Budget Slack: Some Meta-Analytic Evidence

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Abstract

Budget slack is an important control problem in many companies that still attracts considerable research attention. Economic and behavioral theories, such as principal agent, goal setting, or organizational fairness theory get employed to study budget slack, but yield conflicting predictions for several variables. Also the findings of field-based research do not add up into a coherent body of knowledge. The latter also might be a consequence of research design choices, such as small samples, reliability problems, inconsistent construct measurement, or varying sample selection procedures. To assess whether the correlations are in line with theory and which factors cause between-study variation, I use meta-analysis and consolidate results for 16 relations of frequently studied variables with budget slack. My findings show that for many variables, the relations are heterogeneous across studies. Still, the findings help disentangle some of the theoretical conflicts and, in particular, show that in many instances, reliance on a simple theoretical approach likely is not sufficient. For example, it seems necessary to distinguish the extent from the manner of budget-based evaluations and performance to accounting goals from task performance. The between-study variation that affects many relations is partially explained by the measurement of budget slack, which thus represents an important boundary condition for theories of budget slack. Differences in journal quality, sampling procedures, and the level of analysis exert no systematical moderating influence.

1. Introduction

For many organizations, budget slack, defined as 'the intentional underestimation of revenues and productive capabilities and/or overestimation of costs and resources required to complete a budgeted task' (Dunk and Nouri, 1998, p.73), is an important control problem, because it might imply inefficient resource allocation and use (e.g., Indjejikian and Matĕjka, 2006). Therefore, the creation of budget slack is one of the central criticisms levered against budgetary control (e.g., Hansen et al., 2003; Sivabalan et al., 2009). However, many companies appear to be aware of these problems, but instead of going beyond budgeting (e.g., Boumistrov and Kaarbøe, 2013), they rather adapt their budgeting systems, because they still consider budgeting as valuable for management control (de With and Dijkman, 2008; Libby and Lindsay, 2010; Shastri and Stout, 2008). Moreover, budget slack itself might help reduce other control problems, such as earnings management or effort reduction (Indjejikian and Matĕjka, 2006; Merchant and Manzoni, 1989), and also might help attain non-financial goals (Davila and Wouters, 2005; Nohria and Gulati, 1996). Understanding which variables influence budget slack thus is of on-going or even increasing importance (e.g., De Baerdemaeker and Bruggeman, 2015; Schoute and Wiersma, 2011).

Unfortunately, budget slack research so far does not converge into a coherent body of knowledge. Researchers draw on economic and behavioral theories, such as agency, goal setting, or organizational fairness theory, which yield conflicting predictions for important variables. For example, for participative budgeting, budget-based evaluation,[1] and incentives, agency theory proposes positive relations with budget slack. In decentralized organizations, participative budgeting is necessary to gain access to agents' private information, but also gives them the opportunity to misreport and create slack. Agents only will communicate truthfully, if they are paid an informational rent, which also can be interpreted as budget slack (Heinle et al., 2014; Indjejikian and Matĕjka, 2006). Organizational fairness theories, however, predict a negative relation of participative budgeting, budget-based evaluations, and incentives with budget slack, because participation and objective budget-based evaluations increase managers' perception of fairness and thus decrease budget slack (Little et al., 2002). For other

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[1] In the literature, this variable appears with different labels, including budget emphasis (Dunk, 1993), budgetary evaluation (Kenis, 1979), foreman's evaluative effort (Searfoss, 1976), or reliance on accounting performance measures (Harrison, 1993).

variables, such as uncertainty, decentralization, and strategies emphasizing differentiation, growth or innovation, theoretical predictions converge. The theories predict positive relations with budget slack, because uncertainty, decentralization, and strategies emphasizing differentiation, growth, or innovation might increase information asymmetry (agency theory) and demand the setting of goals that grant more flexibility (i.e. budget slack) to be perceived as fair (organizational fairness theory) and as motivating high performance (goal setting theory). Therefore, which proposition best represents organizational reality, is an empirical question.

However, for theoretically important and frequently studied variables (e.g., Dunk and Nouri, 1998), the findings of field-based empirical studies also are inconsistent. For example, for budget-based evaluation, the correlations with budget slack are positive (Huang and Chen, 2010), non-significant (Cammann, 1976), and negative (Van der Stede, 2000). Similar positive (Maiga, 2005), non-significant (Kren, 2003), and negative (Onsi, 1973) correlations exist for participative budgeting. But apart from Dunk and Nouri's (1998) review, no study has attempted to summarize budget slack research comprehensively and unravel these conflicts. Notably, no meta-analysis exists, although meta-analysis is the method of choice to statistically clarify inconsistent research results and their reasons (Aguinis et al., 2011c; Geyskens et al., 2009).

Therefore, and in accordance with the principal aims of meta-analysis (e.g., Aguinis et al., 2011b), the first purpose of this paper is to meta-analytically summarize the correlations of frequently studied variables with budget slack in an attempt to estimate closely their means and between-study variation. To this end, I use Hunter and Schmidt's (2004) meta-analysis methods, because in the process of aggregation, these methods also correct for statistical artifacts, such as between-study variations in sample size (i.e. sampling error) and reliability estimates (i.e. measurement error), which frequently are cited as reasons for non-converging results (e.g., Hartmann, 2000; Noeverman et al., 2005) and may produce the false impression of conflicting results.[2] The findings thus show whether the respective relations generalize across settings.

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[2] In sum, Hunter and Schmidt (2004) identify 11 artefacts that might affect study outcomes: sampling error, measurement error in the independent and dependent variables, range variations in the independent and dependent variables, dichotomizations of continuous independent and dependent variables, deviations from perfect construct validity of independent and dependent variables, reporting or coding errors, and variance due to extraneous uncontrollable factors.

The second purpose is to explore whether the measurement of budget slack is a crucial influence (i.e., a moderating variable) that helps explain non-artifactual variation (Hunter and Schmidt, 2004), in line with many meta-analyses (Carlson and Ji, 2011; Pomeroy and Thornton, 2008). Budget slack is measured in several distinct ways, such as propensity to create slack (Onsi, 1973) or achievability of budget goals (Dunk, 1993). But despite potential theoretical dissimilarities, these measures frequently are assumed to tap the same construct (Kwok and Sharp, 1998). Treating measurement of budget slack as a moderator thus allows assessing whether the resulting correlations differ in their strength and direction. Moreover, between-study variation might be a consequence of research design choices (Briers and Hirst, 1990; Hartmann, 2000). Because meta-analyses on budget-based evaluation and participative budgeting support the influences of some research design choices (Derfuss, 2009, 2015, 2016; Greenberg et al., 1994), variations in research design are included as additional moderating variables.

The paper makes several contributions to the literature. First, I offer initial meta-analytic evidence on the relations of budget slack with frequently studied variables. Thereby, I complement earlier meta-analyses that focus on participative budgeting and budget-based evaluation (Derfuss, 2009, 2016; Greenberg et al., 1994), but not on budget slack as an important budgetary control issue. This summary of results also updates and extends Dunk and Nouri's (1998) review of budget slack research.

Second, I provide estimates of these relations' mean true-score correlations and the associated between-study variance. These estimates show whether and how the respective variables empirically relate to budget slack and whether these relations generalize across settings and thus are reliable components of theoretical models. They also help disentangle existing theoretical conflicts, because in cases of conflicting predictions, they indicate which prediction is supported cumulatively by extant studies.

Third, except from Kwok and Sharp (1998), hardly any review explicitly discusses the measurement of budget slack; earlier studies only focus on the measurement of budget-based evaluation, participative budgeting, or managerial performance (e.g., Briers and Hirst, 1990; Derfuss, 2009; Hartmann, 2000; Otley and Fakiolas, 2000). Responding to Kwok and Sharp's (1998) call for a verification of the validity of the different measures of budget slack, I extend this research by testing whether the measurement of budget slack accounts for inconsistencies in research results. Thereby, I

assess whether the measurement of budget slack presents an important boundary condition for theories on budget slack (Malmi and Granlund, 2009).

The meta-analytic findings also have important practical implications. Understanding how important variables relate to budget slack is vital, because many companies still consider budgeting as valuable (Libby and Lindsay, 2010; Shastri and Stout, 2008; de With and Dijkman, 2008) and thus need to understand how they might manage budget slack in order to avoid its negative (e.g., Indjejikian and Matějka, 2006) and reap its positive (e.g., Davila and Wouters, 2005; Nohria and Gulati, 1996) consequences. The next section presents the theoretical background and hypotheses. Sections describing the selection of studies and the meta-analysis procedures, the results and their discussion, and the conclusions and limitations follow in turn.

2. Theoretical Background

2.1 Theoretical Relations

Although budget slack research studies a wide range of variables, I concentrate on variables that are central to the theories employed. Most prominently, these are agency and goal setting theory, which I supplement with insights from other theories where necessary. Table 1 lists the definitions, measurement instruments, and observed relationships for the variables included in this study.

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2.1.1 Information Asymmetry and Related Variables

Agency theory posits that a principal delegates tasks to effort-averse and utility maximizing agents, who possess superior knowledge necessary for task completion. Decentralization thus is a direct consequence of agents' private information (e.g., Indjejikian and Matějka, 2012). The completion of delegated tasks then depends on agents' effort and on environmental influences, which also distort performance measures. Because supervision is costly, the agents might not provide the necessary effort (moral hazard) or exploit their private information regarding their skills and their departments' environment and productivity (adverse selection). Budget slack thus is a control problem resulting from and potentially increasing in the level of decentralization and information asymmetry (e.g., Baiman and Evans, 1983; Heinle et al., 2014; Indjejikian et al., 2014). Several factors might intensify this control problem, such as environmental and task uncertainty, entity size, or a business unit strategy emphasizing

differentiation, growth, or innovation, because in comparison to top managers' insight into operations, these factors are related to increases in agents' expertise and thus exacerbate their informational advantage (Dekker et al., 2012; Indjejikian and Matějka, 2006). They also intensify agents' compensation risk, such that the principal has to offer higher rents to induce truthful reports and high effort (Milgrom and Roberts, 1992).

Goal setting theory is a frequently used alternative to agency theory, because budget goals regularly serve motivational purposes (Kenis, 1979; Schoute and Wiersma, 2011). The theory's cornerstone is that specific and difficult goals motivate higher task performance than easy and general goals, because, if accepted and perceived as attainable in terms of personal ability, such goals direct action and effort towards their attainment (Corgent et al., 2015; Dekker et al., 2012; Locke and Latham, 1990; Murray, 1990). Because they are specific goals (Hartmann, 2000), budgets that contain less slack help increase managers' task performance (Kenis, 1979). Goals should be set in line with top managers' demands (Locke and Latham, 1990). But if top managers form their demands without sufficient knowledge of the exact circumstances of goal attainment (i.e., under information asymmetry), the resulting goals might be perceived as unattainable. Lower level managers might respond to an unattainable goal either by abandoning effort or by acting unethically, for example by trying to negotiate slack budgets to lower future goal levels (Barsky, 2007; Schweitzer et al., 2004; Welsh and Ordóñez, 2014b). Finally, goals also should respond to external demands (Locke and Latham, 1990). To hold the challenge constant, budgets thus should contain more slack with increasing demands, such as higher environmental uncertainty, task uncertainty, larger organizational entities, or business unit strategies emphasizing differentiation, growth, or innovation (Kenis, 1979; Murray, 1990; Wood et al., 1987).

Organizational theory also is concerned with several exogenous factors explaining the existence of slack. In this view, slack is necessary to cope with environmental and task uncertainty (Bourgeois, 1981; Daniel et al., 2004; Sharfman et al., 1988), to help resolve organizational conflicts arising from decentralization (Bourgeois, 1981), and to foster strategies emphasizing differentiation, growth, or innovation (Bourgeois, 1981; Nohria and Gulati, 1996; Sharfman et al., 1988). Moreover, larger amounts of slack will be observed in larger entities (Sharfman et al., 1988).

In sum, extant theory suggests that information asymmetry and context variables that tend to increase it tend to increase budget slack:

H1. Information asymmetry and related context variables are positively related to budget slack.

2.1.2 Participative Budgeting

Participative budgeting might serve as a means to incorporate subordinate managers' information in budget goals. From an agency theory point of view, the relation with budget slack is positive. While participative budgeting allows agents to disclose their private information, it also gives them the opportunity to misreport and create budget slack. If appropriate incentives that align the principal's and agents' interests are tied to goal attainment, participative budgeting leads to the setting of more accurate budgets and enhanced performance (Baiman and Evans, 1983; Heinle et al., 2014; Kirby et al., 1991; Penno, 1984). But because stronger incentives also imply higher informational rents, principals will allow some budget slack (Heinle et al., 2014; Indjejikian et al., 2014; Kirby et al., 1991).

According to goal setting theory, participative budgeting, as a process of information exchange, helps rule out ambiguities that arise from superiors' demands and a given situation. Therefore, it results in more accurate and also more difficult budgets that closely mirror subordinates' ability. Participatively set budgets also induce goal commitment and acceptance, because they ego-involve managers (Locke and Latham, 1990; Murray, 1990; Shields and Shields, 1998). Moreover, participative budgeting likely reduces unethical behavior, such as slack creation, because it allows the participating managers to consider different aspects of their goal-setting decision, including different more or less ethical strategies of goal attainment (Barsky, 2007). Participative budgeting thus tends to be negatively associated with budget slack (Chong and Johnson, 2007; Murray, 1990). However, especially if incentives are tied to goal attainment, managers might be tempted to include slack into their budgets (Ordóñez et al., 2009). Linking goal setting with organizational fairness considerations, this effect likely is more pronounced, if the distribution of rewards is perceived as unfair (Cugueró-Escofet and Rosanas, 2013; Locke and Latham, 1990).

Finally, organizational fairness theory predicts a negative effect of participative budgeting on budget slack. Outcomes and procedures that are perceived as fair entail

positive consequences, such as lower budget slack, whereas subordinates reciprocate perceived unfairness, for example by negotiating for budget slack (Cohen-Charash and Spector, 2001; Little et al., 2002). A budget setting process that involves the affected managers and allows them to influence the budget goals likely is perceived as fair, whether rewards are tied to goal attainment or not (Cohen-Charash and Spector, 2001; Cugueró-Escofet and Rosanas, 2013; Lau and Tan, 2006).

In sum, the relation of participative budgeting with budget slack might be positive as well as negative, which results in the setting of two competing hypotheses:

H2a. Participative budgeting is negatively related to budget slack.

H2b. Participative budgeting is positively related to budget slack.

2.1.3 Control Systems Variables

To curb opportunistic reporting behavior in a participative budgeting context, control systems might serve two distinct purposes, monitoring managers' performance on the one hand, and measuring and incentivizing their performance on the other. Both purposes need to be considered in the context of budget slack.

Regarding monitoring, agency and goal setting theory suggest that if top management is able to detect budget slack, such as via budgeting or control systems monitoring (Kren, 1993; Schweitzer et al., 2004), budget feedback (Gürtler and Harbring, 2010; Kenis, 1979; Taub, 1997), required explanations of variances (Merchant, 1985), or internal auditing (Christensen, 1982; Cardinaels and Jia, 2016), this provides a disincentive for slack creation (Milgrom and Roberts, 1992; Welsh and Ordóñez, 2014a). Top managers thus will use some means in this regard, because budget slack might imply lower performance (Baiman and Evans, 1983; Indjejikian and Matějka, 2006; Locke and Latham, 1990). Thus, I propose the following hypothesis:

H3. Superiors' ability to detect slack and associated control and monitoring systems are negatively related to budget slack.

Regarding budget-based evaluation and incentives, predictions are more difficult, because the theoretical background is contradictory. According to agency theory, the relation with budget slack is positive. Given participative budgeting, agents will only disclose their private information truthfully, if budget-based evaluations and incentives allow them to earn appropriate informational rents (Baiman and Evans, 1983; Heinle et al., 2014; Indjejikian et al., 2014). Moreover, budget-based evaluations and incentives

also might incentivize agents for withholding private information to create budget slack, which facilitates budget goal attainment and ensures favorable evaluations (Anderson et al., 2010; Heinle et al., 2014; Milgrom and Roberts, 1992; Murphy, 2001; Schiff and Lewin, 1970). Because stronger incentives that help reduce budget slack also imply higher informational rents, principals will allow some budget slack (Kirby et al., 1991).

According to goal setting theory, budget-based evaluations and incentives reinforce managers' goal acceptance and goal commitment, because goal attainment helps them achieve desired outcomes, such as positive evaluations or bonuses. Thus, budget-based evaluation and incentives might motivate the setting of more difficult goals and help reduce budget slack (Corgent et al., 2015; Schoute and Wiersma, 2011). This function likely is limited by the amount of effort a manager is willing to expend on a given task, even though specific and difficult goals direct action and effort towards their attainment (Locke and Latham, 1990). Moreover, budget-based evaluations and incentives might lead to employees' unethical behavior, because employees might wish to attain goals at any cost, due to the increased valence of goal attainment or strong goal commitment that blocks out other considerations, or they might perceive corporate culture as prizing goal attainment above all else (Barsky, 2007; Schweitzer et al., 2004). Alternatively, to avoid ethical issues related to goal attainment, they might negotiate for budget slack.

Finally, organizational fairness theory suggests that budget-based evaluations and incentives reduce budget slack. If evaluations and incentives are perceived as being objective and set according to established procedures and norms, they likely are regarded as fair (Hartmann and Slapničar, 2012; Little et al., 2002). The perception of a fair evaluations and incentives then entail the setting of budgets that contain no slack (Cohen-Charash and Spector, 2001; Little et al., 2002).

To solve this theoretical disparity, I consider earlier studies' findings regarding the measurement of budget-based evaluation (Briers and Hirst, 1990; Derfuss, 2009; Hartmann, 2000; Noeverman et al., 2005; Otley and Fakiolas, 2000). Studies into the measures' differences show that budget-based evaluation is a multi-dimensional construct of which different measures capture different dimensions. The extent of the use of budgets for performance evaluations and the manner of their use are important dimensions of budget-based evaluation (Briers and Hirst, 1990; Derfuss, 2009; Noeverman et al., 2005). Hopwood (1972), for example, shows that the manner, but not

the extent, of budget-based evaluation engenders negative consequences, such as manipulative behaviors including slack creation. Kenis (1979) similarly finds that whereas general evaluations increase budget performance and motivation, punitive evaluations impair cost efficiency, budget, and task performance, but have a positive influence on budget motivation. Therefore, if budget-based evaluations are used in a needling, pressurizing, or even punishing manner, dysfunctional consequences, such as high levels of budget slack, might result (Barsky, 2007; Welsh and Ordóñez, 2014b). A higher extent of use of budget-based evaluations, for example as a part of a tight budgetary control system, rather seems to lower budget slack (Merchant, 1985; Van der Stede, 2000; 2001a). Therefore, I propose the following hypotheses:

H4a. The extent of budget-based evaluations is negatively related to budget slack.

H4b. The manner of budget-based evaluations is positively related to budget slack.

2.1.4 Performance

In general, agency and goal setting theory both predict a negative relation between budget slack and performance. According to agency theory, compared with the first-best solution, slack might entail inefficient use of resources and thus results in underperformance (e.g., Baiman and Evans, 1983; Indjejikian and Matějka, 2006). Goal setting theory also predicts a negative correlation, because budget slack motivates suboptimal effort and performance (Locke and Latham, 1990; Weiss et al., 2011).

However, the correlations between performance and budget slack might differ for different measures of performance. Managerial jobs typically demand attention to multiple tasks and goals, such that decisions on one task critically affect the decisions on the other tasks (Ethiraj and Levinthal, 2009; Feltham and Xie, 1994; Frow et al., 2005; Holmstrom and Milgrom, 1991). Only if a performance measure is noiseless and induces goal congruence between top and subordinate managers, it leads to optimal effort allocations in a multi-task setting (Feltham and Xie, 1994). Tying incentives to a particular goal then indicates on which tasks top management wants subordinate managers to concentrate (Holmstrom and Milgrom, 1991; Luft et al., 2016). Therefore, tying incentives to budget goal attainment indicates that achieving budget goals is a priority. In equilibrium, managers who have the most favorable private information then earn the greatest rent and work hardest, such that the relation of budget slack with performance to accounting goals will be positive. Moreover, if past performance was

used as a benchmark for budget setting (Dekker et al., 2012; Lukka, 1988; Murphy, 2001), undetected slack might persist (Anderson et al., 2010; Van der Stede, 2000). A positive relation also is consistent with principals' contractual commitment not to exploit completely their information about agents' past performance to accounting goals and to allow some slack when setting future goals, which helps ensure truthful reports and high effort and gives agents the chance to earn informational rents (Indjejikian and Matějka, 2006; Indjejikian et al., 2014). Finally, a positive relation also accords with the positive correlation between organizational slack and firm financial performance that Daniel et al. (2004) report in their meta-analysis.

To the extent that budget-based measures are non-congruent performance measures (Feltham and Xie, 1994) and because incentives have an attention-directing influence in multi-task settings (Luft et al., 2016), budget-based incentives might lead subordinate managers to conclude that they should focus on attaining budget goals and less on other tasks. This attention directing effect might be exacerbated in situations characterized by uncertainty, because in these situations managers might focus on the budget to counter uncertainty (Marginson and Ogden, 2005). Budget slack then might further increase this problem, because it not only facilitates attaining financial goals, but higher levels of budget slack also might stifle creativity and innovation (Nohria and Gulati, 1996; Weiss et al., 2011). In sum, this reasoning leads to the following set of hypotheses:

H5a. Performance to accounting goals is positively related to budget slack.

H5b. Task performance is negatively related to budget slack.

2.2 Moderator Variables

2.2.1 Measurement of Budget Slack

Variable measurement received considerable attention in budgeting research, but mostly with a focus on budget-based evaluation, participative budgeting, or performance (e.g., Briers and Hirst, 1990; Derfuss, 2009; Hartmann, 2000; Noeverman et al., 2005), whereas the measurement of budget slack is seldom assessed. Yet, measurement is hampered by the non-observability of budget slack (e.g., Indjejikian and Matějka, 2006; Kwok and Sharp, 1998; Nouri and Parker, 1996a), which has led researchers to conceptualize and measure budget slack in four distinct ways: First, studies following Onsi (1973) capture budget slack via individual managers' propensity to create it. Second, many authors measure the perceived achievability of budget goals,

because goals that contain slack are more easily attainable than those relying on correct estimates (e.g., Dunk, 1993; Van der Stede, 2000). Third, several studies assess the extent of managers' slack creation behaviors (Collins et al., 1987; Douglas and Wier, 2000). Finally, archival data is used to estimate slack at the company (Leavins et al., 1995), segment (Kren, 2003), or department level (Busanelli de Aquino et al., 2008).

But these measures regularly are point of discussion or used under the non-verified assumption that they are comparable and validly capture budget slack (Kwok and Sharp, 1998). For example, Nouri and Parker (1996a) use the propensity to create budget slack 'as a surrogate measure under the assumption that actual slack and the manager's propensity to create slack are highly correlated' (p. 81). However, the correlations, if available, between propensity to create budget slack and slack creation behaviors ($r = 0.626$, Huang and Chen, 2009), segment slack ($r = 0.269$, Kren, 2003), or the achievability of budget goals ($r = 0.520$, Lau, 1998) are positive, but not so high that these measures seem to be multiple indicators of one underlying construct.

Theoretically, the achievability of budget goals is a two-sided construct (Lukka, 1988; Otley, 1985; Schoute and Wiersma, 2011), in that budgets might deviate from managers' best guess in a positive (i.e., positive budget slack or downward bias) or negative way (i.e., negative budget slack or upward bias). In terms of goal setting theory, only negative slack would represent tight budget targets (Merchant and Manzoni, 1989; Schoute and Wiersma, 2011). However, the propensity to create slack, archival data-based measures, and slack creation behavior are one-sided constructs, because they only capture positive slack (see Douglas and Wier, 2000; Onsi, 1973). Kwok and Sharp (1998) therefore call for a verification of the measures' validity. In response, I include the measurement of budget slack as a potential moderator and thus assess whether the relations between budget slack and other variables vary systematically with the measurement of budget slack. Specifically, I predict that studies measuring budget slack with a one-sided constructs (i.e., propensity to create slack, archival data-based measures, slack creation behavior) will report stronger correlations than those that use the two-sided construct of achievability of budget goals. This is not to say, however, that I expect propensity to create slack, archival data-based measures, and slack creation behavior to always yield similar results. On the contrary, as an attitude, the propensity to create budget slack may or may not induce slack creation

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behaviors which may or may not translate into actual budget slack and budgets that are perceived as easily attainable or not.

H6. Studies measuring budget slack via propensity to create slack, archival data-based measures, and slack creation behavior will report stronger correlations than those using the achievability of budget goals.

2.2.2 Methodological and Conceptual Moderators

Apart from the measurement of budget slack, I account for three further potential influences, to assess whether they present alternative explanations of between-study variation.[3] For these moderator variables, I do not propose formal hypotheses, because it is impossible to state how these variables influence the relations under study. First, the quality of the studies included in a meta-analysis is a recurrent issue in the literature, because study quality may challenge the validity of conclusions, insofar as lower quality studies might systematically arrive at different inferences than studies designed and executed with the necessary care (Aguinis et al., 2011c; Geyskens et al., 2009). As a remedy, I only include peer-reviewed articles, because the peer-review process should weed out serious flaws that threaten the validity of published studies' conclusions (Aguinis et al., 2011c). But because the rigor of review processes also might vary, differences in the quality of the studies from quality versus other journals could be possible (Geyskens et al., 2009). However, the basic meta-analytic principle is to base the analyses on as many studies as possible, such that errors in lower-quality studies will cancel each other out in the process of aggregation (Hay et al., 2006). To assess possible differences in quality, I contrast results from quality and other journals.

Second, budgeting research discusses random versus non-random sample selection as a possible driver of results differences (Birnberg et al., 1990; Derfuss, 2009; Lindsay, 1995). Whereas random selection of respondents from multiple organizations allows generalizing the findings to the entire population (Lindsay, 1995; Ostroff and Harrison,

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[3] Several further moderators potentially are important: First, *time-dependence* might be an issue, because the included studies span four decades, such that early studies' conclusions might differ significantly from later findings (Dalton et al., 2003). But upon inspection, the correlations do not appear time dependent. For example, Leavins et al. (1995) and Maiga (2005) report positive correlations of participative budgeting with budget slack, negative correlations are found by Onsi (1973) and Schoute and Wiersma (2011), and non-significant correlations by Kenis (1979) and Kren (2003). Similarly, Cammann (1976) and Busanelli de Aquino et al. (2008) report positive correlations of budget-based incentives with budget slack, whereas Merchant (1985) and Van der Stede (2001b) obtain negative results. Second, budgeting research studies the distinctions between *manufacturing and service firms* and *private and public sector organizations*. But only few studies of service (e.g., Hirst and Lowy, 1990) and public sector organizations (e.g., Wentzel, 2004) are available. Therefore, I cannot control for both differences.

1999), preconfigured samples—typically single- or multi-company data—might help control for organizational and environmental confounds that would otherwise blur the relationships of interest (Lindsay, 1995). But with this data, generalization is limited to the part of the population reflected by the sample (Ostroff and Harrison, 1999). To the extent that non-random samples are chosen for reasons of convenience rather than to establish control, their external validity also might be compromised (Van der Stede et al., 2005). Moreover, in multi-organization samples not all firms will be in equilibrium (see Chenhall and Moers, 2007), whereas single-organization samples represent firms that either are in equilibrium or not, which might yield differing correlations. Therefore, to assess whether different sampling procedures influence extant findings, I distinguish between random multi-organization, non-random single-, and non-random multi-organization samples.

Third, Ostroff and Harrison (1999) indicate that it is important to examine correlations at different levels of analysis, because the relationships will diverge to the extent that different processes are operating at each level. Regarding the creation of budget slack, Merchant and Manzoni (1989) show that profit center managers aim to increase their bonus and operating flexibility and protect their credibility, whereas top managers wish to increase the predictability of corporate performance, reduce incentives to manage earnings, provide competitive compensation, and reduce monitoring costs. This is consistent with research based on agency theory that indicates that principals consider agents compensation risk when setting targets. To achieve this goal, superiors adjust targets to match environmental uncertainty (Bol et al., 2010) or commit not to completely exploit information about agents' past performance to accounting goals and to allow some slack when setting future goals (Indjejikian and Matějka, 2006; Indjejikian et al., 2014). Organizational fairness research also indicates that superiors account for fairness concerns when setting targets (Bol et al., 2010) and making decisions about control systems use (Guo et al., in press). Finally, for the relations between information asymmetry and participative budgeting and between participative budgeting and performance, Derfuss (2015; 2016) finds meta-analytic evidence of significant between-level differences. Therefore, I also analyze differences in studies level of analysis.

3. Methods

3.1. Selection and Coding of Studies

To guarantee a sample of studies that is as complete as possible, I used the following searching strategy, in line with recommendations in the meta-analysis literature (Aguinis et al., 2011a; Geyskens et al., 2009; Hunter and Schmidt, 2004). As a primary means for retrieving studies eligible for inclusion, I searched the *Business Source Complete, EconLIT, Emerald|Insight, JSTOR®, PsycInfo, ScienceDirect®, Scopus®,* and *Thomson Reuters^{TM} Web of Science* electronic databases, using the following keywords: "*budget slack*", "*budgetary slack*", "*slack budget*", "*budget goal tightness*", "*budget goal difficulty*", "*budget tightness*", "*budget difficulty*", "*budget* tight**", "*budget* difficult**", "*propensity to create budget slack*", "*propensity to create budgetary slack*", and "*slack creation propensity*". A thorough search of the reference sections of relevant review papers helped me identify additional studies (Birnberg et al., 1990; Briers and Hirst, 1990; Chenhall, 2003; Covaleski et al., 2003; Derfuss, 2009, 2015, 2016; Dunk, 2001; Dunk and Nouri, 1998; Hartmann, 2000; Kren and Liao, 1988; Kwok and Sharp, 1998; Luft and Shields, 2003; Shields and Shields, 1998). In a final step, I scrutinized the reference lists of all collected papers to locate further studies.

All studies that meet the following criteria were included: First, they were published in an international peer-reviewed journal or book series by the end of 2015. Second, they either focus on slack, propensity to create budget slack, slack creation behavior, goal tightness, or goal difficulty in a management accounting context.[4] That is, I did not include studies on organizational slack, which is a broader construct than budgetary slack (Daniel et al., 2004). Moreover, studies on goal setting that are not explicitly related to accounting goals also were excluded, because Brownell (1982) indicates that reactions to participation might differ for different types of goals. Third, studies are

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[4] The decision to include measures of budget goal tightness or difficulty, with reversed signs of the correlations, is supported by the following observations: First, the respective items are closely similar (Dunk, 1993; Kenis, 1979; Searfoss, 1976; Van der Stede, 2000). Second, I do not find statistically significant differences between the correlations of studies using the respective measures in meta-analyses for two relations with sufficient studies: For the relation with participative budgeting, the correlations of studies that measure the perceived achievability of budget goals ($\rho = -0.130$, $SD_\rho = 0.265$, $N = 909$, $k = 6$; e.g., Indjejikian and Matějka, 2006; Wentzel, 2004) and those that measure budget goal tightness ($\rho = -0.135$, $SD_\rho = 0.331$, $N = 1269$, $k = 9$; e.g., Chong and Johnson, 2007; Kenis, 1979) do not differ significantly (95% CIdiff: –0.321, 0.331). Likewise, for the relation with budget-based incentives, the difference between the correlations from studies that measure the achievability of budget goals ($\rho = -0.042$, $SD_\rho = 0.359$, $N = 1222$, $k = 5$; e.g., Indjejikian and Matějka, 2006; Van der Stede, 2000) and those that measure budget goal difficulty ($\rho = -0.175$, $SD_\rho = 0.267$, $N = 873$, $k = 5$; e.g., Anderson and Lillis, 2011; Shields and Young, 1994) is not significant (95% CIdiff: –0.280, 0.546).

based on survey or archival data, because these studies are representative of actual managerial work situations and thus provide reliable conclusions (Aguinis et al., 2011b). For two reasons, I did not include experiments. Experimental tasks frequently are relatively simple production tasks (e.g., Fisher et al., 2006) that cannot be compared easily with tasks actually performed by managers (Birnberg et al., 1990; Kren and Liao, 1988). Generalizing experimental results also is difficult, for the reason that many experiments use single-period designs (see Fisher et al., 2006; Lau and Eggleton, 2003). Fourth, after attempting to obtain study effects for studies that do not report correlations by contacting the authors, I only included studies that provide either Pearson or Spearman correlation coefficients or statistics that can be transformed into correlation coefficients (e.g., Peterson and Brown, 2005; Rupinski and Dunlap, 1996). Fifth, although meta-analyses are generally possible with two or more correlations (Hunter and Schmidt, 2004), I follow Dalton et al. (2003, also see Derfuss, 2015; Geyskens et al., 2006; Oh et al, 2011) and only provide estimates for samples of three or more correlations, to guarantee minimum stability of the main and moderator analyses' findings. This is necessary, because better estimates of mean correlations and corresponding standard deviations result from meta-analyses with many samples of relatively large sizes (Carlson and Ji, 2011; Hunter and Schmidt, 2004).

To guarantee the statistical independence of the included samples, I used Wood's (2008) procedure for detecting duplicate studies. If several papers build on one dataset, I include the correlation only once. If a study contains conceptual replications, such as two subscales for a variable (e.g., Wentzel, 2004), I compute composite correlations and their respective reliability coefficients to adjust for interdependence, if the subscale inter-correlations are given (Hunter and Schmidt, 2004). If this is impossible, I average the dependent correlations.

In the final dataset, I included 52 independent samples that were used in 65 papers. It consists of 135 correlations for 16 different relations.

To code the data, I primarily focused on sample characteristics, such as sample size, and the moderating variables.[5] I coded a variable as missing, if the necessary information was not reported. First, for differences in the measurement of budget-based

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[5] A trained doctoral student recoded the sample characteristics and moderator variable codes. We then compared our individual codes, discussed any differences, and corrected them by referring to the respective studies.

evaluations (i.e., extent vs. manner) and performance (i.e., performance to accounting goals vs. task performance), I relied on studies' methods sections and the appendixes containing measurement scales Second, for coding the primary moderating variable, measurement of budget slack, I also followed studies' methods sections and grouped the measures according to the four categories outlined in section 2.5. Third, I coded two proxies for journal quality. On the one hand, I distinguished between quality and other journals, based on whether a journal is included in the *Thomson ReutersTM Master Journal List* or published by the *American Accounting Association* (*AAA*) (journal1: quality) or not (journal1: other). I included the *AAA* journals as quality journals, because they frequently are classified as high quality (e.g., Van der Stede et al., 2005; Hay et al., 2006). On the other hand, following Hay et al. (2006) and Derfuss (2015, 2016),[6] I categorized *Accounting, Organizations and Society*, *Behavioral Research in Accounting*, *Contemporary Accounting Research*, *Journal of Accounting Research*, *Journal of Management Accounting Research*, *Management Accounting Research*, and *The Accounting Review* as quality journals (journal2: quality). All other journals were assigned to the other journals group (journal2: other). If one dataset was used for publications in quality and other journals, I assigned it to the quality journals group. Fourth, I coded studies sampling procedures as random multi-, non-random multi-, or non-random single-organization. I classified studies that did not explicitly indicate random sampling as non-random. Finally, for the level of analysis, I distinguish individual from organizational level studies. Coding relied on information from the studies' methods sections and appendixes containing the exact measurement scales.

3.2. Meta-analytic Procedures

I use the random effects artifact distribution meta-analysis procedures developed by Hunter and Schmidt (2004), with corrections for sampling and measurement errors, as implemented in *Comprehensive Meta Analysis*, Version 1.0.23 (Borenstein and Rothstein, 1999). In so doing, I follow prior meta-analyses in budgeting research (e.g., Derfuss, 2009; Greenberg et al., 1994) and recommendations regarding the meta-analysis of correlations (Aguinis et al., 2011b). For each distribution, I first aggregate

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[6] Hay et al. (2006) include *Auditing: A Journal of Practice and Theory*, *Contemporary Accounting Research*, *Journal of Accounting and Economics*, *Journal of Accounting Research*, and *The Accounting Review* as high quality. No studies published in the *Journal of Accounting and Economics* appear in the current analysis.

the correlations and correct them for sampling error by computing the sample size weighted mean correlation (r) and the associated standard deviation (SD_r). Then I correct r and SD_r for measurement error to estimate the mean true-score correlation (ρ) and the related standard deviation (SD_ρ). To this end, I use the reliability distributions for the respective variables, because not all studies report reliability coefficients, such as Cronbach's (1951) alpha (see Table 2). Finally, I rely on 95% confidence intervals (CI) to determine the significance of ρ. I calculated the necessary standard error with the formula for artefact distribution–corrected correlations (Hunter and Schmidt, 2004, p. 207). But if the number of studies (k) is small, the confidence interval might have low power. It thus must be interpreted as approximate, because the number of studies is the sample size for computing the standard error (Schmidt at al., 2009). In the following, ρ in the region of 0.100, 0.300, and 0.500 denote small, medium, and large effect sizes (Cohen, 1988).

--- Insert Table 2 about here---

To assess whether the individual correlations on which the computation of ρ is based are drawn from a single population, I use two criteria (Geyskens et al., 2009), the 75% rule and 95% credibility intervals, because no single test is preferable (Aguinis et al., 2008; Cortina, 2003). The 75% rule (Hunter and Schmidt, 2004) postulates that moderating variables might be influential only if less than 75% of the variance can be attributed to artifacts. Relying on the respective SD_ρ for the computations, 95% credibility intervals (CrI) provide an estimate of the variability of a correlation's observed distribution. Moderating variables should be analyzed if the interval is wide and/or includes zero. Whereas the credibility intervals assess the heterogeneity of a distribution of correlations, confidence intervals refer to the uncertainty associated with the estimated ρ (Whitener, 1990).

Because the moderating variables are categorical, I use subgroup analyses to assess them sequentially (Aguinis et al., 2011c; Cortina, 2003; Geyskens et al., 2009; Hunter and Schmidt, 2004). If the subgroup ρ differ significantly and the corrected variance averages lower across subgroups than in the overall analysis, a moderating influence exists. As a test, I use confidence intervals (95% CIdiff) around the difference of the subgroup ρ (Hunter and Schmidt, 2000). I rely on a Šidák correction to adjust the overall significance level to 0.05 for comparisons of multiple categories (Abdi, 2007).

Because I rely on published articles, the analyses might be affected by publication bias. That is, the dataset might be biased towards significant results and thus might systematically exclude studies that are not published because of reviewers' and editors' biases toward positive hypothesis tests (e.g., Pomeroy and Thornton, 2008). However, for meta-analyses, Dalton et al. (2012) show that this concern plays at best a minor role, because correlations appear to vary less between published and unpublished studies than previously thought. To rule out any bias, I still report a fail-safe k for correlation coefficients (Hunter and Schmidt, 2004), which displays the number of missing studies averaging null results that would be needed to reduce the estimated ρ to a trivial level of 0.040. I adopt this value, because it cannot be rounded to a small effect size of 0.100 that Cohen (1988) expects for many relations in social sciences.

4. Results and Discussion

4.1. Information Asymmetry and Related Variables

Table 3 summarizes the results pertaining to information asymmetry and related variables. However, the findings only partially support H1, which predicts that information asymmetry and related variables are positively related to budget slack.

--- Insert Table 3 about here ---

First, for two relations, the results account for almost all between-study variation and the effects are significant, in line with H1. Decentralization ($\rho = 0.191$, $SD_\rho = 0.000$, $k = 5$) and a business unit strategy emphasizing differentiation, growth, or innovation ($\rho = 0.253$, $SD_\rho = 0.000$, $k = 3$) correlate positively and significantly with budget slack with small to medium effects. The relations also are homogeneous across studies, such that they are in line with agency, goal setting, and organizational theory.

Second, for information asymmetry ($\rho = 0.027$, $SD_\rho = 0.117$, $k = 5$), size ($\rho = -0.014$, $SD_\rho = 0.145$, $k = 6$), task uncertainty ($\rho = -0.098$, $SD_\rho = 0.210$, $k = 4$), and task variability ($\rho = -0.091$, $SD_\rho = 0.242$, $k = 4$) the findings do not support H1. Instead, the correlations are non-significant and marked by considerable heterogeneity, indicating that moderator variables are at play. However, no further analyses are possible, because for each of these relations, only few studies are available.

Third, for environmental uncertainty, the positive and significant ($\rho = 0.137$, $SD_\rho = 0.187$, $k = 11$, 95% CI: 0.002, 0.304) correlation supports H1. But the high between-study variance indicates that moderators exert some influence. Of the moderator

variables, only the level of analysis of budget slack measures exerts no significant influence (95% CIdiff 7, 8: –0.171, 0.269) and no analysis was possible for the way samples are selected. Next, for both proxies, I find significant differences between quality and other journals (95% CIdiff 1, 2: –0.530, –0.278; 95% CIdiff 3, 4: –0.536, –0.254). Specifically, small negative correlations are reported in quality journals (journal1: $\rho = -0.087$, $SD_\rho = 0.000$, $k = 5$; journal2: $\rho = -0.105$, $SD_\rho = 0.000$, $k = 4$), whereas the correlations are positive for the other journals subgroups (journal1: $\rho = 0.317$, $SD_\rho = 0.000$, $k = 6$; journal2: $\rho = 0.290$, $SD_\rho = 0.039$, $k = 7$). Although all between-study heterogeneity is explained, this finding is counterintuitive, because the negative correlation for the quality journals does not accord with agency, goal setting, or organizational theory, whereas the positive finding for the other journals supports these theories. But it appears highly unlikely that only the studies in the other journals subgroup would corroborate extant theory. Therefore, though these subgroups explain all between-study variation, journal quality might not be the best possible explanation.

In line, I find a significant moderating influence of the level of analysis of environmental uncertainty (95% CIdiff 5, 6: 0.105, 0.415), which also explains all between-study heterogeneity. For uncertainty assessments at the individual level, the mean correlation with budget slack is medium-sized, positive, and significant ($\rho = 0.181$, $SD_\rho = 0.000$, $k = 3$), whereas at the organizational level, the relation is small, negative, and non-significant ($\rho = -0.079$, $SD_\rho = 0.000$, $k = 6$). Moreover, regarding the measurement of budget slack, H6 predicts that studies using one-sided measures will report stronger correlations than those using the achievability of budget goals. Supporting H6, I find a non-significant correlation with the achievability of budget goals ($\rho = -0.018$, $SD_\rho = 0.118$, $k = 6$) which is significantly smaller (95% CIdiff 9, 11: 0.046, 0.568) than the medium positive one with the propensity to create budget slack ($\rho = 0.289$, $SD_\rho = 0.124$, $k = 4$). But the positive, non-significant correlation with the archival data measures ($\rho = 0.141$, $SD_\rho = 0.239$, $k = 3$) does not differ significantly from those for the other subgroups (95% CIdiff 9, 10: –0.605, 0.287; 95% CIdiff 10, 11: –0.607, 0.311). Agency, goal setting, or organizational theory predictions thus hold at the individual level of analysis and for the one-sided measures of budget slack, but not at the organizational level or for measures of the achievability of budget goals. This indicates that the influence of perceived environmental uncertainty at the individual

level deviates from the influence of environmental uncertainty at the organizational level. Moreover, environmental uncertainty appears to induce managers' propensity to create slack, but does not lead to budget goals that are perceived as easily attainable, probably because high environmental uncertainty itself makes budget goal attainment difficult (see Arnold and Artz, 2015).

In sum, H1 is supported for decentralization and a business unit strategy emphasizing differentiation, growth, or innovation and partially supported for environmental uncertainty, as is H6. But for information asymmetry, size, task uncertainty, and task variability, H1 is not supported. Though surprising, the non-significant findings might result from the interrelations between these variables. For example, the level of information asymmetry and its influence on budget slack might be a function of the levels of decentralization, environmental uncertainty, and the business unit strategy. The same might be true for the relations of task uncertainty and entity size and their relations with budget slack.

4.2 Participative Budgeting

Table 4 summarizes the results for the main and moderator analyses for the participative budgeting–budget slack relation. In section 2.1.2, I stated two competing hypotheses based on agency, goal setting, and organizational fairness theory, H2a predicted a negative and H2b a positive relation.

--- Insert Table 4 about here---

Although the small, negative, significant mean correlation ($\rho = -0.109$, $SD_\rho = 0.252$, $k = 23$, 95% CI: -0.211, -0.007) supports H2a, the high level of between-study heterogeneity indicates that a positive influence cannot be ruled out either. Moreover, journal quality, sample selection, and studies' level of analysis do not help explain between-study heterogeneity, all associated confidence intervals around the subgroup differences cover zero. The differences between the non-significant correlation for the achievability of budget goals ($\rho = -0.134$, $SD_\rho = 0.307$, $k = 15$) and those for slack creation behavior and propensity to create budget slack also are non-significant (95% CIdiff 12, 13: -0.413, 0.023; 95% CIdiff 12, 14: -0.282, 0.234). Yet, the homogeneous non-significant slack creation behavior correlation ($\rho = 0.061$, $SD_\rho = 0.000$, $k = 4$, 95% CI: -0.002, 0.124) is significantly larger (95% CIdiff 13, 14: 0.042, 0.396) than the negative, significant one for propensity to create budget slack ($\rho = -0.158$, $SD_\rho = 0.170$,

$k = 10$, 95% CI: –0.289, –0.027). This finding leads to a rejection of H6 for the participative budgeting–budget slack relation, the one-sided measurements of slack do not lead to stronger correlations than the two-sided measure of achievability of budget goals. Moreover, though participative budgeting gives subordinate managers' the opportunity to create slack, it decreases their slack creation propensities and does not lead to more achievable targets. In line with organizational fairness theory, managers' use of participative budgeting to create slack thus might depend on their perception of being treated fairly. The way control systems are used also might impact their negotiation behavior while participating in budget setting.

4.3 Control Systems Variables

Table 5 reports the findings for the main and moderator analyses for the control systems variables and their relations with budget slack.

--- Insert Table 5 about here---

H3 predicts that superiors' ability to detect slack and associated control and monitoring systems are negatively related to budget slack. The significant mean correlations for the ability to detect slack ($\rho = $ –0.322, $SD_\rho = 0.000$, $k = 4$, 95% CI: –0.398, –0.246) and budget or control system monitoring ($\rho = $ –0.420, $SD_\rho = 0.064$, $k = 6$, 95% CI: –0.529, –0.311) are relatively homogeneous, negative and of medium size. These findings support H3, in line with agency and goal setting theory. However, for the variables of budget feedback ($\rho = $ –0.116, $SD_\rho = 0.253$, $k = 4$, 95% CI: –0.396, 0.164) and required explanations of variances ($\rho = $ –0.112, $SD_\rho = 0.251$, $k = 4$, 95% CI: –0.392, 0.168), the relations are non-significant and heterogeneous. Because budget feedback and the required explanations of variances both also play a role in budget-based evaluations, their relations with budget slack likely depend on how budget-based evaluations are linked with budget slack.

H4a states that the extent of budget-based evaluations is negatively related to budget slack, whereas according to H4b, the manner of budget-based evaluations is positively related to budget slack. However, though negative, the correlation for the extent of budget-based evaluations ($\rho = $ –0.118, $SD_\rho = 0.286$, $k = 9$, 95% CI: –0.322, 0.086) is non-significant, thus rejecting H4a. Regarding H4b, the small correlation for the manner of budget-based evaluations ($\rho = 0.135$, $SD_\rho = 0.227$, $k = 11$) is positive, but also non-significant. However, corroborating prior evidence (Briers and Hirst, 1990; Derfuss,

2009; Hopwood, 1972; Noeverman et al., 2005), both dimensions differ, though the difference is just non-significant at the 95% level, the confidence interval around their difference just covers zero (95% CIdiff: –0.509, 0.003). That the difference is not stronger most likely is due to the mixture of both dimensions in several studies (e.g. Ezzamel, 1990). Still, this finding indicates that budget-based evaluations indeed might provide both, an incentive and a disincentive for slack creation and that the incentive effect prevails, if evaluations are used in a needling, pressurizing, or punishing manner. Therefore, by separating these dimensions, more specific theories of budget slack should be developed and tested.

Next, for the extent and for the manner of budget-based evaluations, journal quality, sample selection, and level of analysis do not moderate the relations with budget slack, all associated confidence intervals around the respective subgroup differences cover zero. Finally, for the manner of budget-based evaluations, the homogeneous, non-significant mean correlation with the achievability of budget goals ($\rho = -0.129$, $SD_\rho = 0.159$, $k = 4$) is significantly smaller (95% CIdiff 7, 8: –0.632, –0.060, 95% CIdiff 7, 9: 0.057, 0.863) than the significant, positive ones with slack creation behavior ($\rho = 0.217$, $SD_\rho = 0.072$, $k = 4$, 95% CI: 0.100, 0.334) and propensity to create budget slack ($\rho = 0.331$, $SD_\rho = 0.177$, $k = 3$, 95% CI: 0.071, 0.591). Yet, the latter two effects do not differ significantly (95% CIdiff 8, 9: –0.462, 0.234). Supporting H6, the studies using one-sided measurements of budget slack thus report stronger correlations than those using the two-sided construct of achievability of budget goals. Moreover, the manner of budget-based evaluations apparently triggers managers' propensity to create slack and also provokes slack creation behaviors, but these behaviors do not necessarily lead to more achievable budget goals. This might be due to the fact that a needling and pressurizing manner of using budgets creates a climate of mistrust in which top managers monitor subordinate managers' performance to budgets tightly.

Finally, for budget-based incentives, the mean correlation is non-significant ($\rho = -0.045$, $SD_\rho = 0.324$, $k = 14$, 95% CI: –0.223, 0.133). Moreover, none of the moderator variables appears to influence this relation significantly, all associated confidence intervals around the respective subgroup differences cover zero. Therefore, H6 is rejected for this relation. Because budget-based incentives typically are linked with

budget-based evaluations, the extent and manner of use of budget-based evaluations likely also determine the relation between budget-based incentives and budget slack.

4.4 Performance

Table 6 summarizes the findings for the main and moderator analyses for performance. The overall relation is negative ($\rho = -0.138$, $SD_\rho = 0.273$, $k = 16$), as predicted by agency and goal setting theory, but non-significant (95% CI: –0.285, 0.009). Moreover, the large between-study heterogeneity indicates that the relation likely is influenced by moderating variables. For sample selection and studies' level of analysis, I find no significant influence, the respective confidence intervals around the subgroup differences cover zero. But I find a significant difference between the quality ($\rho = 0.074$, $SD_\rho = 0.247$, $k = 6$) and other ($\rho = -0.267$, $SD_\rho = 0.203$, $k = 10$) journals, though only for one of both quality proxies (journal2: 95% CIdiff: 0.077, 0.605). The influence of journal quality thus is non-systematic and sensitive to proxy selection. Moreover, both subgroups are heterogeneous, indicating that journal quality is not the only and probably not even the most important moderator of this relation.

--- Insert Table 6 about here---

H5a predicts that performance to accounting goals is positively related to budget slack, whereas according to H5b, its relation with task performance is negative. As expected, for measures of task performance, the small, negative, and significant correlation ($\rho = -0.332$, $SD_\rho = 0.144$, $k = 8$, 95% CI: –0.458, –0.206) differs significantly (95% CIdiff 12, 13: –0.702, –0.194) from the small, positive, but non-significant effect for performance to accounting goals ($\rho = 0.116$, $SD_\rho = 0.264$, $k = 7$, 95% CI: –0.104, 0.336). Thus, H5a is rejected and H5b supported. Still, these findings show that in multi-task settings, the level of budget slack and its relation with performance might depend on the level of congruence and noisiness of the performance measure(s) used (Feltham and Xie, 1994) and, probably even more importantly, on which performance measure is incentivized and therefore also prioritized (Holmstrom and Milgrom, 1991; Luft et al., 2016). Moreover, the residual heterogeneity in both relations might result from between-study variation in the importance of performance to accounting goals as a part of managers' task performance (Briers and Hirst, 1990; Hirst and Lowy, 1990) or from slack that is explicitly allowed to help managers attain vital non-financial goals (Davila and Wouters, 2005; Merchant and Manzoni, 1989). The

non-significant correlation of budget slack with performance to accounting goals also shows that budget slack is distinct form the broader concept of organizational slack and entails different consequences, because for organizational slack, Daniel et al. (2004) meta-analytically establish a positive relation with firm financial performance. Finally, my findings imply that instead of just stating hypotheses about performance, theoretical and empirical research should specify whether the focus is on performance to accounting goals or on the broader construct of task performance.

5. Conclusions

In this study, I provide initial meta-analytic evidence of the correlations between frequently studied variables and budget slack, which is an important control problem, because many organizations consider their budgeting systems as valuable simultaneously for different purposes, such as planning, control, and performance evaluation (de With and Dijkman, 2008; Libby and Lindsay, 2010; Shastri and Stout, 2008; Sivabalan et al., 2009). Understanding how important variables relate to budget slack thus is vital for managers and researchers alike. However, economic and behavioral theories, such as principal agent, goal setting, or organizational fairness theory, yield conflicting predictions for important variables and studies analyzing these relations report conflicting results. Using meta-analysis, I assess which of these relations are homogeneous and also explore the moderating influence of measurement differences regarding budget slack to explain non-artifactual heterogeneity.

This study makes several contributions to the management accounting literature: First, by providing meta-analytic estimates for frequently studied variables and their relations with budget slack, this paper complements meta-analyses that cover important outcomes of participative budgeting or budget-based evaluations (Derfuss, 2009, 2015, 2016; Greenberg et al., 1994), but disregard budget slack. Moreover, I update and extend earlier review papers (Dunk and Nouri, 1998; Kwok and Sharp, 1998).

Second, the meta-analyses provide estimates of the relations' mean true-score correlations and the associated between-study variance. These estimates show whether and how the respective variables empirically relate to budget slack and whether these relations generalize across settings and thus are reliable components of theoretical models. Specifically, I focus on four (groups of) variables, information asymmetry and related constructs, participative budgeting, control system variables, including budget-

based evaluations and incentives, and performance. However, for many variables, I find heterogeneous relations. Still, the findings help disentangle some of the theoretical conflicts and, in particular, show that in many instances, reliance on a single theoretical approach likely is not sufficient. For example, for the relation between participative budgeting and budget slack, a negative mean correlation emerged, which is in line with some goal setting theory arguments. On the other hand, the large amount of heterogeneity in this relation implies that a positive relation, as implied by agency theory, cannot be ruled out either. However, behavioral economics- (e.g., see Bol et al., 2010; Guo et al., in press) and psychology-based (e.g., see Wentzel, 2004) research considers the effect of perceived fairness, which thus might help solve this conflict. Specifically, participative budgeting likely helps reduce budget slack if budgetary control is perceived as a fair process that leads to fair outcomes for all parties. Moreover, it seems necessary to distinguish the extent from the manner of budget-based evaluations and performance to accounting goals from task performance.

Third, to explain observed between-study heterogeneity, I focus on variable measurement and thereby contribute to related research that primarily is concerned with the measurement of budget-based evaluation, participative budgeting, or managerial performance (e.g., Briers and Hirst, 1990; Derfuss, 2009; Hartmann, 2000; Otley and Fakiolas, 2000). Extending this research, I focus on the measurement of budget slack, because despite Kwok and Sharp's (1998) call for a verification of their validity, hardly any prior study tests whether the measures differ, and several studies assume their equivalence (e.g., Nouri and Parker, 1996a). Inconsistent with this practice, my results indicate that the differences between the measures of budget slack are an important moderator. That is, these measures do not tap into a single overall construct and thus are not exchangeable. Instead, the way slack is measured is an important boundary condition for theories on budget slack (see Malmi and Granlund, 2009).

But the moderating effect of the measurement of budget slack is not entirely systematic across relations. On the one hand, as non-significant subgroup correlations show, the manner of budget-based evaluation, budget-based incentives, environmental uncertainty, and participative budgeting do not increase the achievability of budget goals. On the other hand, the positive subgroup correlations indicate that a pressurizing or punitive manner of budget-based evaluations and uncertain environments increase

managers' propensity to create budget slack and slack creation behavior, whereas participative budgeting, which according to agency theory furnishes the opportunity to create slack, decreases the propensity to create slack and also does not increase slack creation behavior. Thus, theory always must guide the selection of the measure(s) of budget slack. Moreover, theory development, whether economics- or psychology-based, must account for these differences. But many subgroups are small, such that more and comparative tests of the different measures of budget slack are indispensable to more firmly establish the present findings and better inform theory development.

In general, it is disconcerting that after decades of research effort comparatively few correlations are available for many variables and moderator analysis subgroups. This closely mirrors the lack of replication studies criticized in earlier work (Lindsay and Ehrenberg, 1993). More research on budget slack thus is needed, before we might draw robust knowledge from this research. To remedy this shortcoming, more studies are necessary that systematically compare and vary sampling procedures, (industry) settings, and measures of all variables.

Apart from the small samples of correlations, this study is subject to the usual limitations of meta-analyses of correlations. First, judgment calls regarding the statistical procedures and criteria for the search for and inclusion of relevant studies and variables affect all meta-analyses (Aguinis et al., 2011a). Here, for example, they regard the correction of statistical artifacts, because I only correct for sampling and random measurement error, whereas for other artifacts, corrections are not warranted (e.g., for range restrictions) or impossible due to missing data (e.g., for imperfect validity). Second, the correlations might be distorted by variance due to omitted variables and the relations among the analyzed variables (Chenhall and Moers, 2007). This limitation could partially be addressed in additional studies that compile a meta-analytic correlation matrix for analyzing theoretical models. Third, despite the important empirical evidence they provide, I cannot include any case studies (e.g., Dunk and Perera, 1997; Lukka, 1988), because meta-analysis summarizes quantitative findings. A comprehensive review of case studies thus could usefully supplement this analysis.

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Tables

Table 1
Definitions, Representative Measures, and Relations with Budget Slack for Variables Included in the Analyses

Construct	Definition and Measures	Relation with budget slack
Budget slack	*General definition*: The 'intentional underestimation of revenues and productive capabilities and/or overestimation of costs and resources required to complete a budgeted task' (Dunk and Nouri, 1998, p. 73).	
Archival measures	*Definition*: The amount of slack present as estimated from archival (financial) accounting data.	
	Representative measures: Objective indicator of budget slack, Leavins et al. (1995); Segment slack, Kren (2003); Degree of goal achievement, Busanelli de Aquino et al. (2008).	
Achievability of budget goals	*Definition*: The perceived achievability of budget goals (Kenis, 1979; Indjejikian and Matějka, 2006).	
	Representative measures: Defensive orientation scale, Cammann (1976); Budget goal difficulty scale, Kenis (1979); Budget slack scales, Dunk (1993); Nohria and Gulati (1996); Van der Stede (2000); Cost budget tightness scale, Shields and Young (1994); Financial resource constraints scale, Weiss et al. (2011). Signs for correlations with measures of budget difficulty and tightness got reversed before their inclusion in the analyses.	
Propensity to create budget slack	*Definition*: The manager's general attitude towards the creation of budget slack (Onsi, 1973).	
	Representative measures: Propensity to create slack scale, Onsi (1973).	
Slack creation behaviors	*Definition*: The willingness on the subordinate manager's part 'to engage in slack creation and other budget gaming behaviors (e.g., shifting funds between accounts to avoid budget limits and intentionally understating forecasted revenues or overstating costs)' (Douglas and Wier, 2000, p. 273).	
	Representative measures: Devious game pattern, Collins et al. (1987); Slack creation scale, Douglas and Wier (2000).	

Information Asymmetry and Related Context Variables

Construct	Definition and Measures	Relation with budget slack
Business unit strategy emphasizing differentiation, growth, or innovation	*Definition*: The way a business unit can gain competitive advantages over competitors (1) with either a low cost position or high product differentiation (Van der Stede, 2000), (2) with either a short-to-medium term maximization of profitability and cash-flow or a longer term increase in sales and market share (Indjejikian and Matějka, 2006), or (3) with either a focus on cost management or an emphasis on innovation, quality, and speed-to-market (Shields and Young, 1994).	0/+
	Representative measures: Business unit growth strategy, Gupta and Govindarajan (1984); Competitive strategy scale, Govindarajan and Fisher (1990); Top management attention to costs scale, Shields and Young (1994).	
Decentralization	*Definition*: The amount of authority to make decisions delegated to a manager (Bruns and Waterhouse, 1975).	0/+
	Representative measures: Abbreviated Aston schedule, Inkson, Pugh, and Hickson (1970); Accounting decentralization scales, Indjejikian and Matějka (2012); Centralization scale, Nohria and Gulati (1996).	
Environmental uncertainty	*Definition*: The predictability of the external environment, as perceived by key decision makers (Govindarajan, 1986; Kren, 2003).	0/+
	Representative measures: Environmental uncertainty scale, Downey, Hellriegel, and Slocum (1975); Predictability of environment, Indjejikian and Matějka (2006); Environmental volatility (archival data), Kren (2003); Degree of competition and technological dynamism in the environment, Nohria and Gulati (1995).	

Information asymmetry	*Definition*: The degree of differences in information about local conditions between superior and subordinate managers (Dunk, 1993).	0/+
	Representative measures: Information asymmetry scales, Dunk (1993); Douglas and Wier (2000).	
Size	*Construct definition*: The size of the focal entity, i.e., an organization or unit (e.g., Indjejikian et al., 2014).	
	Representative measures: Absolute value or logarithm of number of business units' full-time employees (e.g., Indjejikian et al., 2014) or sales (e.g., Arnold and Artz, 2015; Van der Stede, 2001b).	0/+
Task uncertainty	*Construct definition*: The amount of perceived uncertainty associated with the work environment and the task requirements (Withey, Daft, & Cooper, 1983).	–/0
	Representative measures: Task uncertainty scales, Daft and Macintosh (1981); Van de Veen and Delbecq (1974); Withey et al. (1983); Task pressure scale, Weiss et al. (2011).	
Task variability	*Construct definition*: The number of exceptional events in the work (Withey et al., 1983).	–/0/+
	Representative measures: Task variability scales, Van de Veen and Delbecq (1974); Withey et al. (1983)	

Control System Related Variables

Ability to detect slack	*Definition*: '… the superior's ability to detect slack based on the amount of information he receives' (Onsi, 1973, p. 539).	–/0
	Representative measures: Slack detection scale, Onsi (1973).	
Budget-based evaluation: extent	*Definition*: '… the extent to which superiors rely on, and emphasize those performance criteria which are quantified in accounting and financial terms, and which are prespecified as budget targets' (Harrison, 1993, p.319)	–/0/+
	Representative measures: Superior's use for general evaluation, Cammann (1976); Budgetary evaluation general, Kenis (1979); Evaluative effort scale, Searfoss (1976); Budget emphasis scale, Dunk (1993); Budgetary control scale, Van der Stede (2000).	
Budget-based evaluation: manner	*Definition*: The degree to which managers attribute an 'authoritarian philosophy toward budgeting' to their superiors (Onsi, 1973, p. 539), who use budgets in a pressurizing or punitive way when they evaluate performance (Kenis, 1979).	0/+
	Representative measures: Attitude toward the top management control system scale, Onsi (1973); Budgetary evaluation punitive scale, Kenis (1979); Incentive to create slack scale, Douglas and Wier (2000).	
Budget-based incentives	*Definition*: The amount of (financial as well as other extrinsic) incentives that are tied to the achievement of budgetary performance (Van der Stede, 2001b).	–/0/+
	Representative measures: Superior's use for contingent reward allocation, Cammann (1976); Bonus as a percentage of total compensation, Indjejikian and Matějka (2012); Budget-based compensation (perceived reward dependency) scale, Searfoss (1976); Cost-based compensation scale, Shields and Young (1994); (1) 'percentage of their compensation that was performance-dependent', (2) 'percentage of the manager's bonus that is calculated in a formula-based vs. discretionary manner', (3) 'percentage of their bonus that depended on total corporate performance vs. their own business unit performance', Van der Stede (2001b, p. 42).	
Budget feedback	*Definition*: The amount of information given to subordinate managers about the degree to which they have achieved their budget goals (Kenis, 1979).	–/0
	Representative measures: Budgetary feedback scale, Kenis (1979).	
Budget or control system monitoring	*Definition*: The superiors' or higher-level managers' use of control systems to monitor subordinates to gain information on their activities and decisions and for inferring their performance capabilities, such as formalized policies and procedures, budgeting, or variance analysis systems (Kren, 1993, 2003).	–/0

	Representative measures: Budget firmness and management attention scales, Anderson and Lillis (2011); Control system monitoring scale, Kren (1993); Results monitoring scale, Simons (1987).	
Required explanations of variances	*Construct definition*: The extent to which explanations of variances and activities to correct the variances' causes are demanded (Merchant, 1985).	–/+
	Representative measures: Required explanations of variances scale, Merchant (1985); Swieringa and Moncur (1975).	
Participative budgeting		
Participative budgeting	*Definition*: The degree of managers' involvement in and influence on the setting of budget goals (Shields and Shields, 1998).	–/0/+
	Representative measures: Participative budgeting scales, Onsi (1973); Milani, (1975); Swieringa and Moncur (1975). Cost budget participation scale, Shields and Young (1994).	
Performance		
Performance	*General definition*: The degree of effectiveness and efficiency in the attainment of individual managerial, departmental or organizational goals (Emmanuel et al., 1990).	–/0/+
Task performance	*Definition*: The degree or the frequency of the attainment or fulfillment of managerial tasks or task related goals (Mahoney et al., 1963; Kenis, 1979).	–/0
	Representative measures: Managerial performance scale, Mahoney et al. (1963); Product quality scale, Weiss et al. (2011).	
Performance to accounting goals	*Definition*: The degree or frequency of the attainment of economic, financial, or budget goals (Kenis, 1979; Indjejikian and Matĕjka, 2006).	0/+
	Representative measures: (Past) budgetary performance, Govindarajan (1986); Indjejikian and Matĕjka, (2006); Business unit return on sales over a two-year period, Van der Stede (2000); Project efficiency scale, Weiss et al. (2011).	

Notes: – indicates a negative, 0 a non-significant, and + a positive correlation (non-directional, $p < 0.05$) in prior studies.

Table 2
Reliability Distributions of Analyzed Variables

Variables and Measurement Subgroups	No.	Mean α	SD α
Budget slack	33	0.708	0.119
Achievability of budget goals	18	0.666	0.124
Propensity to create budget slack	13	0.741	0.089
Slack creation behaviors	2	0.870	0.028
Ability to detect slack	3	0.733	0.112
Budget-based evaluation: extent	7	0.718	0.152
Budget-based evaluation: manner	4	0.752	0.083
Budget-based incentives	6	0.800	0.057
Budget feedback	2	0.830	0.057
Budget or control system monitoring	5	0.711	0.187
Business unit strategy emphasizing differentiation, growth, or innovation	1	0.630	-
Decentralization	2	0.613	0.165
Environmental uncertainty	7	0.735	0.095
Information asymmetry	5	0.754	0.066
Participative budgeting	20	0.807	0.112
Douglas and Wier (2000)	4	0.726	0.100
Milani (1975)	10	0.855	0.058
Shields and Young (1994)	3	0.863	0.023
Swieringa and Moncur (1975)	3	0.697	0.204
Performance	8	0.759	0.070
Task performance	6	0.804	0.051
Financial performance	1	0.810	-
Required explanations of variances	2	0.85	0.014
Task uncertainty	3	0.558	0.137
Task variability	4	0.773	0.058

Notes: No.: Number of reliability coefficients for the respective variable. Mean and standard deviation (*SD*) of the respective distribution of reliability coefficients (α). For some variables, the number of reliability coefficients is lower than the respective number of studies, because not all studies report reliability coefficients. For size no reliability coefficients are available.

Table 3

Meta-Analysis Results for Main and Moderator Analyses of the Relations of Budget Slack with Information Asymmetry and Related Variables

Correlate of Slack	k^a	N	r	SD_r	ρ	SD_ρ	95% CI lower	upper	95% CrI lower	upper	% Var. unacc.	k_{fs}	95% CIdiff comp.	lower	upper
Business unit strategy	3	417	0.166	0.014	0.253	0.000	0.229	0.277	0.253	0.253	0.000	16			
Decentralization	5	489	0.127	0.057	0.191	0.000	0.116	0.266	0.191	0.191	0.000	19			
Information asymmetry	5	588	0.020	0.127	0.027	0.117	-0.123	0.177	-0.202	0.256	46.479	-2			
Size	6	1301	-0.011	0.140	-0.014	0.145	-0.157	0.129	-0.298	0.270	76.193	-4			
Task uncertainty	4	412	-0.061	0.165	-0.098	0.210	-0.358	0.162	-0.510	0.314	64.069	6			
Task variability	4	357	-0.067	0.209	-0.091	0.242	-0.369	0.187	-0.565	0.383	74.191	5			
Environmental uncertainty	11	1381	0.096	0.160	0.137	0.187	0.002	0.272	-0.230	0.504	68.825	27			
(1) Journal1: Quality	5	615	-0.061	0.072	-0.087	0.000	-0.177	0.003	-0.087	-0.087	0.000	6	(1) - (2)	-0.530	-0.278
(2) Journal1: Other	6	766	0.223	0.078	0.317	0.000	0.228	0.406	0.317	0.317	0.000	42			
(3) Journal2: Quality	4	538	-0.073	0.070	-0.105	0.000	-0.204	-0.006	-0.105	-0.105	0.000	7	(3) - (4)	-0.536	-0.254
(4) Journal2: Other	7	843	0.204	0.095	0.290	0.039	0.190	0.390	0.214	0.366	8.455	44			
(5) Level Uncertainty: Individual	3	249	0.128	0.078	0.181	0.000	0.056	0.306	0.181	0.181	0.000	11	(5) - (6)	0.105	0.415
(6) Level Uncertainty: Organizational	6	617	-0.056	0.081	-0.079	0.000	-0.170	0.012	-0.079	-0.079	0.000	6			
(7) Level Slack: Individual	6	658	0.010	0.161	0.014	0.181	-0.166	0.194	-0.341	0.369	64.402	-4	(7) - (8)	-0.171	0.269
(8) Level Slack: Organizational	4	257	-0.024	0.088	-0.035	0.000	-0.161	0.091	-0.035	-0.035	0.000	-1			
(9) Slack: Achievability	6	710	-0.013	0.124	-0.018	0.118	-0.155	0.119	-0.249	0.213	44.425	-3	(9) - (10)	-0.605	0.287
(10) Slack: Archival data	3	134	0.119	0.253	0.141	0.239	-0.198	0.480	-0.327	0.609	65.047	8	(9) - (11)	0.046	0.568
(11) Slack: Propensity	4	616	0.209	0.121	0.289	0.124	0.125	0.453	0.046	0.532	56.195	25	(10) - (11)	-0.607	0.311

[a]k:number of correlation coefficients per relation; N: total sample size across k samples; r: weighted mean observed correlation; SD_r: standard deviation of r; ρ: estimated weighted mean correlation corrected for artefacts; SD_ρ: standard deviation for the estimated ρ; 95% CI: lower and upper bounds of the confidence interval for ρ; 95% CrI: lower and upper bounds of the credibility interval for each meta-analysis distribution; % Var. unacc.: percentage of unexplained variance in correlations; k_{fs} is the fail-safe k; SE_ρ: standard error for the estimated ρ; 95% CIdiff.: lower and upper bounds of the confidence interval of the difference between compared (comp.) subgroup ρ.

Table 4

Meta-Analysis Results for Main and Moderator Analyses of the Relation of Budget Slack with Participative Budgeting

Correlate of Slack	k^a	N	r	SD_r	ρ	SD_ρ	95% CI lower	95% CI upper	95% CrI lower	95% CrI upper	% Var. unacc.	k_{fs}	95% CIdiff comp.	95% CIdiff lower	95% CIdiff upper
Participative budgeting	29	3946	-0.082	0.211	-0.109	0.252	-0.211	-0.007	-0.603	0.385	83.381	50			
(1) Journal1: Quality	17	2464	-0.107	0.217	-0.142	0.263	-0.279	-0.005	-0.657	0.373	85.308	43	(1) - (2)	-0.288	0.110
(2) Journal1: Other	12	1482	-0.040	0.193	-0.053	0.223	-0.198	0.092	-0.490	0.384	78.038	4			
(3) Journal2: Quality	12	1787	-0.113	0.236	-0.149	0.288	-0.325	0.027	-0.713	0.415	87.876	33	(3) - (4)	-0.285	0.137
(4) Journal2: Other	17	2159	-0.056	0.184	-0.075	0.211	-0.192	0.042	-0.489	0.339	76.564	15			
(5) Data: Random multi	9	1225	-0.151	0.156	-0.202	0.173	-0.338	-0.066	-0.541	0.137	69.710	36	(5) - (6)	-0.351	0.125
(6) Data: Nonrandom multi	14	1880	-0.067	0.201	-0.089	0.237	-0.229	0.051	-0.554	0.376	81.398	17	(5) - (7)	-0.668	0.098
(7) Data: Nonrandom single	4	702	0.063	0.219	0.083	0.268	-0.200	0.366	-0.442	0.608	88.059	4	(6) - (7)	-0.557	0.213
(8) Level Participation: Individual	21	3043	-0.105	0.221	-0.139	0.267	-0.264	-0.014	-0.662	0.384	85.764	52	(8) - (9)	-0.306	0.042
(9) Level Participation: Organizational	8	903	-0.006	0.150	-0.007	0.154	-0.128	0.114	-0.309	0.295	60.391	-7			
(10) Level Slack: Individual	25	3705	-0.078	0.210	-0.103	0.253	-0.212	0.006	-0.599	0.393	84.545	39	(10) - (11)	-0.202	0.326
(11) Level Slack: Organizational/Unit	5	290	-0.125	0.208	-0.165	0.210	-0.406	0.076	-0.577	0.247	60.145	16			
(12) Slack: Achievability	15	2178	-0.100	0.246	-0.134	0.307	-0.301	0.033	-0.736	0.468	88.579	35	(12) - (13)	-0.413	0.023
(13) Slack: Behavior	4	662	0.049	0.052	0.061	0.000	-0.002	0.124	0.061	0.061	0.000	2	(12) - (14)	-0.282	0.234
(14) Slack: Propensity	10	1106	-0.123	0.164	-0.158	0.170	-0.289	-0.027	-0.491	0.175	66.726	30	(13) - (14)	0.042	0.396

[a]k:number of correlation coefficients per relation; N: total sample size across k samples; r: weighted mean observed correlation; SD_r: standard deviation of r; ρ: estimated weighted mean correlation corrected for artefacts; SD_ρ: standard deviation for the estimated ρ; 95% CI: lower and upper bounds of the confidence interval for ρ; 95% CrI: lower and upper bounds of the credibility interval for each meta-analysis distribution; % Var. unacc.: percentage of unexplained variance in correlations; k_{fs} is the fail-safe k; SE_ρ: standard error for the estimated ρ; 95% CIdiff.: lower and upper bounds of the confidence interval of the difference between compared (comp.) subgroup ρ.

Table 5

Meta-Analysis Results for Main and Moderator Analyses of the Relations of Budget Slack with Control System Variables

Correlate of Budget Slack	k^a	N	r	SD_r	ρ	SD_ρ	95% CI lower	95% CI upper	95% CrI lower	95% CrI upper	% Var. unacc.	n_{fs}	95% CIdiff comp.	95% CIdiff lower	95% CIdiff upper
Ability to detect Slack	4	604	-0.233	0.056	-0.322	0.000	-0.398	-0.246	-0.322	-0.322	0.000	28			
Budget/control system monitoring	6	945	-0.294	0.095	-0.420	0.064	-0.529	-0.311	-0.545	-0.295	22.844	57			
Budget feedback	4	453	-0.087	0.214	-0.116	0.253	-0.396	0.164	-0.612	0.380	80.640	8			
Required explanations of variances	4	442	-0.082	0.209	-0.112	0.251	-0.392	0.168	-0.604	0.380	79.269	7			
Budget based evaluation: extent	9	1269	-0.084	0.222	-0.118	0.286	-0.322	0.086	-0.679	0.443	85.503	18			
(1) Journal1: Quality	4	782	-0.164	0.151	-0.232	0.185	-0.441	-0.023	-0.595	0.131	76.702	19	(1) - (2)	-0.677	0.085
(2) Journal1: Other	5	487	0.045	0.255	0.064	0.330	-0.254	0.382	-0.583	0.711	84.094	3			
(3) Journal2: Quality	3	679	-0.139	0.147	-0.200	0.186	-0.439	0.039	-0.565	0.165	78.669	12	(3) - (4)	-0.559	0.215
(4) Journal2: Other	6	590	-0.020	0.272	-0.028	0.351	-0.333	0.277	-0.716	0.660	86.074	-2			
Budget based evaluation: manner	11	1357	0.098	0.190	0.135	0.227	-0.020	0.290	-0.310	0.580	77.574	26			
(1) Journal1: Quality	7	895	0.097	0.216	0.133	0.268	-0.086	0.352	-0.392	0.658	83.245	16	(1) - (2)	-0.283	0.271
(2) Journal1: Other	4	462	0.101	0.125	0.139	0.114	-0.030	0.308	-0.084	0.362	44.884	10			
(3) Journal2: Quality	5	533	0.023	0.252	0.031	0.318	-0.267	0.329	-0.592	0.654	85.096	-1	(3) - (4)	-0.494	0.150
(4) Journal2: Other	6	824	0.148	0.111	0.203	0.096	0.081	0.325	0.015	0.391	41.183	24			
(3) Data: Random multi	3	292	-0.042	0.365	-0.058	0.479	-0.628	0.512	-0.997	0.881	92.229	1	(5) - (6)	-0.801	0.361
(4) Data: Nonrandom multi	8	1037	0.118	0.118	0.162	0.107	0.050	0.274	-0.048	0.372	44.540	24			
(5) Level manner: Individual	5	584	0.075	0.172	0.104	0.197	-0.105	0.313	-0.282	0.490	70.875	8	(7) - (8)	-0.359	0.249
(6) Level manner: Organizational	6	773	0.116	0.201	0.159	0.245	-0.061	0.379	-0.321	0.639	80.870	18			
(7) Slack: Achievability	4	457	-0.092	0.148	-0.129	0.159	-0.332	0.074	-0.441	0.183	60.150	9	(7) - (8)	-0.632	-0.060
(8) Slack: Behavior	4	662	0.175	0.096	0.217	0.072	0.100	0.334	0.076	0.358	37.582	18	(7) - (9)	0.057	0.863
(9) Slack: Propensity	3	238	0.246	0.171	0.331	0.177	0.071	0.591	-0.016	0.678	60.452	22	(8) - (9)	-0.462	0.234
Budget based incentives	14	2464	-0.034	0.257	-0.045	0.324	-0.223	0.133	-0.680	0.590	91.336	2			
(1) Journal1: Quality/Journal2: Quality	10	2188	-0.040	0.218	-0.054	0.273	-0.236	0.128	-0.589	0.481	90.309	4	(1) - (2)	-0.697	0.539
(2) Journal1: Other/Journal2: Other	4	276	0.019	0.458	0.025	0.584	-0.566	0.616	-1.120	1.170	92.997	-2			
(3) Data: Nonrandom multi	14	1880	-0.067	0.201	-0.089	0.237	-0.229	0.051	-0.554	0.376	81.398	17	(3) - (4)	-0.487	0.143
(4) Data: Nonrandom single	4	702	0.063	0.219	0.083	0.268	-0.200	0.366	-0.442	0.608	88.059	4			
(5) Level Incentives: Individual	9	1774	-0.049	0.260	-0.066	0.331	-0.295	0.163	-0.715	0.583	92.486	6	(5) - (6)	-0.408	0.346
(6) Level Incentives: Organizational	4	635	-0.026	0.227	-0.035	0.281	-0.334	0.264	-0.586	0.516	87.677	-1			

	k	N	r	SD_r	ρ	SD_ρ	95% CI		95% CrI		% Var. unacc.	k_{fs}	comp.	95% CIdiff.	
(7) Level Slack: Individual	10	1783	-0.022	0.278	-0.029	0.354	-0.256	0.198	-0.723	0.665	92.698	-3	(7) - (8)	-0.201	0.421
(8) Level Slack: Organizational	3	626	-0.104	0.140	-0.139	0.161	-0.351	0.073	-0.455	0.177	75.688	7			
(9) Slack: Achievability	9	1987	-0.062	0.256	-0.084	0.331	-0.311	0.143	-0.733	0.565	93.039	10	(9) - (10)	-0.477	0.207
(10) Slack: Propensity	4	422	0.039	0.200	0.051	0.225	-0.205	0.307	-0.390	0.492	76.161	1			

[a]k: number of correlation coefficients per relation; N: total sample size across k samples; r: weighted mean observed correlation; SD_r: standard deviation of r; ρ: estimated weighted mean correlation corrected for artefacts; SD_ρ: standard deviation for the estimated ρ; 95% CI: lower and upper bounds of the confidence interval for ρ; 95% CrI: lower and upper bounds of the credibility interval for each meta-analysis distribution; % Var. unacc.: percentage of unexplained variance in correlations; k_{fs} is the fail-safe k; SE_ρ: standard error for the estimated ρ; 95% CIdiff.: lower and upper bounds of the confidence interval of the difference between compared (comp.) subgroup ρ.

Table 6

Meta-Analysis Results for Main and Moderator Analyses of the Relation of Budget Slack with Performance

Correlate of Budget Slack	k^a	N	r	SD_r	ρ	SD_ρ	95% CI lower	95% CI upper	95% CrI lower	95% CrI upper	% Var. unacc.	k_{fs}	95% CIdiff comp.	lower	upper
Performance	16	2261	-0.102	0.221	-0.138	0.273	-0.285	0.009	-0.673	0.397	85.552	39			
(1) Journal: Quality	11	1443	-0.039	0.213	-0.053	0.259	-0.224	0.118	-0.561	0.455	83.120	4	(1) - (2)	-0.049	0.515
(2) Journal: Other	5	818	-0.212	0.190	-0.286	0.232	-0.511	-0.061	-0.741	0.169	83.313	31			
(3) Journal2: Quality	6	861	0.054	0.201	0.074	0.247	-0.146	0.294	-0.410	0.558	82.642	5	(3) - (4)	0.077	0.605
(4) Journal2: Other	10	1400	-0.198	0.174	-0.267	0.203	-0.412	-0.122	-0.665	0.131	76.796	57			
(5) Data: Random multi	5	581	-0.174	0.115	-0.235	0.091	-0.371	-0.099	-0.413	-0.057	35.534	24	(5) - (6)	-0.454	0.356
(6) Data: Nonrandom multi	7	958	-0.135	0.297	-0.186	0.385	-0.489	0.117	-0.941	0.569	91.720	26	(5) - (7)	-0.507	0.017
(7) Data: Nonrandom single	3	645	0.007	0.103	0.010	0.104	-0.157	0.177	-0.194	0.214	56.019	-2	(6) - (7)	-0.618	0.226
(8) Level Performance: Individual	11	1768	-0.139	0.196	-0.186	0.238	-0.341	-0.031	-0.652	0.280	83.814	40	(8) - (9)	-0.585	0.127
(9) Level Performance: Organization/Unit	5	493	0.030	0.255	0.043	0.333	-0.277	0.363	-0.610	0.696	84.240	0			
(10) Level Slack: Individual	13	2000	-0.097	0.227	-0.130	0.282	-0.295	0.035	-0.683	0.423	87.364	29	(10) - (11)	-0.245	0.391
(11) Level Slack: Organizational/Unit	3	261	-0.141	0.167	-0.203	0.183	-0.475	0.069	-0.562	0.156	59.366	12			
(12) Task performance	8	1113	-0.252	0.138	-0.332	0.144	-0.458	-0.206	-0.614	-0.050	63.955	58	(12) - (13)	-0.702	-0.194
(13) Performance to accounting goals	7	750	0.087	0.223	0.116	0.264	-0.104	0.336	-0.401	0.633	81.308	13			

[a] k: number of correlation coefficients per relation; N: total sample size across k samples; r: weighted mean observed correlation; SD_r: standard deviation of r; ρ: estimated weighted mean correlation corrected for artefacts; SD_ρ: standard deviation for the estimated ρ; 95% CI: lower and upper bounds of the confidence interval for ρ; 95% CrI: lower and upper bounds of the credibility interval for each meta-analysis distribution; % Var. unacc.: percentage of unexplained variance in correlations; k_{fs} is the fail-safe k; SE_ρ: standard error for the estimated ρ; 95% CIdiff.: lower and upper bounds of the confidence interval of the difference between compared (comp.) subgroup ρ.