The effect of gender diversity on corporate cash policy

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Abstract

This paper examines how gender diversity in corporations affects financial policy of the firm. Using a large set of European listed companies, we study the impact of the number of women both in the board of directors as well or in executive positions on the level of cash holdings. Our results show that the impact of gender diversity differs depending on whether women are represented in the board or in the management. Firms with female mangers have higher cash buffers because of the increased importance of the precautionary motive in cash policy. Gender diversity in the board of director on the other hand influences cash policy not through risk aversion but through increased board effectiveness. Both effects remain after controlling for other cash policy determinants as well as corporate governance quality.

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1 Introduction

Prior literature shows that gender diversity influences corporate decision making. It has been shown that the concentration of women in either the board of directors or management influences corporate governance as well as corporate policy. On the one hand, female directors influence the effectiveness of the functioning of corporate boards in general (Adams and Ferreira, 2009) or the quality of monitoring (Campbell and Minguez-Vera, 2008). On the other hand, female executives seem more risk averse when making strategic and financial decisions (Faccio et al., 2012; Huang and Kisgen, 2013). However, empirical evidence on whether these differences in governance and corporate policy affect corporate performance is mixed. Studies that analyse the impact of gender diversity on firm value either find a positive (e.g., Carter et al., 2003; Krishnan and Park, 2005), no significant (e.g., Rose, 2007; Campbell and Minguez-Vera, 2008), or even negative impact (e.g., Adams and Ferreira, 2009; Faccio et al., 2012; Ahern and Dittmar, 2012). Most studies agree however on the fact that the impact of gender diversity is strongly context dependent. The influence of women at top functions is either mediated or obstructed by aspects like outside governance (Adams and Ferreira, 2009; Jurkus et al., 2011), industry characteristics (Rodríguez-Domínguez et al., 2012), or even demographic characteristics of the individuals involved (Nekhili and Gatfaoui, 2013). On top, the gender performance relationship has been shown to suffer strongly from endogeneity issues (Adams and Ferreira, 2009; Jurkus et al., 2011). Jukus et al. (2011) for example show that the choice of hiring female directors or managers is not independent from other firm characteristics gender diversity is meant to influence. Therefore, after controlling for endogeneity, the initial positive impact disappears.

In order to avoid the afore mentioned problems with the gender performance relationship, and to get a better insight in what role gender diversity plays on boards and managerial decision making; this paper focusses on corporate cash policy. As cash is a flexible asset, it allows for

managerial discretionary spending and perquisite consumption (Jensen, 1986; Harford, 1999; Opler et al., 1999; Harford et al., 2008). Hence, if gender diversity influences managerial behaviour, it is likely to be reflected in the cash policy decisions made by managers. On the other hand, Boubaker et al. (2013) show that effective board of directors are able to prevent the potential opportunistic behaviour of managers or any other controlling shareholder with substantial discretionary power over the firm's cash policy, reducing the agency costs of free cash flow. Any improvement in the effectiveness of the board of directors will therefore lead to a better management of the firm's resources in general and its cash holdings in particular.

Our study contributes to the literature in three distinct ways. First, we add to the recent empirical literature on corporate cash management by showing that next to traditional board characteristics like board size or CEO duality (Boubakar et al., 2013) or managerial characteristics like age and experience (Orens and Reheul, 2013), also gender diversity influences corporate cash buffers. A second contribution of our paper is to combine insights from managerial studies (a.o., Adams and Funk, 2012) and finance studies (a.o., Adams and Ferreira, 2009), in order to explain how gender diversity could influence the decision making of executives as well as its oversight by the board of directors. Finally, our study adds to the growing discussion on the usefulness of quota's for female directors and/or managers in many European countries. Conflicting arguments on whether quotas are economically feasible or ethically desirable (see Terjesen et al., 2013; for an overview of this literature) often ignore the empirical evidence on how gender diversity influences corporate decision making.

We study the relationship between gender diversity and cash policy on a sample of listed European companies. In Europe, already some countries have adopted legislation encouraging or even mandating increased gender diversity at the top of major companies. Following the implementation of strict gender quota in Norway, where a law required that 40% of Norwegian large listed firms' directors be women, countries like Spain (in 2007), the

Netherlands (2009), France (2010), and Iceland (2010) have implemented similar legislation while other countries like Belgium, Finland, and Sweden have made legislative steps towards quotas (see, Terjesen et al. (2013) for an overview of gender related legislation in Europe). While Ahern and Dittmar (2012) argue that mandatory gender quotas constrain the value maximizing process of constructing a board of directors which can have a negative impact on shareholder wealth, the political debate in countries adopting gender diversity legislation focusses mainly on the equal opportunities argument. Our study tries to reconcile both arguments by focusing on the influence of gender diversity on decision making rather than on short term value effects during transition periods.

Using European data has the additional advantage that the economic union provides a level playing field for competition while institutional differences, not only on gender diversity legislation, between countries are still quite significant. In other words, companies from countries with restrictive gender laws have to compete with companies without any restrictions of female involvement in corporate policy. This enables us to control for country specific institutional differences. Specifically, as in Ammann et al. (2011), we use a set of European Union countries where the integration process is most advanced over our sample period, i.e. the countries before the most recent integration wave towards former Eastern European countries.[2] Also two non-EU countries, Norway and Switzerland, are included in our set for obvious important economic ties to the other Western European countries.[3]

[2] Some pre-enlargement EU members (e.g., Luxembourgh, Greece and Austria) are not included due to the lack of consolidated statements in the Amadeus database. Even after the enlargement of the European Union to 27 members (EU27) the 12 EU countries in our sample (i.e., Belgium, Germany, Denmark, Spain, Finland, France, UK, Ireland, Italy, Netherlands, Portugal, Sweden) represent about 90% of total EU27 GDP and 82% of trade volume (export and import) within the European Union as a whole (based on Eurostat statistics for 2010).

[3] Switzerland and Norway are included because of their major trade relationship with the EU members in our sample. Their exports to and imports from our sample countries represents between 60% and 70% of their total trade volume respectively. These numbers are similar for the other countries in our sample who realize 50% to 75% of their total trade volume with the other countries of our sample (based on Eurostat statistics for 2010).

Our results indicate that cash holdings increase with female representation but the nature of this relationship depends on whether women hold directorships or executive positions. Cash holdings only increase at high levels of female representation in the board. Having women at the executive level however, increases cash holdings irrespective of the amount of positions held by women. Our results hold after controlling for the traditional determinants of cash policy like size, growth opportunities, risk and alternative liquid assets. More interestingly, the impact of risk on cash holdings is significantly more important in firms with female executives. This is consistent with the precautionary motive of cash holdings in that the firms adopt more conservative cash policies when they are led by female managers. The impact of growth opportunities on cash holdings on the other hand is stronger for firms with female representation in the board. This indicates that board gender diversity mitigates agency costs of free cash flow. Our results suggest that firms benefit from gender diversity in the board through an increased effectiveness in board oversight while the influence of female managers is caused by gender related differences in risk behavior.

The paper is organized as follows. Section 2 outlines and develops the hypotheses related to the influence of gender diversity on cash holdings. Section 3 details the sample formation process, sample description, and the measures of gender diversity. The empirical findings are presented and discussed in Section 4. Section 5 contains robustness tests and finally, Section 6 concludes the paper.

2 Theoretical background and hypotheses

2.1 Conflicting cash policy motives

Following the seminal papers of Kim et al. (1998) and Opler et al. (1999), many studies conclude that next to the transaction motive, hedging against the risk of future underinvestment is an important motive for holding cash (e.g., Haushalter et al., 2007; Han

and Qiu, 2007; Bates et al., 2009; among others). Various empirical studies show that important drivers of precautionary cash holdings include income uncertainty due to riskier cash flows (Riddick and Whited, 2009), financing constraints due to poor access to external capital (Han and Qiu, 2007) or higher financing costs due to informational asymmetries between investors and managers (Almeida and Campello, 2004).

Another motive for cash policy from the literature is related to agency costs. Jensen (1986) argues that a cash buffer can be wasted on self-serving NPV negative projects by the management. This empire building increases the size of the firm or the prestige of the manager at the cost of shareholder wealth. Large cash holdings increase a manager's financial flexibility free from the disciplinary constraints imposed by external capital markets. The cash literature indicates that the quality of corporate governance strongly influences the agency motive as driver of cash policy. Dittmar et al. (2003) find cross-country evidence suggesting that firms hold more cash in countries with higher probabilities of agency conflicts due to inadequate investor protection. On a firm specific level, Kalcheva and Lins (2007) find that agency problems related to the entrenchment of controlling managers strongly influences cash policy, especially when institutional investor protection against expropriation is poor. Similarly, Harford et al. (2008) show that, the absence of adequate corporate governance enables managers of cash-rich firms to engage in value destroying acquisitions.

In sum, preceding evidence suggests that maintaining high cash reserves can be an efficient corporate strategy if these reserves are intended to hedge against cash shortfalls when profitable investment opportunities arise. By contrast, cash hoards tend to become inefficient when cash policy is driven by agency motives especially in the absence of growth opportunities and effective monitoring.

Both the precautionary and the agency motives tend to be related directly to managerial characteristics and indirectly to board characteristics through the quality of governance.

Duchin (2010) argues that cash holdings should decrease when the precautionary motive decreases, for example due to diversification. He finds that this relationship is strongest when firms are adequately governed. But also management characteristics can shape the trade-off between the precautionary and agency motives for holding cash. Lee and Song (2010) show that after the East Asian financial crisis, managers in those countries became more conservative in their cash policy, increasing the precautionary cash buffer. This conservatism can even be value destroying. Dittmar and Duchin (2012) show that when managers become too conservative, as measured by the CEO's stock option activities, market value of the cash buffer even decreases.

Next to managerial characteristics, also board effectiveness influences the motives for holding cash. Boubaker et al. (2013), show that when institutional governance is weak, board characteristics of good governance strongly reduce the agency conflicts in cash policy. More specifically, they find that an independent, well-structured and busy board of directors reduces excessive cash hoarding. The following section elaborates on how gender diversity can influence both the managerial characteristics as well as board effectiveness.

2.2 Gender diversity, corporate decision making and oversight

Existing research on gender diversity in corporations can be divided in two groups. One group of studies mainly focusses on the insights from psychological studies where differences in financial behaviour between male and females are studied (e.g., Faccio et al., 2012; Huang and Kisgen, 2012). These studies conclude that gender can simply be seen as an additional management characteristic like age, education, experience, that can potentially influence managerial decision making. Another group of studies focuses more on the typical diversity mix rather than the characteristics of individuals in explaining effective group dynamics in for example corporate boards (e.g., Chen et al., 2014; Adams and Ferreira, 2009).

2.2.1 Gender related management characteristics

From the economic gender literature, several fundamental differences between men and women have emerged (Croson and Gneezy 2009), going from altruism (Andreoni and Vesterlund 2001) to risk aversion (Sapienza et al., 2009) and even competitiveness (Niederle and Vesterlund, 2007). The main difference between male and female managers that emerged from the corporate finance literature however, is their attitude towards risk in financial decision making (Huang and Kisgen, 2013). Male managers tend to be more overconfident compared to their female counterparts. Huang and Kisgen (2013) show for example that male executives undertake more acquisitions and issue debt more often than female executives. Evidence of overconfidence can also be found in the observation that men postpone the exercising of stock options and place lower bounds on earnings estimates. Similar results on male overconfidence were already found in the research on gender differences in investment behavior (e.g., Barber and Odean, 2001).

Female executives on the other hand tend to be more risk averse than their male colleagues. Faccio et al. (2012) show that firms run by female CEOs have lower leverage, less volatile earnings, and a higher chance of survival than firms run by male CEOs. Other studies show that female managers avoid risky investments .

An often stated critique however, on the gender research based on managerial characteristics is the generalization of behavioural aspects within a particular gender. Female top managers have risen to the top of a man dominated profession mainly due to certain characteristics that may not be gender specific in the first place. On the other hand, also the benefits of certain types of behaviour can not necessarily be generalized across industries. This makes the link between gender as a management characteristic and corporate performance very endogenous.

A solution to this problem is to focus on the impact of gender diversity on its group behaviour implications rather than on the individual characteristics. This leads to the research on gender diversity in professional teams in general and corporate boards in particular.

2.2.2 Gender related Board dynamics

Whereas the literature on female executives focuses on the individual leadership characteristics and the attitude towards risk, the literature on (gender) diversity in corporate boards tries to explain if and how female directors could influence board behaviour.

Most of the research on gender diversity in the board room analyses the impact of female directors on the key activities of the board, i.e. monitoring and strategic decision making. Ehrhardt et al. (2003) state that gender diversity can affect board dynamics in two key aspects, strategic decision making and monitoring. Diversity may be associated with effectiveness of the monitoring function of boards of directors. One of the central issues of corporate governance is the degree to which a CEO may have influence on the board of directors and vice versa. Boubaker et al. (2013) for example, show that effective boards mitigate the agency costs of free cash flow by reducing managerial discretion in cash policy. Jurkus et al. (2011) investigate gender diversity among the top managers of Fortune 500 firms and its effect on agency costs. They find that firms with a greater percentage of female officers present lower agency costs especially when market discipline is poor. The results suggest that increasing diversity in management can have beneficial effects for firms where strong external governance is absent.

Agency theory (Schleifer and Vishny, 1997) suggests that monitoring needs to be independent to be effective. As gender diversity of the board of directors and the subsequent conflict that is considered to commonly occur with diverse group dynamics, is likely to have a positive impact on the controlling function, it could be useful in minimising potential agency issues.

As the board of directors is an important internal control mechanism for safeguarding shareholder interests, boards should be able to provide high-quality and impartial advice (Fama, 1980). Board diversity may increase governance quality as it stimulates board activism by raising concerns that are less likely to be discussed by more homogeneous groups (Ely and Thomas, 2001).

Adams and Ferreira (2009) argue that the presence of women on boards could affect the governance of companies in significant ways. They find for example, that more diverse boards are more likely to hold CEOs accountable for poor stock price performance. Additionally, CEO turnover is more sensitive to stock return performance in firms with relatively more women on boards.

Empirical evidence on the actual functioning of board with increasing female participation is mixed. Some authors find that female directors are more active in monitoring and even encourage male colleges to increase their monitoring activity. But studies on the impact of the mandated board competition in Norway also showed a dark side of this kind of legislation. Ahern and Dittmar (2012) document that the introduction of mandatory board member gender quotas led to an increase in acquisitions and performance deterioration in Norwegian publicly traded firms.

2.3 Gender diversity and corporate cash policy: hypotheses

As already stated above, it is not a priori clear whether gender diversity in either board or management would increase or decrease cash holdings. It strongly depends on the characteristics of this diversity (e.g., number of women, function, external, etc.) and its influence on the motives for hoarding cash. In order to establish empirically testable hypotheses on the impact of gender diversity on cash holdings, we focus on the distinction between the risk based (i.e., precautionary) versus the agency motive of cash holdings.

Because the literature shows that the impact of gender diversity on corporate behaviour can be due to gender based managerial characteristics as well as gender related board effectiveness, we formulate hypotheses for both aspects respectively.

First, although female risk aversion and male overconfidence can lead to similar predictions on firm performance because they both lead to suboptimal levels of cash, the attitude towards risk renders different empirical expectations in the amount of cash that is kept on the balance sheet. Overconfident managers will underestimate the income uncertainty and will therefore hold too little cash. Female executives on the other hand will not underestimate the risk their company is faced with. In case of exaggerated risk aversion, the cash buffer of these firms will even be too big. Therefore, if gender diversity influences the precautionary motive for cash policy we can formulate the following hypothesis:

H1: If gender based management characteristics influence cash policy through the precautionary motive, cash holdings are higher in firms with (more) female executives.

The hypothesis does not distinguish however between overconfidence and risk aversion. In order to assess whether cash holdings are different between high and low gender diverse firms because of either overconfidence or risk avoidance, we interact gender diversity with income uncertainty. Similar to Lee and Song (2010), we can argue that an increased impact of risk on cash holdings can be interpreted as an increase in the precautionary motive. The second hypothesis is as follows:

H2: If risk aversion drives the precautionary motive, the relationship between risk and cash should be more pronounced in firms with (more) female executives.

Second, as gender diversity influences the monitoring effectiveness of the board, one would expect that firms with more female directors suffer less from agency costs of free cash flow. More specifically, an effective board of directors will moderate the opportunistic behaviour of managers and/or controlling shareholders with substantial discretionary power which will limit the agency costs associated with cash holdings. Therefore, increased monitoring of the board will improve the management of the firm's resources in general and its cash holdings in particular (Kusnadi, 2011). This leads to the following hypothesis:

H3: If gender diversity reduces agency costs of free cash flow, firms with (more) female directors should have lower cash holdings.

The problem with the third hypothesis is that we are not able to empirically distinguish which part of the cash buffer can be considered "idle" cash and which part belongs to the strategically necessary buffer. To solve this problem we focus on the interaction between gender diversity and growth opportunities. Dittmar et al. (2003) already showed that when cash holdings are driven by agency conflicts, there is no relationship between cash and growth opportunities measured by Tobin's Q. This way we can argue that if female directors increase the monitoring quality of the board of directors, the impact of growth opportunities on the cash policy should be more pronounced. Hence, we formulate the following hypothesis:

H4: If gender diversity reduces agency conflicts, the impact of growth opportunities on cash holdings should be more pronounced in firms with (more) female directors.

3. Methodology and Data

3.1. Methodology

In order to test our hypotheses, we explore first the impact of gender diversity in management as well as board of directors on the level of cash holdings, and then analyse potential interactions of diversity with other determinants of cash holdings. This allows us to establish whether and how, after controlling for the common determinants of cash holdings, gender diversity influences the cash policy motives. Our approach is similar to Lee and Song (2012) who show that the Asian financial crisis influenced the level as well as the motives of cash policy. Additionally, we use similar control variables but incorporate also measures of gender diversity in the cash models. Contrary to Lee and Song (2012), we use cross sectional data for one year only, as we are interested in differences in cash policy between companies rather than changes in cash policy within the same firm over time.

3.2. Data and variable construction

3.2.1. Data selection

Similarly to Faccio et al. (2012), we use the Bureau Van Dijk's Amadeus database covering a large number of European publicly-traded companies. For our empirical investigation, we initially use an unbalanced sample of non-financial European companies from 14 countries over the period 2008-2012. For these countries we include all listed firms with consolidated financial statements available in the Amadeus Database of Bureau Van Dijk. Bureau Van Dijk standardizes balance sheet information with the objective of achieving cross-border uniformity. As discussed in the introduction, we will treat our set comprising of European countries (i.e., 12 EU members, Norway and Switzerland) as one product market due to the strong trade relations among these countries.

The data set of large consolidating companies initially consists of 2563 firms. As discussed below, we only use listed firms to more accurately calculate gender diversity. Due to data availability on gender characteristics and the use of lagged values both in the variable definitions and estimation methodology, the effective sample in the reported univariate and multivariate results is always somewhat smaller. To minimize the influence of outliers in the analysis, we replace extreme observations of all ratio variables with missing values. Extreme observations include values in the 99th percentile and, for variables with negative values, also those in the 1st percentile.

3.2.2. Measures of gender diversity

As Faccio et al. (2012), we gather information on the identity and the gender of managers and directors from Amadeus. As certain types of owners are sometimes represented in the board of directors by a legal entity that has no gender, we only consider natural persons. We identify the gender of a manager or a board member based on the salutation, as reported in the database for 2012. We use the salutation rather than the individuals' first name as it indisputably allows identifying the gender. If the salutation is not available, we employ country-specific internet-based sources to classify gender based on each individual's first name. Using country-specific sources is important to avoid misclassification.

In order to distinguish between executives and board members, we use the job title classifications as used by Amadeus. The ratio of female executive members (EXECRATIO) can therefore be defined as the sum of female executives divided by the total number of executives within the firm. A dummy (FEMEXEC) indicates whether a company has at least 1 woman in a management function. Note that we do not only look at the gender of the CEO as not all firms use that particular job title to indicate the top manager. Similar to the

executive positions, we also count the non-executive female representation in the board of directors. Gender diversity in the board (BOARDRATIO) can therefore be defined as the proportion of female directors in the sum of all directors. Other variables will be used to distinguish between firms with at least one female director (FEMBOARD). We will also use the quartiles of the ratio of all female board members (executive as well as non-executive) over all board members to split the sample in 4 groups based on gender diversity. An overview of the gender diversity measures across the different countries in our study can be found in Table 1.

TABLE 1

Apart from the observation that even in 2012 the manifestation of women at the top of listed companies is still very modest with an average female representation of 17.52% and 13.72% in board and top management respectively, there are two other important conclusions that can be drawn from this table. First, even though in most countries around 75% of the listed firms have at least one female director in the board, the proportion of firms with female executives is still very low (i.e., 30%). A second conclusion is that even in countries with legislation of gender quotas in place or under way, the average proportion of women in the board of directors does not always reach the mandatory proportion. In Norway for example, where listed companies are supposed to have 40% women in the board, the average representation only amounts to about 34%. This is possible because the quota only apply to the largest listed companies. More strikingly is the observation that only about 26% of Norwegian firms have at least one female executive. This number is much lower than countries with no real gender diversity legislation in place like Germany where almost half of the companies have at least one female manager.

3.2.3. Determinants of cash holdings

Following the literature on cash policy (e.g., Opler et al., 1999; Haushalter et al., 2007; Kalcheva and Lins, 2007), we define cash holdings as the ratio of cash and cash equivalents divided by net assets (CASHNA), where net assets are the total assets of a firm minus cash and cash equivalents. The other dependent variable in our study is the industry corrected cash ratio where for each year the corresponding (3-digit SIC) industry average is subtracted from the cash variable rendering a measure for excess cash holdings (EXCASHNA).

The cash policy models are similar to the ones in Kalcheva and Lins (2007) and involve the control variables discussed below. As we estimate a cross sectional cash model for the year 2012, cash as well as gender diversity are measured at that years end. However, our initial unbalanced panel data setting allows us to lag other control variables in order to avoid reverse causality with cash policy.

Size (SIZE) is often found to affect cash holdings due to the economies of scale that larger firms can realize in the cash levels required to finance day-to-day operations (Opler et al., 1999). Therefore, we expect a negative relation between firm size, measured as the natural logarithm of total assets, and cash holdings.

Leverage (LEV) also affects a firm's cash holdings. Empirical evidence (Opler et al., 1999; Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004) suggests a negative relationship between financial leverage and cash. The argument is that leverage and cash can be considered substitutes since firms can always issue debt when cash shortfalls occur. However, both Ozkan and Ozkan (2004) and Ferreira and Vilela (2004) argue that the predicted relationship between leverage and cash is ambiguous. Since high debt levels increase the probability of financial distress, high levered firms could also increase cash holdings to

counter this risk. They find, however, no evidence for the positive relationship between leverage and cash holdings. Leverage is defined as the ratio of total debt to total assets.

Investment opportunities (INV) as measured by the change in tangible fixed assets plus depreciation divided by total assets, is expected to reduce the agency costs of free cash flow especially when combined with leverage (Kalchava and Lins, 2007).

Other liquid assets (LIQ), apart from cash and cash equivalents, are expected to reduce cash holdings, since these assets can be considered substitutes for cash. In line with Garcıa-Teruel and Martınez-Solano (2008), we define other liquid assets (LIQ) as net working capital minus cash and cash equivalents divided by total assets.

Cash flow (CF) is also a determinant of a firm's cash holdings. Due to the hierarchy of financing sources (Myers and Majluf, 1984), firms with large cash flows are expected to keep higher cash levels, as is confirmed by Opler et al. (1999) and Ozkan and Ozkan (2004) for the US and UK markets respectively, or by Ferreira and Vilela (2004) for European Monetary Union countries. We define cash flow (CF) as the ratio of EBITDA over total assets in our empirical analysis.

Growth opportunities (Q) are measured, as in Dittmar et al. (2003) by using the market to book of the company. This measure is defined as the market value of equity plus total assets less book value of equity all divided by total assets.

Finally, the dividend payment variable (DIV) is a dummy that receives the value 1 if a firm has paid out dividends in a certain year and 0 otherwise. As the payout policy of a firm partly determines what amount of cash is kept in the firm, we control for the fact that management decides to distribute at least part of the year-end cash flow towards shareholders.

Cash flow uncertainty (RISK) increases the probability of cash shortfalls, ceteris paribus (Opler et al., 1999). Hence, risky firms should increase cash holdings in order to avoid cash shortfalls. We measure RISK as the standard deviation of the cash flow ratio defined above over the last three years.

Following Kalchava and Lins (2007), we control for corporate governance by using measures of insider ownership. We assume that when insiders' control of a firm increases, the probability of expropriation of outside shareholders also increases. As expropriation could influence cash policy, we control for it by including the INSIDEOWN variable in the cash models as well as the firm value models. Kalcheva and Lins (2007) and others also emphasize the role of the board of directors in improving monitoring quality. We us the number of non-executive directors (BOARDSIZE) as a proxy for governance quality.

4. Empirical results

4.1. Descriptive statistics and univariate results

In order to characterize the firms in our sample, we report the descriptive statistics of the variables used in Table 2. The summary statistics for the cash variable are similar to other studies using European data in the same time period. Companies are holding roughly 14% of their net assets (i.e., total assets minus cash) in cash or cash equivalents. Firm value measured by Tobin's Q has an average of 1.3 over all firms during the sample period. The average company in our data set has total assets of about 253 million euro. Firms are on average highly leveraged, with total debt to total assets (LEV) amounting to 55%. The change in tangible fixed assets (INV) amounts to a modest 0.6% of total assets on average while alternative liquid assets (LIQ) represent 5.7%%, and the cash flow variable (CF) 1.25% of total assets respectively. About 60% of firms has paid a dividend over the sample period

while the volatility of cash flow amounts to 6%. The average value of the entrenchment variable (INSIDEOWN) indicates that 42% of the firms have an insider owner with a stake of 5% or more. Finally, the average of non-executive board members is 11.36 while there are 3.86 executives in our sample firms on average.

TABLE 2

As we will focus on the cross-sectional differences in cash policies between firms for the year 2012 only, table 3 gives an overview of the average values for 2012 only of the dependent as well as the control variables for different sub-sets based on gender diversity.

TABLE3

When we compare the cash levels of firms with either no or high female representation in the board, a u-shaped pattern emerges. While all male companies held on average 14% of net assets in cash and cash equivalents in 2012, that number drops to 12,5% for firms in the 2nd quartiles of female representation to increase to above 15% in the group with the highest gender diversity. This indicates that either no or a lot of female directors leads to an increase in cash holdings compared with the overall average of 13.11%. The results are similar for the industry adjusted cash variable (EXCASHNA). When we split up our sample firm based on whether they have at least one women as a non-executive board member or as an executive, an interesting result emerges. While having women as board members reduces the level of cash holdings compared to firms with no women at all, having female executives increases cash. This is in line with both our first and third hypothesis.

Another interesting result is the difference in cash flow generation between the zero group and the subsample with female executives. The latter group of firms generated on average 4%

more cash flow in 2012. Other variables show that firms with the highest gender diversity have significantly lower liquid assets and cash flow volatility while the leverage and dividend payments were noticeably higher. Overall these results confirm earlier findings from (Faccio et al., 2012) that gender diversity reduces the risk while increasing leverage. However, the distinction between executive and non-executives seems important and needs further attention in the multivariate setting.

4.2 Gender diversity in cash models

Because of the time invariant nature of our gender diversity data, we will focus on the cross sectional differences in cash policy rather than on the dynamics of the cash buffer over time. The static cash model estimates the impact of female representation in the company on the level of cash holdings, controlling for the traditional determinants of cash. All control variables are lagged one year in order to avoid potential endogeneity issues in cash policy. We explicitly control for country specific as well as industry specific fixed effects due to large differences in dependent and independent variables across countries and industries.

Table 4 reports the results for the basic cash models augmented with one of the gender diversity measures. The dependent variable in Panel A is CASHNA while Panel B uses the industry corrected measure of cash (EXCASHNA). Models (2) an (4) of Panel A show a positive and significant impact of increasing female representation in either board or management. However, model (1) shows that simply having a women on the board (FEMBOARD) has no significant impact on cash holdings. On the other hand, firms with at least one female executives increases the cash holdings with about 2% as can be seen in model (3). This result confirms the univariate statistics from Table 2 and is in line with our first hypothesis that female executives increase cash holdings.

TABLE 4

The coefficients of the control variables are in line with the empirical literature on cash policy. Larger firms with more alternative liquid assets and high leverage hold significantly lower amounts of cash. Cash flow generation on the other hand increases the cash holdings significantly. These results prove that, as already established in the cash policy literature, all firms base their cash buffer to some extend on the transaction motive.

Panel B of Table 4 reports very similar results for the industry corrected measure of cash (EXCASHNA). Also here excess levels of cash are significantly driven by the amount of women in executive as well as non-executive positions but only firms with female executives hold higher cash buffers on average. This result might be partly due to the U shaped relationship between gender diversity and cash holdings that was apparent in Table 2.

To explore the potential motives, i.e. agency and precautionary, two variables deserve further attention. First, as argued by Dittmar et al. (2003) an efficient cash policy free from agency conflicts of free cash flow, should reflect growth opportunities of the firm. Therefore we expect Q to have a significantly positive impact on the level of cash holdings. Table 4 shows that this is the case irrespective of whether or not cash holdings are industry adjusted. The impact of growth opportunities is even significant in economic terms as en increase in Q with one standard deviation increases the cash ration with more than 2.5%. These results indicate that overall cash policy in our set of European listed companies is not dominated by agency conflicts. The precautionary motive on the other hand also seems to influence cash policy significantly as well as economically. An increase in the cash flow volatility with one standard deviation increases cash with around 1.5%.

In order to test the second and fourth hypotheses to reveal the impact of gender diversity on the motives of cash holding, we interact the gender diversity dummies with measures of

growth opportunities (Q) and income uncertainty (RISK). Table 5 reports the results of these interaction models. As interactions between two continuous variables are difficult to interpret, we will use the FEMEXEC and FEMBOARD dummies that indicate whether the firm has at least one female executive or non-executive director respectively. Models 1 and 3 estimate the impact of these two dummies in the CASHNA models while models 2 and 4 use the industry adjusted measure of excess cash (EXCASHNA). Analogue to the results in table 4, an interesting difference emerges depending on whether firms have at least one women in either a management (models 1 and 2) or non-executive board (models 3 and 4) position.

TABLE 5

When corrected for the interaction between FEMEXEC and growth opportunities and income uncertainty respectively, having female executives does not increase corporate cash holdings significantly. However, there is a strong positive interaction between FEMEXEC and risk indicating that the precautionary motive is more important for female managers. This finding supports our second hypothesis and is analogue to Lee and Song (2012) who interpret an increased importance of risk in cash models as evidence for the dominance of the precautionary motive in cash policy. Models 3 and 4 on the other hand show that female non-executives in the board seem to reduce cash holdings significantly unless when growth opportunities are important. This strong positive interaction between FEMBOARD and Q indicates in line with hypothesis 3 and 4 that gender diversity reduces agency costs of free cash flow. Analogue to Dittmar et al. (2003) we can therefore conclude that gender diversity increases the influence of growth opportunities in cash policy making it less dependent on agency conflicts.

Our results from Table 5 confirm that managerial characteristics as well as board dynamics play a role in the impact of gender diversity on cash policy. They also confirm, in line with Faccio et al. (2012) that the increase in cash buffers in firms with female executives is due to risk aversion rather than overconfidence on the part of managers in all male management teams.

4.3 The optimal level of gender diversity

Previous results from Tables 4 and 5 only revealed the impact of gender diversity in the board of directors on cash policy either in a continuous (i.e., BOARDRATIO and EXECRATIO) or a discrete (i.e., FEMBOARD, FEMEXEC) manner. It is however important to asses at what level of gender diversity we can expect the biggest influence. For this reason we estimate the cash models on subsamples of gender diversity. Table 6 reports the results for the determinants of cash policy when the sample is split up based on female representation in executive or non-executive positions and the quartiles of the ration of all women (executive or not) on the total of all board members. Again, we focus more particularly on the impact of both growth opportunities (Q) and income uncertainty (Risk). Consistent with the interaction results from table 5, the coefficient for Q is highest for firms with at least one female board member while the RISK coefficient is most outspoken in firms with at least one female executive.

The results for the quartiles subsamples shows the impact of general gender diversity (executive or not). Interestingly, although the coefficient for Q is always higher compared to firms with no female representation what so ever, in the highest quartile however the impact of Q reduces somewhat. This indicates that the influence of female board members on the quality of monitoring diminishes when female representation becomes very large. The coefficient of risk on the other hand is only significant in the subsample with highest and

lowest female representation. This shows that the somewhat counterintuitive result in table 4, that female board representation increase cash holdings, is strongly influenced by the companies with very high female representation. Once the female directors become more dominant in the board of directors, cash policies seem to become over conservative. At moderate levels of gender diversity in the board however, the reduction of the agency conflict dominants this conservatism.

4.4 Robustness testing

As the literature on board effectiveness shows that the quality of corporate governance is strongly influenced by ownership and board size , we assess whether these aspects influence the impact of gender diversity. Table 7 reports the results for the cash models, as reported in Table 4, controlling for insider ownership (INSIDE) as well as board size (BOARDSIZE). Our results remain largely unaffected. Only firms with at least one female executive have higher cash holding ceteris paribus. Further, in line with we also find that inside ownership as well as board size also have a positive although not very significant impact on the level of cash holdings.

TABLE 7

5. Conclusions

In this paper we study the relationship between gender diversity and cash policy on a set of large European listed companies. In Europe, already some countries have adopted legislation encouraging or even mandating increased gender diversity at the top of major companies. As the economic union provides a level playing field for competition while institutional differences, not only on gender diversity legislation, between countries are still quite significant, companies from countries with restrictive gender laws have to compete with

companies without any restrictions of female involvement in corporate policy. This makes our data setting an ideal testing ground for the impact of gender diversity on corporate decision making.

Our results indicate that cash holdings increase with female representation but the nature of this relationship depends on whether women hold directorships or executive positions. Cash holdings only increase at high levels of female representation in the board. Having women at the executive level however, increases cash holdings irrespective of the amount of positions held by women. Our results hold after controlling for the traditional determinants of cash policy like size, growth opportunities, risk and alternative liquid assets. More interestingly, the impact of risk on cash holdings is significantly more important in firms with female executives. This is consistent with the precautionary motive of cash holdings in that the firms adopt more conservative cash policies when they are led by female managers. The impact of growth opportunities on cash holdings on the other hand is stronger for firms with female representation in the board. This indicates that board gender diversity mitigates agency costs of free cash flow.

The main insight from our study is that firms benefit from gender diversity in the board through an increased effectiveness in board oversight while the influence of female managers is caused by gender related differences in risk behavior. As an avenue for further research, it might be interesting to test whether not only cash levels but also the value of cash is significantly impacted by gender diversity. This way we will be able to assess whether female executives or board members generate shareholder value through sound decision making. Another interesting future research question is whether our findings on cash policy can be translated to other financial corporate decisions like dividend or investment policies.

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Table 1

Country-level summary statistics.

Country	Firms	EXECRATIO	FEMEXEC	BOARDRATIO	FEMBOARD
Belgium	64	7,89%	31,25%	14,28%	76,56%
Denmark	68	5,07%	13,24%	10,92%	63,24%
Finland	77	16,99%	62,34%	23,45%	97,40%
France	443	23,28%	33,78%	21,53%	87,84%
Germany	403	12,67%	46,65%	8,54%	50,12%
Ireland	32	7,18%	15,15%	16,49%	81,82%
Italy	169	8,63%	16,86%	11,12%	81,40%
Netherlands	82	14,76%	30,49%	16,61%	84,15%
Norway	124	10,89%	25,81%	34,23%	96,77%
Portugal	14	15,61%	28,57%	20,39%	92,86%
Spain	75	9,87%	21,05%	9,65%	81,58%
Sweden	262	10,02%	21,29%	16,91%	80,23%
Switzerland	39	6,61%	17,95%	9,49%	69,23%
UK	711	14,00%	22,47%	20,58%	70,08%
Full sample	2563	13,72%	29,13%	17,52%	74,95%

Table 2.

Summary statistics

Variable	Mean	Median	Minimum	Maximum	Std. dev.
CASHNA	0.1388	0.0839	0.0000	1.2655	0.1629
EXCASHNA	0.0379	0.0000	-0.3584	0.9879	0.1531
SIZE	19.3531	19.1688	12.2535	26.2704	2.2987
CF	0.0125	0.0291	-0.9213	0.7222	0.1186
Q	1.3074	1.0553	0.2977	9.2087	0.8457
LIQ	0.0570	0.0460	-0.6340	0.9241	0.1848
INV	0.0067	0.0013	-0.6814	0.5644	0.0640
LEV	0.5484	0.5608	-0.0428	0.9979	0.1862
DIV	0.6087	1.0000	0.0000	1.0000	0.4881
RISK	0.0595	0.0345	0.0003	0.7481	0.0792
INSIDE	0.4260	0.0000	0.0000	1.0000	0.4946
BOARDSIZE	11.36	9.00	1.00	66.00	8.48
EXECSIZE	3.86	3.00	1.00	19.00	3.28

Table 3.

Summary statistics gender diversity

Variable	Full sample	No women	Quart1	Quart2	Quart3	Quart4	Women in board	Women in exec
CASHNA	0.1311	0.1408	0.1339	0.1250	0.1455	0.1518	0.1344	0.1556
EXCASHNA	0.0323	0.0385	0.0337	0.0251	0.0427	0.0507	0.0346	0.0534
SIZE	19.5221	17.8855	18.7431	19.6921	19.6175	19.3003	19.7325	19.8190
CF	0.0108	-0.0158	-0.0062	0.0146	0.0247	0.0158	0.0178	0.0270
Q	1.3031	1.3142	1.2664	1.2520	1.3813	1.3332	1.3087	1.3326
LIQ	0.0492	0.0805	0.0754	0.0648	0.0471	0.0411	0.0474	0.0730
INV	0.0067	0.0126	0.0082	0.0017	0.0061	0.0113	0.0055	0.0086
LEV	0.5822	0.4977	0.5281	0.5772	0.5432	0.5413	0.5625	0.5441
DIV	0.6329	0.4239	0.5130	0.6643	0.6468	0.6011	0.6446	0.6910
RISK	0.0632	0.0915	0.0774	0.0506	0.0549	0.0567	0.0534	0.0492
BOARDRATIO	0.1756	-	0.0179	0.1223	0.1969	0.3678	0.2279	0.1897
EXECRATIO	0.1364	-	0.0177	0.0919	0.1602	0.2738	0.1370	0.3621

Table 4:

Cross sectional regression of gender diversity in cash holdings

	Panel A: CASHNA			
Explanatory var (expected sign)	(1)	(2)	(3)	(4)
C	0.265***	0.263***	0.273***	0.252***
	7.70	7.72	7.90	6.95
SIZE(-1)	-0.008***	-0.008***	-0.008***	-0.007***
	-4.22	-4.37	-4.52	-3.74
CF(-1)	0.158***	0.156***	0.158***	0.143***
	3.32	3.27	3.32	3.97
Q(-1)	0.030***	0.030***	0.030***	0.035***
	4.37	4.44	4.38	8.65
LIQ(-1)	-0.098***	-0.098***	-0.098***	-0.098***
	-4.07	-4.09	-4.07	-4.61
INV(-1)	-0.063*	-0.064*	-0.061*	-0.062*
	-1.86	-1.90	-1.83	-1.70
LEV(-1)	-0.148***	-0.148***	-0.145***	-0.153***
	-6.86	-6.90	-6.82	-7.32
DIV(-1)	-0.004	-0.004	-0.004	-0.010
	-0.52	-0.54	-0.57	-1.29
RISK(-1)	0.190***	0.193***	0.192***	0.173***
	2.92	2.96	2.97	3.27
FEMBOARD	0.007			
	0.72			
BOARDRATIO		0.042*		
		1.70		
FEMEXEC			0.019***	
			2.61	
EXECRATIO				0.022*
				1.67
Fixed country effects	Yes	Yes	Yes	Yes
Fixed industry effects	Yes	Yes	Yes	Yes
Obs.	2012	2012	1719	1719
Adjusted R^2	0.189	0.190	0.192	0.198

This table reports the results for the cross section (Fixed country & industry effects) cash models (White's heteroskedasticity consistent t–statistics in parentheses). The dependent variable is either the CASHNA variable, measured as cash and cash equivalents divided by total assets, or EXCASHNA, measured as CASHNA minus the 3-digit industry median. Level of significance: ***1%; **5%; *10%.

	Panel B: EXCASHNA			
Explanatory var (expected sign)	(5)	(6)	(7)	(8)
C	0.160***	0.158***	0.171***	0.139***
	4.48	4.54	4.78	3.72
SIZE(-1)	-0.007***	-0.007***	-0.008***	-0.006***
	-3.90	-4.03	-4.32	-3.36
CF(-1)	0.174***	0.172***	0.174***	0.162***
	3.63	5.20	3.63	4.34
Q(-1)	0.029***	0.029***	0.029***	0.036***
	3.84	8.43	3.83	8.86
LIQ(-1)	-0.103***	-0.103***	-0.103***	-0.105***
	-4.23	-4.91	-4.23	-4.77
INV(-1)	-0.073**	-0.074**	-0.070**	-0.075**
	-2.04	-2.00	-2.00	-1.97
LEV(-1)	-0.143***	-0.143***	-0.140***	-0.145***
	-6.47	-7.00	-6.44	-6.72
DIV(-1)	-0.002	-0.002	-0.002	-0.008
	-0.19	-0.23	-0.25	-1.02
RISK(-1)	0.164**	0.167***	0.167***	0.144***
	2.55	3.34	2.62	2.64
FEMBOARD	0.007			
	0.72			
BOARDRATIO		0.041*		
		1.77		
FEMEXEC			0.024***	
			3.25	
EXECRATIO				0.027**
				1.97
Fixed country effects	Yes	Yes	Yes	Yes
Fixed industry effects	Yes	Yes	Yes	Yes
Obs.	2018	2018	1724	1724
Adjusted R^2	0.115	0.116	0.120	0.134

This table reports the results for the cross section (Fixed country & industry effects) cash models (White's heteroskedasticity consistent t–statistics in parentheses). The dependent variable is either the CASHNA variable, measured as cash and cash equivalents divided by total assets, or EXCASHNA, measured as CASHNA minus the 3-digit industry median. Level of significance: ***1%; **5%; *10%.

Table 5:
Interaction of gender diversity with growth opportunities and income uncertainty

	Panel A		Panel B	
Explanatory var (expected sign)	(1)	(2)	(3)	(4)
C	0.275***	0.176***	0.281***	0.178***
	7.85	4.90	8.23	5.04
SIZE(-1)	-0.008***	-0.007***	-0.007***	-0.007***
	-4.43	-4.21	-4.20	-3.82
CF(-1)	0.157***	0.170***	0.156***	0.172***
	3.30	3.55	4.90	5.21
Q(-1)	0.028***	0.024***	0.018***	0.015**
	3.56	2.94	3.03	2.46
LIQ(-1)	-0.100***	-0.105***	-0.098***	-0.103***
	-4.12	-4.23	-4.83	-4.90
INV(-1)	-0.066**	-0.076**	-0.063*	-0.072**
	-1.96	-2.16	-1.76	-1.96
LEV(-1)	-0.147***	-0.140***	-0.146***	-0.140***
	-6.85	-6.44	-7.41	-6.86
DIV(-1)	-0.004	-0.002	-0.004	-0.001
	-0.49	-0.19	-0.53	-0.17
RISK(-1)	0.138**	0.114*	0.143**	0.112*
	2.06	1.72	2.19	1.65
FEMEXEC	-0.008	-0.019		
	-0.43	-0.92		
FEMBOARD			-0.025*	-0.029**
			-1.79	-2.06
FEMEXEC*Q(-1)	0.007	0.018		
	0.55	1.24		
FEMEXEC*RISK(-1)	0.328*	0.327**		
	1.86	1.99		
FEMBOARD*Q(-1)			0.018**	0.021***
			2.53	2.85
FEMBOARD*RISK(-1)			0.091	0.101
			1.06	1.14
Fixed country effects	Yes	Yes	Yes	Yes
Fixed industry effects	Yes	Yes	Yes	Yes
Obs.	1719	1,724	2,012	2018
Adjusted R^2	0.195	0.126	0.192	0.118

This table reports the results for the cross section (Fixed country & industry effects) cash models (White's heteroskedasticity consistent t–statistics in parentheses). The dependent variable is either the CASHNA variable, measured as cash and cash equivalents divided by total assets, or EXCASHNA, measured as CASHNA minus the 3-digit industry median. Level of significance: ***1%; **5%; *10%.

Table 6.
Cash policy models depending on the level of gender diversity in the board of directors

	CASHNA						
Explanatory var (expected sign)	No Women	Femboard	Femexec	Quart1	Quart2	Quart3	Quart4
C	0.260**	0.264***	0.333***	0.215***	0.217***	0.279***	0.396***
	2.52	7.03	4.65	(2.63)	(3.27)	(3.65)	(4.86)
SIZE(-1)	-0.007	-0.007***	-0.007**	-0.006	-0.007**	-0.006	-0.014***
	-1.22	-4.00	-2.15	(-1.28)	(-1.98)	(-1.62)	(-3.49)
CFTA(-1)	0.178***	0.140***	0.238***	0.135**	0.076	0.126	0.283***
	2.87	3.66	2.96	(2.22)	(1.19)	(1.54)	(3.31)
Q(-1)	0.019***	0.037***	0.033***	0.023***	0.028***	0.050***	0.043***
	2.95	9.17	4.22	(3.67)	(4.00)	(6.32)	(4.64)
LIQTA(-1)	0.022	-0.121***	-0.216***	-0.003	-0.101**	-0.160***	-0.151***
	0.48	-5.28	-5.15	(-0.07)	(-2.52)	(-3.37)	(-3.18)
INVTA(-1)	-0.075	-0.042	-0.136*	-0.025	-0.113	-0.166	-0.099
	-1.09	-1.01	-1.70	(-0.45)	(-1.10)	(-1.28)	(-1.22)
LEV(-1)	-0.149***	-0.154***	-0.215***	-0.107**	-0.122***	-0.191***	-0.188***
	-3.30	-6.84	-5.35	(-2.48)	(-2.97)	(-4.10)	(-4.22)
DIV(-1)	-0.009	-0.006	-0.023	-0.015	0.003	-0.053***	0.031*
	-0.48	-0.68	-1.56	(-0.91)	(0.23)	(-3.06)	(1.75)
RISK(-1)	0.134*	0.208***	0.501***	0.140*	0.119	0.007	0.549***
	1.71	3.25	3.93	(1.77)	(0.93)	(0.06)	(3.88)
Fixed country effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	311	1577	647	496	501	497	495
Adjusted R^2	0.131	0.210	0.202	0.133	0.136	0.257	0.248

This table reports the results for the cross section (Fixed country & industry effects) cash models (White's heteroskedasticity consistent t–statistics in parentheses). The dependent variable is the CASHNA variable, measured as cash and cash equivalents divided by total assets. Level of significance: ***1%; **5%; *10%.

Table 7.
The impact of gender diversity controlled for corporate governance

	CASHNA		EXCASHNA	
Explanatory var (expected sign)	(1)	(2)	(3)	(4)
C	0.253***	0.261***	0.146***	0.156***
	7.04	7.24	3.92	4.18
SIZE(-1)	-0.008***	-0.009***	-0.008***	-0.008***
	-3.76	-3.98	-3.34	-3.62
CFTA(-1)	0.155***	0.155***	0.172***	0.171***
	4.87	4.88	5.19	5.19
Q(-1)	0.030***	0.030***	0.029***	0.029***
	8.80	8.75	8.33	8.24
LIQTA(-1)	-0.098***	-0.098***	-0.103***	-0.103***
	-4.81	-4.83	-4.88	-4.90
INVTA(-1)	-0.062*	-0.060*	-0.073*	-0.070*
	-1.75	-1.69	-1.96	-1.89
LEV(-1)	-0.147***	-0.146***	-0.142***	-0.140***
	-7.48	-7.42	-6.94	-6.87
DIV(-1)	-0.005	-0.005	-0.002	-0.003
	-0.64	-0.69	-0.29	-0.35
RISK(-1)	0.192***	0.195***	0.166***	0.171***
	3.98	4.06	3.32	3.42
FEMBOARD	0.003		0.003	
	0.34		0.37	
FEMEXEC		0.019***		0.024***
		2.73		3.44
BOARDSIZE	0.009	0.009	0.008	0.008
	1.27	1.26	1.07	1.02
INSIDE	0.014**	0.014	0.014*	0.014*
	2.07	2.12	2.04	2.11
Fixed country effects	Yes	Yes	Yes	Yes
Fixed industry effects	Yes	Yes	Yes	Yes
Obs.	2,012	1,719	2,018	1,724
Adjusted R^2	0.194	0.191	0.116	0.122

This table reports the results for the cross section (Fixed country & industry effects) cash models (White's heteroskedasticity consistent t–statistics in parentheses). The dependent variable is either the CASHNA variable, measured as cash and cash equivalents divided by total assets, or EXCASHNA, measured as CASHNA minus the 3-digit industry median. Level of significance: ***1%; **5%; *10%.