Promising avenue or dead end street? A meta analytic review of the Forbes and Milliken model of board behaviour

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Abstract

Purpose – *Over the past decades, growing interest in the behaviour of boards of directors has brought forth empirical studies on actual board behaviour. An important stream within this research followed the model proposed by Forbes and Milliken in 1999 in which the board processes, effort norms, cognitive conflict and the use of knowledge, are hypothesized to influence the performance of boards of directors. This paper aims to take stock of the results from this stream of research. The sometimes inconsistent results, and assumed methodological flaws of this research, leave open the question whether it makes sense to continue with this line of research.*

Design/methodology/approach – *Through a research synthesis of 17 primary studies on (parts of) the model proposed by Forbes and Milliken (1999), this question is addressed directly by clarifying what is known from the research done so far and by identifying possible distorting methodological moderators.*

Findings – *Strong empirical support is found for the effect of effort norms and the use of knowledge and skills on board task performance. The evidence for cognitive conflicts however was found to be inconclusive. Common method and respondent bias seem to be a lesser concern than often stated.*

Research limitations/implications – *Future studies should not only look closely at the construct validity of conflict, but should also have to account for the multidimensionality of conflicts and the interdependency and endogeneity in the relationship between behaviour and performance in boards.*

Originality/value – *This is the first paper that systematically integrates and reviews the empirical results of the research following the Forbes and Milliken model and sketches roads for future research on board behaviour.*

Keywords *Boards of Directors, Meta-analysis, Boardroom dynamics, Conflict management, Boardroom effectiveness, Boardroom performance*

Paper type *Literature review*

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1. Introduction

Over the past decade of corporate governance research, the insight that it is not so much the structural or formal characteristics that determine board performance, but rather social and behavioural aspects has been gaining ground (Ong and Wan, 2008; Sur, 2014). Several studies have been conducted, from different theoretical perspectives and with different methods, on the behavioural processes within boards of directors (Murphy and McIntyre, 2007; Neill and Dulewicz, 2010). Within this diverse stream of research, the concise and researchable model presented by Forbes and Milliken in 1999 has been the most promising avenue for the behavioural study of boards of directors. Huse considered it to be one of the major building blocks in understanding behavioural perspectives on boards, calling the article "a main point of reference for scholars wanting to explore behavioural dynamics in the boardroom" (Huse, 2009c, p. 64).

The findings in the research on board behaviour and board task performance using Forbes and Milliken, however, seem unclear and inconsistent. Although most researchers do conclude that the behavioural determinants are a better predictor of board performance compared to the formal and structural features, the effects of these behavioural determinants differ across studies (Huybrechts *et al.,* 2016; Kumar and Zattoni, 2017). The effect of cognitive conflicts on board task performance for instance is sometimes not significant (Zona and Zattoni, 2007), negative (Minichilli *et al.,* 2012) or positive (Bailey and Peck, 2011).

Despite the impact their widely cited article has had, these mixed results in subsequent empirical research and the methodological issues associated with survey research on organizational behaviour, left the promise of Forbes and Milliken (1999) to expand and refine our understanding of what makes boards effective unfulfilled (Huse *et al.,* 2011).

Does it then make sense to pursue this rather disappointing line of research further or should we abandon the Forbes and Milliken model altogether? Before we throw out the good with the bad, we have to examine what the research into the Forbes and Milliken model of board performance (FM-Model) has contributed up till now and asses how the methodological issues it entails are to be addressed in future research on board behaviour.

Hence, a meta-analysis is performed on the effects drawn from empirical studies on (parts of) the FM-Model in investigating the three board processes it suggests: effort norms, cognitive conflict and the use of knowledge and skills. Meta-analysis allows us to test the hypotheses within the FM-Model empirically with larger datasets than those reported in any single primary study. Furthermore, meta-analytic research can identify possible methodological moderators on the relationships found between board processes and board performance in the studies under consideration. Three methodological issues associated with the research into the FM-Model are addressed in this meta-analysis: common method variance, single respondent bias and validity of constructs.

The effects of the use of knowledge and skills and effort norms on board task performance are found to be significant across studies, while the effects of cognitive conflicts are more heterogeneous (Heemskerk *et al.*, 2017). Contrary to what is often thought, common method and response bias seem to pose no serious threat to the outcomes in research on board behaviour as their moderating effects were nonsignificant. The construct validity of cognitive conflict was found to have a strong moderating effect. Operationalisations of cognitive conflict aimed at the frequency of conflicts finds a negligibly small effect (ρ = 0.01), while operationalisations of cognitive conflict aimed at cognitive differences among board members finds a much larger effect (ρ = 0.37). This further emphasizes the complexity of conflicts as behavioural processes and calls for recognition of the multidimensionality and interdependency of conflicts in boards.

Section 2 discusses the hypotheses set forth by Forbes and Milliken (1999) and will further extend the hypotheses from the FM-Model with methodological moderators to guide further research. In Section 3, the method of meta-analysis is presented and discussed. Section 4 presents the results of the meta-analyses. The findings and the directions for further research are discussed in Sections 5 and 6 of this paper.

2. Theory and hypotheses

2.1 The Forbes and Milliken model of board performance

At the close of the twentieth century, Forbes and Milliken (1999) published their influential article on boards of directors as decision-making groups. They sought to understand the processes and behaviours involved in effective board performance. To do so, they saw a need to go beyond the demography-outcome approach and to incorporate the study of process-variables in the study of boards of directors in order to disentangle the predictions

offered by multiple theoretical perspectives with regard to board demography. The effectiveness of boards in their model has two components. Control and service task performance constitute *board task performance*. They further identify three board processes that will influence board task performance: effort norms, cognitive conflict and the use of knowledge and skills. *Effort norms* are useful for ensuring preparation, participation and analysis. *Cognitive conflict* contributes to the leveraging of differences of perspective. *Use of knowledge and skills* is the ability to make use of the resources within the board in performing its tasks. The following hypotheses summarize the propositions as set forth by Forbes and Milliken (1999, p. 497):

H1. Effort norms will be positively associated with effective board task performance.

H2. Cognitive conflicts will be positively associated with effective board task performance.

H3. The use of knowledge and skills will be positively associated with effective board task performance.

2.2 Methodological issues of the Forbes and Milliken model

The mixed results of the FM-model are usually attributed to methodological issues within the self-report survey research of team processes (Huse, 2009b). The key methodological issues in research using the FM-Model are:

- common method variance (CMV);
- relying on single respondents (mostly CEOs); and
- validity of the constructs.

Almost all studies on the FM -model address the issue of CMV ex post or ex ante and it is often considered as a limitation of the research performed (Bailey and Peck, 2011). Likewise, the reliance on the CEO as the only respondent is an issue that is discussed in the limitations section of most studies (Zona and Zattoni, 2007). Not all studies reflect extensively on the construct validity of their concepts, but in particular with regard to conflict, the low construct validity is seen as a limitation of the research (Van Ees *et al.,* 2008).

CMV or bias is often considered a major threat to the reliability of the correlations in self-report survey research design (Podsakoff *et al.,* 2003). This threat of CMV, however, seems to be somewhat exaggerated. Spector (2006) therefore even considers it an urban legend and Fuller *et al.* (2016) argue that survey researchers face an unnecessary "presumption of guilt" in relation to CMV. Researchers testing for CMV using Harman's one factor test or principal component analyses seldom find distorting effects of CMV in real-life data and the level of CMV in simulation data seems not to represent a grave threat to the reliability of study outcomes (Fuller *et al.,* 2016). Therefore, the effect of board behaviour in studies that conduct ex-post analyses of CMV are not expected to differ from studies that do not explicitly address the issue of CMV:

H4. Effort norms, cognitive conflict and the use of knowledge and skills will be equally positively associated with effective board task performance when the issue of CMV is addressed through ex-post analyses.

Survey studies in corporate governance are often based on the CEO as a single respondent (Huse, 2009a; Minichilli *et al.,* 2009). Although the potential threat to the reliability of the data gained through one respondent is recognized, the difficulties in gaining access to multiple board members force studies to limit themselves to one respondent. The CEO then seems the most obvious option for they are in a better position than other board members to report on the functioning of the board (Huse, 2009a; Minichilli *et al.,* 2009). The value creating board surveys (Huse, 2009b; Sellevoll *et al.,* 2007) were conducted among CEOs, board chairs and board members and thus allow for a comparison between different respondents.

CEOs are found to be in general less positive on boards' task performance than chairs and other board members (Sellevoll *et al.,* 2007: Table LXXII and LXXIII). Chairs and other board members also reported higher levels of cognitive conflict and preparation and involvement (Sellevoll *et al.,* 2007: Table LXIII and LXVIII). As CEOs are more critical of board processes and board performance, we might expect that the effect of board processes would be smaller when measured through the CEO as the single respondent as compared to board chairs and other board members:

H5. Effort norms, cognitive conflict and the use of knowledge and skills will be less positively associated with effective board task performance when measured through the CEO as single respondent.

Most discussions on the validity of the survey constructs in the FM-model concentrate on the operationalization of cognitive conflicts. There are broadly two ways in which task conflict is operationalized in studies following the FM-model. Some focus on the frequency of task conflicts while others are more concerned with the underlying cognition differences between board members. Forbes and Milliken themselves make use of Jehn's (1995) definition of cognitive conflicts and point to Jehn's four-item scale for task conflict as a reliable operationalization of cognitive conflict: "Using this scale, researchers could ask respondents to gauge, using Likert-type items, the frequency of conflicts about ideas and the extent of differences of opinion on the board" (Forbes and Milliken, 1999, p. 199). However, the studies that build on the FM model differ greatly in their operationalization of cognitive conflicts. Studies sometimes use different descriptions for cognitive conflicts: intragroup conflict (Garnes and Mathisen, 2014), critical debate (Minichilli *et al.,* 2009) or task conflict (Heemskerk *et al.,* 2015). In addition, studies using similar descriptions differ in the actual Likert-scale items used. Some follow Forbes and Milliken's suggestion and ask for the frequency of conflicts or disagreement on several issues while others ask for differences in the way board members reason and argue. This difference in focus most likely also has an impact on the effect of task conflict.

Bendersky *et al.* (2010) differentiate between two different aspects of task conflicts, either as divergent task conflicts (discussing additional options and alternatives) or as convergent task conflicts (disagreement on a joint decision or solution). The cognition-based operationalization of cognitive conflict – how board members think and reason – seems to be more aimed at the divergent aspects of task conflict, while the frequency-based operationalization seems more concerned with the convergent aspects of task conflict. The performance-enhancing effects of cognitive conflict are attributed especially to the divergence of views and arguments (Forbes and Milliken, 1999, p. 494). This divergence in opinions, solutions and arguments is more likely to be found in the cognition-based operationalization than in the one that focuses more on the frequency of conflicts. We thus might expect a stronger effect of cognitive conflict on board task performance in studies using a cognition-based operationalization compared to studies using a frequency-based operationalization of cognitive conflict:

H6. Cognitive conflict will be more positively associated with effective board task performance when survey items focus on cognition rather than frequency of conflicts.

3. Meta-analytic methods

3.1 Inclusion criteria and effect size

To review the empirical evidence on the hypotheses within the FM-Model and to test for the additional hypotheses on methodological moderators, meta-analyses were conducted as a quantitative method for combining evidence from different studies (Schmidt and Hunter, 2014). First, all studies citing the 1999 Forbes and Milliken article were searched using Google Scholar (1,485 articles) and Web of Science (361 articles) up until August 16, 2016. Those articles that empirically tested the hypothesis of the FM-Model were selected by screening the abstracts of these articles. Inclusion criteria were primarily the explicit use of

(part of) the FM-Model to quantitatively examine board effectiveness. Qualitative studies using the FM-Model, quantitative studies on board behaviour not using the FM-Model or quantitative studies using the FM-Model but not inquiring board effectiveness were not included. Three quantitative studies missing effect sizes on the FM-Model relations were not included (Mande *et al.*, 2013; Marchewka, 2015; Zona, 2015). The final sample consisted of 17 primary studies (Appendix 1). All included studies were coded using a coding guide in line with the suggestions of Cooper (2009).

The Pearson correlation coefficient (r) for board processes and board task performance was used as effect size to integrate results from the included studies. The correlation coefficient is commonly used in meta-analyses for it is a scale-free measure of linear association. In total, 70 correlations between board processes and board outcomes were obtained. As previously elaborated, the various studies differ in the way they classify board tasks. Some treat board task performance as one monolithic dependent variable, while others use different twofold or threefold classification in their operationalization of board task performance. For the inclusion of the board task performance variables, the classification of board task performance as service and control in the FM-Model was followed and when possible a distinction was made between the control or monitoring board task performance and the service or advisory task of board directors. Additional board tasks outside the scope of the FM-Model, such as the performance of the resource-dependency role of the board (Wan and Ong, 2005) or the networking role of the board (Zona and Zattoni, 2007), were excluded from the analyses (Forbes and Milliken, 1999, pp. 501-502). The included independent and dependent variables and the effect sizes extracted are presented and accounted in Appendix 1.

3.2 Meta-analysis techniques

For the meta-analysis of the main effects, a random-effects model was used. Sampling variance was calculated using the formula in Hedges and Olkin (1985): $\mathrm{Var(e)} = (1 - \rho^2)^2/\mathrm{N} - 1$. As suggested by Schmidt and Hunter (2014) the population correlation (ρ) in the calculated sampling variance was estimated by the mean observed correlation rather than the individual study correlations; for the latter might lead to a negative bias (Aguinis, 2001). Study-level variance was estimated using Hunter and Schmidt's (2014) estimator of heterogeneity variance ($\tau^2 = \max\{0,(Q - k)/\sum W_i\}$). Calculations were performed directly on the correlation coefficients (Schmidt and Hunter, 2014). No artefact corrections were performed since the study characteristics are treated as moderating effects in the analyses.

For the moderator analyses, a hierarchical two-stage approach was followed. First, a mixed effects model, using Hunter and Schmidt's (2014) estimator of heterogeneity variance, was calculated to test the moderator hypotheses of the dummy-coded moderators. Second, a subgroup analysis of fixed effects was conducted, in which the calculating of the meta-analytic mean correlations and confidence intervals were adopted from Hedges and Olkin (1985). The mean correlation coefficient (r) was calculated using Fisher's (inverse) transformation ($z = \frac{1}{2}\mathrm{Ln}((r + 1)/(r - 1))$ to correct for skewness in the effect size distribution. Mean ρ was estimated by weighting the effect sizes as z-scores by their sample size (mean $z = \sum(n - 3)z/\sum(n - 3)$) and converted to mean rho (ρ) using Fisher's transformation. The random and mixed effects models were calculated in R version 3.2.4 using the metafor package version 1.9-9 (R Core Team, 2016; Viechtbauer, 2010). Fixed effect subgroup calculations were done by hand using the suggestions by Hedges and Olkin (1985).

4. Results

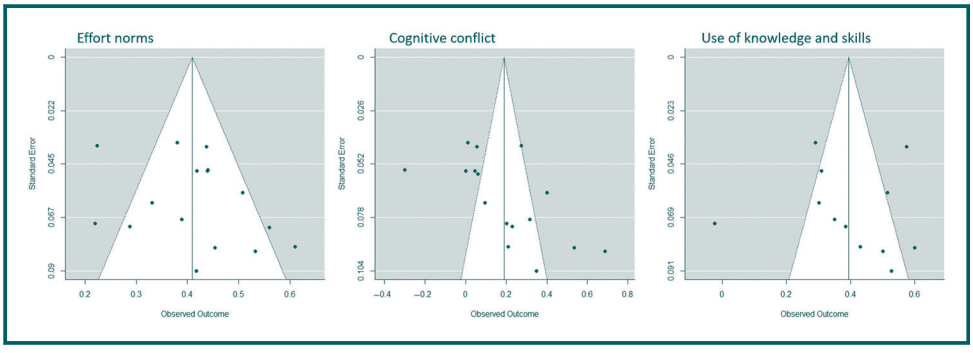
Table I presents meta-analytic evidence that further bears on the broad relationships between board processes and board task performance. Analyses of the funnel plots for these effects, presented in Figure 1 suggest no distorting effect of publication bias (Egger

Table I Meta-analyses results

Relation	k	N	*Mean* r	*Mean* ρ	*SE* ρ	*95% confidence interval*	*Q test of homogeneity*
Overall board performance							
Effort norms	16	3793	0.42	0.41	0.026	0.36; 0.46	54.37**
Cognitive conflict	16	3943	0.21	0.19	0.052	0.09; 0.29	177.18**
Use of knowledge and skills	12	2552	0.41	0.39	0.046	0.31; 0.48	85.15**
Service task performance							
Effort norms	9	2705	0.43	0.41	0.036	0.34; 0.48	42.80**
Cognitive conflict	10	2990	0.16	0.14	0.048	0.05; 0.24	69.07**
Use of knowledge and skills	7	1906	0.41	0.40	0.061	0.28; 0.52	67.84**
Control task performance							
Effort norms	9	2705	0.36	0.35	0.035	0.29; 0.42	36.44**
Cognitive conflict	10	2990	0.21	0.20	0.054	0.09; 0.30	92.21**
Use of knowledge and skills	7	1906	0.53	0.51	0.064	0.38; 0.64	98.24**

Notes: *k* = number of effect sizes; *N* = total sample size; *r* = mean estimate of uncorrected correlations; rho = mean estimate of corrected population correlation; SE rho = estimated standard error of rho. Overall board task performance for studies reporting separate effects for service task performance and control task performance was calculated by computing their mean using Fisher's (inverse) z-transformation. *$p < 0.05$; **$p < 0.01$

Figure 1 Funnel plots of the main effects



et al., 1997). As most studies compare the effects of board processes in the FM-Model with the formal characteristics of boards (size, composition, CEO-duality, etc.), it is indeed not expected that non-significant findings will not be published.

Support was found for *H1*, which proposed a positive relationship between effort norms and board task performance; a positive relationship was found between effort norms and overall board task performance (ρ = 0.41, CI = 0.36 – 0.46), as well as between effort norms and both service and control task performance (ρ = 0.41, CI = 0.34 – 0.48 and ρ = 0.35, CI = 0.29 – 0.42, respectively). Effort norms thus seem relevant behavioural determinants of board task performance.

The meta-analysed effect of cognitive conflict on overall board task performance is rather small (ρ = 0.19, CI = 0.19 – 0.29). Given the value of Q relative to the number of studies included ($I^2 > 90$ per cent[1]) indicating evidence of considerable heterogeneity, the effect is too small to firmly confirm *H2*, which predicted a positive association between cognitive conflicts and effective board task performance. The separate effects of cognitive conflict on service task performance (ρ = 0.14, CI = 0.05 – 0.24) and control task performance (ρ = 0.20, CI = 0.09 – 0.30) do not support the idea that cognitive conflicts have a different effect on specific board tasks. Support was found for *H3*, which proposed a positive association between the use of knowledge and skills and effective board task performance. This

positive relationship was found between the use of knowledge and skills and *overall* board task performance (ρ = 0.39, CI = 0.31 – 0.48), as well as between the use of knowledge and skills and both board *service* task performance and board *control* task performance (ρ = 0.40, CI = 0.28 – 0.52 and ρ = 0.51, CI = 0.38 – 0.64, respectively).

4.1 Methodological moderating effects

The Q-values reported in Table I suggest the existence of moderating variables. To test *H4*, which proposed no moderating effect of ex post controlling for CMV-issues on the relation between board processes and board task performance, the included studies were divided into two categories: studies in which the possibility of CMV was assessed through Harman's one factor test or other statistical post analyses (Podsakoff *et al.*, 2003) and studies in which such analyses were not reported. The two studies with a multi-method research design were excluded from the analyses (McNulty *et al.*, 2013; Ranasinghe *et al.* 2015). For all three board processes, the moderator model for ex-post CMV controlling was non-significant ($Q_{m\ effort\ norms}$ = 1,58; $p > 0.05$, $Q_{m\ cognitive\ conflict}$ = 0,35; $p > 0.05$ and $Q_{m\ use\ of\ knowledge\ and\ skills}$ = 0,78; $p > 0.05$). Results of the meta-analyses for both categories are summarized in Table III, which further support *H4* as the confidence intervals for all three board processes overlap in both cases Table II.

To test for the moderating effect of relying on the CEO as single respondent versus the use of other respondents, the studies were grouped by those targeting the CEO and those who surveyed other or multiple respondents (board chairs, non-executive directors, board secretaries, etc.). Studies that combined data gathered from both CEOs and (supervisory) board chairs were thus classified as using other respondents (Van Ees *et al.*, 2008).

The type of respondent as a moderator was found not significant for all three board processes ($Q_{m\ effort\ norms}$ = 0.07; $p > 0.05$, $Q_{m\ cognitive\ conflict}$ = 1.21; $p > 0.05$, $Q_{m\ use\ of\ knowledge\ and\ skills}$ = 0.00; $p > 0.05$). The results of the meta-analyses presented in Table IV further illustrate that, contrary to *H5*, there is no significant difference in effects of board processes in studies only targeting the CEO compared to studies using other or multiple respondents Table III.

H6 predicted that cognitive conflict is more positively associated with effective board task performance in studies that used cognition-based items rather than frequency-based items. To test for the moderating effect of operationalization of cognitive conflict, the studies were grouped by those primarily inquiring the frequency of conflicts on different subjects and those that asked about the differences in reasoning and arguing within the board. An

Table II Meta-analysis of the moderating effect of ex post CMV controlling on board task performance

Relation	k	N	*Mean* r	*Mean* ρ	*95% confidence interval*	*Q test*
No ex post CMV tests[a]						
Effort norms	7	1571	0.41	0.37	0.33; 0.41	29.59**
Cognitive conflict	7	1721	0.18	0.11	0.07; 0.16	101.06**
Use of knowledge and skills	3	675	0.51	0.49	0.40; 0.58	4.12
Ex post CMV test[b]						
Effort norms	7	1897	0.47	0.44	0.40; 0.47	10.79
Cognitive conflict	7	1897	0.26	0.14	0.09; 0.18	74.55**
Use of knowledge and skills	7	1897	0.43	0.42	0.38; 0.45	38.74**

Notes: *k* = number of effect sizes; *N* = total sample size; *r* = mean estimate of uncorrected correlations; rho = mean estimate of corrected population correlation. *$p < 0.5$; **$p < 0.1$; [a]includes: Garnes and Mathisen (2014), Gnan and Zattoni (2009), Minichilli *et al.* (2009), Mostert *et al.* (2015), Msweli and Singh (2014), Namoga (2011), Scarborough *et al.* (2010) and Van Ees *et al.* (2008); [b]includes: Bailey and Peck (2011), Heemskerk *et al.* (2015), Minichilli *et al.* (2012), Wan and Ong (2005), Zattoni *et al.* (2015), Zona and Zattoni (2007) and Zona (2016)

Table III Meta-analysis of the moderating effect of respondents on board task performance

Relation	k	N	*Mean* r	*Mean* ρ	*95% confidence interval*	*Q test*
CEO respondent[a]						
Effort norms	7	2380	0.42	0.39	0.35; 0.42	29.16**
Cognitive conflict	7	2380	0.13	0.11	0.07; 0.15	34.37**
Use of knowledge and skills	5	1581	0.40	0.41	0.36; 0.45	37.84**
Other respondent(s)[b]						
Effort norms	9	1413	0.42	0.42	0.38; 0.47	21.57**
Cognitive conflict	9	1563	0.27	0.17	0.12; 0.22	156.85**
Use of knowledge and skills	7	971	0.42	0.40	0.35; 0.45	45.83**

Notes: k = number of effect sizes; N = total sample size; r = mean estimate of uncorrected correlations; rho = mean estimate of corrected population correlation. *$p < 0.5$; **$p < 0.1$; [a]includes: Gnan and Zattoni (2009), Heemskerk *et al.* (2015), Minichilli *et al.* (2009), Minichilli *et al.* (2012), Zattoni *et al.* (2015), Zona and Zattoni (2007) and Zona (2016); [b]includes: Bailey and Peck (2011), Garnes and Mathisen (2014), McNulty *et al.* (2013), Mostert *et al.* (2015), Msweli and Singh (2014), Namoga (2011), Ranasinghe *et al.* (2015), Scarborough *et al.* (2010), Van Ees *et al.* (2008) and Wan and Ong (2005)

overview of all survey items on cognitive conflict in the included studies can be found in Appendix 2. One study did not report survey items and was excluded from the analysis (Ranasinghe *et al.*, 2015). The moderator model was indeed found significant (Q_m = 27.49; $p < 0.01$) and the differences in meta-analysed effect size, as shown in Table IV, are indeed quite large (ρ = 0.01, CI = 0.03 − 0.05 for frequency-based studies ρ = 0.37, CI = 0.32 − 0.41 for cognition-based studies). While both sets of studies remain heterogenic, the level of heterogeneity is more equally divided and less excessively high (I^2 < 90 per cent) (Table IV).

5. Discussion and conclusions

The purpose of this meta-analysis is twofold. First, the aim is to take stock of the research on the FM-Model and to estimate the effect of effort norms, cognitive conflicts and the use of knowledge and skills on board task performance. A second objective is to assess the moderating effect of the methodological issues within self-report survey research on the FM-Model.

Regarding the first objective, the meta-analyses performed demonstrate that there is enough evidence for the significant positive effect of both effort norms and the use of knowledge and skills on board task performance. The meta-analysis of the effect of

Table IV Meta-analysis of the moderating effect of the item types of cognitive conflict on board task performance

Relation	k	N	*Mean* r	*Mean* ρ	*95% confidence interval*	*Q test*
Cognitive conflict						
Frequency-based items[a]	8	2467	0.04	0.01	0.03; 0.05	42.82**
Cognition-based items[b]	7	1292	0.41	0.37	0.32; 0.41	35.09**

Notes: k = number of effect sizes; N = total sample size; r = mean estimate of uncorrected correlations; rho = mean estimate of corrected population correlation. *$p < 0.5$; **$p < 0.1$; [a]includes: Garnes and Mathisen (2014), McNulty *et al.* (2013), Minichilli *et al.* (2009), Minichilli *et al.* (2012), Mostert *et al.* (2015), Zattoni *et al.* (2015), Zona and Zattoni (2007) and Zona (2016); [b]includes: Bailey and Peck (2011), Gnan and Zattoni (2009), Heemskerk *et al.* (2015), Msweli and Singh (2014), Namoga (2011), Van Ees *et al.* (2008) and Wan and Ong (2005)

cognitive conflict on board task performance, however, demonstrated considerable heterogeneity. This further underlines the severe differences in findings between studies and makes it hard to draw conclusions. Some empirical studies have found that the impact of cognitive conflict depends on the board task and have suggested that cognitive conflict has a more positive impact on the service task of a board than on its control task (Zattoni *et al.,* 2015, Heemskerk *et al.* 2015). However, the similarities found in the meta-analysis for the effect on board control task performance, and board service task performance does not support this supposition.

The inconclusive findings on cognitive conflict reflect the ongoing debate in the team effectiveness literature on the possible positive effects of task conflicts. At the end of the previous century, Jehn (1995) found that task conflicts increased team performance and Amason (1996) showed that task conflict was positively linked to decision-quality in TMTs. However, this positive perception on task conflict began to tilt when De Dreu and Weingart (2003) detected no positive effect of task conflict on team performance in their meta-analysis. They only left room for positive effects of conflicts "under very specific circumstances" (De Dreu and Weingart, 2003, p. 748). Two recent meta-analyses on conflict and team performance provide a more complex and detailed understanding of these specific circumstances. First, the effect seems to be context dependent; task conflicts produce more positive outcomes for strategic and complex decision-making and more negative outcomes for routine tasks (O'Neill *et al.,* 2013). Second, the effect seems to depend on the organizational level at which they occur; the higher up in the organizational hierarchy, the more positive the effects of task conflicts are (De Wit *et al.,* 2012). This suggests that boards might benefit from task conflict, because they are typically involved in non-routine decision-making at the apex of organizational hierarchy (Heemskerk *et al.,* 2017).

The heterogeneity in the effects of cognitive conflicts might also partly be due to a limitation of this meta-analysis. There is a certain variation in the operationalization of board effectiveness between the various included studies (financial risk taking, commitment, etc.) while the measurement of performance has turned out to be a moderator in meta-analyses of the effect of task conflict on team performance (De Wit *et al.,* 2012).

In answer to why research on board processes is still limited in number, Huse states that: "Response rates tend to be very low, respondent and common method biases are likely to occur, [. . .] and concept validity is often weak" (Huse, 2009b, p. 368). The second purpose of this meta-analysis is to assess the effect of these methodological issues: CMV, relying on a single respondent and validity of concepts.

Research on the FM-Model typically uses the same method to measure the dependent and independent variables. It is often believed that such research leads to inflated correlations through CMV or bias. The risk of CMV however seems grossly exaggerated. Studies that control for CMV almost never find a confounding effect of CMV and, in simulations, the effect is negligible (Fuller *et al.,* 2016; Spector, 2006). The moderator analysis for ex post CMV controlling confirms this. We found no significant differences in effect between studies that do and studies that do not check for CMV afterwards. Moreover, in all the studies controlling for CMV, it had no distorting effect on the outcomes. CMV seems to be less of a concern in FM-Model research than often assumed.

Another regularly criticized methodological issue in the research on the FM-Model is the reliance on the CEO as a single respondent in some of the research (Huse, 2009a). The choice of the CEO as the single respondent is often motivated by the difficult accessibility of non-executive board members and justified by stating that the CEO is the only person that can properly assess both the ins and outs of the organization as well as the functioning of the board of directors (Minichilli *et al.,* 2012; Heemskerk *et al.,* 2015). Contrary to our hypotheses, the moderator model comparing studies that relied on the CEO as single

respondent with studies that relied on other or multiple respondents was not significant. The number of respondents targeted within the board thus does not seem to influence the effect found for the board processes on board effectiveness. This makes the choice to question only the CEO more defensible, but it remains interesting to identify – not at the aggregate, but at the micro level – the differences in responses between CEOs and other board members.

Furthermore, it is interesting to see that there is a notable difference between the cognition-oriented and frequency-oriented operationalizations of cognitive conflict. This points to the need to come to a shared operationalization of conflicts in board process studies to avoid comparing apples and oranges. Upon closer inspection, operationalizations of conflict appear sloppy and simplistic in both approaches. Frequency-based items often too simply examine if there are frequent conflicts and disagreements among directors (Minichilli *et al.,* 2009) leaving it unclear to what extent disagreement is cognitive or task-oriented. Cognition-based items differ along studies; in one study, for instance, one of the three items on conflict asked respondents' opinion on the statement: "A good director doesn't wait too long to resign" (Van Ees *et al.* 2008, p. 91). This is an item not used in other studies and it does not seem to adequately measure conflict. It is also troublesome to notice that exactly the same items are sometimes excluded, based on reliability analysis, in one study, yet not excluded in another. For instance, the item "The board is able to reach collectively shared decisions following a full and frank debate" was excluded based on a factor analysis in Bailey and Peck (2011, p. 14) and was not excluded in McNulty *et al.* (2013) based on a principal component analysis.

6. Directions for future research

Almost two decades since Forbes and Milliken, strong evidence has been accumulated for the positive effect of board processes such as effort norms and the use of knowledge and skills. Unfortunately the discussion above illustrate that we still lack understanding of what is arguably the most interesting and promising of all board processes: cognitive conflict. The actual methodological issues of the FM-model are far more fundamental than the overestimated threats of common method and respondent bias. Empirical research into board behaviour and performance could therefore greatly benefit from further research that changes course from research on conflicts within boards done so far in two important ways.

First, to clarify the effect of conflicts within boards, it is crucial for future research to recognize the multidimensionality of conflicts. The history of the conflict classification as sketched by Jehn (2014) shows a tendency toward a tripartite distinction between task conflicts, process conflicts and relationship conflicts. Task conflicts are focussed on the content of the task at hand, process conflicts are focussed on how tasks should be accomplished, and relationship conflicts are driven by interpersonal incompatibilities resulting in tension, animosity and annoyance among team members (Jehn, 1995). An important additional distinction typical for conflicts within boards that needs to be included in future research on the FM-Model is the difference between intragroup conflicts, debate and arguments among non-executive board members, and debate and arguments between non-executive board members and the CEO and other executive directors (Heemskerk *et al.,* 2017). More attention to the multi-dimensionality of conflicts and more rigour in the operationalization of conflicts in future research will bring more insight into the workings of conflicts in boards.

Second, future research could further address the limitations through a longitudinal research design in which board's behavioural processes and task performance are measured at multiple times. This longitudinal approach would enable us to clarify the interdependencies between different board processes and to unravel the endogeneity

in the causal relations between processes and performance (Boyce *et al.*, 2015; Byers *et al.* 2015). Although a longitudinal study is more resource intensive, difficult and risky, it is a necessary step to move beyond oversimplified research designs in board effectiveness studies (Van Ees *et al.*, 2009). The FM-model is still a promising avenue for gaining insight in the inner working of boards, but to live up to its promise, we need to take the next step and improve the rigour and relevance of the behavioural study of boards.

Note

1. I^2 describes the percentage of variation across studies due to heterogeneity rather than chance. It was calculated using $I^2 = ((Q - df)/Q) * 100\%$.

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Appendix 1

Table AI Effect sizes of included studies

Author	N	*Setting*	*Process variables included*	*Board performance variables included*	*Effect sizes (r)*
1. Wan and Ong (2005)	424	Listed firms in Singapore	EN CC UKS	A. Service role B. Monitoring role	EN × A: 0.44 EN × B: 0.57 CC × A: 0.38 CC × B: 0.47 UKS × A: 0.56 UKS × B: 0.58
2. Zona and Zattoni (2007)	301	Large manufacturing firms in Italy	EN CC UKS	A. Service B. Monitoring	EN × A: 0.50 EN × B: 0.33 CC × A: 0.00 CC × B: 0.00 UKS × A: 0.25 UKS × B: 0.39
3. van Ees *et al.* (2008)	136	Large firms in the Netherlands	EN CC UKS	A. Strategy B. Monitoring	EN × A: 0.19 EN × B: 0.38 CC × A: 0.02 CC × B: 0.45 UKS × A: 0.24 UKS × B: 0.57
4. Minichilli *et al.* (2009)	301	Large industrial firms in Italy	EN (commitment) CC (critical debate)	A. Service: Advisory task, networking task and strategic participation B. Control: Behavioural control, output control and strategy control.	EN × A: 0.46[a] EN × B: 0.41[a] CC × A: 0.08[a] CC × B: 0.01[a]
5. Gnan and Zattoni (2009)	498	Small firms in Norway	EN (commitment) CC	A. Advisory task B. Control task	EN × A: 0.26[b] EN × B: 0.19[b] CC × A: 0.27[b] CC × B: 0.30[b]
6. Scarborough *et al.* (2010)	135	Firms with a corporate secretary in the US	EN	Board activism	EN: 0.56
7. Bailey and Peck (2011)	104	Publicly traded firms in the United Stated	EN CC UKS	Board task performance	EN: 0.53 CC: 0.69 UKS: 0.50
8. Namoga (2011)	86	Public and private enterprises on Fiji and Solomon Islands	EN CC UKS	A. Service role performance B. Monitoring and control role performance	EN × A: 0.62 EN × B: 0.17 CC × A: 0.44 CC × B: 0.29 UKS × A: 0.45 UKS × B: 0.73
9. Minichilli *et al.* (2012)	535	Listed and large firms in Norway and Italy	EN CC UKS	A. Advisory task performance B. Control task performance	EN × A: 0.40 EN × B: 0.36 CC × A: 0.01 CC × B: 0.01 UKS × A: 0.34 UKS × B: 0.26
10. Garnes and Mathisen (2014)	307	Collaborative tourist organisations in Norway	EN CC	Board commitment	EN 0.44 CC–0.30

(*continued*)

Table AI

Author	N	*Setting*	*Process variables included*	*Board performance variables included*	*Effect sizes (r)*
11. McNulty *et al.* (2013)	141	Large firms in the United Kingdom	EN CC UKS	Financial risk-taking	EN: 0.22[c] CC: 0.20[c] UKS: −0.02[c]
12. Msweli and Singh (2014)	289	State owned firms in South Africa	EN CC UKS	Board decision quality	EN: 0.45 CC: 0.54 UKS: 0.60
13. Zattoni *et al.* (2015)	488	SMEs in Norway	EN CC UKS	A. Strategy task performance B. Monitoring task performance	EN × A: 0.50 EN × B: 0.37 CC × A: 0.10 CC × B: 0.01 UKS × A: 0.65 UKS × B: 0.66
14. Heemskerk *et al.* (2015)	148	Educational organisations in the Netherlands	EN CC (task conflict) UKS	A. Advisory task performance B. Control task performance	EN × A: 0.39 EN × B: 0.39 CC × A: 0.33 CC × B: 0.32 UKS × A: 0.32 UKS × B: 0.41
15. Ranasinghe *et al.* (2015)	184	Listed firms in Australia	EN CC UKS	Monitoring of financial reporting	EN: 0.33 CC: 0.10 UKS: 0.30
16. Mostert *et al.* (2015)	285	Banks and insurance companies in the Netherlands	CC	A. Board advice provision B. Board monitoring	CC × A: −0.09 CC × B: 0.21
17. Zona (2016)	109	Family firms in Italy	EN CC UKS	Board performance	EN: 0.61 CC: 0.21 UKS: 0.43

Notes: EN = effort norms, CC = cognitive conflict and UKS = the use of knowledge and skills. [a]Both board roles were measured as three separate variables. Although one should in general not add up correlations, the similarity of the three board roles both in concept as in outcome makes it justifiable to compute a mean r using Fisher's z-transformation. [b]Effect sizes in this study were reported as βs within a multiple regression analysis. Estimates of effect sizes as r are calculated using the transformation suggested by Peterson and Brown (2005): $r = 0.99\beta + 0.04\lambda + 0.2\eta$ with $\lambda = 1$ (for $\beta > 0$) and $\eta = 1$ (for the average intercorrelation of the predictor variable set is > 0.18). [c]Effect sizes of the three (inverse) proxies of financial risk-taking during the credit crisis: ΔCash&Equivalents, ΔNetCash and ΔFinancialSlack were reported separately. Given the similarities, conceptual as well as numerical, a mean effect size for r was computed using Fisher's z-transformation

Appendix 2. Overview of survey items on cognitive conflict

1. Wan & Ong, 2005	
Label	Cognitive conflict
Definition	Conflict is divided in cognitive, affective and process conflict. Cognitive conflict is considered as task-oriented conflict, following Jehn (1995).
Type of questions	5-point Likert Scale
Classification	Cognition
1	Consider viewpoints of different members
2	Decisions settled amicably
3	Decisions open and candid
4	Atmosphere encourages critical thinking
5	Meetings often result in clear decision

2. Zona & Zattoni, 2007	
Label	Cognitive conflict
Definition	Following Forbes & Milliken: task-oriented differences in judgement or issue-related disagreement among directors
Type of questions	5-point Likert scale
Classification	Frequency
1	There are frequently conflicts and disagreements among directors
2	There are frequently conflicts and disagreements on decisions to be taken
3	There are frequently conflicts and disagreements on how the board should work
4	There are frequently conflicts and disagreements on how to pursue the firm's goal

3. Van Ees *et al.*, 2008	
Label	(Cognitive) conflict
Definition	'The disagreement relating to the board roles'.
Type of questions	5-point Likert scale
Classification	Cognition
1	Directors can sufficiently bring in their own views during meeting
2	Substantial differences of opinion increase the quality of decision making
3	A good director doesn't wait too long to resign

4. Minichilli *et al.*, 2009	
Label	Critical debate
Definition	'The positive effects that task-related conflicts or disagreements may produce'.
Type of questions	5-point Likert scale
Classification	Frequency
1	There are conflict and disagreements on the decisions to be taken during meetings
2	There are conflict and disagreements on the firms' legitimate stakeholders
3	There are conflict and disagreements on the general purpose of the firm
4	There are conflict and disagreements on the board working styles
5	There are conflict and disagreements on the decision process
6	There are conflict and disagreements among directors

(*continued*)

5. Gnan & Zattoni, 2009	
Label	Cognitive conflict
Definition	Task-oriented differences in judgement or issue related disagreement among directors.
Type of questions	5-point Likert scale
Classification	Cognition
1	Board members discuss professional opposing views
2	Board members accept the risk they can be wrong
3	Board members explain the CEO their personal view and ideas

7. Bailey & Peck, 2011	
Label	Cognitive conflict
Definition	Follows Jehn: "Disagreement about the content of the tasks being performed, including differences in viewpoints, ideas and opinions." (1995: 258)
Type of questions	5-point Likert scale
Classification	Cognition
1	All board and executive team members have ample opportunity to constructively challenge and debate decisions brought to the board.
2	The climate within the board room encourages board members to express their disagreements and concerns when issues are presented to the board.
3*	Board member deliberations are based upon a healthy discussion of the facts. (rejected based on an EFA)
4*	The board is able to reach collectively shared decisions following a full and frank debate. (rejected based on an EFA)
5	All board members have ample opportunity to influence the decisions made by the board.
6	During board meetings, the board chair creates an environment where all board members are comfortable expressing their opinions without fear of retribution or embarrassment.

8. Namogo, 2011	
Label	Cognitive conflict
Definition	Following Forbes & Milliken: "conflicts pertaining to the task-oriented differences in judgement among members of a group" (1999:494).
Type of questions	5-point Likert scale
Classification	Cognition
1	Board considers all member viewpoints before making decision
2	Board decisions are settled amicably
3	Board discussions are open and candid

9. Minichilli *et al*., 2012	
Label	Cognitive conflict
Definition	Following Jehn: ''task-oriented differences in judgment among group members, often manifested in 'disagreements about the content of the tasks being performed, including differences in viewpoints, ideas and opinions'. (1995: 258)
Type of questions	5-point Likert scale
Classification	Frequency
The extent to which conflicts and disagreements emerged in the boardroom on:	
1	Decisions to be taken during the board meetings
2	how to define what is the best for the firm
3	decision processes
4	firm's owners and stakeholders' interests

(*continued*)

10. Garnes & Mathisen, 2014

Label	Intragroup conflict
Definition	Refers to both relationship conflict and task conflict, where the relationship conflict refers to an awareness of interpersonal incompatibilities and task conflict refers to an awareness of differences in viewpoints and opinions.
Type of questions	5-point Likert scale
Classification	Frequency

1 There may be frictions among members of the board.
2 There may be personality conflicts evident in the board.
3 There is tension among members of the board.
4 There are emotional conflicts among members of the board.
5 There may be conflicts about ideas in the board.
6 There may be conflict about how work in the board should be done.
7 There are often differences of opinion in the board.

11. McNulty *et al.*, 2013

Label	Cognitive conflict
Definition	'The presence of issue-related disagreement among members'
Type of questions	5-point Likert scale
Classification	Frequency

the extent to which there are differences of opinion at board level about:
1 Key decisions to be taken
2 The role and responsibilities of the board
3 How the board should work
4 The overall purpose and strategy of the firm
5 Company results and performance
the level of satisfaction in respect of the following:
6 There is constructive challenge and debate between non-executive and executive directors at board meetings
7 The board is able to reach collectively shared decisions following full and frank debate

12. Msweli & Singh, 2014

Label	Cognitive conflict
Definition	'A form of dissent or disagreement about issues under discussion'.
Type of questions	5-point Likert scale
Classification	Cognition

1 All board and executive team members have ample opportunity to constructively challenge and debate decisions brought to the board.
2 The culture within the boardroom encourages board members to express their disagreements and concerns when issues are presented to the board.
3 The board is able to reach collectively shared decisions following a full and frank debate.
4 During board meetings, the board chair creates an environment where all board members are comfortable expressing their opinions without fear of retribution.

13. Zattoni *et al.*, 2015

Label	Cognitive conflict
Definition	Following Jehn: ''task-oriented differences in judgment among group members, often manifested in 'disagreements about the content of the tasks being performed, including differences in viewpoints, ideas and opinions". (1995: 258)
Type of questions	5-point Likert scale
Classification	Frequency

The extent to which conflicts and disagreements emerged in the boardroom on:
1 Decisions to be taken during the board meetings
2 How to define what is the best for the firm
3 Decision processes
4 Firm's owners and stakeholders' interests

(*continued*)

14. Heemskerk *et al.*, 2015	
Label	Cognitive conflict
Definition	Following Jehn: ''conflicts about the content of the tasks to be performed because of differences in viewpoints, ideas, and opinions". (1995: 258)
Type of questions	7-point Likert scale
Classification	Cognition
1	The members of the board often have different opinions about important agenda items.
2	The members of the board look at the issues at hand from very different perspectives.
3	The members of the board reason in very different ways.

15. Ranasinghe *et al.*, 2015	
Label	Cognitive conflict
Definition	Following Jehn: ''the "disagreements about the content of the task being performed, including differences in viewpoints, ideas and opinions". (1995: 258)
Type of questions	7-point Likert scale
Classification	–

The items used were not reported and not provided after request. The study seems to discern both operationalizations of conflict as EXCC (frequency) and DEALCC (cognition): *"We measured CC using five items. Firstly, based on a priori criterion, we extracted one factor (CC), α = 0.790. We excluded two items due to the very low weightings. Secondly, based on the Eigen value criteria we extracted two factors, existence of cognitive conflicts (EXCC), α = 0.748 and dealing with cognitive conflicts (DEALCC), α = 0.791."*

16. Mostert *et al.*, 2015	
Label	Executive-board cognitive conflict
Definition	Following Jehn: "Disagreements related to the content of decisions and differences in viewpoints, ideas and opinions" (1995: 258).
Type of questions	7-point Likert scale
Classification	Frequency
1	How much conflict of ideas is there between the supervisory board and the management board?
2	How frequently do the supervisory board and the management board have job related disagreements?
3	How often do the supervisory board and the management board have differences of professional opinion?

17. Zona, 2016	
Label	Cognitive conflict
Definition	Following Jehn: '''Disagreements about the content of the tasks being performed, including differences in viewpoints, ideas and opinions'' (1995: 258).
Type of questions	7-point Likert scale
Classification	Frequency

Items asking whether in board discussions there are frequently

1	divergent opinions or ideas among directors;
2	conflict and disagreements on the content of discussion; and
3	conflict with regard to decisions to be taken.

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