disc* is a dummy variable, equal to one if the fund provides voluntary disclosure over the semi-annual time period and zero otherwise. *Expense* is the fund's operating expense ratio. *Lowrank* is a dummy variable, equal to one if fund performance belongs to the bottom quintile and zero otherwise. *Midrank* is a dummy variable, equal to one if fund performance belongs to the 2nd to 4th quintiles and zero otherwise. *Highrank* is a dummy variable, equal to one if fund performance belongs to the highest quintile and zero otherwise. *Stddev* is the standard deviation of the past 12 monthly benchmark-adjusted returns. *Logtna* is the natural logarithm of total net assets. *Logage* is the natural logarithm of days since inception. All of the independent variables are lagged by a semi-annual time period. Time dummies are included in the regression. White's panel-corrected standard errors are used.

	Panel A: Australia 2005 - 2008		Panel B: Australia 2009-2010		Panel C: New Zealand 2005-2008		Panel D: New Zealand 2009-2010	
	Coefficient	P value	Coefficient	P value	Coefficient	P value	Coefficient	P value
Disc* lowrank	-0.117	0.390	-0.518	0.130	-0.925	0.707	3.809***	0.001
Disc* midrank	0.071	0.460	-0.318	0.104	-1.296	0.225	1.084	0.213
Disc* highrank	0.051	0.774	-0.250	0.469	-0.714	0.826	-0.167	0.949
Lowrank	-7.148***	0.000	0.342	0.265	-1.673**	0.045	-1.435	0.215
Midrank								
Highrank	-1.144***	0.002	-2.018***	0.000	-0.714	0.826	-0.222	0.905
Logtna	-0.014	0.475	0.066*	0.079	-0.266	0.283	0.385	0.216
Logage	0.085	0.141	0.279**	0.014	-0.76	0.327	-1.247*	0.054
Std dev	1.107**	0.000	0.836***	0.000	0.358	0.365	0.138	0.812
Intercept	-3.74	0.369	0.080***	0.000	8.525	0.210	7.250	0.298
Observations	7,147		5,099		280		261	
R ²	0.458		0.080***	0.000	0.113		0.146	

*** 1 significance; ** 5% significance; * 10% significance

Table 6. The Impact of Voluntary Disclosure on Money Flows

$$Fund\ Flow_{i,t} = \beta_0 + \beta_1 Lowrank + \beta_2 Highrank_{i,t-1} + \beta_3 Disc * lowrank_{i,t-1} + \beta_4 Disc * midrank_{i,t-1} + \beta_5 Disc * highrank_{i,t-1} + \beta_6 Stddev_{i,t-1} + \beta_7 Logtna_{i,t-1} + \beta_8 Logage_{i,t-1}$$

This table reports the results of the panel regressions at the fund level. The sample consists of equity mutual funds from 2005 to 2010 and regression results are presented for Australian funds and New Zealand funds in Panels A and B and Panels C and D respectively. *Fund flow* is calculated as a percentage of the beginning-of-period total net assets. *Disc* is a dummy variable, equal to one if the fund provides voluntary disclosure over the semi-annual time period and zero otherwise. *Lowrank* is a dummy variable, equal to one if fund performance belongs to the bottom quintile and zero otherwise. *Midrank* is a dummy variable, equal to one if the fund performance belongs to the 2nd to 4th quintiles and zero otherwise. *Highrank* is an indicator variable, equal to one if fund performance belongs to the highest quintile and zero otherwise. *Logtna* is the natural logarithm of total net assets. *Logage* is the natural logarithm of the age of a fund. *Stddev* is defined as the standard deviation of the previous 12 monthly market-adjusted fund returns. All regressions using pooled data include time dummies and panel-corrected standard errors.

	Panel A: Australia		Panel B: Australia		Panel C: New Zealand		Panel D: New Zealand	
	Coefficient	P value	Coefficient	P value	Coefficient	P value	Coefficient	P value
Disc* lowrank			0.019	0.992			0.091	0.434
Disc* midrank			-2.569**	0.034			0.072	0.396
Disc* highrank			-1.529	0.507			0.585**	0.019
Disclosure	-1.72*	0.088			0.159*	0.075		
Lowrank			-0.254	0.781			-0.155*	0.065
Midrank								
Highrank			3.568*	0.087			-0.086	0.351
Logtna	-0.486	0.121	-0.504	0.038	-0.098**	0.033	-0.102**	0.026
Logage	-3.017***	0.000	-2.952***	0.170	-0.045	0.538	-0.048	0.482
Std dev	0.096	0.780	-0.356	0.417	-0.013	0.471	-0.016	0.363
Intercept	33.26**	0.000	33.349***	0.000	2.034***	0.000	2.216***	0.000
Observations	8,628		8,628		369		369	
R ²	0.011		0.010		0.071		0.090	

*** 1 significance; ** 5% significance; * 10% significance

Table 7. Sub-Period Analysis: The Impact of Voluntary Disclosure on Fund Money Flows

$$Fund\ Flow_{i,t} = \beta_0 + \beta_1 Lowrank + \beta_2 Highrank_{i,t-1} + \beta_3 Disc * lowrank_{i,t-1} + \beta_4 Disc * midrank_{i,t-1} + \beta_5 Disc * highrank_{i,t-1} + \beta_6 Stddev_{i,t-1} + \beta_7 Logtna_{i,t-1} + \beta_8 Logage_{i,t-1}$$

This table reports the results of the panel regressions at fund level. The sub-period analysis provides regressions for two samples from New Zealand and two samples from Australia, covering the periods January 2005 to June 2008 and January 2009 to December 2010. Fund flow is calculated as a percentage of the beginning-of-period total net assets. *Lowrank* is a dummy variable, equal to one if fund performance belongs to the bottom quintile and zero otherwise. *Midrank* is a dummy variable, equal to one if the fund performance belongs to the 2nd to 4th quintiles and zero otherwise. *Highrank* is an indicator variable, equal to one if fund performance belongs to the highest quintile and zero otherwise. *Disc* is defined as an indicator variable, equal to one if the fund provides quarterly disclosure during the semi-annual period and zero otherwise. *Expense* is the funds indirect cost ratio. *Logtna* is the natural logarithm of total net assets. *Logage* is the natural logarithm of the age of a fund. *Stddev* is defined as the standard deviation of the previous 12 monthly market-adjusted fund returns. All regressions using panel data include time dummies and White's panel-corrected standard errors.

	Panel A: Australia 2005-2008		Panel B: Australia 2009-2010		Panel C: New Zealand 2005-2008		Panel D: New Zealand 2009-2010	
	Coefficient	P value	Coefficient	P value	Coefficient	P value	Coefficient	P value
Disc* lowrank	0.116	0.969	-0.078	0.976	-0.119*	0.099	0.192	0.213
Disc* midrank	-3.363*	0.052	-1.668	0.269	-0.041	0.524	0.132	0.154
Disc* highrank	0.681	0.820	0.210	0.936	-0.301**	0.048	.652***	0.005
Lowrank	-0.654	0.794	-0.334	0.886	0.014	0.869	-0.103*	0.063
Midrank								
Highrank	.681***	0.006	-0.333	0.890	0.072	0.617	-0.024	0.681
Logtna	0.268	0.419	-0.819***	0.006	0.000	0.986	0.106**	0.025
Logage	-4.627	0.000	-2.614***	0.000	-0.136***	0.002	-0.084**	0.012
Std dev	-0.722	0.424	-0.185	0.652	-0.038	0.160	-0.027	0.122
Intercept	31.160***	0.000	33.658***	0.000	1.133***	0.000	2.556***	0.001
Observations	3,876		3,708		93		226	
R ²	0.018		0.009		0.150		0.265	

*** 1 significance; ** 5% significance; * 10% significance