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EFFECT OF RISK MANAGEMENT ON INVESTMENT STRATEGY AND CONTRIBUTORY PENSION SCHEME SUSTAINABILITY NEXUS IN NIGERIA

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Abstract

In line with the increasing desire for sustainability across numerous areas of study, occupational pension sustainability has emerged among the core objectives of pension reforms. Thus, this study assesses the impact of risk management on the relationship between investment strategy and sustainability of contributory pension scheme (CPS) in Nigeria. Using data obtained from survey of 197 managers and assistant managers of pension fund administrators that manage CPS fund in Nigeria, the study employs partial least square structural equation modelling to examine the effects of investment strategy and risk management on sustainability of CPS. The study further examines the moderating effect of risk management on the relationship investment strategy and contributory pension scheme sustainability. Findings reveal that investment strategy and risk management have significant positive effects on the sustainability of CPS in Nigeria. Further analyses show that risk management has negative moderating effect on the relationship between investment strategy and the sustainability of CPS. The implications of the findings to management practices of the Nigerian CPS were presented among which we recommend that pension fund administrators need to strike a balance between their investment strategy and risk management decisions. This would improve their liquidity, reduce the risks to the minimum and facilitate the sustainability of the pension fund entrusted in their management.

Keywords: Occupational pension sustainability, Contributory pension scheme, investment strategy, risk management, pension fund administrators

JEL Classification Codes: Q56, G11, G23, G32

1. INTRODUCTION

Empirical and anecdotal evidence has emphasised the need to address the challenges facing occupational pension (OP) globally. Thus, there have been growing concerns on the need to address the sustainability challenge of OP plans. OP is the post-retirement benefit payable to employees after leaving employment to reduce poverty among employees during retirement life (Ambachtsheer, 2008; Holzmann, Hinz & Dorfman, 2008). Contrary to aim of OP, evidence has shown that payments of pension obligations as at when due has remained a difficult task for employers globally (Ambachtsheer, 2008). In case of Nigeria, the defined benefit (DB) OP scheme was no doubt a stark example of OP plan in crisis with liabilities to retirees from Federal Civil Service and the 36 states estimated at \$9.3billion and \$14.7 billion respectively (Oyetunji, 2010). Among the reasons cited for the huge pension liabilities was the unfunded nature of the DB scheme where OP payments are being financed from

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budgetary allocation which, in most cases, was too low relative to the liabilities. For decades, the poor budget prompted concern on sustainability of DB pension scheme in Nigeria. In 2004 a funded contributory pension scheme (CPS) was implemented to alleviate the challenge of OP funding in line global norm with sustainability among the core objectives (Ahmad, 2008; Ijeoma & Nwufu, 2015). However, the implementation of CPS has not minimized stakeholders' concerns on tendency of CPS to provide a sustainable OP (Aborisade, 2008; Nyong & Duze, 2011).

There is agreement among policymakers and scholars that optimal investment strategy and risk management of pension fund are vital towards achieving prompt payments of pension benefits (Baker, Logue, & Rader, 2005). Whereas risk management has proven to be an indispensable managerial tool to minimise risks associated with pension fund management, documented evidence on the impacts of pension fund investment strategy has remained mixed both in Nigeria and elsewhere (Barr & Diamond, 2008; Nwozo & Nkeki, 2011). Specifically, scholars seemed to have devoted less attention to effects of investment strategy and risk management on the achievement of a sustainable CPS in Nigerian. Available literature reveal that only the study by (Ijeoma & Nwufu, 2015) has examined the effect of investment strategy and risk management on the sustainability of Nigerian CPS, to the best of our knowledge. Thus, this study replicates the study of Ijeoma and Nwufu (2015) with some extensions.

One, while Ijeoma and Nwufu (2015) examine the effects of investment strategy and risk management as separate determinants of CPS sustainability, our study propose and test the interaction effects of the both determinants (investment strategy and risk management) on CPS sustainability. We based this test on the intertwined relationship between investment strategy and risk management decisions as the risk appetite determines the allocation of pension fund to various asset classes based on their associated risks and need to minimise the risk effects on pension fund (Rauh, 2009). Second, Ijeoma and Nwufu limit their sample to survey of managers of open pension fund administrators [PFAs]. We extend the sample by drawing sample from closed PFAs as well to test the generalisability of their findings with validated measurements developed in literature within and outside Nigeria for the measurements of the variables under study. The remaining part of the study was organized as follow. Section two discusses the related literature leading to developments of research hypotheses. Section three explains the methodology while Section four presents the data and discussion of findings. Section five concludes the study.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Occupational Pension Scheme Sustainability

According to Whitehouse, D'Addio, Chomik, and Reilly (2009), occupational pension sustainability is the ability to generate adequate resource through the contributions and earnings thereon for pension payments. Holzmann et al (2008) conceptualise a sustainable pension as “one that is financially sound and can be maintained over a foreseeable horizon under a broad set of reasonable assumptions”. Asher and Bali (2013) define occupational pension sustainability as the tendency of the pension system to maintain a long-term balance between pension assets and liabilities. Asher and Bali (2013) further stated the sustainability of occupational pension as the ratio of monetary balance between the pension assets and pension liabilities known as the funding ratio. OP sustainability attained attention of scholars

during the financial crisis of 2007-2008 when some too “big to fail” companies went bankrupt due to failure to meet their OP obligations (Merton, 2014). Since then there has been increasing concern on the sustainability of occupational pension schemes on account of their significant impacts on the economy. Sustainability is salient among the motives for pension reform to improve the long-term finances of pension systems in the face of the funding pressure of maturing retirement benefits (Whitehouse et al., 2009). Besides, Amalric (2006) views that sustainability of pension system is vital given that pension funds have become major institutional shareholders in big corporations. Sustainable pension also promotes increased national savings that can be channelled into long-term investments to boost employment, productivity and the financial markets (Elveren & Hsu, 2007).

Empirical studies have identified some determinants of OP sustainability. For example, Blake and Mayhew (2006) conducted a scenario analysis of the pension contributions and payments in the UK. The results established that by as early as 2020 and not later than 2030, population ageing and declining fertility would negatively affect OP sustainability. Blake and Mayhew recommended encouragement of immigrant inflow to remedy the negative effects of population ageing and declining fertility on the UK occupational pension sustainability. A Spanish study by Serrano, Eguia, and Ferreiro (2011) provided empirical evidence on the effects of immigrant population on OP sustainability. Based on scenario analysis, they found that despite hosting the largest immigrant population, there is a little propensity of elongating the year before pension contributions exceed pension liabilities. Both studies, agree that the negative effects could be delayed with major pension reforms such as an increase in both pension contribution rate and the retirement age as well as a decrease in pension benefits payable.

Moizer, Farrar and Hyde (2017) examined the effect of government deferral incentives that pay additional reward at retirement to encourage workers to defer their retirement under the National Insurance Fund (NIF) in the UK. Dynamics simulation models of data from policy incentive parameters were conducted for deferral periods of 2, 4 and 6 years, population dynamics, and life expectancy projections over a 40-year period from 2016 to 2056. The results indicate that the deferral choice options, through enhanced pension benefits, would significantly impact on pension sustainability. Darmaraj and Narayanan (2019) assessed the sustainability of Malaysian non-contributory defined benefit civil service pension scheme (CSPS) directly funded with the budget. Contrary to findings of Moizer et al. (2017), they found that analysis of eight scenarios varying retirement age, contribution rate, and replacement rate using annual pension model over a 75-year period will not improve CSPS sustainability.

Studies have also documented the effects of economic condition and stakeholders’ support on OP sustainability. Beblavý (2011) examined the sustainability of private pension reforms in Central and Eastern European countries, controlling for prevailing economic conditions. Using pension data from EUROSTAT, the study found that pension sustainability (measured as the difference between contributions and liabilities) was high during a favourable economic period and low during a period of economic crisis. Beblavý (2011) documented that the level of support for pension reforms was negatively affected during the periods of financial crises. In a Romanian study, Ionescu (2013) found that the public support for privately managed pension funds tends to be low during a financial crisis. The findings of Ionescu corroborated that of Beblavý as both studies provided evidence that stakeholders

support during the reforms had no relationship with the future sustainability of OP. Thus, pension reform with popular support is not a guarantee of sustainability of the reform.

2.2 Investment Strategy of Pension Fund

Investment strategy of pension fund refers to the allocation of pension assets on stocks, bonds, estates and cash as considered appropriate to meet the long run liability constraints without exceeding tendency to bear risk (Baker et al., 2005). Traditionally, investment strategy dictates the allocation of pension asset to various investment outlets (equities, bonds, mortgage, and money markets) and domain (local or foreign) among others (Queisser & Vitas, 2000). Investment strategy of pension fund is designed in line with pension assets valuation (Queisser & Vitas, 2000). However, valuation approach has been challenged by Merton (2014) in favour of income-focused investment strategy that allocates pension assets in accordance with the income from the asset class to minimise the far-reaching effect of loss associated with pension assets valuation approach (Woods & Urwin, 2010). Muralidhar (2001) advocate that irrespective of the approach, private pension schemes need to put in place a diversified asset allocation that reflects the ageing of the plan participants in line with life-cycle of the funds with cognisance to asset-liability analysis. Similarly, Stewart (2010) asserted that the average age of participants in a pension plan significantly influenced the investment strategy on various pension assets. Impavido, Lasagabaster and Garc (2010) documented that investment strategy assist pension asset managers to avoid suboptimal investment portfolios.

Despite the significance of investment strategy on pension assets, the debate on optimal investment allocation on various financial securities has largely remained unsettled in the literature. For example, Dobra and Lubich (2013) analysed the relationship between pension asset allocation (measured by the percentage of pension assets invested in equities, bonds, short-term securities, and cash) and proportion of plan participants (active and retired) of state and local government pension funds in the US. Regression results of data obtained from biennial survey conducted by the Public Pension Coordinating Council (PPCC) over 1995-2001 showed there was a significant positive relationship between the allocation of pension assets and percentage of active and retired participants. Cocco and Volpin (2007) in a study of 90 pension trustees in the UK found that fluctuations in prices of equities had a substantial impact on the investment strategy. Their study showed a positive relationship between the allocation of pension assets to risky investment and the leverage (capability to meet the financial requirements of paying pension benefit as and when due) of a pension plan. Mohan and Zhang (2014) analysed the effect of funding ratio (sustainability) and percentage of equity investment of 126 pension plans in the US over a period of 10-year. Their findings showed a significant negative relationship between the pension sustainability and equity investment.

Studies have further examined the effect of restrictions and preferential bias on investment strategy. In a study of Italian pension fund managers, Lippi (2016) examined the effect of managers' nationality on the proportion of investment in Italian government securities, corporate bonds and equities. Data on total assets under management (AUM), asset under management (AUM) invested in Italian government securities and corporate bonds, and equities; and the managers' nationality were extracted from the balance sheet of 35 pension funds over the years 2007–2011. Regression results showed a significant effect of home (local) bias of pension managers on pension assets invested in Italian securities.

Brown, Pollet and Weisbenner (2015) also found that pension funds show bias to invest in stocks of firms headquartered in their states from a sample of 27 state pension funds in the USA. The findings showed that geographical proximity offers information advantage which makes the local equities preferable among pension fund managers. This may be connected to the fact that the managers tend to have more information needed to make an informed decision on home securities compared to foreign ones. Relying on three cross sectional surveys of US pension fund, Nofsinger (1998) found an insignificant impact between the investments returns of pension plans with restricted-investment strategy and those with an unrestricted investment strategy.

Egbe, Awogbemi and Osu (2013) examined the optimality of the investment strategy of CPS in Nigeria. The results of linear programming analyses show that the allocation of a CPS fund to various assets classes which allows up to 80% on government bonds is not at the optimal level. The study noted low asset pension allocation to equities and real estate investment trusts (REITs) market despite their buoyancy in Nigeria. Tsado and Gunu (2011) conducted a study to identify the factors considered by pension fund administrators (PFAs) of Nigerian CPS in the allocation of the pension fund into different asset classes. Results of principal factor analyses of a survey of managers of drawn from five open PFAs showed that economic, risk and perceived security are the significant factors that influence the decision of PFAs in the allocation of CPS fund to different asset classes.

In Australian, De Francesco and Levy (2008) found that investment strategy of real estate investment trusts has positive impacts on fund sustainability. Ijeoma and Nwufu (2015) empirically assessed the impacts of investment strategy on the sustainability of Nigerian CPS. Survey data from sample of managers from five PFAs reported a significant effect on the sustainability of CPS. Besides using a very limited sample size, Ijeoma and Nwufu selected sample from only one category of PFAs (open PFAs) and ignored the other (closed PFAs). This study examines the impact of investment strategy on the sustainability of the CPS in Nigeria by drawing a broader sample from all categories of PFAs. This study examined the impact of investment strategy on the sustainability of the CPS in Nigeria by drawing a broader sample from both categories of PFAs in Nigeria. In view of the above evidence, this study proposes a significant impact of investment strategy on the sustainability of CPS in Nigeria as stated in the following hypothesis:

H1: Pension fund investment strategy has positive effect on CPS sustainability in Nigeria.

2.3 Interaction of risk management and investment strategy of pension fund

Risk management entails procedures designed to identify, measure, quantify and minimise risks (Van Gestel & Baesens, 2008). Due to universal nature of risks, risk management has become a tool in management of firms. International Monetary Fund [IMF] (2009) advocates institutionalizing risk management to minimize risk effects on pension plans overall objective achievement as critical aspect in pension management to promote pension sustainability. Ambachtsheer (2012) advocated risk management as an integral part of pension fund management to cater for the recent trend of partial to full transition from the DB to DC plan and privatisation. Integrating risk management facilitates diversification of risks which has improved liquidity of pension funds (Ammann & Zingg, 2010). The Nigerian capital market, where part of CPS fund is invested, is characterised by high return and exposure to high risk on investment (Osamwonyi & Asein, 2012). Extant literature establish

that investment strategy and risk management of fund are inter-related. Specifically, Exley (2005) argued that the value of pension fund is unaffected by its mixture of investment on various asset classes similar to the postulation of “irrelevance theory” by Franco Modigliani and Merton Miller that total value of the firm is unaffected by its capital structure, According to (Exley, 2005), pension funds’ asset investment mix depends on the riskiness of the asset class invested. Therefore, the impact of risk management on pension fund investment strategy cannot be neglected.

Studies have established the links among investment strategy, risk management and sustainability. For instance, Rauh (2009) examined the impact of risk incentives (risk shifting and risk management) on the investment strategies (measured in percentage of pension assets on each class of investible securities) of US pension plans. Based on characteristics such as credit rating status, pension funding ratio and proportions of active and retired plan participants, pooled panel data regression results of 2,186 observation-year revealed a significant positive relationship between equity investment (considered more-risky) and significant negative relationship with investment in government bonds and other fixed income investments (considered less risky). The results further showed no significant difference between pension plans rated by Standard and Poor Rating (S & P) agency and those not rated. However, the effects of funding ratio and proportion of active and retired plan participants were found insignificant on the investment strategy even for pension plans on the verge of freezing indicated by significant Altman Z-score signalling bankruptcy. Froot, Scharfstein, and Stein (1993) examined the interaction between investment strategy in relation to financial policies and report that risk management can enhance the optimal investment policies. Later study by Tao and Hitchinson (2013) of Australian finance industry with 711 observations over 2006–2008 showed that risk management proxied by director’s membership of risk management committee negatively moderates the relationship between risk and firm performance among high risk-exposed firms.

Studies have examined the impact of risk management on investment related decisions. For example, risk tolerance was found to influence the quality of investment decision by fund managers (Hallahan, Faff & Mckenzie, 2004). Stewart (2010) also established that a sound risk management practice by pension managers was essential for a prudent allocation of pension funds to minimize risks relating to pension funds’ financial vulnerability and their potential adverse effects. In his study, Louargand (1992) asserted that risk management has become an integral part of pension fund management as risks influence the achievement of pension fund objectives. Haneef et al. (2012) also reported that the absence of risk management practice is a threat to the profitability of banks in Pakistan.

Previous studies have examined the moderating effects of risk management on the performance of firms generally and fund specifically (including pension fund) characteristics and reported mixed results. For examples, Kallamu and Saat (2015) found that risk management committee positively moderates the relationship between non-traditional strategy and firm performance of the finance industry in Malaysia. Mahat, Ali and Nasir (2011) also reported inconsistent moderating effect of risks management on combination of funds based on their characteristics and performance. Based on above empirical evidence, we therefore proposed and tested interaction effect of investment strategy and risk management on pension funds without combining with other type of funds focus on the interaction effect on Nigerian CPS sustainability. Thus, this study hypothesised as follow:

H2: Risk management has a positive effect on contributory pension scheme sustainability in Nigeria.

H3: Risk management has a moderating effect on the relationship between investment strategy and contributory pension scheme sustainability in Nigerian.

3. METHODOLOGY

The collection of data for the study was through questionnaires in a cross-sectional survey. The measurement items were adapted from previous studies. The five measurement items for CPS sustainability are adapted from studies by Cong, Frank, Gianakis, and Guo (2015) and Ijeoma and Nwifo (2015). Measurement for investment strategy were adopted from Tsado and Gunu (2011), while those of risk management were adapted from Arnold, Benford, Canada, and Sutton (2011). As control variables, measures for pension fund size was adopted from Aiyabei (2013) while PFA type was measured nominally. Responses to the questions were on Likert-scale of minimum of 1 to maximum of 7 indicating strongly disagree and strongly agree respectively. We sought and obtained the permission of the human resource managers of PFAs managing CPS funds prior to the conduct of the survey. With the assistance of the human resource managers of PFAs, ten questionnaires were administered to ten managers and assistant-managers of 28 PFAs using drop-collect mode. Out of the 280 questionnaires administered, a total of 197 consisting of 155 respondents from open PFAs and 42 from closed PFAs filled and returned the questionnaires. The survey yielded a response rate of 70.4%. The data collected were analysed with partial least square structural equation modelling (PLS-SEM) following the laid down measurement and structural assessments with SmartPLS 3.2.6 Statistical Software.

4. FINDINGS AND DISCUSSIONS

4.1 Respondents' Profiles

The gender distribution of the respondents comprises of 107 males (54.3%) and 90 females (45.7%). A total of 132 (67%) respondents had bachelor's degree/ higher national diploma (HND), 64 (32.5%) had post-graduate degree while only one (0.5) respondent possessed diploma certificate. Out of the 197 total respondents, 63 held the position of manager while 134 held the position of assistant managers. The length of working tenure, in range of year, varies from less than one year, 1-5 years, to 6-10 years and above ten years for 3, 11, 118 and 65 respondents respectively. The average years in their current managerial position was 3.88 years with standard deviation of 2.91 years.

4.2 Model Measurement Assessments

As shown in Figure 1, all the measurement items loading, except INV7, reported loading above the threshold of .50 suggested by Hair Jr., Hult, Ringle, and Sarstedt (2017). The internal consistency of the constructs was tested using composite reliability (CR) and Dijkstra-Henseler rho_A estimates of internal consistency for PLS-SEM (Chin, 2010; Dijkstra & Henseler, 2015; Fornell & Lacker, 1981). The reported internal consistency of the constructs of the study were all above the benchmark of 0.7 suggested in PLS-SEM methodological literature (Chin, 2010; Dijkstra & Henseler, 2015; Hair Jr. et al. (2017). The item loading range were greater than minimum of 0.40 threshold (Hair Jr. et al., 2017), as

shown in Table 1, signifying the items measures their respective constructs. Average variance Extracted (AVE) was computed to test the convergent validity of the items that measure the constructs (Fornell & Larcker, 1981). All constructs reported above the 0.5 acceptable AVE (Table 1). The discriminant validity is also assessed with three criteria of Fornell-Lacker criterion (Fornell & Larcker, 1981), cross-loading (Chin, 2010) and heterotrait-monotrait (HTMT) ratio of correlations (Henseler, Ringle & Sarstedt, 2015). For the Fornell-Lacker criterion, the square roots of AVE obtained were higher than the off-diagonal correlation coefficients along the corresponding rows and columns which indicate discriminant validity of constructs of the study (Chin 2010; Fornell & Larcker 1981) as displayed in Table 2. Cross-loading estimates (see Appendix 1) show that items were strongly correlated with the construct they measures than other constructs as suggested by Chin (2010) and Henseler, et al (2015). Thus, item-level discriminant validity is not a threat in this study.

As suggested by Henseler et al, (2015), HTMT was reported in line with recent arguments that the duo-criteria of Fornell-Lacker criterion and cross-loading may not reveal the presence of discriminant validity threat due to different sources of validity and their low sensitivities. Nunnally (1978) defines HTMT ratio as an estimate of the correlation between constructs, which parallels the disattenuated constructs correlations. We assesses HTMT with two estimates recommended by Henseler, et al (2015). First, we test the HTMT ratio against a pre-defined threshold in PLS-SEM methodological literature within the range from 0.85-1.00 (Henseler, et al, 2015; Kline, 2011). The threshold is considered fit with class interval (CI) of 0.05-0.95 as adequate HTMT statistical test of inference. Results depicted in Appendix 2 indicate that all the constructs of the study met the duo criteria and free from the threat of discriminant validity. The measurement model was obtained from Figure 1.

Table 1: Measurement model estimates

Constucts	Loading range	rho_A	CR	AVE
Contributory pension sustainability (CPSS)	0.777-0.850	0.887	0.909	0.667
Investment strategy (INV)	0.584-0.884	0.958	0.957	0.957
Risk management (RM)	0.872-0.930	0.948	0.959	0.825
Pension fund size (SIZE)	0.748-0.941	0.995	0.938	0.752

Table 2: Fornell-Lacker Criteria

Constructs	1	2	3	4
1 Contributory pension sustainability (CPSS)	0.817			
2. Investment strategy (INV)	0.246	0.765		
3. Risk management (RM)	0.653	0.276	0.908	
4 Pension fund size (SIZE)	-0.090	0.156	0.093	0.867

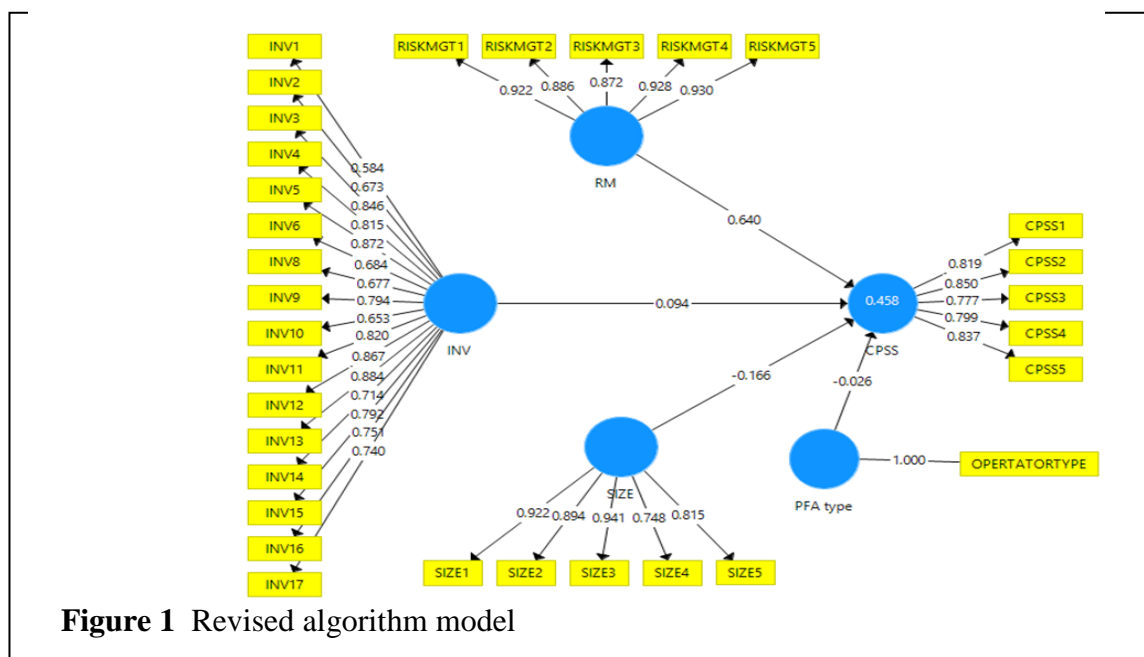


Figure 1 Revised algorithm model

4.3 Model Structural Assessment

Multicollinearity of the constructs was assessed with variance inflation factor (VIF) and tolerance index. The VIF of the exogeneous variables are INV (1.103), RM (1.092) and SIZE (1.031). The tolerance index ranges from .468 to .876. Thus, there was no collinearity among the exogeneous constructs of this study. The R² of 45.8% also confirmed that variation in CPS sustainability (CPSS) was moderately explained by exogeneous constructs. The impacts of exogeneous constructs on R² of the model were assessed with effect size (*f*²) categorized as small, medium and substantial at 0.02, 0.15 and 0.35 respectively (Cohen, 1988). From the model, the values of *f*² for INV, RM and SIZE were 0.02, 0.69 and 0.05 respectively. Furthermore, the model has adequate predictive relevance (Q²) with Q² estimate of 0.276 above the minimum benchmark of 0 suggested by Stone (1974). The output of bootstrapped model to test the direct hypotheses (H1 and H2) was shown in Figure 2. For H1 that hypothesised that investment strategy has positive effect on contributory pension scheme sustainability in Nigeria, the results ($\beta = .094, t = 1.709, p < .044$) represented by path linking INV to CPSS showed a significant positive effect of INV on CPSS. Therefore, H1 was supported. For H2 on the effect of risk management on CPS sustainability the results ($\beta = .640, t = 11.869, p < .000$) of the path linking RM to CPSS also supported H2.

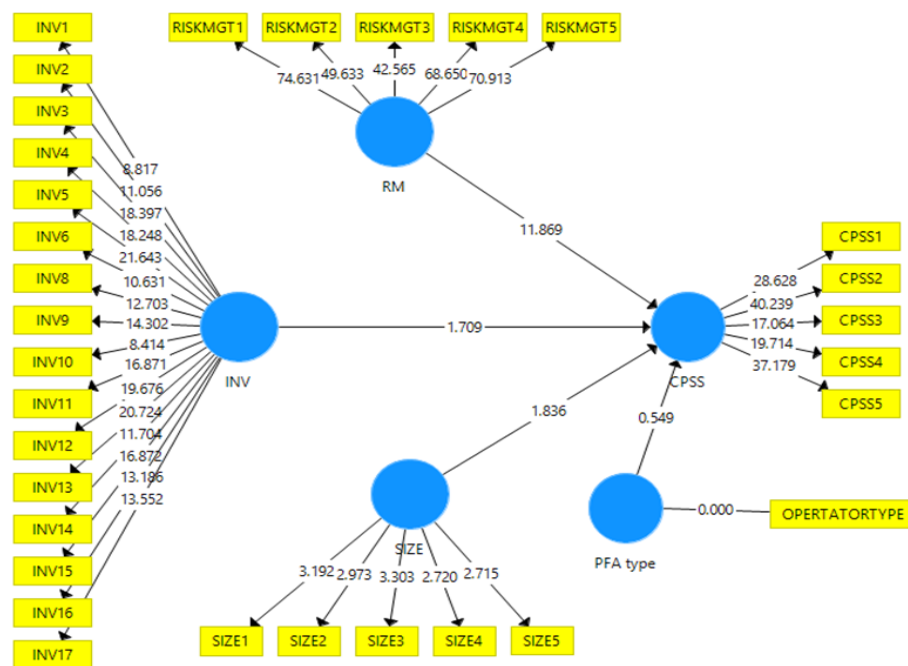


Figure 2 Direct bootstrapped model

Figure 3 showed the bootstrapped model of hypothesis H2 which predicted interaction of risk management and investment strategy (RM*INV) on CPSS with estimates ($\beta = -0.252$, $t = 4.245$, $p < .000$) was also supported. However, the interaction effect was negative indicating that the more the RM the weaker the relationship between INV and CPSS (see Figure 4).

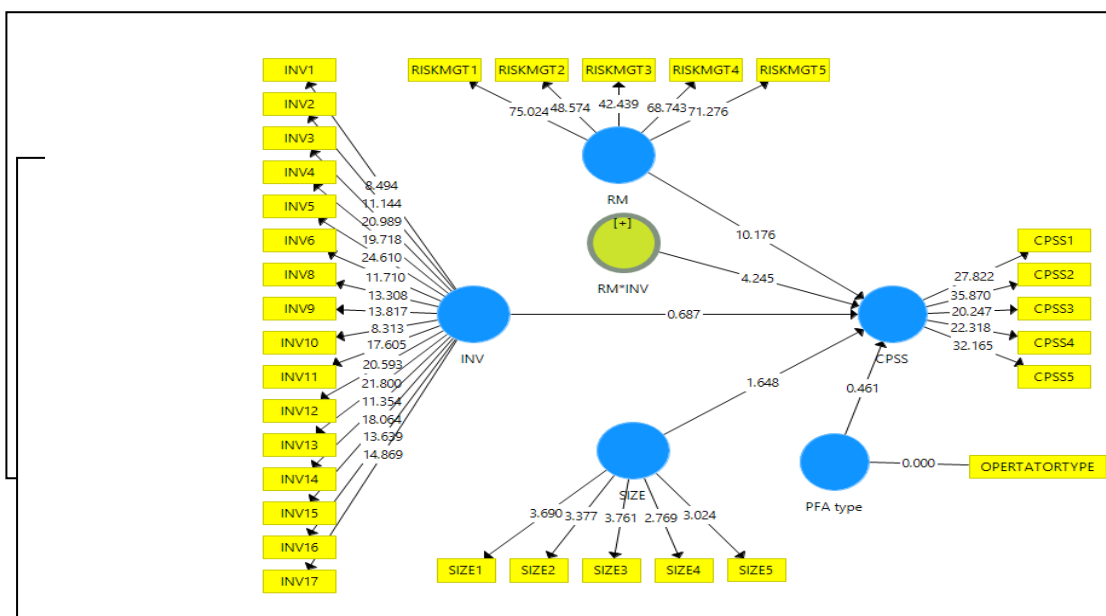


Figure 3 Indirect bootstrapped model

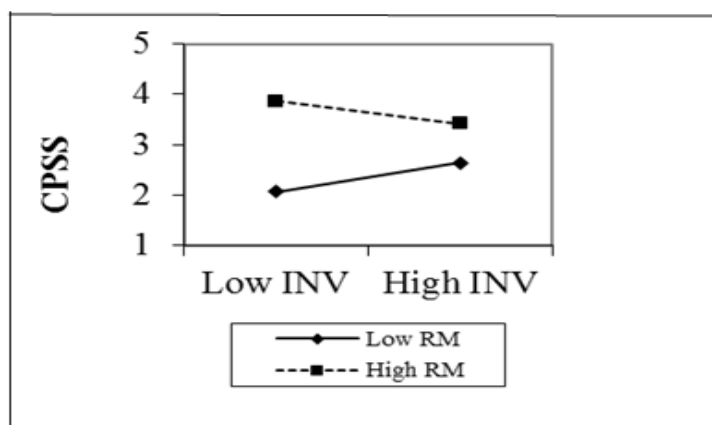


Figure 4 Moderating effects of risk management on the relationship between investment strategy and contributory pension scheme sustainability

4.4 Discussions of Findings

For the direct hypotheses (H1 and H2) linking investment strategy and risk management to CPS sustainability were revealed as positive and significant effects. The findings indicate that the more the optimal the investment strategy and risk management of CPS fund, the more the sustainability of the CPS. The findings are in consonance with findings of other studies (De Francesco & Levy, 2008; Ijeoma & Nwifo, 2015). These results provide additional empirical evidence on the significance of investment strategy and risk management on CPS sustainability. The results prove the potentials of investment strategy and risk management to contribute positively to CPS sustainability. A number of plausible factors could account for the positive findings. One, the existing PenCom's investment strategy guidelines allows PFAs to invest substantial part (up to 80%) of the pension funds in bonds and treasury bills of federal, state and local governments which are risk-free. For instance, 72.08% of pension assets are invested in bonds and treasury bills of state and federal governments with meagre investments of 6.54% and 0.69% in local and foreign shares respectively (PenCom, 2019).

In addition, both local and foreign shares invested by PFAs of CPS are those certified by PenCom approved rating agencies in line with provision of investment guidelines. All these have guaranteed the sustainable growth of the CPS asset without being impaired by risks. Another factor as noted by Lippi (2016) may be linked to preference for domestic securities over foreign ones positively affect the investment of pension funds. Lippi asserted there is always high tendency to have more information on the local securities relative to the foreign ones among pension fund managers due to better knowledge of the local economy within their geographical proximity. Unlike foreign securities with high risks, bias towards domestic securities minimise the associated investment risks and protected CPS fund from investment risks emanating from other geographical territories where pension fund managers and the local regulator have little or no influence to exert control.

For H3, the negative effect of risk management reported is consistent with finding of Tao and Hitchinson (2013) that also reported risk management proxied by director's membership of risk management committee negatively moderates the relationship between risk and firm performance. However, the finding is contrary to the findings of Kallamu and Saat (2013) that risk management committee positively moderates the relationship between

non-traditional strategy and firm performance of finance industry in Malaysia. Furthermore, Mahat et al. (2011) reported inconsistent moderating effect of risks management on combination of funds based on fund characteristics and performance. With regards to the negative effect of RM on the relationship between INV and CPS sustainability, one of the plausible reason may be attributed to the way and manner the pension fund managers apply the investment strategy of CPS gives due consideration to the peculiar environmental challenges. This is evident from the finding of Tsado and Gunu (2011) that managers of CPS operators are much more concerned on perceived risks and security of the various asset classes they invest in. This assertion is supported by the results of the model which showed that RM has a very large effect far above the other exogeneous constructs. Thus, the implication of the large effect size (0.69) for RM is that managers of CPS are much more concerned on ensuring the safety of their pension assets investment rather than allocating the assets towards the laid down investment strategy.

5. CONCLUSION AND RECOMMENDATIONS

Among the core objectives of CPS reform Nigeria is the desire for a sustainable pension scheme. This study examines the effects of investment strategy and risk management on the sustainability of CPS in Nigeria. The results showed that investment strategy and risk management positively influence the sustainability of CPS. The study further test the interaction effect of investment strategy and risk management on CPS. The result showed a negative interaction effect of both variables CPS sustainability which indicate that the stronger the risk management, the weaker the investment strategy effect on the sustainability of CPS in Nigeria. We provide plausible factors that may account for all the findings. The study provide empirical evidence on the effects of investment strategy and risk management from the sample of both open and closed PFAs. This is an extension of the previous study conducted by Ijeoma & Nwifo (2015) that limit the sample to open PFAs managing the accumulated fund under the CPS in Nigeria. The results is consistent with the previous study (Ijeoma and Nwifo, 2015). In addition, the findings of the proposed interaction effect suggest that the PFAs need to strike a balance in their investment strategy and risk management decisions to improve their liquidity and reduce the risk to the minimum for the sustainability of the pension fund in their management.

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Appendix 1: Cross-loading

Items	CPSS	INV	RM	SIZE
CPSS1	0.819	0.209	0.501	-0.179
CPSS2	0.850	0.206	0.631	0.029
CPSS3	0.777	0.169	0.388	-0.128
CPSS4	0.799	0.187	0.462	-0.134
CPSS5	0.837	0.223	0.628	-0.002
INV1	0.142	0.584	0.045	0.145
INV2	0.140	0.673	-0.010	0.055
INV3	0.197	0.846	0.200	0.161
INV4	0.194	0.815	0.221	0.090
INV5	0.214	0.872	0.329	0.149
INV6	0.232	0.684	0.158	0.116
INV8	0.216	0.677	0.164	0.018
INV9	0.063	0.794	0.146	0.208
INV10	0.101	0.653	0.062	0.078
INV11	0.183	0.820	0.247	0.179
INV12	0.177	0.867	0.284	0.129
INV13	0.211	0.884	0.305	0.195
INV14	0.169	0.714	0.169	0.050
INV15	0.191	0.792	0.280	0.079
INV16	0.133	0.751	0.204	0.109
INV17	0.245	0.740	0.327	0.165
RISKMG1	0.630	0.261	0.922	0.110
RISKMG2	0.621	0.270	0.886	0.135
RISKMG3	0.560	0.276	0.872	0.162
RISKMG4	0.581	0.215	0.928	-0.014
RISKMG5	0.565	0.229	0.930	0.024
SIZE1	-0.097	0.126	0.091	0.922
SIZE2	-0.056	0.227	0.153	0.894
SIZE3	-0.104	0.158	0.114	0.941
SIZE4	-0.055	0.029	-0.044	0.748
SIZE5	-0.046	0.137	0.052	0.815

Appendix 2: Heterotrait-Monotrait Ratio (HTMT)

	CPSS	INV	RM
INV	0.250[CI, 0.118:0.420]		
RM	0.699[CI, 0.573:0.804]	0.274[CI, 0.162:0.416]	
SIZE	0.134[CI, 0.088:0.265]	0.175[CI, 0.114:0.290]	0.125[0.083:0.270]

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