# A comparison of the returns of 'Regulation 28' compliant and non-compliant Funds in South Africa

by

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I hereby declare that I have read and understood the regulations governing the submission of Master of Commerce dissertations, including those relating to length and plagiarism, as contained in the rules of the University, and that this dissertation conforms to those regulations.

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## Abstract

The shift from defined benefit to defined contribution plans has exposed pensioners to a number of new risks which the South African government has been encouraged to mitigate through the aggressive implementation of retirement fund regulations. This study specifically focuses on the effect of asset allocation restrictions. The effect of these regulations is critically evaluated by comparing the long-term effects of both excess returns and risk-weighted returns of Regulation 28 compliant funds, to fully discretional non-compliant portfolios.

With a population of 27 compliant funds and 21 non-compliant funds, it was found that while mean excess long-term return of non-compliant funds consistently outperforms compliant funds, there is no significant statistical difference between the two data sets. Additionally, while regulations successfully reduce the variation of excess returns of the compliant funds relative to the non-compliant funds, and the mean risk-weighted performance of compliant funds consistently outperformed non-compliant funds during the latter parts of the scoped period, no significant statistical difference was identified between compliant and non-compliant investment funds.

# Contents

# Introduction

Retirement fund regulations have been a controversial area of global industry practice for a number of years, since first implemented in the early sixties. Fundamental reforms of these regulations are currently being proposed and implemented in several jurisdictions including, most recently, South Africa. These reforms have been implemented with the intention of protecting both government and privately managed retirement benefit schemes from drastic volatility spikes, and to ensure long-term, sustainable growth of all members' benefits. These reforms have not been without opposition, with many arguing that they would result in a number of negative, unintended consequences which may potentially mitigate any benefits obtained.

While there is no doubt that retirement regulations theoretically hold a number of benefits, Srinvas (1999), Queisser (1998) and Quintyn (2002) believe that their aggressive implementation may potentially stifle real returns and have a negligible effect on return volatility. They argue that these regulations distort incentives of fund managers, increase administration costs and limit member choice and portability in the short term. These forms of 'over regulation' are particularly evident in emerging nations, as these governments are more wary of the lack of education and experience of trustees, and the risks associated with certain types of developing investments and markets (Shah, 1997).

The objective of this paper is to compare and contrast both the quantum and variability of returns of regulated funds (which are a proxy for the effects of regulation) against unregulated funds as the control group, over a long-term investment horizon.

This paper analyses the relevant global literature, and provides an overview of the South African retirement industry, insight into the risks that the regulations are aiming to address and the challenges faced by the various regulatory bodies. The effect of regulation on both the return and volatility of funds will be evaluated, by comparing South African multi-asset, balanced compliant unit trusts to fully discretionary, multi-asset non-compliant unit trusts, over 10-year rolling investment periods. The results obtained will be compared to the literature discussed, with specific findings being discussed further.

Based on the literature reviewed and South African findings, an inference will be drawn as to whether regulations imposed on South African retirement funds are in the best interest of members in the long-run, or whether the limitation of certain asset classes or investments may limit the long-term potential return of a fund. Additionally, any limitations of this study will be noted, along with any recommendations for future studies.

# 3. Literature Review

## 3.1 Introduction

There are two types of fund schemes present in South Africa - defined contribution schemes, whereby an employee's benefit will be based on the accumulation of contributions and investment returns over time; and a defined benefit schemes, whereby benefits are based on a combination of years of annual service and salary at the date of retirement.

During the previous two decades, defined contribution schemes have become more common in South Africa as they shift the risk of underperformance from the employer to the employee. Most employers have attempted to shift their employees from defined benefit to defined contribution schemes, to protect themselves from the risk of underperformance. This has also resulted in defined contribution funds becoming employers' default choice for newly created funds, and defined benefit funds being phased out over time. Defined contribution and defined benefit funds have their own distinctive risks. Although defined contribution schemes are fully funded, the risk to the members lies in the management of the underlying assets of the fund, with benefit pay-outs on retirement being based on the accumulated member contributions and investment returns over the entire membership period. On the other hand, the risk associated with defined benefit schemes relates to the asset-liability funding levels within the fund. The shift towards defined contribution schemes has resulted in members of traditionally defined benefit retirement funds being exposed to a number of new investment preservation related risks. These risks specifically relate to loss due to investment choice and market movements; and loss due to premature withdrawal and wastage prior to retirement age. In an attempt to mitigate these risks, governments have been forced to preserve and protect members' retirement savings by implementing more rigorous legislation which strictly controls the industry's structure, participants and investment choices.

Srinivas, Whitehouse, & Yermo (2000) outline the three main retirement fund regulatory objectives as follows:

- To provide the freedom of choice in selecting suitable retirement funds
- To maintain healthy competition and portability between funds, in order to provide reasonable pension benefits; and
- To limit risk through appropriate diversification and limitations.

Within a South African context, it appears that in practice these objectives are seldom met. While local regulations have predominantly focussed on asset allocation and industry structure, additional

structural limitations have compelled employees either to be members of a specific fund based on an *employers'* choice, or to become stuck in a particular fund due to portability constraints.

The remainder of this paper will focus on the third retirement objective above, relating to the limitation of risk through diversification and various asset selection restrictions. This objective is mainly addressed through the implementation of set asset allocation limits that are tightly monitored and controlled. While there is a large amount of global commentary surrounding the theoretical impacts and effects of this objective, a dearth of research exists that attempts to practically evaluate the long-term impact of this objective on retirement fund's excess and risk-weighted returns either locally or abroad.

One study that contains a small component of the above concern is a separate study performed by Srinvas and Yermo (1999), on a sample of Latin American jurisdictions. This study concluded that short-term risk-adjusted performance of certain jurisdictions' funds was adversely affected as a result of the implementation of strict investment regulation in the 1980's. Once this investment regulation was subsequently relaxed towards the 1990's, risk-adjusted returns improved significantly when compared to the benchmark. By reducing the severity of asset restrictions and allowing portfolio managers to construct a more balanced portfolio, risk-weighted returns were enhanced.

Furthermore, South African retirement fund legislation has recently been updated to require retirement fund managers to ensure that their funds not only comply with asset allocation restrictions on an overall fund level, but also comply on an individual member level. This change has resulted in the further limitation of individual investment choice, and increased the direct impact of asset allocation restrictions on the long-term effect of many retirement members' investment growth.

The rest of this literature review assesses the development of the South African retirement industry and identifies motivations for introducing stricter industry regulation in recent years. The important risks of the retirement industry are explored and various methods of mitigating these risks are outlined. Finally the difficulties encountered in implementing these methods are discussed to highlight the challenging cost versus benefit debate surrounding the regulation conundrum that currently faces the South African regulatory authorities.

## 3.2 The South African Retirement Fund Landscape

The South African retirement fund industry has developed significantly in recent years. While much change has already occurred, many stakeholders believe that greater change is still to come with increased reform, supervision and regulations to be imposed in the foreseeable future (PWC, 2014).

Countries and regions around the world have adopted a number of varying models to approach the regulation conundrum of the investment environment, depending on the stage of development of the private pension sector, as well as the historical and cultural conditions of the region. In South Africa, the majority of Retirement Fund regulations are determined and imposed by the Financial Services Board (FSB). The FSB aims to protect the investing community by enforcing compliance with relevant legislation, thereby ensuring a sound financial investment environment within South Africa.

The South African approach to Investment regulation is similar to the Latin American approach, whereby a separate agency is set up exclusively to monitor and maintain responsibility for investment supervision. However, an effective regulatory system cannot be entirely reliant on a single, isolated regulatory organisation, but also requires dependable and effective supervision in other areas of the financial sector, such as securities exchange, currency control and insurance (Queisser, 1998). Over the past two decades, South Africa has developed a strong financial investment environment with a well regulated securities exchange and sound banking system (Tuomi, 2011). This justifies South Africa's approach of delegating retirement investment supervision to a broader financial service regulatory agency such as the FSB, as this avoids the shortcomings of focussing too narrowly on a single area of regulation, while reaping the benefits from South Africa's sound financial services environment.

In terms of South African legislation, the Minister of Finance can impose various restrictions on the amount and extent to which retirement schemes may invest in certain types and classes of assets. In South Africa, these investment regulations are referred to as Regulation 28. Regulation 28 specifies how South African retirement funds may manage their assets, with the aim of ensuring long-term, sustainable and non-volatile growth. Over the past 10-years these regulations have become increasingly defined, with further stringent limitations being imposed. Continuous updates and improvements to the Regulations are being proposed by interested stakeholders. Regulation 28 aims to improve the transparency and accountability of those charged with governance, by incorporating a number of principles that strengthen the decision making process of the Trustees.

The main tool of the Regulators is the ability to regulate asset allocation limits. Asset allocation limits aim to restrict the exposure of a portfolio of assets by increasing the level of diversity within the fund. This leads to the discouragement of investment in riskier assets within the fund portfolio. However this strategy requires careful consideration, as the limitation of certain asset classes or investments may limit the long-term potential return of a fund.

Growth in South African retirement fund investments is particularly important in order to encourage a saving mentality among citizens. While certain juristic entities in South Africa are saving, individual South Africans are not. Low domestic savings rates in South Africa lead to lower growth, and increase the risk of falling into a 'growth trap' (Aron & Muellbauer, 2000). Retirement funds that show long-term, positive, real returns would theoretically encourage South Africans to increase savings rates, and promote a culture of saving for future generations. A growing retirement fund industry also plays a vital role in reducing social equity burdens, reducing social inequality, improving fiscal discipline, developing local markets and boosting long-term real growth of the economy (Shah, 1997).

## 3.3 Motivation for Regulation

Quintyn et al (2002) outline three broad motivations for government regulation of financial markets. The three main reasons are as follows:

1. Monopolistic exploitation – monitoring of market participants allows regulators to maintain control and ensures natural competition by enabling markets to remain at a competitive balance.
2. Stability of markets – proper regulations, that consider all stakeholders equally, can play a key role in maintaining financial stability across numerous sectors and significantly contribute to the public good in a utilitarian manner.
3. Protection of individuals – a framework of rules is able to help prevent excess, reduce agency costs and avoid failures of a market that is left entirely to its own devices.

Additionally, regulators aim to mitigate the risk relating to the principal-agent dilemma, whereby managers may invest members' monies with the intention of optimising a personal agenda rather than the members' best interests.

With respect to fund returns and risk, protection of individuals is the major motivation. Strict asset allocation rules promote diversification, limit investment in highly volatile instruments and theoretically reduce the risk of the portfolio. While potentially stifling long run returns, asset allocation restrictions drastically reduce the risk of significant, radical loss due to market failure and poor investment decisions. This ultimately results in the monies contributed by members being invested prudently and in turn protecting their long-term interests.

The remaining motivations are still relevant to the South African retirement fund industry, and various structural regulations are applied in order to address these objectives. For more detail, refer to appendix B and C.

## 3.4 Pension Fund Risks

While a few individuals may be able to accumulate wealth without the assistance of a pension scheme, the majority of South Africans do not have the expertise and financial self-control to effectively plan for their retirement. The legacy of Apartheid on the investment in historical education for the majority of South Africans has resulted in a significant portion of the aging population of South Africa being poorly educated (Chisholm, 2012). Hamilton and Clemens (1999) show that education is one of the essential building blocks that increases human capital and ultimately leads to improved genuine savings rates by individuals. As retirement funds are long-term contracts that encompass a relatively high percentage of most retiree's net wealth, the risk of drastic loss involves economic, financial and social implications. Accordingly, the risk of loss in the retirement fund arena requires careful management and consideration.

Prior to 2007, many members – despite numerous warnings from prior research – focussed predominantly on returns. However, after the financial crisis, the focus shifted drastically towards risk management (Powell, 2009). This shift of focus was mirrored by the regulatory bodies, with regulations imposed placing more emphasis on risk management relative to absolute returns earned by the industry participants.

Traditionally, pension fund trustees have defined pension fund risk as the trade-off between the returns earned and the volatility of these returns. However, within the defined benefit space, absolute returns are not the only consideration, as trustees are specifically tasked with ensuring the fund's assets are sufficient to meet all future liabilities payable by the fund. While a conservative approach to asset management may result in low but stable returns, this approach may not necessarily result in the value of the assets maintaining parity with the future liabilities of the fund (Arnott, Bernstein, & Hall, 1991). The situation of the fund being 'underfunded' may result in members not being able to receive their necessitated pension in terms of the rules of the fund.

Srinvas et al outlines the three major areas of pension fund risk as the following:

- Systematic market risk
- Systemic risk
- Agency risk.

*Systematic market risk*

Systematic risk is the risk that is inherent across the entire market and is impossible to mitigate entirely. While systematic risk can be mitigated to some degree through a diverse asset allocation, investors are unable to avoid systematic risk in its entirety. Although an argument exists that systematic risk can be further mitigated through the use of inter-generational risk-pooling or the pooling of returns across time, the majority of these policies are not readily traded in South Africa. Additionally, the relatively long-term nature of these strategies, together with the threat of market crisis, deters investors from these products (Srinivas, Whitehouse, & Yermo, 2000). There is a strong argument that the efficient implementation of government intervention, such as the guaranteeing of a certain percentage of pensioners monies, can further mitigate this risk. However, this approach may not be the best option as these guarantees create a moral-hazard - investment managers may take excessive risks in order to meet performance targets, knowing that the pensioner's money is underwritten by the government. These guarantees may mitigate one type of risk, but may increase other types (Chang, 2000).

*Systemic Risk*

Systematic risk refers to the collapse of a critical component of the financial system that may ultimately lead to the downfall of the entire system. Capital markets are dependent on the efficiency and faith in the banking and financial system. South Africa is fortunate in that it is reasonably insulated from global banking risks as it has relatively stringent, well-developed accounting and banking standards. In addition, South Africa's financial service sector compares favourably with most industrialised countries, and is backed by a sound regulatory and legal framework (The Banking Association of South Africa, 2012). According to the World Economic Forum Competitive Survey, South African banks are rated 2$^{nd}$ out of 144 for soundness of banks and rated 1$^{st}$ for regulation of securities exchanges (Schwab & Sala-i-Martin, 2012). These factors result in systemic risk in the South African Financial Services industry being considerably less than many other jurisdictions. This was particularly evident during the Subprime Crisis. South Africa's strict regulations and strong bank supervision ensured that local Banks remained well capitalised as they were shielded from any direct exposure to the troubled debt market in the United States (Kahn, 2012).

*Agency Risk*

Agency risk refers to the risk that an agent will use their authority or power to benefit themselves rather than the stakeholders. This risk is often mitigated at a market level and at an individual retirement fund level. Agency risk is addressed via a number of prudential control mechanisms, including: stringent accounting policies; disclosure and standard setting; strict conflict of interest limitations; and strong minimum levels of diversification of asset allocation (Srinivas, Whitehouse, & Yermo, 2000). South Africa is supported by relatively strong prudential controls over not only the retirement fund industry, but also the financial services industry as a whole. This results in the mitigation of the above risk at both a specific fund and overall industry level, and ultimately leads to a strong regulatory culture within the South African landscape.

## 3.5 Difficulties in Pension Fund Regulation

Types of regulations imposed depend on the types of retirement scheme structures within a particular country. South Africa's retirement fund industry consists of both Defined Contribution (DC) and Defined Benefit (DB) plans, and regulations have been designed to be applied consistently across both fund types. During the past two decades there has been a drastic shift away from DB plans towards DC plans, in an attempt to transfer the obligation and responsibility of fund performance from the employer to the employee. As such, employees are becoming increasingly exposed to financial markets, and retirement savings are subject to greater variability than before (Broadbent, Palumbo, & Woodman, 2006). This has resulted in the increased importance of, and further emphasis being placed on retirement funding regulations. DC plans are easier to regulate as they are fully funded, and do not require additional regulations to govern the continuous assessment of funding level adequacy, as with DB funds. DC plans in South Africa operate similarly to Unit Trust investments, as they are confined to a highly regulated environment, and have the objective of managing assets in accordance with a risk-based mandate, with the ultimate aim of achieving the highest possible risk-constrained, long-run return.

DB plans are more difficult to regulate than DC funds, as the employer commits to provide a certain benefit to the member upon retirement. Regulators therefore have to ensure that funding levels remain appropriate, to enable the fund to meet obligations to members in the foreseeable future. These regulations are particularly important as they serve a dual purpose of protecting the rights of the members, as well as influencing the investment strategies of the retirement fund trustees.

Regulatory bodies also face challenges with regards to the portability of DB members' benefits, when a member transfers from one fund to another. These transfers are normally case-specific and regulators have found it challenging to implement all-encompassing principles that can be applied consistently. With DC plans, these challenges do not exist, as the members are entitled to their share of the accumulated fund balance at the date they exit the fund.

Regulators also have to ensure that appropriate insurance is taken out by all funds under their umbrella of supervision. This is more complex for DB schemes, as sufficient insurance needs to be taken out such that members can be paid out their benefits per the rules of the fund, whereas DC fund are only required to be insured against fraud and mismanagement of the plan.

## 3.6 Regulatory approaches

There are two main schools of thought regarding pension fund regulatory: the 'prudent person' principle and the draconian approach.

The 'prudent person' principle is not a set of strict rules that are enforced, but rather a set of principles imposed on fund managers. These principles attempt to encourage trustees to invest fund monies based on the best interests of the members of the fund, while encouraging trustees to make investment decisions with appropriate care, skill and diligence. Under this approach, regulators do not specify which assets a fund may invest in. Rather the behaviour of the fund is monitored and assessed as to whether it is being managed in an appropriate manner. In most countries where the 'prudent person' approach is applied, including South Africa, trustees are required to document an investment strategy which explicitly details the investment structure targets that the fund aims to implement. This strategy document will be approved by the regulatory body, and compliance with this strategy will be monitored by the regulator on a continuous basis.

The draconian approach is a far stricter approach and consists of a number of rules and restrictions imposed by regulators on the industries' market participants, structure, investment policies and performance. These restrictions usually include quantitative limits with respect to asset allocation on class, issuer and geographical level. These rules are strictly enforced by regulators, and any breaches thereof require separate approval by the regulator, or the regulator needs to take remedial action.

Vittas's (1998) early research into these two distinctive regulatory approaches concluded that Draconian regulations are more appropriate in countries with mandatory pension plans and less developed financial markets. Conversely, the 'prudent person' approach was more appropriate in

countries with voluntary pension plans and well developed financial markets. Vittas determined that all countries should adopt the 'prudent person' approach once their economic system and financial markets had become more developed. This conclusion was echoed by Rocha, Hinz and Gutierrez (1999), who evaluated the regulatory approach taken by countries in the OECD, Latin America and the Anglo-Saxon nations. Likewise, they concluded that over time, once an emerging market becomes more developed, it is preferable for the nation to adopt the 'prudent person' approach, in order to maximise returns to members in the long run.

South Africa has adopted a combined approach, whereby both Draconian rules and 'prudent person' principles are applied. This has resulted in a fairly highly regulated industry relative to other jurisdictions. A combined approach aims to ensure simplicity in the industry, and to improve transparency to all major stakeholders. A strong regulatory approach assists the industry in gaining public trust, and provides adequate safeguards for avoiding failures within the retirement system (Vittas, 1998). However, an argument exists that over-regulation may introduce a number of unintended consequences, which ultimately could be to the detriment of the member.

## 3.7 Types of regulation

### Regulating industry structure

In a South African context, the Retirement Fund industry is regulated in terms of the Pension Funds Act of 1956, and compliance with this act is monitored and controlled by the FSB. The FSB promotes a safe and stable environment, so that the interests of all stakeholders can be met in a timeous and responsible fashion. The FSB is directly responsible for the licensing and registration of funds and fund administrators, the monitoring and supervision of funds, the surveillance and enforcement of rules and complaints, and research into new legislation *(Financial Services Board of South Africa, 2014)*.

The Financial Services Board specifically restricts the industry's structure in the following ways:

- In terms of S13B of the Pension Funds Act, the administration of funds is restricted to certain approved administrators.
- The asset managers in which a fund may invest need to be registered with the FSB as a 'financial services provider' in terms of the Financial Advisory and Intermediary Services (FAIS) Act.
- All fund rules need to be approved by the FSB.

- All funds are required to appoint a valuator to monitor asset-liability matching, and are subject to an annual audit, both of which need to be performed by approved third parties.
- Compulsory, regular training of fund trustees is required to ensure they maintain an appropriate level of knowledge in order to make educated and informed decisions.
- Funds must develop and comply with a formal Investment Policy Statement, which details the investment strategy and asset limitations within the fund.

South African schemes are offered by a number of administrators. However, there are neither regulations limiting the number of funds administered by each manager, nor regulations limiting other activities performed by these providers. Some schemes are administered directly by the employer, whereas others are administered by a third party administrator. Most of the large institutional administrators offer both in-house umbrella funds, as well as the administration of private funds on behalf of employers. The private pension fund administration industry is noticeably diversified within South Africa, with approximately 98 different entities administering private funds, and an additional 45 companies that administer their own employee's funds (Financial Services Board of South Africa, 2014). For further insights into the rationale and potential consequences of structural regulations, refer to appendix B and C respectively.

## Regulating asset allocation

The regulation of asset allocation limits in terms of Regulation 28 in South Africa are tightly monitored and controlled. The tools employed to restrict asset allocation are as follows:

- Limits based on asset class (limits as to the percentage of the fund invested in equity, bonds, cash etc.).
- Limits based on asset geographical location (local vs. foreign investment)
- Limits based on a per issuer level (limits as to the amount that can be invested in one institution)
- Limits based on security level (limits as to the amount that can be invested in one instrument)

Appendix A sets out a comprehensive summary of Regulation 28's asset allocation limits.

Similar to legislation in many other developing countries, Regulation 28 does limit concentration of ownership in a particular company. However there are no limits restricting investments in unrated/'junk rated' instruments. Additional guidelines are provided to encourage trustees to invest members' money responsibly with the aim to earn adequate risk-adjusted returns to meet the specific

members' profile, liquidity needs and future liabilities (Girdwood, 2013). These guidelines act as a disincentive to invest too aggressively in these higher risk instruments.

The above rules are a type of prudential regulation. In addition to these prudential rules, Regulation 28 imposes a number of other constraints and principles. These principles were developed in consultation with a number of stakeholders, and outline the way in which trustees should act, and the considerations that they should contemplate whilst managing members' money. The main aim of these new principal-based guidelines is to encourage trustees to take ownership of the funds under their care, and to take a responsible investment approach that is in the best interest of the members and the country as a whole. A more detailed list of these considerations is included in Appendix A.

Over time, investment limitations in the retirement fund industry have relaxed. Limitations in equities and foreign assets have increased, whereas investments that were previously prohibited (such as illiquid private equity, derivatives and real estate) have since been approved. This has allowed funds to invest in a larger variety of asset classes, and has also created a large capital injection into these developing areas of the South African investment landscape (Loubser, Viviers, & Andrea, 2013). These investments are also well suited to younger members who wish to increase their returns within the fund, by choosing the higher risk life stage options. Additionally, other members are now afforded an opportunity to diversify their portfolios away from purely listed equities and debt. The relaxation of historically stricter asset allocation limits allow portfolio managers to construct more balanced portfolios, and potentially reduce the severity of negative consequences of asset allocation limitation.

### *Rationale of asset allocation regulation*

The most prominent argument in favour of the strict regulation of asset limits is threefold - to control the investment policy of the trustees; to limit the volatility of capital flows; and to achieve stability of returns within the fund (Fontaine, 1997). Stability of returns within a pension fund is more important than in other funds, as members do not always have the choice of when they exit the fund due to fixed retirement ages, retrenchment, disability or death. If the fund performs poorly over a short period, members are not always able to stay invested within the fund until markets correct, but rather are forced to exit at a specific point in time. This problem is heightened in defined contribution funds, as it results in the benefits received being much lower than if the members had been able to time their exit of the fund slightly differently.

In addition, asset allocation limits encourage investment in local investments. This reduces capital flight, deepens domestic financial markets and aids in developing institutional infrastructure (Reisen, 1997). Undeveloped markets often lack liquidity in the less concentrated areas of the market, and the

large capital flows relating to retirement funds provide necessary liquidity into these areas of the market.

A strong incentive for governments to impose strict asset allocation limits is to encourage pension funds investment in local government debt. In a number of OECD countries, pension funds are not only subject to maximum asset limits, but also minimum limits in relation to government debt (Queisser, 1998). These limits are not directly imposed in South Africa, however the strict, relatively stringent limits imposed on other asset classes such as equity, properties and commodities, indirectly channel a considerable amount of additional investment into the local government bond market. By increasing the demand for government debt, liquidity in this market increases, which results in government instruments being more desirable and fairly priced on a daily basis.

There are a number of arguments that have been used to justify asset allocation restrictions. The majority of the considerations aim to limit the risk that is taken on by trustees. The lack of trustee experience in fund management is a concern in the South African Retirement Fund space. Portfolio limits serve to align trustees' behaviour and encourage investment in less risky products. Limiting the fund's risk can also reduce the significance of the moral-hazard problem, as trustees are not able to take reckless risks due to the portfolio asset class limits (Srinivas, Whitehouse, & Yermo, 2000).

The lack of experience of the trustees assigned to manage large percentages of individuals' net worth in portfolio and risk management is a major concern for most developing nations. Asset allocation limits tend to act as guidance until sufficient experience has been gained by those charged with governance. A number of newly appointed employee nominated trustees have little or no experience in financial services, and may not be able to interpret and assess investment strategies in the best interest of the fund and its members.

Asset allocation limits facilitate a prudent approach to fund management, as these limits encourage both diversification across a number of asset classes and investment in lower risk investments such as cash or debt instruments. The foreign limits imposed reduce the extent of foreign currency, settlement and liquidity risks. Some fund managers will argue that these risks can be hedged away, however in times of high volatility this would come at a high cost to the fund. Furthermore, the majority of members will retire in South Africa; therefore closely matching their assets to their liabilities will avoid exposing them to unnecessary and unpredictable currency fluctuation risk.

Similar to the structural limits of the industry, asset allocation limits are able to reduce systemic risks in capital markets, by encouraging diversification across multiple asset classes, in multiple jurisdictions. Regulations that limit cash investment in a single bank reduce the fund's exposure to a

potential bank run or financial collapse. In addition, asset allocation limits indirectly result in the fund employing a diverse investment spread across a number of asset classes and jurisdictions, which also limits the fund's exposure to a large decline in one of these markets.

Strict asset allocation limits mitigate potential conflicts of interest arising between participating employers, trustees and the ultimate beneficiaries of the fund. Historically, employers were able to use their employee's retirement fund to act as a float to stabilise and manipulate the share price of their own publically listed company. However, changes in the regulations have limited investment in participating employers and require additional disclosure of these investments. This also protects the members of the fund against additional exposure to the bankruptcy of the participating employer of the fund (Phillip-Davis, 2000).

### *Adverse effects of asset allocation regulations*

Modern portfolio theory provides the most evidence surrounding the adverse effects of asset allocation regulations. Shah (1997) uses the capital asset pricing model to illustrate that asset allocation regulations hinder the ability of a fund to optimise their portfolios and achieve the highest risk-weighted return. Additionally, Yermo (2002) concluded that this finding is particularly relevant for developing countries, as the range of products is more limited and regularly traded, and liquid investments are scarcer than in developed markets. This has further led to 'herding' by various pension funds in developing markets. Investment managers have constructed very similar portfolios in order to meet strict regulation restrictions, due to the limited number of shares and debt instruments with enough liquidity and depth to be traded on a large scale.

Quantitative asset limits restrict member choice, as these restrictions are applied equally across investors with differing ages, backgrounds and financial needs. The 'one size fits all approach' does not take into account individual member's needs, but rather the needs of the average member (Financial Services Board, 2000). The current legislation encourages investment in more conservative money market and debt instruments. The current legislation was recently updated to apply all quantitative limits not only on a fund basis, but also on an individual member basis. This has resulted in young, risk-hungry members being forced into investment portfolios that are too conservative for their needs, as they are unable to invest more than three quarters of their savings in equities and other riskier instruments.

Diversification within funds is limited as the restrictions applied are not in line with the optimal asset allocation models. This increases non-systematic risks in the funds that could otherwise be diversified away. Optimal risk return scenarios (maximising the sharp ratio) can only be reached at a higher point

on the risk matrix than is possible in a constrained regime (Srinvas & Yermo, 1999). Davis (1998) confirmed this hypothesis by comparing both constrained and non-constrained funds in OECD countries. He noted that non-constrained funds invested significantly more in the equity markets, than constrained funds. In addition, he compared the average real returns of constrained funds against non-constrained funds, over a 13 year period, and concluded that returns were 1.17 times higher in in the funds that were free of asset restrictions. Due to the limited number of high quality, eligible investments within developing markets, and the fact that asset allocation is the most important factor in determining returns earned by pension funds, the above effect is likely to be very costly in the long run.

As funds are encouraged to invest in certain types of assets, larger funds are invested in a disproportionate share of certain markets in which they are permitted to invest. This leads to the liquidity of these instruments decreasing, as funds retain these investments for a long period of time. Furthermore, funds cannot trade freely in these instruments without affecting prices in the short term. As discussed above, this short term fluctuation in prices can dramatically affect the benefits of members who exit the fund during this period. This effect is exaggerated in developing countries as the drop in efficiency of these markets increases the time taken for the prices to return to normal.

Strict asset allocation restrictions indirectly have a negative effect on less orthodox investments such as the private equity and unlisted equity markets. These types of investments play a major role in assisting the development of emerging nations, by acquiring foreign expertise and encouraging infrastructural developments, which ultimately leads to increased growth and national stability (Kashyap & Berry, 2014). By encouraging investment in other 'less risky' asset classes and limiting investment in the above investments, capital flows in these investments are restricted, which further increases their liquidity risk. This results in a snow-ball effect, as the overall risk relating to these investments is further increased as liquidity is reduced, which results in them being less appealing to other investors, which in turn further increases liquidity risk.

As the pension fund market develops and the average fund size begins to increase, concentration in certain asset classes or instruments can create problems in domestic markets. This concentration can cause liquidity issues as a large percentage of Top 40 shares are tied up in long-term pension funds. As industry consensus is strong, funds tend to make similar trades in the short term due to market announcements. This leads to large amounts of a company's shares being traded at one time, which can further affect prices as discussed above (Srinvas & Yermo, 1999). This anomaly often forces larger funds to disinvest in considerable stakes over a longer period of time, to avoid flooding the market

with liquidity and dumping prices. However this is often to the detriment of members, as this lag prevents the fund from acting timeously.

Chisari and Dal-Bò (1996) conducted a theoretical study on Argentinian data, and found that regulations increase inefficiencies amongst portfolio construction. By eliminating some of the limits, they were able to halve the level of risk in the higher risk life stage models. In addition, they found that the less risk averse a member was, the greater the negative impact of asset restrictions were on that member. Asset allocation restrictions did not have a large effect on the Sharpe ratios of low-risk members. This is expected as low-risk instruments, such as money market and debt instruments, have very generous limits, and these limits are not normally approached by fund managers.

High fund concentration raises the issue of shareholder activism. Are pension funds and their trustees experienced and equipped to manage large companies? South Africa is following a growing global trend relating to the rise in shareholder activism. Pension funds are specifically relevant to this argument. Due to their large stakes in a number of companies, trustees and principal officers are becoming more involved in the management of other listed entities in which their funds invest (Holmes, 2014). There is a lack of academic evidence available to determine whether this increased involvement by trustees is beneficial to fund performance in the long run, considering their perceived lack of experience in managing large entities.

There is an argument that although members may be prejudiced through asset allocation limits in their pension accounts, they are not restricted in their private accounts. Therefore, a member could invest privately in an attempt to reach their optimal risk return in their overall portfolio. However, due to the poor savings rates in South Africa, the weak average education of the members, and the lack of disclosure of funds' investments breakdown on a member level, this argument can be rebutted within a South African context.

## 3.8 Impact of adverse effects

The investment of funds' assets is the most critical aspect of fund management, and earning an appropriate risk adjusted return on these assets is the trustee's primary focus. As most members currently belong to defined contribution funds, the risk attached to the non-performance of the fund is borne by the members, and not the employer, as with defined benefit funds.

Due to the term and size of pension funds' investments, even the smallest inefficiencies, reduced annual returns and careless behaviour by trustees can create enormous losses to both the members and society as a whole. Assuming constant growth rates, if a comparison is made between a fund that earns on average 10% per year to a more efficient fund that earns 12% a year, over an average period of 40 years, a member who retires in the more efficient fund would retire with a pension that is 61% larger than his/her less fortunate counterpart. This pension would be twice as large if the comparative advantage increased to 3% (Shah, 1997).

The above illustration demonstrates the importance of continuous and long-term efficiency of performance of pension funds. The smallest inefficiencies, over the long-term, can result in drastically reduced returns for members. Ultimately, on a large scale these inefficiencies affect society as a whole. Elderly retired citizens have less to spend and may become reliant on family or the state, should their retirement benefits not be sufficient to meet their daily needs. South Africa is renowned for having one of the worst savings rates in the developing world (Duncan, 2012). These inefficiencies will lead to lower growth in the economy, and remove the incentive on members to add additional, voluntary contributions to their compulsory monthly contributions, which in turn reduces general savings rates. Low savings rates will ultimately further limit future growth, increase dependency and slow the progress made in reaching the country's equality goals.

Deaton (1989) demonstrates how at the microeconomic level, savings rates in developing countries are especially important due to the demographic and cultural structure of the average household. Most families are large and supported by one bread-winner, who is likely engaged in an occupation that lacks long-term, stable earnings prospects such as agriculture or a form of labour-intensive service provision. In addition, few developing countries are able to provide a reliable system that can support struggling citizens to stabilise their fluctuating income and employment in times of need. In a study performed by Ehrlich (1996), he confirmed previous studies that concluded crime is linearly related to wealth and savings rates. Therefore, it can be inferred that regulations that severely hinder the ability to earn appropriate risk-weighted returns will not only suppress savings rates within South Africa, but will also indirectly contribute to future long-term crime related problems within the country.

An effective, high performing retirement fund industry is essential in closing the equality gap at a domestic level. Gustman & Steinmeier (1999) showed that an effectively functioning pension structure is essential in forming an acceptable level of retirement wealth. Cook (1995) goes on to show the inverse relationship in developing markets between savings rates and inequality. Kelly (2000) highlighted the social costs of inequality in developing markets and concluded that these costs include lower economic growth, hindered human capital development and an increase in crime. These

negative impacts are further exacerbated as the inequality gap grows. It can be inferred from the above, that any inefficiencies in pension wealth accumulation serve to decrease savings rates, decrease average wealth, increase criminal activity and increase inequality.

The consideration of the impact of retirement regulation over the long-term is of great importance as this aligns the analysis with the presumed term of the investment. While many studies consider the short term or immediate effect of retirement regulations, a dearth of research exists to consider the long-term effects. This distinction is important, as the behavioural finance study by Bernartzi and Thaler (1999) shows that due to myopic loss aversion, investors are much more likely to invest a greater amount of their salary in retirement savings, if they are shown long-term returns rather than short-term rates of return. Therefore, the adverse effects of regulations on long-term savings will have a greater impact on future savings levels than shorter term positive or negative effects.

Encouraging investment into a pension fund rather than a personal savings account raises a number of behavioural issues. Many individuals find it much easier to save if monies are automatically deducted by their employers from their gross salary before receiving their monthly salary, when compared to receiving the money and paying it into a separate account. As the money was never received by them, the negative utility of setting it aside as savings does not feel as severe as the former option. In addition, as access to money that has been invested in a pension plan is difficult to withdraw, the mental accounting effect improves member's restraint in terms of early withdrawal. As the money is paid over to a separate party and mentally separated from their other finances, it is less likely to be spent on spontaneous luxury purchases or given to others (Dupas & Robertson, 2012). These effects all contribute to a long-term, successful, future retirement endowment.

# 4. Data

The Fund data was manually obtained from the online system of a reputable, global data provider. The data used in this study consisted of quarterly returns for specific unit trust funds as well as the quarterly returns of the MSCI World global index. The study period was from January 2002 to September 2014. The South African Unit Trust market was stratified into its main sectors, and only funds in the unconstrained funds categories were considered appropriate for the purposes of this study. This ensured that the results of the study were not skewed by other inherent investment limitations of mandated fund objectives or rules. As such, only funds from the following four sectors were considered: Global – Multi Asset Flexible, South Africa - Multi Asset Flexible, Worldwide - Multi Asset Flexible and South Africa - Multi Asset High Equity.

The data was further stratified into Regulation 28 compliant and non-compliant funds. Funds that were not in existence for in excess of 13 years were excluded from the data set, as the study aims to focus on the long-term effects of Regulation 28 restrictions. This was done in order to match the time period with the interests of a retirement member's investment period. Lastly, fund outliers that were managed differently in comparison to the other funds in the data set, for example those with peculiar benchmarks or alternative specific investment restrictions, were eliminated.

The data included total quarterly returns for the remaining funds, assuming reinvestment of all dividends and excluding transaction costs. This data was used to calculate the total returns over rolling 10-year time periods, together with other risk and return based metrics.

After sorting the population into the respective groups, the resulting samples were as follows:

- 12 sets of 10-year rolling returns for 27 Regulation 28 compliant funds.
- 12 sets of 10-year rolling returns for 21 Regulation 28 non-compliant funds.

The two main metrics that were used in this study, in the evaluation of the data, include rolling 10-year excess returns, as well as the rolling 10-year risk-adjusted returns using the Sharpe measures. The Sharpe measure is calculated by dividing the excess return of each fund by the standard deviation of the fund's total returns. The Sharpe measures used aim to take into account all levels of risk (not only systematic risk) through the utilisation of the standard deviation of total returns (Reilly & Brown, 2006).

Excess mean returns were calculated by averaging the quarterly excess return over the rolling 10-year time period. Excess returns were calculated using a consistent proxy for a world index across all funds. A world index was used due to the global outlook and investment objectives of the funds included in

the study. The MSCI World index was deemed as an appropriate benchmark to be used in this study. Gregory and Whittaker (2005) investigated various proxies for appropriate world indexes, and determined that the MSCI World index appeared to be the most appropriate and successful. Dimson et all (2008) also concluded that the MSCI index is historically the most widely used international market benchmark since its origination in 1970.

Once the data was appropriately cleaned, various statistical models and methods were run to evaluate the relationship between the two sets of compliant and non-compliant data. These included mean and variance analysis, individual static t-tests, and linear mixed effect models. The significant results of the tests are summarised below.

# 5. Results

A summary of the data used in this study is contained in Appendix D and the distribution curves are contained in Appendix E. The initial analysis of the data involved using mean analysis over the periods of interest. Here the total rolling 10-year returns were compared for both compliant and non-compliant funds. Figure 1a depicts mean excess 10-year rolling returns of both compliant and non-compliant funds over the research period. This clearly shows that the mean excess returns for non-compliant funds consistently outperform the compliant funds over the scoped period. However, the whiskers indicate a high degree of overlap between the two data sets, which is plausible as they are both tracking the same benchmark, and are subject to similar market conditions. Furthermore, Figure 1a indicates that in periods from the rolling period commencing in 2003 onwards, the regulations appear to have successfully reduced risk of the portfolios, as the variation between the upper and lower quartiles is consistently lower on all of the following rolling periods of return. An f-test on the two data sets confirmed that the variance of excess returns of the constrained portfolio is statistically lower than that of the non-constrained funds over the scoped period.

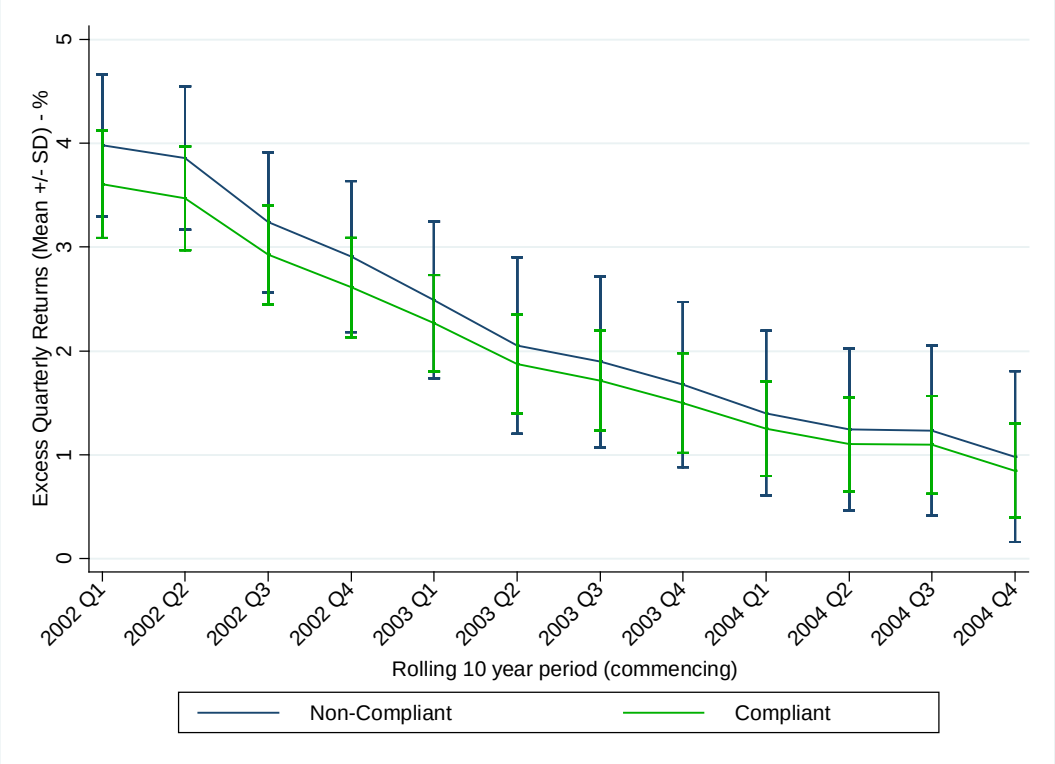



***Figure 1a – Mean excess returns***

Figure 1b depicts the relationship between mean rolling 10-year risk weighted returns (Sharpe ratios). Once we introduce the risk-weighting adjustment, the compliant funds appear to slightly outperform the non-compliant funds over the scoped period. Similarly to the excess returns analysis above, the whiskers indicate a significant overlap between the two data sets. Interestingly, while the Sharpe ratios mean variance below the lower quartiles for non-compliant funds appears to be greater for all 12 data points, the mean variance above the upper quartiles for compliant funds appears to be greater for 4 of the 8 data points during the middle period of the study. This is most likely an anomaly due to the significance that the 2008 financial crisis had on the data collected during this period. As the market instability had a larger impact on foreign markets relative to domestic markets, and non-compliant funds generally have a larger stake in these markets, market volatility of non-compliant funds would have been impacted to a greater extent during this time.

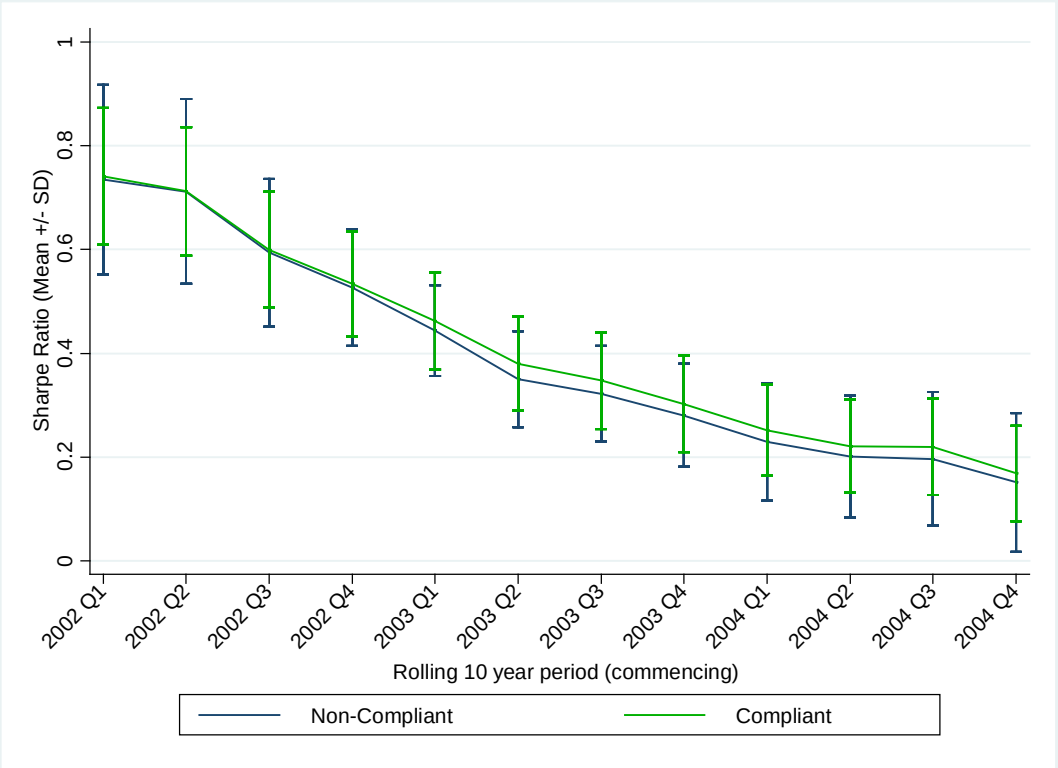



***Figure 1b – Mean risk-weighted returns (Sharpe Ratio)***

Figures 2a and 2b show a summary of the t-test data output, statically comparing the 10-year rolling periods individually. The p-values have been corrected using Holm's adjustment, to adjust for the multiple natures of the tests being performed (Holm, 1979). With regards to both excess returns and risk adjusted returns (Sharpe Ratios), none of the adjusted p-values indicate any significant difference between compliant and non-compliant firms. This is as a result of the significant overlap of large portions of the returns throughout each time period as well as the superior performance of a few of the constrained funds during the scoped period.

| *T-test Output (Excess Return)* | | |
|---|---|---|
| Period | T - stat | Corrected p-value (Holm's) |
| 2002q1 - 2011q4 | 2.1767 | 0.3817 |
| 2002q2 - 2012q1 | 2.2731 | 0.3324 |
| 2002q3 - 2012q2 | 1.897 | 0.641 |
| 2002q4 - 2012q3 | 1.7057 | 0.8532 |
| 2003q1 - 2012q4 | 1.2695 | 0.2106 |
| 2003q2 - 2013q1 | 0.9094 | 0.3679 |
| 2003q3 - 2013q2 | 0.9643 | 0.3399 |
| 2003q4 - 2013q3 | 0.95 | 0.3471 |
| 2004q1 - 2013q4 | 0.8142 | 0.4197 |
| 2004q2 - 2014q1 | 0.799 | 0.4284 |
| 2004q3 - 2014q2 | 0.7247 | 0.4723 |
| 2004q4 - 2014q3 | 0.7233 | 0.4731 |

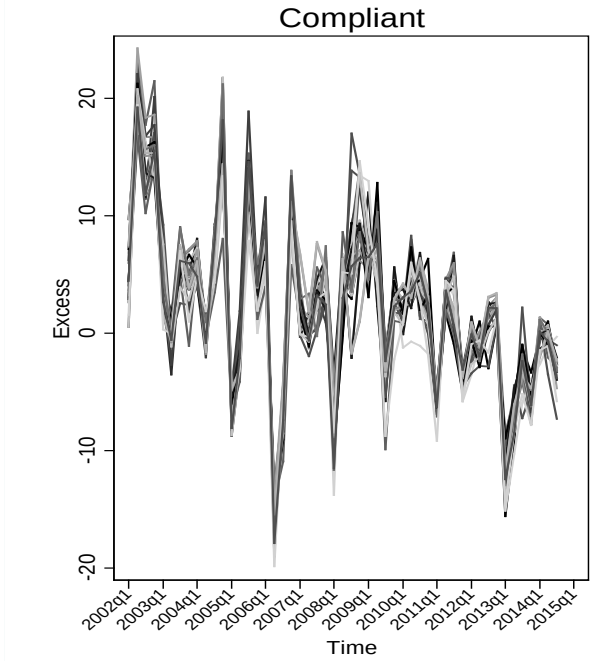
***Figure 2a – Excess return multiple t-test***

| *T-test Output (Risk-weighted Return)* | | |
|---|---|---|
| Period | T - stat | Corrected p-value (Holm's) |
| 2002q1 - 2011q4 | -0.1383 | 0.8906 |
| 2002q2 - 2012q1 | -0.0076 | 0.994 |
| 2002q3 - 2012q2 | -0.16 | 0.8736 |
| 2002q4 - 2012q3 | -0.2376 | 0.8132 |
| 2003q1 - 2012q4 | -0.6832 | 0.4979 |
| 2003q2 - 2013q1 | -1.1377 | 0.2611 |
| 2003q3 - 2013q2 | -0.9267 | 0.3589 |
| 2003q4 - 2013q3 | -0.7939 | 0.4314 |
| 2004q1 - 2013q4 | -0.7874 | 0.4351 |
| 2004q2 - 2014q1 | -0.6592 | 0.513 |
| 2004q3 - 2014q2 | -0.7193 | 0.4756 |
| 2004q4 - 2014q3 | -0.528 | 0.6001 |

***Figure 2b – Risk-weighted return multiple t-test***

The linear mixed effect model showed similar results. The mixed effect model allowed for the data to be expressed in terms of both fixed and random effects. The fixed effects account for the parameters associated with the population as a whole, which is represented by the compliant and non-compliant characteristics of the funds. The fixed effects are responsible for the basic trend of the data over time. The random effects are represented by each individual unit trust's separate characteristics. By including random effects in the analysis, the population averages and estimates of variation are obtained, whilst simultaneously quantifying the variability due to the effect of regulations, compared to the variability due to the individual unit trust's separate characteristics. The model returns predicted mean curves, together with associated confidence intervals for both the fixed and variable effects. These confidence intervals allow us to infer at which points in time the data sets are significantly different from each other. The raw model data depicted in figure 3a clearly shows that the excess return of compliant funds appear to move together as a herd whereas the non-compliant funds, where more investment choice is available, move more erratically, and do not show this characteristic in such a strong fashion. The raw model data from the risk adjusted returns appears to show similar characteristics. Similarly to the individual t-tests, the mixed effect model concluded that holding other random variables constant, there is no significant difference between the compliant and non-compliant data set over the period from both an excess return and risk-weighted return perspective. Interestingly, the mixed effect model did identify that the excess return for both data sets decreased over time and computed a 0.79% unit decrease in excess return for each rolling 10-year period. This phenomenon could be explored further in future studies.

Specifically towards the end of the period of interest, South African equities began performing very well. As the majority of the constrained funds contained a relatively high proportion of South African equities relative to non-constrained funds, this may have contributed to the findings above.



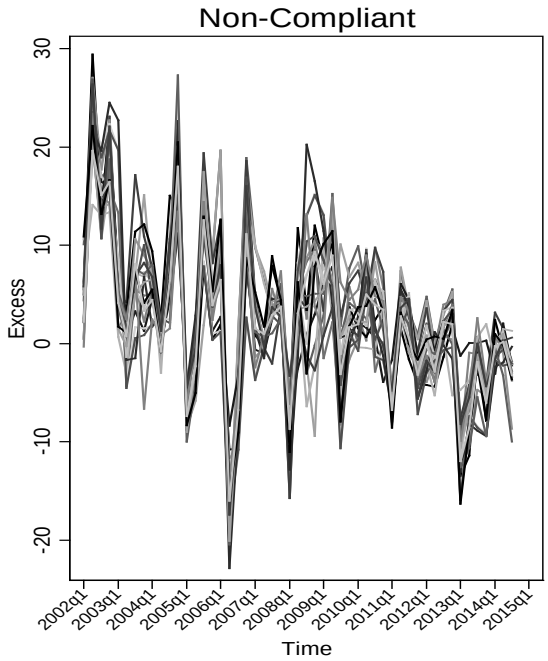
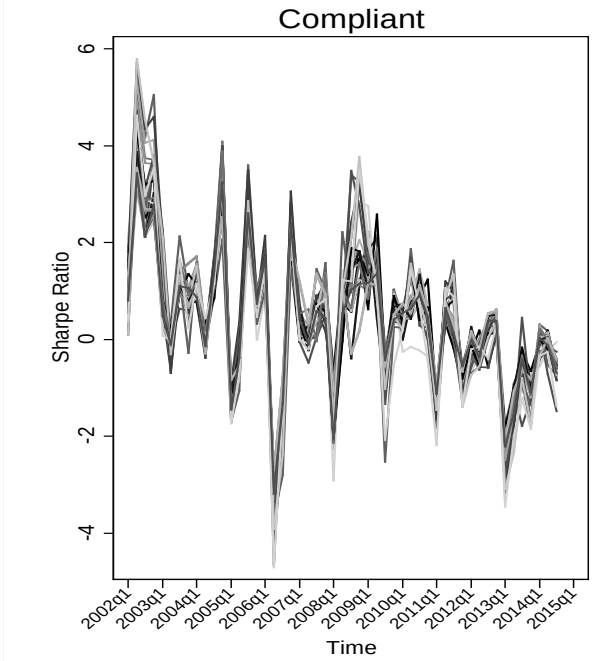




***Figure 3a - Excess returns raw data***



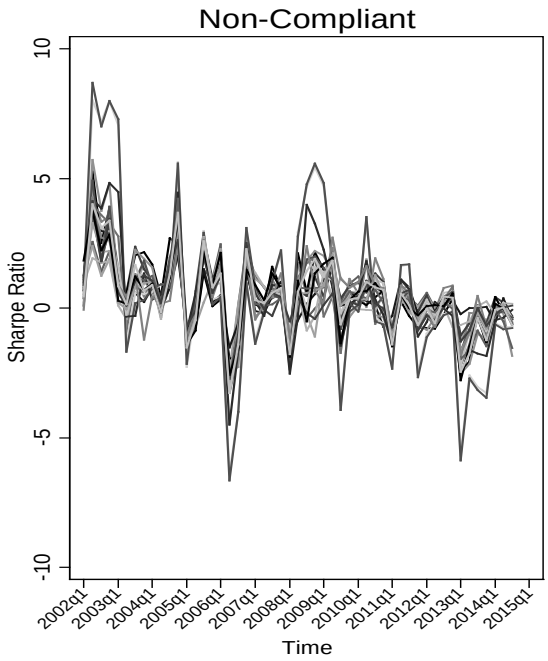




***Figure 3b – Risk-weighted returns raw data***

# 6. Limitations and future recommendations

As in other studies, there were various limitations that need to be considered when interpreting the findings of this study. The return metrics in this study were analysed without taking into account the additional transaction costs which may be marginally different between the two data sets. Furthermore, exchange rate risk, which one would expect to play a larger role in the variability of returns in non-compliant funds, was not separately considered.

Due to this study's specific focus on long-term returns (to align the term of the analysis with the expected term of the investment) a few additional limitations were encountered. A potential weakness of the analysis above is that it does not adjust for potential survivorship bias. Besides the obvious problem that this raises for any investigation, it could be of greater concern for a study using a small number of funds, where the levels of survivorship differs greatly between the compliant and non-compliant samples. This could be further investigated in future studies. In addition, as only funds that survived the 12 year period were considered, the number of funds included in the sample was much smaller than it would have been had all funds been included. By including these funds, this could increase the robustness of future studies.

Furthermore, this study does not consider the costs of implementing and monitoring compliance with these regulations, on an individual pension fund level. Actuary, administrator, auditor and trustee costs are all increased due to the implementation, monitoring and enforcement of compliance with Regulation 28. Once these costs are included, it could potentially diminish returns of compliant investments further.

The analysis above has one further weakness. The variability of returns for both the compliant and non-complaint funds is calculated on both variability above and below the mean. Arguably, any variability above the mean should be considered positive and any variability below the mean should be considered negative. As such, non-compliant funds are prejudiced for large increases in good years which should not be the case. Further studies could be conducted to only include variability below the mean as a factor of risk, which may result in non-compliant funds' risk being reduced, which could add a different perspective.

# 7. Conclusion

While no doubt exists as to the theoretical benefits of retirement fund regulations, much literature suggests that their aggressive implementation may potentially stifle long-term real returns and have a negligible effect on return volatility. However, other studies have argued that these regulations hold greater advantages in developing markets, as governments aim to decrease retirement investment volatility and protect members' retirement savings from mismanagement, to ensure long-term sustainable growth of members' investment accounts.

The objective of this paper was to compare and contrast both the quantum and variability of returns of regulated funds (which are a proxy for the effects of regulation) against unregulated funds as the control group over a long-term investment horizon. Furthermore, the study was conducted to infer whether current South African retirement fund members' retirement endowments are being prejudiced on a risk-weighted basis, by being limited to invest in Regulation 28 compliant retirement funds. A total of 27 compliant funds were compared to 21 non-compliant funds over the period January 2002 to 2014. The MSCI world index was used as a benchmark across both data sets.

While the mean 10-year rolling excess returns for the non-compliant funds were consistently greater than that of the compliant funds, the significant overlap of the two data sets resulted in there being no statistical significance between the sets' excess returns. Similarly, on a risk-weighted basis, the compliant funds slightly outperformed the non-compliant funds over the scoped period. However there was no statistical difference between the two sets of risk-weighted returns.

While other international studies have claimed in theory that strict asset allocation rules reduce investment efficiency, this study is the first of its kind to be adopted in South Africa that practically aims to statistically evaluate these effects. The results and limitations of this study have opened a number of alternative areas for future studies to investigate.

While a number of other studies theoretically criticised asset allocation restrictions as a form of regulation, this study concluded that in the South African investment arena asset investment choice limitations did not statistically affect long-term retirement savings, from both a return and risk-weighted return perspective. However, regulations did appear to reduce return volatility, which suggests that these regulations are operating as intended by the regulators. As such, no inference can be drawn as to the long-term effects of these regulations and the effect of these regulations on members' interests without additional research being performed.

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# Appendix A

## Prudential asset limits

| Category | Limit | Sub-limit |
|---|---|---|
| EQUITIES | 75% | |
| Equities with market cap in excess of R20 billion | | 15% |
| Equities with market cap between R2 billion and R20 billion | | 12% |
| Equities with market cap of less than R2 billion | | 5% |
| Unlisted equities | | 15% |
| Foreign exposure (excl. Africa) | | 25% |
| African investments | | 5% |
| CASH | 100% | |
| DEBT | 75% | |
| PROPERTY | 25% | |
| Property with a market can in excess of R10 billion | | 15% |
| Property with market cap between R3 billion and R10 billion | | 10% |
| Property with market cap of less than R3 billion | | 5% |
| COMMODITIES | 10% | |
| Gold | | 10% |
| Other commodities | | 5% |
| HEDGE FUNDS AND PRIVATE EQUITY | 15% | |
| Fund of Funds (per fund) | | 5% |
| Individual Funds (per fund) | | 2.5% |
| OTHER ASSETS | 2.5% | |
| PARTICIPATING EMPLOYER | 5% | |

## Draconian investment principles

In addition to complying with the above strict asset limits, a fund's trustees are also required to comply with the following key principles:

- Develop, apply and carefully monitor compliance with a formal investor policy statement detailing the fund's investment strategy.
- Ensure the fund's assets are appropriate to meet its future liabilities while considering the long-term effect of the investment strategy on members' expected benefits.
- Be responsible and attempt to earn adequate risk-adjusted returns to meet members' specific liquidity and future retirement needs.
- Promote the education of trustees in both governance and investment related matters.
- Ensure that each member level choice complies with the above regulatory limits.
- Understand fully the nature and risks of each asset in which they invest. This would include performing appropriate due diligence prior to investing, keeping track of the changing economic environments and evaluating the impact of these changing environments on every investment of the fund.
- Promote Broad-Based Black Economic Empowerment (BBBEE).

(Financial Services Board, 2010)

# Appendix B

### *Rationale for structural regulation*

Structural restrictions are designed to simplify the industry, as well as grant a central governing body control and surveillance over the industry as a whole. In addition, the implementation of structural rules theoretically results in a system that is easier for market participants to understand. However over time, as the pension fund industry develops and the regulations become entrenched, this simplification of the system becomes less important.

Limiting the administration of funds, as well as the potential asset managers who are eligible to invest assets on the funds behalf, allows the FSB to perform an appropriate due diligence on the relevant parties with the aim of appropriately mitigating the risk of fraud and error. The above entities are required to have appropriate controls and systems in place to ensure that the services performed and recorded at these institutions are in line with the mandates and instructions provided to them.

In many other emerging markets, a trend is developing whereby existing financial intermediaries such as banks and insurance companies are prohibited from administrating pension funds due to weaknesses identified in local banking systems. The aim of these restrictions is to isolate and protect retirement savings from deficiencies within these institutions, and guard retirement funds from agency risks that are not monitored by the existing regulatory system. Owing to South Africa's strong banking system, this has not been deemed a necessary step by local regulatory bodies.

The appointment of an approved valuator and auditor by each fund, and the annual provision of services ensure that any turbulence within the fund is identified and rectified on a timely basis. The valuator ensures that the fund's future assets are sufficient to meet its future liabilities on a continuous basis. The auditors assume responsibility over the fair reporting and compliance with relevant legislation. These two parties play a major role in assisting the FSB in identifying and preventing breaches of regulations by the fund.

Compulsory and regular training of trustees is a more recent requirement of the FSB. This condition was implemented in order to address the obvious and severe skills shortages that were evident in South Africa across a number of smaller, privately managed retirement funds. Trustee training ensures that those charged with governance are properly equipped to make informed, educated decisions to manage members' money responsibly, in terms of the limitations set out in the Pension Funds act of South Africa.

By requiring trustees to develop a formal investment strategy, they are obliged, after consulting appropriate experts, to apply their minds to develop an appropriate strategy. This enables trustees to

demonstrate improved governance and limit their risk relating to accusations of non-performance of their fiduciary duties. Risks of the investment strategy are more likely to be appropriately understood and documented, with downside protection more likely to be in place and managed appropriately (Financial Services Board, 2000). In addition, forcing the implementation of an investment strategy reduces the risk of manipulation of products in order to achieve compliance with other Draconian limitations.

In addition to the above structural restrictions, the FSB also performs spontaneous site visits to fund service providers, to ensure compliance with all legislation, and assess the levels of governance within the fund. These site visits are important as they encourage administrators and trustees to comply with all forms of legislation on a continuous basis. In addition, these visits confirm whether the systems and processes in place at the fund service providers are suitable to conduct fund business.

Several other countries have much stricter industry structural regulations in place. These regulations include limiting the members to one instrument, and limiting fund administration companies to one fund each (Srinivas, Whitehouse, & Yermo, 2000). While this does improve the structural architecture of the retirement fund environment, overregulation of industry structure results in shortcomings, as member investment choice and flexibility is reduced. However, the above does mitigate the moral-hazard risk presented by minimum government guarantees, as investment managers would not be willing to take unnecessarily risky bets because failure would result in 100% of their portfolios being terminated.

# *Appendix C*

## Adverse effects of structural regulations

The most prominent adverse effect of the above regulations are compliance costs, which are ultimately transferred to the members of the funds. In a recent PWC retirement industry survey, 79% of trustees indicated that compliance with the on-going regulatory changes results in additional costs transferred to members. In addition, 76% of trustees indicated that there is a desire to simplify the structure of both the funds and industry in South Africa (PWC, 2014).

In a 2010 study, Davies (2010) found that the administration and regulatory costs associated with smaller funds and employers is higher than that of larger funds. Similarly, the administrative burden on open funds with multiple-employers is higher than that of closed, single-employer funds. While it is not possible to diminish the gap between the varying costs across different fund types, other governments have managed to encourage change and incentivise lower costing structures. This has been achieved by further increasing the costs of less desirable fund types. Currently, the umbrella funds within South Africa have not reached a significant enough size for the benefit of their size to outweigh the handicap of multiple employers. Ultimately, the creation of a larger, standardised fund will simplify the processes and lead to increased automation, thereby reducing average costs per member (Davies, 2010).

The above structural constraints may serve as barriers to entry for new administrators and asset managers. This in turn, could result in the limitation of competition, and ultimately the raising of fees charged by these institutions. However, this is not the only driver of administrative costs - factors such as size of the industry, development of markets and the transferability of members between funds should also be considered (Srinivas, Whitehouse, & Yermo, 2000).

Due to the above structural restrictions and overall surveillance by the FSB, the industry is hindered by a certain degree of red tape. The requirement that there needs to be a number of approvals from the FSB prior to fund rules being amended or policies being implemented, adds a significant time lag to many decisions being made by the trustees. This is often to the detriment of the members involved. Furthermore, approval by the FSB is required for a member to transfer to a different fund, which can take as long as 180 days to obtain (Stokes, 2010). This long time lag diminishes members' portability between funds, and is a barrier that deters members from switching to a fund that is better suited to them. Additionally, it is not straightforward to switch out from an underperforming fund to a better performing fund, which limits member choice and deters them from investing their money in their best interest. This structural red tape limits competition in the market which may result in higher costs and less efficient management of members' money.

# *Appendix D*

## Summary statistics:

### *Excess Return*

| *Period* | *N* | *Min* | *Max* | *Mean* | *Std Dev.* | *Median* | *25th Percentile* | *75th Percentile* |
|---|---|---|---|---|---|---|---|---|
| | | | | | Compliant | | | |
| 2002q1 - 2011q4 | 27 | 2.22 | 4.41 | 3.61 | 0.52 | 3.64 | 3.37 | 3.91 |
| 2002q2 - 2012q1 | 27 | 2.10 | 4.25 | 3.47 | 0.50 | 3.50 | 3.23 | 3.74 |
| 2002q3 - 2012q2 | 27 | 1.61 | 3.69 | 2.93 | 0.48 | 2.98 | 2.77 | 3.18 |
| 2002q4 - 2012q3 | 27 | 1.36 | 3.32 | 2.61 | 0.48 | 2.65 | 2.44 | 2.96 |
| 2003q1 - 2012q4 | 27 | 1.04 | 2.97 | 2.27 | 0.47 | 2.34 | 2.07 | 2.59 |
| 2003q2 - 2013q1 | 27 | 0.72 | 2.58 | 1.88 | 0.47 | 1.95 | 1.63 | 2.17 |
| 2003q3 - 2013q2 | 27 | 0.60 | 2.45 | 1.72 | 0.48 | 1.81 | 1.44 | 2.01 |
| 2003q4 - 2013q3 | 27 | 0.30 | 2.24 | 1.50 | 0.48 | 1.63 | 1.33 | 1.80 |
| 2004q1 - 2013q4 | 27 | 0.07 | 1.99 | 1.25 | 0.46 | 1.35 | 1.10 | 1.53 |
| 2004q2 - 2014q1 | 27 | -0.08 | 1.85 | 1.10 | 0.45 | 1.20 | 0.98 | 1.34 |
| 2004q3 - 2014q2 | 27 | -0.16 | 1.87 | 1.10 | 0.47 | 1.19 | 0.95 | 1.37 |
| 2004q4 - 2014q3 | 27 | -0.42 | 1.57 | 0.85 | 0.45 | 0.95 | 0.65 | 1.13 |
| | | | | | | | | |
| Period | | | | | | Non-Compliant | | |
| 2002q1 - 2011q4 | 21 | 2.86 | 5.65 | 3.98 | 0.68 | 3.94 | 3.51 | 4.33 |
| 2002q2 - 2012q1 | 21 | 2.85 | 5.61 | 3.86 | 0.69 | 3.83 | 3.45 | 4.22 |
| 2002q3 - 2012q2 | 21 | 2.28 | 4.89 | 3.24 | 0.67 | 3.22 | 2.76 | 3.48 |
| 2002q4 - 2012q3 | 21 | 1.92 | 4.65 | 2.91 | 0.73 | 2.90 | 2.48 | 3.20 |
| 2003q1 - 2012q4 | 21 | 1.38 | 4.19 | 2.49 | 0.75 | 2.50 | 2.00 | 2.65 |
| 2003q2 - 2013q1 | 21 | 0.49 | 3.87 | 2.05 | 0.85 | 1.99 | 1.70 | 2.28 |
| 2003q3 - 2013q2 | 21 | 0.42 | 3.66 | 1.90 | 0.82 | 1.74 | 1.54 | 2.15 |
| 2003q4 - 2013q3 | 21 | 0.19 | 3.16 | 1.67 | 0.79 | 1.50 | 1.32 | 1.97 |
| 2004q1 - 2013q4 | 21 | -0.07 | 2.92 | 1.40 | 0.79 | 1.28 | 0.95 | 1.82 |
| 2004q2 - 2014q1 | 21 | -0.16 | 2.71 | 1.24 | 0.78 | 1.09 | 0.85 | 1.65 |
| 2004q3 - 2014q2 | 21 | -0.28 | 2.76 | 1.23 | 0.82 | 1.15 | 0.73 | 1.67 |
| 2004q4 - 2014q3 | 21 | -0.38 | 2.52 | 0.98 | 0.82 | 0.89 | 0.43 | 1.46 |

*Risk-weighted returns (Sharpe Ratio)*

| *Period* | *N* | *Min* | *Max* | *Mean* | *Std Dev.* | *Median* | *25th Percentile* | *75th Percentile* |
|---|---|---|---|---|---|---|---|---|
| | | | | | Compliant | | | |
| 2002q1 - 2011q4 | 27 | 0.57 | 1.04 | 0.74 | 0.13 | 0.70 | 0.64 | 0.83 |
| 2002q2 - 2012q1 | 27 | 0.54 | 0.99 | 0.71 | 0.12 | 0.69 | 0.61 | 0.79 |
| 2002q3 - 2012q2 | 27 | 0.41 | 0.85 | 0.60 | 0.11 | 0.58 | 0.52 | 0.67 |
| 2002q4 - 2012q3 | 27 | 0.35 | 0.74 | 0.53 | 0.10 | 0.53 | 0.46 | 0.60 |
| 2003q1 - 2012q4 | 27 | 0.27 | 0.65 | 0.46 | 0.09 | 0.46 | 0.41 | 0.51 |
| 2003q2 - 2013q1 | 27 | 0.19 | 0.55 | 0.38 | 0.09 | 0.38 | 0.34 | 0.41 |
| 2003q3 - 2013q2 | 27 | 0.14 | 0.51 | 0.35 | 0.09 | 0.35 | 0.30 | 0.39 |
| 2003q4 - 2013q3 | 27 | 0.07 | 0.45 | 0.30 | 0.09 | 0.30 | 0.27 | 0.35 |
| 2004q1 - 2013q4 | 27 | 0.02 | 0.39 | 0.25 | 0.09 | 0.26 | 0.23 | 0.31 |
| 2004q2 - 2014q1 | 27 | -0.02 | 0.36 | 0.22 | 0.09 | 0.23 | 0.21 | 0.28 |
| 2004q3 - 2014q2 | 27 | -0.04 | 0.36 | 0.22 | 0.09 | 0.23 | 0.19 | 0.27 |
| 2004q4 - 2014q3 | 27 | -0.10 | 0.31 | 0.17 | 0.09 | 0.18 | 0.13 | 0.21 |
| | | | | | | | | |
| Period | | | | | Non-Compliant | | | |
| 2002q1 - 2011q4 | 21 | 0.43 | 1.18 | 0.73 | 0.18 | 0.72 | 0.62 | 0.80 |
| 2002q2 - 2012q1 | 21 | 0.40 | 1.14 | 0.71 | 0.18 | 0.71 | 0.61 | 0.77 |
| 2002q3 - 2012q2 | 21 | 0.34 | 0.93 | 0.59 | 0.14 | 0.59 | 0.52 | 0.66 |
| 2002q4 - 2012q3 | 21 | 0.30 | 0.74 | 0.53 | 0.11 | 0.53 | 0.46 | 0.57 |
| 2003q1 - 2012q4 | 21 | 0.23 | 0.58 | 0.44 | 0.09 | 0.45 | 0.41 | 0.51 |
| 2003q2 - 2013q1 | 21 | 0.18 | 0.53 | 0.35 | 0.09 | 0.36 | 0.27 | 0.39 |
| 2003q3 - 2013q2 | 21 | 0.15 | 0.51 | 0.32 | 0.09 | 0.31 | 0.25 | 0.37 |
| 2003q4 - 2013q3 | 21 | 0.07 | 0.45 | 0.28 | 0.10 | 0.27 | 0.23 | 0.35 |
| 2004q1 - 2013q4 | 21 | -0.02 | 0.40 | 0.23 | 0.11 | 0.22 | 0.17 | 0.30 |
| 2004q2 - 2014q1 | 21 | -0.06 | 0.37 | 0.20 | 0.12 | 0.20 | 0.13 | 0.27 |
| 2004q3 - 2014q2 | 21 | -0.10 | 0.38 | 0.20 | 0.13 | 0.20 | 0.13 | 0.27 |
| 2004q4 - 2014q3 | 21 | -0.14 | 0.35 | 0.15 | 0.13 | 0.16 | 0.08 | 0.24 |

## Appendix E

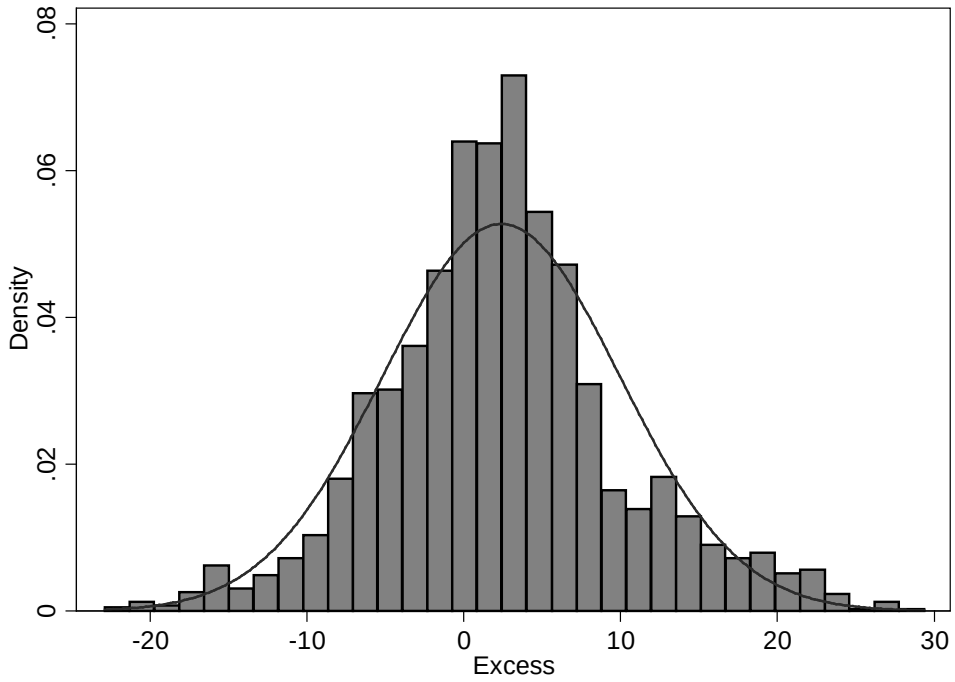


***Figure 4a – Distribution excess returns***

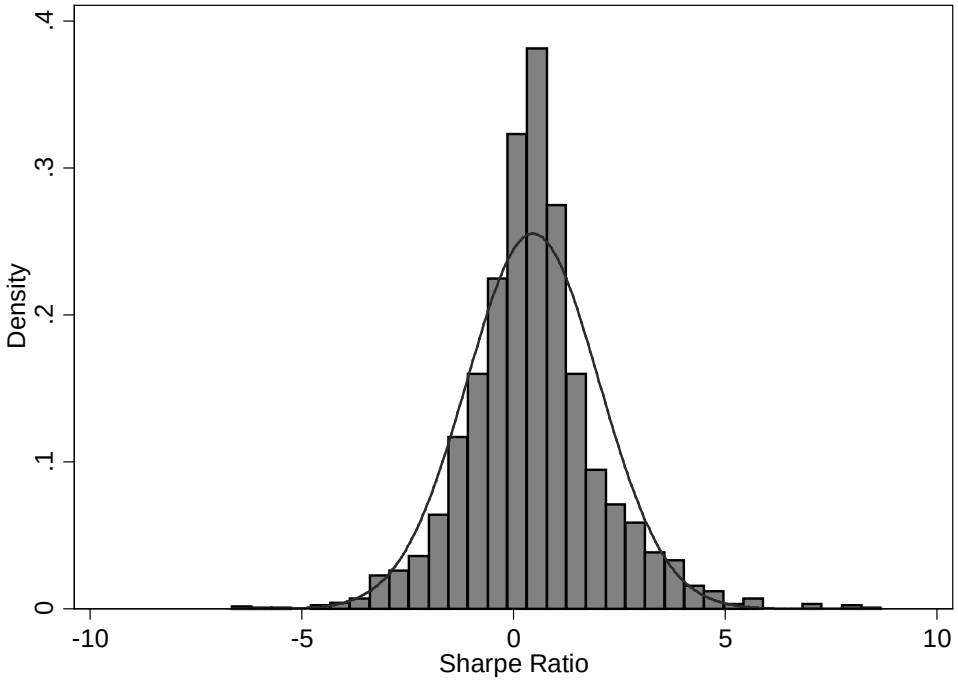


***Figure 4b – Distribution risk-weighted Returns***