

## **Annual budgets and rolling budgets use in UK and Australian firms**

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### **Abstract**

The purposes and uses of annual budgets have been questioned for decades. The meta-reporting and analysis of operational budget trends outside North America have been sparse and academically under-reported in the past 20 years. Innovations such as the rolling budget have challenged and/or supplemented traditional annual budgets, while organisations increasingly demand more flexible budgeting approaches. Our research examines the current state of budgeting practice relating to both rolling and annual budgets across a surveyed sample of 380 UK and Australian firms. We find that despite concerns about its applicability, the annual budget overwhelmingly remains a critical planning and control tool, but functions as a performance evaluation tool to a lesser extent. Nearly a third of firms use rolling budgets, for various reasons including planning and control, aligning with annual budgets. These findings hold across business-as-usual operations, not only during economic crises. We find that of the firms using annual and rolling budgets, 75 percent indicated they are equally important, with both budgeting forms used jointly rather than as substitutes. This is an important contribution not reported in prior literature.

## **1. Introduction**

Budgeting practice has come under criticism (Hansen & Van der Stede, 2004) and has been questioned over the past two decades (Hope & Fraser, 2003a; Jensen, 2003), with varied calls to abandon traditional budgeting practices. Simultaneously, practices such as rolling budgets offer benefits while avoiding the criticisms related to the static nature of annual budgets. Rolling budgets focus on predicting budgeted line items across a stream of monthly, quarterly or other sub-annual periods extending beyond the end of the current fiscal year (Bhimani et al., 2018; Haka & Krishnan, 2005). In this study, we examine the practice of annual budgets and rolling budgets. Specifically, the study aims to investigate to what extent, for which purposes, and how annual budgets and rolling budgets are adopted and used in UK and Australian firms, as well as investigate potential moderators of annual and rolling budget adoption and use. Prior studies have shown that annual and rolling budgets co-exist without expanding further on this connection. Our study addresses this gap by investigating to what extent these two budget types co-exist in practice, and whether they are linked and used together, or instead used independently, thereby advancing Bhimani et al. (2018) as well as Hansen et al. (2003).

Our paper builds upon a large stream of research, some of which initially claimed annual budgets to be counter-productive tools (Hope & Fraser, 2003b; Wallander, 1999). A range of other management accounting tools, such as activity-based costing, balanced scorecards, beyond budgeting, and EVA (Economic Value Added), have been proposed as substitutes for its function. Still, these have yet to lead to a pivoting of this focus. Budget practice continues to dominate businesses (Østergren & Stensaker, 2011). However, most budget studies in the budgeting literature focus on the traditional annual budget and pay little attention to the minutiae and nature of rolling budget practice in organisations (Bhimani et al., 2018). Fewer still study how both budget types come together to assist an organisation. A

small number of studies acknowledge that firms using annual budgets also use a rolling budget (Libby & Lindsay, 2010) but only leave the acknowledgement at the level of demographic data without exploring their interconnection. Analyses of how both come together are surprisingly scant and needed for a more complete explication of how budgets relate to organisational control. For example, Libby and Lindsay (2010) acknowledge that firms use rolling budgets in their survey responses but do not explore how rolling budgets are used or if/how they link with annual budgets. Their existence is acknowledged, with no further empirics applied to the study of the same.

Since Hope and Fraser (2003a), global crises have caused increasingly uncertain, challenging, and volatile industrial environments. A stream of studies have moved beyond Hope and Fraser (2003a), as well as the reliance on accounting performance measures (RAPM) literature (Hartmann, 2000), and vouched for the role of annual budgets in helping the management of this volatility (Becker et al., 2016; Frow et al., 2010; Marginson & Ogden, 2005). Yet, these studies do not explain the conjoint use of rolling budgets in many of these organisations and the extent to which rolling budgets work alongside annual budgets to support this control process. If annual budgets are still considered relevant and used by a majority of organisations, notwithstanding uncertainties, their role in assisting organisations cannot be limited to that characterised by stable work settings, such as has been argued within contingency theory-focused budgeting studies (see the reliance on accounting performance measures (RAPM) research stream discussed by Hartmann (2000)). We investigate the extent to which annual budgets persist in such uncertain states but outside times of economic crises (Becker et al., 2016) and comment on their relevance alongside rolling budgets where relevant.

Calls to forsake traditional budgets have ceased mainly, in no small part, owing to the burgeoning prevalence of studies in management accounting evidencing the persistence of

annual budgeting in turbulent environments and the use of annual budgets in firms (Becker et al., 2016; Frow et al., 2010; Sivabalan et al., 2009). Even organisations that eliminated annual budgets appear to have reinstated them (Becker, 2014). The persistence of annual budgets thus bulwarks talk of its abandonment (Hope & Fraser, 2003a; Libby & Lindsay, 2010). Despite calls to reduce reliance on traditional (annual) budgets, studies argue for the continuing role of rolling budgets, which focus on predicting budgeted line items across a stream of future monthly, quarterly, or other sub-annual periods beyond the end of the current fiscal year (Bhimani et al., 2018; Haka & Krishnan, 2005). Predicting budget figures for shorter periods, e.g. months or quarters, may be more appropriate when firms operate in uncertain and dynamic environments. However, it should be noted that rolling budget period figures at the most distant period of the budgeting horizon may be quite uncertain.

How rolling budgets operate as complements or substitutes to annual budgets remains less explored in practice. Hansen et al. (2003) acknowledged the joint use of rolling and annual budgets, especially amongst European users. Libby and Lindsay (2010) again revealed the existence of both annual budgets and rolling budgets amongst some users but did not delve into this conjoint use, instead focusing on the arguments relating to the persistence of budgeting, notwithstanding budget criticisms. They simply acknowledge that rolling budgets exist and are used alongside the annual budget, but whether both are connected or disparate and the extent to which their rationales align are not explored. Finally, Bhimani et al. (2018) focus on rolling budgets and acknowledge the existence of annual budgets in the same firms but do not study the implications of the same. That firms in the sample also use the annual budget is highlighted but not explored further. Sivabalan et al. (2009) similarly focus on annual budgets and acknowledge that 65 percent of surveyed firms claim to use a rolling budget without analysing this any further, findings that offer more specificity than discussed in Hope and Fraser (2003). Approximately two decades of budgeting research reveal that five

to six studies acknowledge the joint existence of both methods in their dataset. However, they only focus their data collection and/or analysis on one, leaving the other as simply being identified as existing or not. To this end, it is surprising that no study to date has more deeply explored both in the same survey. This conjoint use of both in more detail may bring out new learnings in the way budgeting operates in organisations. Our first motivation is to address this gap in the literature.

Our second motivation is to offer further empirical evidence, more than a decade post Libby and Lindsay (2010), regarding how budgets continue to persist in organisations. Addressing the concerns of Banham (2011), we offer a current set of updated empirical data for how budgeting practice reveals itself since Libby and Lindsay (2010), marshalling reasons relating to the way annual budgets impact in a range of settings, and alongside rolling budgets in more depth, which was not engaged with by Libby and Lindsay (2010). This is important, as the growing use of rolling budgets in organisations (Bhimani et al., 2018; Haka & Krishnan, 2005) may have significant implications for how annual budgets are prepared and used, given the variation in efficacy, for example, from a dynamic and informational perspective, of the budgetary tools. Using annual and rolling budgets could impact factors relating to preparation time, reasons for use and user satisfaction. This remains less investigated in studies to date.

We surveyed 380 firms across Australia and the UK to better understand the current state of operations budgets. These two nations represent two modern advanced economies with stable and similar rule of law, democratic systems, and multicultural population demographics. To this end, our learning from this data set can be generalised more broadly to most advanced economies globally. We contribute to the literature by synthesising the current state of budget practice, building upon prior work and lending a more important focus towards the conjoint use of annual budgets and rolling budgets, and expanding the setting outside of North

America to lend empirical breadth in literature, important given the different usage of budgets across countries and regions (Hoffjan et al., 2012). The inclusion of rolling budgets is particularly beneficial, as there exists a need for more rolling budget studies (Bhimani et al., 2018). While our primary focus is on providing a more up-to-date perspective on the state of operational budgeting for the purpose of the literature, this study is also useful for practitioners to understand operationally where firms are placed relative to practice more widely. Specifically, firms can benchmark their budget practices with those used more widely and understand, for example, where they have similar reasons and challenges associated with annual and rolling budget use. This could form the basis for initiating a review of budget practices and potentially change processes. For instance, some firms may struggle to monitor and action performance through sole reliance on annual budgets simply because this is a practice always undertaken by the firm, and management anecdotally claims this is normal practice. Our study demonstrates that a notable proportion of firms undertake rolling and annual budgets, providing motivation for firms not undertaking such practice to consider if it is also of value. The rest of the paper is as follows: Section two provides the literature review and identifies questions concerning the current state of budgeting. Section three describes the data and research method. Section four presents the results and discussion, and section five concludes with suggestions for future research.

## **2. Literature review**

### **2.1. *The use of annual budgets***

Historically, the annual budget process has been a centrepiece of organisational planning and control. The initial dissemination and diffusion of budget practice occurred over many decades (Berland & Boyns, 2002) and is now deeply ingrained in the culture and systems of organisations (Becker, 2014). The growth of annual budgets from the 1920s to the 1960s coincided with globalisation, economic growth, and associated uncertainty. Annual

budgets continued to offer a means for dealing with business environmental uncertainty (Berland & Boyns, 2002; Horngren et al., 2014; Merchant, 1984; Simons, 2000).

However, from the late 1990s through to the early 2000s, criticisms of annual budgets increased. Budgeting was characterised as an ‘unnecessary evil’ by Wallander (1999), who claimed annual budgets should be abandoned to improve organisational performance. The literature provides numerous examples of firms discarding the annual budget process (Hope & Fraser, 2000; Wallander, 1999). The early 2000s was characterised as a period of movement to greater customer choice, bringing unpredictability to business. The budget process was criticised as increasingly irrelevant and encouraged counterproductive behaviour through managerial gaming and lies (Jensen, 2003).

Academic exploration of annual budget abandonment has been around for over two decades, continuing to be echoed in academia and practice (Becker, 2014; Ekholm & Wallin, 2000).<sup>1</sup> Despite sustained interest in annual budget abandonment, there appear to be few companies prepared to discard budgets, with Ekholm and Wallin (2000) finding only 14.3 percent of firms ‘considering’ budget abandonment. However, surveys of firms show that annual budget effectiveness is very much dependent on a range of factors, including uncertainty and competitive strategy (Ekholm & Wallin, 2011; Libby & Lindsay, 2010). Moves to remove annual budgets may have initially appeared ‘successful’, but observations indicate the reintroduction of annual budgets due to reasons, including managerial turnover and organisational crisis (Becker, 2014). Perhaps the greatest impediment to calls to abandon annual budgets is that some commentators consider them as one of many interrelated and complementary control mechanisms, and the focus should be on re-designing overall management control systems (Libby & Lindsay, 2010; Østergren & Stensaker, 2011).

With significant turbulence in business, we now know that a dominant majority of firms use the annual budget, but the contextual factors impacting firms vary significantly regarding the

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<sup>1</sup> <https://www.performancecanvas.com/abandon-traditional-budgeting/>

way factors such as uncertainty, strategy, size and even firm performance relate to the use of annual budgets (Becker et al., 2016; Bhimani et al., 2018; Hartmann, 2000). For firms using annual budgets, operational details regarding the time taken to prepare an annual budget are less explored, with the exception of a few studies that show the average time to complete as being three to four months (Ekholm & Wallin, 2000; Sivabalan et al., 2009), with no evidence on the rolling budget preparation times. We will acknowledge later in our review that planning reasons for annual budgets tend to meet with greater satisfaction and importance than evaluation reasons (Becker et al., 2016; Hansen & Van der Stede, 2004), and this is also the case for rolling budgets, and if anything, even more so (Haka and Krishnan, 2005). Overall, we wish to study the current purpose and ways of using annual budgets amongst UK and Australian firms, followed by rolling budgets and if they are linked and used together or rather used independently. Interestingly, and to date, no study has operationally examined, jointly and in-depth, how annual budgets and rolling budgets from the same sample might be jointly used and the extent to which their preparation is connected. In attempting to do so, we now progress to a discussion on the use of rolling budgets in prior research.

## **2.2. *The use of rolling budgets***

If annual budgets are to be abandoned, what do firms use for planning and decision-making? Rolling budgets were initially proposed as a novel technique to replace and better manage organisations, especially in dynamic environments (Hansen et al., 2003). Rolling budgets<sup>2</sup> are characterised by detailed prediction of budget line items on a more frequent basis, and where a period (e.g. month or quarter) is added as one period expires, such that the rolling budget horizon remains constant. Despite the considerable interest in rolling budgets, there is limited literature examining the extent to which firms adopt this practice and little on

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<sup>2</sup> Rolling forecasts focus on higher level broad performance benchmarks, rather than the detailed prediction of the budget line items on a more frequently basis, and are an attribute of beyond budgeting (Wallander, 1999) Wallander, J. (1999). Budgeting—an unnecessary evil. *Scandinavian journal of Management*, 15(4), 405-421.

how the rolling budget practice is operationalised. While rolling budgets have conventionally been widely promoted, few companies have adopted the technique (Banham, 1999). Yet, later studies indicate wider usage (Sivabalan et al., 2009). There is little extant work on its manner of working and construction.

An important aspect of rolling budgets is the length of each rolling budget period. Common periods noted are monthly and quarterly (Bhimani et al., 2018; Haka & Krishnan, 2005). Rolling budgets appear more sensitive to uncertainty and strategic characteristics when reported monthly and less sensitive when reported quarterly. This is consistent with studies reported earlier, to the extent that longer budgeting periods (annual budgets) show less relation to dynamic strategies or turbulent environments (Ekholm & Wallin, 2011; Libby & Lindsay, 2010).

To better understand rolling budget uptake, the literature examines the reasons for and performance implications of rolling budget use (Bhimani et al., 2018; Haka & Krishnan, 2005). When environmental uncertainty is high, rolling budget firms appear to make better decisions, leading to higher performance (Haka & Krishnan, 2005), arguably because more updated numbers facilitate better planning-related decision-making. In situations of low uncertainty, rolling budget use has a less substantial impact on performance, as budget variations are not sufficient to begin with. On a related point, recent literature indicates that where employees perceive formal contracts such as hurdle contracts related to budgets, their trust in the organisation reduces, and their incentive to game the budget increases (Brunner & Ostermaier, 2019), thereby adversely impacting performance. This contributes to the argument that when used for performance evaluation, rolling budgets might be more problematic when numbers pivot, and employees struggle to identify a single value to work towards. Therefore, studies of rolling budget use have found that the value of rolling budgets is greater for planning and control reasons than for performance evaluation reasons (Haka &

Krishnan, 2005). When used for evaluation, rolling budgets require shifting the goalposts, making it difficult for employees to appreciate what must be achieved (Sivabalan et al., 2009). While changing budget numbers to keep them updated is best practice from a planning perspective, it is less so from a performance evaluation perspective (Bhimani et al., 2018).

Consistent with the limited literature on rolling budget use, questions remain – what is the uptake of rolling budgets, and how are they operationalised, for example, the length of rolling budget periods? Similarly to the annual budget above, do contextual factors such as uncertainty, strategy, size, and firm performance relate to rolling budget uptake? What are the reasons behind rolling budget use, and how are they used for control purposes?

### **2.3. *Annual and rolling budget use***

The early budgeting and control literature reported widespread criticism of annual budgets (see Nguyen et al. (2018) for a summary). This might indicate an appetite for annual budgets to be abandoned (Hope & Fraser, 2003a; Wallander, 1999) and possibly replaced with alternative flexible budget forms such as rolling budgets. Annual budget roles, however, continue to persist. For example, Ekholm and Wallin (2000) indicate that the annual budget can primarily be used to communicate with external stakeholders, while more flexible techniques, such as rolling budgets, can be used internally. But they don't expand on the different ways through which this "use" might manifest. Sivabalan et al. (2009) find that most of their surveyed sample (97 percent) of medium to large firms continue using the traditional annual budget and that approximately 65 percent of their survey sampled used rolling budgets, but they do not engage in further exploration of how rolling budgets might co-exist with annual budgets. Frow et al. (2010) explain the value of budget use in periods of ambiguity that require flexibility, while Becker et al. (2016) emphasise the value of annual budgets in periods of turbulence amidst crises. These all speak to the annual budget possibly having a positive effect on organisations even in volatile environments – but these studies

don't account for the possible presence of rolling budgets within these organisations (a likely scenario, given the high uptake of rolling budgets in modern larger corporations), and its impact on freeing up the annual budget to be more responsive in periods of turbulence (Becker et al. 2016).

Ekholm and Wallin (2000) also report that annual budgets can provide an important foundation in the overall budgeting process, particularly in uncertain conditions, consistent with what was proposed much earlier as one of the important reasons for using annual budgets (Berland & Boyns, 2002; Merchant, 1984). Finally, Libby and Lindsay (2010) deconstruct arguments for allaying the fears brought on by Beyond Budgeting proponents and empirically offer a compelling set of descriptive statistics that speak strongly in favour of the persistence of annual budgets. Accordingly, the mutually exclusive debate relating to the implementation of rolling budgets in place of abandoned annual budgets seems to have never gained significant traction (Bhimani et al., 2018).

The term hybrid systems captures what is more consistent with what businesses are using (Ekholm & Wallin, 2011). Much of the criticisms of budgeting use, particularly annual budgets, stem from less than desirable behavioural implications, mainly when used for evaluation reasons (Brunner & Ostermaier, 2019; Jensen, 2003). However, Sivabalan et al. (2009) demonstrate that organisations largely believe that budgets are more useful for planning and control than evaluation, similar to that explained in Becker et al. (2016). They also suggest that rolling and annual budgets are complementary and used to provide the information needed for planning and control. As we noted above, the conditions organisations face, for example, uncertainty, have an important bearing on budget practices and organisational flexibility required in such contexts (Dugdale & Lyne, 2008; Libby & Lindsay, 2007; Marginson & Ogden, 2005). More broadly and recently, Spraakman and O'Grady (2023) suggest that firms no longer rely solely on budgets for planning and control activities,

and researchers need to consider the combined use of multiple planning and control tools. Accordingly, the literature largely suggests that rather than a tension between annual budgets and rolling budgets, they should be used together, particularly where organisations face challenging conditions (Frow et al., 2010).

Despite the literature above, the ways in which annual and rolling budgets might be used and deployed together, however, remain less explored. We seek to explore and shed light on this use. As explained above, might we observe, consistent with Hansen and Van der Stede (2004), that annual budgets may indeed be used more for evaluation, if rolling budgets exist in order to better allow organisations to dynamically plan. Haka and Krishnan (2005) emphasise the importance of performance targets linked to static annual budgets so as not to shift the goalposts on employees being evaluated – even when numbers may lose relevance. This effect may well be more pronounced when annual budgets are supported by rolling budgets. Or they may not be, as they're fundamentally used across different periods – the literature on exploratory studies that investigate these theoretical spaces is quite absent. We offer valuable evidence to add to this literature. In addition, while the advantages of the joint use of annual and rolling budgets may be apparent, it is important to acknowledge that doing both imposes a greater workload burden on Finance administration in organisations (Park and Jang, 2021). This can lead to preparation times for both taking longer, or possibly the quality of budgeting being impacted. Studies to date have not explored the extent to which these effects may manifest. Based on the above and given the dynamic context firms operate within, the same questions remains, do firms use both annual and rolling budgets instead of just one of them, for which purpose do they use them, and how?

### **3. Data and research method**

The data for this study is collected through a cross-sectional survey questionnaire sent to senior financial decision-makers of business units. Senior financial decision-makers<sup>3</sup> were targeted so that they could provide a broad insight into the state of budgets in their organisations. The list of firms and senior-level decision-makers was based on a list from Dunn and Bradstreet. Each firm was only included once in the list. While surveying multiple personnel in each firm would be desirable to triangulate the responses and state of budgeting in each organisation, the realities of survey response rates mean such an approach could not be effectively operationalised. Given the broad criteria for participant selection, we survey participants on factors including firm size, industry, and respondent positions, which we discuss in this section below.

We collected data from Australia and the UK as they were the home countries for the authorship team, and access was most easily obtained in these regions. That said, both countries are geo-politically similar and share many common cultural traits. On the one hand, both are advanced economies, possessing a similar rule of law (Commonwealth law) and political governance (Westminster system). They are also relevant contexts for data collection due to their organisational characteristics being largely consistent with those found in developed countries, which represent the majority of prior studies (Garg, 2018; Sundin et al., 2010). To this end, we saw the offering of empirics relating to both countries as further cementing the durability of our findings. If they persist across both settings, then they are particularly consistent. If they do not, it's important that we acknowledge these differences, which we do where required.

In terms of differences, we acknowledge that Australia and the UK bring variation and richness in context in ways other than the similarities explained above. For example,

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<sup>3</sup> To examine whether organisational position is related to different survey responses, thereby the results to some extent, we ran an ANOVA analysis to compare responses based on respondent position. Largely we find no significant difference, thereby, indicating that position is not related to differences in responses.

Australia is regionally isolated from other countries and highly trade-dependent, and its competitiveness across different industries can vary widely. It has also been economically robust in recent decades. In contrast, the UK is less regionally isolated, generally exhibits higher levels of competition across industries, and has faced more economic challenges than Australia in recent decades. Given such differences, the method we report as follows will be run separately across the Australian and UK sub-samples, further to the full sample analysis.

The survey design and administration follow the guidance of Dillman (2000). Some of the survey questions are contingent on earlier responses, and accordingly, an online survey is conducted to tailor the contingent variation in the questions. The survey was pilot-tested with industry practitioners and fellow researchers. The survey administration was conducted progressively over 12 months from 2015 to 2016 by contacting respondent organisations via email, followed by two follow-up rounds.

Based on the responses received, our response rate is 6.8 percent from a sample of 5,706 firms contacted. There are no publicly available direct email databases for target respondents, and therefore, electronic survey links were largely emailed through 'gatekeepers' such as executive assistants. It is also possible that potential respondents considered higher-order budgeting questions, such as working with rolling budgets, a confidential topic (Irvine, 2003). The difficulty in gathering data on budget practice and, in particular, the rolling budget partially explains the lack of survey-based research. Notwithstanding this, our response rate aligns with survey-based management accounting research response rates (Chenhall et al., 2011; De Baerdemaeker & Bruggeman, 2015; Moores & Yuen, 2001). Response rates to studies with large respondent databases, such as those done via online survey contact, cause much lower response rates, such as the IMA North American response rate noted in Libby and Lindsay (2010), which was 1.5 percent.

After deleting unusable responses, we have 380 usable responses (237 from Australia and 143 from the UK). It is important to note that questions in the survey are not compulsory, as we are aware that some participants may not wish to share certain data points due to concerns about confidentiality. Making all questions compulsory would mean that some participants would have failed to disclose any further information after reaching any question of concern. However, we observe relatively consistent completion rates<sup>4</sup>, factoring in that some questions were contingent (and only asked in some cases) based on prior responses. Respondents have been with their organisation for an adequate period on average (mean 8.61 years) and in an appropriate position (sufficiently senior) to complete the survey, as shown in Table 1. The respondent positions are largely similar across Australia and the UK, with a few exceptions that may reflect different title conventions across the two countries.

[INSERT TABLE 1 HERE]

To address concerns associated with non-response bias, we conducted several analyses. First, we compare early and late respondents (Armstrong & Overton, 1977). While we cannot identify individual respondents' responses, we can identify the period in which respondents completed the survey following contact. We identified respondents completing the survey in a short period post-contact (early response within 24 hours, consisting of 332 responses) and those with a considerable lag (late response after at least 72 hours, consisting of 56 responses). The independent sample tests (Mann-Whitney U) demonstrate no significant differences in the distribution of the survey data between early and late responses, suggesting that non-response bias is of minimal or no concern.

Second, to address concerns of non-response bias, we also examine the business unit industry of respondents' as seen in Table 2 below. There is considerable variation in the nature of the respondent organisations, consistent with the industry involvement in Australia

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<sup>4</sup> See Table 3, column "N" for question completion rates.

and the UK. Further, there is considerable variation in the size of respondent organisations (based on employees), ranging from 2 – 1,000,000. The respondent characteristics illustrate that a broad cross-section of organisations is represented. This spread of institutions further ameliorates the impact of a lower overall response rate and inherent bias in the sample.

[INSERT TABLE 2 HERE]

The survey questions used appear in the Appendix, which also provides the sources from which the survey questions were adapted. The tables in the results and discussion section specify the questions used for the statistics and results reported in each table. The descriptive statistics are provided in Table 3 below. The descriptive statistics indicate considerable variation across the variables used in this study. Such variation is particularly useful as we compare differences in budget usage and perceptions across low and high levels associated with uncertainty, strategic and business unit performance variables. The low and high levels are based on splitting the sample based on the median scores for the uncertainty, strategy and business unit performance variables by creating relatively low and high levels for the respective sub-samples. Comparing the state of budgeting across relatively low and high levels of uncertainty, strategy and business unit performance variables will provide insight into the variation in budget practices accordingly.

[INSERT TABLE 3]

We report the correlations between the variables examined in this study in Table 4 below. The significant correlations are largely in line with what we would reasonably expect. For example, plans to abandon annual budgets are significant and negatively correlated with the reasons for using annual budgets. We observe significant correlations between indicators grouped within certain individual questions, for example the different reasons for using annual budgets, reasons for rolling budgets and factors that drove the introduction of rolling

budgets are significantly correlated. This indicates that firms had multiple reasons for using annual and rolling budgets, as would be expected. We see that reasons for using rolling budgets are significantly correlated with the challenges of using rolling budgets in some cases, consistent with the challenges that would be expected when using the rolling budget tool. We also see that the moderating variables are significantly correlated with reasons for using rolling and annual budgets and how they are used, consistent with the results and discussion section that follows in this paper. Given the significant correlations observed, we test for common method bias in the survey data by running Harman's single-factor test. The results confirm that common method bias is not present. (Podsakoff et al., 2003).

[INSERT TABLE 4 HERE]

#### **4. Results and discussion**

##### **4.1. Annual budget use and purpose**

Most firms use the annual budget, per Table 5, Panel A. Across all respondents, 95.5 percent indicate that their business unit prepares an annual budget. This percentage is not dissimilar to Ekholm and Wallin (2000) and Bhimani et al (2018). This emphasises that calls to abandon annual budgets have gained little, if any, traction since Hope and Fraser (2000) and Wallander (1999). Such a high proportion of firms using annual budgets is consistent with prior studies arguing that firms continue to perceive value in the application of the traditional annual budget (Becker, 2014). Unsurprisingly, we find that the preparation of the annual budget displays little sensitivity to the moderating factors we examine to identify differences in practice, bar two exceptions, being those applying a differentiation strategy (Mann-Whitney  $U = 6,308$ ;  $p = 0.039$ ) and larger firms, based on the number of business unit employees ( $U = 17,010$ ;  $p = 0.026$ ). The former is surprising as cost leader firms have been traditionally argued to be more suited to traditional budgeting practices, but we find

differentiators adopting it at higher rates than cost leaders. These findings contrast Ekholm and Wallin (2000) as well as Hartmann, 2000.

[INSERT TABLE 5 HERE]

Consistent with studies arguing the importance of the annual budget for control and coordination, it is unsurprising that larger firms are more likely to use the annual budget (Merchant, 1984), however, we observe<sup>5</sup> this only holds for large UK firms. We observe that UK firms are significantly larger than Australian firms in our sample, consistent with the larger UK and associated European market compared with Australia. Accordingly, given the larger size of UK firms on average, they are more likely to use annual budgets than smaller Australian firms on average. This result is therefore not driven by location, but company size.

RAPM literature in the 1980s and 1990s initially identified annual budgets as less beneficial in uncertain environments. However, this has been contrasted by more recent studies indicating the value of budgets where uncertainty is higher (Becker et al., 2016; Marginson & Ogden, 2005). Our findings appear to align with latter studies, indicating no differences in budget preparation across low and high uncertainty business units. Respondents are not abandoning budgets in high uncertainty environments. These findings lend support and further evidence to Becker et al. (2016) who explored the beneficial use of budgets in volatile environments.

Only 11.2 and 12.1 percent of firms have some level of agreement concerning plans to abandon annual budgets for managerial motivation and performance evaluation purposes, respectively. While prior-recent literature indicates annual budgets are useful in the context of uncertainty (Becker et al., 2016), we observe<sup>6</sup> no differences in sub-samples relating to

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<sup>5</sup> Mention of ‘observed’ results or results we ‘observe’, throughout this paper, refers to additional statistics beyond those directly addressing the questions we asked in the literature review. These were not tabulated in the interests of maintaining the paper at an acceptable length. These additional descriptive statistics are available from the authors upon request.

<sup>6</sup> Mention of ‘observed’ results or results we ‘observe’, throughout this paper, refers to additional statistics beyond those directly addressing the questions we asked in the literature review. These were not tabulated in the

uncertainty. This indicates that uncertainty is not a factor driving annual budget abandonment, as some literature suggests (Hope & Fraser, 2000; Wallander, 1999).

Given the extensive use of annual budgets, we next examine the time spent on annual budget preparation. Perhaps business units use budgets, but use them somewhat superficially, and this may reflect in their preparation time. Table 5, Panel C indicates most firms spend between 0 and 60 days preparing the budget, with 14.1 percent and 50.7 percent spending between 0-30 days and 31-60 days, respectively. In comparison, only 2.0 percent of firms spend more than 120 days on budget preparation. The comparisons confirm that larger business units ( $U = 11,670.5; p < 0.001$ ) and whole companies ( $U = 10,827; p < 0.001$ ) spend significantly greater periods of time preparing the annual budget, consistent with the more hierarchical nature of these firms. But this time need not be a negative artefact, as argued in Hope and Fraser (2003). This also suggests that large firms are not dynamic and fast-paced decision-makers in uncertain times (Ekholm & Wallin, 2011). We find that firms taking less time to prepare the annual budget indicate they achieve high ‘average business unit performance’, suggesting agility is important. On a separate and perhaps related point, Australian-based survey participants indicate it takes them less time to prepare the annual budget, possibly indicating Australian firms’ more independent and distant operations. In any case, we observe across Australia and the UK that large firms take longer to budget, but higher performers take less time, suggesting our findings are broadly applicable in terms of time to prepare the budget.

Having identified the existence of annual budgets and its preparation attributes, we focus on why they’re used, focusing on reasons relating to decision-making and control (Table 5, Panel D). We find all our reasons presented as gleaned from prior literature (Sivabalan et al., 2009) scored highly, but there existed significantly higher agreement with

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interests of maintaining the paper at an acceptable length. These additional descriptive statistics are available from the authors upon request.

‘control of organisational resources’ and ‘better planning’ budget reasons, over the ‘performance evaluation of the business unit’ (Wilcoxon  $Z = -2.617$ ;  $p = 0.009$ ) and ‘performance evaluation of managers’ (Wilcoxon  $Z = -8.115$ ;  $p < 0.001$ ) reasons. This finding offers broader support for the claims made by Sivabalan et al. (2009) and Becker et al. (2016) regarding the relevance of budgets weighting in favour of operational planning as opposed to performance evaluation rationales. However, extending Becker et al. (2016), our findings indicate that the emphasis on operational planning over performance evaluation persists even in normal operations when uncertainty is lower, independent of crises.

Interestingly, we find that organisations are significantly more likely to use annual budgets for the performance evaluation of managers ( $Z = -2.948$ ;  $p = 0.003$ ) and as information for decision-making ( $Z = -2.377$ ;  $p = 0.017$ ) where there is high internal uncertainty, and for the performance evaluation of managers ( $Z = -2.322$ ;  $p = 0.020$ ) and earnings forecasts ( $Z = -2.943$ ;  $p = 0.003$ ) where there is high external uncertainty. These findings offer empirical support for Libby and Lindsay (2010) arguments regarding why the annual budgets continue to persist, and are not replaced by alternative applications such as beyond budgets, even when uncertainty is high. The continued prevalence of budget use from a performance evaluation perspective, even in a high uncertainty environment furthers our understanding beyond that in prior literature (Becker et al., 2016; Brunner & Ostermaier, 2019; Jensen, 2003; Sivabalan et al., 2009). Further, there is a significantly higher agreement for annual budget reasons when firms indicate greater alignment with a competitive strategy. In particular, firms adopting cost leadership strategies show significantly higher scores for all reasons for using the annual budget (all Mann-Whitney U values  $> 6100$  and p values  $< 0.004$ ). These findings are aligned to but offer specificity greater than that gleaned from Becker, et al (2016) and Libby and Lindsay (2010) regarding the persistence of annual budgets. We further observe significantly less agreement in annual budget use for the

performance evaluation of managers ( $U = 12,093.5$ ;  $p = 0.015$ ) and information for decision making in larger organisations ( $U = 11,437$ ;  $p = 0.002$ ), again suggesting larger firms are less dynamic and consistent with the longer annual budget preparation time periods noted above. The usefulness of annual budgets appears validated by the higher average business unit performance noted by firms indicating significantly higher agreement with better planning ( $U = 9,267.5$ ;  $p = 0.001$ ), information for decision making ( $U = 9,623.5$ ;  $p = 0.012$ ) and earnings forecast reasons ( $U = 8,423$ ;  $p < 0.001$ ). When analysing the Australian and UK firm subsamples separately, we observe reasons relating to strategic choices and uncertainty and performance to a lesser extent, consistent across both regions.

Contrasting the very high level of annual budget use, it is interesting that firm satisfaction with the annual budget is mixed, as reported in Table 5, panel E. There is a high level of satisfaction in using the annual budget to manage business units, with 85.6 percent of firms indicating some level of satisfaction (satisfied or very satisfied), consistent with the widespread use of annual budgets. This finding offers more specificity to the general identification of using budgets for business unit evaluation, explained in Sivabalan et al (2009). However, this satisfaction declines for more specific reasons, with 70.6 percent of the sample indicating some level of satisfaction with the annual budget for making short-term operation decisions and 58.7 percent indicating satisfaction with using the annual budget to make long-term strategic decisions, an element of budget use not traditionally associated with the annual budget. These numbers speak encouragingly for the relevance of operational budgets in organisations, notwithstanding their use. While these satisfaction levels would not be characterised as low, they are noticeably lower than the 96.5 percent of firms that use annual budgets. Most organisations use budgets, but some literature claims there is little satisfaction in their use, for example see Hansen et al (2003) and Jensen (2003). We find that a majority are satisfied with budgets, and some respondents show more satisfaction with

some budget reasons than others. This inconsistency is likely one of the drivers of why firms use rolling budgets to supplement their annual budgets, as we detail in the sections that follow below.

We observe higher satisfaction with the annual budget for firms exhibiting higher average and overall business unit performance, generally offering important empirical affirmation that it is possible for firms using annual budgets, on balance, to do better and be satisfied with the budgeting process – but this was specifically observed for the Australian firm sample, and not the UK firm sample. Our findings indicate greater satisfaction with the annual budget for firms undertaking cost leadership strategies, consistent with driving efficiency. Findings also indicate greater satisfaction with the annual budget for long-term strategic decisions for firms undertaking differentiation strategies, consistent with the need to plan to ensure perceived differentiation. The results indicate that larger companies have lower satisfaction with the annual budget for short- and long-term decisions, consistent with larger companies' lower agreement with reasons for using the annual budget and lengthy-time preparation periods. Other than the moderating effect of performance on satisfaction for Australian firms, the moderating effects on budget satisfaction are largely consistent across Australia and the UK.

#### **4.2. *Rolling budget use and purpose***

Our survey indicates that 29.3 percent of firms prepare rolling budgets, Table 6, Panel A, higher than indications in prior literature but lower than those observed in Sivabalan et al. (2009). Notably, none of the moderating factors presented in Table 6, Panel A, are associated with the different rates of rolling budget adoption, regardless of whether firms are based in Australia or the UK. This indicates that the reasons for rolling budget adoption vary widely across different firms, and there may not be a single consistent reason for their use. This contrasts with suggestions in the literature relating to the applicability of rolling budgets in

more dynamic and turbulent environments (Ekholm & Wallin, 2011; Hansen et al., 2003; Libby & Lindsay, 2010).

[INSERT TABLE 6 HERE]

Given that a minority of firms only prepare rolling budgets, we survey firms on why rolling budgets are not prepared, with these results summarised in Table 6, Panel B. Only a minority of firms agree the rolling budget is not undertaken because predicting future expectations is too difficult (33.7 percent), information is inaccessible (26.5 percent) and due to employee resistance (23.0 percent). However, 68.9 percent of firms agree that the rolling budget is not undertaken due to excessive time to prepare and update the rolling budget. As we showed earlier, most firms spend more than 30 days preparing the annual budget, and therefore, some may question the need to spend additional time preparing rolling budgets. Through our comparisons across the moderation variables, we observe that firms largely agree with the reasons for not undertaking rolling budgets, and this moderation remains consistent across Australia and the UK. However, the exception is Australian companies reporting higher employee resistance as a reason for not undertaking the rolling budget ( $U = 6,230$ ;  $p = 0.046$ ). This finding offers an internal resistance rationale for rolling budget non-adoption previously posited but not empirically captured in prior studies (Hansen et al. 2003; Bhimani et al. 2018).

We next survey firms on factors that drove the introduction of the rolling budget, summarised in Table 6, Panel C. The most important reasons are executive expertise and training (rationales not discussed in Bhimani et al., 2018) and recommendations from those with experience and expertise, suggesting decision-makers use their informed judgment when introducing rolling budgets and rely on experts' recommendations in the field. However, unsurprisingly, we observe that firms facing higher uncertainty, internal and external, indicate external pressure was a more important reason driving the introduction of rolling budgets,

consistent with suggestions in literature (Hansen et al., 2003), although this only applies to Australian firms rather than UK firms. Perhaps the UK context is inherently more uncertain overall, thus, uncertainty variation appears not to relate to rolling budget introduction. It should be noted, however, that the level of uncertainty itself, as discussed above, does not appear to moderate the use of rolling budgets. Further, Australian firms indicated that consultants' advice is a more important factor driving their selection of rolling budgets. Interestingly, external consultant advice is a less important reason to adopt for firms with a differentiation strategy, suggesting these firms are more reliant on internal processes and expertise when making decisions. Finally, larger business units are less interested in whether other firms use rolling budgets as a reason to adopt.

Next, we survey firms on their reasons for using rolling budgets, and these results are presented in Table 6, Panel D. The reasons surveyed are parallel to those for using annual budgets. Largely, we find high levels of agreement for different reasons for using rolling budgets. We observe that firms with cost leadership and differentiation strategies are more likely to use rolling budgets for planning and control of organisational resources, especially in Australian firms. This findings offers more detail regarding how rolling budgets aid the budgeting process, advancing Hansen, et al. (2003).

We next compare the relative agreement with reasons for use across both rolling and annual budgets, reported in Table 6, Panel E. We find significant differences (Wilcoxon  $Z$  values  $< 2.215$ ;  $p$  values  $< 0.05$ ), indicated by the Wilcoxon sign test when comparing matched survey participant agreement levels across annual and rolling budget reasons. Except for better planning, where there is a very high agreement for annual and rolling budgets, there are significant differences for all annual and rolling budget reasons. Participants indicate lower agreement for all reasons relating to rolling budgets, except information for decision-making, which is higher for rolling budgets. The very high agreement for the use of rolling

budgets for better planning and information for decision-making is consistent with the value of rolling budgets reported in the literature (Haka & Krishnan, 2005). The higher agreement with the remaining reasons is consistent with the reasons for traditionally using annual budgets. To this extent, we further emphasise the perceived value amongst organisations for the conduct of annual budgets – even when rolling budgets are present, reflecting the value of multiple planning and control tools, as we will discuss later (Sprakman & O'Grady, 2023).

Rolling budget practice is intended to be interactive, facilitating communication, information sharing and decision making (Bhimani et al., 2018). Accordingly, to understand how firms use rolling budgets and whether the use is consistent with intentions, we survey respondents on the extent to which lower-level management is involved in the rolling budget process, as reported in Table 6, Panel F. The responses indicate, noting that these are from senior-level decision makers, that there is a level of agreement that lower-level management is provided with significant reasoning for rolling budget revisions, that there is contribution to the process in a way regarded as important by senior management, and there is engagement by senior management in rolling budget discussions. However, just over half of firms indicate lower-level management has significant control over rolling budgets, and under half indicate lower management initiates discussions and has a significant influence on the rolling budget process. We do not observe any significant differences across the sub-samples.

To examine how tightly control is exercised through the rolling budget, we survey participants on the degree to which they are accountable for rolling budget numbers, as reported in Table 6, Panel G. Overall, the findings indicate moderate levels of rolling budget accountability. Findings indicate participants take rolling budgets seriously, with 61.46 percent indicating some level of agreement that they feel the pressure of rolling budget numbers. However, interestingly, only 15.6 and 36.1 percent report some level of agreement that there are penalties for missing rolling budget targets and that bonuses are a significant

portion of salaries, respectively. Further, just under half of firm senior management contest rolling budget numbers submitted by lower-level management and 63.9 percent of firms allow lower-level management to propose rolling budget adjustment as new information emerges. We also find that senior management are more likely to contest rolling budget numbers in larger companies ( $U = 815$ ;  $p = 0.030$ ), indicating a top-down managerial approach. Finally, our data reveals that higher-performing firms are less likely to penalise management where targets are missed ( $U = 655.5$ ;  $p = 0.046$ ), providing some support for the value of budgets and as a planning and communication device rather than a control technique, affecting employee trust in budget use (Brunner & Ostermaier, 2019).

Further to the results presented above, we survey participants on the tendencies of senior management to use the rolling budget to control lower management. The findings are reported in Table 6, Panel H. Overall, while the importance of rolling budgets is emphasised, these results largely indicate rolling budgets are not used to exert tight control, consistent with the results discussed in relation to Panel G above. We find that 71.1 and 67.0 percent of participants indicate some level of agreement that senior management constantly emphasise the need to meet targets and controls by monitoring how well performance meets rolling budget targets, respectively. However, respondents indicate that only 28.9 percent of senior management determine promotion prospects through rolling budgets, and only half consider them as accurately reflecting success. Further, we observed senior management adapt control and put less emphasis on control through monitoring how well performance meets rolling budget targets where internal uncertainty is higher (Mann-Whitney  $U = 655$ ;  $p = 0.049$ ) and less emphasis on determining promotion prospects in larger business units ( $U = 819$ ;  $p = 0.014$ ). Higher-performing firms place less emphasis on meeting rolling budget targets, offering an alternative view for the lower use of rolling budgets for performance evaluation to that discussed in Haka and Krishnan (2005).

The next part of our study focuses on the operationalisation of rolling budgets. There is an even split of firms using monthly and quarterly rolling budget periods, at 41.7 and 43.5 percent, respectively, reported in Table 7, Panel A. The remaining 14.8 percent use a longer period, with many indicating six months and even yearly or greater, which appears more aligned with a traditional annual budget. The statistics we report on rolling budget operationalisation relate only to those firms using monthly or quarterly rolling budgets for clarity and consistency. The moderation variables we examine (uncertainty, strategy, and business unit performance) do not impact the period chosen, consistent with firms' general use of annual and rolling budgets, rather than the sensitivity to uncertainty and strategic characteristics as suggested in literature (Ekholm & Wallin, 2011; Libby & Lindsay, 2010).

[INSERT TABLE 7 HERE]

The findings in Table 7, Panel B, indicate that when summing all the rolling budgets periods planned, on average, firms plan for approximately one year. Monthly rolling budgeters plan an average of 51.42 weeks, and quarterly budgeters for 61.04 weeks. Accordingly, it appears firms are very much still working on an annual overall period perspective, indicating the annual budget period is well engrained (Becker, 2014) and the way in which rolling budgets are used for planning and their horizons reveals more detail than offered in Sivabalan, et al. (2009). There is some variation in the horizon period ahead based on the moderating factors. The horizon period ahead for monthly rolling budgeters is shorter for firms facing higher internal uncertainty, unsurprisingly, and longer for larger companies. These findings lend further support to Bhimani et al. (2018) explanations of how rolling budgets are used, in more detail. There are no significant differences noted for quarterly budgeters, except for UK firms planning for a significantly longer period, indicating quarterly rolling budget firms appear less flexible in the context of the moderating factors we examine. This contrasts with the findings above in relation to the choice between monthly

and quarterly rolling budget periods and provides some indication of sensitivity to uncertainty following suggestions in prior literature (Ekholm & Wallin, 2011; Libby & Lindsay, 2010).

In Table 7, Panel C, we show the length of time, in weeks, that is reviewed of the rolling budget plans. Monthly rolling budgeters review ahead 27.6 weeks, on average, and quarterly budgeters 25.7 weeks, indicating that both monthly and quarterly budgeters review approximately 50 percent of rolling budget numbers moving forward (as above 51.4 and 61.0 weeks for monthly and quarterly budgeters, respectively). While there is some variation, for example, UK based larger companies (based on business unit employees) are reviewing substantially more ahead (quarterly budgeters), while UK based higher performing review less time ahead (monthly budgeters); firms are largely revising half of the planned period.

We survey firms on what attributes they review. These responses are reported in Table 7, Panel D. Firms largely indicate strong argument with reviewing aggregate values, activities that cause change to revenues and costs, and less so, although still a large proportion, individual line items. We observe that UK firms with higher internal uncertainty are more likely to review a greater proportion of individual line items ( $U = 674$ ;  $p = 0.041$ ), and firms generally across both regions with cost leadership strategies review a greater proportion of activities that cause changes to revenues and costs ( $U = 393.5$ ;  $p = 0.001$ ).

To better understand the resources firms devote to preparing rolling budgets in each business unit, we survey participants on the number of employees involved and the days per quarter these employees spend on rolling budgets. We find, on average, 12.8 employees are involved in the preparation each period, and they spend an average of 6.0 days per quarter on rolling budget preparation. Our moderating variables do not significantly affect the proportion of employees involved. This indicates that firms generally perceive relatively consistent efforts are necessary to affect the rolling budget setting process, regardless of their circumstances.

We survey firms on the challenges when conducting rolling budget preparation, as reported in Table 7, Panel E. Unsurprisingly, the biggest challenge noted is predicting future expectations across the rolling budget horizon, with 79.4 percent indicating some level of agreement. We observe that access to information for conducting rolling budgets is also problematic, with 45.4 percent of firms indicating some level of agreement with this challenge. We find that firms with higher internal uncertainty ( $U = 637.5$ ;  $p = 0.042$ ), lower business unit performance ( $U = 480.5$ ;  $p = 0.033$ ), and specifically larger Australian firms ( $U = 372$ ;  $p = 0.016$ ) reported greater challenges accessing information. Time taken to prepare and update the rolling budget is also problematic, with 48.5 percent indicating some level of agreement with this challenge. This is particularly exacerbated in situations of high external uncertainty, specifically for Australian companies and for larger companies. Employee resistance is the least challenging aspect of rolling budgets, with only 20.6 percent of firms indicating some agreement, although larger UK firms are likely to face relatively higher resistance. The nature of the challenges we find aligns with the importance of rolling budgets for planning more so than performance evaluation (Bhimani et al., 2018).

Prior to discussing the joint use of annual and rolling budgets, in the next section, it is also worth reporting that 2.6 percent of firms solely use the rolling budget. This indicates that a very small portion of firms have substituted annual budgets with rolling budgets, or simply did not use annual budgets. The small proportion of firms solely using rolling budgets, compared to the much larger proportion of firms using both annual and rolling budgets, supports that lack of traction in terms annual budgets being substituted by rolling budgets (Bhimani et al., 2018).

#### **4.3 Using the annual and rolling budget**

Table 8 reports 27.9 percent of firms using both rolling and annual budgets. Unsurprisingly, given that most firms use the annual budget, the percentage of firms using

rolling and annual budgets is very similar to that of firms using rolling budgets. While there is variation in the percentage of firms using rolling and annual budgets combined across the moderating variables, our mean percentage comparisons indicate such variation is not significantly different, including under variation in uncertainty, which is also the case when examining all moderators across the Australian and UK sub-samples independently. Our evidence reinforces and advances Bhimani, et al (2018), in approximating rolling budget adoption to similar levels in their study.

[INSERT TABLE 8 HERE]

Table 9 shows that 75.3 percent of firms indicate some level of agreement that annual and rolling budgets are equally important, and we observe that Australian firms indicate higher levels of agreement. This finding emphasises the joint importance of both budget forms amongst the majority of the sample, highlighting their role as complements and not substitutes as espoused in some budgeting literature (Frow et al., 2010; Spraakman & O'Grady, 2023). Despite this agreement, we find that firms have significantly higher agreement that the annual budget is more useful than the rolling budget for controlling organisational resources, performance evaluation of the business unit, performance evaluation of managers and earning forecasts, although the extent of the difference are not substantial. Further validating the importance of the intersection between both budget forms is that 71.1% percent of firms indicate agreement that rolling budget preparation is linked with annual budgets, advancing Bhimani et al (2018) and Libby and Lindsay (2010) in more specifically explaining the explicit link between annual and rolling budget, beyond their co-existence.

[INSERT TABLE 9 HERE]

More than 95% of respondents agreed that rolling budgets improve future period predictions, notwithstanding their decision to adopt the rolling budget. Despite this, we find that where firms use both budgetary forms, annual budget use for planning and performance evaluation reasons is not observed to a greater extent, compared to where firms use only annual budgets. The importance of budgeting choices associated with cost control and efficiency pursuits is further demonstrated with a higher proportion of firms with cost leadership strategies indicating agreement that a rolling budget improves predictions ( $U = 463$ ;  $p = 0.039$ ). The findings more specifically offer a rationale for rolling budget use in cost leader environments, advancing Bhimani et al (2018), offering a positive perception to rolling budget utility, even amongst non-adopters. The usefulness of rolling and annual budgets together may offset the dissatisfaction firms face alone with annual budgets to make short-term operational decisions to the extent that it is observed that annual budget satisfaction scores are higher in business units that also use the rolling budget ( $U = 10,549$ ;  $p = 0.044$ ) – further offering empirical evidence for the complementary argument of the relationship between both, as hinted in Bhimani et al (2018) and Haka and Krishnan (2005).

## **5. Conclusion**

Our study provides an important examination and key findings relating to the state of play of budget practice, with a focus on annual and rolling budgets, as summarised in Table 10, below. Our evidence firmly suggests that annual budgets are a vital part of organisational control practice (Hansen & Van der Stede, 2004) and advancing Libby and Lindsay (2010), we show how budgets are used by, and satisfy the expectations of respondents. (Becker et al., 2016; Haka & Krishnan, 2005; Libby & Lindsay, 2010) Our findings clearly refute anecdotal evidence that they may persist in the consultant community that firms are abandoning annual budgets, providing practitioners with a more accurate view of the current state of budget practice and where their firms are relatively placed. We show that annual budget use is very

pervasive outside times of crisis (Becker et al., 2016), and rolling budgets exist alongside annual budgets in many business units.

[INSERT TABLE10 HERE]

We find that a notable proportion of firms use rolling budgets. Nearly one-third of firms use both annual and rolling budgets jointly, and there appears an even split across monthly and quarterly rolling budget periods. Interestingly, firms using rolling budgets plan a year ahead on average and review half of their plans at the end of each period. Our detailed evidence, including the reasons why rolling budgets are used, are not used, how they are used, and the association of these factors with uncertainty, strategy, size and business unit performance, provides a comprehensive assessment of rolling budget state play not present in prior literature. Such an assessment is fundamentally important given the material proportion of firms using rolling budgets. Our findings relating to rolling budgets considerably extend the mere acknowledgement of rolling budget existence in extant literature (Haka & Krishnan, 2005; Libby & Lindsay, 2010).

A notable proportion of firms consider annual budgets as important as rolling budgets, and accordingly, the importance of one does not inversely relate to the importance of the other, with only a very small proportion of firms using the rolling and not annual budgets. This is a finding not theoretically advanced in prior research – that rolling budget importance and annual budget importance can exist alongside one another and for the same reasons. Our findings relating to the conjoint use of annual and rolling budgets align with more recent literature (Sprakman & O'Grady, 2023) that suggests annual budgets persist within the presence of conjoint use of other planning and control tools, such as rolling budgets. As detailed in this paper, considerable literature is questioning the applicability and highlighting the limitations of annual budgets. The findings of this and related studies suggest that conjoint use of the annual budget with other tools used may alleviate weakness associated

with sole reliance on annual budgets. We can conclude from our findings and, for example, those of Spraakman and O’Grady (2023) that while annual budgets remain fundamental in the vast majority of firms, based on their extensive use, many firms no longer rely on them but instead use them conjointly with other planning and control tools, such as the rolling budget. For the purpose of future studies, this suggests researchers avoid sole focus and analysis of the annual budget and instead consider how annual budgets are conjointly used with other planning and control tools. This also has important implications for practitioners solely relying on annual budgets and how their firms may consider evolving in the future, where they face control weakness through sole annual budget reliance.

Our paper provides numerous implications of relevance to practitioners, including reporting on the actual rather than anecdotal state of play. This includes generally observing that firms identify value in using both annual and rolling budgets, and therefore, using organisational resources in operating such techniques is warranted. Training of executives appears to be an important driver of rolling budget introduction, indicating such training is of value in demonstrating the value of rolling budgets in organisations. Budgeting techniques also appear to be adaptable and valuable across numerous factors, including uncertainty and strategy, demonstrating the adaptability of such budgetary techniques. Satisfaction with budget use appears high, and firms note high levels of performance when using budgetary techniques, suggesting that poor performance outcomes are not the result of budgetary techniques but due to other interrelated factors.

This paper has examined and reported a range of statistics relating to annual budgets and rolling budgets in an exploratory manner, which can be investigated in greater detail in further research. From the beginning of this paper, our intention has been to report on the current state of budgeting, specifically focusing on annual and rolling budgets. As with any study of this nature, more questions and associated research opportunities are presented and

alluded to than answered, paving the way for more deductive studies in the future. This could include a range of diverse questions, including further analysing the conjoint use of budget tools, as we suggest above, conceptually developing measures of budget attributes beyond the individual indicators we present, incremental benefits of using different forms of rolling budgets including that related to strategic plan implementation, what impact unanticipated events have on budget processes and how the conjoint budget process relates incentives. We report on the conjoint use of rolling and annual budgets, and the majority of firms using both indicating that these are linked and equally important. This provides scope to examine in further detail firms that only use one form of budgeting and the reasons for this approach. We acknowledge that a larger dataset would assist in disaggregating rolling budgets into monthly and quarterly sub-groups, enabling more nuanced analyses of rolling budget effects. This presents a challenge and opportunity for further studies to find a larger dataset of organisations conducting rolling budgets. This study provides a starting point for assessing the current state of budgeting and identifies budget research opportunities, including the conjoint study of the different budgeting approaches in many organisations.

## **Statements and Declarations**

**Competing interests:** The authors have no financial or proprietary interests in any material discussed in this article.

**Data availability:** The dataset for this study is not publicly available, consistent with the institutional ethics requirements. The data is available from the corresponding author on reasonable request.

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## Appendix

Note: This section provides the questions referred to in this paper.

### Question 1 – Annual budget use

Source: Adapted from Sivabalan, Malmi And Brown (2009)

Does your business unit prepare an annual budget? Yes/No

### Question 2 – Internal uncertainty

Source: Adapted from Govindarajan (1984), Kruis (2008) and Rainey (1983)

Please indicate the extent to which you agree with the following in your business unit (five-point Likert scale ranging from ‘Strongly agree’ = 5 to ‘Strongly disagree’ = 1):

- a. the tasks of managers remain the same from day-to-day
- b. managers perform the same job in the same way most of the time
- c. the operational work is routine
- d. the managers basically perform repetitive activities in doing their jobs
- e. there is a clearly known way to perform the major types of work
- f. there is a sequence of steps followed in getting the work done
- g. there is a defined body of knowledge guiding managers in their work
- h. managers rely on established procedures and practices to do their work

### Question 3 – External uncertainty

Source: Adapted from Hoque (2005).

Indicate the extent to which you agree business unit management can predict the following developments which affect operations (five-point Likert scale ranging from ‘Strongly agree’ = 5 to ‘Strongly disagree’ = 1):

- a. Supplier actions
- b. Customer demands, tastes and preferences
- c. Deregulation and globalisation
- d. Market activities of competitors
- e. Production and information technologies
- f. Government regulation and policies
- g. Economic environment
- h. Industrial relations

### Question 4 – Competitive strategy

Source: Adapted from Dess and Davis (1984).

The following factors are important to the competitiveness of the business unit (five-point Likert scale ranging from ‘Strongly agree’ = 5 to ‘Strongly disagree’ = 1; indicators a – e relate to cost leadership strategy, and indicators f – j relate to differentiation strategy):

- a. Operational efficiency
- b. Competitive pricing
- c. Procurement of product inputs

- d. Reducing production costs
- e. Minimisation of outside financing
- f. New product development
- g. Brand identification
- h. Innovative marketing techniques
- i. Control of distribution channels
- j. Advertising

Question 5 – Employee numbers

Source: Adapted from Shalit and Sankar (1977)

Please estimate how many employees work in your:

- a. Business Unit
- b. Whole company

Question 6 – Average business unit performance

Source: Adapted from multiple measures of performance in literature (Andersson et al., 2002; Carlsson et al., 2005; Colakoglu & Caligiuri, 2008; Monteiro et al., 2008; Slangen & Hennart, 2008).

Please rate your business unit performance relative to competitors on the following dimensions (five-point Likert scale ranging from ‘Extremely satisfied’ = 5 to ‘Extremely dissatisfied’ = 1, plus ‘not relevant’):

- a. Profitability
- b. Sales growth
- c. Market share
- d. Cost effectiveness
- e. Productivity
- f. Product quality
- g. Customer satisfaction
- h. Corporate citizenship

Question 7 – Overall business unit performance

Source: Adapted from Geringer and Hebert (1991)

If your ideal/maximum performance level is 100%, please estimate your actual performance in the most recent budget period in comparison to this ideal level. Please note that your answer must lie between (0 and 100).

Question 8 – Plans to abandon the annual budget

Source: Libby and Lindsay (2010)

Do you plan to abandon the use of annual budgets for (five-point Likert scale ranging from ‘Strongly agree’ = 5 to ‘Strongly disagree’ = 1):

- a. Managerial motivation
- b. Performance evaluation

Question 9 – Time to prepare the annual budget

Source: Adapted from Libby and Lindsay (2010)

How much time does it take your business unit to prepare the annual budget?

- a. 0-30 days
- b. 31-60 days
- c. 61-90 days
- d. 91-120 days
- e. More than 120 days

Question 10 – Reasons for using the annual budget

Source: Adapted from Sivabalan, Malmi And Brown (2009)

To what extent do you agree with the following reasons for your business unit's use of the annual budget (five-point Likert scale ranging from 'Strongly agree' = 5 to 'Strongly disagree' = 1):

- a. Better planning
- b. Control of organisational resources
- c. Information for decision making
- d. Performance evaluation of the business unit
- e. Performance evaluation of managers
- f. Earnings forecasts (e.g. share market earnings announcements)

Question 11 – Satisfaction with the annual budget

Source: Adapted from Hansen and Van der Stede (Hansen & Van der Stede, 2004)

Indicate your satisfaction with annual budgets as an aid to (five-point Likert scale ranging from 'Strongly agree' = 5 to 'Strongly disagree' = 1):

- a. manage the business unit
- b. make short term, operational decisions
- c. make long term, strategic decisions

Question 12 – Rolling budget use

Source: Based on rolling budget definitions within literature (Bhimani et al., 2018; Haka & Krishnan, 2005).

A rolling budget is a continually updated budget of a series of short periods (e.g. monthly, quarterly), where a new budget period is added as the most recent budget period is completed. For example, a firm might conduct 1 month budgets for the next 18 months, progressively adding 1 month every time an existing month expires (*this definition was provided in the survey before respondents were asked the question below*).

Does your business unit prepare a rolling budget? Yes/No

Question 13 – Reasons rolling budgets are not prepared

Source: Adapted from Bhimani, Sivabalan and Soonawalla (2018)

Indicate the reasons rolling budgeting is not undertaken (five-point Likert scale ranging from 'Strongly agree' = 5 to 'Strongly disagree' = 1):

- a. Predicting future expectations is too difficult
- b. Information inaccessible for the purposes of conducting rolling budgets

- c. Employee resistance to rolling budget process
- d. Time taken to prepare and update rolling budget is excessive

Question 14 – What factors drove the introduction of a rolling budget

Source: Adapted from Bhimani, Sivabalan and Soonawalla (2018)

What factors drove the introduction of a rolling budget into your business unit (five-point Likert scale ranging from ‘Strongly agree’ = 5 to ‘Strongly disagree’ = 1):

- a. Other firms are using rolling budgets
- b. Other business units in our firm are using rolling budgets
- c. Consultants advised us to use rolling budgets
- d. Executive expertise and training caused us to use rolling budgets
- e. Recommended by those with experience and expertise
- f. Financial markets (stock exchange) require the use of rolling budgets
- g. Creditors (lending institutions) require the use of rolling budgets
- h. My business unit uses rolling budgets due to external pressure

Question 15 – Reasons for using rolling budgets

Source: Adapted from Bhimani, Sivabalan and Soonawalla (2018)

To what extent do you agree with the following reasons for your business unit’s use of the rolling budget (five-point Likert scale ranging from ‘Strongly agree’ = 5 to ‘Strongly disagree’ = 1):

- a. Better planning
- b. Control of organisational resources
- c. Information for decision making
- d. Performance evaluation of the business unit
- e. Performance evaluation of managers
- f. Earnings forecasts (e.g. share market earnings announcements)

Question 16 - Lower level management involvement with rolling budgets

Source: Adapted from Bhimani, Sivabalan and Soonawalla (2018)

Please indicate the extent to which you agree that lower level management in your business unit (five-point Likert scale ranging from ‘Strongly agree’ = 5 to ‘Strongly disagree’ = 1):

- a. Has significant control over the rolling budget they are involved in setting
- b. Are provided with significant reasoning when the rolling budget is revised
- c. Initiate rolling budget related discussions
- d. Has a significant influence on the rolling budgeting process
- e. Contributes to the rolling budget process in ways regarded as important by senior management
- f. Is engaged by senior management frequently in rolling budget discussions

Question 17 – Rolling budget accountability

Source: Adapted from Bhimani, Sivabalan and Soonawalla (2018)

Indicate your agreement with the following (five-point Likert scale ranging from ‘Strongly agree’ = 5 to ‘Strongly disagree’ = 1):

- a. I feel the pressure of meeting my rolling budget numbers
- b. There are penalties for missing rolling budget targets in a period
- c. Bonuses are a significant portion of base salaries in my business unit
- d. Senior management contest the rolling budget numbers submitted by lower level management
- e. Within a period, senior management allow lower level management to propose rolling budget adjustments as new information emerges

Question 18 – Control through rolling budgets

Source: Adapted from Bhimani, Sivabalan and Soonawalla (2018)

Indicate the extent to which you agree that senior management does the following to lower level management (five-point Likert scale ranging from ‘Strongly agree’ = 5 to ‘Strongly disagree’ = 1):

- a. Constantly emphasises the need to meet their rolling budget targets
- b. Controls them by monitoring how well performance meets rolling budget targets
- c. Determines their promotion prospects based on meeting rolling budget targets
- d. Considers achieving rolling budget targets as accurately reflecting their success

Question 19 – Rolling budget periods

Source: Based on rolling budget definitions within literature (Bhimani et al., 2018; Haka & Krishnan, 2005).

Period – What is the length of each rolling forecast period?

- a. Monthly
- b. Quarterly
- c. Other

Question 20 – Time planned ahead

Source: Based on rolling budget definitions within literature (Bhimani et al., 2018; Haka & Krishnan, 2005)

How many periods ahead do you conduct forecasts for? (Respondents asked to select options ranging from 2 months to greater than 23 months, for monthly rolling budgeters, or from 2 quarters to 17 quarters or greater, for quarterly rolling budgeters).

Question 21 – Reviewing time planned ahead

Source: Based on rolling budget definitions within literature (Bhimani et al., 2018; Haka & Krishnan, 2005)

At the end of each month/quarter, which future months/quarters in your horizon do you reflect on and consider changing? (Respondent asked to select the relevant periods, contingent on their response relating to the rolling budget periods their firm plans ahead in question 20).

Question 22 – Attributes reviewed

Source: Based on rolling budget definitions within literature (Bhimani et al., 2018; Haka & Krishnan, 2005)

When modifying your rolling budget, indicate the degree to which your business unit reviews the following (five-point Likert scale ranging from ‘Strongly agree’ = 5 to ‘Strongly disagree’ = 1):

- a. Aggregate values (e.g. sales revenue, total costs, net profit, etc.)
- b. Individual line item values (e.g. rent expense, cost of sales, salary expense, etc.)
- c. Activities that cause changes to revenues or costs (i.e. activity drivers)

Question 23 – Rolling budget involvement

Source: Question developed for the purpose of this study.

Approximately how many employees work with the preparation of the rolling budget in your business unit, each period?

Question 24 – Days working on rolling budget

Source: Question developed for the purpose of this study.

Approximately how many days per quarter (on average) might each employee work to prepare or modify the rolling budget?

Question 25 – Challenges

Source: Adapted from Bhimani, Sivabalan and Soonawalla (2018)

What challenges do you face when conducting rolling budgets? (five-point Likert scale ranging from ‘Strongly agree’ = 5 to ‘Strongly disagree’ = 1):

- a. Predicting future expectations across the rolling budget horizon
- b. Access to information for conducting rolling budgets
- c. Employee resistance to rolling budget process
- d. Time taken to prepare and update rolling budget

Question 26 – Using the annual and rolling budget

Source: Question developed for the purpose of this study.

Please indicate the extent to which you agree or disagree with the following statements (five-point Likert scale ranging from ‘Strongly agree’ = 5 to ‘Strongly disagree’ = 1):

- a. Both annual budgets and rolling budgets are equally important
- b. Working with the rolling budget improves future period predictions
- c. Annual and rolling budget preparation processes are not linked

## Tables

**TABLE 1: Respondent positions percentages**

<b>Position</b>	<b>Total</b>	<b>Australia</b>	<b>UK</b>
Managing Director/Chief Executive Officer	22.7% <sup>680</sup>	22.0% <sup>1,992</sup>	23.8% <sup>10</sup>
Chief Financial Officer	16.8% <sup>753</sup>	20.3% <sup>32</sup>	10.9% <sup>884</sup>
Finance Director	13.9% <sup>18</sup>	4.1% <sup>49</sup>	29.9% <sup>32</sup>
Financial Controller	11.6% <sup>598</sup>	16.2% <sup>183</sup>	4.1% <sup>082</sup>
General Manager	11.1% <sup>082</sup>	14.9% <sup>38</sup>	4.8% <sup>762</sup>
Finance Manager	8.0% <sup>7,990</sup>	8.3% <sup>299</sup>	7.5% <sup>483</sup>
Executive Director	6.2% <sup>186</sup>	5.0% <sup>4,979</sup>	8.2% <sup>163</sup>
Accountant	2.8% <sup>35</sup>	2.9% <sup>05</sup>	2.7% <sup>21</sup>
Chairperson	1.8% <sup>04</sup>	0.4% <sup>15</sup>	4.1% <sup>082</sup>
Operations Manager	1.5% <sup>46</sup>	1.7% <sup>660</sup>	1.4% <sup>361</sup>
Chief Operating Officer	1.3% <sup>289</sup>	0.8% <sup>30</sup>	2.0% <sup>041</sup>
Other	2.3% <sup>20</sup>	3.3% <sup>320</sup>	0.7% <sup>680</sup>

**TABLE 2: Business unit industry classification\***

<b>Industry</b>	<b>Total</b>	<b>Australia</b>	<b>UK</b>
Accommodation & Food Services	6.1% <sup>053</sup>	6.8% <sup>751</sup>	4.9% <sup>895</sup>
Administrative & Support Services	4.2% <sup>11</sup>	3.8% <sup>797</sup>	4.9% <sup>895</sup>
Agriculture, Forestry & Fishing	6.1% <sup>053</sup>	8.9% <sup>861</sup>	1.4% <sup>399</sup>
Arts & Recreation Services	2.1% <sup>05</sup>	1.7% <sup>688</sup>	2.8% <sup>797</sup>
Construction	12.4% <sup>368</sup>	14.3% <sup>46</sup>	9.1% <sup>091</sup>
Education & Training	5.0% <sup>00</sup>	2.5% <sup>32</sup>	9.1% <sup>091</sup>
Electricity, Gas, Water & Waste Services	4.5% <sup>474</sup>	3.8% <sup>797</sup>	5.6% <sup>594</sup>
<u>Finance &amp; Insurance Services</u>	<u>8.4%</u>	<u>6.8%</u>	<u>11.2%</u>
<u>Finance &amp; Insurance Services</u>	<u>8.421</u>	<u>6.751</u>	<u>11.189</u>
Health Care & Social Assistance	10.0% <sup>000</sup>	9.7% <sup>05</sup>	10.5% <sup>490</sup>
Information Media & Telecommunications	6.1% <sup>053</sup>	6.3% <sup>29</sup>	5.6% <sup>594</sup>
Manufacturing	27.1% <sup>105</sup>	27.0% <sup>04</sup>	27.3% <sup>273</sup>
Mining	6.6% <sup>579</sup>	8.9% <sup>861</sup>	2.8% <sup>797</sup>
Professional, Scientific & Technical Services	10.3% <sup>263</sup>	12.2% <sup>36</sup>	7.0% <sup>6.993</sup>
Public Administration & Safety	1.6% <sup>579</sup>	0.4% <sup>22</sup>	3.5% <sup>497</sup>
Rental, Hiring & Real Estate Services	3.7% <sup>684</sup>	4.6% <sup>41</sup>	2.1% <sup>098</sup>
Retail Trade	10.5% <sup>526</sup>	14.8% <sup>768</sup>	3.5% <sup>497</sup>
Transport, Postal & Warehousing	7.4% <sup>368</sup>	9.7% <sup>05</sup>	3.5% <sup>497</sup>
Wholesale Trade	9.5% <sup>474</sup>	13.9% <sup>24</sup>	2.1% <sup>098</sup>
Other Services	16.3% <sup>16</sup>	15.2% <sup>190</sup>	18.2% <sup>182</sup>

\*Some organisations operate in more than one industry sector and accordingly, the table percentages sum to greater than 100%

**TABLE 3: Descriptive statistics**

<b>Variable</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Median</b>	<b>Std dev.</b>	<b>N</b>
<b>Annual budget use percentage</b>	0.00 $\theta$	1.00 $\theta$	0.9655	1.00 $\theta$	0.2107	380
<b>Plans to abandon the annual budget</b>						
<i>Managerial motivation</i>	1.00 $\theta$	5.00 $\theta$	2.343	2.00 $\theta$	0.903	347
<i>Performance evaluation</i>	1.00 $\theta$	5.00 $\theta$	2.354	2.00 $\theta$	0.964	347
<b>Reasons for using the annual budget</b>						
<i>Better planning</i>	1.00 $\theta$	5.00 $\theta$	4.4548	5.00 $\theta$	0.65 $\theta$	346
<i>Control of organisational resources</i>	1.00 $\theta$	5.00 $\theta$	4.4875	5.00 $\theta$	0.652	345
<i>Information for decision-making</i>	1.00 $\theta$	5.00 $\theta$	4.327	4.00 $\theta$	0.7548	343
<i>Performance evaluation of the business unit</i>	1.00 $\theta$	5.00 $\theta$	4.333	4.00 $\theta$	0.77768	345
<i>Performance evaluation of managers</i>	1.00 $\theta$	5.00 $\theta$	4.003.997	4.00 $\theta$	0.9325	346
<i>Earnings forecasts</i>	1.00 $\theta$	5.00 $\theta$	3.6987	4.00 $\theta$	1.213	342
<b>Rolling budget use</b>	0.00 $\theta$	1.00 $\theta$	0.293	0.00 $\theta$	0.4656	358
<b>Reasons rolling budgets are not prepared</b>						
<i>Predicting future expectations is too difficult</i>	1.00 $\theta$	5.00 $\theta$	2.92 $\theta$	3.00 $\theta$	0.993	249
<i>Information inaccessible for the purposes of conducting rolling budgets</i>	1.00 $\theta$	5.00 $\theta$	2.8439	3.00 $\theta$	0.9549	249
<i>Employee resistance to rolling budget process</i>	1.00 $\theta$	5.00 $\theta$	2.782	3.00 $\theta$	0.9109	248
<i>Time taken to prepare and update rolling budget is excessive</i>	1.00 $\theta$	5.00 $\theta$	3.7769	4.00 $\theta$	0.9326	251
<b>What factors drove the introduction of a rolling budget</b>						
<i>Other firms are using rolling budgets</i>	1.00 $\theta$	5.00 $\theta$	2.443	3.00 $\theta$	1.00 $\theta$	97
<i>Other business units in our firm are using rolling budgets</i>	1.00 $\theta$	5.00 $\theta$	2.60 $\theta$	3.00 $\theta$	1.124	95
<i>Consultants advised us to use rolling budgets</i>	1.00 $\theta$	5.00 $\theta$	2.213	2.00 $\theta$	0.971	94
<i>Executive expertise and training caused us to use rolling budgets</i>	1.00 $\theta$	5.00 $\theta$	3.6435	4.00 $\theta$	1.162	96

<b>Variable</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Median</b>	<b>Std dev.</b>	<b>N</b>
<i>Recommended by those with experience and expertise</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.48 <del>79</del>	4.00 <del>0</del>	1.15 <del>2</del>	94
<i>Financial markets (stock exchange) require the use of rolling budgets</i>	1.00 <del>0</del>	5.00 <del>0</del>	2.41 <del>1</del>	2.00 <del>0</del>	1.00 <del>0</del> .99 <del>5</del>	95
<i>Creditors (lending institutions) require the use of rolling budgets</i>	1.00 <del>0</del>	5.00 <del>0</del>	2.47 <del>4</del>	2.00 <del>0</del>	1.01 <del>0</del>	95
<i>My business unit uses rolling budgets due to external pressure</i>	1.00 <del>0</del>	5.00 <del>0</del>	2.35 <del>47</del>	2.00 <del>0</del>	1.10 <del>0</del> 99	95
<b>Reasons for using rolling budgets</b>						
<i>Better planning</i>	1.00 <del>0</del>	5.00 <del>0</del>	4.43 <del>3</del>	4.00 <del>0</del>	0.64 <del>4</del>	97
<i>Control of organisational resources</i>	1.00 <del>0</del>	5.00 <del>0</del>	4.32 <del>0</del>	4.00 <del>0</del>	0.68 <del>9</del> 5	97
<i>Information for decision-making</i>	1.00 <del>0</del>	5.00 <del>0</del>	4.39 <del>1</del>	4.00 <del>0</del>	0.72 <del>1</del> 5	97
<i>Performance evaluation of the business unit</i>	1.00 <del>0</del>	5.00 <del>0</del>	4.04 <del>2</del>	4.00 <del>0</del>	0.89 <del>3</del>	96
<i>Performance evaluation of managers</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.60 <del>5</del> 98	4.00 <del>0</del>	0.95 <del>4</del>	97
<i>Earnings forecasts</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.67 <del>0</del>	4.00 <del>0</del>	1.17 <del>0</del>	97
<b>Lower level management involvement with rolling budgets</b>						
<i>Significant control over the rolling budget they are involved in setting</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.34 <del>0</del>	4.00 <del>0</del>	0.91 <del>2</del>	97
<i>Provided with significant reasoning when the rolling budget is revised</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.65 <del>4</del> 9	4.00 <del>0</del>	0.75 <del>1</del>	97
<i>Initiate rolling budget related discussions</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.12 <del>4</del>	3.00 <del>0</del>	0.99 <del>2</del>	97
<i>Has a significant influence on the rolling budgeting process</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.21 <del>0</del> 6	3.00 <del>0</del>	0.91 <del>2</del>	97
<i>Contributes to the rolling budget process in ways regarded as important by senior management</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.61 <del>0</del> 8	4.00 <del>0</del>	0.77 <del>1</del>	97
<i>Is engaged by senior management frequently in rolling budget discussions</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.78 <del>4</del>	4.00 <del>0</del>	0.88 <del>1</del>	97

Variable	Min	Max	Mean	Median	Std dev.	N
<b>Rolling budget accountability</b>						
<i>I feel the pressure of meeting my rolling budget numbers</i>	1.00 <sup>0</sup>	5.00 <sup>0</sup>	3.58 <sup>3</sup>	4.00 <sup>0</sup>	0.97 <sup>0</sup>	96
<i>There are penalties for missing rolling budget targets in a period</i>	1.00 <sup>0</sup>	5.00 <sup>0</sup>	2.65 <sup>46</sup>	3.00 <sup>0</sup>	0.91 <sup>06</sup>	96
<i>Bonuses are a significant portion of base salaries in my business unit</i>	1.00 <sup>0</sup>	5.00 <sup>0</sup>	2.83 <sup>25</sup>	2.00 <sup>0</sup>	1.12 <sup>19</sup>	97
<i>Senior management contest the rolling budget numbers submitted by lower level management</i>	1.00 <sup>0</sup>	5.00 <sup>0</sup>	3.25 <sup>0</sup>	3.00 <sup>0</sup>	0.94 <sup>0</sup>	96
<i>Within a period, senior management allow lower level management to propose rolling budget adjustments as new information emerges</i>	1.00 <sup>0</sup>	5.00 <sup>0</sup>	3.52 <sup>15</sup>	4.00 <sup>0</sup>	0.89 <sup>1</sup>	97
<b>Control through rolling budgets</b>						
<i>Constantly emphasises the need to meet their rolling budget targets</i>	1.00 <sup>0</sup>	5.00 <sup>0</sup>	3.75 <sup>3</sup>	4.00 <sup>0</sup>	0.87 <sup>66</sup>	97
<i>Controls them by monitoring how well performance meets rolling budget targets</i>	1.00 <sup>0</sup>	5.00 <sup>0</sup>	3.67 <sup>0</sup>	4.00 <sup>0</sup>	0.88 <sup>75</sup>	97
<i>Determines their promotion prospects based on meeting rolling budget targets</i>	1.00 <sup>0</sup>	5.00 <sup>0</sup>	2.96 <sup>59</sup>	3.00 <sup>0</sup>	0.91 <sup>2</sup>	97
<i>Considers achieving rolling budget targets as accurately reflecting their success</i>	1.00 <sup>0</sup>	5.00 <sup>0</sup>	3.42 <sup>17</sup>	3.50 <sup>0</sup>	0.80 <sup>4</sup>	96
<b>Rolling budget operationalisation</b>						
<i>Monthly</i>	0.00 <sup>0</sup>	1.00 <sup>0</sup>	0.42 <sup>17</sup>	0.00 <sup>0</sup>	0.50 <sup>495</sup>	108
<i>Quarterly</i>	0.00 <sup>0</sup>	1.00 <sup>0</sup>	0.43 <sup>45</sup>	0.00 <sup>0</sup>	0.50 <sup>498</sup>	108
<i>Other</i>	0.00 <sup>0</sup>	1.00 <sup>0</sup>	0.15 <sup>48</sup>	0.00 <sup>0</sup>	0.36 <sup>357</sup>	108
<b>Time planned ahead - weeks</b>						
<i>Monthly rolling budgeters</i>	8.67 <sup>67</sup>	104.00 <sup>0</sup>	51.42 <sup>2</sup>	52.00 <sup>0</sup>	22.67 <sup>98</sup>	45

<b>Variable</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Median</b>	<b>Std dev.</b>	<b>N</b>
<i>Quarterly rolling budgeters</i>	26.00 <del>0</del>	221.00 <del>0</del>	61.04 <del>3</del>	52.00 <del>0</del>	33.7 <del>5</del> <sup>47</sup>	46
<b>Reviewing time planned ahead - weeks</b>						
<i>Monthly rolling budgeters</i>	0.00 <del>0</del>	104.00 <del>0</del>	27.73 <del>3</del>	17.33 <del>3</del>	27.58 <del>3</del>	45
<i>Quarterly rolling budgeters</i>	13.00 <del>0</del>	78.00 <del>0</del>	25.7 <del>2</del> <sup>17</sup>	13.00 <del>0</del>	17.8 <del>7</del> <sup>65</sup>	46
<b>Rolling budget operationalisation – attributes reviewed</b>						
<i>Aggregate values (e.g. sales revenue, total costs, net profit, etc.)</i>	1.00 <del>0</del>	5.00 <del>0</del>	4.3 <del>8</del> <sup>75</sup>	4.00 <del>0</del>	0.6 <del>6</del> <sup>56</sup>	104
<i>Individual line item values (e.g. rent expense, cost of sales, salary expense, etc.)</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.90 <del>3</del>	4.00 <del>0</del>	0.83 <del>4</del>	103
<i>Activities that cause changes to revenues or costs (i.e. activity drivers)</i>	1.00 <del>0</del>	5.00 <del>0</del>	5.00 <del>0</del>	4.00 <del>0</del>	0.7 <del>9</del> <sup>88</sup>	102
<b>Rolling budget resourcing</b>						
<i>Number of employees working on rolling budget in business unit</i>	1.00 <del>0</del>	250.00 <del>0</del>	12.8 <del>5</del> <sup>48</sup>	5.00 <del>0</del>	28.3 <del>5</del> <sup>46</sup>	105
<i>Days per quarter employees work on the rolling budget</i>	1.00 <del>0</del>	75.00 <del>0</del>	5.97 <del>1</del>	3.00 <del>0</del>	9.1 <del>0</del> <sup>97</sup>	1.05
<b>Rolling budget operationalisation - challenges</b>						
<i>Predicting future expectations across the rolling budget horizon</i>	2.00 <del>0</del>	5.00 <del>0</del>	4.00 <del>0</del>	4.00 <del>0</del>	0.79 <del>1</del>	97
<i>Access to information for conducting rolling budgets</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.33 <del>0</del>	3.00 <del>0</del>	<del>0</del> <sup>1.00</sup> .997	97
<i>Employee resistance to rolling budget process</i>	1.00 <del>0</del>	5.00 <del>0</del>	2.69 <del>1</del>	3.00 <del>0</del>	0.99 <del>3</del>	97
<i>Time taken to prepare and update rolling budget</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.38 <del>1</del>	3.00 <del>0</del>	0.94 <del>0</del>	97
<b>Using the annual and rolling budget</b>						
<i>Both annual budgets and rolling budgets are equally important</i>	1.00 <del>0</del>	5.00 <del>0</del>	3.8 <del>9</del> <sup>87</sup>	4.00 <del>0</del>	1.0 <del>8</del> <sup>79</sup>	97

<b>Variable</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Median</b>	<b>Std dev.</b>	<b>N</b>
<i>Working with the rolling budget improves future period predictions</i>	1.00 <del>0</del>	5.00 <del>0</del>	4.33 <del>3</del>	4.00 <del>0</del>	0.72 <del>1</del>	96
<i>Annual and rolling budget preparation processes are not linked</i>	1.00 <del>00</del>	5.00 <del>0</del>	2.22 <del>16</del>	2.00 <del>0</del>	1.16 <del>57</del>	97
<b>Internal uncertainty</b>	2.00 <del>0</del>	5.00 <del>0</del>	3.41 <del>4</del>	3.50 <del>0</del>	0.60 <del>597</del>	324
<b>External uncertainty</b>	1.25 <del>0</del>	4.75 <del>0</del>	3.20 <del>4</del>	3.25 <del>0</del>	0.57 <del>0</del>	324
<b>Cost leadership strategy</b>	1.60 <del>0</del>	5.00 <del>0</del>	3.97 <del>0</del>	4.00 <del>0</del>	0.55 <del>46</del>	324
<b>Differentiation strategy</b>	1.00 <del>0</del>	5.00 <del>0</del>	3.64 <del>36</del>	3.800 <del>0</del>	0.73 <del>1</del>	324
<b>Business unit employees</b>	0.00 <del>0</del>	4000 <del>0</del>	814.21 <del>05</del>	160.00 <del>0</del>	2883.94 <del>39</del>	380
<b>Whole company employees</b>	2.00 <del>0</del>	1000000	11227.00 <del>6.997</del>	450.00 <del>0</del>	56444.08 <del>75</del>	380
<b>Average business unit performance</b>	0.00 <del>0</del>	5.00 <del>0</del>	3.49 <del>3</del>	3.56 <del>3</del>	0.71 <del>07</del>	318
<b>Overall business unit performance</b>	10.00 <del>0</del>	116.00 <del>0</del>	81.11 <del>3</del>	85.00 <del>0</del>	17.01 <del>09</del>	318

**TABLE 4: Correlations**

See “Correlations\_formatted.xlsm” supplementary file.

**TABLE 5: Annual budget**  
**Panel A: Annual budget use percentage**

<b>Full sample percentage</b>	<b>95.5265</b>		
<b>Sub-sample percentages</b>	<b>Low</b>	<b>High</b>	<b>Mann-Whitney U</b>
Internal uncertainty	96.2503	95.205	11,558.000
External uncertainty	96.2178	95.000	10,860.500
Cost leader strategy	97.2222	96.000	8,890.000
Differentiation strategy	95.000	100.000	6,308.0000**
Business unit employees	93.1122	97.9884	17,010.000**
Whole company employees	93.9889	96.825	16510.500
Average business unit performance	95.6597	95.6597	12,640.500
Overall business unit performance	95.4364	95.7652	10,389.0000
United Kingdom/Australia	94.4406	96.203	16,641.000

Survey questions 1 – 7 were used to collect data reported in this table.

**TABLE 5: Annual budget (continued)**  
**Panel B: Plans to abandon the annual budget**

Reason	Average Likert scale	Percentages (Likert scale points)				
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Managerial motivation	2.34 <sub>3</sub>	14.12 <sub>1</sub>	50.72 <sub>0</sub>	23.92 <sub>19</sub>	9.22 <sub>2</sub>	2.02 <sub>17</sub>
Performance evaluation	2.35 <sub>4</sub>	16.43 <sub>27</sub>	46.97 <sub>4</sub>	24.50 <sub>496</sub>	8.93 <sub>4</sub>	3.17 <sub>0</sub>

Survey question 8 was used to collect data reported in this table.

**Panel C: Time to prepare the annual budget**

Average	Likert scale point average				
	0-30 days (1)	31-60 days (2)	61-90 days (3)	91-120 days (4)	More than 120 days (5)
2.34 <sub>3</sub>	14.12 <sub>1</sub>	50.72 <sub>0</sub>	23.92 <sub>19</sub>	9.22 <sub>2</sub>	2.02 <sub>17</sub>

Survey question 9 was used to collect data reported in this table.

**TABLE 5: Annual budget (continued)**  
**Panel D: Reasons for using the annual budget**

Reasons	Average Likert scale	Percentages (Likert scale points)				
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Better planning <sup>^</sup>	4.4548	0.2989	1.1656	3.4678	43.642	51.4545
Control of organisational resources	4.4875	0.290	1.4549	2.6109	41.7439	53.913
Information for decision-making	4.3327	0.8875	1.7549	6.414	45.773	45.190
Performance evaluation of the business unit <sup>^*</sup>	4.333	0.580	2.3219	7.8326	41.7439	47.5436
Performance evaluation of managers <sup>^*</sup>	4.003997	2.023	5.202	15.0329	46.532	31.214
Earnings forecasts	3.6987	8.1987	7.90895	21.053	32.7549	30.1217

<sup>^</sup> The Wilcoxon Signed Ranks Test confirmed the Likert scale scores for ‘Better planning’ is significantly higher ( $p < 0.001$ ) than the matched scores for ‘Performance evaluation of the business unit’ ( $Z = -2.6217$ ;  $p = 0.009$ ) and ‘Performance evaluation of managers’ ( $Z = -8.1215$ ;  $p < 0.001$ ).

<sup>\*</sup>The Wilcoxon Signed Ranks Test confirmed a significant difference ( $Z = -7.952$ ;  $p < 0.001$ ) between the matched Likert scale scores for ‘Performance evaluation of the business unit’ and ‘Performance evaluation of managers’.

Survey question 10 was used to collect data reported in this table.

**TABLE 5: Annual budget (continued)**  
**Panel E: Satisfaction with the annual budget**

Satisfaction	Average Likert scale	Percentages (Likert scale points)				
		Very dissatisfied (1)	Dissatisfied (2)	Neither satisfied nor dissatisfied (3)	Satisfied (4)	Very satisfied (5)
Managing the business unit	3.9 <del>877</del>	1.4 <del>545</del>	3.4 <del>768</del>	9.5 <del>438</del>	67.05 <del>2</del>	18.50 <del>497</del>
Making short-term operational decisions	2.31 <del>2</del>	2.02 <del>17</del>	8.93 <del>4</del>	18.4 <del>548</del>	56.20 <del>196</del>	14.4 <del>109</del>
Making long-term strategic decisions	3.51 <del>2</del>	2.31 <del>2</del>	15.0 <del>329</del>	23.9 <del>988</del>	46.53 <del>2</del>	12.1 <del>439</del>

Survey question 11 was used to collect data reported in this table.

**TABLE 6: Rolling budgets**  
**Panel A: Rolling budget use**

<b>Full sample percentages</b>	29.330		
<b>Sub-sample percentages</b>	<b>Low</b>	<b>High</b>	<b>Mann-Whitney U</b>
Internal uncertainty	28.75 <del>0</del>	25.5 <del>2</del> 17	11,225.00 <del>0</del>
External uncertainty	26.92 <del>3</del>	22.8 <del>6</del> 57	10,476.00 <del>0</del>
Cost leader strategy	27.7 <del>8</del> 78	25.60 <del>0</del>	8,804.00 <del>0</del>
Differentiation strategy	26.8 <del>8</del> 75	31.7 <del>1</del> 07	6,243.00 <del>0</del>
Business unit employees	26.8 <del>2</del> 16	31.6 <del>4</del> 38	15,0077.50 <del>0</del>
Whole company employees	28.90 <del>2</del>	29.71 <del>4</del>	15,014.50 <del>0</del>
Average business unit performance	25.7 <del>9</del> 86	27.2 <del>2</del> 15	12,381.50 <del>0</del>
Overall business unit performance	24.6 <del>7</del> 67	26.0 <del>9</del> 87	10,203.00 <del>0</del>
United Kingdom/Australia	24.24 <del>2</del>	32.30 <del>1</del>	13,714.00 <del>0</del>

Survey questions 12 and 2-7 were used to collect data reported in this table.

**TABLE 6: Rolling budgets (continued)**

**Panel B: Reasons rolling budgets are not prepared**

Reason	Average Likert scale	Percentages (Likert scale points)				
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Predicting future expectations is too difficult	2.92 <sup>0</sup>	6.02 <sup>4</sup>	32.53 <sup>0</sup>	27.71 <sup>1</sup>	30.92 <sup>4</sup>	2.81 <sup>1</sup>
Information inaccessible for the purposes of conducting rolling budgets	2.84 <sup>39</sup>	5.22 <sup>1</sup>	35.34 <sup>1</sup>	32.93 <sup>2</sup>	23.29 <sup>3</sup>	3.21 <sup>3</sup>
Employee resistance to rolling budget process	2.78 <sup>2</sup>	4.84 <sup>39</sup>	37.50 <sup>0</sup>	34.68 <sup>77</sup>	20.57 <sup>65</sup>	2.42 <sup>19</sup>
Time taken to prepare and update rolling budget is excessive	3.77 <sup>69</sup>	0.40 <sup>398</sup>	11.95 <sup>2</sup>	18.73 <sup>25</sup>	48.21 <sup>07</sup>	20.72 <sup>17</sup>

Survey question 13 was used to collect data reported in this table.

**TABLE 6: Rolling budgets (continued)**

**Panel C: What factors drove the introduction of a rolling budget**

Reason	Average Likert scale	Percentages (Likert scale points)				
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Other firms are using rolling budgets	2.44 <sup>3</sup>	20.6 <sup>2</sup> 1 <sup>9</sup>	28.8 <sup>7</sup> 6 <sup>6</sup>	38.14 <sup>4</sup>	10.3 <sup>1</sup> 0 <sup>9</sup>	2.06 <sup>2</sup>
Other business units in our firm are using rolling budgets	2.60 <sup>0</sup>	20.00 <sup>0</sup>	26.3 <sup>2</sup> 1 <sup>6</sup>	31.5 <sup>8</sup> 7 <sup>9</sup>	17. <sup>9</sup> 0 <sup>8</sup> 9 <sup>5</sup>	4.21 <sup>1</sup>
Consultants advised us to use rolling budgets	2.21 <sup>3</sup>	28.72 <sup>3</sup>	29.7 <sup>9</sup> 8 <sup>7</sup>	34.04 <sup>3</sup>	6.38 <sup>3</sup>	1.06 <sup>4</sup>
Executive expertise and training caused us to use rolling budgets	3.6 <sup>4</sup> 3 <sup>5</sup>	4.1 <sup>7</sup> 6 <sup>7</sup>	16.6 <sup>7</sup> 6 <sup>7</sup>	16.6 <sup>7</sup> 6 <sup>7</sup>	36.4 <sup>6</sup> 5 <sup>8</sup>	26.04 <sup>2</sup>
Recommended by those with experience and expertise	3.4 <sup>8</sup> 7 <sup>9</sup>	6.38 <sup>3</sup>	15.9 <sup>6</sup> 5 <sup>7</sup>	19.1 <sup>5</sup> 4 <sup>9</sup>	40.4 <sup>3</sup> 2 <sup>6</sup>	18.0 <sup>9</sup> 8 <sup>5</sup>
Financial markets (stock exchange) require the use of rolling budgets	2.41 <sup>1</sup>	22.1 <sup>1</sup> 0 <sup>5</sup>	28.42 <sup>1</sup>	36.84 <sup>2</sup>	11.5 <sup>8</sup> 7 <sup>9</sup>	1.05 <sup>3</sup>
Creditors (lending institutions) require the use of rolling budgets	2.47 <sup>4</sup>	21.05 <sup>5</sup> 3	30.5 <sup>3</sup> 2 <sup>6</sup>	31.5 <sup>8</sup> 7 <sup>9</sup>	13.68 <sup>4</sup>	3.1 <sup>6</sup> 5 <sup>8</sup>
My business unit uses rolling budgets due to external pressure	2.3 <sup>5</sup> 4 <sup>7</sup>	26.3 <sup>2</sup> 1 <sup>6</sup>	30.5 <sup>3</sup> 2 <sup>6</sup>	29.47 <sup>4</sup>	9.47 <sup>4</sup>	4.21 <sup>1</sup>

Survey question 14 was used to collect data reported in this table.

**TABLE 6: Rolling budgets (continued)**  
**Panel D: Reasons for using rolling budgets**

Reason	Average Likert scale	Percentages (Likert scale points)				
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Better planning	4.43 <del>3</del>	1.03 <del>1</del>	0.00 <del>0</del>	2.06 <del>2</del>	48.45 <del>4</del>	48.45 <del>4</del>
Control of organisational resources	4.32 <del>0</del>	1.03 <del>1</del>	1.03 <del>1</del>	3.09 <del>3</del>	54.46 <del>39</del>	40.21 <del>06</del>
Information for decision-making	4.39 <del>2</del>	2.06 <del>2</del>	0.00 <del>0</del>	1.03 <del>1</del>	50.52 <del>515</del>	46.39 <del>2</del>
Performance evaluation of the business unit	4.04 <del>2</del>	2.08 <del>3</del>	3.13 <del>25</del>	15.63 <del>25</del>	46.88 <del>75</del>	32.29 <del>2</del>
Performance evaluation of managers	3.60 <del>598</del>	3.09 <del>3</del>	7.22 <del>16</del>	32.99 <del>0</del>	40.21 <del>06</del>	16.50 <del>495</del>
Earnings forecasts	3.67 <del>0</del>	9.28 <del>78</del>	3.09 <del>3</del>	24.74 <del>2</del>	37.11 <del>3</del>	25.77 <del>3</del>

Survey question 15 was used to collect data reported in this table.

**TABLE 6: Rolling budgets (continued)****Panel E: Reasons for using annual and rolling budgets compared**

Reason	Budget type		Z-stat	p-value
	Annual	Rolling		
Better planning	4.462	4.452	-0.343	0.732
Control of organisational resources	4.50495	4.333	-2.4766**	0.014
Information for decision-making	4.3436	4.4109	-	0.000
Performance evaluation of the business unit	4.2658	4.0765	-2.0547**	0.041
Performance evaluation of managers	3.9989	3.624	-	0.000
Earnings forecasts	3.9435	3.6877	-2.2215**	0.0327

Survey questions 10 and 15 were used to collect data reported in this table.

**TABLE 6: Rolling budgets (continued)**

**Panel F: Lower level management involvement with rolling budgets**

Involvement	Average Likert scale	Percentages (Likert scale points)				
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Significant control over the rolling budget they are involved in setting	3.34 <del>0</del>	3.09 <del>3</del>	17.5 <del>3</del> 26	24.74 <del>2</del>	51.5 <del>5</del> 46	3.09 <del>3</del>
Provided with significant reasoning when the rolling budget is revised	3.6 <del>5</del> 49	2.06 <del>2</del>	6.1 <del>9</del> 86	20.6 <del>2</del> 19	67.01 <del>0</del>	4.12 <del>4</del>
Initiate rolling budget related discussions	3.12 <del>4</del>	3.09 <del>3</del>	29.9 <del>0</del> 897	22.68 <del>0</del>	40.2 <del>1</del> 06	4.12 <del>4</del>
Has a significant influence on the rolling budgeting process	3.2 <del>1</del> 06	3.09 <del>3</del>	20.6 <del>2</del> 19	31.9 <del>6</del> 59	41.2 <del>4</del> 37	3.09 <del>3</del>
Contributes to the rolling budget process in ways regarded as important by senior management	3.6 <del>1</del> 08	2.06 <del>2</del>	7.2 <del>2</del> 16	22.68 <del>0</del>	63.9 <del>2</del> 18	4.12 <del>4</del>
Is engaged by senior management frequently in rolling budget discussions	3.78 <del>4</del>	2.06 <del>2</del>	7.2 <del>2</del> 16	17.5 <del>3</del> 26	56.70 <del>1</del>	16.5 <del>0</del> 495

Survey question 16 was used to collect data reported in this table.

**TABLE 6: Rolling budgets (continued)**  
**Panel G: Rolling budget accountability**

Involvement	Average Likert scale	Percentages (Likert scale points)				
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
I feel the pressure of meeting my rolling budget numbers	3.583	2.083	13.542	22.9217	46.8875	14.583
There are penalties for missing rolling budget targets in a period	2.6545	7.292	39.583	37.500	12.500	3.1325
Bonuses are a significant portion of base salaries in my business unit	2.8325	11.340	39.1875	13.402	27.8435	8.2547
Senior management contest the rolling budget numbers submitted by lower level management	3.250	3.1325	20.833	28.1325	43.750	4.1767
Within a period, senior management allow lower level management to propose rolling budget adjustments as new information emerges	3.5215	2.062	14.433	19.5988	57.732	6.1986

Survey question 17 was used to collect data reported in this table.

**TABLE 6: Rolling budgets (continued)**  
**Panel H: Control through rolling budgets**

Involvement	Average Likert scale	Percentages (Likert scale points)				
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Constantly emphasises the need to meet their rolling budget targets	3.75 <del>3</del>	1.03 <del>1</del>	9.28 <del>78</del>	18.56 <del>57</del>	55.67 <del>0</del>	15.46 <del>4</del>
Controls them by monitoring how well performance meets rolling budget targets	3.67 <del>0</del>	2.06 <del>2</del>	8.25 <del>47</del>	22.68 <del>0</del>	54.64 <del>39</del>	12.37 <del>1</del>
Determines their promotion prospects based on meeting rolling budget targets	2.96 <del>59</del>	4.12 <del>4</del>	27.84 <del>35</del>	39.18 <del>75</del>	25.77 <del>3</del>	3.09 <del>3</del>
Considers achieving rolling budget targets as accurately reflecting their success	3.42 <del>17</del>	1.04 <del>2</del>	11.46 <del>58</del>	37.50 <del>0</del>	44.79 <del>2</del>	5.21 <del>08</del>

Survey question 18 was used to collect data reported in this table.

**TABLE 7: Rolling budget operationalisation**

**Panel A: Rolling budget periods**

<b>Period</b>	<b>Percentage (%)</b>
Monthly	41.6 <del>7</del> <sup>67</sup>
Quarterly	43.5 <del>1</del> <sup>19</sup>
Other	14.8 <del>2</del> <sup>15</sup>

Survey question 19 was used to collect data reported in this table.

**TABLE 7: Rolling budget operationalisation (Continued)**  
**Panel B: Time planned ahead - weeks**

**(i) Monthly rolling budgeters**

<b>Full sample percentage</b>	51.42 <del>2</del>		
<b>Sub-sample percentages</b>	<b>Low</b>	<b>High</b>	<b>Mann-Whitney U</b>
Internal uncertainty	61.12 <del>3</del>	43.09 <del>3</del>	106.00 <del>0</del> **
External uncertainty	50.47 <del>1</del>	53.00 <del>0</del>	99.50 <del>0</del>
Cost leader strategy	55.82 <del>4</del>	46.14 <del>37</del>	118.50 <del>0</del>
Differentiation strategy	52.77 <del>65</del>	49.11 <del>1</del>	92.50 <del>0</del>
Business unit employees	44.06 <del>56</del>	56.33 <del>3</del>	173.50 <del>0</del> *
Whole company employees	44.85 <del>0</del>	58.50 <del>0</del>	168.00 <del>0</del> **
Average business unit performance	56.57 <del>4</del>	47.43 <del>26</del>	130.00 <del>0</del>
Overall business unit performance	60.94 <del>38</del>	45.93 <del>3</del>	79.00 <del>0</del>
United Kingdom/Australia	51.67 <del>67</del>	51.32 <del>3</del>	207.00 <del>0</del>

Survey questions 20 and 2-7 were used to collect data reported in this table.

**(ii) Quarterly rolling budgeters**

<b>Full sample percentage</b>	61.04 <del>3</del>		
<b>Sub-sample percentages</b>	<b>Low</b>	<b>High</b>	<b>Mann-Whitney U</b>
Internal uncertainty	65.00 <del>0</del>	57.74 <del>35</del>	143.50 <del>0</del>
External uncertainty	62.26 <del>3</del>	66.73 <del>3</del>	135.50 <del>0</del>
Cost leader strategy	50.38 <del>75</del>	72.50 <del>0</del>	73.00 <del>0</del>
Differentiation strategy	54.96 <del>55</del>	67.60 <del>0</del>	106.00 <del>0</del>
Business unit employees	53.86 <del>57</del>	67.71 <del>08</del>	199.50 <del>0</del>
Whole company employees	52.62 <del>19</del>	69.52 <del>2</del>	197.50 <del>0</del>
Average business unit performance	63.70 <del>0</del>	63.56 <del>56</del>	161.00 <del>0</del>
Overall business unit performance	59.31 <del>3</del>	67.29 <del>4</del>	110.00 <del>0</del>
United Kingdom/Australia	70.63 <del>3</del>	56.40 <del>3</del>	128.50 <del>0</del> ***

Survey questions 20 and 2-7 were used to collect data reported in this table.

**TABLE 7: Rolling budget operationalisation (Continued)****Panel C: Reviewing time planned ahead - weeks****(i) Monthly rolling budgeters**

<b>Full sample percentage</b>	27.6 <del>437</del>		
<b>Sub-sample percentages</b>	<b>Low</b>	<b>High</b>	<b>Mann-Whitney U</b>
Internal uncertainty	35.12 <del>3</del>	22.1 <del>548</del>	138.00 <del>0</del>
External uncertainty	31.10 <del>098</del>	27.33 <del>3</del>	103.50 <del>0</del>
Cost leader strategy	27.5 <del>329</del>	23.7 <del>106</del>	136.00 <del>0</del>
Differentiation strategy	29.0 <del>659</del>	22.0 <del>328</del>	93.00 <del>0</del>
Business unit employees	23.35 <del>2</del>	30.49 <del>4</del>	195.00 <del>0</del>
Whole company employees	19.17 <del>1</del>	35.2 <del>108</del>	155.50 <del>0</del> **
Average business unit performance	33.46 <del>3</del>	23.83 <del>3</del>	137.50 <del>0</del>
Overall business unit performance	36.83 <del>3</del>	21.9 <del>656</del>	80.00 <del>0</del>
United Kingdom/Australia	26.6 <del>767</del>	28.03 <del>1</del>	205.50 <del>0</del>

Survey questions 21 and 2-7 were used to collect data reported in this table.

**(ii) Quarterly rolling budgeters**

<b>Full sample percentage</b>	25.717		
<b>Sub-sample percentages</b>	<b>Low</b>	<b>High</b>	<b>Mann-Whitney U</b>
Internal uncertainty	32.50 <del>0</del>	23.7 <del>106</del>	102.50 <del>0</del> *
External uncertainty	28.7 <del>437</del>	22.53 <del>3</del>	113.00 <del>0</del>
Cost leader strategy	30.8 <del>875</del>	28.00 <del>0</del>	88.00 <del>0</del>
Differentiation strategy	30.1 <del>436</del>	23.40 <del>0</del>	84.00 <del>0</del>
Business unit employees	22.9 <del>105</del>	28.7 <del>108</del>	193.50 <del>0</del>
Whole company employees	31.57 <del>1</del>	19.78 <del>3</del>	168.50 <del>0</del> *
Average business unit performance	22.75 <del>0</del>	32.50 <del>0</del>	127.00 <del>0</del>
Overall business unit performance	22.75 <del>0</del>	29.0 <del>659</del>	112.00 <del>0</del>
United Kingdom/Australia	26.8 <del>767</del>	25.16 <del>1</del>	215.00 <del>0</del>

Survey questions 21 and 2-7 were used to collect data reported in this table.

**TABLE 7: Rolling budget operationalisation (Continued)**

**Panel D: Attributes reviewed**

Attribute reviewed	Average Likert scale	Percentages (Likert scale points)				
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Aggregate values (e.g. sales revenue, total costs, net profit, etc.)	4.3875	0.962	0.000	3.8546	50.962	44.231
Individual line item values (e.g. rent expense, cost of sales, salary expense, etc.)	3.903	0.971	6.80796	13.592	58.252	20.3988
Activities that cause changes to revenues or costs (i.e. activity drivers)	4.284	0.980	3.922	2.941	50.000	42.1657

Survey question 22 was used to collect data reported in this table.

**TABLE 7: Rolling budget operationalisation (Continued)**

**Panel E: Challenges**

Challenge	Average Likert scale	Percentages (Likert scale points)				
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Predicting future expectations across the rolling budget horizon	4.00 <del>0</del>	0.00 <del>0</del>	5.16 <del>55</del>	15.46 <del>4</del>	53.61 <del>08</del>	25.77 <del>3</del>
Access to information for conducting rolling budgets	3.33 <del>0</del>	1.03 <del>±</del>	22.68 <del>0</del>	30.93 <del>28</del>	32.99 <del>0</del>	12.37 <del>±</del>
Employee resistance to rolling budget process	2.69 <del>±</del>	9.28 <del>78</del>	37.11 <del>3</del>	32.99 <del>0</del>	16.50 <del>495</del>	4.12 <del>4</del>
Time taken to prepare and update rolling budget	3.38 <del>±</del>	1.03 <del>±</del>	18.56 <del>57</del>	31.96 <del>59</del>	38.14 <del>4</del>	10.31 <del>09</del>

Survey question 23 was used to collect data reported in this table.

**TABLE 8: Combined rolling and annual budget use**

<b>Full sample percentages</b>	27.933		
<b>Sub-sample percentages</b>	<b>Low</b>	<b>High</b>	<b>Mann-Whitney U</b>
Internal uncertainty	28.13 <del>25</del>	24.14 <del>38</del>	11137.50 <del>0</del>
External uncertainty	26.38 <del>2</del>	21.43 <del>29</del>	10390.00 <del>0</del>
Cost leader strategy	27.08 <del>3</del>	24.80 <del>0</del>	8794.50 <del>0</del>
Differentiation strategy	25.63 <del>25</del>	31.71 <del>07</del>	6161.00 <del>0</del>
Business unit employees	25.70 <del>698</del>	29.94 <del>4</del>	15169.00 <del>0</del>
Whole company employees	28.32 <del>4</del>	27.43 <del>29</del>	15002.00 <del>0</del>
Average business unit performance	24.53 <del>28</del>	25.95 <del>49</del>	12382.50 <del>0</del>
Overall business unit performance	23.33 <del>3</del>	25.36 <del>2</del>	10140.00 <del>0</del>
United Kingdom/Australia	21.97 <del>0</del>	31.42 <del>16</del>	13507.00 <del>0</del> *

**TABLE 9: Using the annual and rolling budget**

	Average Likert scale	Percentages (Likert scale points)				
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Both annual budgets and rolling budgets are equally important	3.8987	2.062	14.433	8.2847	43.30299	31.9659
Working with the rolling budget improves future period predictions	4.333	2.083	0.000	2.083	54.1767	41.6767
Annual and rolling budget preparation processes are not linked	2.2216	28.8766	42.2768	14.433	7.2216	7.2216

Survey question 26 was used to collect data reported in this table.

**TABLE 10: Key findings**

	<b>Annual budget</b>	<b>Rolling budget</b>	<b>Combined annual and rolling budgets</b>
<b>Adoption</b>	95.50% (Similar to Ekholm & Wallin, 2000; Bhimani et al., 2018)	29.30% (Less than Sivabalan et al., 2009; similar to Bhimani et al., 2018)	27.90% (new, previously not provided and advancing Bhimani et al., 2018)
<b>Key characteristics</b>	65% of firms spend 0 - 60 days on budget preparation (more specificity than Hope & Fraser, 2003a; Sivabalan et al., 2009)	Typically introduced due to executive training and expertise, and expert recommendations (new rationales not offered in Bhimani et al., 2018)	Rolling budget more useful for decision-making, while annual budget more useful for control and evaluation (aligning with Spraakman & O'Grady, 2023)
	Better planning more important than performance evaluation reasons (advancing Sivabalan et al., 2009 Becker, et al 2016)	Over 80% use monthly or quarterly rolling budgets (aligned with Bhimani et al., 2018)	86% of firms indicate rolling and annual budgets linked (advancing Bhimani et al, 2018; Libby and Lindsay, 2010)
	86% satisfied with using the annual budget to manage business units (similar to Sivabalan et al., 2009)	Plan for one year ahead and review six months ahead after each period (more detail than offered in Sivabalan et al., 2009).	75% indicate that both annual and rolling budgets are equally important (advancing Frow et al., 2010; Spraakman and O'Grady, 2023)
<b>Key variations</b>	Cost leaders have higher agreement generally across reasons for using annual budgets (additional to that offered in Becker, et al., 2016; Libby & Lindsay, 2010)	Cost leaders and differentiators are more likely to use rolling budgets for planning and control reasons (more detail than Hansen et al., 2003).	Cost leadership firms indicate higher agreement that rolling budgets improve overall budget predictions (advancing Bhimani et al., 2018)
	Differentiators and larger firms are more likely to use annual budget (advancing Ekholm & Wallin, 2000; contrasting Hartmann, 2000)	Australian firms indicate higher employee resistance to rolling budgets (new and additional to Sivabalan et al., 2009; Libby & Lindsay, 2010)	Australian firms indicate higher agreement that both annual and rolling budgets are equally important. (advancing Frow et al., 2010)
	Uncertainty not associated with annual budget adoption (Advancing Becker et al., 2016)	Monthly rolling budget firms plan for a shorter period ahead where there is higher internal uncertainty (aligned to Bhimani et al., 2018)	Variation in combined annual and rolling use across moderating variables is not significantly different (more detailed empirical evidence supporting Bhimani et al., 2018)

**TABLE 10: Key findings (Continued)**

	<b>Annual budget</b>	<b>Rolling budget</b>	<b>Combined annual and rolling budgets</b>
<b>Key variations (continued)</b>	<p>Firms are more likely to use annual budgets for performance evaluation of managers under higher uncertainty (advancing Libby &amp; Lindsay, 2010 arguments for annual budget persistence in high uncertainty)</p> <hr/> <p>Large firms take longer to prepare an annual budget (as discussed in Hope &amp; Fraser, 2003, but empirics show no negative consequence, only that additional time is required)</p>	<p>External pressure to introduce rolling budgets is more important where uncertainty is higher (aligned with Hansen et al., 2003; Bhimani et al., 2018)</p>	<p>As indicated above, 86% of firms indicate rolling and annual budgets linked, and therefore, 14% use these tools separately as different tools.</p>
<b>Higher performing firms</b>	<p>Possibility of faster preparation and greater satisfaction with the annual budget (advancing Libby &amp; Lindsay, 2010)</p>	<p>Less emphasis on meeting rolling budget targets, and less likely to penalise when targets are missed (more nuance than offered by Brunner &amp; Ostermaier, 2019 and Bhimani et al., 2018)</p>	<p>Firms using rolling budgets are more satisfied with annual budget use (additional to Bhimani et al., 2018; Haka &amp; Krishnan, 2005)</p>
<b>Future practice</b>	<p>Uncertainty is a smaller factor (11-12%) driving the abandonment of annual budgets (advancing empirical that contrast Wallander, 1999 and Hope &amp; Fraser, 2003a)</p>	<p>69% of sample are non-rolling budget preparers due to excessive preparation time, difficulties in predicting future expectations, accessing information and employee resistance (advancing Hansen et al., 2003; Bhimani et al., 2018)</p>	<p>95% agree that a rolling budget improves future period predictions (advancing Bhimani et al., 2018)</p>