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BEYOND BUDGETING AND ROLLING FORECAST TO IMPROVE MANAGEMENT IN THE PUBLIC SCHOOLS NELLY ROSE MSIZA, OGECHUKWU LAWRENCE OBOKOH, OLUMIDE HENRIE BENEDICT

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Abstract: There has been an increasing concern that principals of public schools spend beyond the allocated budget or fail to use the funds provided. They seem to have difficulty in simply managing school funds, which has an impact on the quality of public school education. The purpose of this paper is to examine the relationship between beyond budgeting and rolling forecast, as well as the improvement of management in the public schools. The researchers employed a quantitative-type questionnaire which was administered to 100 public schools in the Cape Town Metropolitan area. The researchers conducted reliability, validity, discriminant validity, and structural modelling analysis using of the Statistical Package for the Social Sciences (SPSS) and the partial least squares-structural equation modelling approach (PLS-SEM) for data analysis. The results revealed a positive and significant relationship between the variables beyond budgeting and rolling forecast and the improvement of management in the public schools**.** It is recommended that the Department of Education should provide training to the management of the public school; particularly in respect of flexible tools such as beyond budgeting and rolling forecast, to improve the schools' financial performance. The results of the paper could serve to educate representatives of public schools operating in the Cape Metropole on effective financial management. The South African government, particularly the Department of Education, could draw on the findings of this paper to develop effective strategies for training principals, heads of departments, and members of school governing bodies in the management of school finances.

Keywords: *public schools, financial management, financial mismanagement, strategic tools, beyond budgeting, rolling forecast*

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1. Introduction

Public schools play an essential role in social development and economic growth in supporting family stability and gainful employment (Good & Nelson, 2020). Investing in a public education system is much more cost-effective for the state than the devastating consequences of a poorly educated nation (Kidder, 2019). However, the realisation of a high-quality education system depends on sound financial management (Aina & Bipath, 2020). Furthermore, understanding what school financial management entails and adhering to legal

requirements when making financial decisions are critical prerequisites for achieving effective school financial management (Aina, 2017). Despite the importance of public schools, studies have shown that many public schools are faced with financial mismanagement, incompetence, inadequate resources, and a lack of financial management skills (Mestry, 2018; Alio Chui & Githui, 2019; Aina & Bipath, 2020; Amos, 2021). Additionally, in public schools, there tends to be limited financial accountability, a lack of transparency in financial reporting to school governing bodies and other stakeholders, and an absence of proper forecasting regarding financial resources (Myende, Samuel & Pillay, 2018).

The principles of beyond budgeting are divided-up as follows: six leadership processes and other six management process principles (Úlfarsson, 2018). The six leadership processes (purpose, values, transparency, organisation, trust, and customers) relate to the management structure that is vital for improving organisational flexibility (O'Grady, Akroyd & Scott, 2017). The other six principles relate to the management procedure (tempo, desires, plans and forecasts, resource allocation, performance evaluation, and rewards) (O'Grady *et al.*, 2017). With beyond budgeting, the use of rolling forecast falls under the management processes of rhythm, plans and forecasting (Gustavsen & Hornnes, 2019).

According to Jones, Rakow and Reitano (2019), rolling forecast are utilised in school districts for enrolment prediction to inform budgetary forecasting and strategic planning. In practice, enrolment predictions should consider demographic and socio-economic factors which can be utilised to generate forecasts for teachers' salaries, benefits, and other expenditures relating to educational facilities (OECD, 2017). If resources are allocated sufficiently to every department in public schools, the all-round quality of education will improve since the resources will then be deployed to what matters for school advancement (OECD, 2015). With this background, the current paper seeks to examine the relationship between beyond budgeting and rolling forecast as well as the improvement of management in public schools. Little research has been conducted on their use in public schools. Most international scholars have conducted research in organisations other than public schools (Ilchikabir, 2015; Henttu-Aho, 2018; Samudrage & Beddage, 2018; Úlfarsson, 2018; Guruge, 2021).

2. Literature Review

2.1. Allocation or resources theory

The allocation of resources theory which is thought to offer a suitable theoretical foundation for this study. Allocation of resources theory investigates how an organisation's assets and capabilities can be utilised to lay the groundwork for competitive advantage (Barney, 1991). Public schools are faced with a shortage of financial management skills, inadequate resources and a lack of relevant training (Rangongo, 2016). Public schools can, however, use strategic tools to help achieve their educational objectives and improve management processes (OECD, 2017). Improved management processes will aid in the development of strong relationships among; principals, schools' governing bodies, and other stakeholders such as parents. Such relationships will encourage transparency and collaboration toward achieving educational objectives, which is the equivalent in the education sector of gaining a competitive edge.

2.2. System theory

Koul's organisation framework theory for school financial management describes a school as a system of interconnected elements that all contribute to the system's effective functioning

(Koul,1984). System theory facilitates our understanding of the need for schools to be adaptable and to engage in continuous improvement of learners' experiences and achievements (Mathews, 2010). In this study, the researchers used systems theory as a theoretical framework to examine interactions within communal frameworks. The budget process at the school involves several entities, including the school governing body, the school management team, the finance committee, and parents; and systems theory aids in recognising the roles that these entities play in maintaining control over school funds. Financial resources are an essential input into any public system because they provide the means to operate all of the institution's affairs and attain educational goals (Boston, Martin, Pallot & Walsh, 1996).

2.3. Conceptual model and hypotheses formulation

A conceptual model defines the cause-effect link between variables to explain an issue (Sumaedi *et al.*, 2014). A schematic representation of a theoretical model allows the reader to visualise the conceptual relationships between the model variables (Maziriri, 2018); and, in this case, gain a rapid understanding of how a financial mismanagement problem should be solved. The conceptual model shows the suggested connections between the three constructs: beyond budgeting, rolling forecast and improvement in public school management. The sections that follow will discuss the literature on the paper's main variables. Furthermore, the hypothesised relationships between the study variables are discussed in the following sections; based on previous research and logically derived from prior results.

2.4. Rolling forecast and beyond budgeting

In beyond budgeting, the target setting process is isolated from the rolling forecast process, and targets are made more flexible (Becker, 2014). The fundamental goal of the rolling forecast method is to enable more dynamic and proactive decision-making, and it varies from scenario planning in that it only provides estimates for single future points (Goretzki & Messner 2016; Palermo, 2018). Beyond budgeting and rolling forecast forecasts are deemed to be the most effective strategic tools and best practices for assisting public school organisations with planning and coordinating in uncertain circumstances (Bogsnes, 2016). Both strategic tools address numerous budgeting flaws and help public schools to adjust to environmental changes more quickly (Holmen & Skurtveit, 2014). In this way, new risks and opportunities can be rapidly detected (De Leon, Rafferty & Herschel, 2012). Beyond budgeting and rolling forecast are both innovative strategic tools that seek to improve performance by developing efficiency and effectiveness, to manage public schools through flexible sense-and-respond mechanisms rather than the more rigid, traditional command-and-control models (Lohan, 2013; Alrawazqee & Tsatkhlanova, 2021). Some studies have shown a relationship between beyond budgeting and rolling forecast (Bogsnes, 2016; O'Grady & Akroyd, 2016; Guruge, 2021). According to Guruge (2021), rolling forecast do not focus on a specific end date for a budget period. Similarly, the ideas of beyond budgeting can help public schools to manage their performance and decentralise their decision-making process without using annual budgets (O'Grady *et al.*, 2017).

H1: There is a positive and significant relationship between rolling forecast and Beyond budgeting.

2.5. Rolling forecast and improvement in the management of public schools

Rolling forecast is a process that entails frequent forecasts to be performed, at similar intervals such as quarterly, half-yearly or even monthly (Joachim, 2007; CIMA, 2013). The

method results in organisations using fewer cost centres or general ledgers when drafting budget figures. The process is further explained as always extending a set number of financial periods into the future. Rolling forecast create the foundation for a new and far more valuable information system (Henttu-Aho, 2018). It can provide public school management with a constant picture of both the current situation and a short-term future perspective (Day & Sammons, 2014). School management should create financial reports meticulously and conduct analyses based on a reliable system of documenting financial transactions (Laurie, Nonoyama-Tarumi, Mckeown & Hopkins, 2016). A third element is a study by Amos and Koda (2018) who suggested that school management should possess the financial capabilities to discover other sources of funding for academic and extracurricular activities at their schools. Creating appropriate financial resources is the main prerequisite for effective curriculum implementation and excellent education delivery (Nevenglosky, Cale & Aguilar, 2019). The fourth element of a rolling forecast is to periodically monitor and assess financial resources to make it possible for public schools to provide seamless and adequate financial reports (Amos, 2021). Studies have established relationships between rolling forecast and the improvement of management (Kiristova, 2018; Dikov, 2020; Calzon, 2021). There are therefore sufficient empirical grounds to propose the following hypothesis for objective two.

H2: There is a positive and significant relationship between rolling forecast and improvement in the management of public schools.

2.6. Beyond budgeting and improvement in the management of public schools

Beyond budgeting is a flexible strategic tool that was introduced in the late 1990s. The beyond budgeting system benefits organisations competing in the knowledge industry sector, where only a few organisations currently use this approach (Heupel & Schmitz, 2015). Beyond budgeting is a management concept that aims to help businesses to adapt to rapidly changing business conditions (Nguyen, Weigel & Hiebl, 2018).

Beyond budgeting encourages decentralised decision-making in the development and implementation of school projects. It allows school leaders to recognise learners and teachers as essential assets in the development of schools (Amos, 2021). School leaders should organise a financial management committee to further improve effective decision-making involvement and create autonomy in financial decision-making (Godda, 2018). To ensure collective decision-making in financial management, school management should also develop a dedicated procurement team that can deliver good quality education (Kinyanzii,Ombuki & Kalii,2019).

Radzi, Ghani, Siraj and Afshari (2015) claimed that a school's vision and mission should be the overarching guide to its financial management. An adequate school vision and mission act as drivers for members to improve the school funding plan and assign school resources to achieve the school's vision and goals (Mosha, 2018). Several empirical types of research have established the relationship between Beyond budgeting and improvement of management (Jutta & John, 2018; Kinyanzii *et al.*, 2019 Alrawazqee & Tsatkhlanova, 2021). As a result of the preceding discussion, there is a reason to propose the hypotheses for objective four.

H3: There is a positive and significant relationship between Beyond budgeting and improvement in the management of public schools.

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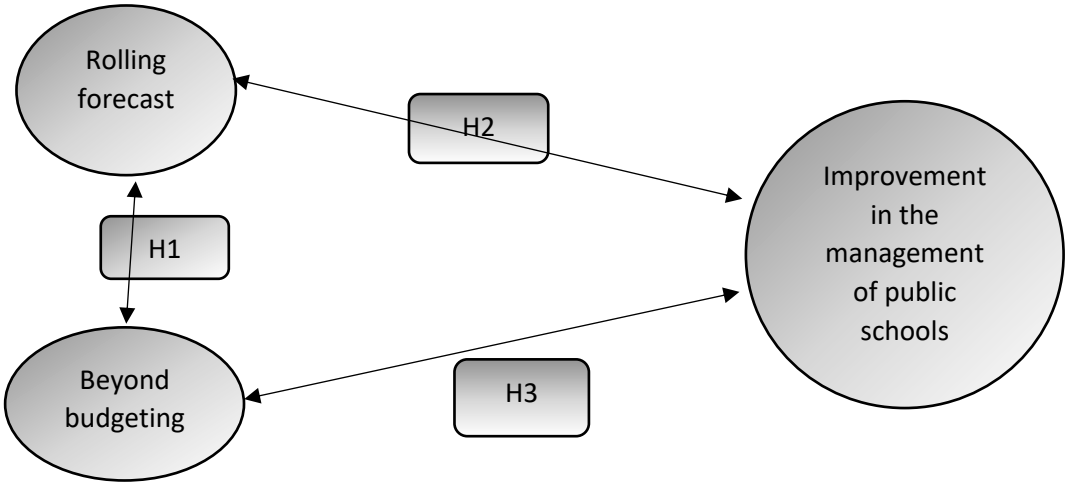

Figure 1. Conceptual Model
Sources: Developed by the Researchers

3. Research Method

The target population comprised principals, school governing body members and heads of departments at both primary and secondary public schools in the Cape Metropole. The sample size was calculated using a Raosoft calculator, with a 95 per cent confidence level and a 5 per cent margin of error; in which a minimum sample size of 103 is required. The sample size was increased to account for unavoidable flaws such as incomplete filling in of questionnaires and some respondents' inability to return questionnaires (Dewaele, 2018). Thus,140 questionnaires were distributed.

4. Results & Discussion

4.1. Results

Validity and reliability

Table 1 below shows Cronbach's alpha values for overall measurement and convergent validity for each construct's validity and reliability. The model's Average Variance Extracted (AVE) value for each construct, as shown in Table 1, was significantly higher than the suggested cut-off AVE value of 0.5. (Hair Jr, Hult, Ringle & Sarstedt, 2021). Additionally, the composite reliability ratings for both structures exceeded the suggested value of 0.700, according to Sarstedt Hair Jr, Cheah Becker & Ringle (2019). The composite outcomes were between 0.881 and 0. 927. Finally, Cronbach's alpha values met the 0.700 cut-offs with values ranging from 0.821 to 0.913. (Hair Jr, Howard & Nitzl, 2020). By analysing the composite reliability values, the internal consistency technique was used to test the reliability.

Table 1. Composite Reliability (C.R.), Average Variance Extracted (AVE) and Cronbach's Alpha

Research constructs	Cronbach's alpha	Composite reliability (C.R.)	Average variance extracted (AVE)
BB	0.913	0.927	0.538
RF	0.821	0.881	0.65
IMOPS	0.841	0.884	0.562

BB = Beyond budgeting; RF = Rolling forecast; IMOPS = Improvement in the management of public schools.

Table 2. Discriminant validity (Heterotrait-Monotrait Ratio-HTMT)

	Beyond budgeting	**Improvement in the management of public schools**	**Rolling forecast**
Beyond budgeting	**1.000**		
Improvement in the management of public schools	0.778	**1.000**	
Rolling forecast	**0.679**	0.788	**1.000**

Structural model analysis

The analysis approach is converted into SmartPLS version 3.3.3 graphics. Figure 2 below depicts the diagram. Additionally, the arrows that connect the inner structural model were evaluated to see if the endogenous and exogenous variables had any relationship. For the non-return model, the path coefficients were computed using a non-parametric, bootstrapping routine (Vinzi *et al.*, 2010), with 100 cases and 5,000 samples (two-tailed; 0.05 significance level; no sign changes). The standardised root mean square residual (SRMR) was used to measure the model's efficiency, built on the hypothesis that a good model has an SRMR value of less than 0.08 (Henseler, Hubona & Ray, 2016). The SRMR of the structural model in Figure 2 was 0.057, indicating sufficient validity of the constructs. In the model, the three variables (Beyond budgeting, rolling forecast and improvement in the management of public schools) had R^2 estimates of 0.727 and 0.656, respectively, indicating adequate predictive precision for the structural model.

Table 3 Summary of Path Coefficients

Hypothesis	**Proposed hypothesis relationship**	**Beta coefficients (β)**	**T-statistics**	**P-values**	**Decision**
H_1	RF→ BB	0.853	27.501	0.000	Positive and significant
H_2	RF→ IMOPS	0.264	2.233	0.026	Positive and significant
H_3	BB→ IMOPS	0.573	4.975	0.000	Positive and significant

BB = Beyond budgeting; RF = Rolling forecast; IMOPS = Improvement in the management of public schools.

4.2. Discussion

The outcome of hypotheses testing

Path coefficient values and t-values for the structural model produced from the bootstrapping procedure were used to evaluate the hypotheses in this study. T-values reflect whether there is a substantial association between model variables and path coefficients (Beneke & Blampied, 2012), indicating the strength of the associations in the model. The standardised path coefficients and their matching t-values are shown in Figure 2 and Table 3

above. A t-value greater than 1.96 at a 5 per cent level of significance indicates a statistically significant correlation (Chin, 1998).

The outcome of testing hypothesis 1: Rolling forecast and Beyond budgeting

The primary hypothesis suggests a positive and significant relationship between rolling forecast and Beyond budgeting. It can be seen in Figure 2 and Table 3 above that the rolling forecast had a positive relationship and a statistically significant relationship ($P < 0.000$, $\beta=0.853$, $t=27.501$) with beyond budgeting. This outcome proposes that there is a nexus between a rolling forecast and beyond budgeting. Consequently, the analysis fails to dismiss H1. This study's results also support the validity of a valuable relationship between rolling forecast and Beyond budgeting. The outcomes attained in the recent study are also not without empirical evidence (Becker, Messner & Schäffer, 2010; Goode & Malik, 2011; Hope & Fraser, 2003a; Fraser, 2018; Úlfarsson, 2018).

The outcome of testing hypothesis 2: Rolling forecast and improvement in the management of public schools

The second hypothesis states that there is a positive and significant relationship between a rolling forecast and improvement in the management of public schools. It can be seen in Figure 2 and Table 3 above that rolling forecast had a positive relationship and a statistically significant relationship ($p < 0.0026$ $\beta=0.264$, $t=2.233$) with improvement in the management of public schools. This outcome proposes that there is an association between rolling forecast and improvement in the management of public schools. Consequently, the analysis supports H2. The result is in line with Liang and Ordasi (2013), who discovered that rolling forecast positively correlated with improvement in management.

The outcome of testing hypothesis 3: Beyond budgeting and improvement in the management of public schools

The third hypothesis states that there is a positive and significant relationship between Beyond budgeting and improvement in the management of public schools. In this examination, this hypothesis is upheld. Figure 2 and Table 3 above show that Beyond budgeting had a positive relationship and a statistically significant relationship ($p < 0.000$. $\beta=0.573$, $t=4.975$) with improvement in the management of public schools. This outcome indicates that the higher the level of beyond budgeting, the higher the level of improvement in the management of public schools. This examination thus supports H3. This finding mirrors the work of Tian, Qian, Hao and Wu (2015), who found a positive association between beyond budgeting and improvement in the management of organisations. The findings of this study's analysis supports that there are substantial connections between Beyond budgeting and improvement in the management of public schools (O'Grady *et al.*, 2017). Similar results were reported by Guruge (2021), who explored associations between beyond budgeting and rolling forecast in small and medium enterprises.

5. Conclusion

The paper proposed the relationship between beyond budgeting, rolling forecast and improvement of public schools by using SmartPLS and SPSS as a tool of analysis. A hypothesis was developed to show that beyond budgeting and rolling forecast have directly influenced the improvement of management in public schools. The findings indicated that there is a significant and positive relationship between beyond budgeting, rolling forecast and improvement of

public schools. Furthermore, the paper made a theory-based model that would guide future research for improvement in the management of public schools. For instance, principals can derive some insights from this study to improve the management of their schools.

Once processes at schools have been streamlined to support effective and efficient financial management and good governance, schools should enjoy adequate resources and thereby improve the quality of the education that they offer. It is imperative that more training is conducted on the use of all strategic tools to avoid financial mismanagement, as the economy relies heavily on the development of public schools. According to human capital theory, citizens are critical about the generation of economic value. Yet to fulfil this function, they need to be decently educated at fully functional schools.

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