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Role of Beyond Budgeting and Rolling Forecast to Improve Management in the Public Schools

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Abstract

There has been an increasing concern that principals of public schools either spend beyond the allocated budget or fail to use the funds provided. They seem to have difficulty in managing the school funds, which has an impact on the quality of public-school education. The purpose of this study 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 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 regarding effective financial management. The South African government, particularly the Department of Education, can use the findings of this paper to develop effective strategies to train principals, heads of departments, and members of school governing bodies regarding the management of school finances.

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

Introduction

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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 as compared to 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 while making financial decisions are critical prerequisites to achieve effective financial management of school funds (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 & 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 et al., 2018).

Encouraging flexible strategic tools such as beyond budgeting and rolling forecast is one of the solutions that can be utilised to lessen financial mismanagement in public schools (Rompho, 2020). Beyond budgeting is a process that allows management of public schools to distribute financial resources to the neediest and to remove programmes and subdivisions that are ineffective in utilising resources (Smyth, 2021). Rolling forecast are described as continuous, monthly, and quarterly forecast updates of the budgets (Bergmann et al., 2020). Beyond budgeting and rolling forecast are flexible tools that can play a significant role in organisational planning of public schools (Sponem & Lambert, 2016). These tools are more flexible and can support organisations' planning and control processes (Golyagina & Valuckas, 2012; Popesko et al., 2017).

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 the improvement of organisational flexibility (O'Grady et al., 2017). The other six principles relate to the management procedures (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). Adopting rolling forecast in public schools increases enrolment prediction and the reliability of projections allows for development planning and assists in improving quality education (Henttu-Aho, 2018).

According to Jones et al. (2019), rolling forecast is 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 related to educational facilities (OECD, 2017). If resources are allocated sufficiently to every department in public schools, the overall quality of education will improve since the resources will then be deployed to what matters for the betterment of school a (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 financial management in public schools. Little research has been conducted on the use of above discussed tools use in public schools. It has also been observed that ost of the international scholars have conducted research in organisations other than public schools (Ilchikabir, 2015; Henttu-Aho, 2018; Samudrage & Beddage, 2018; Úlfarsson, 2018; Guruge, 2021).

In South Africa, research has been conducted in private organisations (King, 2010; Sabela, 2012; Mokgope, 2015). Hence, the focal purpose of the paper is to examine the relationship between beyond budgeting and rolling forecast and the role of these tools in the improvement of financial management of public schools.Following are the research objectives:

- To determine if the rolling forecast has a positive and significant relationship with beyond budgeting.
- To determine if the rolling forecast has a positive and significant relationship with an improvement in the financial management of public schools.
- To determine if beyond budgeting has a positive and significant relationship with an improvement of the management of public schools.

Rest of the paper is structured as follows: theoretical lens, literature review, conceptual model and hypotheses formulation, methodology,

empirical results and discussion, recommendations, limitations of the study, direction for future research and the conclusion.

National Norms and Standards for School Funding (NNSSF)

In the year1998, the National Norms and Standards for School Funding were published, thus establishing a framework for allocating resources to public schools. Section 39 of the National Standards for School Funding (Republic of South Africa [RSA], 1998), and the basic rationale for giving funds to schools; is to 'effect redress and fairness in school funding, to gradually improve the standard of school education within the context of increased productivity in planning, coordinating, and delivering educational services' (RSA, 1998). The state is required to provide the necessary funds to public schools from public funds, according to Section 34(1) of the Schools Act. These funds are distributed fairly to ensure that all students have access to high-quality education and that historical gaps in educational provision are filled (RSA, 1996). The funding norms are divided into six categories comprising; new buildings, immovable resources, upgrades, recurring costs, and non-teaching staff costs Chisholm et al. (2003).

Theoretical Framework

In an attempt to identify strategic tools for the management and improvement of public schools, this study uses the concepts of resource theory and general systems theory to create a theoretical framework. These theories are discussed in the following sections:

Allocation of Resources Theory

The allocation of resources theory is considered 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 towards the achievement of educational

objectives, which is equivalent of gaining a competitive edge in the education sector.

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). 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 et al., 1996).

Conceptual Model and Hypotheses Formulation

Figure 1 below shows the conceptual model reflecting the various connections and paths between the constructs being examined. 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 or logically derived from prior results.

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 as it only provides estimates for single future points (Goretzki & Messner, 2016; Palermo, 2018). Forecasts obtained from beyond budgeting

and rolling forecast method are deemed to be the most effective strategic tools and best practices to assist 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 & 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-response 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 does 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). The beyond budgeting concept suggests that ongoing performance evaluations should replace rigid annual budget-based performance evaluations. The approach focuses on the link between performance of public-school management and the strategy (Alrawazqee & Tsatkhlanova, 2021). Keeping in view the above discussed connections, following hypothesis is developed:

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

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; Chartered Institute of Management Accountants [CIMA], 2013). The method results in organisations using fewer cost centres or general ledgers while drafting the 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). A rolling forecast

becomes a crucial aid for public school management in decision-making (Dikov, 2020).

In addition, a rolling forecast allows public school management to follow the strategy of continuous improvement (Kiristova, 2018). Public school management can then analyse financial records frequently and learn to make accurate predictions (Calzon, 2021). By removing the necessity for a fixed fiscal year-end, rolling forecast emphasises the importance of dynamic management. Rolling forecast are updated monthly or quarterly and always look twelve or eighteen months ahead. Thus, forecasts become more dynamic and adaptable to change (Holmen & Skurtveit, 2014). The study proposes that better policies for tracking schools' financial resources are needed, to ensure proper, adequate, and accountable use of the limited state resources allocated for education.

According to Kaguri et al. (2014), the first element in rolling forecast that can improve school management is resource allocation. The study proposes that better policies to track schools' financial resources are needed to ensure proper, adequate, and accountable use of the limited state resources allocated for education. It also explores whether the resources allocated have been used as intended (Amos, 2021). The second element is that auditing public school finances is considered as a tool to measure the efficiency and effectiveness of school funds acquisition and utilisation, as indicators of quality education in a specific institution (OECD, 2017).

School management should create financial reports accurately and conduct analyses based on a reliable system of documenting financial transactions (Laurie et al., 2016). Amos and Koda (2018) suggestthat school management should have the financial capabilities to discover different 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 et al., 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 financial management (Calzon, 2021; Dikov, 2020; Kiristova, 2018). 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.

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 in competing in the knowledge industry sector, where only a few organisations are currently using this approach (Heupel & Schmitz, 2015). Beyond budgeting is a management related concept that aims to help businesses to adapt to rapidly changing business conditions (Nguyen et al., 2018).

Beyond budgeting is based on a philosophy that emphasises on the alignment of empowered leadership principles with adaptive management practices (Úlfarsson, 2018). Beyond budgeting reflects a shift in management style and culture, as well as the application of existing and new management tools, in the direction of a more dynamic, flexible, and self-regulating management model (Morlidge & Player, 2010).

Úlfarsson (2018) emphasised on the importance of building trust across the various hierarchical levels in a public school organisations. Hope and Fraser (2003) also emphasised the importance of mutual confidence between employees (i.e., principals, school governing bodies and teachers) and employers (public schools). Beyond budgeting signals confidence in employees' ability and willingness to make budget adjustments, as well as the public school management's ability to make proper decisions (Alrawazqee & Tsatkhlanova, 2021). The participation of local stakeholders, such as school management, financial committees and parent groups, improves the system of school-based leadership for appropriate decision-making in the interests of quality education (Aina & Bipath, 2020). 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 formulate 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 et al.,

2019). According to Mosha (2018), a clear vision and a mission statement with school objectives remain key components in the quest for excellence in education and the execution of high-quality educational curricula.

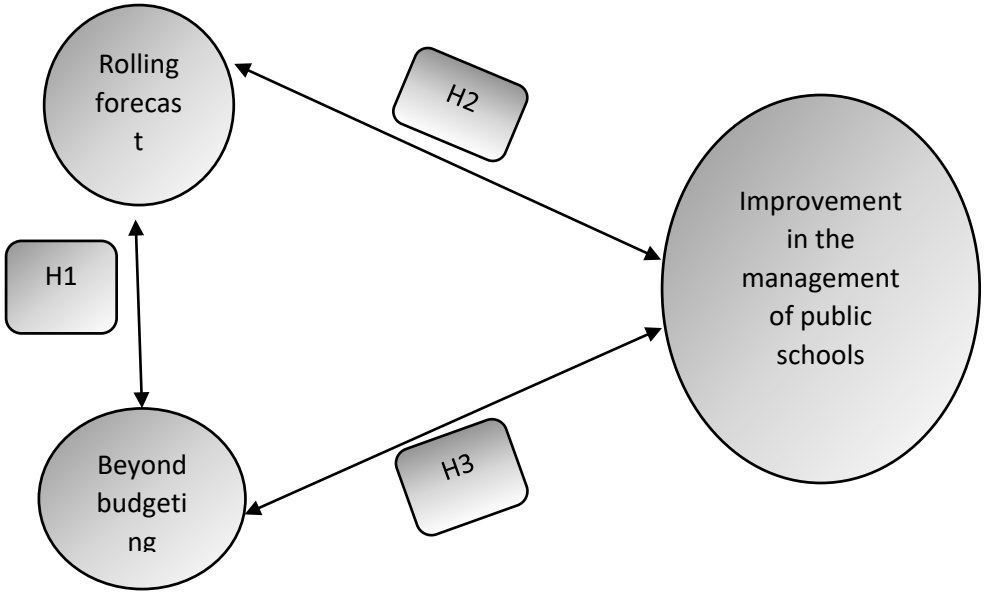
Radzi et al. (2015) claimed that a school's vision and mission should be the overarching guide to its financial management. An adequate school vision and mission acts as a driver for the improvement of school funding plan and assign school resources to achieve the school's vision and goals (Mosha, **2018**).Research hasestablished 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.

Conceptual Model

Figure 1

Conceptual Model



Methodology

The quantitative method was followed in this paper. The convenience sampling technique also known as non-probability sampling was used. The technique was chosen to enable the process of data gathering completed in a short period (Taherdoost, 2016).

Target Population and Sample

The target population comprised of 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.

Research Instrument

A hundred questionnaires were completed and returned. The questionnaire was adapted from prior studies (Henttu-Aho, 2018; Úlfarsson, 2018; Buenaventura-Vera & Gudziol-Vidal, 2020). The key aspects of the questionnaire were as follows: the beyond budgeting section had 13 items adapted from a study by Úlfarsson (2018). The study formulated 12 principles of beyond budgeting. The section dealt with the objective one, which is the relationship between beyond budgeting and rolling forecast. The rolling forecast section contained four items adapted from Henttu-Aho (2018), modified to achieve objective two, which is the relationship between rolling forecast and improvement in the management of public schools. Finally, improvement in the management of public schools was assessed using 8 items adapted from Buenaventura-Vera and Gudziol-Vidal (2020).

Results and Discussion

In this paper, the researchers conducted reliability, validity, discriminant validity, and structural modelling analyses by using SPSS and the partial least squares-structural equation modelling approach for data analysis.

Validity and Reliability

Table 1 below shows Cronbach's alpha values for overall measurement and convergent validity to meaure the validity and reliability of each construct. The model's Average Variance Extracted (AVE) value for each construct, s shown in Table 1, was significantly higher than the suggested cut-off AVE value of 0.5. (Hair et al., 2021). Additionally, the composite reliability ratings for both structures exceeded the suggested value of 0.700, according to Sarstedt et al. (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 et al., 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 (CR)	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

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

According to Hair, Hult, Ringle and Sarstedt (2017), discriminant validity refers to items that measure various concepts. Discriminant validity determines whether a scale adequately distinguishes between groups that should or should not vary, based on theoretical grounds or past research (Hair et al., 2020). The Heteromonotrait (HTMT) correlation ratio was developed by Henseler (2017) as a novel method to examine the discriminant validity of measurement model structures. On average, an HTMT score greater than 0.85 indicates a potential problem with discriminant validity (Purwanto, 2021). Table 2 below shows that the HTMT values in this sample were all just below the 0.85 threshold, indicating that discriminant validity was not an issue. The maximum HTMT value obtained was 0.788, which was lower than the conservative estimate

of 0.85, as shown in Table 2. Thus, all the constructs satisfy the discriminant validity criterion.

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 in this section is SmartPLS version 3.3.3 graphics. Figure 2 below depicts the diagram. Additionally, the arrows that connect the inner structural model are used to check whether 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 et al., 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.

Figure 2
Structural Model

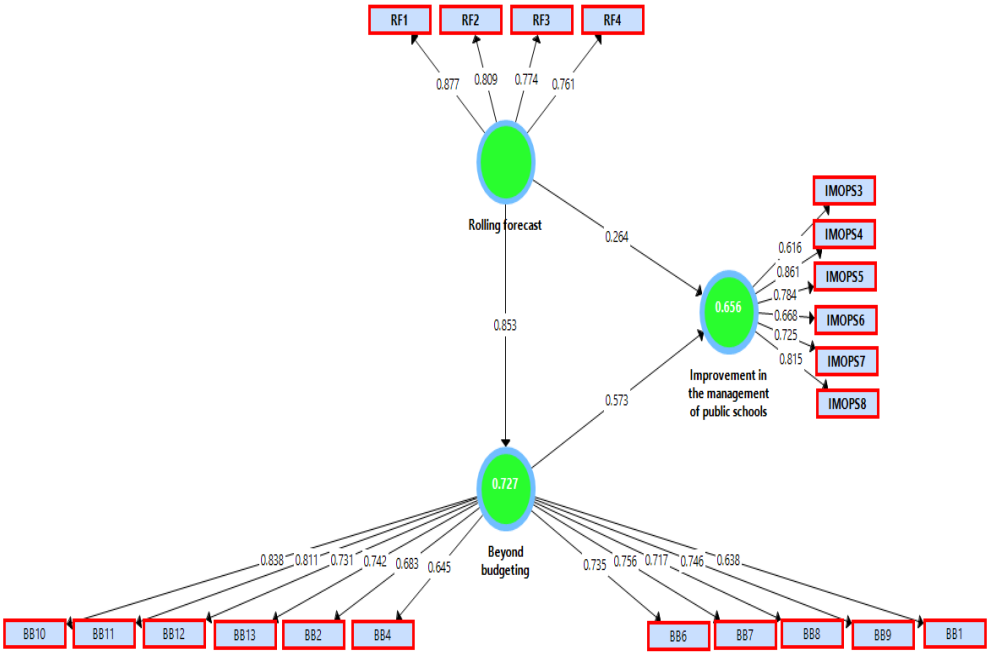


Table 3
Summary of Path Coefficients

Hypo	Proposed hypothesis relationship	Beta (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

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

Empirical Findings

Path coefficient values and t-values for the structural model produced from the bootstrapping procedure were used to evaluate the hypotheses of 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 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.

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 is positively correlated with improvement in management.

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 et al.

(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.

Conclusion and Recommendations

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.

Based on these results, the authors recommend that rolling forecast and beyond budgeting should be incorporated into the financial management of public schools with other strategic tools such as traditional budgeting. The paper will assist public school with financial planning and general management. In public schools, performance is vital to the achievement of educational objectives. Hence the researchers further recommend that school management can better allocate resources to needy departments or projects by combining a wide target setting with improved reporting. The paper allows for the delegation of complex decisions to the school

operational level, where the requirements are most explicit, and resources can be deployed most efficiently. In addition, the researchers recommend that the Western Cape Department of Education should focus on training public school management. The training will assist the school heads in honing their skills in the use of flexible strategic tools such as beyond budgeting and rolling forecast. For academics, the paper can serve as a foundation for further investigation into how to improve the management of public schools in the Cape Metropole. For the government, the study can function as evidence supporting the enforcement of strategies and requirements for policy implementation at public schools.

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