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Contents

Editor's Letter

This issue of the *Nordic Journal of Business* includes two peer-reviewed articles. In the first article, Anna Rossi and Petri Sahlström examine the role of corporate cash holdings and expected future cash flows in equity issuance decisions. The second article by Kari Huhtala, Pasi Tuominen and Terhi Tuominen provides a systematic review of different factors of board governance in co-operative firms.

I hope you enjoy reading the interesting contributions featured in this issue of the *Nordic Journal of Business*.

Sami Vähämaa
Editor
Nordic Journal of Business

Cash Shortfall as a Predictor of Equity Issuance Decisions: The Role of Current Cash Holdings and Expected Future Cash Flows

Anna Rossi and Petri Sahlström

Abstract

This paper examines the role of cash shortfall components, namely existing cash holdings and expected future cash flows, in equity issue decisions. We find that the relation between cash shortfall and equity issue likelihood is attributable to the expected future cash flow component, whereas existing cash balance is not associated with the likelihood of equity issues. Furthermore, our findings indicate that cash-rich issuers receive more issue proceeds and retain a greater portion of these proceeds in their cash accounts. Results of our additional analyses indicate that target cash level considerations are important in explaining the documented regularities.

Keywords:

equity issues, cash holdings, cash shortfall

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1. Introduction

Why do firms issue equity? Myers and Majluf's (1984) pecking-order theory predicts that firms raise external capital when their internal funds are insufficient to finance valuable investment projects. In this framework, the answer to the question is that firms undertake equity issues primarily for immediate cash needs.[1, 2]

More recently, DeAngelo, DeAngelo and Stulz (2010) propose to empirically access the magnitude of immediate cash needs with a measure of cash shortfall – a probability of depletion of existing cash savings in the absence of capital raising. The cash shortfall measure reflects how well a firm can finance its planned expenditures with cash on hand. Employing the definition of cash needs similar to DeAngelo, DeAngelo and Stulz (2010), Huang and Ritter (2021) and McLean and Palazzo (2017) provide further evidence that cash squeeze is an economically important predictor of both debt and equity issues. While the measure of cash shortfall is intuitively appealing, its empirical validity has not been explored in the existing studies. Specifically, is the assumption that a firm would spend all of its existing cash holdings to cover its planned expenditures plausible?

In this study, we evaluate the empirical power of the cash shortfall measure by examining how its components – existing cash balance and expected cash flows – are related to equity issue policies. If both components represent the sources of liquidity considered by firms in their financing policies, we expect both higher expected cash flows and higher existing cash holdings to be associated with a lower probability of equity issue, and, conditional on an issue, with lower issue proceeds.

To test our hypotheses, we employ a sample of U.S. public equity issuers spanning the period of 1986-2014. As a first step, we estimate a logit model of equity issue probability, where we control for known determinants of equity issues and the two components of cash shortfall. The results of these tests show that the impact of cash shortfall on equity issue likelihood is driven entirely by the expected cash flow component of the cash shortfall, whereas there is no relation between pre-issue cash balance and the probability of equity issue. Next, we examine whether the two components explain the size of the equity issue. If issuers plan to match the issue proceeds to their cash shortfall, then, conditional on the issue, we expect both components of the cash shortfall to be inversely related to the amount of issue proceeds. In these tests, we again find that the expected cash flow is inversely related to the size of the equity issue, whereas pre-issue cash balance exhibits a positive association with the size of the equity issue – the opposite of what the "immediate cash needs" hypothesis predicts.

Finally, we perform several additional analyses to understand the drivers of the counter-intuitive results with respect to the cash holdings component of cash shortfall and the equity issue policies. First, we examine the savings rates of issue proceeds of equity issuers in the year

[1] Other prominent explanations for equity issue policies include market timing (e.g., Loughran and Ritter, 1995; Baker and Wurgler, 2002) and capital structure rebalancing (e.g., Shyam-Sunder and Myers, 1999; Welch, 2004; Leary and Roberts, 2005).

[2] Pecking order theory makes several other predictions with respect to corporate capital structure and financing choices. Perhaps the most well-known one is that companies should finance investment projects first with internal cash flows, then with debt and turn to equity financing only as a last resort. The central assumption underlying this prediction is an existence of information asymmetries between managers and potential capital providers, that leads to losses associated with capital raising. See for example, Shyam-Sunder and Myers (1999), Frank and Goyal (2003), Fama and French (2005) for a broader discussion on the predictions and implications of the pecking order theory, and Bharath, Pasquariello, and Wu (2009), Autore and Kovacs (2010), Akyol, Cooper, Meoli, and Vismara (2014), Cattaneo, Meoli, and Vismara (2015) for the role of information asymmetries in corporate financing policies.

of and several years following the issue. If equity issuers take into account their existing cash holdings while planning their expenditures, one would expect issuers with higher pre-issue cash holdings to dissipate the issue proceeds at a faster rate relative to issuers with lower pre-issue cash holdings. To test this prediction, we estimate saving rates of equity issue proceeds following the approach of McLean (2011), however, we fail to find evidence supportive of our predictions. In fact, the results indicate that equity issuers holding higher pre-issue cash reserves retain more of the issue proceeds in their cash accounts.

Another plausible explanation for why firms do not consider the existing cash holdings as a source of liquidity is because of their reluctance to deviate from their optimal cash ratios. To test for this explanation, we determine optimal and suboptimal levels of cash following the approach of Opler, Pinkowitz, Stulz, and Williamson (1999) and examine how each is related to our outcome variables. We find that the counterintuitive relations we document in the primary analysis are attributable to the optimal cash level, whereas the suboptimal component of the cash holdings generally behaves as predicted by the "immediate cash needs" hypothesis.

Taken together, our results suggest that after controlling for expected cash flows, existing cash holdings are not associated with the equity issue policies in the manner predicted by the "immediate cash needs" hypothesis. The results of additional analysis imply that the absence of predicted relations is driven by a company's target cash considerations.

Although our findings may seem counterintuitive at first glance, they are consistent with several studies showing that cash-rich companies prefer equity over cash in various corporate transactions such as compensating employees (Bergman and Jenter, 2007) and financing mergers and acquisitions (M&As) (Pinkowitz, Sturgess, and Williamson, 2013). Our results are also in line with Acharya, Davydenko and Strebulaev (2012), who document that, by contrast to common intuition that firms with larger cash holdings are 'safer', larger cash holdings are actually associated with higher levels of credit risk. Together with the results of these studies, our findings suggest that a reconsideration of the framework for corporate cash reserves as a source of corporate liquidity may be warranted.

Our study makes the following contributions to the literature. DeAngelo, DeAngelo and Stulz (2010) provide initial evidence on the importance of cash shortfall for equity issue decisions, while Huang and Ritter (2021) investigate the effect of cash shortfall on external financing decisions in a more comprehensive manner. We push forward this line of research by disaggregating the cash shortfall measure into the exiting cash holdings and expected cash flow components and, using a regression approach, test how each of the components is related to equity issue policies.

Our results suggest that the cash holdings component of the cash shortfall does not behave as predicted by the "immediate cash needs" hypothesis and thus imply that measuring cash needs with expected cash flows may be better suited to capturing the cash needs. Considering the contribution more broadly, our investigation helps to assess the reasonableness of several assumptions made in the related literature with respect to the consequences of ample cash holdings. For example, in Myers and Majluf's (1984) framework, financial slack allows firms to avoid external financing, implying that cash-rich companies should be less likely to issue. In a similar vein, Faulkender and Wang (2006) build some of their hypotheses on a premise that companies with higher cash holdings are less likely to access capital markets in the near future. In a parallel stream of literature on financial constraints, the existing cash balance is consid-

ered an alternative source of internal funds together with cash inflows.[3] Under this view, cash-rich firms are perceived as relatively unconstrained (Kaplan and Zingales, 1997; Kaplan and Zingales, 2000; Almeida, Campello, and Weisbach, 2004). However, studies such as Fazzari, Hubbard, and Petersen (1988), Fazzari, Hubbard, and Petersen (2000), and Hadlock and Pierce (2010) suggest that firms with more cash are actually more likely to be constrained. Overall, there is a disagreement in the existing literature on whether or not cash-rich companies are willing to deplete their cash reserves and whether they experience higher costs in accessing external markets. Studying the implications of cash holdings for equity issues sheds more light on this debate.

The remainder of the paper is organized as follows. Section 2 presents the decomposition of cash shortfall into a "stock" component and a "flow" component and develops hypotheses. Section 3 describes our sample selection procedure. Section 4 reports the main empirical results. Section 5 provides analyses of alternative explanations for the main results, while Section 6 reports robustness tests. Section 7 concludes the paper.

2. Disaggregation of cash shortfall and hypotheses development

In this section, we lay out the definition of the cash shortfall measure, decompose it into "stock" and "flow" components and develop hypotheses regarding the relationship between each of the components and equity issue policies. Prior research has adopted several approaches to the measurement of a firm's immediate cash needs. Early empirical research has focused primarily on the "flow" component. This component, also known as "financial deficit", is defined using the following cash flow statement identity:

$$DEFICIT = DIV_t + INVESTMENT_t + \Delta WC_t - ICF_t = \Delta D_t + \Delta E_t \quad (1)$$

where DIV_t = cash dividends; $INVESTMENT_t$ = net investments, including capital expenditures and acquisitions; ΔWC_t = net increase in working capital; ICF_t = internal operating cash flows after tax and interest; ΔD_t = net cash proceeds from debt issues; ΔE_t = net cash proceeds from equity issues.

The measure of financial deficit, first introduced by Shyam-Sunder and Myers (1999) and subsequently employed by Frank and Goyal (2003), Kayhan and Titman (2007), Lemmon and Zender (2010) and Bharath, Pasquariello, and Wu (2009), among others, is supposed to capture the cash needed to carry out operating activities and undertake investments.[4] Eq. (1) also implies that the imbalances in cash flows from operating and investing activities must be covered with cash proceeds from the issuance of external capital. Hence, due to the cash flow statement identity, *DEFICIT* can equivalently be viewed as net external funds raised.[5, 6]

[3] Financial constraints can be defined as a wedge between a firm's opportunity cost of internal capital and its cost of external capital (e.g., Farre-Mensa and Ljungqvist, 2015). This stream of literature investigates differences in companies' behavior facing different levels of financial constraints, thereby focusing on companies' actions undertaken to minimize the cost of external financing.

[4] Eq. (1) presents definition of DEFICIT following Frank and Goyal (2003).

[5] Some tests of capital structure theories employ a broader definition of deficit, which focuses on the financing side of the deficit identity and encompasses non-cash transactions, such as equity grants to employees or equity-financed acquisitions (e.g., Fama and French, 2005).

[6] The literature, which employs the *DEFICIT* measure, usually focuses on the corporate financing choice, i.e., the choice between raising debt or equity. Because this choice is not the focus of our discussion, we lump together the sources of external capital in explaining the cash need measures.

More recent studies add the "stock" component, i.e., existing cash holdings, to the measure of cash needs. DeAngelo, DeAngelo, and Stulz (2010, p. 287) note that "a firm with large current funds flow deficit and ample cash balances has no immediate need to raise outside capital". To evaluate the importance of issue proceeds for a firm's operating and financing policies, DeAngelo, DeAngelo, and Stulz (2010) calculate "pro forma" cash-to-asset ratio of issuing firms in the year after a seasoned equity offering (SEO) under an assumption that the firms did not receive the offer proceeds, but otherwise maintained all other non-SEO investment and financial decisions. Hence, the superiority of the cash shortfall measure over the *DEFICIT* stems from taking into account existing cash balances to gauge the extent to which a firm truly requires outside funds.

Huang and Ritter (2021) follow DeAngelo, DeAngelo, and Stulz (2010) to identify firms that are running out of cash by calculating the year-end hypothetical cash balance under the assumption of no external financing. Specifically, they define realized cash shortfall as:

$$CASH\ EX\ POST = CASH_{t-1} + NET\ CASH\ FLOW_t \quad (2)$$

where:

$CASH_{t-1}$ is the cash holdings at the beginning of the year;

$$NET\ CASH\ FLOW_t = ICF_t - INVESTMENT_t - \Delta\ NON\text{-}CASH\ WC_t - DIV_t, \quad (2a)$$

or, equivalently:

$$NET\ CASH\ FLOW_t = \Delta CASH_t - \Delta D_t - \Delta E_t. \quad (2b)$$

Note, that the *NET CASH FLOW* is a close counterpart of the *DEFICIT* measure described above. As demonstrated in Equations (1), (2a) and (2b), the only difference between *DEFICIT* and *NET CASH FLOW* stems from the treatment of cash change. Specifically, it is usually included in the *DEFICIT* as a part of the change in working capital, but is excluded from *NET CASH FLOW.*[7]

Eq. (2) demonstrates that the cash shortfall can be expressed as a function of pre-issue cash balance and net cash flows. Thus, if cash needs as measured by the cash shortfall are important in equity issue decisions, we expect both the flow component ($NET\ CASH\ FLOW_t$) and the stock components ($CASH_{t-1}$) of the cash shortfall to be associated with the equity issue probability.[8] Specifically, we form the following hypotheses:

Hypothesis 1a: Higher expected cash flows are associated with a lower likelihood of equity issue probability.

Hypothesis 1b: Higher existing cash holdings are associated with lower equity issue probability.

[7] However, depending on the purposes of analysis, change in cash is sometimes backed out from the DEFICIT as well (e.g., Denis and McKeon, 2012).

[8] In the main regression analysis, Huang and Ritter (2021) employ a measure of cash depletion, defined as an indicator variable equal one if net cash outflows exceed beginning-of-year cash balance, zero otherwise, and as such, represents a transformation of the cash shortfall measure in Eq. (2).

The theory assumes that the "flow" component of the cash shortfall is exogenous in the sense that it is the cash need that drives the decision to raise external financing. Yet, one can argue that the more firms raise, the more they spend. In other words, firms raising extra equity capital, for example, because of favorable market conditions, may undertake certain investment projects that they would not otherwise have taken. Likewise, firms can omit, cut back or delay certain investment projects if the costs of raising external funds prevent them from capital issuance. Due to the cash flow identity, the sources of funds and the uses of funds are determined contemporaneously, which leads to the reverse causality problem and potentially introduces a bias into the relation between cash shortfall and equity issuance decisions. To mitigate this problem, in some of the empirical tests, we use lagged values of cash flows to approximate the expected cash flows.

Next, if issuers expect to match the issue proceeds to their cash shortfall, conditional on an issue, we expect these components of the cash shortfall to be inversely related to the size of the issue proceeds. Specifically:

Hypothesis 2a. Conditional on equity issue, higher expected cash flows are associated with lower equity issue proceeds.

Hypothesis 2b. Conditional on equity issue, higher existing cash balances are associated with lower equity issue proceeds.

3. Sample selection

We start our sample selection by obtaining annual financial data from Compustat and stock market data from the Center for Research in Security Prices (CRSP) for the period 1987 to 2014. The choice of the first year of our sample is motivated by the introduction in 1987 of the standardized format for reporting of cash flow statements (Statement of Financial Accounting Standards (SFAS) #95), which facilitates precise measurement of variables employing cash flow statement information. We lose the first and the last years of our sample due to the requirement of availability of lagged and one-year-ahead variables. To select equity issues, we apply the following screens. First, we exclude financial and utility companies (2-digit SIC codes 49 and 60-69), because they are subject to regulatory forces. Second, we remove observations with negative values of book equity and observations lacking the necessary information for our main empirical tests. Companies with negative book values are removed since those companies are in deep financial distress and their accounting numbers are not necessarily reflecting correctly going concern principles behind the financial reporting rules.

To identify equity issue years, we select firm-years in which cash proceeds from equity issues reported in cash flow statements exceed 5% of the beginning total assets. We remove observations where equity issue proceeds are small relative to total assets in order to reduce potential noise associated with cash inflows resulting from stock option exercises.[9] Applying these screens, we identify 13,033 equity issues during 1988-2013. Details of our sample selection procedure are presented in Table 1.

[9] The 5% threshold was used, for example, in studies modeling likelihood of debt versus equity issues (e.g., Hovakimian, Opler, and Titman, 2001; Chang, Dasgupta, and Hilary, 2006; Leary and Roberts, 2010). Our subsequent results are also robust to identifying equity issuers as those whose issue proceeds exceed both 5% of beginning total assets and 3% of beginning market value (McKeon, 2015) and to identifying equity issuers using SDC Platinum database.

Table 1 Sample selection

All firm-year observations in Compustat over 1987–2014 with non-missing CRSP and Compustat identifiers	178,682
Less:	
Firms in financial and regulated utility industries (2-digit SIC-codes 49 and 60-69)	(60,136)
Negative values of shareholder's equity and missing values of variables used in the main empirical analysis ($LOGAT_{t-1}$, MB_{t-1}, RET_{t-1}, RET_{t-1}, $FIRM\_AGE_{t-1}$, $CASH\_STOCK_{t-1}$, $CASH\_FLOW_{t-1}$, $CASH\_FLOW_t$, EQ_ISS_t, DIF_CASH_t, OCF_t, $DEBT\_ISS_t$, $OTHER_t$)	(35,043)
Sample of firms used in regressions modelling probability of an equity issue	**83,498**
Less:	
Observations where gross equity issue proceeds are less than 5% of beginning total assets	(70,465)
The final sample of equity issues	**13,033**

Notes: The table illustrates our sample selection procedure.

Along with the information on equity issue and cash shortfall, we retrieve information necessary to construct control variables in models of equity issue probability, equity issue size and cash savings. Definitions of all variables are presented in Appendix A. We winsorize all continuous variables at the top and bottom 1% levels to mitigate the impact of outliers.

Table 2 reports summary statistics of all variables used in the empirical analysis both in the full sample, which includes both equity issuers and non-issuers (Panel A) and the sample limited exclusively to equity issuers (Panel B).

Table 2 Summary statistics of variables used in the empirical analysis

PANEL A: FULL SAMPLE								
Variable	N	Mean	Min	Q1	Median	Q3	Max	Std Dev
EQ_ISS_t	83,498	0.07	0.00	0.00	0.00	0.02	1.50	0.22
RET_{t+1}	83,498	0.05	-0.94	-0.34	-0.06	0.24	3.34	0.67
RET_{t-1}	83,498	0.06	-0.92	-0.33	-0.06	0.25	3.45	0.68
MB_{t-1}	83,498	3.15	0.30	1.20	1.99	3.46	26.69	3.84
$LOGAT_{t-1}$	83,498	5.46	1.47	3.89	5.30	6.87	10.81	2.10
$CASH\_FLOW_{t-1}$	83,498	-0.07	-1.51	-0.11	-0.01	0.05	0.35	0.27
$CASH\_FLOW_t$	83,498	-0.06	-1.32	-0.10	0.00	0.06	0.34	0.24
$CASH\_STOCK_{t-1}$	83,498	0.19	0.00	0.03	0.10	0.27	0.91	0.22
$FIRM\_AGE_{t-1}$	83,498	12.89	2.00	7.00	13.00	20.00	20.00	6.18
OCF_t	83,498	0.05	-0.77	0.01	0.08	0.14	0.43	0.18
OCF_{t-1}	83,498	0.05	-0.79	0.01	0.08	0.15	0.45	0.18
$INVCF_t$	83,498	-0.10	-1.07	-0.14	-0.06	-0.02	0.35	0.19
$DVCF_t$	83,498	0.01	0.00	0.00	0.00	0.01	0.13	0.02
$INVCF_{t-1}$	83,498	-0.12	-1.22	-0.15	-0.07	-0.02	0.34	0.21
$DVCF_{t-1}$	83,498	0.01	0.00	0.00	0.00	0.01	0.13	0.02

PANEL B: SAMPLE OF EQUITY ISSUERS								
Variable	N	Mean	Min	Q1	Median	Q3	Max	Std Dev
EQ_ISS_t	13,033	0.45	0.05	0.09	0.21	0.52	4.00	0.66
RET_{t+1}	13,033	-0.05	-1.04	-0.51	-0.20	0.17	3.91	0.77
RET_{t-1}	13,033	0.33	-0.97	-0.35	0.04	0.56	6.34	1.17
MB_{t-1}	13,033	6.31	0.45	1.98	3.52	6.68	62.23	8.94
$LOGAT_{t-1}$	13,033	4.31	1.13	2.89	4.10	5.53	9.18	1.85
$CASH\_FLOW_{t-1}$	13,033	-0.26	-2.62	-0.37	-0.11	0.01	0.38	0.47
$CASH\_FLOW_t$	13,033	-0.35	-3.02	-0.49	-0.19	-0.03	0.37	0.55
$CASH\_STOCK_{t-1}$	13,033	0.29	0.00	0.05	0.20	0.48	0.96	0.28
$FIRM\_AGE_{t-1}$	13,033	9.85	2.00	5.00	8.00	14.00	20.00	5.50
DIF_CASH_t	13,033	0.21	-0.47	-0.01	0.05	0.26	2.97	0.50
$DEBT\_ISS_t$	13,033	0.15	0.00	0.00	0.00	0.12	2.10	0.34
OCF_t	13,033	-0.10	-1.63	-0.25	0.00	0.13	0.55	0.37
$OTHER_t$	13,033	0.05	0.00	0.00	0.00	0.01	1.16	0.18
$INVCF_t$	13,033	-0.25	-2.49	-0.32	-0.12	-0.03	0.44	0.43
$DVCF_t$	13,033	0.01	0.00	0.00	0.00	0.00	0.11	0.02
OCF_{t-1}	13,033	-0.09	-1.58	-0.23	0.00	0.12	0.53	0.35
$INVCF_{t-1}$	13,033	-0.16	-1.82	-0.22	-0.08	-0.01	0.50	0.33
$DVCF_{t-1}$	13,033	0.00	0.00	0.00	0.00	0.00	0.11	0.02
RD_t	12,466	1.95	0.00	0.00	0.05	0.23	76.03	9.28
$INDSIGMA_t$	13,024	0.15	0.04	0.11	0.14	0.18	0.26	0.05

Notes: The table displays summary statistics of variables used in the empirical analysis. Panel A contains summary statistics of variables in the sample, which includes both equity issuers and non-issuers, while Panel B reports summary statistics of variables in the sample of equity issuers. All of the variables are defined in Appendix A.

As reported in Panel B, equity issuers experience a stock price run-up in the year preceding the equity issue and negative stock returns in the year following the issue– a pattern consistent with Loughran and Ritter (1995). Additionally, a median issuer is 8 years old and experiences negative cash flows in both the year of issue and the preceding year ($CASH\_FLOW_t$ = -0.19 and $CASH\_FLOW_{t-1}$ = -0.11). Comparison of mean and median values in panels A and B reveal further differences between issuers and non-issuers. Specifically, issuers as smaller, younger and have better investment opportunities, as captured by the values of $LOGAT_{t-1}$, $FIRM\_AGE_{t-1}$ and MB_{t-1}, respectively. Importantly, equity issuers experience more negative cash flows, yet hold larger cash balances (mean $CASH\_STOCK_{t-1}$ = 0.29 in Panel B) relative to the full sample of issuers and non-issuers (mean $CASH\_STOCK_{t-1}$ = 0.19 in Panel A).

4. Empirical specification and main multivariate results

4.1 Probability of equity issue

To test Hypothesis 1a and Hypothesis 1b, we follow the approach of DeAngelo, DeAngelo, and Stulz (2010) and estimate the probability of an equity issue as a function of market-to-book ratio, market-adjusted stock returns over prior and subsequent years, and the numbers of years listed. We further augment this baseline model with components of cash shortfall, namely, beginning-of-year cash-to-asset ratio and cash flows as defined in Eq. (2). Unlike DeAngelo, DeAngelo, and Stulz (2010), who include past and future 36-month market-adjusted stock returns, we use one-year-lagged and one-year-ahead market-adjusted returns in order to minimize loss of observations and control for firm size using a natural logarithm of total assets at the beginning of the equity issue year. Specifically, we estimate the following logit regression:

$$Prob(EQ\ ISS=1)_t = \beta_0 + \beta_1 LOGAT_{t-1} + \beta_2 MB_{t-1} + \beta_3 RET_{t+1} + \beta_4 RET_{t-1} + \beta_5 FIRM\_AGE_{t-1} + \beta_6 CASH\_STOCK_{t-1} + \beta_7 CASH\_FLOW_t + INDUSTRY + YEAR \quad (3)$$

where the dependent variable takes a value of one if the gross equity issue constitutes more than 5% of the beginning total assets, and zero otherwise. The right-hand side variables are defined in Appendix A. The model includes yearly and industry fixed effects, and the standard errors are double-clustered by firm and year.

Table 3 Results of logit regression of equity issue probability

	(1)	(2)	(3)	(4)
MB_{t-1}	0.094 (0.00)	0.102 (0.00)	0.095 (0.00)	0.101 (0.00)
$LOGAT_{t-1}$	-0.203 (0.00)	-0.269 (0.00)	-0.179 (0.00)	-0.203 (0.00)
RET_{t+1}	-0.155 (0.00)	-0.206 (0.00)	-0.148 (0.00)	-0.204 (0.00)
RET_{t-1}	0.225 (0.00)	0.265 (0.00)	0.241 (0.00)	0.341 (0.00)
$FIRM\_AGE_{t-1}$	-0.056 (0.00)	-0.060 (0.00)	-0.053 (0.00)	-0.058 (0.00)
$CASH\_STOCK_{t-1}$	-0.119 (0.65)	0.281 (0.34)	-0.242 (0.33)	0.086 (0.69)
$CASH\_FLOW_{t}$	-3.307 (0.00)			
$CASH\_FLOW_{t-1}$		-1.062 (0.00)		
OCF_{t}			-3.874 (0.00)	
$INVCF_{t}$			-3.430 (0.00)	
$DVCF_{t}$			-0.046 (0.99)	
OCF_{t-1}				-2.254 (0.00)
$INVCF_{t-1}$				-0.540 (0.03)
$DVCF_{t-1}$				-3.921 (0.23)
Pseudo *R*-squared	0.2712	0.2070	0.2754	0.2174
Number of observations	83,498	83,498	83,498	83,498

Notes: This table shows the results of a logit regression modeling a probability of equity issue following DeAngelo, DeAngelo, and Stulz (2010). Coefficients on intercept and indicator variables for year and industry are not shown. Standard errors are clustered by firm and year. The numbers reported in parentheses are p-values. All variables are defined in Appendix A.

The results of estimating Eq. (3) are reported in Table 3. The first column shows the regression results with cash shortfall decomposed into pre-issue cash balance and concurrent cash flows. In this specification, we find a negative relation between the "flow" component ($CASH\_FLOW_t$) and the probability of issue and an insignificant relation between the "stock" ($CASH\_STOCK_{t-1}$) component and the probability of issue. In column 2 of Table 3, we use cash flows lagged by one year as a proxy for the expected "flow" component ($CASH\_FLOW_{t-1}$) of the cash shortfall to address a potential simultaneity between equity issue decision and the concurrent cash flows. We further address this potential problem in the robustness check section by replacing cash flow variable with lagged earnings, dividends and depreciation and amortization variables. In this specification, while the expected flow component remains a significant predictor of equity issue, the estimated coefficient on $CASH\_STOCK_{t-1}$ is again not statistically different from zero. When it comes to other control variables, their sign and magnitude are in line with those

reported in DeAngelo, DeAngelo, and Stulz (2010). Specifically, market-to-book ratio and past stock returns are positively related to the probability of equity issue, while firm size, future stock returns and firm age are negatively related to the probability of equity issue. We further address a potential simultaneity between equity issue decision and the concurrent cash flows in the robustness check section by replacing the cash flow variable with lagged earnings, dividends, and depreciation & amortization variables.

In columns 3 and 4 of Table 3, we further disaggregate cash flows into components, namely operating cash flows, investing cash flows and cash dividends, in order to find out whether the coefficient on $CASH\_STOCK_{t-1}$ is affected by alternative definitions of expected cash flows. Column 3 shows the results of estimating this specification with $CASH\_FLOW_t$ further decomposed into cash flows from operating activities (OCF_t), cash flows from investing activities ($INVCF_t$) and cash dividend payments ($DVCF_t$).[10] Column 4 reports the results of the regression, in which lagged cash flows ($CASH\_FLOW_{t-1}$) are disaggregated accordingly. The results show that operating and investing cash flows (OCF_t and $INVCF_t$ in column 3 and OCF_{t-1} and $INVCF_{t-1}$ in column 4) are inversely related to the probability of an equity issue. The coefficient on the cash dividend component is insignificant in both columns, which may be related to the fact that dividend payment status itself captures lifecycle considerations or financial constraints (DeAngelo, DeAngelo, and Stulz, 2010; Fazzari, Hubbard, and Petersen, 1988). Similar to the results reported in the first two columns, the coefficient on pre-issue cash balance ($CASH\_STOCK_{t-1}$) is not statistically different from zero.

Taken together, the results reported in Table 3 suggest that after having controlled for alternative proxies of expected cash flows and other determinants of equity issues, the cash balance component of the cash shortfall does not have a predictive ability for equity issue likelihood.

4.2 Equity issue size

We next turn to an investigation of the relationship between components of cash shortfall and equity issue size. Specifically, using only equity issue observations, we test Hypothesis 2a and Hypothesis 2b by estimating the following OLS regression model:

$$EQ\_ISS_t = \beta_0 + \beta_1 LOGAT_{t-1} + \beta_2 MB_{t-1} + \beta_3 RET_{t+1} + \beta_4 RET_{t-1} + \beta_5 FIRM\_AGE_{t-1} + \beta_6 CASH\_STOCK_{t-1} + \beta_7 CASH\_FLOW + IND + YEAR \quad (4)$$

where the dependent variable is equal to equity issue proceeds deflated by the beginning total assets. The right-hand-side variables are defined in Appendix A. The model includes yearly and industry fixed effects, and standard errors are clustered by firm.

When estimating Eq. (4), we include the same set of control variables as in the logit regression of equity issue probability (Eq. (3)), because the size of equity issue is likely to be determined by similar factors as equity issue decisions. For example, equity issue size can reflect

[10] The cash flow from operating activities corresponds to the sum of internal cash flows (ICF_t) and changes in working capital ($\Delta NON\text{-}CASH\ WC_t$) discussed in Section 2.

timing behavior, because firms are better off issuing a larger amount when the market conditions are favorable (e.g., Chang, Dasgupta, and Hilary, 2006). Stock returns surrounding the equity issue years and market-to-book ratios are suitable candidates to control for market timing motives (Loughran and Ritter, 1995; Loughran and Ritter, 1997; Baker and Wurgler, 2002). Further, companies facing higher issue costs are likely to make larger equity issues. Therefore, smaller firms, whose issue costs are higher in relative amounts, should have stronger incentives to make larger issues, implying an inverse relation between firm size and the amount of equity issue proceeds.

Table 4 Results of OLS regression of equity issue size

	(1)	(2)	(3)	(4)
MB_{t-1}	0.004 (0.00)	0.012 (0.00)	0.004 (0.00)	0.010 (0.00)
$LOGAT_{t-1}$	-0.039 (0.00)	-0.091 (0.00)	-0.036 (0.00)	-0.069 (0.00)
RET_{t+1}	-0.005 (0.29)	-0.033 (0.00)	-0.005 (0.38)	-0.032 (0.00)
RET_{t-1}	0.022 (0.00)	0.036 (0.00)	0.026 (0.00)	0.054 (0.00)
$FIRM\_AGE_{t-1}$	0.000 (0.82)	-0.003 (0.00)	0.000 (0.78)	-0.004 (0.00)
$CASH\_STOCK_{t-1}$	0.061 (0.01)	0.284 (0.00)	0.043 (0.05)	0.233 (0.00)
$CASH\_FLOW_{t}$	-0.800 (0.00)			
$CASH\_FLOW_{t-1}$		-0.165 (0.00)		
OCF_{t}			-0.854 (0.00)	
$INVCF_{t}$			-0.777 (0.00)	
$DVCF_{t}$			1.125 (0.00)	
OCF_{t-1}				-0.417 (0.00)
$INVCF_{t-1}$				0.020 (0.31)
$DVCF_{t-1}$				0.902 (0.00)
Adj. *R*-squared	0.5832	0.2474	0.5749	0.2662
Number of observations	13,033	13,033	13,033	13,033

Notes: This table reports the results of an OLS regression modeling size of equity issue proceeds. The dependent variable is proceeds from equity issues scaled by lagged total assets. The sample used includes only firms with equity issues in excess of 5% of lagged total assets. Coefficients on intercept and indicator variables for year and industry are not reported. Standard errors are clustered at the firm level. The numbers reported in parentheses are p-values. All variables are defined in Appendix A.

The results of estimating Eq. (4) are presented in Table 4. The table follows the same logic as Table 3, i.e., the first column contains concurrent cash flows, the second column contains lagged cash flows, and in the last two columns, these cash flow measures are decomposed into cash flow from operating activities, cash flow from investing activities and cash dividend payments.

Similar to the results reported in Table 3, the results reported in Table 4 show that cash flows, either lagged or current, are significantly negatively associated with the size of equity issue proceeds. In turn, the size of equity issue proceeds actually increases with the beginning cash balance, as indicated by the positive coefficients on $CASH\_STOCK_t$ varying from 0.043 to 0.284, opposite to the "immediate cash needs" hypothesis. Other results indicate that lagged investment is a poor predictor of future cash needs, as $INVCF_{t-1}$ in column 4 is not statistically significant. Overall, this analysis implies that cash-rich issuers do not behave as if they take into account their existing cash holdings in planning their equity issues.

5. Alternative explanations and additional analysis

The analysis so far indicates that companies do not act in their equity issue policies as if they consider their existing cash balances as a source of liquidity. To further understand what drives these results, we perform several additional analyses. First, we investigate whether pre-issue cash holdings of equity issuers are related to retention patterns of their equity proceeds in the year of or years after the issue. In the second set of tests, we investigate whether optimal cash considerations explain our main findings.

5.1 Cash needs and cash savings of equity issuers

If issuers consider their existing cash balances in planning their investment policies, one would expect issuers with higher pre-issue cash holdings to dissipate the issue proceeds at a faster rate relative to issuers with lower pre-issue cash holdings. Evidence of the substantial cash expenditures of issue proceeds would thus explain a positive association between pre-issue cash holdings and the amount of issue proceeds. To address this question, we estimate an issuance-saving regression model of McLean (2011) augmented with an interaction between equity issue proceeds and pre-issue cash balance:

$$DIF\_CASH_t = \beta_0 + \beta_1 EQ\_ISS_t + \beta_2 CASH\_STOCK_{t-1} + \beta_3 EQ\_ISS_t \times CASH\_STOCK_{t-1} + \beta_4 OCF_t + \beta_5 DEBT\_ISS_t + \beta_6 OTHER_t + \beta_7 LOGAT_{t-1} + IND + YEAR \quad (5)$$

The variables from Eq. (5) are defined in Appendix A. When estimating this model, we limit our sample to equity issue years with *t* denoting the year of issue.

Table 5 Results of estimating equity issuance-cash savings relation

	(1)	(2)	(3)	(4)	(5)
EQ_ISS_t	0.607 (0.00)	0.626 (0.00)	0.604 (0.00)	0.481 (0.00)	0.507 (0.00)
$CASH\_STOCK_{t-1}$	-0.099 (0.00)	-0.095 (0.00)	-0.061 (0.00)	-0.070 (0.00)	-0.036 (0.08)
$EQ\_ISS_t * CASH\_STOCK_{t-1}$	0.227 (0.00)	0.210 (0.00)	0.189 (0.00)	0.174 (0.00)	0.133 (0.00)
OCF_t	0.555 (0.00)	0.562 (0.00)	0.542 (0.00)	0.558 (0.00)	0.551 (0.00)
$DEBT\_ISS_t$	0.087 (0.00)	0.093 (0.00)	0.080 (0.00)	0.090 (0.00)	0.090 (0.00)
$OTHER_t$	0.050 (0.03)	0.046 (0.04)	0.043 (0.05)	0.050 (0.02)	0.039 (0.08)
$LOGAT_{t-1}$	-0.011 (0.00)	-0.009 (0.00)	-0.010 (0.00)	-0.011 (0.00)	-0.009 (0.00)
$DVCF_t$		-0.287 (0.26)			-0.218 (0.41)
$EQ\_ISS_t * DVCF_t$		-3.066 (0.00)			-3.283 (0.00)
RD_t			-0.002 (0.00)		-0.002 (0.00)
$EQ\_ISS_t * RD_t$			0.002 (0.00)		0.001 (0.01)
$INDSIGMA_t$				-0.085 (0.56)	0.103 (0.49)
$EQ\_ISS_t * INDSIGMA_t$				0.948 (0.00)	0.877 (0.00)
Adj. *R*-squared	0.6864	0.6906	0.6699	0.6896	0.6774
Number of observations	13,033	13,033	12,466	13,024	12,457

Notes: This table reports the results of an OLS regression modeling the cash saving rates of equity issuers. The dependent variable is the difference in cash during the year scaled by lagged total assets. The sample only includes firms with equity issues in excess of 5% of lagged total assets. Coefficients on intercept and indicator variables for year and industry are not reported. Standard errors are clustered at the firm level. The numbers reported in parentheses are p-values. All variables are defined in Appendix A.

The results of estimating Eq. (5) are reported in Table 5. The results reported in column 1 show that cash-rich issuers tend to retain more cash from issue proceeds (the coefficient on EQ_ISS_t*-$CASH\_STOCK_{t-1}$ = 0.227, p-value<0.00). This finding does not support the notion that existing cash balance is considered by the equity issuers in spending of their equity issue proceeds. McLean (2011) argues that saving issue proceeds reflects precautionary motives and provides evidence that post-issue cash savings rates vary cross-sectionally with proxies for precautionary motives. One concern with our findings is that the pre-issue cash balance in itself can capture some dimension of precautionary considerations. For example, as argued by Fazzari, Hubbard, and Petersen (2000), the more financially constrained a firm is, the greater its incentive to accumulate cash. To address this concern, we augment Eq. (5) with proxies for precautionary motives as advocated by McLean (2011). Specifically, we interact EQ_ISS_t with dividend payments, R&D expenditures

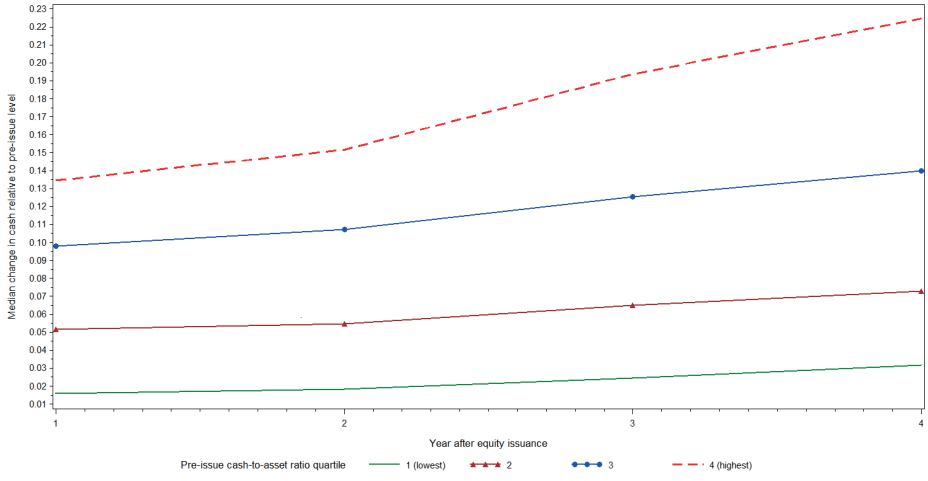
and industry cash flow variance.[11] The results of these specifications are reported in columns 2-5 of Table 5. The results show that cash-rich companies tend to retain more equity issue proceeds even after controlling for the precautionary motives for cash savings identified by McLean (2011).

With respect to interaction variables, the direction of coefficients on interaction variables capturing precautionary motives is similar to the one reported in McLean (2011). We note that the magnitude of some coefficients is different because we focus on economically significant equity issues, whereas McLean's sample includes all firm-years available in Compustat and, as such, may contain noise related to passive equity issues associated with the exercise of stock options.

A potential explanation for the higher rates of cash retention of cash-rich firms is that these companies may need more cash to finance their anticipated expenditures in the years subsequent to the issue. These planned investment outlays may explain the issue decisions of cash-rich companies. To investigate this possibility, we first examine the time trends in the cash-saving patterns of equity issuers by grouping the equity issuers into quartiles according to their pre-issue cash-to-asset ratios and tracking the evolution of changes in cash in each of these groups over the next four years. We deflate the cash change each year by the total assets in the pre-issue year. If cash-rich issuers use their cash reserves in the years following the issue, one would expect to observe sharper reversals of cash increases in companies with the highest pre-issue cash ratios over time.

Figure 1 plots median changes in cash deflated by pre-issue total assets in years 1 through 4 after the equity issue year for groups of companies sorted by pre-issue cash-to-asset ratios.

Figure 1 Cash saving rates of equity issuers over long horizons



Notes: The figure shows the median cumulative change in cash over the course of four years following equity issues relative to pre-issue cash deflated by pre-issue total assets in companies grouped by a pre-issue cash-to-asset ratio. Each year, we compute the change in cash as (Casht – Cash0)/Assets0 for t=1, 2, 3, 4. Equity is issued in year 1.

[11] While McLean (2011) measures R&D expenditures and dividend variables as continuous variables, one concern with this measurement approach is that these variables are themselves outcomes of the accounting system and hence may capture the effect of associated cash flows instead of proxying for precautionary motives. To partially address these concerns, we alternatively measure R&D expenditures and dividend payments as indicator variables equal to one, if the corresponding amount is greater than zero, and zero otherwise. Our results are unaffected by this modification.

Figure 1 is not consistent with the argument that cash-rich firms deplete their cash reserves in the long run. In fact, the figure shows that cash savings of the cash-richest firms also continue to increase more dramatically after the equity issue year relative to issuers holding less cash. For example, a change in cash reserves of equity issuers in the upper quartile of pre-issue cash-to-asset ratio grows from approximately 14% to 22% of the pre-issue asset level between the first and the fourth year after the issue. The corresponding difference is virtually non-existent for the issuers in the lowest quartile of the pre-issue cash-to-asset ratio.

To further investigate this question in a multivariate setting, we follow Kim and Weisbach (2008) and estimate the issuance-saving regression (Eq. (5)) using change in cash over a 2-, 3-, and 4-year horizon following the equity issue year. In this specification, we accumulate other flow variables from the right-hand side of Eq. (5) (equity issue proceeds, debt issue proceeds, operating cash flows, and other cash flows) over the same time windows to correspond to the change in cash. *CASH_STOCK* and *LOGAT* are measured at the pre-issue level and denoted with the subscript *0*. The results are presented in Table 6.

Table 6 Cash savings of equity issuers over long horizons

	(1) T=2	(2) T=3	(3) T=4
EQ_ISS_t	0.504 (0.00)	0.422 (0.00)	0.388 (0.00)
$CASH\_STOCK_0$	-0.222 (0.00)	-0.335 (0.00)	-0.365 (0.00)
$EQ\_ISS_t * CASH\_STOCK_0$	0.220 (0.00)	0.235 (0.00)	0.175 (0.00)
OCF_t	0.430 (0.00)	0.366 (0.00)	0.301 (0.00)
$DEBT\_ISS_t$	0.032 (0.04)	0.009 (0.56)	-0.005 (0.74)
$OTHER_t$	0.049 (0.01)	0.088 (0.00)	0.090 (0.31)
$LOGAT_0$	-0.007 (0.04)	-0.011 (0.03)	-0.007 (0.31)
Adj. *R*-squared	0.6448	0.6059	0.5644
Number of observations	12,971	11,695	10,577

Notes: This table reports the results of an OLS regression modeling retention of equity issue proceeds of equity issuers over a 2-, 3- and 4-year period following issuance. The dependent variable is the change in cash relative to pre-issue cash level scaled by pre-issue total assets. The flow right-hand-side variables (EQ_ISS_t, OCF_t, $DEBT\_ISS_t$, $OTHER_t$) are aggregated over the same period as the dependent variable. Subscript *0* denotes pre-issue levels. Coefficients on intercept and indicator variables for year and industry are not reported. Standard errors are clustered at the firm level. The numbers reported in parentheses are *p*-values. All variables are defined in Appendix A.

Due to attrition, sample sizes vary by the length of the period over which we measure cash changes. Overall, the results reported in Table 6 suggest that cash increases continue to persist in cash-rich companies in the years following the issue as the interaction variable $EQ\_ISS_t * CASH\_STOCK_0$ is significantly positive in each of the three columns. This implies that such companies use equity issues as a part of their cash accumulation strategy.

5.2 Target cash levels

The literature on cash holdings determinants (see, e.g., Opler, Pinkowitz, Stulz, and Williamson, 1999; Bates, Kahle, and Stulz, 2009) posits that firms may choose to hold higher cash reserves because it serves as a buffer against adverse cash flow shocks (precautionary motive) and because it saves transaction costs (transaction motive). The downsides of higher cash holdings include a lower rate of return, tax disadvantages and agency costs of free cash flows, among others (Opler, Pinkowitz, Stulz, and Williamson, 1999).

Thus, rather than simply reflecting resources being freely available for operating and investment needs, a firm's existing cash balances may be a result of the firm's optimal choice determined by trading off the costs and benefits of cash holdings. Under this view, firms may be unwilling to deploy their existing cash holdings because such actions will result in a distortion of the trade-off and movement away from the target balance. Hence, a firm lacking cash for operations and investments may prefer to raise financing from external markets rather than spend its optimal cash. Conversely, the suboptimal portion of the observed cash levels should be more discretionary and, consequently, the relations predicted by the "immediate cash needs" hypothesis should hold primarily with respect to the suboptimal portion, as opposed to the optimal cash level.

To test for the possible differential relation between optimal and suboptimal portions of the observed cash levels and equity issue policies, we first estimate a model of optimal cash holdings following Opler, Pinkowitz, Stulz, and Williamson (1999) and Bates, Kahle, and Stulz (2009), described further in Appendix B. We next investigate how lagged residuals and lagged fitted values from this model (our estimates of suboptimal and target cash) are related to equity issue probability and size. The results of these tests are presented in Table 7 and Table 8.

Table 7 Relation between optimal and suboptimal cash and equity issue likelihood

	(1)	(2)	(3)	(4)
MB_{t-1}	0.094 (0.00)	0.098 (0.00)	0.097 (0.00)	0.105 (0.00)
$LOGAT_{t-1}$	-0.176 (0.00)	-0.194 (0.00)	-0.220 (0.00)	-0.262 (0.00)
RET_{t+1}	-0.163 (0.00)	-0.161 (0.00)	-0.218 (0.00)	-0.220 (0.00)
RET_{t-1}	0.213 (0.00)	0.217 (0.00)	0.263 (0.00)	0.274 (0.00)
$FIRM\_AGE_{t-1}$	-0.053 (0.00)	-0.057 (0.00)	-0.056 (0.00)	-0.062 (0.00)
$CASH\_STOCK\_OPT_{t-1}$	0.890 (0.07)		1.779 (0.00)	
$CASH\_STOCK\_SUBOPT_{t-1}$		-0.733 (0.00)		-0.552 (0.03)
$CASH\_FLOW_{t}$	-3.434 (0.00)	-3.539 (0.00)		
$CASH\_FLOW_{t-1}$			-1.182 (0.00)	-1.219 (0.00)
Pseudo *R*-squared	0.2602	0.2605	0.1985	0.1940
Number of observations	66,757	66,757	66,757	66,757

Notes: This table shows the results of a logit regression modeling probability of equity issue following DeAngelo, DeAngelo, and Stulz (2010). Coefficients on intercept and indicator variables for year and industry are not shown. Standard errors are clustered by firm and year. The numbers reported in parentheses are *p*-values. All variables are defined in Appendix A.

Table 8 Relation between optimal and suboptimal cash and equity issue size

	(1)	(2)	(3)	(4)
MB_{t-1}	0.006 (0.00)	0.007 (0.00)	0.013 (0.00)	0.015 (0.00)
$LOGAT_{t-1}$	-0.029 (0.00)	-0.035 (0.00)	-0.060 (0.00)	-0.079 (0.00)
RET_{t+1}	-0.013 (0.02)	-0.013 (0.02)	-0.041 (0.00)	-0.043 (0.00)
RET_{t-1}	0.018 (0.00)	0.020 (0.00)	0.032 (0.00)	0.037 (0.00)
$FIRM\_AGE_{t-1}$	0.000 (0.56)	0.000 (0.80)	-0.003 (0.00)	-0.004 (0.00)
$CASH\_STOCK\_OPT_{t-1}$	0.226 (0.00)		0.629 (0.00)	
$CASH\_STOCK\_SUBOPT_{t-1}$		-0.057 (0.06)		0.013 (0.76)
$CASH\_FLOW_{t}$	-0.759 (0.00)	-0.772 (0.00)		
$CASH\_FLOW_{t-1}$			-0.146 (0.00)	-0.164 (0.00)
Adj. *R*-squared	0.5834	0.5770	0.2595	0.2390
Number of observations	9,509	9,509	9,509	9,509

Notes: This table reports the results of an OLS regression modeling size of equity issue proceeds of equity issuers. The dependent variable is proceeds from equity issues scaled by lagged total assets. The sample includes only firms with equity issues in excess of 5% of lagged total assets. Coefficients on intercept and indicator variables for year and industry are not reported. Standard errors are clustered at the firm level. The numbers reported in parentheses are *p*-values. All variables are defined in Appendix A.

As reported in Table 7, the relations between the two portions of the total cash holdings and our outcome variables are of different signs. Specifically, Columns 2 and 4 of Table 7 show that the suboptimal portion of cash is significantly negatively related to equity issue probability, in line with the "immediate cash needs" hypothesis. Similarly, there is some evidence that the relationship between suboptimal cash level and equity issue size is also weakly negative (Table 8, Column 2). In turn, the positive relationship between total cash balance and equity issue size documented earlier is largely attributable to the "target" cash, i.e., the portion of cash predicted by the cost-and-benefit tradeoff. In summary, these results provide support for the "immediate cash needs" hypothesis with respect to the suboptimal portion of total cash holdings.

Our interpretation of these results is that certain characteristics affect a firm's preferences for target cash holdings, which, in turn, drive the relation between pre-issue observed cash holdings and equity issue policies. Taken together, the results reported in this section imply that firms do not view their existing cash reserves as an unrestricted liquidity cushion, but are affected by target cash considerations when planning their financing policies.

6. Robustness tests

6.1 Alternative empirical proxies

To assess the robustness of our results, we employ several alternative definitions of the primary variables used in our regression analysis. First, we replicate our tests using net instead of gross equity and debt issues. That is, we subtract equity repurchases from equity issues and debt repurchases from debt issues to construct our *EQ_ISS* and *DEBT_ISS* measures. Second, we define *CASH_STOCK* using total assets net of cash as a deflator. Third, we rerun our empirical tests using a cash richness indicator variable, which we set equal to one if lagged cash-to-asset ratio exceeds our sample median, and to zero otherwise. Fourth, to alleviate a potential spurious correlation between lagged cash and our dependent variables, we use a twice-lagged cash-to-asset ratio in place of a lagged cash-to-asset ratio in our empirical tests (e.g., Almeida, Campello, and Weisbach, 2004). Fifth, to further tackle the potential simultaneity between the equity issue decision and the concurrent cash flows, we replace cash flow variables with lagged earnings, dividends and depreciation and amortization variables. Based on the findings of Barth, Cram and Nelson (2001) accounting earnings is a good proxy for future operating cash flows. Since it can be assumed that the dividend cut is costly, the dividend is a good proxy for the desired level of future dividends. Moreover, depreciation and amortization can be viewed as a good proxy for investment to maintain existing assets in place. Our main empirical results remain robust to these alternative specifications.

6.2 Alternative samples

Next, we re-estimate all of our empirical tests employing an alternative sample of equity issues from the SDC Platinum database. To construct the sample, we pull all U.S. non-IPO common stock issue transactions and exclude pure secondary share offerings, because in such offerings, proceeds do not flow to the firm, but rather, to existing shareholders. Whenever companies make several issues during the fiscal year, we add up the proceeds from all of these offerings so that the unit of observation corresponds to a firm-year. The final SDC sample with necessary financial information contains 4,023 equity issues that occurred during 1988-2013. Similar to the results of our primary empirical tests, we find that $CASH\_STOCK_{t-1}$ is unrelated to equity issue probability and significantly positively related to the size of equity issues. We also find that companies with higher pre-issue cash-to-asset ratios tend to retain a larger portion of equity issue proceeds as cash rather than spend them immediately.

7. Conclusions

Even though equity offerings is one of the most researched topics in corporate finance, we still do not fully understand why firms issue equity. According to one theory, firms issue equity primarily to finance their immediate cash needs. While some studies support this view, existing empirical evidence is not fully conclusive.

The purpose of our study is to shed more light on the "immediate cash needs" motive for equity issues by studying the association between the cash shortfall components and equity issue policies. Our primary results, estimated using a sample of U.S. public companies over the period 1987-2014, can be summarized as follows. First, we find that the existing cash reserves do not predict the incidence of equity issues. Rather, the impact of cash shortfall on equity issue likelihood comes through the expected cash flow component of cash shortfall. Second, our empirical evidence indicates that cash-richer firms tend to raise larger amounts of equity and retain a greater portion of the equity proceeds as cash. Taken together, these findings imply that firms do not consider their cash balances in their equity issue policies, and thus existing cash balance is not a reliable indicator of immediate cash needs. The results of our additional analysis are most consistent with the view that companies prefer to sit on cash because of target cash level considerations, thereby offering a more nuanced perspective on cash shortfall as a reason for equity issues.

While the immediate cash needs represent a straightforward and intuitive reason for equity issues, the relation between cash needs and equity issue policies is inherently difficult to test empirically due to a potential reverse causality problem. For example, one can argue that firms raising extra capital may undertake certain investment projects that they would not otherwise have taken. Likewise, firms can omit, cut back or delay certain investment projects if the costs of raising external funds prevent them from capital issuance. Although we have attempted to address this reverse causality problem by making use of lagged values in the construction of our empirical measures, we cannot fully rule out the possibility that our results and conclusions are unaffected by the reverse causality problem. One fruitful avenue for future research in equity issues is to identify settings where companies face external pressure to undertake investments and test whether companies with cash needs react to such pressures by raising capital.

Appendix A. Variable definitions

VARIABLE	DEFINITION	COMPUSTAT DATA ITEM FORMULA
EQ_ISS	Equity issue proceeds deflated by beginning-of-period total assets. This variable is set equal to 0 for values below 5%.	SSTK/lag(AT)
CASH_STOCK	Cash-to-asset ratio	CHE/AT
CASH_FLOW	The sum of operating and investing cash flows less cash dividends divided by beginning-of-period total assets as defined in Eq. (2a).	(OANCF + IVNCF – DV)/lag(AT)
MB	Market-to-book ratio	(PRCC*CSHO)/CEQ
LOGAT	Natural logarithm of total assets expressed in terms of purchasing power in 1999	ln(AT/CPI)
FIRM_AGE	Number of years the firm appears on Compustat, winsorized at 20 years	
DIF_CASH	Change in cash to beginning-of-period total assets	(CHE-lag(CHE))/lag(AT)
OCF	Operating cash flows deflated by beginning-of-period total assets	OANCF/lag(AT)
OTHER	Other cash flows deflated by beginning-of-period total assets	(SPPE+SIV+FSRCO)/lag(AT)
DEBT_ISS	Debt issue proceeds deflated by beginning-of-period total assets	DLTIS/lag(AT)
RET	Annual stock returns from CRSP less returns on CRSP value-weighted index over the same period	
INVCF	Investing cash flows deflated by beginning-of-period total assets	IVNCF/lag(AT)
DVCF	Cash dividends deflated by beginning-of-period total assets	DV/lag(AT)
RD	R&D expense deflated by total sales. Set equal to zero if R&D expense is missing.	max(0,XRD)/SALE
INDSIGMA	The average standard deviation of cash flows within each firm's 2-digit SIC code over the past 10 years with at least 5 years of available data. We disregard industries with fewer than 5 companies.	(OIBDP-XINT-TXT-DVC)/AT
CASH_STOCK_OPT	The predicted value of cash-to-asset ratio from the regression model described in Appendix B	
CASH_STOCK_SUBOPT	The residual value of cash-to-asset ratio from the regression model described in Appendix B	

Appendix B. Model of optimal cash

To estimate optimal and suboptimal levels of cash, we employ the model of cash determinants from Opler, Pinkowitz, Stulz, and Williamson (1999):

$$CASH\_STOCK_t = \beta_0 + \beta_1 MTB_t + \beta_2 LOGAT_t + \beta_3 CF_t + \beta_4 NWC_t + \beta_5 RD_t + \beta_6 INDSIGMA_t + \beta_7 LEV_t + \beta_8 CAPEX_t + \beta_9 DIV_t \quad \text{(B.1)}$$

where $CASH\_STOCK_t$ is cash-to-asset ratio (Compustat data item formula: CHE/AT); MTB_t is market-to-book ratio (Compustat data item formula: (AT+(PRCC*CSHO)-CEQ)/AT); $LOGAT_t$ is a natural logarithm of total assets (Compustat data item AT) expressed in terms of purchasing power in 1999; CF_t is a ratio of cash flows to total assets (Compustat data item formula: (OIBDP-XINT-TXT-DVC)/AT); NWC_t is net working capital deflated by total assets (Compustat data item formula: (WCAP - CHE)/AT); RD_t is R&D expense deflated by total sales (Compustat data item formula: max(0,XRD)/SALE); $INDSIGMA_t$ is average standard deviation of cash flows (Compustat data item formula: (OIBDP-XINT-TXT-DVC)/AT) within each firm's 2-digit SIC code over the last 10 years with at least 5 years of available data; LEV_t is firm leverage (Compustat data item formula: (DLC+DLTT)/AT); $CAPEX_t$ is a ratio of capital expenditures to total assets (Compustat data item formula: CAPX/AT); DIV_t is an indicator variable equal to one if a firm paid common dividends (Compustat data item DVC) in the current year, and zero otherwise.

We estimate this model using all companies in Compustat with available data by year over our sample period. Note, that in order to maintain consistency with our earlier tests, we make two modifications to the original regression specification used in Opler, Pinkowitz, Stulz, and Williamson (1999). First, we follow Bates, Kahle, and Stulz, (2009) and use total assets instead of net assets as a deflator of cash holdings and relevant right-hand-side regression variables. Second, unlike Opler, Pinkowitz, Stulz, and Williamson (1999), we do not apply a logarithmic transformation to the dependent variable.

Dittmar and Mahrt-Smith (2007) estimate the optimal cash regression using both firm and yearly fixed effects, basing this specification on the argument that some firms hold cash for idiosyncratic reasons. As a sensitivity check, we also include firm and yearly fixed effects in the optimal cash regression to control for unobserved heterogeneity among firms. Our results are robust to this alternative specification.

References

Almeida, H., Campello, M., & Weisbach, M.S. (2004). The cash flow sensitivity of cash. *Journal of Finance* 59, 1777-1804.

Acharya, V., Davydenko, S.A., & Strebulaev, I.A. (2012). Cash holdings and credit risk. *The Review of Financial Studies* 25, 3572-3609.

Akyol, A. C., Cooper, T., Meoli, M., & Vismara, S. (2014). Do regulatory changes affect the underpricing of European IPOs? *Journal of Banking and Finance* 45, 43-58.

Autore, D.M., & Kovacs, T. (2010). Equity issues and temporal variation in information asymmetry. *Journal of Banking and Finance* 34, 12-23.

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *Journal of Finance* 57, 1-32.

Barth, M., Cram, D., & Nelson, K. (2001). Accruals and the prediction of future cash flows. *The Accounting Review* 76, 27-58.

Bates, T.W., Kahle, K.M., & Stulz, R.M. (2009). Why do U.S. firms hold so much more cash than they used to? *Journal of Finance* 64, 1985-2021.

Bergman, N.K., & Jenter, D. (2007). Employee sentiment and stock option compensation. *Journal of Financial Economics* 84, 667-712.

Bharath, S.T., Pasquariello, P., & Wu G. (2009). Does asymmetric information drive capital structure decisions? *The Review of Financial Studies* 22, 3211-3243.

Cattaneo, M., Meoli, M., & Vismara, S. (2015). Financial regulation and IPOs: Evidence from the history of the Italian stock market. *Journal of Corporate Finance* 31, 116-131.

Chang, X., Dasgupta, S., & Hilary, G. (2006). Analyst coverage and financing decisions. *Journal of Finance* 61(3), 3009-3048.

DeAngelo, H., DeAngelo, L., & Stulz, R. M. (2010). Seasoned equity offerings, market timing, and the corporate lifecycle. *Journal of Financial Economics* 95:2, 275-295.

Denis, D. J., & McKeon, S. B. (2012). Debt financing and financial flexibility evidence from proactive leverage increases. *The Review of Financial Studies* 25:6, 1897-1929.

Dittmar, A., & Mahrt-Smith, J. (2007). Corporate governance and the value of cash holdings. *Journal of Financial Economics* 83:3, 599-634.

Fama, E. F., & French, K. R. (2005). Financing decisions: Who issues stock? *Journal of Financial Economics* 76:3, 549-582.

Farre-Mensa, J., & Ljungqvist, A. (2015). Do measures of financial constraints measure financial constraints? *The Review of Financial Studies* 29:2, 271-308.

Faulkender, M., & Wang, R. (2006). Corporate financial policy and the value of cash. *Journal of Finance* 61:4, 1957-1990.

Fazzari, S. M., Hubbard, R. G., & Petersen, B. C. (2000). Investment-cash flow sensitivities are useful: A comment on Kaplan and Zingales. *Quarterly Journal of Economics* 115:2, 695-705.

Fazzari, S. M., Hubbard, R. G., & Petersen, B. C. (1988). Financing constraints and corporate investment. *Brookings Papers on Economic Activity* 19:1, 141-195.

Frank, M. Z., & Goyal, V. K. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics* 67:2, 217-248.

Hadlock, C. J., & Pierce, J. R. (2010). New evidence on measuring financial constraints: Moving beyond the KZ index. *The Review of Financial Studies* 23:5, 1909-1940.

Hovakimian, A., Opler, T., & Titman, S. (2001). The debt-equity choice. *Journal of Financial and Quantitative Analysis* 36:1, 1-24.

Huang, R., & Ritter, J. R. (2021). Corporate cash shortfalls and financing decisions. *The Review of Financial Studies* 34, 1789-1833.

Kaplan, S. N., & Zingales, L. (1997). Do investment-cash flow sensitivities provide useful measures of financing constraints? Quarterly Journal of Economics, 112(1), 169-215.

Kaplan, S. N., & Zingales, L. (2000). Investment-cash flow sensitivities are not valid measures of financing constraints. *Quarterly Journal of Economics* 115:2, 707-712.

Kayhan, A., & Titman, S. (2007). Firms' histories and their capital structures. *Journal of Financial Economics* 83:1, 1-32.

Kim, W., & Weisbach, M. S. (2008). Motivations for public equity offers: An international perspective. *Journal of Financial Economics* 87:2, 281-307.

Leary, M. T., & Roberts, M. R. (2005). Do firms rebalance their capital structures? *Journal of Finance* 60:6, 2575-2619.

Leary, M. T., & Roberts, M. R. (2010). The pecking order, debt capacity, and information asymmetry. *Journal of Financial Economics* 95:3, 332-355.

Lemmon, M. L., & Zender, J. F. (2010). Debt capacity and tests of capital structure theories. *Journal of Financial and Quantitative Analysis* 45:5, 1161-1187.

Loughran, T., & Ritter, J. R. (1995). The new issues puzzle. *Journal of Finance*, 50:1, 23-51.

Loughran, T., & Ritter, J. R. (1997). The operating performance of firms conducting seasoned equity offerings. *Journal of Finance* 52:5, 1823-1850.

McKeon, S. B. (2015). Employee option exercise and equity issuance motives. Working paper, University of Oregon.

McLean, D.R. (2011). Share issuance and cash savings. *Journal of Financial Economics* 99, 693-715.

McLean, R.D., & Palazzo, B. (2017). The motives and limits of long-term debt issues. Working paper, Georgetown University and Questrom School of Business.

Myers, S.C., & Majluf, N.S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics* 13, 187-221.

Opler, T., Pinkowitz, L., Stulz, R., & Williamson, R. (1999). The determinants and implications of corporate cash holdings. *Journal of Financial Economics* 52, 3-46.

Pinkowitz, L., Sturgess, J., & Williamson, R. (2013). Do cash stockpiles fuel cash acquisitions? *Journal of Corporate Finance* 23, 128-149.

Shyam-Sunder, L., & Myers, C.S. (1999). Testing static tradeoff against pecking order models of capital structure. *Journal of Financial Economics* 51, 219-244.

Welch, I. (2004). Capital structure and stock returns. *Journal of Political Economy* 112, 106-131.

Factors in the Board Governance of Cooperatives: A Systematic Review

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Abstract

Corporate board governance has been the subject of many studies during recent decades. The discussion has focused on the context of investor-owned corporations, while the discussion on cooperatives is still quite ambiguous. In this study, a systematic review is conducted by analyzing existing knowledge on the subject in 37 peer-reviewed articles covering all types of cooperatives. As a result, the scope of the current academic literature on the factors of board governance in cooperatives is shown to be narrow. The biggest gaps are seen in worker cooperatives and to some extent in consumer cooperatives and by different factors in board contexts, member participation and commitment as well as in director selection. Given that cooperatives are multi-purpose companies, no studies were found that dealt with the topic of board governance from the perspectives of sustainable development or responsibility.

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1. Introduction

Corporate board governance has broadly been the subject of extensive scrutiny in the academic literature, and it has been found to have implications on the company's performance of its tasks (Darmadi, 2013; Durisin & Puzone, 2009; Payne et al., 2009; Zhu et al., 2014). However, so far most of the academic discussion on the topic has focused on the context of investor-owned corporations, and regarding other types of organizations, such as cooperatives, the literature has been quite scarce. Although cooperatives and their governance have similarities with corporations, they have certain special characteristics that justify their study from their own perspectives. First, the ownership of cooperatives is based on membership (Diaz-Foncea & Marcuello, 2013). Second, the aim of cooperatives is to serve their members' interests rather than to maximize profit (Baltaca & Mavrenko, 2009). Third, the decision-making processes used in cooperatives are distinctively characterized by participation and internal democracy (Diaz-Foncea & Marcuello, 2013). Additionally, specific dilemmas between the performance and conformance roles in cooperatives can be perceived (Cornforth, 2004). One of them is the tension between board members acting as representatives for membership groups and as experts promoting the performance of the organization.

The social responsibility of corporations has become a central object of interest in social and academic discussions. Large companies have recently expressed that a limited company should have goals other than profit. From this point of view, cooperatives as multi-purpose companies are an even more interesting form of business, the governance of which should be studied more closely than before. In this environment, cooperatives could possibly find a competitive edge by developing their board work and governance. Cooperatives play a major role in many countries as they employ approximately 280 million people and generate 2.1 trillion USD in turnover worldwide and have a membership of over one billion people worldwide (ICA Coop, 2018). Many cooperatives operate in sectors (e.g. food, forest, energy, finance) that have proven to be quite critical and important in recent rapid economic and societal upheavals. Therefore, the absence of a systematic approach to the board governance of cooperatives can be considered a significant shortage and it is vital to understand in depth the factors behind it.

The purpose of this systematic review (see Tranfield et al., 2003) is to provide a synthesis of the factors of board governance in cooperatives by analysing the academic literature on the topic. We define board governance as a "set of roles, attributes and contextual variables and their impact on the BOD" (based on Korac-Kakabadse 2001 et al., p. 25.) The definition is increasingly used in the mainstream literature as it includes not only the control but also the stakeholder perspective of board governance (Cascio, 2004; Van den Bongard & Lehmann, 2013). This perspective is suitable for examining cooperatives because a cooperative is by definition "an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically-controlled enterprise" (ICA Coop, 2018b). In general, it seems to be typical for research on the governance topics of cooperatives that the studies focus on cooperatives of one industry or sector at a time. As an example, Grashuis & Su (2019) have conducted a review of articles containing a quantitative study, focusing on performance, ownership, and governance as well as on finance and member attitudes in producer cooperatives. Also, while Höhler & Kühl (2018) have summarized the existing literature on member heterogeneity, they have focused only on producer cooperatives. It should be noted that producer cooperatives constitute only one part of the cooperative sector, which also includes consumer cooperatives, financial cooperatives and worker cooperatives. Moreover, while certain themes, such as the diversity of

boards (Guerrero et al. 2017; Unda et al., 2019) and slow director renewal (e.g. Yamori et al. 2019) have recently gained some momentum in cooperative research, there are several other themes in this field that call for better scrutiny. Thus, we argue that the understanding of the diversity across different types of cooperatives and an overall view of the topic has remained incomplete.

The research question for our review is *"How are the central factors of board governance discussed in the cooperative literature?"* The purpose of this review is to give a comprehensive, industry-independent picture of the academic discussion so far and both deepen the overall picture and enrich the industry-specific discussions by comparing the findings across the different industries. We aim to highlight both the most and the least researched areas of the governance topic and thus provide insights for further research. Our paper makes important contributions to the discussion on the governance of cooperatives. First, we present an in-depth analysis of the factors of board governance, accounting for the diversity of cooperatives as our review included all types of cooperatives (worker, producer, consumer and financial cooperatives, see *Appendix 1*). Second, we provide a platform for future research by identifying how board governance factors are shaped by the board's performance and conformance roles in cooperatives.

The paper is organized as follows: First, we describe how we conducted our systematic review by following the guidelines proposed by Tranfield et al. (2003). Second, we present the findings of our literature review. Finally, we discuss the implications of the findings for future research on cooperative governance and propose new avenues of research.

2. Working Method: Systematic Literature Review

2.1. Review process

The aim of a systematic review is to bring together as many studies as possible that are relevant to the research topic. We chose this method as a replicable, scientific and transparent process that aims to decrease the possibility of selection bias through exhaustive literature searches (see Tranfield et al., 2003). If the sample is not collected using a systematic review, it is possible to miss articles published in journals representing academic disciplines with which the researchers are not familiar (Newbert, 2007).

The planning of the review project began by identifying the need for a systematic literature review. We first conducted a preliminary review and found two literature reviews on cooperatives which focused on performance, ownership, governance, finance and member attitude in producer cooperatives (Grashuis & Su, 2019) and on member heterogeneity (Höhler & Kühl, 2018). However, the reviews addressed exclusively producer cooperatives and omitted other types of cooperatives, and second, they did not include a systematic in-depth analysis of the discussion on the key factors of board governance in the cooperative literature. Against this background, we next established the review approach: to synthesize the factors of board governance in the literature on cooperatives. Our planning was concluded by establishing a review protocol to include studies that focus on the research topic.

We initiated the review by nominating a review panel, which consisted of the three authors of the article. To identify and select studies, we generated keyword lists and search strings, selected information sources and established criteria to determine the relevance of the studies. The following keyword list was used: cooperative, credit union, board and governance. The next phase included the evaluation of the information sources (Brown, 2007; Newbert, 2007). We used the scientific databases SCOPUS, EBSCO and ABI and Google scholar. We limited the

search to published academic papers to maintain sufficient quality and rigor. The following overall search process was used:

1. A search using the formula: (TITLE (cooperative*) OR TITLE (credit union*)) AND TITLE-ABS-KEY (board* AND governance*) AND (LIMIT-TO (LANGUAGE, "English")). The purpose was to find the most effective combination of keywords and thus to ensure the relevance and high quality of the search.
2. To avoid missing articles, we supplemented the search by examining the reference lists of the articles found in step 1.
3. The third search was made manually by reading through all volumes of the following cooperative journals: Annals of Public and Cooperative Economics, Journal of Cooperative Studies, years 2004- , The International Journal of Cooperative Management, years 2004- and Journal of Cooperative Organization and Management, years 2013-.
4. The fourth search was made by manually checking the reference lists of the articles that were included in Step 3.

The purpose of this four-step search was to ensure that no essential articles on cooperative board governance were omitted. Finally, we made a quality assessment of the selected studies followed by data extraction and data synthesis (see Tranfield et al., 2003). Quality assessment began by checking the keywords and reading the abstracts of the articles that had been found. If they fulfilled the protocol criteria, we included the article for closer examination. After that, we excluded the articles that were not relevant to the research question, did not deal with cooperatives, or otherwise failed to match the criteria (see *Table 1*).

Our literature review on cooperative board governance yielded some general observations. The first search resulted in 66 articles. A careful analysis of the content and quality of these scientific articles showed that only 37 articles fulfilled the criteria of the review protocol (see comments and remarks in *Table 1*). Twenty-five of the included articles came from the database searches (*Table 1*, Step 1), four from the reference lists (*Table 1*, Step 2) and eight from the analysis of cooperative journals (*Table* 1, Step 3a-4). Twenty-nine articles were omitted for the reasons listed in *Table 1*.

Table 1: Data Search and Screening Process.

SOURCE OF DATA	NUMBER OF ARTICLES INCLUDED	COMMENTS AND REMARKS
Step 1: Database search	25	16 potential articles were omitted. Reasons: -Irrelevant field: 1 -Did not deal with the research question of this review: 14 -Dealt with research design: 1
Step 2: Reference lists:	4	8 potential articles were omitted. Reasons: -Did not deal with cooperatives: 2 -Were not peer-reviewed articles: 6
Step 3a: Annals of Public and Cooperative Economics	1	5 potential articles were omitted. Reasons: Did not deal with the research question
Step 3b: Journal of Cooperative Studies	1	
Step 3c: International Journal of Cooperative Management	2	
Step 3d: Journal of Cooperative Organization and Management	1	
Step 4: Reference list from Step 3.	3	
TOTAL	**37**	**29**

The second stage was a systematic content analysis. We cross-tabulated the articles by type of cooperative to increase quality and rigor. Finally, we briefly described the main findings from each included article.

1.2. General Information on data

The articles were published between the years 2001 and 2022 (*Figure 1*). There were no published articles related to the topic in the years 2002, 2003, 2006, 2010, 2011 and 2020. The number of articles published each year varied between 1 and 5 articles per year.

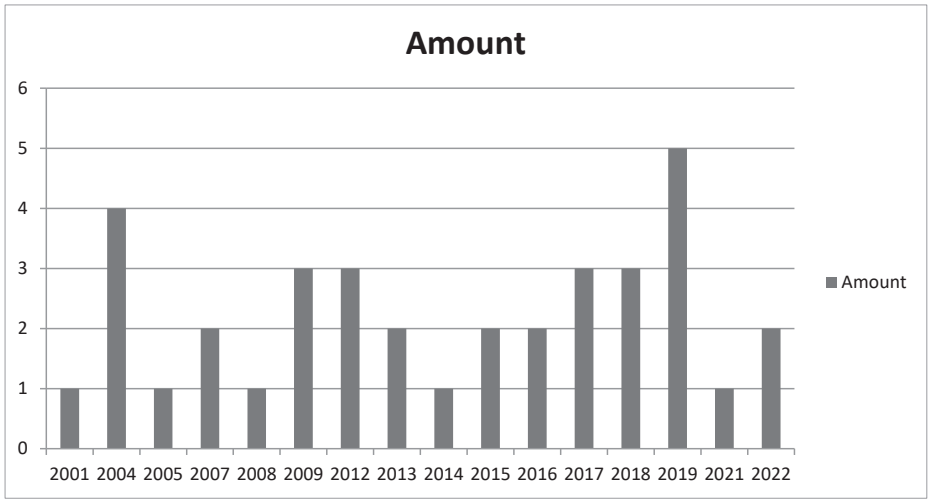

Figure 1: Number of Included Articles by Publishing Year.

Figure 1 shows that the number of publications increased in the 2010s compared to the previous decade but has again been lower in the early 2020s. Looking at each continent, publications have been made evenly throughout the review period in Europe, while in North America the first publication is from 2009 and from other continents only in 2013 (*Table 2*). Individually noteworthy is the arrival of publications from Asia and Australia & New Zealand in the late 2010s (*Table 2*). A deeper analysis of the publications trends is presented later in *Table 3* and *Figure 2*.

The research was centralized to a few countries, while most continents were represented *(Table 2)*. The studies were published in 21 different journals. Most of them had been carried out in Europe (16 studies). Five were published in North America, three in Australia & New Zealand as well as in Asia and one in South America as well as in Africa. The rest of the studies were geographically undefined. Most of the reviewed studies (19/37) used quantitative methods *(Table 2)*. Qualitative methods were used in 8/37 articles, while both quantitative and qualitative methods were applied in 5/37 articles. Five out of 37 articles were solely theoretical and did not include any empirical data. Finally, regarding theories applied in the studies, the most common theory was the agency theory, which had been applied in 16 articles (*Table 2*). The democratic perspective (three articles) and the resource dependency theory (3) were the next most common and the stewardship, stakeholder and political theories were used in two articles each. Three of the articles were literature reviews. Sixteen other theories had also been used (see table 2).

Table 2. Publications by journal, country of publication, methodology and research orientation.

JOURNAL	NAME AND YEAR OF THE ARTICLE	COUNTRY OF PUBLICATION	METHODOLOGY	RESEARCH ORIENTATION/ TARGET THEORY
Annals of Public and Cooperative Economics	1 The governance of cooperatives and mutual associations: A paradox perspective. Cornforth, C. 75(1), 11-32. 2004.	-	Theoretical	Agency, stewardship, stakeholder, managerial hegemony
	2 Faces of governance of production cooperatives: An exploratory study of ten French cooperatives. Bataille-Chedotel, F., Huntzinger, F. 75(1), 89-111. 2004.	France	Qualitative	Political
	3 Governance of the Mondragon Corporacio'n Cooperativa. Bakaikoa, B., Errasti, A., Begiristain, A. 5:1 2004.	Spain	Qualitative	Degeneration
	4 Shifting control? the changes of internal governance in agricultural cooperatives in the EU. Bijman, J., Hanisch, M., van der Sangen, G. 85 (4), 641-661. 2014.	Western Europe	Quantitative	Agency
	5 Drivers of pro-active member participation in agricultural cooperatives: Evidence from Brazil. Cechin, A., Bijman, J., Pascucci, S., Zylbersztajn, D., Omta, O. 84(4), 443-468. 2013.	Brazil	Quantitative	Political
	6 Governance in democratic member-based organisations. Vol 75, No 1, pp 33-59. Spear, R. 2004.	Canada	Theoretical	Agency, stewardship
	7 Governance of nine Ontario food cooperatives. Berge, S., Caldwell, W., Mount, P. 2016.	-	Qualitative	Cyclical board behaviour
	8 Dimensions of Member Heterogeneity in Cooperatives and their Impact on Organization–A Literature Review. Höhler, J., Kühl, R. pp. 89:4. 697-712. 2018.	-	Qualitative + Quantitative	Literature review
	9 A Review of the Empirical Literature on Farmer Cooperatives: Performance, Ownership and Governance, Finance, and Member Attitude. Grashuis, J., Su, Y. 90:1 pp. 77-102. 2019.		Qualitative + Quantitative	Literature review
Managerial and Decision Economics	10 Accommodating two worlds in one organisation: Changing board models in agricultural cooperatives. Bijman, J., Hendrikse, G., van Oijen, A. 34(3-5), 204-217. 2013.	Netherlands	Qualitative + Quantitative	Agency
	11 The Impact of CEO Tenure on Cooperative Governance. Cook, M., Burress, M. 34: 218-229. 2013.	United States	Quantitative	Agency
European Review of Agricultural Economics	12 Managerial vision bias and cooperative governance. Deng, W., Hendrikse, G. 42(5), 797-828. 2015.	-	Theoretical	Decisiontheoretic model

Canadian Journal on Aging	13 Community-based home support agencies: Comparing the quality of care of cooperative and non-profit organizations. Leviten-Reid, C., Hoyt, A. 28(2), 107-120. 2009.	Canada	Quantitative	-
Agribusiness	14 Members' Perception of Their Participation in the Governance of Cooperatives: The Key to Trust and Commitment in Agricultural Cooperatives. Österberg, P., Nilsson, J. Volume 25, Issue 2. 2009.	Sweden	Quantitative	Agency, socio-psychological
World Development	15 Women leaders and social performance: Evidence from financial cooperatives in Senegal. Périlleux, A., Szafarz, A. 74, 437-452. 2015.	Senegal	Quantitative	Congruity
Journal of Cooperative Studies	16 Cooperative Governance: the case of Spanish Credit Cooperatives. Chaves, R., Soler, F, Sajardo, A. 41.2, 30-37. August 2008.	Spain	Qualitative	Agency
International Journal of Cooperative Management	17 Dynamics and Tensions in Governance: evidence from Finnish cooperatives. Jussila, I., Saksa, J., Tienari, J. Volume 3, Number 2, November 2007.	Finland	Qualitative	Institutional
	18 Overcoming Challenges to Governance in Consumer Cooperatives: analysing reports of key representatives. Tuominen, P., Jussila, I., Kojonen, S. Volume 4, Number 2, September. 2009.	Finland	Qualitative	Democratic
	19 The stakeholder model as a leading model for excellence in governance. A comparative perspective on a cooperative opportunity. Bleger, I. Volume 2, Number 1, August 2005.	-	Theoretical	Stakeholder
	20 An alternative approach to oversight: the case of the supervisory committee in Irish credit unions. Byrne, N., McCarthy, O., Ward, M. Volume 3, Number 2, November 2007.	Ireland	Qualitative+ Quantitative	Agency
International Food and Agribusiness Management Review	21 The relationship between members' trust and participation in the governance of cooperatives: the role of organizational commitment. Barraud-Didier, V., Henninger, M-C, Akremic, A. 2012.	France	Quantitative	Social Exchange
Agricultural Finance Review	22 Strategic options associated with cooperative members' equity. Power, G., Saline, V., Park, J. 72(1), 48-67. 2012.	-	Quantitative	Property rights
Corporate Governance: The international journal of business in society	23 The Governance of Cooperatives Under Competitive Conditions: Issues, Processes and Culture. Davis, P, 1, 28–39, Vol. 1 Iss: 4, pp.28 – 39. 2001.	-	Theoretical	Democratic
Accounting and Finance	24 Board characteristics and credit union performance. Unda, L., Ahmed, K., Mather, P. 59 (4), pp. 2735-2764. 2019.	Australia & New Zealand	Quantitative	Agency, resource dependence, labour market, democratic

Corporate Governance: An International Review	25 Board member monitoring behaviours in credit unions: the role of conscientiousness and identification with shareholders. Guerrero, S., Lapalme, Herrbach, O., Seguin, M. 25,134–144. 2017.	Canada	Quantitative	Social Identity
	26 Does Bank Institutional Setting Affect Board Effectiveness? Evidence from Cooperative and Joint-Stock Banks. D'Amato, A., Gallo, A. 25 (2), pp. 78-99. 2017.	Italy	Quantitative	Agency
JASSA:The Journal of the Securities Institute of Australia	27 The impact of regulatory governance standards on board characteristics: Evidence from Australian credit unions. Unda, L. 4, 21–26. 2016.	Australia	Quantitative	Democratic
Sustainability	28 Do corporate governance recommendations apply to U.S. agricultural cooperatives? Franken, J., Cook, M. 11 (19), art. no. 5321. 2019.	United States	Quantitative	Resource dependency
	29 Governance in Estonian Agricultural Cooperatives: Structures and Processes. Iliopoulos, C., Värnik, R., Kiisk, T., Varthalamis, G., Sinnott, L. 14(23):16031. 2022.	Estonia	Quantitative+ Qualitative	Conceptual
Journal of Cooperative Organization and Management	30 The presidency of the governing boards of cooperatives in Spain: a gendered approach. Esteban-Salvador, L., Gargallo-Castel, A., Pérez-Sanz, J. 7 (1), pp. 34-41. 2019.	Spain	Quantitative	Agency, resource dependency, gender role
	31 Understanding the board of Swedish farmer cooperatives – Cases focusing on board composition and interaction patterns. Hakelius, K. 6 (2), pp. 45-52. 2018.	Sweden	Quantitative	Agency
	32 Board characteristics and financial performance: Evidence from Indian cooperative banks. Author links open overlay panel. Saibal, G., Jugnu, A. 2018.	India	Quantitative	Agency
Pacific-Basin Finance Journal	33 To pay or not pay: Board remuneration and insolvency risk in credit unions. Unda, L., Ranasinghe, D. 2019.	Australia	Quantitative	Agency
International Journal of Finance and Economics	34 Corporate governance structure and efficiencies of cooperative banks. Yamori, N., Harimaya, K., Tomimura, K., 22 (4), pp. 368-378. 2017.	Japan	Quantitative	Agency
International Social Science Journal	35 Enhancing governance practice for better performance of credit union cooperatives in Thailand. Kumkit, T., Gan, C., Anh, D., Hu, B. 72(245), pp. 597–612. 2022.	Thailand	Quantitative	Agency, overview
Bulgarian Journal of Agricultural Science	36 Governance transformation of the Bulgarian cooperative movement: values, principles, practices and members' satisfaction. Sarov, A. Vol. 27 Issue 1, p. 65-71. 2021.	Bulgaria	Qualitative	Literature review

Cogent Business & Management	37 Director selection in agricultural cooperatives—The process and the roles in the Finnish context. Huhtala, K., Tuominen, P., Tuominen, T. Vol. 7:1, 1746171. 2020.	Finland	Qualitative	
Total: 21 journals	Total: 37 articles	Europe (16 articles) North America (5) Australia & N. Zealand (3) Asia (3) South America (1) Africa (1) Undefined (8)	Quantitative (19) Qualitative (8) Quantitative+ qualitative (5) Theoretical (5)	Agency (16) Democratic (3) Resource dependency (3) Stewardship (2) Stakeholder (2) Political (2) Literature review (3) Other theories (16)

3. Findings

In this section *(see Table 4)*, we describe our analysis of the factors contributing to board governance in cooperatives which constitutes our data. The factors were classified by cooperative type *(see Appendix 1)*.

We first made a numeric analysis by classifying the articles per cooperative type and by factor of board governance discussed *(Table 3)*. The table shows that 13 articles discussed board characteristics, ten board processes, six director selection and three board context. Additionally, nine articles discussed member participation and commitment, 15 articles the performance role of boards and 13 articles the conformance role of boards. Noteworthy, some of the articles are classified under several factors if the study discussed more than one factor of board governance.

Table 3. The number of articles per cooperative type classified by factors of board governance.

FACTOR OF BOARD GOVERNANCE	NUMBER OF ARTICLES PER COOPERATIVE TYPE AND BY FACTOR DISCUSSED (TOTAL, UNTIL 2010, AFTER 2010)					
	Financial cooperative	Consumer cooperative	Producer cooperative	Worker cooperative	Other cooperatives	Total
Board characteristics	Total: 4 <2010: 2 ≥ 2010: 3	Total: 3 <2010: 2 ≥ 2010: 1	Total: 4 <2010: 0 ≥ 2010: 4	Total: 1 <2010: 1 ≥ 2010: 0		13 <2010: 5 ≥ 2010: 8
Board processes	Total: 1 <2010: 0 ≥ 2010: 1	Total: 2 <2010: 1 ≥ 2010: 1	Total: 5 <2010: 1 ≥ 2010: 4	Total: 1 <2010: 1 ≥ 2010: 0	Total: 1 <2010: 1 ≥ 2010: 0	10 <2010: 4 ≥ 2010: 6
Director selection	Total: 3 <2010: 1 ≥ 2010: 2	Total: 0	Total: 0	Total: 1 <2010: 1 ≥ 2010: 0	Total: 0	6 <2010: 2 ≥ 2010: 4
Board context	Total: 0	Total: 1 <2010: 1 ≥ 2010: 0	Total: 0	Total: 0	Total: 1 <2010: 1 ≥ 2010: 0	3 <2010: 2 ≥ 2010: 1
Member participation and commitment	Total: 1 <2010: 1 ≥ 2010: 0	Total: 1 <2010: 1 ≥ 2010: 0	Total: 5 <2010: 1 ≥ 2010: 4	Total: 1 <2010: 1 ≥ 2010: 0	Total:	9 <2010: 5 ≥ 2010: 4
Performance role	Total: 6 <2010: 1 ≥ 2010: 5	Total: 0	Total: 6 <2010: 0 ≥ 2010: 6	Total: 0	Total: 3 <2010: 2 ≥ 2010: 1	15 <2010: 3 ≥ 2010: 12
Conformance role	Total: 1 <2010: 1 ≥ 2010: 0	Total: 2 <2010: 1 ≥ 2010: 1	Total: 5 <2010: 1 ≥ 2010: 4	Total: 1 <2010: 1 ≥ 2010: 0	Total: 3 <2010: 3 ≥ 2010: 0	13 <2010: 7 ≥ 2010: 6

We continued the analysis by dividing the published articles into two groups based on their publication date. The first group consisted of the articles that were published before 2010 and the second group comprised the articles published in the year 2010 onwards. The results are displayed by the factors of board governance in *Figure 2*. We would like to point out that the number of articles in this figure is higher than in *Figure 1* because more than one board factor may have been discussed in the same article.

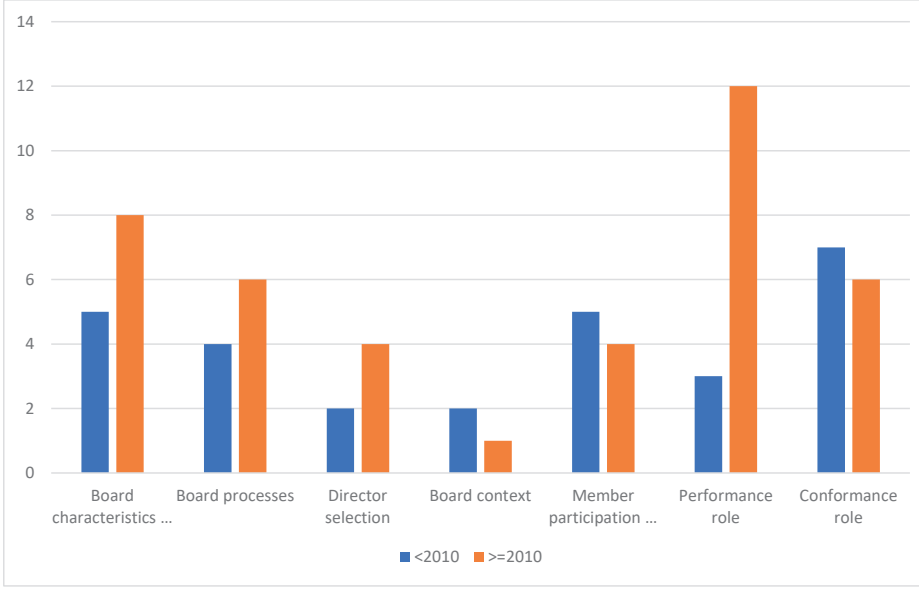

Figure 2: Number of Articles per Factor discussed by Publication date (before 2010 or 2010 onwards).

Figure 2 shows that the amount of research on the performance role increased strongly from 2010 onwards. This concerns especially financial and producer cooperatives (*Table 3*). Research on board characteristics increased somewhat, most in producer cooperatives. Director selection and board processes also increased somewhat. On the other hand, research on the conformance role and member participation and commitment decreased slightly, except in producer cooperatives where they grew. Board context research remained low throughout the review period.

Next, we present the substantive results of our research, i.e. the discussion themes and below them we present excerpts of the content of each article related to the theme (*Table 4*). The themes and their contents are compiled into entities in the text after *Table 4*. The results in the table are grouped in vertical columns by type of cooperative and by row based on what the factor of board governance discussion themes are related to.

Table 4: Results of the review: Themes Discussed in the Articles by Type of Cooperative.

FACTOR OF BOARD GOVERNANCE	THEMES OF COOPERATIVE BOARD GOVERNANCE DISCUSSED IN THE REVIEWED ARTICLES				
	Financial cooperative	Consumer cooperative	Producer cooperative	Worker cooperative	Other cooperatives / not defined
Board characteristics In 12 articles, (Jussila et al. 2007 occurs twice)	**Theme: Board composition** Guerrero et al. 2017 *Women and young people not sufficiently represented* Périlleux & Szafarz 2015 *Female-dominated boards favour social orientation* Unda 2016 *Credit unions with previous merger and acquisition activity have larger boards and a higher percentage of female directors* **Theme: Tensions** Jussila et al. 2007 *Owners on boards create tensions as regional and local cooperatives may have diverging values and objectives* Chaves et al. 2008 *Good level of representativeness of board members but low rate of renewal of board-level members realized*	**Theme: Director's competencies** Berge 2016 *The qualifications of a good board member may need to be modified* Tuominen et al. 2009 *Lack of qualified directors* **Theme: Tensions** Jussila et al. 2007 *Owners as board members: regional and local cooperatives may have diverging values and interests*	**Theme: Board composition** Bijman et al. 2014 *Compositions of boards in cooperatives differ from those in IOFs* Franken & Cook 2019 *Larger cooperatives have larger boards with more outside directors* **Theme: Board models** Bijman et al. 2013 *Presents different models of boards, defines good cooperative governance* Iliopoulos et al. 2022 *More knowledge needed about governance structures and professional board practices*	**Theme: Board composition** Bakaikoa et al. 2004 *Tensions between non-member employees and member employees*	

Board processes In 10 articles	**Theme: Competence gaps** D'Amato & Gallo 2017 *Board deficiencies likely to occur in credit management process*	**Theme: Board and CEO** Davis 2001 *Committed management who appreciate characteristics of cooperative important* Berge 2016 *Cooperative managers experience tension created by the changes in the role of the board of directors*	**Theme: Competence gaps** Österberg & Nilsson 2009 *Need for better training of directors in terms of management and social skills* Iliopoulos et al. 2022 *Director training, financial expertise, and board evaluation routines needed* Cook & Burress 2013 *Long-tenured CEOs experience less board monitoring due to procedural mechanisms* **Theme: Board and CEO** Deng & Hendrikse 2015 *Member CEOs upstream focused, professional CEOs downstream focused* **Theme: The duality of cooperative** Bijman et al. 2014 *BOD needs to understand the purpose of cooperative*	**Theme: Competence gaps** Bataille-Chedotel & Huntzinger 2004 *BOD may restrict itself to the role of a watchdog by placing its trust in the competence of the chair*	**Theme: Board and CEO** Spear 2004 *Managers in consumer/user cooperatives and mutual cooperatives have more power than those in similar private sector organizations*

Director selection In 6 articles	**Theme: Board renewal** Chaves et al. 2008 *Low rate of renewal of board members observed* Unda et al. 2019 *Lack of board renewal limits the scope for identifying new directors within the membership* **Theme: Board nomination** Guerrero et al. 2017 *The nominating committee mostly appointed by the BOD in Canada, in the US often by the chair of the BOD*		**Theme: Board renewal** Cechin et al. 2013 *Classifies members in terms of how active or passive they are in the governance, observed reluctance to replace older directors* Huhtala et al. 2020 *Additional research needed from social and paradox perspectives on the use of authority and on the administrative culture*	**Theme: Board nomination** Bakaikoa et al. 2004 *Manner of board nomination and election; the issue of organizational degeneration where control is concent-rated in the hands of a few*	
Board context In 3 articles		**Theme: Circumstances and environment** Davis 2001 *Whether the board should have non-executive directors depends on circumstances*	**Theme: Circumstances and environment** Bijman et al. 2013 *Cooperatives shift to a new corporate governance model because of changes in the competitive environment*		**Theme: Need of new research** Cornforth 2004 *More studies needed that examine how contextual factors influence boards*

Member participation and commitment In 9 articles	**Theme: Low participation** Chaves et al. 2008 *Low level of member participation characteristic of large cooperatives*	**Theme: Low participation** Tuominen et al. 2009 *Members´ low participation in governance makes representativeness questionable*	**Theme: Significance of participation** Österberg & Nilsson 2009 *Participation related to commitment* Barraud-Didier et al. 2012 *Members' trust, participation and commitment interrelated* Cechin et al. 2013 *Positive relationship between duration of membership and participation, Democratic member control and concern for community important in members' participation* **Theme: Member satisfaction** Sarov 2021 *Governance including cooperative values and practices impact on members' satisfaction* **Theme: Member heterogeneity** Höhler & Kühl 2018 *Different dimensions of heterogeneity identified and ways of measuring their impact on cooperative organization proposed*	**Theme: Significance of participation** Leviten-Reid 2009 *Participation on the board a determinant of satisfaction and overall quality*	**Theme: Low participation** Spear 2004 *Low level of participation identified especially in bigger cooperatives*

Performance role In 15 articles	**Theme: Antecedents of firm performance** Saibal & Jugnu 2018 *Board size does not exert discernible impact on performance, gender diversity exerts an impact on performance in low-income districts* Yamori et al. 2019 *Large board has negative effects on efficiency measures, outside directors have a significant effect on efficiency measures* Unda et al. 2019 *Board remuneration, board expertise and attendance at meetings increase credit union performance* *Kumkit et al. 2022* *Performance affected by members' participation, the board of directors, the management team and organisations' age and size* Unda & Ranasinghe 2019 *Volunteer boards and highly paid boards are associated with a lower likelihood of the credit union becoming insolvent* **Theme: Role of BOD** Byrne et al. 2007 *The BOD performs an executive and, to a lesser extent, oversight functio*n		**Theme: Antecedents of firm performance** Franken & Cook 2019 *Board size correlates negatively with most financial measures but positively with overall performance, CEO tenure positively correlated with current and past performance and overall performance* Hakelius 2018 *Large boards, director education, consensus between the directors and the CEO influence positively performance* Bijman et al. 2013 *Traditional board models do not necessarily perform better, corporation models do not overall perform worse than other models* Grashuis & Su 2019 *No clear evidence between non-traditional ownership or governance and superior performance* **Theme: Performance measures** Bijman et al. 2014 *Boards use different performance measures in cooperatives vs. IOFs* **Theme: Role of BOD** Power et al. 2012 *A major challenge of the board is to retain enough equity to fund business growth*		**Theme: Antecedents of firm performance** Esteban-Salvador et al. 2019 *Cooperatives chaired by a woman more likely to have good financial and employment ratios* **Theme: Governance performance** Spear 2004 *Necessary to develop an approach that combines both control perspectives and collaborative perspectives* **Theme: Role of BOD** Cornforth 2004 *Tension between the board roles of driving forward organizational performance and ensuring conformance*

Conformance role In 12 articles	**Theme: Member democracy** Chaves et al. 2008 *Challenges related to the implementation of democratic principles*	**Theme: Member democracy** Berge 2016 *Board's role important as a supervisor and protector of the democratic rights of membership* Tuominen et al. 2009 *Representation of members in positions of trust important*	**Theme: Member democracy** Bijman et al. 2013 *Maintaining democratic decision-making principles important* Österberg&Nilsson 2009 *Members experience that democratic control of board is important* **Theme: Member benefits** Bijman et al. 2014 *Key function of the board is to ensure the interests of members-as-users* Power et al. 2012 *To return sufficient value to the members important* Barraud-Didier et al. 2012 *Board's role to guide and control strategy and trust explains a member´s favourable behaviour towards his/her cooperative*	**Theme: Dual role of BOD** Bakaikoa et al. 2004 *Agency problem of the board as the representative of owner-members, and professional management.*	**Theme: Member democracy** Bleger 2005 *Represent-ation of member interests the key driver in the work of a board member* **Theme: Dual role of BOD** Spear 2004 *Board roles as a controller and a collaborator important* Cornforth 2004 *Tension identified between the board roles of driving forward organizati-on-al performance and ensuring conformance*
TOTAL NR. OF ARTICLES	17 articles	9 articles	28 articles	5 articles	9 articles

Board characteristics

Our review showed that themes related to board characteristics were discussed in the cooperative literature most often regarding financial and producer cooperatives, however less often in consumer and worker cooperatives (see T*able 3*). The most common discussion topic was board composition. For credit unions, Guerrero et al. (2017) pondered the insufficient representation of women and young people on boards, while Périlleux & Szafarz (2015) noticed that the social perspective is emphasized in female-dominated boards. Guerrero et al. (2017) highlighted that attempts had been made to increase the number of women and young but with mixed results. Some of the reasons mentioned were the busyness of young people in their thirties and the family reasons of women (Guerrero et al., 2017). In credit unions, the boards are larger, and they have a higher proportion of women in a situation where there are preceding mergers or acquisitions. In producer cooperatives, Bijman et al. (2014) found that the composition of the board differs compared to IOFs and Franken & Cook (2019) noted, that large producer cooperatives have larger boards and have more outside board members. In worker cooperatives, the board has both member employees and non-member employees, which was found to cause tensions (Bakaikoa et al. 2004). Unlike the previous types of cooperatives, board composition had not been included in the articles on consumer cooperatives. Instead, they discussed directors' competencies on a general level, pointing out that there is a lack of qualified directors (Tuominen et al., 2009) and that the qualifications for a good board member may need to be thought of in a new way (Berge, 2016). In a few studies, tensions related to the board of the cooperative were brought up (Jussila et al., 2007; Chaves et al., 2008). Regional and local factors can cause tensions in credit unions and consumer cooperatives, as can the credit union's strong member representativeness, which results in slowness in board renewal. Producer cooperatives were the only group for which new governance practices were discussed. In that regard, Bijman et al. (2013) presented innovative board models in the Netherlands related to good governance where the management is given more power for decision making. Iliopoulos et al. (2022) emphasized the importance of structures and professional board practices.

Board Processes

Board processes refer to the decision-making activities of boards, which usually involve individuals' ability to work together as a team, critical discussion, board's engagement, and exchange of information (Forbes & Milliken, 1999; Milliken & Vollrath, 1991; Samra-Fredericks, 2000a, b; Zahra & Pearce, 1989). Themes related to board processes were discussed in ten of the reviewed articles (*Table 3*). The most common discussion topic was competence gaps, which was discussed especially in the case of producer cooperatives. Österberg & Nilsson (2009) called for better training of board members regarding leadership and, among other things, social skills. Also, Iliopoulos et al. (2022) emphasized the importance of training and the professionalization of board practices. Cook & Burress (2013) found that long-serving CEOs are less monitored by boards, concluding that there is a need to professionalize the monitoring of CEOs. Regarding credit unions, D'Amato & Gallo (2017) found that there were more shortcomings in the ability of cooperative banks' boards to handle credit management than in joint-stock banks. Bataille-Chedotel & Huntzinger (2004) studied worker cooperatives and found that the rank-and-file members of the board emphatically trust the competence of the chairman while remaining in the role of watchdog. Another theme of discussion regarding the board process was the relationship between the board and the CEO. Deng & Hendrikse (2015) found that if the CEO of a producer cooperative is a member of that cooperative, he or she emphasizes

the beginning of the value chain while professional CEOs are more suitable for managing the end of the value chain. Nevertheless, their conclusion was that the recruitment of CEOs needs professionalization. This was also highlighted in the context of consumer cooperatives, where Davis (2001) emphasized how important it is to recruit a CEO who is committed to the cooperative and its characteristics. This is because in consumer and insurance cooperatives, the CEO seems to have more power than in private sector organizations (Spear, 2004). Moreover, as the commitment of board members varies and when the continuity of board work is considered CEOs experience tensions (Berge, 2016). Finally, Bijman et al. (2014) highlight the duality of cooperative. The authors point out that the functions of BODs in cooperatives deviate from those in IOFs in two respects: first, the key function of the BOD in a cooperative is to ensure that the interests of the members-as-users are translated into decisions by the cooperative, and second, the BOD of a cooperative uses different performance measures compared to boards in IOFs and is also much more directly involved in strategic and operational decisions.

Director Selection

Director selection was not a widely discussed topic in the reviewed article, as only five articles focused on this factor (T*able 3*). The articles discussed two themes: board renewal and board nomination. Regarding credit unions, Chaves et al. (2008) explain that a low rate of director renewal may be a symptom of paralysis or passivity at the grass-roots level of membership. Another reason for low renewal in credit unions may be that new directors are not actively identified within the membership (Unda et al., 2019). In terms of producer cooperatives, Cechin et al., (2013) discussed the reluctance to replace older directors, which may be related to the level of member activity/passivity in participating in governance. Regarding board nomination, Guerrero et al. (2017) point out that, in cooperatives where directors must be drawn from the membership, several issues potentially limit governance capacity. Their results highlight low membership involvement in the selection of nominating committee members, and hence the dominating actors who appoint nominating committee may be either the BOD or the chair of the BOD. One article on worker cooperatives, Bakaikoa et al. (2004) discussed the manner of board nomination and election in a large worker cooperative. They concluded that, in a governance model with several tiers, while the role of working members in selecting members to the first-stage representative organ is guaranteed, their role in the selection of higher-stage governing bodies (e.g. General Council) is limited, which may lead to organizational degeneration where control is concentrated in the hands of a few.

Board Context

Board context was the least discussed factor in our reviewed articles, as only three articles dealt with it ((T*able 3*). Cornforth (2004) maintains that meagre attention has been given to contextual factors, such as the organization's size or changes in public policy, which may influence or shape board characteristics or the way boards work. He suggests that there would be a need for future studies that examine how contextual factors influence what boards do. Regarding consumer cooperatives, Davis (2001) stated that the market impacts on how good governance in cooperatives should be understood, simultaneously bearing in mind that cooperatives must fulfil their purpose. He concludes that the need for non-executive directors is not a matter of principle but depends on circumstances. Considering producer cooperatives and their board governance Bijman et al. (2013) higlight that the cooperatives meet the pressure of the changing agri-food market and thus need to strengthen the autonomy of the management, to reduce

member influence on operational decisions, to find new sources of equity capital, and to professionalize their supervisory bodies.

Member Participation and commitment

Our review analysis established that member participation and commitment were considered essential factors of board governance in cooperatives (*Table 3*). One of the discussion themes was related to low participation activity. Chaves et al. (2008) found a low level of member participation, also known as membership apathy, in large and mature credit cooperatives. Similarly, in the context of consumer cooperatives, Tuominen et al. (2009) reported a low level of member participation, concluding that this makes representativeness questionable. The significance of participation was a discussion theme in several articles. Regarding producer cooperatives, Österberg & Nilsson (2009) highlighted the relationship between participation and commitment pointing out that participation is important for members, and democratic control is crucial. Barraud-Didier et al. (2012) disclosed the interrelationship between trust, participation and commitment concluding that members participate in the governance of their cooperative when they are effectively attached to it. Cechin et al., (2013) realized that members' support of the board is dependent on whether the members feel that they can influence the decisions through democratic control. The authors noted that there is a positive relationship between the duration of membership and proactive participation. They maintained that democratic member control and concern for community are important in understanding members' proactive participation. Regarding worker cooperatives, Leviten-Reid (2009) investigated consumers' and workers' participation on the board and realised that participation was a determinant of satisfaction with services and a determinant of overall quality. Regarding cooperatives in general, Spear's (2004) concern was the low level of member participation and consequently, members have no influence on the board. In his opinion, this problem tends to arise when the cooperative grows. Member satisfaction and member heterogeneity in producer cooperatives were two other themes discussed. Sarov (2021) found that governance with cooperative values, principles and practices impacts members' positive satisfaction. Höhler & Kühl (2018) investigated different dimensions of member heterogeneity in their literature review proposing further measurement.

Performance Role

Our review showed that themes related to the performance role were considered important for the board governance of cooperatives, as they were discussed in 15 articles (*Table 3*) which was the highest number of all the factors covered. The most discussed theme was antecedents of firm performance, which was studied especially in credit unions and producer cooperatives. The results on the impact of board size and the presence of outside directors on performance in credit unions were inconclusive. Saibal & Jugnu (2018) stated that board size does not exert any discernible impact while Yamori et al. (2019) concluded that large boards have negative effects on efficiency. The share of outside directors either fails to influence performance (Saibal & Jugnu, 2018) or seems to have a positive influence (Yamori et al. 2019). Positive impact on performance in credit unions is affected by gender diversity in low-income districts (Saibal & Jugnu 2018) as well as by board remuneration, board expertise and attendance at meetings (Unda et al. 2019). Kumkit (et al. 2022) stated in general that the performance is affected by members' participation, the board of directors, the management team, as well as the organizations' age and size. Unda & Ranasinghe (2019) looked at the matter from the perspective of

risk management, stating that volunteer boards and highly paid boards are associated with a lower likelihood of the credit union becoming insolvent. Regarding producer cooperatives, the results from the impact of board size on performance are inconclusive as well. According to Franken & Cook (2019), board size correlates negatively with most financial measures but positively with overall performance. However, Hakelius (2018) states that large boards, director education, and consensus between the directors and the CEO influence performance positively. Additionally, CEO tenure is also positively correlated with most measures of current and past performance and strongly with overall performance (Franken & Cook 2019). Bijman et al. (2013) examined the impact of different board models on the performance of the cooperative in the Netherlands and their conclusions were bifurcated: traditional board models do not necessarily perform better, and corporation models do not overall perform worse than other models. Grashuis & Su (2019) in their broad literature review found no clear evidence either to suggest that non-traditional ownership or governance is linked to superior performance. Regarding worker cooperatives, Esteban-Salvador et al. (2019) stated that cooperatives chaired by a woman are more likely to have good financial and employment ratios. A few articles concentrated on the role of BOD. Byrne et al (2007) emphasized that the BOD performs an executive and, to a lesser extent, oversight function while Cornforth (2004) highlighted the dual role of the board in driving forward organizational performance and ensuring conformance towards the membership. Power et al. (2012) argued that a major challenge of the board of directors is to retain enough equity to fund business growth. Finally, some general and technical topics were brought out. Spear (2004) suggested that to improve the functionality of governance it is necessary to develop an approach that combines both control perspectives and collaborative perspectives. Bijman et al. (2014) suggested that boards in cooperatives use different performance measures than those that are used in investor-owned firms.

Conformance role

Based on our review analysis, themes related to the conformance role were discussed in 13 articles (T*able 3*). According to Cornforth (2004), conformance means that the organisation behaves in an accountable and prudent manner, which means that its central task is to safeguard the owner-members' interests. Member democracy was clearly the most common theme of discussion and was discussed in the context of all types of cooperatives, except worker cooperatives. Regarding financial cooperatives, Chaves et al. (2008) realized challenges related to the implementation of democratic principles. The authors argued that a low level of member participation may contribute to tension in cooperative governance and cause some democratic and economic imbalance. In terms of consumer cooperatives, Berge (2016) addressed the board's important role as a supervisor and protector of the members' democratic rights. Tuominen et al. (2009) concluded that members elected to positions of trust should represent the whole membership and their interests as closely as possible, and members' low participation in governance makes representativeness questionable. In the context of producer cooperatives, Bijman et al. (2013) and Österberg & Nilsson (2009) discussed ways to maintain democratic decision-making and control, returning value to the members and thus, ensuring the interests of the members-as-users and the board's controlling role. Bleger (2005) noted that member interests should be the key driver of a board. Member benefits were one theme of the discussion that was addressed for producer cooperatives, but not for other types of cooperatives. Bijman et al. (2014) addressed that the key function of the board is to ensure the interests of members-as-users. They also maintained that a supervisory board consisting of

members of the cooperative is the central body for monitoring the BOD. Power et al. (2012) emphasized that returning sufficient value to the members is important. Barraud-Didier et al. (2012) found that the board's role to guide and control strategy and trust explains a member´s favorable behavior towards the cooperative. Finally, the dual role of the BOD came to the fore regarding worker cooperatives. Bakaikoa et al. (2004) identified the agency problem in this duality addressing the board's role as the representative of owner-members parallel to the professional management. Spear (2004) addressed that identifying the duality is a prerequisite for understanding governance performance. Cornforth (2004) identified the tension between the board's roles of driving forward organizational performance and ensuring conformance.

Finally, Figure 3 summarizes the results of our systematic review. We identified that the central issues of board governance are discussed in the cooperative literature under the following factors: board characteristics, board processes, director selection, board context and member participation & commitment. Second, *Figure 3* shows two important board roles that are discussed in the cooperative literature and are related to the dependencies of the BOD: the roles for performance and conformance.

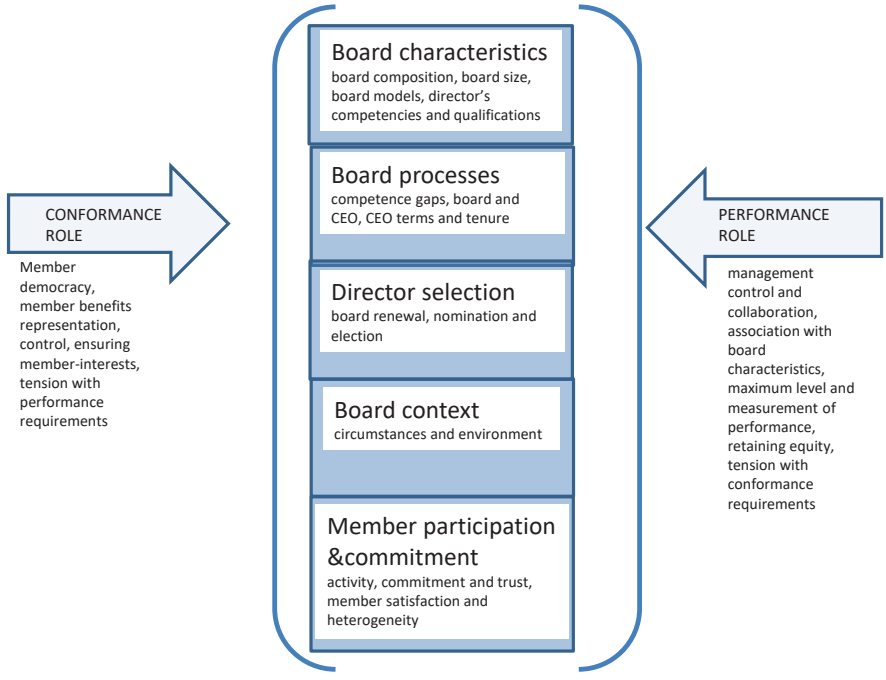

Figure 3: Central factors of board governance and board roles discussed in the cooperative literature

4. Discussion

In general, board governance in cooperatives turned out to be a rarely investigated subject, as we found only 37 relevant peer-reviewed articles. The reviewed articles had been published during the years 2001-2022. The number of published articles increased slightly towards the end of the period but began to decline after 2019. Approximately 40 percent of the studies were conducted in Europe, but the proportion of other continents grew towards the end of the research period. The majority of the articles reported quantitative results and about 50 percent of the studies had applied the agency theory, which was by far the most common approach (see *Table 3*). This finding is similar to the previous reviews of corporate governance in the mainstream literature (e.g. Gabrielsson & Huse 2004).

A closer examination of our findings indicates that it is important to pay attention to the contexts in which boards operate. Some articles focused on the external context, including the market and the competitive environment as well as the growing role of consumers and public policy (Davis, 2001; Jussila et al., 2007; Bijman et al., 2013; Cornforth, 2004). As it comes to the external context, changes in the operational environment challenge the management and governance of cooperatives. In that regard, Bijman et al. (2014) remark that when cooperatives grow bigger, they need to adjust the composition of their boards to the changing market environments, and the traditional representational board composition may become a hindrance. Sometimes the changes in the competitive environment may even require the development of new governance models (Bijman et al., 2013). This, in turn, is important, as an example, in the consideration of non-executive directors (Davis, 2001). A distinct line of discussion in the reviewed articles was related to the members' roles and representation on boards. While there are clear benefits in member representation, several concerns were raised. According to Guerrero et al. (2017), limiting directors to be drawn from the membership may limit governance capacity. Moreover, regional interests often play a major role in board composition and the representativeness of board members may hence override the need for independent directors (Jussila et al., 2007). While the mainstream management literature devotes much attention to non-representational outside directors (e.g. Menozzi et al., 2012), cooperative literature rarely discusses this theme. This observation may reflect the fact that some cooperatives are reluctant to recruit outsiders into BODs, which supports the argument by Davis (2001, p. 29) that "cooperative governance has … as a central part of its primary purpose, the upholding of cooperative identity". Nevertheless, the scarcity of research on board contexts challenges scholars to dig deeper and to ask, for instance, which special circumstances in cooperatives – either external or internal – would speak for the inclusion of outside directors in the BOD?

Regarding board diversity, our findings indicate that there is a scarcity of research on gender balance on boards in cooperative literature. In that regard, our findings diverge from the findings made in the mainstream literature, where the theme has received increasing attention (e.g. Brunzell & Liljeblom, 2014; Martín-Ugedo & Minguez-Vera, 2014). However, some important notions can still be made and in the cooperative literature, one of the main concerns was women's underrepresentation as well as the underrepresentation of young people (Guerrero et al., 2017). This notion is remarkable because women on boards are seen to enhance social orientation (Périlleux & Szafarz, 2015), and cooperatives with a female chair provide higher liquidity ratios, higher numbers of employees, higher percentages of female employees, higher employee costs divided by operating revenue ratio and lower indebtedness (Esteban-Salvador et al., 2019). Thus, the underrepresentation of women as well as the underrepresentation of young people is a central challenge, to which both practitioners and future scholars should try to find a solution.

Based on the findings, tensions were observed at different levels of the cooperatives' governance, which stem from the cooperative's dual nature, i.e. being a business enterprise and a community of members at the same time (e.g. Cornforth 2004). This may manifest as BOD's need to safeguard the owner-members' interests (conformance role) and be successful in the market (performance role) at the same time. A low level of member participation and increasing member heterogeneity may become a challenge to how the BOD of the cooperative is able to manage its dual role. Members' low activity raised concerns in some of the studies, as it may be a source of risk, resulting in membership apathy, which strengthens the autonomous power of the managers (e.g. Chaves et al., 2008). In UK's consumer cooperatives, for example, only a small proportion of members participate in board elections, with the larger and older organizations tending to have the lowest participation levels (Spear, 2004). This may lead to a decline or degeneration of member democracy and reduce the legitimacy of and trust in the representatives on boards. In the context of a large worker cooperative, it was not easy to reconcile cooperative democracy and participation with the election of governance members (Bakaikoa et al., 2004). Our review findings support Hansmann's (1996) observation that the more members there are, the more probable it is that member heterogeneity becomes an issue. Given that cooperatives generally tend to grow, the heterogeneity issue is likely to grow as well. Some scholars call for better involvement of members in the affairs of cooperative societies (Österberg & Nilsson, 2009; Cechin et al., 2013). Importantly, member influence can be a resource (Davis, 2001), and thus, one of the board's key responsibilities is to encourage the growth of membership and its involvement in the affairs of society.

Tensions can also arise because the task of the cooperative's management is to strive for good results in the market, but the board's expertise and practices do not necessarily correspond to this (Berge 2016). Thus, it seems that cooperative boards are facing competence gaps. Nevertheless, the results related to the performance of cooperative boards remained somewhat inconclusive or the opposite. Regarding the influence of board size on performance Franken & Cook (2019) found both positive and negative effects while Hakelius (2018) found positive and Saibal & Jugnu (2018) negative effects. In terms of external directors Yamori (2019) found positive but Saibal & Jugnu (2018) negative effects. Some characteristics like gender diversity (Saibal & Jugnu, 2018; Esteban-Salvador et al., 2019), board expertise (Unda et al., 2019), directors' remuneration (Unda et al., 2019; Unda & Ranasinghe, 2019) and member participation (Kumkit et al., 2022) manifested positive effects on the performance. This same inconclusiveness was also seen in studies of different board and governance models (Bijman et al., 2013; Grashuis & Su, 2019), between which no differences were found in relation to the performance of the cooperative. These partially contradictory results challenge us to ask, are the used performance measures suitable for cooperatives? Noteworthy, Bijman et al. (2014) observed that different performance measures are used in cooperatives than in IOFs. The ambiguity arising from the research may also be connected to the fact that there are such tensions around the cooperative board governance, about which not enough is known yet.

Noteworthy, director selection was most actively discussed in the context of financial cooperatives (e.g. Chaves et al. 2008; Guerrero et al. 2017) and producer cooperatives (Cechin et al. 2013; Huhtala et al. 2020), but rarely discussed in worker cooperatives and not at all in consumer cooperatives. This may stem from the fact that the financial cooperatives are facing growing regulative demands and producer cooperatives are challenged by market pressures which are likely to set new demands for the competence of the board. It can be regarded as a shortcoming in the research on cooperatives that very little is known of board nomination and

selection processes, while the results of mainstream studies have shown that nomination committees improve the board's effectiveness by, for instance, increasing the proportion of independent directors corporations (e.g. Van Ees & Postma, 2004; Ruigrok et al., 2016). One central line of discussion in the cooperative literature has been the slow renewal of board members (Chaves et al., 2008; Unda et al., 2019). This topic was discussed in financial, consumer and producer cooperatives along with directors' terms and tenure and the planning of director succession. Regarding director selection, Cook & Burress (2013) did not believe that cooperative management is likely to play a formally dominant role in nominating board members. There was also some concern regarding the centralization of power in the hands of a few (Bakaikoa et al., 2004). Huhtala et al. (2020) proposed that the understanding of the selection of board members should be increased by studying the use of authority in the governance of cooperatives and the culture present in the governance.

The outcomes of our research on board governance show that the focal interests of researchers are partly different in mainstream and cooperative scholarship, but the areas of research interests also vary to some extent across different types of cooperatives. The supervisory committee, cooperative identity and the representation of directors, as discussed in the cooperative literature, are dimensions that are not explicitly discussed in the mainstream corporate literature. The reason may be that cooperatives are much more closely controlled by their member-owners than are IOFs (Hansmann, 1999).

Finally, this study discloses gaps in the research on the factors of board governance and specifies a need for research across different types of cooperatives. The following Table 4 summarizes the factors of board governance by type of cooperative that were not or were only rarely (maximum 2 articles found) investigated in the articles

FACTORS OF BOARD GOVERNANCE	FINANCIAL CO-OPERATIVES	CONSUMER CO-OPERATIVES	PRODUCER CO-OPERATIVES	WORKER CO-OPERATIVES	OTHER CO-'OPERATIVES
Board characteristics				Rarely investigated	Not investigated
Board processes	Rarely investigated			Rarely investigated	Rarely investigated
Director selection		Not investigated		Not investigated	Rarely investigated
Board context	Not investigated	Rarely investigated	Rarely investigated	Not investigated	Rarely investigated
Member participation and commitment	Rarely investigated	Rarely investigated		Rarely investigated	Rarely investigated
Performance role		Not investigated		Not investigated	
Conformance role	Rarely investigated			Rarely investigated	

Table 5: Factors of board governance not investigated or rarely investigated by the type of cooperative.

Table 5 shows that, regarding different types of cooperatives, the biggest gaps are seen in the research on worker cooperatives where all the factors of board governance were either not in-

vestigated or rarely investigated. Regarding consumer cooperatives, director selection, board context, member participation and commitment as well as performance role were either not investigated or rarely investigated. Producer cooperatives were the most widely investigated group of cooperatives, where only board context was a rarely touched factor. Financial cooperatives were the second most widely studied type of cooperative, where, however, the board context was completely unstudied and board processes, member participation and conformance role were rarely investigated. It should be noted, however, that the total number of research publications can be considered small (37 articles) and the number of factors of board governance studied did not exceed 6 articles for a single cooperative group.

The results revealed big differences in the scope and coverage of the research of different cooperative groups, which calls for new research that utilizes more diverse approaches than the current ones. This literature review is unique in its coverage and thus its results cannot be directly compared to previous reviews. The literature review of Grashuis & Su (2019) dealing with producer cooperatives stated that organizational growth is connected to increased heterogeneity in member attitudes and objectives, particularly in terms of commitment and participation. Our results confirm this not only for producer cooperatives but also for financial cooperatives. The matter would also be worth investigating for consumer and worker cooperatives. Our results regarding producer cooperatives also agree with Grashuis & Su (2019) in that the corporate or hybrid models brought alongside the traditional ownership and board models do not practically differ from each other in terms of performance. According to the literature review of Höhler & Kühl (2018), member heterogeneity presents a major challenge for agricultural cooperatives. While they did not investigate other than producer cooperatives, they assess that their findings could be relevant for other types of cooperatives as the trend towards increasing individualization may also cause a growth in heterogeneity in other types of cooperatives, for instance, consumer, worker or housing cooperatives. Our results did not include studies that examined member heterogeneity in other than producer cooperatives. It should be noted, however, that in all the cooperative groups in our study, low participation was mentioned as a cause for concern, and thus it could give indications that growing cooperatives other than producer cooperatives may also perceive the matter of growing heterogeneity as a challenge.

In the introduction, it was stated that cooperatives as multi-purpose companies are an interesting form of business regarding the common discussion on the purpose of firms and on the ways they operate. In this review, no studies related to cooperatives were found that dealt with the topic of board governance from the perspectives of sustainable development or responsibility. This can be considered one of the key future research fields for which there is a need.

5. Conclusions

The purpose of this review was to provide a synthesis of the factors of board governance in cooperatives by analysing the academic literature. Our study indicates that the scale and the scope of the current academic literature on the factors of board governance in cooperatives are narrow. The review found current themes that have not been discussed at all. The agency theory approach dominates in cooperative research, suggesting that the approach applied to cooperatives has often been the same as that applied to IOFs. Application of qualitative methods would bring new understanding of the mechanisms of influence and the interrelationships across the board governance factors.

The novelty of this research rests, first, on our systematic approach to the factors of board governance in all types of cooperatives. Second, it can be stated that our review is more comprehensive than the previous ones also, as it includes all the important factors discussed in the reviewed articles. The research is incremental (see Corley & Gioia, 2011), as it builds its findings and theories on the existing scholarship in literature. The review benefits academics as it demonstrates both theoretical and empirical deficiencies in the scholarship of cooperative board governance and additionally, makes proposals for new research in the field. The review benefits practitioners as it reveals potential development targets in the governance of cooperatives.

As regards the limitations of this study, it should be noted that our deliberate choice was to limit the analysis to refereed journals in English to maintain consistency and good data quality. This obviously leaves gaps that could possibly be covered using non-English sources, non-academic papers as well as books. Moreover, while the cooperative definition used in this study may apply to both incorporated and non-incorporated cooperatives, we limited our scope to articles that dealt with cooperatives having acquired the status of a legal person through a public registration process. This calls for research on such other organizations (associations, non-profits, etc.) that are built on membership or have similar governance structures as cooperatives.

APPENDIX 1

Reference: Table 3 - Table 5

Parity between ICA classification of cooperative types and the classification used in this article

THE WORLD COOPERATIVE MONITOR COOPERATIVE SUBTYPES (ICA)	MODIFIED CLASSIFICATION OF COOPERATIVE SUBTYPES (DEVELOPED BY THE AUTHORS)
Worker cooperative	**Worker cooperative**
Producer cooperative	**Producer cooperative**
Consumer cooperative	**Consumer cooperative**
Financial cooperative	**Financial cooperative**
Retail cooperative	**Other cooperatives**
Purchasing cooperative	
Housing cooperative	
Social cooperative	
Other type, e.g. multi-stakeholder cooperative	

References

Bakaikoa, B., Errasti, A. & Begiristain, A. (2004). Governance of the Mondragon Corporacion Cooperativa. *Annals of Public and Cooperative Economics* 75:1, 61-87.

Baltaca, B., Mavrenko, T. (2009). Financial cooperation as a low-cost tool or effective microfinancing. *Journal of Business Management* 2:1, 56-64.

Barraud-Didier, V., Henninger, M. & Akremi, A. (2012). The relationship between members' trust and participation in the governance of cooperatives: The role of organizational commitment. *International Food and Agribusiness Management Review* 15:1, 1-24.

Bataille-Chedotel, F., Huntzinger, F. (2004). Faces of governance of production cooperatives: An exploratory study of ten French cooperatives. *Annals of Public and Cooperative Economics* 75:1, 89-111.

Berge, S., Caldwell, W. & Mount, P. (2016). Governance of nine Ontario food co-operatives. *Annals of Public and Cooperative Economics* 87:3, 457–474.

Bijman, J., Hanisch, M. & van der Sangen, G. (2014). Shifting control? The changes of internal governance in agricultural cooperatives in the EU. *Annals of Public and Cooperative Economics* 85:4, 641-661.

Bijman, J., Hendrikse, G. & van Oijen, A. (2013). Accommodating two worlds in one organisation: Changing board models in agricultural cooperatives. *Managerial and Decision Economics* 34:3-5, 204-217.

Bleger, I. (2005). The stakeholder model as a leading model for excellence in governance. A comparative perspective on a co-operative opportunity. *International Journal of Co-operative Management* 2:1, 28-36.

Brown, C. (2007) Economic theories of entrepreneurship: A systematic review of the literature. *MRes, Cranfield University.*

Brunzell, T. & Liljeblom, E. (2014). Chairmen's perceptions of female board representation: A study on Nordic listed companies. *Equality, Diversity and Inclusion* 33:6, 523–534.

Byrne, N., McCarthy, O. & Ward, M. (2007). An alternative approach to oversight: the case of the supervisory committee in Irish credit unions. *International Journal of Co-operative Management* 3:2, 58-67.

Cascio, W. (2004). Board governance: A social systems perspective. *Academy of Management Perspectives* 18:1, 97-100.

Cechin, A., Bijman, J., Pascucci, S., Zylbersztajn, D. & Omta, O. (2013). Drivers of pro-active member participation in agricultural cooperatives: Evidence from Brazil. *Annals of Public and Cooperative Economics* 4:4, 443-468.

Chaves, R., Soler, F. & Sajardo, A. (2008). Co-operative governance: The case of Spanish credit co-operatives. *Journal of Co-operative Studies* 41:2, 30-37.

Cook, M. &, Burress, M. (2013). The impact of CEO tenure on cooperative governance. *Managerial and Decision Economics* 34:3-5, 218-229.

Corley, K. & Gioia, D. (2011). Building theory about theory building: What constitutes a theoretical contribution? *Academy of Management Review* 36:1, 12-32.

Cornforth, C. (2004). The governance of cooperatives and mutual associations: a paradox perspective. *Annals of Public and Cooperative Economics* 75:1, 11-32.

D'Amato, A. & Gallo, A. (2017). Does bank institutional setting affect board effectiveness? Evidence from cooperative and joint-stock banks. *Corporate Governance* 25:2, 78-99.

Darmadi, S. (2013). Board members' education and firm performance: Evidence from a developing economy. *International Journal of Commerce and Management* 23:2, 113-135.

Davis, P. (2001). The governance of co-operatives under competitive conditions: Issues, processes and culture. *Corporate Governance,* 1:4, 28–39.

Deng, W. & Hendrikse, G. (2015). Managerial vision bias and cooperative governance. *European Review of Agricultural Economics* 42:5, 797-828.

Diaz-Foncea, M. & Marcuello, C. (2013). Entrepreneurs and the context of co-operative organizations: A definition of co-operative entrepreneur. *Canadian Journal of Administrative Sciences,* 30:4, 238-251.

Durisin, B. & Puzone, F. (2009). Maturation of corporate governance research, 1993-2007: An assessment. *Corporate Governance* 17:3, 266-291.

Esteban-Salvador, L., Gargallo-Castel, A. & Pérez-Sanz, J. (2019). The presidency of the governing boards of cooperatives in Spain: a gendered approach. *Journal of Co-operative Organization and Management* 7:1, 34-41.

Forbes, D. & Milliken, F. (1999). Cognition and corporate governance: Understanding boards of directors as strategic decision-making groups. *Academy of Management Review* 23:3, 489–505.

Franken, J. & Cook, M. (2019). Do corporate governance recommendations apply to U.S. agricultural cooperatives? *Sustainability* 11:19, 5321.

Gabrielsson, J. & Huse, M. (2004). Context, behavior, and rvolution: Challenges in research on boards and governance. *International Studies of Management & Organization* 34:2, 11-36.

Grashuis, J. & Su, Y. (2019). A review of the empirical literature on farmer cooperatives: Performance, ownership and governance, finance, and member attitude. *Annals of Public and Cooperative Economics* 90:1, 77-102.

Guerrero, S., Lapalme, M.-E., Herrbach, O. & Séguin, M. (2017). Board member monitoring behaviors in credit unions: The role of conscientiousness and identification with shareholders. *Corporate Governance* 25:2,134–144.

Hakelius, K. (2018). Understanding the board of Swedish farmer cooperatives – Cases focusing on board composition and interaction patterns. *Journal of Co-operative Organization and Management* 6:2, 45-52.

Hansmann, H. (1996). *The Ownership of Enterprise.* Belknap Press.

Hansmann, H. (1999). Cooperative firms in theory and practice. *Liiketaloudellinen Aikakausikirja* 4:99, 387-403.

Huhtala, K., Tuominen, P. & Tuominen, T. (2020). Director selection in agricultural cooperatives — The process and the roles in the Finnish context. *Cogent Business &Management* 7:1, 1746171.

Höhler, J. & Kühl, R. (2018). Dimensions of member heterogeneity in cooperatives and their impact on organization – A literature review. *Annals of Public and Cooperative Economics* 89:4, 697-712.

ICA Coop (2018). Available at: https://www.ica.coop/en/the-alliance/about-us.

ICA Coop (2018b). Available at: https://www.ica.coop/en/whats-co-op/co-operative-identity-values-principles

Iliopoulos, C., Värnik, R., Kiisk, T., Varthalamis, G. & Sinnott, L. (2022). Governance in Estonian agricultural cooperatives: Structures and processes. *Sustainability* 14:23, 16031.

Jussila, I., Saksa, J. & Tienari, J. (2007). Dynamics and tensions in governance: Evidence from Finnish co-operatives. *International Journal of Co-operative Management* 3:2, 29-39.

Korac- Kakabadse, N., Kakabadse, A. & Kouzmin, A. (2001). Board governance and company performance: any correlations? *Corporate Governance* 1:1, 24-30.

Kumkit, T., Gan, C., Anh, D. & Hu, B. (2022). Enhancing governance practice for better performance of credit union cooperatives in Thailand. *International Social Science Journal* 72:245, 597–612.

Leviten-Reid, C. & Hoyt, A. (2009). Community-based home support agencies: Comparing the quality of care of cooperative and non-profit organizations. *Canadian Journal on Aging.* 28:2, 107 - 120.

Martín-Ugedo, J. & Minguez-Vera, A. (2014). Firm performance and women on the board: Evidence from Spanish small and medium-sized enterprises. *Feminist Economics* 20:3, 136-162.

Menozzi, A., Urtiaga, M. & Vannoni, D. (2012). Board composition, political connections, and performance in state-owned enterprises. *Industrial and Corporate Change* 21:3, 671-698.

Milliken, F. & Vollrath, D. (1991). Strategic decision-making tasks and group effectiveness: Insights from theory and research on small group performance. *Human Relations* 44:12, 229–1253.

Newbert, S. (2007). Empirical research on the resource-based view of the firm: An assessment and suggestions for future research. *Strategic Management Journal* 28:2, 121-146.

Payne, G., Benson, G. & Finegold, (2009). Corporate board attributes, team effectiveness and financial performance. *Journal of Management Studies* 46:4, 704-731.

Périlleux, A. & Szafarz, A. (2015). Women leaders and social performance: Evidence from financial cooperatives in Senegal. *World Development* 74, 437-452.

Power, G., Saline, V. & Park, J. (2012). Strategic options associated with co-operative members' equity. *Agricultural Finance Review* 72:1, 48-67.

Ruigrok, W., Peck, S., Tacheva, S., Greve, P. & HuThe, Y. (2006). Determinants and effects of board nomination committees. *Journal of Management & Governance* 10:2, 119-148.

Saibal, G. & Jugnu, A. (2018). Board characteristics and financial performance: Evidence from Indian cooperative banks. Author links open overlay panel. *Journal of Co-operative Organization and Management* 6:2, 86-9.

Samra-Fredericks, D. (2000a). Doing 'Boards-in-Action' Research — An ethnographic approach for the capture and analysis of directors' and senior managers' interactive routines. *Corporate Governance* 8:3, 244–257.

Samra-Fredericks, D. (2000b). An analysis of the behavioural dynamics of corporate governance – A talk-based ethnography of a UK manufacturing 'board-in-action. *Corporate Governance* 8:4, 311–326.

Sarov, A. (2021). Governance transformation of the Bulgarian cooperative movement: values, principles, practices and members' satisfaction. *Bulgarian Journal of Agricultural Science* 27:1, 65-71.

Spear, R. (2004). Governance in democratic member-based organisations. *Annals of Public and Cooperative Economics*, 75:1, 33-59.

Tranfield, D., Denyer, D. & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management* 14:3, 207–222.

Tuominen, P., Jussila, I. & Kojonen, S. (2009). Overcoming challenges to governance in consumer co-operatives: Analysing reports of key representatives. *International Journal of Co-operative Management* Vol. 4:2, 22-35.

Unda, L. (2016). The impact of regulatory governance standards on board characteristics: Evidence from Australian credit unions. *JASSA: The Journal of the Securities Institute of Australia* 4, 21–26.

Unda, L., Ahmed, K. & Mather, P (2019). Board characteristics and credit union performance. *Accounting and Finance* 59:4, 2735-2764.

Unda, L. & Ranasinghe, D. (2019). To pay or not pay: Board remuneration and insolvency risk in credit unions. *Pacific-Basin Finance Journal,* 101128.

Van den Bongard, I. & Lehmann, M. (2013). Is busy really busy? Board governance revisited. *Journal of Business Finance & Accounting* 40:9-10, 1221-1246.

Van Ees, H. & Postma, T. (2004). Dutch boards and governance: A comparative institutional analysis of board roles and member (s)election procedures. *International Studies of Management and Organization Issue* 34:2, 90 – 112.

Yamori, N., Harimaya, K. & Tomimura, K. (2017). Corporate governance structure and efficiencies of cooperative banks. *International Journal of Finance and Economics* 22:4, 368-378.

Zahra, S. & Pearce II, J. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management* 15:2, 291–334.

Zhu, H., Wang, P. & Bart, C. (2014). Board processes, board strategic involvement, and organizational performance in for-profit and non-profit organizations. *Journal of Business Ethics* 136:2, 311–328.

Österberg, P. & Nilsson, J. (2009). Members' perception of their participation in the governance of cooperatives: The key to trust and commitment in agricultural cooperatives. *Agribusiness 25:2*, 181-197.

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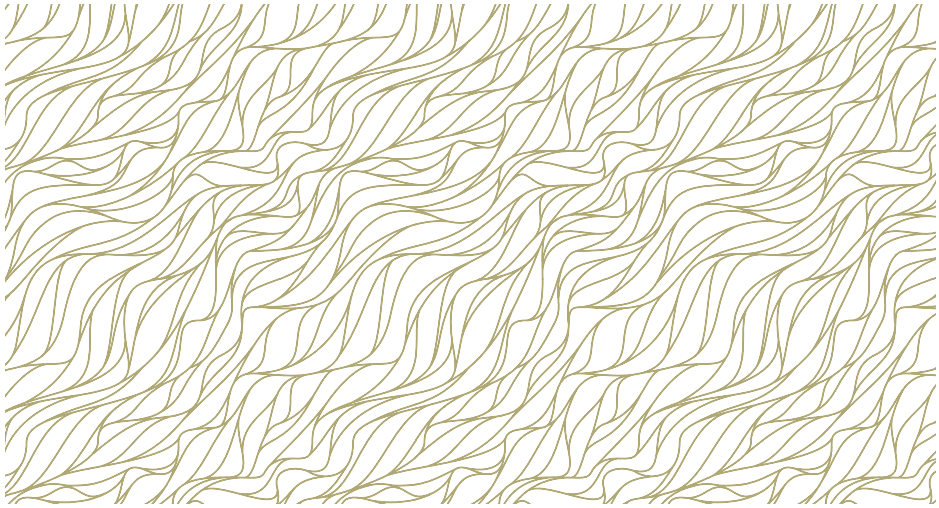

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