Financial Disclosure Environment and the Cash Policy of Private Firms

Marcelo Ortiz

This version: March 2020

(January 2020)

Barcelona GSE Working Paper Series

Working Paper nº 1148

Financial Reporting Environment and Precautionary Cash Policy: Evidence from Private Firms

Marcelo Ortiz*

(Version: March 2020)

Abstract

This paper proposes that greater transparency in the financial reporting environment facilitates the estimation of future liquidity needs and thus discourages financially constrained firms from accumulating cash for precautionary reasons. I examine this prediction using a sample of private firms from 12 European countries with disclosure mandates for public and private firms. The results indicate that private firms hold less cash when they operate in a more transparent reporting environment. Furthermore, I find that the decrease in cash holdings is more pronounced in industries with higher cash-deficit risk and for younger firms. The analysis of cash flow allocation indicates that cash reduction is driven by a higher fraction of cash flow being used to reduce debt and less cash saving out of cash flow, and not by more investment. Collectively, this study increases our understanding of how a transparent reporting environment influences the allocation of corporate cash among its alternative uses.

Keywords: Disclosure Regulation, Financial Disclosure, Cash Policy, Financial Constraints, Private Firms.

JEL Codes: M41, M48, G32.

---

* Universitat Pompeu Fabra & Barcelona GSE. E-Mail: marcelo.ortizm@upf.edu.

Acknowledgments: Marcelo Ortiz gratefully acknowledges the valuable suggestions from Itay Goldstein, Maximilian Müller, Francisco Urzua, Peter Caspar, Matias Braun, Wolf Wagner, and Benito Arruñada; and to seminar participants at the Erasmus School of Economics, Rotterdam School of Management, WHU – Otto Beisheim School of Management, IÉSEG School of Management, and Universitat Pompeu Fabra. Marcelo Ortiz also acknowledges financial support from the Spanish Ministry of Economy and Competitiveness, through the Severo Ochoa Programme for Centres of Excellence in R&D (SEV-2015-0563).

1. INTRODUCTION

The accounting literature has largely recognized that firms benefit from transparency in the financial reporting environment. The underlying argument is that firms have common sources of uncertainty at the macro and industry levels, and thus, a more transparent disclosure environment facilitates the deciphering of the economic condition under which all firms operate. Although prior studies have reported a positive link between the transparency in the reporting environment and corporate investment (Roychowdhury, Shroff, and Verdi 2019), little research has addressed its effect on cash policy. This dearth of scholarly attention is noteworthy because the corporate decision to transform cash into productive assets depends on the level of financial constraints (Campello et al., 2010; Denis and Sibilkov, 2010; Gilchrist and Himmelberg, 1995; Lins et al., 2010). To the extent that financing frictions matter, the reduced uncertainty generated by a richer reporting environment might influence the allocation of corporate liquidity among its alternative uses. In addition to financing investment, these uses of corporate liquidity might include cash saving, debt reduction, dividend payouts, and capital repurchase (Chang et al., 2014; Gatchev et al., 2010). In this sense, it is important to extend our understanding of the effects of the reporting environment on corporate cash policy.

The uncertainty regarding future cash flows exacerbates the incentive to postpone the use of cash (Han and Qiu, 2007). The holding of a cash buffer provides protection against cash shortfalls, which debt capacity or derivatives cannot substitute (Almeida et al., 2014). Therefore, firms facing external financing constraints can use cash reserves to fund expenditures (Denis and Sibilkov, 2010), reducing the need for the future liquidation of productive assets or an inefficient closing of the firm (Harford et al., 2014). However, firms face a cost of holding a precautionary cash reserve. The rate of return on cash holdings is lower than the cost of capital (Graham and Leary, 2018; Lins et al., 2010). In addition to this direct cost of precautionary cash saving, financially constrained firms might

also forego profitable projects that endanger cash reserves (Han and Qiu, 2007), affecting their competitive capacity (Fresard, 2010).

The set of peer disclosures is a useful source of information for firms as it promotes learning and reduces informational asymmetries among them (Beyer et al., 2010; Leuz and Wysocki, 2016). However, not all financial reports contribute equally to the level of transparency in the disclosure environment. In most parts of the world, public firms are required to disclose detailed financial reports in accordance with International Financial Reporting Standards (IFRS), while private firms have non- or limited-disclosure requirements (Minnis and Shroff, 2017). Peers' reports with extended disclosure requirements provide a more transparent view of the operating environment since abbreviated financial reports may not include the relevant subcategories and disclose only an aggregation of them into a single item. For example, in an abbreviated income statement, the subcategories of "sales," "changes in finished goods," and "cost of materials" may be aggregated into the single item "gross profit" (Bernard et al., 2018), making it more difficult for peers to perform an accurate analysis of the economic trends and risks in the industry.

This paper uses a sample of private firms from 12 European countries to investigate the effects of the level of transparency in the reporting environment on corporate cash holding and cash flow allocation. This paper poses that a higher level of transparency in the reporting environment (e.g., a higher fraction of industry peers disclosing extended financial reports) has the potential to reduce firms' uncertainty regarding their future cash flows. According to multiple surveys, managers use peers' reports to determine the profitability of new markets, products, or technologies, as well as investment and margin trends in the industry (Arruñada, 2011; Minnis and Shroff, 2017). Henceforth, extended disclosures enable the elaboration of more accurate estimates of future cash flows and the corresponding liquidity needs. Better estimates increase the willingness of firms to reallocate cash reserves. The depletion of cash reserves can be achieved by allocating a smaller fraction of cash flow

for cash saving. Additionally, firms can also use cash holdings and cash flows for funding investment or reducing costly debt.

Conversely, there are credible arguments for why transparency in the reporting environment may have a contrary effect. By reducing information asymmetries with creditors, the higher transparency in the reporting environment might also decrease the cost of capital on a market-wide scale (Lambert et al., 2007) and, through this, diminish the cost of precautionary cash policies. Therefore, if firms are not able to learn from the set of peers' extended disclosures about future liquidity needs, then the lower cost of capital might cheapen cash accumulation as a hedging strategy. In this context, with the same level of cash flow uncertainty but a lower cost of capital, firms might boost their cash balance by saving their current cash flows or by issuing additional debt at a more convenient price.

From a theoretical perspective, the focus on cash policy is especially relevant in the context of financial constraints that are predominant among private firms (Chen et al., 2012; Gao et al., 2013). The higher financing frictions of private firms make their cash reserves more sensitive to cash flow fluctuations (Brav, 2009). In addition, private firms, especially younger private firms, might lack experience or knowledge to produce accurate estimations of future cash flow needs (Ehling and Haushalter, 2014). In sum, the incentives behind precautionary cash policy (i.e., financing constraint and cash flows uncertainty) are more pronounced in the context of private firms. Finally, private firms are usually closely held, reducing the concern about agency conflicts driving cash reserves (Gao et al., 2013; Michaely and Roberts, 2012).

Beyond the theoretical advantage of the focus on private firms, this setting is also important from a policymaker perspective. Relative to public firms, most of the private firms face severe financing constraints (Gao et al., 2013; Michaely and Roberts, 2012). Since private firms are an economically significant group of firms around the world (Badertscher et al., 2013; Gao et al., 2013;

Michaely and Roberts, 2012), systematic mistakes in their cash flow estimations might have important economic consequences.

As a result of the European Commission Disclosure Directive enacted in 2003, most of the countries in the European Union (EU) converged to similar disclosure regulations for private firms, providing a suitable setting for evaluating the effects of the disclosure environment (Bernard et al., 2018, 2016; Breuer, 2017). Private firms below the country-specific firm-size threshold are mandated to disclose only a minimal amount of financial information, while private firms above the threshold must disclose detailed balance sheets, income statements, and director reports. Similarly, most of the public companies listed in stock markets in the EU have been required to provide detailed financial information under IFRS since 2002 (De George et al., 2016).

For each private firm in the sample, I measure the transparency in its reporting environment at the country-industry-year level as the percentage of peers (public and private) disclosing extended financial statements (henceforth, *% Full Disclosure*). Regarding the financial disclosure of private firms, this percentage varies at the country level due to the different country-specific firm-size thresholds and varies at the industry level due to differences in the firm-size distribution across industries. With respect to the presence of public firms, this percentage varies at the country-industry level regarding the history of listing and delisting. Arguably, the three sources of variation are out of the scope of individual firms' management, and therefore, this percentage constitutes an exogenous measure of the level of public availability of peer financial reports.

In the first empirical design, I isolate the cross-sectional variation of *% Full Disclosure* from any other time-varying confounder factor at the country (e.g., credit cycle) and industry levels (e.g., industry business cycle) through country-year and industry-year fixed effects. This strategy allows for the evaluation of how the cash ratio differs with different levels of transparency in the reporting environment, adjusted by the differences in cash policies across industries (within the same country-year) and across countries (within the same industry-year). The results indicate that private firms hold

less cash when they operate in a more transparent environment. In terms of economic magnitude, the results suggest that an increase in *% Full Disclosure* of 6.9% (that is, one standard deviation) represents a reduction of 6% (18%) of the average (median) cash holding. This result holds when controlling for multiple characteristics at the firm and industry levels, as well as when including firm fixed effects. Furthermore, the cross-industry analysis shows that the relation between transparency in the reporting environment and cash holdings is stronger in industries with high cash-deficit risk. Then, I find that given the same level of transparency in the reporting environment, not all of the firms reduce their cash holdings by the same proportion. In particular, I focus on the role of firm age for two reasons. First, younger private firms have less business experience and therefore have stronger incentives to use peers' disclosure as a source of information. In contrast, older firms might rely more on their accumulated knowledge to estimate future cash flow needs. Second, younger private firms suffer more information frictions with lenders. As a result, younger private firms have stronger financing constraints than older firms (Gao et al., 2013). Consistent with the cash flow learning perspective, I document that the focal effect is weaker the older the firm is, especially in industries with high cash-deficit risk.

Previous studies have documented a strong information spillover from the financial reports of public firms to their private peers (Badertscher et al., 2013; Shroff et al., 2012). However, since the financing constraints faced by private firms differ from those of their public peers, private firms might be reluctant to use public firms' reports as a guide for cash policy. Additionally, agency conflicts in public firms seem to lead to excessive cash accumulation (Gao et al., 2013), which can be financially unbearable for private peers (Mortal et al., 2016). To test this idea, I use solely the mandated disclosure of private peers. I document that the mandated disclosures of private peers affect the cash holdings at a market-wide scale, independent of the presence of a public peer. However, the findings also show a substitutive relationship between public and private peers' disclosures,

suggesting that the presence of public peers might alleviate the information requirements for the cash flow estimation of private firms.

Finally, I study whether transparency in the reporting environment shapes the cash flow allocation of private firms. I do so by estimating the cash-flow sensitivities of cash, investment, and debt (Chang et al., 2014). This approach allows for the identification of the cash flow uses affected by the level of transparency in the reporting environment. The findings indicate that in more transparent industries, private firms use a lower fraction of cash flow for saving cash and a higher fraction for reducing debt. The results also document a statistically insignificant effect on investment. Overall, the cash flow sensitivities suggest that in more transparent industries, private firms are more prone to save debt capacity rather than hoarding cash. This result is consistent with the hedging models of Acharya, Almeida, and Campello (2007) and Mortal, Nanda, and Reisel (2016) in the sense that financially constrained firms reduce costly debt rather than accumulate cash when they face a lower uncertainty about future cash flows.

This paper belongs to the growing literature exploring the consequences of the financial disclosure environment (Goldstein and Yang, 2019, 2017; Roychowdhury et al., 2019). Previous studies have analyzed whether the presence of public firms affects the investment efficiency of private firms (Badertscher et al., 2013). These studies assume that the presence of a public firm has no effect on the financing condition of its private peers since the "information disclosed by public firms doesn't directly concern the private firms' borrowing capacity" (Badertscher, Shroff, and White, 2013: 5). However, recent evidence indicates that the disclosure environment affects financing conditions on a market-wide scale (Dye and Hughes, 2018; Lambert et al., 2007; Shroff et al., 2017). This paper builds on this research by evaluating both effects in a cash policy framework. This focus on cash policy complements the prior research because it shows that the disclosure environment shapes the cash allocation among alternative uses, such as funding investment or hedging against future cash shortfalls.

This paper also builds on the literature on corporate liquidity management (Almeida et al., 2014; Chang et al., 2014; Denis and Sibilkov, 2010; Graham and Leary, 2018). Previous studies have analyzed how the cash flows uncertainty fuels precautionary cash policies among financially constrained firms (Acharya et al., 2007; Duchin, 2010; Harford et al., 2014). This paper builds in this research field by studying the role of peers' disclosures in the estimation of cash flows and by examining how the precautionary motive of cash is discouraged by more transparent financial disclosure regulations.

Finally, this paper also contributes directly to the literature on mandatory disclosure regulations for private firms. In the last decade, many countries have reformed their disclosure regulations for private firms following disparate recommendations for the expansion or reduction of publication requirements (Arruñada, 2011). This inconsistent evolution across the world highlights the need for a better understanding of the social desirability of forced transparency for private firms. This paper contributes to this discussion by documenting an information spillover among private peers with similar financing frictions, especially in contexts without public firms. The evidence informs the ongoing debate on the benefits of disclosure mandates for private firms about the consequences for precautionary cash policy (Leuz, 2018; Leuz and Wysocki, 2016; Minnis and Shroff, 2017).

2. INSTITUTIONAL BACKGROUND AND MOTIVATION

2.1 Disclosure environment of European firms

In the early 2000s, most of the European national governments defined their country-specific financial disclosure regulations for private limited liability firms following the framework provided by European Commission Directives.[1] As a result, the set of country-specific disclosure regulations for this type of firm has three common characteristics (Bernard et al., 2018; Breuer, 2017). First, most of the regulations classify firms according to three size-based groups using at least two of the three

[1] EU Directive 2003/58/EC.

firm size variables, i.e., total assets, number of employees and annual sales. Second, the extent of the mandated financial disclosure is related to the firm size classification (small, medium or large). Third, the major step in terms of the extension of disclosing requirements is the step from small to medium firm size. In this context, previous studies document a sharp difference in the level of disclosure requirements for both sides of the small-medium firm-size threshold (Bernard, Burgstahler, and Kaya 2018; Breuer 2017). Private firms classified as a small are mandated to disclose only abbreviated financial statements, and in some countries (e.g., Austria, Germany, and the United Kingdom), they are even exempt from disclosing income statements. In contrast, those classified as medium or large firms must report detailed balance sheets, income statements, and director reports, as well as file their documents in a reduced period.

Conversely, as in most of the world, in the EU, disclosure regulations force publicly listed firms to disclose extended and standardized financial statements. These regulations were also harmonized at the country level following EU Directives.[2] The disclosure mandates also include analyses of past performance and the expected future outlook (Christensen et al., 2016; De George et al., 2016). Additionally, public firms usually complement the disclosure requirements with additional voluntary reports that may be beneficial for external stakeholders (Balakrishnan et al., 2014; Shroff et al., 2013).

2.2 Theoretical motivation

2.2.1 Cash-deficit risk and the incentive for cash accumulation

Information asymmetries with capital markets create a wedge between the cost of internal finance and that of external finance. This wedge leads private firms to save cash from cash flows to ensure the financing of future liquidity needs. The uncertainty about future cash flows and financing friction exacerbate the incentive to accumulate cash as a protection mechanism in the case of a future

[2] EU Directive 2004/109/EC.

cash deficit (Han and Qiu 2007).[3] A large cash buffer might not only prevent the liquidation of productive assets or inefficient closing of the firm (Harford, Klasa, and Maxwell 2014) but also deter the alternative uses of cash (Chang et al., 2014).

Firms might use financial derivatives to manage cash-deficit risk. However, private firms, especially small private firms, could lack the knowledge or access to use financial derivatives, making them more prone to build up and hold a precautionary cash buffer to protect themselves against adverse shocks (Ehling and Haushalter 2014).

Firms pay a cost for the protection provided by cash holdings. The cost of cash holdings is the cost of capital minus the rate of return of the cash. Indeed, firms facing an increase in the cost of debt optimally decide to reduce the liquidity buffer to pay down debt (Azar et al., 2016; Mortal et al., 2016). Accordingly, survey-based evidence shows that the cost of debt is one of the key determinants in deciding the level of cash holdings (Lins, Servaes, and Tufano 2010). In the context of private firms, the higher level of information asymmetries with external capital providers increases the cost of capital and, therefore, exacerbates the cost of holding cash for precautionary reasons.

2.2.2 Effects of the reporting environment on the incentive for cash accumulation

The set of peers' disclosures facilitates the learning process about the cash flow generation of new products, technologies, and markets previously explored by specific competitors. In addition, peers' disclosures ease the identification of industry trends in sales, margins, and financial constraints. In the presence of extended reports in the industry, these analyses include more accurate data since firms can observe detailed accounting information instead of aggregated items. For example, firms can produce more accurate estimates of sales and cost of goods when they are able to separately evaluate the changes in "sales" and "cost of materials" rather than by observing only "gross profit".

[3] Agency conflicts can also affect the level of cash holding. Entrenched managers could pursue selfish incentives and hold an inefficient level of cash. However, private firms are usually closely held, reducing the risk of incentive deviation between owners and managers.

Similarly, estimates of inventory turnover and financial solvency are more precise when including peers' detailed composition of "inventory" (raw materials and work in progress), "liabilities" (short and long-term), and "current asset" (cash, short-term investment, financial derivatives, trade, and other receivables). Finally, an overview of the liquidity situation and risk exposure is often part of the analysis section in extended disclosures (e.g., Directors' Reports; Management Discussion and Analysis). In summary, when firms evaluate the capital budget, the study of peers' extended reports enables them to make more accurate forecasts about future cash flows and the corresponding cash-deficit risk. The better estimates, ceteris paribus, reduce the incentives for hoarding a costly cash buffer. This incentive shift, therefore, makes firms more prone to use cash reserves and current cash flows for funding investment opportunities or reducing outstanding debt.

On the other hand, the level of transparency might also affect cash policy through a market-wide reduction in the cost of capital. Information frictions with the capital market increase the financing cost (Myers and Majluf 1984). The set of regulated and standardized financial reports facilitates the selection and monitoring of firms by external investors (Zingales 2009). Therefore, this market-wide reduction in information asymmetries reduces agency-related financing costs. Furthermore, the reporting environment can also reduce the cost of capital in a context absent of agency conflicts. In a capital asset pricing model context, the set of forced disclosures increases the accuracy of investors' assessment of firms' cash flow covariance and through this, moves the cost of capital of all firms closer to the risk-free rate (Lambert, Leuz, and Verrecchia 2007). The lower cost of capital, ceteris paribus, reduces the cost of cash accumulation. Therefore, in a scenario with a low cost of capital but the same level of cash flow uncertainty, firms might prefer to build up a cash reserve through cash flow saving or issuing new debt (Acharya et al., 2007).

These effects are not mutually exclusive. It is possible that firms benefit from peers' reports by making more accurate estimations of cash flow needs but also noticing the corresponding market-wide relaxation of external financing constraints. In a scenario where the cash flow learning effect is

predominant, firms have even weaker incentives for precautionary cash policy. In this case, the more accurate outlook of future financing needs and the better expectation to obtain external funding more strongly reduce the incentive for a costly cash reserve. In contrast, if the cost-of-capital effect predominates, firms will thus have lower but still significant uncertainty about future liquidity needs. Therefore, firms will be more prone to save internally generated funds or to issue new debt at a lower cost.

3. DATA AND METHODOLOGY

3.1 Data and sample selection

I use the information regarding the mandatory disclosure regulations of private firms from Bernard, Burgstahler, and Kaya (2018). In their research, Bernard, Burgstahler, and Kaya (2018) list the regulatory firm size thresholds for the extended disclosure requirement of 12 European countries for the period 2003-2011. For those countries, I use Amadeus (Bureau van Dijk) to collect the unconsolidated annual financial information of private limited liability firms for the years 2003 to 2012. Firms belonging to the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit, and public administration (SIC 8000-9999) industries are excluded from the sample due to possible regulations that may affect their liquidity and disclosing policy. Additionally, since the learning process from peer disclosures requires the existence of at least one peer, the sample is restricted to industries with more than one firm. The sample consists of small, medium and large private firms with total assets greater than 1 million euros. Despite the reduced number of financial variables available for small firms, the aim of their inclusion is to test the effect of the disclosure environment on a more heterogeneous group of firms.

Panel A of Table 1 shows the composition of the sample by country and firm size. After following the standard cleaning process (Kalemli-Ozcan et al., 2015; Larrain et al., 2017)[4], the

[4] Specifically, the cleaning process drops firm-year observations with negative values for total assets, turnover, or fixed assets, and truncates the distribution of ROA (=EBITDA / total assets) and the annual growth in total assets at -100% and 100%.

number of firm-year observations is approximately 3.5 million. The median (average) firm size in the sample is 2.40 (11.54) million euros in assets. The countries with the highest firm-size dispersion, measured as the interquartile range (Q3-Q1) in assets, are Austria, Finland, and Germany (4.85 million, 4.48 million, and 4.36 million euros, respectively).

3.2 Measure of transparency in the reporting environment

To capture the level of transparency in the financial reporting environment, I measure the percentage of both private and public firms disclosing extended financial statements at the country-industry-year level. Previous studies have focused separately on the contribution of public firms (Badertscher et al., 2013; Christensen et al., 2016) or private firms (Breuer, 2017; Breuer et al., 2017) to the reporting environment. However, the combination of both more completely describes the disclosure environment in which private firms operate. To compute this percentage, we first need to identify the number of active firms and then identify the subset of those firms that disclose extended financial reports.

3.2.1 Number of Active Firms

To identify the number of active firms in a given year, I use the incorporation date rather than the number of observations in Amadeus. The coverage of firms in Amadeus varies across the years, and some firms are not included in this dataset immediately following their legal incorporation in the public registries. To overcome this coverage bias, for each firm in Amadeus with no missing industry code, I compare the year of its first register in Amadeus with its incorporation year. This screening process enables us to identify the uncovered observations in Amadeus (e.g., firms that were incorporated in public registries in a given year but were not covered by Amadeus that year). I complement the panel of observations in Amadeus with these identified firm-year missing records ("the enhanced panel of firms"). Then, I define the number of active firms in a given country-industry-year as the number of firms that have an incorporation date before the corresponding year of analysis using the enhanced panel of firms.

3.2.2 Full Disclosure

I computed the number of private firms disclosing extended financial statements using the financial data from Amadeus and the regulatory firm size thresholds from Bernard, Burgstahler, and Kaya (2018).[5] Due to the level of missing observations in the number of employees in Amadeus, I classify a private firm in the medium-large firm size group if at least two out of the three firm size variables are larger than the regulatory threshold (Breuer, 2017). To quantify the presence of public firms, I count the number of publicly-listed firms in Amadeus. Finally, *% Full Disclosure* is defined as the sum of the number of private firms disclosing extended financial reports plus the number of publicly listed firms, scaled by the number of active firms in the country-industry-year.

Table 2 shows the number of active firms in each country during the period 2003-2011. The total number of active firms is approximately 63 million. The variation in *% Full Disclosure* across countries is considerable. For example, the average *% Full Disclosure* is 20% in France (the highest), 11% in Sweden, 3% in Denmark, and 2% in Belgium (the lowest).

Figures 1 and 2 illustrate how the distribution of *% Full Disclosure* and its two components evolve during the sample period. In particular, Figure 1 shows a stable dynamic of the empirical distribution of *% Full Disclosure* across time. Figure 2 illustrates the decomposition of *% Full Disclosure*; the mean of the percentage of private firms with extended disclosure oscillates smoothly between 5% and 7%, while the percentage of public firms varies between 0.8% and 1.3%.

3.3 Baseline Regression

To evaluate the effect of transparency in the reporting environment on cash policy, I first estimate the following regression:

[5] As previously mentioned, each country uses total assets, sales and number of employees as firm-size variables to define the regulatory threshold. Bernard, Burgstahler, and Kaya (2018) document that during the period 2003-2011, the average regulatory threshold (across countries and years) was 3.2 million euros for assets, 4.8 million euros for sales, and 47 employees. The lowest thresholds were in France in 2003-2009 (0.2 million euros in assets, 0.5 million euros in sales, and 10 employees), while the highest were in Denmark in 2011-2012 (4.8 million euros in assets, 9.6 million euros in sales, and 50 employees).

$$Cash_{ijct} = \beta_h \% \, Full \, Disclosure_{jct-1} + Controls_{ijt} + \alpha_{ct} + \alpha_{jt} + \varepsilon_{ijct} \quad (1)$$

where the dependent variable, Cash, is measured as cash and cash equivalent over total assets for firm *i* in industry *j* (3-digit SIC codes), country *c*, and year *t*. The specification also includes the following different control variables that are likely to influence cash management: (1) Log(assets) (the natural log of total assets); (2) Leverage (the ratio of the long-term debt to total assets); (3) Tangibility (the ratio of tangible assets to total assets); (4) Working capital (the sum of inventory plus accounts receivable minus accounts payable, divided by total assets); (5) Investment (the one-year change in the value of tangible assets, divided by the lagged total assets); (6) Cash flow (the ratio of net earnings plus depreciation to total assets); and (7) Profitability (the ratio of earnings before interest and taxes plus depreciation to total assets). Additionally, the specification includes (8) Industry sales growth (the industry median annual sales growth rate) as a control variable to control for industry-wide growth opportunities that might affect firms' cash position. All financial variables are winsorized at the 2.5% and 97.5% levels (Gao et al., 2013). The specification also controls for other industry characteristics, such as the (8) Average firm size (log(average firm size)) and (9) Number of firms (log(number of active firms)). These additional variables control the heterogeneity in the firm size distributions and the level of competition across industries.[6] Finally, indicator variables for each country-year were included to capture systematic changes in liquidity across countries and years. Similarly, industry-year dummies were also included to absorb time-varying industry characteristics, such as industry business cycle and cash flow fluctuations.

As previously mentioned, the distribution of *% Full Disclosure* is quite stable across time. This characteristic of the focal variable hinders the use of firm fixed effects in the main empirical design. However, when specified in the table, the regression also includes firm fixed effects. By doing so, the panel regression absorbs unobservable time-invariant firm heterogeneity, and therefore, the

[6] Alternative measures of industry competition using sales or assets cannot be computed precisely due to the limited disclosure requirements for small firms. However, the results hold if these alternative measures are included in the specification.

results are driven by the variation in *% Full Disclosure* rather than by its level. I clustered standard errors at the country-industry (3-digit SIC codes) levels to correct for residual correlation within a country-industry (across years).

The coefficient of interest in the above equation is β_h. The cost-of-capital effect of the reporting environment predicts a positive value of β_h, indicating that firms hold more cash in a context with lower information asymmetries. In contrast, the cash flow learning argument predicts a negative value of β_h, implying that firms hold less cash in industries with a more detailed reporting environment.

4. EMPIRICAL RESULTS

4.1 Descriptive statistics

The sample composition in terms of exposure to peers' extended reports is in Panel B of Table 1. A total of 54.66% of the sample operates in an industry with at least one public firm, while almost all the firms in the sample (99.74%) have at least one private peer disclosing extended financial reports.

Table 3 presents the summary statistics of the variables of interest. The firms have, on average (median), a cash ratio of 0.107 (0.036), a leverage ratio of 0.178 (0.043), and a tangibility of 0.237 (0.121). Additionally, the average (median) firm operates in an industry with a *% Full Disclosure* of 5.1% (2.8%). In other words, for the average firm, the information set of peer disclosures includes the extended reports of the 5.1% of its peers and the limited reports (if anything) of the other 94.9% of the industry.

4.2 Reporting environment transparency and Cash holding

Table 4 evaluates the effect of the reporting environment on cash holdings. Model 1 tests the relationship between *% Full Disclosure* and the cash ratio, controlling for firm size, industry sales growth, and the set of firm size distribution variables. Measuring sales growth at the industry level helps to alleviate the lack of sales data in small firms due to their fewer disclosure requirements and

allows us to capture industry-wide growth opportunities that might affect cash accumulation. Model 2 adds firm-level characteristics from the balance sheet (leverage, tangibility, working capital, and investment), and Model 3 also includes the cash flow and profitability in the set of control variables. While Models 2 and 3 progressively bias the sample by excluding small firms (Model 2 requires variables from a more detailed balance sheet, while Model 3 requires the disclosure of the income statement), they allow for testing if the result holds with more stringent specifications. In Model 1, the coefficient of *% Full Disclosure* is negative and statistically significant (β_h = -0.103, $p < 0.01$), suggesting that private firms hold less cash when they operate in industries with a higher fraction of firms mandated to disclose detailed financial statements. In economic terms, an increase in *% Full Disclosure* of one standard deviation (that is, an increase of 6.9%) represents a reduction of 6.2% (4.3%) of the average (standard deviation) cash ratio. This industry wide effect of transparency has similar economic magnitude and significance across the different specifications, even with the substantial decline of 42% in the sample size between Models 1 and 3.

Model 4 of Table 4 adds firm fixed effects to control for constant unobservable firm-level characteristics affecting cash holdings. Thus, β_h in Model 4 captures the effect of the within-firm variation in *% Full Disclosure* (across time), after controlling for its dynamics at the country and industry levels (due to the country-year and industry-year fixed effects). This stringent specification is also consistent with the learning hypothesis. The negative coefficient (β_h = -0.009, $p < 0.1$) indicates that firms hold less cash when they face an increase in the percentage of peers reporting extended disclosures.

4.3 Cross-industry variation in cash-deficit risk

The incentive for cash accumulation is determined by the joint distribution of investment opportunities and cash flows (Acharya et al., 2007; Denis and Sibilkov, 2010). Firms facing a positive correlation between investment opportunities and cash flows can finance current investments with simultaneous cash flows. Consequently, this positive correlation represents a lower cash-deficit risk.

Conversely, firms in industries with a negative correlation generate scarce cash flows when they face growth opportunities, increasing their cash-deficit risk. This higher risk strengthens the incentives to postpone the use of the cash (e.g., financing investment and debt reduction). This incentive is especially stronger in the context of external financing friction, which is the typical case for private firms.

I calculate the correlation between investment opportunities and cash flows at the country-industry level because both variables can be endogenously related at the firm level (Acharya et al., 2007). Previous studies have named this measure of cash-deficit risk "hedging need" (Acharya et al., 2007; Denis and Sibilkov, 2010; Duchin, 2010). I calculate the streams of average cash flow and average sales growth for each country-industry. The industry investment opportunity is estimated as the three-year-ahead average sales growth. Then, I compute the correlation between the industry investment opportunity and the industry average cash flow using a moving window of 6 years. The measure of industry investment opportunity lays in the assumption that firms' perception of growth prospects is related to the sales forecast and that those estimations, on average, match with the observed data in the following years (Acharya et al., 2007). Finally, to facilitate the interpretation, the measure of hedging need is defined as the correlation coefficient multiplied by negative one.

Table 5 includes the industry measure of hedging needs. Model 1 interacts this measure with *% Full Disclosure*. As expected, the effect of hedging needs on cash holding is positive (i.e., firms hold more cash in industries with more risk of cash shortfalls) ($\beta = 0.05$, $p < 0.01$), and the effect of *% Full Disclosure* and the interaction term are negative ($\beta = -0.110$, $p < 0.01$ and $\beta = -0.086$, $p < 0.01$, respectively). These estimates are coherent with the view that peers' extended disclosures are especially informative about liquidity needs in industries with higher incentives for cash accumulation.

To quantify the difference in the impact of reporting environment transparency across different levels of cash shortfall risk, I follow Acharya, Almeida, and Campello (2007) and select

firms in industries with high or low hedging needs. The cutoff for the high (low) hedging need is a correlation coefficient of -0.2 (0.2) for Models 2 and 3, and -0.4 (0.4) for Models 4 and 5. All the specifications show a stronger effect of *% Full Disclosure* in industries with high hedging needs. The magnitude is, on average, almost twice that in industries with low hedging needs, and this difference is quite stable and significant across the different specifications.

4.4 Within-industry: The role of firm age

In this section, the analysis focuses on the heterogeneous effect across firms within the same industry. The aim is to evaluate whether, given the same peer disclosures, all firms in a given industry reduce their cash holdings in the same proportion. The results will contribute to the discussion regarding what type of firm benefits most from mandatory disclosure regulations (Arruñada, 2011; Bernard, 2016; Minnis and Shroff, 2017).

I focus on the role of firm age for two reasons. First, from the cash flow learning hypothesis, younger private firms have less experience running the business and therefore can benefit more from seeing peers' disclosure. In contrast, older firms might be more prone to use accumulated knowledge to estimate future cash flows. Secondly, from the cost-of-capital approach, younger private firms suffer more severe information friction with external capital providers and thus, have stronger financing constraints than older firms (Gao et al., 2013).

For each firm-year observation, I define *Relative firm age* as the firm age minus the corresponding industry mean, divided by the industry standard deviation. Table 6 documents the results of this analysis. Model 1 includes *relative firm age,* and Model 2 adds *(relative firm age)*^{2}. The estimates of Model 1 are consistent with the same level of transparency in the reporting environment having a stronger effect on younger firms; i.e., the longer the business experience of the firm is, the lower the negative effect of *% Full Disclosure* on cash holding. The result of Model 2 shows a negative marginal effect of firm age, suggesting that the effect of peers' disclosures is marginally weaker as the firm accumulates more business experience and less financing friction.

Arguably, two firms (i) of the same age and (ii) operating in the same level of transparency but (iii) in different hedging need contexts will face diverse levels of uncertainty due to the nature of their business. Thus, while the benefit of accessing peers' reports might be shared for a wider spectrum of firm ages in industries with high hedging needs, the effect might be mainly seen in younger firms in industries with lower hedging incentives. I test this idea by splitting the sample into industries with high and low hedging needs, using cutoffs of 0.2 and -0.2, respectively. Models 3 and 4 of Table 6 present the results. To ease the comparison of the triple interactions, Figure 3 plots the conditional marginal effects of *% Full Disclosure* at different firm ages. The conditional marginal effect of an increase in *% Full Disclosure* is flatter and more negative in the first sample (*High Hedging Need)* than in the second sample (*Low Hedging Need)*. Furthermore, the 95% confidence intervals of the marginal effects in the first sample include the zero marginal effect when the relative firm age is equal to zero (that is, when the firm age is equal to the industry average). In contrast, in the second sample, the marginal effects lose statistical significance when the relative firm age is -0.5 (that is, when the firm age is equal to the industry average minus 0.5 times the industry standard deviation). Both graphs thus confirm the intuition that the effect of the reporting environment is more distributed across different firm ages in industries with greater cash-deficit risk.

4.5 Reporting environment decomposition: the role of the mandatory disclosure regulation of private firms

This paper has focused on the joint contribution of public and private firms' disclosures to the overall level of transparency in the industry. Scholars have documented a strong information spillover from public firm presence (Badertscher et al., 2013; Shroff et al., 2017, 2012); therefore, it is important to evaluate whether the previous results are solely driven by the disclosures of public firms. However, since the level of financing constraints differs sharply between private and public peers, private firms might be reluctant to use public peers' reports as a guide for cash policy. Additionally, agency conflicts in public firms seem to lead to excessive cash accumulation (Gao et al., 2013), which can be economically unbearable to imitate for private peers (Mortal et al., 2016).

However, the public firm presence attracts attention to the industry from the business press and financial analysts; additionally, their reports include a detailed discussion about past results and business outlook (Badertscher et al., 2013). Thus, while the financing constraint of public firms might not be the same for private firms, their presence in the industry has the potential effect of enriching cash flow estimates.

I evaluate this issue by analyzing the effect of private peer disclosures in contexts with and without public peers. As noted in Table 1, Panel B, the presence of public firms is not pervasive across industries. More than 45% of the firms in the sample operate in an industry with only extended disclosures of private peers, while 54% operate in an industry with both types of disclosures. Table 7 reports the estimate for the percentage of private firms disclosing extended financial statements (*% Full Disclosure Priv*) interacted with a dummy variable for the presence of at least one public peer. The results in Table 7 show a robust negative association between private peers' extended reports and cash holdings when no public peer is disclosing in the industry (for example, in Model 1, $\beta = -0.146$, $p < 0.01$). Interestingly, the interaction term is positive (in Model 1, $\beta = 0.094$, $p < 0.01$), suggesting a substitution effect between public and private peers' disclosures. The magnitude of the substitution seems to be relevant since the effect of private peers' disclosures on cash holding in the context with public peers is, on average, one-third of that in the context without public peers (in Model 1, is 35.6% = [-0.146+0.094]/-0.146).

Relative to public firms, the disclosure regulation for private firms is especially difficult to justify (Minnis and Shroff, 2017). An argument to support this regulation is the presence of positive externalities. In line with this, Table 7 provides evidence supporting the existence of an externality, i.e., the mandatory disclosure of private firms can generate a market-wide reduction in cash accumulation for precautionary reasons, especially in contexts without public peers.

4.6 What is driving the lower cash holding? Cash-flow allocation analysis

In sum, the previous analyses generate multiple results consistent with the hypothesis of private firms being able to use peers' reports to learn about future cash flows. However, these analyses do not provide an answer regarding what cash use is driving the lower cash holding. To shed some light on this direction, this subsection analyzes the cash policy from the perspective of cash flow allocation. Similar to Chang et al. (2014) and Gatchev et al. (2010), I evaluate the cash flow allocation by estimating the cash flow sensitivities of various cash uses. By doing so, I can evaluate whether this allocation depends on the level of reporting transparency where they operate.

Given the scarce data available for private firms, I am not able to track all potential cash uses (Chang et al., 2014; Gatchev et al., 2010). Instead, I evaluate the cash flow sensitivity of cash, investment, and total debt. By doing so, I evaluate whether firms are more prone to using their cash flows to save cash, invest in tangible assets, or reduce debt when they operate in a more transparent reporting environment. In particular, I estimate the following set of panel regressions:

$$Y_{ijct} = \gamma CF_{ijt-1} + \delta \,\%\, Full\ Disclosure_{jct-1} + \beta_h CF_{ijt-1} \cdot \%\, Full\ Disclosure_{jct-1} + Controls_{ijt-1} + \alpha_i + \alpha_{ct} + \varepsilon_{ijct} \quad (2)$$

where Y_{ijct} is (1) Investment (the one-year change in the value of tangible fixed assets divided by the lagged assets), (2) Cash growth (the one-year change in the value of cash and cash equivalents divided by the lagged assets), or (3) Debt growth (the one-year change in the value of long-term debt plus short-term loan divided by the lagged assets). Following the literature on cash flow allocation (Chang et al., 2014; Duchin, 2010), the specifications include firm fixed effects and country-industry fixed effects, as well as controls such as firm size, tangibility, leverage, cash ratio, and working capital. The difference between this model and a traditional cash flow equation is that Model (2) includes *% Full Disclosure* and its interaction with cash flow.

The results are tabulated in Table 8. Model 1 documents the cash flow sensitivity of investment. The coefficient of cash flow is positive and significant at the 1% level but its interaction

with *% Full Disclosure* is statistically insignificant. Model 2 presents the cash flow sensitivity of cash. In this case, the direct effect of cash flow is positive while its interaction with *% Full Disclosure* is negative, both significant at the 1% level. Model 3 documents the cash flow sensitivity of debt. The estimate of the direct effect of cash flow is positive and its interaction with *% Full Disclosure* is negative, both significant at the 1% level.

The results in Table 8 suggest that a better reporting environment discourages the use of cash flow for building cash reserves and promotes its use for reducing debt. This debt reduction is consistent with the argument that financially constrained firms prefer to save debt capacity (rather than cash holding) as a hedging mechanism against future cash shortfalls (Acharya et al., 2007). Therefore, Models 2 and 3 of Table 8 seem to indicate that the reporting environment moderates the selection between cash reserves and debt capacity as a self-protection mechanism.

Importantly, the estimates of Model 1 suggest that richer reporting environments do not increase the fraction of cash flow that funds investment. This result is inconsistent with previous studies suggesting a positive impact of reporting environment transparency on investment decisions.[7] In terms of cash flow allocation, the results of Table 8 indicate that a richer reporting environment has a stronger effect on hedging incentives than on investment. However, this conclusion has to be considered cautiously because the reporting requirement for small firms impedes us from calculating their cash flows, and therefore, Table 8 has a sample bias by excluding small private firms. Thus, it can be the case that reporting environment transparency does have an effect on the cash allocation in investment but only for smaller firms, which, as previously mentioned, are the firms with stronger financial constraints and incentives to learn from their peers' report.

[7] For a recent review of this literature, see Roychowdhury, Shroff, and Verdi (2019).

5. CONCLUSIONS

Cash is the main risk-management tool used for private firms, and this tool is particularly costly for those facing financial constraints and cash flow uncertainty. This paper evaluates two possible effects of transparency in the reporting environment on the corporate cash policy of private firms. First, peers' disclosures enable private firms to elaborate more accurate analyses of industry trends and peers' prior strategies. Second, peers' disclosures have the potential effect of reducing the cost of cash holdings. Since both effects have contrary consequences for the level and use of corporate cash in the economy, it is important to evaluate which is predominant.

This paper documents a robust negative association between the level of transparency in the reporting environment and the cash ratio of private firms, especially for firms facing stronger financial constraints and cash shortfall risk. Furthermore, the cash flow sensitivities report that a more transparent reporting environment reduces the fraction of cash flow used to build cash reserves and increases the fraction that goes to reduce debt. Overall, the findings are consistent with the argument that a more transparent reporting environment facilitates the elaboration of more accurate estimates of future liquidity needs. The better estimates discourage cash accumulation and promote the use of cash flows for saving debt capacity as an alternative hedging mechanism against future cash shortfalls.

This study relied on the public disclosure of financial statements to estimate the impact of the reporting environment on cash policies. Thus, the cash policies of private firms are not observable before the introduction of the disclosure regulations for private firms in the EU. As a consequence, the empirical strategies used in this study could underestimate the total effect of disclosure regulations on the overall uncertainty reduction.

Finally, further studies might investigate the effect of the reporting environment on trade-credit risk management. Trade-credit represents an important source of external finance provided by

trading partners (Love et al., 2007; Shenoy and Williams, 2017). The variation in reporting environment transparency through the supply chain seems to be an interesting question to tackle.

References

Acharya, V. V., Almeida, H., Campello, M., 2007. Is cash negative debt? A hedging perspective on corporate financial policies. J. Financ. Intermediation 16, 515–554. https://doi.org/10.1016/j.jfi.2007.04.001

Almeida, H., Campello, M., Cunha, I., Weisbach, M.S., 2014. Corporate Liquidity Management: A Conceptual Framework and Survey. Annu. Rev. Financ. Econ. 6, 135–162. https://doi.org/10.1146/annurev-financial-110613-034502

Arruñada, B., 2011. Mandatory accounting disclosure by small private companies. Eur. J. Law Econ. 32, 377–413. https://doi.org/10.1007/s10657-010-9145-3

Azar, J.A., Kagy, J.F., Schmalz, M.C., 2016. Can changes in the cost of carry explain the dynamics of corporate "Cash" holdings? Rev. Financ. Stud. 29, 2194–2240. https://doi.org/10.1093/rfs/hhw021

Badertscher, B., Shroff, N., White, H.D., 2013. Externalities of public firm presence: Evidence from private firms' investment decisions. J. financ. econ. 109, 682–706. https://doi.org/10.1016/j.jfineco.2013.03.012

Balakrishnan, K., Billings, M.B., Kelly, B., Ljungqvist, A., 2014. Shaping liquidity: On the causal effects of voluntary disclosure. J. Finance 69, 2237–2278. https://doi.org/10.1111/jofi.12180

Bernard, D., 2016. Is the risk of product market predation a cost of disclosure? J. Account. Econ. 62, 305–325. https://doi.org/10.1016/j.jacceco.2016.07.001

Bernard, D., Burgstahler, D., Kaya, D., 2018. Size management by European private firms to minimize proprietary costs of disclosure. J. Account. Econ. https://doi.org/10.1016/J.JACCECO.2018.03.001

Bernard, D., Burgstahler, D., Kaya, D., 2016. Disclosure incentives and Data availability for Private

Firms: implications for comparisons of Public and Private Firm Financial Reporting Quality. SSRN Electron. J. https://doi.org/10.2139/ssrn.2749747

Beyer, A., Cohen, D.A., Lys, T.Z., Walther, B.R., 2010. The financial reporting environment: Review of the recent literature. J. Account. Econ. 50, 296–343. https://doi.org/10.1016/j.jacceco.2010.10.003

Brav, O., 2009. Access to capital, capital structure, and the funding of the firm. J. Finance 64, 263–308. https://doi.org/10.1111/j.1540-6261.2008.01434.x

Breuer, M., 2017. How Does Financial-Reporting Regulation Affect Market-Wide Resource Allocation? SSRN Electron. J. https://doi.org/10.2139/ssrn.3082924

Breuer, M., Hombach, K., Müller, M.A., 2017. How does financial reporting regulation affect firms' banking? Rev. Financ. Stud. 31, 1265–1297. https://doi.org/10.1093/rfs/hhx123

Campello, M., Graham, J.R., Harvey, C.R., 2010. The real effects of financial constraints: Evidence from a financial crisis. J. financ. econ. 97, 470–487. https://doi.org/10.1016/j.jfineco.2010.02.009

Chang, X., Dasgupta, S., Wong, G., Yao, J., 2014. Cash-flow sensitivities and the allocation of internal cash flow. Rev. Financ. Stud. 27, 3628–3657. https://doi.org/10.1093/rfs/hhu066

Chen, Q., Chen, X., Schipper, K., Xu, Y., Xue, J., 2012. The sensitivity of corporate cash holdings to corporate governance. Rev. Financ. Stud. 25, 3610–3644. https://doi.org/10.1093/rfs/hhs099

Christensen, H.B., Hail, L., Leuz, C., 2016. Capital-market effects of securities regulation: Prior conditions, implementation, and enforcement. Rev. Financ. Stud. 29, 2885–2924. https://doi.org/10.1093/rfs/hhw055

De George, E.T., Li, X., Shivakumar, L., 2016. A review of the IFRS adoption literature, Review of Accounting Studies. https://doi.org/10.1007/s11142-016-9363-1

Denis, D.J., Sibilkov, V., 2010. Financial constraints, investment, and the value of cash holdings. Rev. Financ. Stud. 23, 247–269. https://doi.org/10.1093/rfs/hhp031

Duchin, R., 2010. Cash Holdings and Corporate Diversification. J. Finance 65, 955–992. https://doi.org/10.1111/j.1540-6261.2010.01558.x

Dye, R.A., Hughes, J.S., 2018. Equilibrium voluntary disclosures, asset pricing, and information transfers. J. Account. Econ. 66, 1–24. https://doi.org/10.1016/j.jacceco.2017.11.003

Ehling, P., Haushalter, D., 2014. When does cash matter ? Evidence for private firms, Documentos de Trabajo N.º 1412, Banco de España.

Fresard, L., 2010. Financial Strength and Product Market Behavior: The Real Effects of Corporate Cash Holdings. J. Finance. https://doi.org/10.1111/j.1540-6261.2010.01562.x

Gao, H., Harford, J., Li, K., 2013. Determinants of corporate cash policy: Insights from private firms. J. financ. econ. 109, 623–639. https://doi.org/10.1016/j.jfineco.2013.04.008

Gatchev, V.A., Pulvino, T., Tarhan, V., 2010. The interdependent and intertemporal nature of financial decisions: An application to cash flow sensitivities. J. Finance 65, 725–763. https://doi.org/10.1111/j.1540-6261.2009.01549.x

Gilchrist, S., Himmelberg, C.P., 1995. Evidence on the role of cash flow for investment. J. Monet. Econ. 36, 541–572. https://doi.org/10.1016/0304-3932(95)01223-0

Goldstein, I., Yang, L., 2019. Good disclosure, bad disclosure. J. financ. econ. 131, 118–138. https://doi.org/10.1016/j.jfineco.2018.08.004

Goldstein, I., Yang, L., 2017. Information Disclosure in Financial Markets. Annu. Rev. Financ. Econ. 9, 101–125. https://doi.org/10.1146/annurev-financial-110716-032355

Graham, J.R., Leary, M.T., 2018. The evolution of corporate cash. Rev. Financ. Stud. 31, 4288–4344. https://doi.org/10.1093/rfs/hhy075

Han, S., Qiu, J., 2007. Corporate precautionary cash holdings. J. Corp. Financ. 13, 43–57. https://doi.org/10.1016/j.jcorpfin.2006.05.002

Harford, J., Klasa, S., Maxwell, W.F., 2014. Refinancing risk and cash holdings. J. Finance 69, 975–1012. https://doi.org/10.1111/jofi.12133

Kalemli-Ozcan, S., SSrensen, B.E., Villegas-Sanchez, C., Volosovych, V., Yesiltas, S., 2015. How to Construct Nationally Representative Firm Level Data from the ORBIS Global Database, SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2660191

Lambert, R., Leuz, C., Verrecchia, R.E., 2007. Accounting information, disclosure, and the cost of capital. J. Account. Res. 45, 385–420. https://doi.org/10.1111/j.1475-679X.2007.00238.x

Larrain, B., Tapia, M., Urzúa I., F., 2017. Investor protection and corporate control. J. Corp. Financ. 47, 174–190. https://doi.org/10.1016/j.jcorpfin.2017.09.002

Leuz, C., 2018. Evidence-Based Policymaking: Promise, Challenges and Opportunities for Accounting and Financial Markets Research. Account. Bus. Res. 48, 582–608. https://doi.org/10.1080/00014788.2018.1470151

Leuz, C., Wysocki, P.D., 2016. The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. J. Account. Res. 54, 525–622. https://doi.org/10.1111/1475-679X.12115

Lins, K. V., Servaes, H., Tufano, P., 2010. What drives corporate liquidity? An international survey of cash holdings and lines of credit. J. financ. econ. 98, 160–176. https://doi.org/10.1016/j.jfineco.2010.04.006

Love, I., Preve, L.A., Sarria-Allende, V., 2007. Trade credit and bank credit: Evidence from recent financial crises. J. financ. econ. 83, 453–469. https://doi.org/10.1016/j.jfineco.2005.11.002

Michaely, R., Roberts, M.R., 2012. Corporate dividend policies: Lessons from private firms. Rev.

Financ. Stud. 25, 711–746. https://doi.org/10.1093/rfs/hhr108

Minnis, M., Shroff, N., 2017. Why regulate private firm disclosure and auditing? Account. Bus. Res. 47, 473–502. https://doi.org/10.1080/00014788.2017.1303962

Mortal, S., Nanda, V.K., Reisel, N., 2016. Why do Private firms hold less cash than Public Firms? International evidence on cash holdings and borrowing costs. SSRN Electron. J. https://doi.org/10.2139/ssrn.2830709

Roychowdhury, S., Shroff, N., Verdi, R.S., 2019. The Effects of Financial Reporting and Disclosure on Corporate Investment: A Review. J. Account. Econ. (JAE), Forthcom. 101246. https://doi.org/10.2139/ssrn.3364582

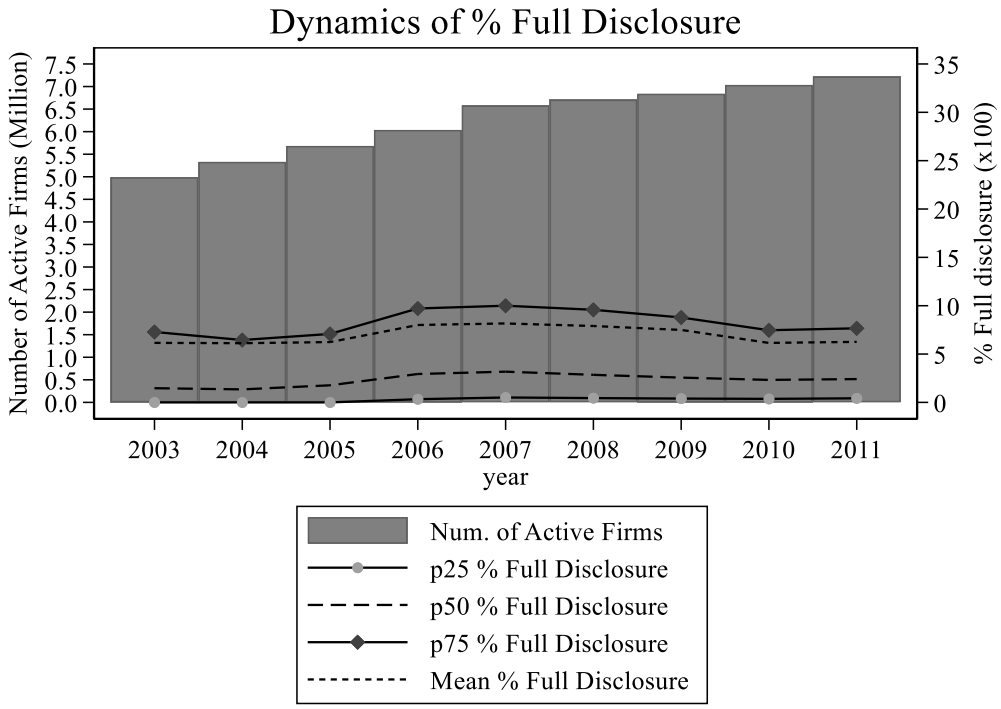
Shenoy, J., Williams, R., 2017. Trade credit and the joint effects of supplier and customer financial characteristics. J. Financ. Intermediation 29, 68–80. https://doi.org/10.1016/j.jfi.2015.09.001

Shroff, N., Sun, A.X., White, H.D., Zhang, W., 2013. Voluntary disclosure and information asymmetry: Evidence from the 2005 securities offering reform. J. Account. Res. 51, 1299–1345. https://doi.org/10.1111/1475-679X.12022

Shroff, N., Verdi, R.S., Yost, B., 2017. When does peer-firm information matter? J. Account. Econ. (JAE), Forthcom. 1–67.

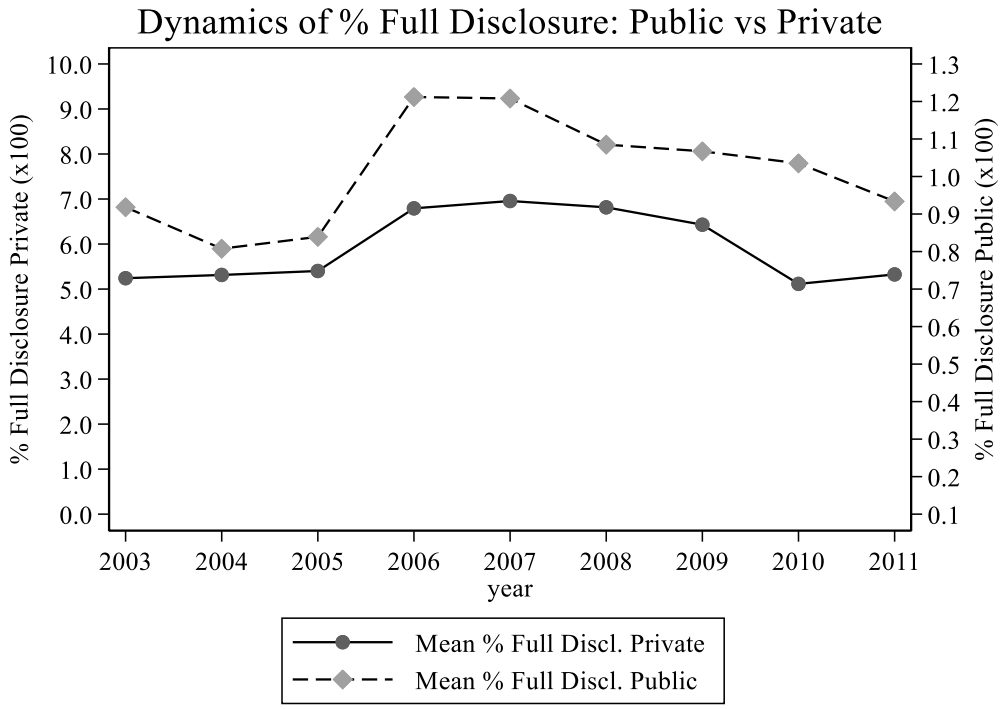
Shroff, N., Verdi, R.S., Yu, G., Verdi, R.S., 2012. Information Environment and the Investment Decisions of Multinational Corporations. Account. Rev. 89, 759–790. https://doi.org/10.2308/accr-50643

Figure 1



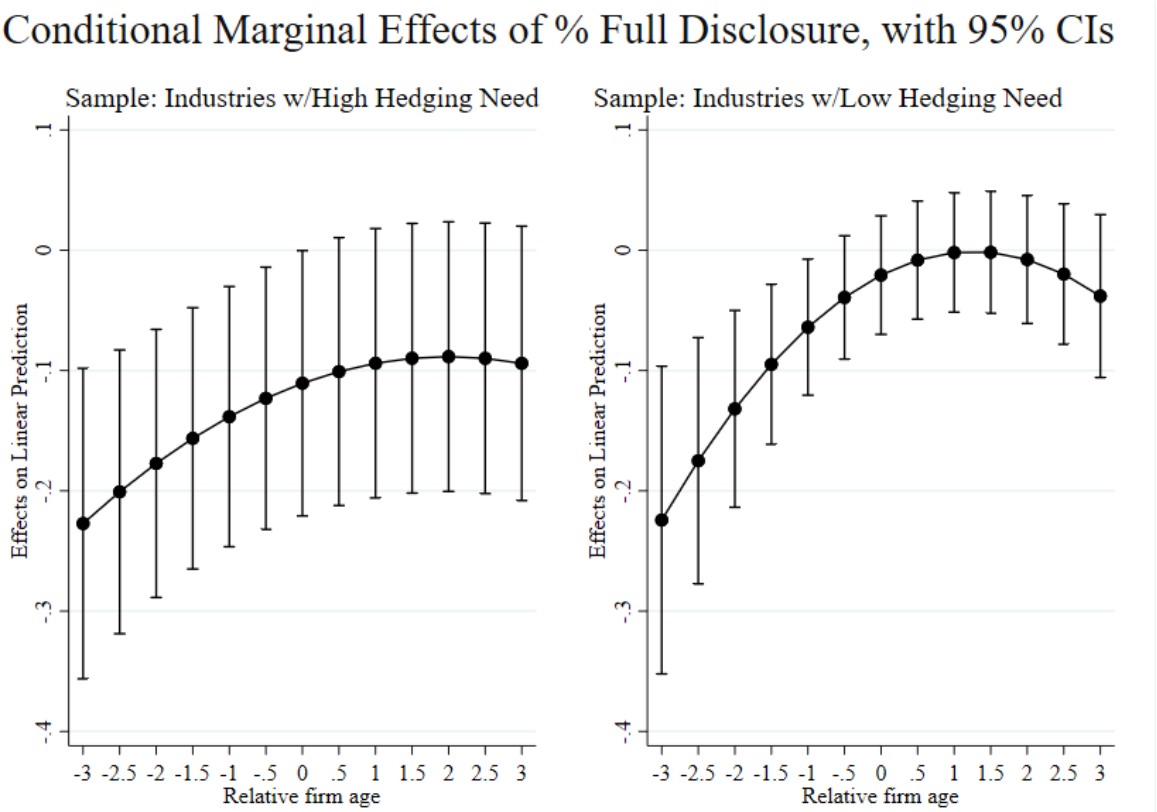
This figure presents the empirical distribution of the measure of transparency in the reporting environment (*% Full Disclosure*) and the number of active firms each year. *% Full Disclosure* is computed at the country-industry-year level and is defined as the number of public and private firms disclosing extended financial reports, scaled by the number of active firms. The lines represent the 25th, 50th and 75th percentile, as well as the mean of the empirical distribution of *% Full Disclosure* each year. The bars represent the number of active firms each year. See the text for a description of the methodology used for identifying the number of active firms. The data are from Amadeus for the period 2003-2011 and exclude companies from the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit and public administration (SIC 8000-9999) industries, and from industries with only one firm.

Figure 2



This figure plots the evolution of *% Full Discl. Private* and *% Full Discl. Public*. The variable *% Full Discl. Private* (*% Full Discl. Public*) is computed at the country-industry-year level and is defined as the number of private (public) firms disclosing extended financial reports, scaled by the number of active firms. See the text for a description of the methodology used for identifying the number of active firms. The lines represent the mean of the empirical distribution each year. The data are from Amadeus for the period 2003-2011 and exclude companies from the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit and public administration (SIC 8000-9999) industries, and from industries with only one firm.

Figure 3



This figure presents the conditional marginal effects of the transparency in the reporting environment (*% Full Disclosure*) on cash holding for different *Relative firm ages* and *Ind. hedging need*. Industries with High (Low) hedging need are the industries with *Ind. hedging need* greater than 0.2 (lower than -0.2). See Table A1 for variable definitions. The data are from Amadeus for the period 2003-2007. The sample excludes companies from the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit and public administration (SIC 8000-9999) industries, and from industries with only one firm.

Table 1

A) Sample composition by country and firm size

		Total assets (in millions of euros)				
Country	Obs.	Mean	Q1	Q2	Q3	Q3-Q1
Austria	106,513	13.86	1.67	2.84	6.52	4.85
Belgium	63,145	10.95	1.33	1.79	2.94	1.61
Denmark	2,981	21.23	1.38	2.02	3.92	2.54
Finland	60,272	13.45	1.57	2.57	6.05	4.48
France	203,368	2.69	1.28	1.65	2.43	1.15
Germany	700,655	13.16	1.63	2.72	5.99	4.36
Ireland	32,178	7.75	1.56	2.50	4.90	3.33
Italy	978,634	5.47	1.57	2.43	4.50	2.94
Netherlands	207,893	14.93	1.52	2.35	4.54	3.02
Spain	568,014	6.94	1.50	2.30	4.45	2.95
Sweden	93,664	13.72	1.55	2.42	5.19	3.64
United Kingdom	538,829	26.54	1.59	2.59	5.78	4.19
Total	**3,556,146**					
Mean	**296,346**	**11.54**	**1.53**	**2.40**	**4.78**	**3.25**

B) Sample composition by exposure to extended financial statements

		From Public Firms					
		no		yes		Total	
From Priv. Firms	no	8,536	0.24%	697	0.02%	9,233	0.26%
	yes	1,603,078	45.08%	1,943,835	54.66%	3,546,913	99.74%
	Total	1,611,614	45.32%	1,944,532	54.68%	3,556,146	100.00%

Panel A and B report the sample composition by country and firm size, and by exposure to peer extended disclosures, respectively. The data are from Amadeus for the period 2004-2012. The sample consists of private firms with more than 1 million euros in total assets, excluding companies from the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit and public administration (SIC 8000-9999) industries, and from industries with only one firm.

Table 2

Reporting environment across countries

Country	Active Firms obs.	% Full Disclosure	
		Mean	Std. Dev
Austria	1,107,056	0.07	0.11
Belgium	2,271,547	0.02	0.06
Denmark	1,323,423	0.03	0.09
Finland	1,542,940	0.08	0.12
France	8,078,993	0.20	0.16
Germany	7,786,905	0.09	0.13
Ireland	513,309	0.03	0.07
Italy	8,022,162	0.05	0.06
Netherlands	6,287,367	0.05	0.07
Spain	8,060,062	0.04	0.08
Sweden	1,690,104	0.11	0.15
United Kingdom	16,933,604	0.06	0.12
Total	**63,617,472**	**0.07**	**0.12**

This table presents the number of active firms and basic statistics of *% Full Disclosure* by country. The data are from Amadeus for the period 2003-2011 and exclude companies from the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit and public administration (SIC 8000-9999) industries, and from industries with only one firm. See the text for a description of the methodology used for identifying the number of active firms. *% Full Disclosure* is computed at the country-industry-year level and is defined as the sum of the number of public and private firms disclosing extended financial reports, scaled by the number of active firms.

Table 3

Summary statistics

	Obs.	Mean	Median	Std. Dev
Firm characteristics:				
Cash ratio	3,556,146	0.107	0.036	0.153
Log(assets)	3,556,146	14.962	14.690	1.006
Tangibility	3,468,992	0.237	0.121	0.269
Working capital	3,230,244	0.279	0.220	0.285
Leverage	3,113,238	0.178	0.043	0.255
Investment	3,457,727	0.005	-0.002	0.062
Debt growth	2,681,902	0.008	0.000	0.128
Cash growth	3,499,909	0.003	0.000	0.082
Cash flow	2,262,341	0.055	0.041	0.085
Profitability	2,464,367	0.019	0.010	0.107
Firm age	3,553,615	20.085	15.000	19.291
Country-Industry (3-digits) characteristics:				
% Full Disclosure	3,556,146	0.051	0.028	0.069
% Full Disclosure Private	3,556,146	0.050	0.028	0.068
% Full Disclosure Public	3,556,146	0.001	0.000	0.005
Log(average firm size)	3,556,146	15.789	15.614	0.839
Log(num. of firms)	3,556,146	8.629	8.616	1.759
Ind. sales growth	3,556,146	0.001	0.011	0.093
Ind. hedging need	3,546,767	-0.168	-0.250	0.556

This table reports descriptive statistics for the sample. The data are from Amadeus for the period of 2004-2012. The sample consists of private firms with more than 1 million euros in total assets, excluding companies from the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit and public administration (SIC 8000-9999) industries, and from industries with only one firm.

Table 4

Reporting environment transparency and Cash ratio

Dependent Var: Cash ratio	(1)	(2)	(3)	(4)
% Full Disclosure	**-0.103*** **	**-0.095** **	**-0.080** **	**-0.009***
	(0.040)	(0.038)	(0.036)	(0.006)
Log(assets)	-0.015***	-0.014***	-0.012***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Leverage		-0.072***	-0.047***	0.001
		(0.009)	(0.009)	(0.002)
Tangibility		-0.169***	-0.154***	-0.157***
		(0.005)	(0.004)	(0.008)
Working capital		-0.175***	-0.157***	-0.153***
		(0.011)	(0.009)	(0.004)
Investment		0.017***	-0.004	-0.015***
		(0.002)	(0.002)	(0.002)
Cash flow			0.258***	0.126***
			(0.010)	(0.005)
Profitability			0.092***	0.016***
			(0.008)	(0.002)
Ind. sales growth	0.024***	0.018***	0.012*	-0.003
	(0.006)	(0.007)	(0.007)	(0.003)
Log(average firm size)	0.000	0.001	0.001	0.000
	(0.002)	(0.002)	(0.002)	(0.001)
Log(num. of firms)	-0.001	-0.000	-0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.006)
Country-Year FE	yes	yes	yes	yes
Industry(3-digits)-Year FE	yes	yes	yes	yes
Firm FE	no	no	no	yes
Observations	3,556,146	2,889,839	2,067,046	1,958,352
Adjusted R-squared	0.100	0.235	0.271	0.795

This table reports OLS regressions for cash holdings on reporting environment transparency. The data are from Amadeus for the period 2004-2012. The sample consists of private firms with more than 1 million euros in total assets, excluding companies from the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit and public administration (SIC 8000-9999) industries, and from industries with only one firm. The dependent variable is *Cash ratio* (the ratio of cash and cash equivalent to total assets). The primary variable of interest is *% Full Disclosure* (the number of public and private firms disclosing extended financial reports, scaled by the number of active firms). See Table A1 for the definitions of the control variables. Robust standard errors, clustered at the Country-Industry(3-digits) level, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5

Cross-industry variation in cash-deficit risk

	Sample:	Sample:		Sample:	
	All	|Ind. hedging need|>0.2		|Ind. hedging need|>0.4	
Dependent Var: Cash ratio	(1)	(2)	(3)	(4)	(5)
% Full Disclosure	**-0.110*** **				
	(0.034)				
Ind. hedging need x % Full Disclosure	**-0.086*** **				
	(0.017)				
Ind. hedging need	0.005***				
	(0.002)				
(A) % Full Disclosure x High hedging need		**-0.121*** **	**-0.120*** **	**-0.119*** **	**-0.131*** **
		(0.038)	(0.040)	(0.039)	(0.046)
(B) % Full Disclosure x Low hedging need		**-0.055** **	**-0.057***	**-0.039**	**-0.051***
		(0.027)	(0.030)	(0.027)	(0.031)
Ind. sales growth	0.032***	0.017	0.013	-0.002	-0.007
	(0.011)	(0.015)	(0.009)	(0.015)	(0.012)
Log(assets)	-0.014***	-0.014***	-0.012***	-0.015***	-0.012***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Leverage	-0.072***	-0.071***	-0.046***	-0.075***	-0.047***
	(0.009)	(0.010)	(0.009)	(0.010)	(0.011)
Tangibility	-0.168***	-0.169***	-0.155***	-0.170***	-0.158***
	(0.005)	(0.005)	(0.004)	(0.006)	(0.005)
Working capital	-0.175***	-0.174***	-0.157***	-0.178***	-0.161***
	(0.011)	(0.012)	(0.010)	(0.013)	(0.012)
Investment	0.017***	0.019***	-0.000	0.018***	-0.003
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Cash Flow			0.266***		0.270***
			(0.010)		(0.012)
Profitability			0.092***		0.099***
			(0.008)		(0.008)
Diff A-B		-0.066***	-0.063***	-0.080***	-0.080***
Additional industry controls	yes	yes	yes	yes	yes
Country-Year FE	yes	yes	yes	yes	yes
Industry(3-digits)-Year FE	yes	yes	yes	yes	yes
Observations	2,755,241	2,228,724	1,619,128	1,694,477	1,239,021
Adjusted R-squared	0.237	0.238	0.276	0.242	0.282

This table presents results from examining whether the effect of reporting environment transparency on cash holdings varies with the level of cash-deficit risk at the industry level. The data are from Amadeus for the period 2004-2012. The sample consists of private firms with more than 1 million euros in total assets, excluding companies from the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit and public administration (SIC 8000-9999) industries, and from industries with only one firm. It also excludes firms in industries with less than 5 years of financial data. The dependent variable is *Cash ratio* (the ratio of cash and cash equivalent to total assets). The primary variables of interest are (1) *% Full Disclosure* (the number of public and private firms disclosing extended financial reports, scaled by the number of active firms), and (2) *Ind. hedging need* (the correlation coefficient between the streams of industry cash flow and industry investment opportunities, multiplied by negative one. The industry cash flow is the cash flow of the average firm. The industry investment opportunities are measured as the three-year-ahead average of the sales growth rate). Additional industry controls include Log(average firm size), and Log(num. of firms). See Table A1 for the definitions of the control variables. Robust standard errors, clustered at the Country-Industry(3-digits) level, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6

Within industry variation in firm age

	Sample: All		Sample: Ind. hedging need >0.2	Sample: Ind. hedging need < -0.2
Dependent Var: Cash ratio	(1)	(2)	(3)	(4)
% Full Disclosure	**-0.096****	**-0.088****	**-0.137****	**-0.016**
	(0.039)	(0.041)	(0.063)	(0.021)
Relative firm age x % Full Disclosure	**0.028*****	**0.038*****	**0.035*****	**0.045*****
	(0.006)	(0.010)	(0.012)	(0.009)
(Relative firm age)^2 x % Full Disclosure		**-0.009****	**-0.007**	**-0.012*****
		(0.004)	(0.005)	(0.004)
Relative firm age	0.006***	0.010***	0.008***	0.011***
	(0.001)	(0.001)	(0.002)	(0.001)
(Relative firm age)^2		-0.002***	-0.002***	-0.002***
		(0.000)	(0.001)	(0.000)
Log(assets)	-0.015***	-0.015***	-0.013***	-0.016***
	(0.001)	(0.001)	(0.001)	(0.001)
Leverage	-0.069***	-0.068***	-0.053***	-0.075***
	(0.009)	(0.009)	(0.010)	(0.008)
Tangibility	-0.172***	-0.172***	-0.153***	-0.183***
	(0.005)	(0.005)	(0.008)	(0.005)
Working capital	-0.176***	-0.177***	-0.148***	-0.196***
	(0.011)	(0.011)	(0.015)	(0.011)
Investment	0.021***	0.022***	0.029***	0.020***
	(0.002)	(0.002)	(0.006)	(0.003)
Ind. sales growth	0.019***	0.019***	0.021	0.003
	(0.007)	(0.007)	(0.014)	(0.014)
Ind. hedging need	0.000	0.000	-0.011***	-0.002
	(0.001)	(0.001)	(0.004)	(0.003)
Additional industry controls	yes	yes	yes	yes
Country-Year FE	yes	yes	yes	yes
Industry(3-digits)-Year FE	yes	yes	yes	yes
Observations	2,885,307	2,885,307	795,295	1,432,248
Adjusted R-squared	0.238	0.239	0.243	0.247

This table reports results from examining whether the effect of reporting environment transparency on cash holdings varies with firm age. The data are from Amadeus for the period 2004-2012. The sample consists of private firms with more than 1 million euros in total assets, excluding companies from the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit and public administration (SIC 8000-9999) industries, and from industries with only one firm. The dependent variable is *Cash ratio* (the ratio of cash and cash equivalent to total assets). The primary variable of interest are *% Full Disclosure* (the number of public and private firms disclosing extended financial reports, scaled by the number of active firms) and *Relative firm age* (the standardized firm age at the country-industry level). Additional industry controls include Log(average firm size) and Log(num. of firms). See Table A1 for the definitions of the control variables. Robust standard errors, clustered at the Country-Industry(3-digits) level, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 7

Mandatory disclosure of private firms and cash holding

Dependent Var: Cash ratio	(1)	(2)	(3)
% Full Disclosure Priv	**-0.146*** **	**-0.145*** **	**-0.126*** **
	(0.042)	(0.040)	(0.042)
Dummy Public Peer	**-0.006*** **	**-0.008*** **	**-0.006*** **
	(0.002)	(0.002)	(0.002)
% Full Disclosure Priv x Dummy Public Peer	**0.094*** **	**0.104*** **	**0.087*** **
	(0.030)	(0.028)	(0.029)
Log(assets)	-0.015***	-0.014***	-0.012***
	(0.001)	(0.001)	(0.001)
Leverage		-0.072***	-0.047***
		(0.009)	(0.009)
Tangibility		-0.169***	-0.154***
		(0.005)	(0.004)
Working capital		-0.176***	-0.157***
		(0.011)	(0.009)
Investment		0.016***	-0.004
		(0.002)	(0.002)
Cash flow			0.258***
			(0.010)
Profitability			0.092***
			(0.008)
Ind. sales growth	0.028***	0.021***	0.011
	(0.007)	(0.007)	(0.007)
Ind. hedging need	-0.001	-0.000	-0.002*
	(0.001)	(0.001)	(0.001)
Additional industry controls	yes	yes	yes
Country-Year FE	yes	yes	yes
Industry(3-digits)-Year FE	yes	yes	yes
Observations	3,546,763	2,887,128	2,065,990
Adjusted R-squared	0.101	0.235	0.271

This table reports OLS regressions for cash holdings on mandatory disclosure of private firms. The data are from Amadeus for the period 2004-2012. The sample consists of private firms with more than 1 million euros in total assets, excluding companies from the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit and public administration (SIC 8000-9999) industries, and from industries with only one firm. The dependent variable is *Cash ratio* (the ratio of cash and cash equivalent to total assets). The primary variables of interest are (1) *% Full Disclosure Priv*, defined as the number of private firms disclosing extended financial reports scaled by the number of active firms; and (2) *Dummy Public Peer*, a dummy variable with value of one if there is at least one public firm in the industry, and zero otherwise. Additional industry controls include Log(average firm size) and Log(num. of firms). See Table A1 for the definitions of the control variables. Robust standard errors, clustered at the Country-Industry(3-digits) level, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 8

Cash Flow sensitivity analyses

Dependent Variable:	Investment (1)	Cash growth (2)	Debt growth (3)
Cash flow	**0.0314*** **	**0.0302*** **	**0.0887*** **
	(0.0030)	(0.0034)	(0.0069)
Cash flow x % Full Disclosure	**-0.0023**	**-0.1369*** **	**-0.0772*** **
	(0.0226)	(0.0219)	(0.0295)
% Full Disclosure	0.0068*	-0.0142*	0.0259
	(0.0039)	(0.0078)	(0.0343)
Log(assets)	-0.0471***	-0.0408***	-0.0846***
	(0.0030)	(0.0033)	(0.0048)
Tangibility	-0.3444***	-0.0020	0.0282***
	(0.0116)	(0.0014)	(0.0045)
Leverage	0.0019*	-0.0070***	-0.5726***
	(0.0012)	(0.0014)	(0.0083)
Cash ratio	0.0153***	-0.7165***	-0.0075
	(0.0015)	(0.0062)	(0.0052)
Working capital	0.0002	0.0220***	-0.0228***
	(0.0015)	(0.0012)	(0.0052)
Ind. sales growth	0.0083***	0.0023	0.0079
	(0.0019)	(0.0019)	(0.0054)
Additional industry controls	yes	yes	yes
Firm FE	yes	yes	yes
Country-Year FE	yes	yes	yes
Observations	1,408,240	1,408,240	1,408,240
Adjusted R-squared	0.284	0.305	0.153

This table presents OLS regressions for the effect of reporting environment transparency on cash flow allocation. The data are from Amadeus for the period 2004-2012. The sample consists of private limited liability firms with more than 1 million euros in total assets, excluding companies from the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit and public administration (SIC 8000-9999) industries, and from industries with only one firm. The dependent variables are (1) *Investment* (the one-year change in the value of tangible fixed assets divided by the lagged assets), (2) *Cash growth* (the one-year change in the value of cash and cash equivalents divided by the lagged assets), and (3) *Debt growth* (the one-year change in the value of long-term debt plus short-term loan divided by the lagged assets). The primary variables of interest are (1) *% Full Disclosure* (the number of public and private firms disclosing extended financial reports, scaled by the number of active firms), and (2) *Cash flow* (the ratio of net earning plus depreciation to total assets). Additional industry controls include Log(average firm size), and Log(num. of firms). See Table A1 for the definitions of the control variables. Robust standard errors, clustered at the Country-Industry(3-digits) level, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix A:

Variable Definitions

Variable	Definition
Firm characteristics:	
Cash ratio	the ratio of cash and cash equivalent to total assets
Log(assets)	the natural log of total assets
Tangibility	the ratio of tangible assets to total assets
Working capital	the sum of inventory plus accounts receivable minus accounts payable, divided by total assets
Leverage	the ratio of long-term debt to total assets
Investment	the one-year change in tangible fixed assets divided by the lagged assets
Debt growth	the one-year change in long-term debt plus short-term loan divided by the lagged assets
Cash growth	the one-year change in cash and cash equivalents divided by the lagged assets
Cash flow	the ratio of net earning plus depreciation to total assets
Profitability	the ratio of earnings before interest and taxes plus depreciation to total assets
Firm age	the firm age since incorporation year
Country-Industry(3-digits)-Year characteristics:	
% Full Disclosure	the sum of the number of public and private firms disclosing extended financial reports, scaled by the number of active firms
% Full Disclosure Private	the number of private firms disclosing extended financial reports, scaled by the number of active firms
% Full Disclosure Public	the number of public firms scaled by the number of active firms
Log(average firm size)	the natural log of the average firm' total assets
Log(num. of firms)	the natural log of the number of active firms
Ind. sales growth	the industry median annual sales growth rate
Ind. hedging need	the correlation coefficient between the streams of industry cash flow and industry investment opportunities, multiplied by negative one. The industry cash flow is the cash flow of the average firm. The industry investment opportunities are measured as the three-year-ahead average of the sales growth rate