The Relationship Between Financial and Organizational Efficiency of Namibian Pension Funds

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Abstract

This paper seeks to synthesize the results of the two previous papers, which tests and explain the efficiency of Namibian pension funds using Data envelopment Analysis (DEA) and Structural Equations Modeling (SEM) as a confirmatory process. The methodological approach taken is to assess the association between financial efficiency (as measured by DEA) and organizational efficiency (measured by SEM). Therefore, the paper outcome provides evidence-based knowledge and a synthesized analytical framework based on results of correlation and One-way analysis of variance (ANOVA) between the variables. The empirical findings indicate that no significant association exists between financial efficiency and organizational efficiency of Namibian pension funds. The study has fully conceptualized the theory on pension fund efficiency and has answered the empirical inquiry into the significance of the relationship between financial and organizational efficiency of pension funds using acceptable methodological and analytical approaches.

Keywords

Structural Equation Modeling, Confirmatory Factor Analysis, Data Envelopment Analysis, One-way Analysis of Variance, Financial Efficiency, Organizational Efficiency

1. Introduction

The study has analysed the dimensions of those issues that the literature has highlighted to be determinants of pension fund efficiency in Namibia. Globally pension funds have attracted attention due to volatile markets and the consequent erosion of member's retirement values. Consequently, it is imperative to understand the issues that drive efficiency to enable trustees of pension funds to make informed decisions with a view to optimizing member retirement values.

The purpose of this paper is twofold; firstly to evaluate the association between financial efficiency as measured by DEA (Zamuee, 2015) and organizational efficiency as represented by the four factors describing the latter as per the CFA/SEM results in the previous study (Zamuee 2016). Therefore, instead of using simple regression analysis as the sole basis for the cross-model analysis, this study uses the empirical results of SEM/CFA as a more appropriate method given reliable results yielded in a similar study in Kenya (Njuguna, 2010). Given the non-parametric nature of DEA, researchers have been grappling with the task of statistically testing the hypothesis for goodness of fit or strength of relationships between variables and hence this cross-model approach has received praise as a more reliable method to overcome this challenge (Sohn & Moon, 2004).

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Furthermore, the paper will conclude with a synthesized discussion of the implications of all the research findings on the Namibian pension fund industry and theoretical contribution to the body of knowledge.

2. Literature Review

2.1. Introduction

Previous studies on efficiency looked at DEA as a non-parametric technique to determine the financial efficiency of pension funds (Zamuee, 2015), whilst SEM/CFA was used to test the fit and strength of multiple relationships between variables (Zamuee, 2016). A cross-model approach was preferred to test the statistical significance of the results of both methodological approaches. This approach was used in previous studies with successful results (Sohn & Moon, 2004). Therefore, efficiency is influenced by multiple factors sounded in financial and non-financial criteria and this forms the theoretical foundation on which the cross-model analysis was based.

The literature conceptualizes organizational efficiency as the functional synthesis of combined resources including systems, processes and human resources to deliver an optimized outcome for members at retirement (Zamuee, 2015, Carmichael & Palacios, 2003). Additionally, the empirical SEM model explains organizational efficiency in terms of a four-factor matrix, namely governance, ethics, compliance and operational efficiency (Zamuee, 2016). This means that organizational efficiency relates to the ability of pension funds to adopt governance standards that are compliant with laws, based on ethical values and robust operational synthesis (OECD, 2009). In other words, the operational rules, structures and regulations must deliver maximized retirement values for members of pension funds.

On the other hand, financial efficiency is defined as the ability of pension funds to convert inputs into outputs in a manner that adds value by optimizing on member values (Davis, 2005). Comparative literature suggest that the measurement criteria of efficiency should not just be limited to financial considerations and non-financial issues like governance and ethics should be taken into account as issues predicting organisational efficiency (Clark & Monk, 2010). This view was supported in the Kenya study which covered broader non-financial issues like investment strategy, age, fund design and compliance (Njuguna, 2010).

According to the World Bank, there is an associative relationship between organizational efficiency and financial efficiency, meaning that only those pension funds that are financially efficient tends to be also efficient in the structural or organizational sense (Stewart & Yermo, 2008). This view is also supported by the OECD, which state that to achieve financial efficiency, requirements of operational efficiency must be adhered to (Yermo, 2008). Despite contrary views that see organizational drivers like governance as illusive and politically motivated (Kwame & Chowdhury, 2012), the overwhelming global consensus is that good governance and compliance leads to improved efficiencies for organisations (Ambachtsheer, 2007).

Based on the above literature, some form of association is established between financial and organizational and hence it made logical sense to empirically test the nature and strength of these relationships. Nevertheless, previous studies in other countries have analysed the empirical relationship between financial and organizational efficiency and the following is a crystalized discussion of the some of the results.

2.2. Empirical Literature on DEA/SEM Studies

Financial efficiency employs a quantitative basis to evaluate and measure the performance of decision-making units and is widely used in diverse sectors (Charnes, Cooper, & Rhodes, 1978) (Braglia, Zanoni, & Zavanella, 2003). Various studies on performance of pension funds have used several methods to analyze the efficiency. For example, stochastic frontier was used in the Portugal study whilst others used financial ratios like Jensen's alpha, Sharpe's index or Treynor's (Bui, 2013). However, data envelopment analysis (DEA) emerged as a more superior method as revealed in the Kenya, Portuguese and Australian studies. Therefore, the test of financial efficiency in the study was carried out using DEA, which uses inputs and outputs criteria to test optimization of scarce resources (Davis E., 2005). The results showed that Namibian pension funds have lower efficiency scores than peers in Africa like Kenya and developed economies like Australia (Zamuee, 2015).

As we have seen above, organizational efficiency is defined in terms of the employment of a mix of resources to achieve optimized value (Harris, 2006). These resources refer to the identified research variables as per the literature review including governance, compliance, ethics, risk management, investment strategy and organizational efficiency. The above-mentioned variables created the hypothesized measurement model and formed the basis for the questionnaire survey based on a Likert-scale. Therefore, the research was seeking to test a theory and hence quantitative in nature (Burke, 2007) (Creswell, 2009). The results were analyzed using various analytical methods including parallel analysis, factor analysis and structural equation modeling.

Methodically, scaling was used to convert ordinal data from the Likert-styled survey to numeric data to aid parametric analysis. Scaling is widely regarded as robust and effective to achieve this objective without compromising on data integrity (Stacey, 2015). Given the multi-dimensionality of the hypothesized factors predicting organizational efficiency, it was imperative to employ factor reduction strategies like EFA and CFA as prelude to SEM. Parallel analysis was used a reliable tool to create the initial EFA factor structure. Therefore, results from the CFA analysis in table 1 below created the theoretical foundation to test measurement models for goodness of fit under the SEM models. The CFA model summarized the data into four factors forming the basis for the path analysis in figure 1 below.

Table 1. Confirmatory Factor Analysis Results.

Factors	Label	Attributes	Standardized Factor Loadings
Factor 1: Governance	GOV 9	Internal controls	0.739
	GOV 11	Trustee appraisal	0.656
	GOV 6	Trustee training	0.628
Factor 2: Regulatory compliance	COMP 4	NAMFISA circulars	0.842
	COMP 5	Receiver circulars	0.861
	COMP 13	NAMFISA data reporting	0.804
Factor 3: Ethics	INVSTR 10	Investment feedback	0.629
	ETH 3	Conflicts of interests	0.789
	ETH 5	Service providers	0.889
	ETH 7	No Employer control	0.697
Factor 4: Operational Efficiency	RISK 6	Contingency costs	0.781
	OPE 13	Internal controls	0.811
	OPE 7	Record-keeping	0.774
	OPE 6	Trustee skill levels	0.611
	OPE 3	Benefit payments	0.748
	OPE 2	Retirement values	0.721
	OPE 1	Strategic fund management	0.858

The results of CFA in table 1 above indicate that factor loadings for most variables were generally above 0.7 showing strong evidence of construct validity (Hair, Black & Anderson, 2010). CFA standardized factor loadings of greater than 0.4 were also held to be statistically significant in previous studies (Nunnally & Bernstein, 1994). It is interesting to note that pension funds perceives trustee training and internal controls as critical focus areas since both issues were ranked very important in the survey results and recorded to have shown improvement over the last there years. Furthermore, the path analysis diagram in figure 1 below depicts the link between the scale items (manifest variables) measuring the latent variables they represent as per the CFA analysis. Therefore, the model tests the hypothesized association between governance and organizational efficiency, regulatory compliance and organizational efficiency, investment fiduciary and organizational efficiency and operational efficiency and organizational efficiency. Under figure 1 below, the rectangular shapes points to manifest variables; the ecliptic shapes represent the latent variables whilst small circles show measurement error. Single-headed arrows show a dependence relationship whilst a double-herded arrow shows covariance. The numeric value of 1.0 shows the fixed parameter on the path.
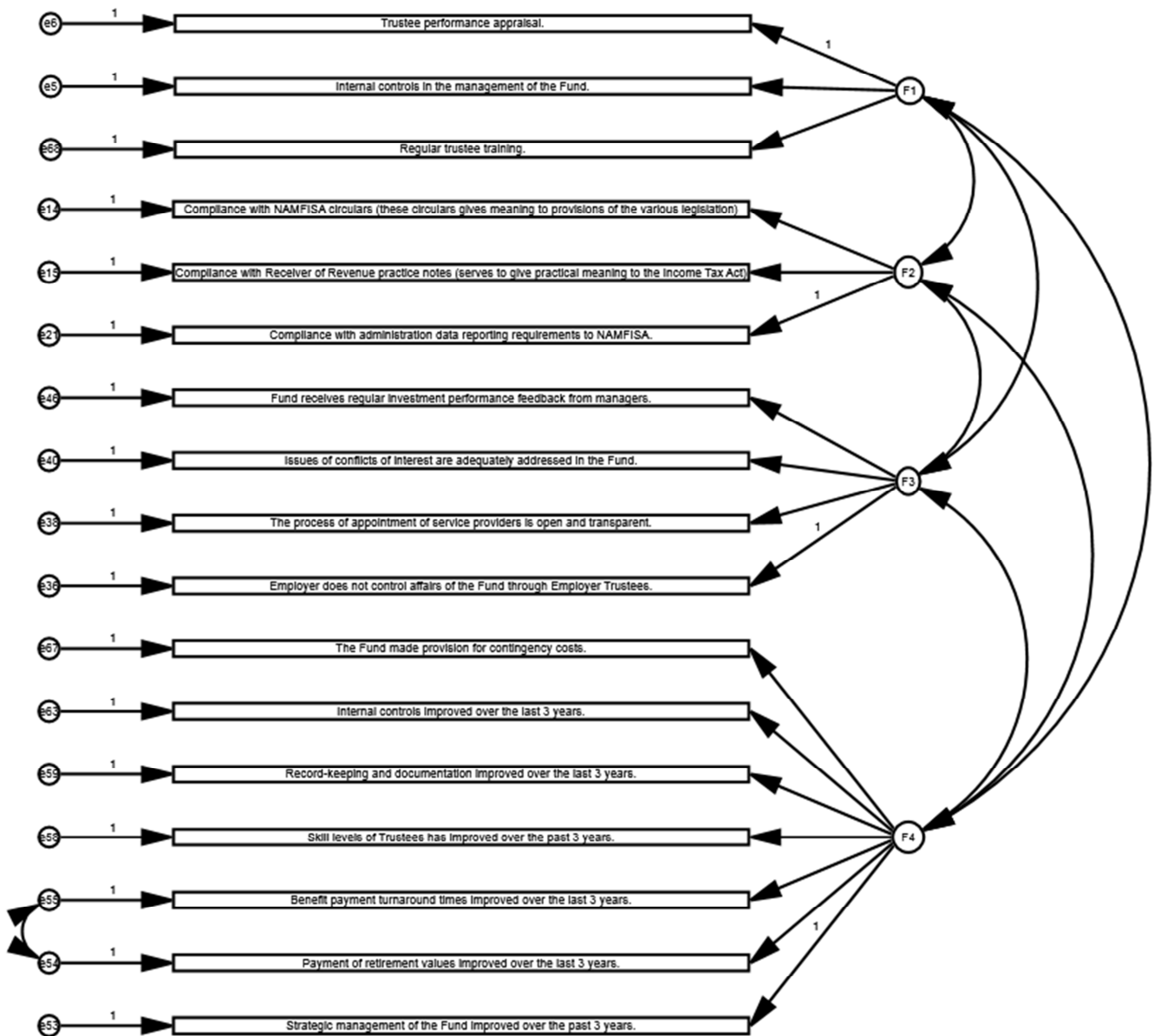
Figure 1. Path analysis diagram.

Therefore, the results of SEM in figure 1 reveals goodness of fit between the measurement mode and the data and confirms that F1 (governance), F2 (ethics), F3 (compliance) and F4 (operational efficiency) were valid and reliable predictors of organizational efficiency.

It is important to note that the results of DEA and multivariate analysis have shown that efficiency enhancements did not only come from financial imperatives, but also marked improvements in governance, compliance, ethical standards and operational efficiency of pension funds.

This cross-model or two-stage analysis was also used in previous studies with successful results measuring the efficiency of health systems (Canadian Institute for Health Information, 2013) and police services (Goltz, 2006). The two-stage analysis is found to offend regression assumptions, but this can be overcome with backward and forward step-wise regression methodology as can be seen in the final regression results (Simar & Wilson, 1997).

As the empirical findings will show, that although some of the inputs/outputs character under DEA resembles some similarity with the four predictors of organizational efficiency, the strength of association between the variables is not strong enough to induce empirical evidence to the hypothesis that financial efficiency and organizational efficiency are significantly related.

3. Empirical Findings

As indicated above, the first approach undertaken to estimate the financial efficiency of pension funds was DEA. In terms

of this analytical approach specific inputs and outputs were identified, as the important resources required achieving the retirement objectives of pension funds. The following resources constituted the components of the measured input/output structure for DEA:

Table 2. DEA inputs and outputs.

INPUTS	OUTPUTS
1. Retirement Funding Contributions 2. Administration Costs 3. Investment Costs 4. Total Fund Expenses	1. Fund Credits at end of 5 years 2. Investment Returns 3. Average Fund Assets

Figure 2. Graphical illustration of DEA scores.

The analysis of results in figure 2 below reveals that only 20% of Namibian pension funds are financially efficient and accounting for 17% of the overall membership of the funds (Zamuee, 2015). The overall mean score of 0.552 and standard deviation of 0.313 confirmed the wide spread or variation between the efficient and inefficient funds (Zamuee, 2015). This means that Namibian pension funds operating below the performance frontier are required to emulate the example of those funds that are efficient by understanding all the drivers of efficiency in order to bridge the efficiency gap.
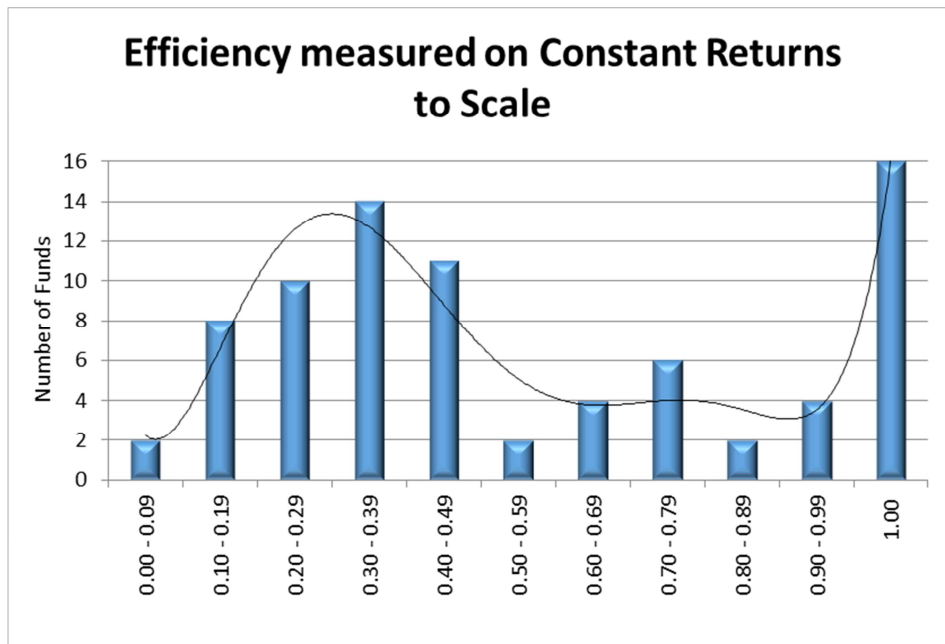
To provide context and explanation of the variances in the efficiency estimates, it was imperative to analyze and compare the mutuality of variables across DEA (Zamuee, 2015) and multivariate factors (Zamuee, 2016) forming the basis for financial and organization efficiency.

Although DEA is mainly a linear optimization tool and SEM a variance measurement error analytical method, the results in table 2 above resemble some similarity to the four variables under CFA model in table 1. For example, the DEA inputs relating to costs are similar to contingency costs issues under operational efficiency and the DEA output structure on investment returns and assets relates to issues predicting governance and ethics. Although this similarity carries no statistical significance, it is worth mentioning since the areas of similarity resonate with the literature as a basis for retirement benefit optimization (Zamuee, 2015). Indeed, it is this literature nexus that intuitively seduces a cross-model analysis and makes this research so intriguing and interesting.

To achieve the above stated study objective, the first level of this inquiry was to run correlation analysis to test the One-way ANOVA results for the relationship between financial efficiency and the four independent variables namely, governance, ethics, compliance and operational efficiency as illustrated in table 3 below. Following this approach, the financial efficiency estimates under DEA were used a dependent variables. The second test runs correlations to determine the significance of the relationship between financial efficiency and organizational efficiency as indicated in table 4 below.

Table 3. Relationship between financial efficiency and governance, ethics, compliance and operational efficiency.

Independent variable	F-value	p-value
Fund governance	1.63	0.249
Ethics	1.59	0.203
Operational efficiency	0.91	0.403
Compliance	1.67	0.790
Degrees of freedom error =40		

Note: * = significant at $p < 0.01$ level

The results in table 2 above shows that none of the above variables predicting organizational efficiency as per the empirical findings (Zamuee, 2016) are significantly related to financial efficiency based on the DEA efficiency estimates. The above conclusion is based on a benchmark criterion p-value of <0.01 recommended for studies of this nature (Goltz, 2006).

Table 4. Statistical description of variables and correlation coefficients (N=105).

Independent variable	Mean	Standard Deviation	Correlation Coefficients
Fund governance	1.36	0.65	-0.14
Ethics	1.13	0.33	0.26
Operational efficiency	1.67	0.56	-0.06
Compliance	2.62	1.06	0.12
Note: * = statistically significant at p < 0.05 level			

The above correlation results in table 4 above show that no significant relationship exists between financial efficiency and organizational efficiency as represented by the four variables describing organizational efficiency in the CFA/SEM structure as per figure 1 above. It is interesting to observe that fund governance and operational efficiency yielded negative correlation coefficients making them oscillate at opposite ends of financial efficiency. In other words, as the one variable increases, the other decreases creating a linear negative correlation or association with each other (Hair *et al*, 2010). In practice this means that pension funds bestowed with good governance, ethics, compliance and operational efficiency, are not necessarily financially efficient or vice versa. In other words, we may have pension funds that are organizational efficient and still remain wanting in terms of solvency and ability to maximize member retirement values in terms of optimization of contributions, returns and assets under management.

These results are important in the sense that now decision-makers (including trustees of pension funds) can improve the structuring and operations of pension funds in line with financial and broader organizational optimization goals (Zamuee, 2016).

However, the empirical findings create dissonance with the literature that suggests that governance leads to enhanced cost and revenue optimization (OECD, 2009). Ethical standards in the selection of service providers are generally regarded as key criteria to enhance transparency and ensure the financial soundness of pension funds (Stewart&Yermo, 2008). Therefore, the empirical findings in table 3 above are at odds with the literature view that good ethics precipitates financial efficiency. Furthermore, compliance refers to adherence to regulations and one would have expected the former to have a significant association to financial efficiency given the literature suggesting that those pension

funds that are compliant avoids undue penalties and saves costs (Vittas, 2008, Bikker & De Dreu, 2009). However, the above results in table 4 above also reveal a contrary position and assert that regulatory compliance has no significant relationship to financial efficiency. The same contrarian result applies to operational efficiency, which covers the spectrum of structural and systems issues in pension fund management (Faryadas, 2004). Meaning that those pension funds with adequate controls, systems and processes are not necessarily financially efficient.

The above results in Table 4 clearly show that organizational efficiency with all its constituent vectors is not highly correlated to financial efficiency. This finding is important as it affirms the validity and reliability of organizational efficiency and financial efficiency as distinct and separate measures of pension fund efficiency.

The overall results shows that in addition to the most powerful DEA enhancing variables like contributions, cost management and investment returns, non-financial variables like ethics, governance, compliance and operational efficiency, (although not highly associated to financial efficiency) are equally important to predict the overall efficiency of Namibian pension funds.

4. Discussion of Results and Implications for the Pension Fund Industry

4.1. Financial Efficiency

The result of DEA (Zamuee, 2015) shows that retirement funding contributions is one of the strongest inputs to enhance the financial efficiency of Namibian pension funds. Smaller pension funds in terms of membership and assets have yielded better efficiencies due to relatively higher contribution structures, which targets higher retirement values as we have seen from the DEA results. This view is in line with the thinking that higher contribution rates leads to increased retirement values and hence better efficiencies (Shah, 1997). Although the preponderance of literature advocates consolidation of funds due to economies of scale (Dyck & Pomorski, 2011), this empirical finding highlights the dangers of diseconomies of scale, which may arise in larger funds due to lack of optimization leading to inefficiencies. In the study of the United States pension fund industry, it was held that although bigger pension funds yields lower expenses, this alone did not lead to better performance (Andonov *et al*, 2012). The logical conclusion to be drawn from these findings is that pension fund trustees must design contribution rates that targets to replace pre-retirement income in line with the defined efficiency frontier.

In other words, financial efficiency must be used as the ruling criteria rather the size of assets under management or membership of the fund (Dyck & Pomorski, 2011).

Another striking finding of the DEA study (Zamuee, 2015) is the discrepancy between assets under management and member credits. This suggests that not all investment returns are declared to member accounts. This may be the practice with smoothed bonus funds where returns are withheld to smooth out market fluctuations and members' accounts are only credited with the lesser of market and book values (Van Zyl, 2010). Therefore, in addressing this issue trustees of pension fund may adopt a more progressive interest declaration policy that seeks to increase member values based on actual returns earned by the fund's assets. Based on the DEA empirical theory, this approach may increase output (retirement benefits) without an increase in input (member contributions) as held in the Australian study (Bui, 2011).

Another explanation for this variance can be the degree of portability of pension benefits at pre-retirement exists from the fund (Millard, 2008). Full withdrawal options of member credits during employment pre-retirement exits can reduce the member credits and pose a challenge to efficiency if not preserved (Funnell & Martin, 2014). Pension funds can overcome this by intensifying member financial literacy campaigns and introducing withdrawal default options to retain member fund credits in the pension funds to retirement (Blake & Orszag, 1998).

4.2. Organizational Efficiency

As seen above, the CFA/SEM study outcome (Zamuee, 2016) has validated governance, ethics, compliance and operational efficiency as valid and reliable predictors of organizational efficiency. Hereunder is a stylized discussion of the major findings and implications for the Namibian pension funds industry.

The concept of governance is new to Namibia and covers all aspects of fund leadership from trustee performance appraisals, internal controls and regular trustee meetings (NAMCODE, 2014; OECD, 2009). This classification is in congruence with literature that sees governance as the totality of running an organization (Carmichael & Palacios, 2003).

Therefore, the study findings have revealed that trustee performance appraisal; internal controls and regular trustee training are important predictors of governance in Namibia (Zamuee, 2016). The reality is that most of Namibian pension funds do not have a formal performance evaluation criteria and the focus has always been on evaluation of external service providers rather than the trustees themselves (NAMFISA, 2014). Therefore, the results of the study supports the literature that trustee evaluation must be

formalized and done at least annually by independent experts based on agreed criteria and industry benchmarks (Stewart & Yermo, 2008).

Another important governance highlight as indicated above, is internal controls. Internal controls are synonymous to risk management (Stewart, 2010). Therefore, since risk talks to the probability of adverse events happening (Bunge, 1989), trustees must ensure that all risks facing pension funds are identified and mitigated through an effective intervention strategy (Randle & Rudolph, 2014).

The study findings also showed regular trustee training is an important predictor of governance and hence essential to achieve organizational efficiency (Zamuee, 2016). Therefore, these results reflect the current information inequity in Namibia. Generally, trustees of pension funds are required to obtain professional expert advice where their own knowledge is lacking, but must have a basic understanding of trustee duties and responsibilities (Rusconi, 2008). Therefore, regular trustee training by qualified trainers will significantly enhance the pension fund knowledge economy. Furthermore, the proposed Financial Institutions and Financial Markets Bill of 2014 requires pension fund trustees to display adequate levels of knowledge and competence in the field of pension funds. The United Kingdom is an example of a country where trustee-training standards are regulated and incorporated into the governance fiber of pension fund management (UK Department for Work and Pensions, 2014).

Based on the CFA/SEM model, compliance emerged highly correlated to organizational efficiency (Zamuee, 2016). This concept is described by three issues namely compliance with NAMFISA circulars, Receiver of Revenue directives and periodical administration data requests (Zamuee, 2015). Although the initial measurement model hypothesized regulations as a separate variable, the empirical findings in the study have showed that regulations and compliance are highly correlated. Pension industries across the world make use of circulars and practice note to give certainty and effect to legislations (George, 2009). In Namibia, the pension fund regulators being the Namibian Financial Institutions Supervisory Authority (NAMFISA) and the Receiver of Revenue have issued a number of practice notes to aid the pension fund industry in the interpretation of legislation and regulations. These practice notes and circulars are not mandatory, but offers a persuasive position of the regulators perspective on regulatory issues (Pension Funds Adjudicator, 2010). The survey results are not surprising given the active role that both regulators play in the industry and rigorous enforcement of penalties for non-compliance. Most of the levies for non-compliances against pension funds relates to non-submission of statutory returns including financial and actuarial valuations reports and non-reporting of late

payments of contributions causing members loss (NAMFISA, 2014).

Pension fund ethics was also held to be a vital predictor of organizational efficiency (Zamuee, 2016). Although generally ethics is defined in terms of moral or behavioral standards (Bunge, 1989), the survey participants broadened the concept to include issues of conflicts of interest, transparency in the appointment of service providers and avoidance of control of the affairs of the pension fund by the employer, making ethics highly associated to governance. These empirical findings must be seen in the context of a local pension fund industry that is highly concentrated and monopolistic in terms of external service providers who offers vertically integrated products on a bulking basis (Rusconi, 2008). In other words, one service provider offers administration, consulting and actuarial services to the same pension fund creating an obvious opportunity for conflicts of interests and lack of transparency in service delivery. The significance of these findings is to encourage trustees to separate services between various independent service providers and promote transparency in the selection and appointment of these service providers. This finding supports the recommendations in the King III Report that requires functional separation of services (King, 2009). The most surprising empirical result was the inclusion of regular investment feedback with ethics. The bulk of the literature deals with the ethics of investing as part of the overall investment strategy rather than the specific ethics-performance appraisal relationship (Schwartz, 2003; Renneboog *et al*, 2002). Therefore, the outcome of the study creates an empirical framework that introduces regular investment feedback as an ethical standard that must be upheld by trustees if they were to be efficient in managing the affairs of the pension fund (Zamuee, 2016). One of the predictive issues under ethics is that pension funds must be free from employer control in all its affairs. This study finding is in line with the Namibian Income Tax Act 24 of 1981, which specifically prohibits the employer from controlling the affairs of the pension fund. Trustees must recognize that a pension fund is a separate legal person under the Pension Funds Act and undue interference may amount to abdication of fiduciary responsibilities (Richardson, 2013).

The final issue representing organizational efficiency is operational efficiency.

Whilst organizational efficiency conceptualizes the broader functional synthesis of resources to deliver an optimized outcome for members at retirement (Carmichael & Palacios, 2003), operational efficiency is viewed in terms of adequate provision for contingency fees, improvement of internal controls, record keeping, trustee skill levels, benefit payment turn-around times and overall strategic management of

pension funds (Zamuee 2016). Therefore, whilst both concepts relate to optimization, organizational efficiency creates a broader framework for organizational synthesis that includes the process and systems represented by operational efficiency (Harris, 2006). In other words, operational efficiency possesses predictive qualities of organizational efficiency, but the latter is broader and covers other aspects like governance, ethics and compliance.

Of all the four factors explaining organizational efficiency, operational efficiency seems to have the highest number of issues predicting the former variable. It is very interesting to note that most of the issues under operational efficiency, which has shown improvement over the last three years, like internal controls; strategic management and trustee skill levels reflect commonality with some of the issues discussed under governance. Based on the literature these issues would have been part of governance (Carmichael & Palacios, 2003), but the respondents perceive them to be separate and important drivers of operational efficiency.

Adequate provision for contingency costs is one of the issues on a broad-brush basis is closely related to risk management since it makes provision for some future event (Sorsa & Roumpakis, 2012). Pension funds are faced with various cost scenarios given the challenging environment of compliance and must make adequate provision for contingency costs without compromising its retirement objective. This is in line with the test of efficiency to optimize resources without increasing inputs (Bui, 2013).

4.3. Implications of the Findings on the Relationship Between Financial Efficiency and Organizational Efficiency

Contrary to the comparative literature, the empirical findings revealed that organizational efficiency has no significant relationship with financial efficiency (Zamuee, 2016). This means that although some of the issues describing the two levels of efficiencies might be similar, the level of association is not significant and hence both measurement models must be applied on a complimentary and interrelated basis to measure the overall efficiencies of pension funds. The similarity in some of the issues may also be ascribed to lack of technical understanding of some trustees who could not differentiate between operational and organizational efficiency. However, the high reliability coefficients yielded by the measuring instruments is indicative of the adequacy and validity of the findings.

At a practical level, the empirical results (financial and organizational efficiency analysis) present some practical guidelines for pension funds as follows:

- Consolidation of pension funds to ensure efficiency

levels taking into account potential diseconomies of scale due to risky investments or lack of cost optimization (Barrientos & Boussofiane, 2005);

- Improved efficiency frontier positioning through cost reduction strategies due to standardisation of administration services, investment pooling and regulatory compliance (Bikker and Dreu, 2009). Cost management will lead to output optimisation (Njuguna, 2010;

- Regular investment feedback and introduction of preservation strategies to encourage savings which leads to increased asset values (OECD, 2016), contribution and benefit optimisation (SA Treasury, 2012);

- Improvement of internal controls through regular system and process audits reduces exposure to adverse risks (Randle & Rudolph), 2014). This will also lead to improvement in turn-around times for benefit payments;

- Conflicts of interest (whether due to lack of transparency in the appointment of service providers or undue interference by the Employer) leads to benefit deprivation and poses an ethical challenge to pension funds. This outcome is counterintuitive to financial and operational efficiency (OECD), 2009);

- Continuous skill development initiatives like independent trustee training and performance evaluation leads to quality decision-making which in turn leads to informed optimisation strategies (Roscony, 2008);

- Data integrity forms the backbone of any pension system (OECD, 2009). Therefore, maintenance of accurate member records is an effective efficiency enhancing imperative (Carmichael and Palacious, 2003).

Based on the above, the most important implication for pension funds is that in addition to the most powerful DEA enhancing attributes like contributions, cost management and investment returns, non-financial variables like ethics, governance, compliance and operational efficiency, are equally important to predict the overall efficiency of `Namibian pension funds. This means that pension funds must not only evaluate their performance in terms of financial results, but due regard must be had to standards of organizational efficiency (Clarke & Monk, 2010). Whereas the relevance of financial efficiency pertains to optimization of costs and benefits, organizational efficiency primary relates to issues of governance, ethics and strategic operational management (Zamuee, 2016).

4.4. Limitations and Suggestions for Future Research

As indicated before, the results of this study expand managerial understanding of the drivers of efficiency in an organization endowed with limited resources requiring optimization, like pension funds. These drivers include good governance and ethical standards, compliance and robust and portable process and systems conducive to operational efficiency. Although the empirical evidence in the study is specific to the Namibian pension fund industry, the application of the theory is capable of wider application. The limited Namibian data sample did not compromise the reliability and validity properties of the measurement scales given the fact that a sample of 100 items or more is held to carry adequate statistical power to conduct CFA/SEM (Hair, Black, Babin & Anderson, 2010). Second, the survey data collected were cross-sectional and only measures correlational relationships without looking at causal impact of variables or general causation.

Based on the above caveat more opportunities emerged for future research. First, the empirical framework of the study can be used for further research based on a broader regional database, which may cover the experience of more than one country. Second, to enhance the generalizability of the empirical results, the study can be applied in future to measure the efficiency of pension funds in other countries within the Southern African Development Community like South Africa and Botswana given the similarity of socio-economic environment. Third, future research can also investigate other variables that may impact on efficiency as an important driver of institutional performance.

5. Conclusion

This research creates an important framework of understanding on the important issues facing trustees in the management of pension funds. The study outcome has fully conceptualized the theory on pension fund efficiency and has answered the empirical inquiry into the issues that drives efficiency of pension funds using acceptable methodological and analytical approaches.

The study outcome revealed that although the size of the funds was held to be a determinant of financial efficiency under the DEA model, the same inference could not be made under the SEM model since none of the predictors of operational efficiency were significantly influenced by the size of pension funds. Larger pension funds experienced diseconomies of scale under the DEA model and this can be explained by lack of cost optimization and risky investments (Bikker and Dreu, 2009). This is an important finding and allows pension funds to carefully consider the decision to join umbrella funds since this may result in diseconomies of scale arising from a larger membership and assets under management.

The empirical results showed that governance, regulatory compliance, fund ethics and operational efficiency were significantly associated with organizational efficiency. This means that pension funds that have sound governance standards like regular trustee training, self-evaluation and performance appraisals tends to be more organizationally efficient. Pension funds that adhere to regulations were held to be organizationally more efficient than others, and this means that trustees have a fiduciary obligation to ensure that their operating structures and risk management policies are compliant with legislation (Stewart, 2010). Importantly, issues of ethics in the selection of service providers, integrity and operational autonomy emerged as one of the important predictors of organizational efficiency. This means that pension funds must adopt formal code of ethics as behavioural guidelines in decision-making. The issues raised under operational efficiency talks to the overall strategic management or administration of pension funds. This means that trustees can now impose standards to administrators around benefit payments, internal controls and record keeping (Carmichael & Palacious, 2003).

At a practical level, the study outcome has created a foundation for pension funds to prioritize and focus on those efficiency enhancing activities like risk management, trustee skill development, compliance, performance appraisals, good ethics and promotion of good governance in the management of pension funds.

The most important statistical significance of the study is that it attest to the supremacy of DEA and SEM as reliable optimization tools and has introduced novel analytical models like parallel analysis as a factor reduction technique with credible results. The cross model approach delivered successful results in the measurement of financial and organizational efficiency of pension funds.

Therefore, the study achieved proper conceptualization and empirical evidence of the synthesis and symbiosis of organizational and financial efficiency in the performance of pension funds as decision-making units with a fiduciary duty to optimize on scarce resources. Overall, the conclusion is that although financial and organizational efficiency are not statistically highly associated, the two criteria are both important and no credible analysis of relative efficiency of pension funds can be completed without looking at both.

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