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**Financial disclosure environment and the
cash policy of private firms**

Marcelo Ortiz

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Financial Disclosure Environment and the Cash Policy of Private Firms

Marcelo Ortiz*

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Abstract

This paper proposes that private firms facing stronger financial constraints benefit from greater transparency in the financial disclosure environment since it facilitates the estimation of future liquidity needs. I test this idea using a sample of private firms from 12 European countries with similar disclosure regulations for public and private firms. Consistently, I find that private firms hold less cash when they operate in industries with a higher fraction of peers disclosing extended financial reports. Further, I find that the decrease in cash holding is more pronounced in industries with higher cash-deficit risk and for younger firms. These findings are mainly explained by the disclosures of other private peers, which provide a means for learning from firms with similar liquidity constraints.

Keywords: Disclosure Regulation, Cash Policy, Private Firms.

JEL Codes: M41, M48, G32.

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

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1. INTRODUCTION

The uncertainty regarding future liquidity needs exacerbates the incentive to hold cash as a self-protection mechanism (Han and Qiu 2007). Cash holding provides downside protection that debt capacity or derivatives cannot substitute (Almeida et al. 2014), and might prevent a future liquidation of productive assets or an inefficient closing of the firm (Harford, Klasa, and Maxwell 2014). Nonetheless, firms face a cost for the protection provided by cash reserves, since the rate of return on cash holdings is lower than the cost of capital (Lins, Servaes, and Tufano 2010; Graham and Leary 2018).

The set of publicly available financial reports in an industry contributes to the Financial Disclosure Environment (henceforth, FDE) for all firms operating in that industry. This set of reports is a useful source of information for competitors and investors, as it promotes learning and reduces informational asymmetries (Leuz and Wysocki 2016; Beyer et al. 2010). However, not all the financial reports contribute equally to the level of transparency in the FDE. In most parts of the world, public firms are required to disclose detailed financial reports in accordance with 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 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, Burgstahler, and Kaya 2018), making it more difficult for peers and investors 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 whether the level of transparency in the FDE affects the incentives of private firms to hold a costly cash buffer. This paper poses that a higher level of transparency in the FDE (e.g., a higher fraction of industry peers disclosing extended financial reports) has the potential effect of reducing the firms' uncertainty

regarding their future liquidity needs. According to multiple surveys, managers use peers' reports to find out about the profitability of new markets, products, or technologies, as well as investment and margin trends in the industry (Minnis and Shroff 2017; Arruñada 2011). Thus, the more extended the peers' reports, the more accurate the future cash-flow estimates. Better estimates reduce uncertainty about liquidity needs and discourage the accumulation of a costly cash buffer.

On the other hand, there are credible arguments for why the transparency in the FDE may have a contrary effect or none at all. By reducing information asymmetries with creditors, the higher transparency in the FDE might also decrease the cost of capital at a market-wide scale (Lambert, Leuz, and Verrecchia 2007) and, through this, diminish the cost of holding cash. Therefore, when firms are not able to learn from the set of peers' extended disclosures about future liquidity needs, the lower cost of capital might cheapen the cash accumulation.

From a theoretical perspective, cash management is especially relevant in the context of private firms. The higher financing frictions of private firms make their cash reserves more sensitive to cash flow fluctuations (Brav 2009). Besides, private firms, especially the younger private firms, might lack the experience or knowledge to produce accurate estimations of future cash-flow needs (Ehling and Haushalter 2014). In sum, the incentives behind precautionary cash policies (i.e., financing constraint and cash-flows uncertainty) are more pronounced in the context of private firms. Lastly, private firms are usually closely held, reducing the concern about agency conflicts driving the cash reserves (Gao, Harford, and Li 2013; Michaely and Roberts 2012).

From a policy-maker perspective, it is important to evaluate the externalities of disclosure regulations, especially those affecting the cash positions of private firms. Most of the private firms face severe financing constraints (Gao, Harford, and Li 2013; Michaely and Roberts 2012). Since private firms are an economically important group of firms around the world (B. Badertscher, Shroff, and White 2013; Gao, Harford, and Li 2013; Michaely and Roberts 2012), systematic mistakes in their cash-flow estimations might have severe market-wide 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 to evaluate the effects of the disclosure environment (Bernard, Burgstahler, and Kaya 2016; Breuer 2017; Bernard, Burgstahler, and Kaya 2018). 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's 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, Li, and Shivakumar 2016).

For each private firm in the sample, I measure the transparency in its FDE 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 level (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 at different levels of FDE transparency, 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 industries with greater transparency in the FDE. 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. Furthermore, the cross-industry analysis shows that the relation between the transparency in the FDE and cash holding is stronger in industries with high cash-deficit risk. This result holds when controlling for multiple characteristics at the firm and industry level, as well as when including firm fixed effects.

Then, I find that given the same level of transparency in the FDE, not all of the firms reduce their cash holdings by the same proportion. In particular, I focus on the role of the 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. Secondly, younger private firms suffer more information frictions with lenders. As a result, younger private firms have stronger financing constraints than older firms (Gao, Harford, and Li 2013). In short, the focus on firm age helps us to stress both contradicting hypotheses. Consistent with the learning perspective, I document that the focal effect is weaker the older the firm age. Furthermore, the relation with firm age is non-linear and has a higher marginal effect for younger firms, 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. The motivation behind these studies is that the rich information environment around public firms facilitates the identification, assessment, and monitoring of industry-wide growth opportunities (B. Badertscher, Shroff, and White 2013; Shroff, Verdi, and Yu 2014). However, since the financing constraints faced by private firms differ from their public peers, private firms might be reluctant to use public firms as a guide for their cash policies. Additionally, agency conflicts in public firms seem to lead to excessive cash accumulation (Gao, Harford, and Li 2013), which can be financially unbearable for private peers (Mortal, Nanda, and Reisel 2016). To test this idea, I use solely the extended disclosure of private firms. I document that the extended

disclosures of private peers affect the cash holdings in a market-wide scale independently 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.

In sum, the previous cash holdings analyses generate multiple results consistent with the hypothesis of private firms being able to use peer reports to generate more accurate estimates of future cash-flow needs, and, therefore, having lower incentives for holding a costly cash buffer. However, these analyses do not provide an answer regarding what financing or investment policy is driving the lower cash ratio. To bring some lights in this direction, I evaluate the cash-flow sensitivity of cash, investment, and debt. The findings indicate that in more transparent industries, private firms save less cash out of cash-flows, but there is no evidence that transparency increases the cash-flows allocation in investment or debt-reduction. Therefore, it seems that the FDE transparency is associated with less cash accumulation rather than with more conversion of cash to productive assets.

The results of this paper are robust to alternative research-designs (see Appendix B). As a supplementary analysis, I evaluate exogenous shocks in the liquidity risk and the level of transparency of the FDE. In the first case, the analysis of the 2008-2009 financial crisis shows that when external financing is difficult to obtain, private firms in a more transparent FDE reduce cash growth and increase the level of investment. This is consistent with the argument of greater transparency discouraging cash accumulation, i.e., when the capital market fails, firms in more transparent industries are less prone to cut or postpone investment to sustain a costly cash buffer. For the second case, I exploit an enforcement reform to the disclosure regulation of private firms in Germany in 2006. By creating a new Federal Agency responsible for the disclosure enforcement and imposing fines ranging from 2.500 to 25.000 euros, the rate of disclosure compliance among German private firms grew from 16% to above 90% (Laschewski and Nasev 2017). I use the increase in the disclosure compliance at the industry level to evaluate how the new disclosures affected the financial policies

of those private peers that met the disclosure requirement before the enforcement strengthening. The estimates show that post-reform, the firms in industries with more new disclosures reduced their cash growth, increased their leverage, and had no significant change in investment.

This paper belongs to the growing literature exploring the consequences of the financial reporting environment (Goldstein and Yang 2017, 2019; Roychowdhury, Shroff, and Verdi 2019). Previous studies analyze whether the presence of publicly-listed firms improves the investment efficiency of private firms (B. Badertscher, Shroff, and White 2013; B. A. Badertscher, Shanthikumar, and Teoh 2019). These studies assume that the information enhancement generated by the presence of a public firm has no effect on the cost of capital of its private peers. However, the spillover effect on the cost of capital of industry peers has been largely documented (Shroff, Verdi, and Yost 2017; Lambert, Leuz, and Verrecchia 2007; Dye and Hughes 2018). This paper evaluates both channels in a cash policy framework, and proposes that a greater presence of extended financial reports provides a better input for the estimation of future liquidity needs. Consistently, this paper documents a strong negative association between the reporting environment and the cash held by younger private firms facing higher risk of cash shortfalls.

This paper also contributes directly to the literature on the mandatory disclosure regulation for private firms. The mandated level of transparency in the financial reports of private firms varies considerably across the world (Minnis and Shroff 2017). Additionally, in the last decade, many countries have reformed their disclosure regulations for private firms following disparate recommendations for the expansion or reduction of the 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 a strong informational spillover among private peers with similar cash-deficit risk, and by describing the type of private peer that benefits most from this set of financial reports.

Finally, this paper contributes to the literature of corporate liquidity management (Almeida et al. 2014; Chang et al. 2014; Denis and Sibilkov 2010; Graham and Leary 2018) by documenting that peers' financial reports have a market-wide effect on the assessment of future liquidity needs. Moreover, this study provides insight into cash management as a risk management tool in private firms (Gao, Harford, and Li 2013; Anderson and Hamadi 2016) by analyzing how the incentive for cash accumulation in private firms is reduced in better information environments.

2. MOTIVATION

2.1 Cash-deficit risk and the incentive for cash accumulation

Information asymmetries with capital markets create a wedge between the cost of internal and 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 exacerbates the incentive to accumulate cash as a protection mechanism in case of a future cash deficit (Han and Qiu 2007).¹ A large cash buffer might prevent the liquidation of productive assets or an inefficient closing of the firm (Harford, Klasa, and Maxwell 2014).

Firms might use financial derivatives to manage liquidity 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).

However, 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 decide optimally to reduce the liquidity buffer to pay down debt (Azar, Kagy, and Schmalz 2016; Mortal, Nanda, and Reisel 2016). Accordingly, survey-based evidence shows that the

¹ 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.

cost of debt is one of the key determinants for deciding the level of cash holding (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 Effects of the FDE on the incentive for cash accumulation

The set of peers' disclosures facilitates the learning process about the cash-flow generation of new products, technologies, or markets previously explored by specific competitors. Besides, 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 cash-flows estimates when they are able to evaluate separately the changes in "sales" and "cost of materials" rather than by observing only "gross profit". Similarly, cash-deficit risk analyses are more precise when including peers' detailed composition of "inventory" (raw materials, work in progress), "liabilities" (short and long-term), and "current asset" (cash, short-term investment, financial derivatives, trade and other receivables). Lastly, an overview of the liquidity situation and risk expositions is often part of the analysis section in extended disclosures (e.g., Directors' Reports, and the Management Discussion and Analysis Section). In summary, when firms evaluate the capital budget, the study of peers' extended report enables them to make more accurate forecasts about future financing needs and the corresponding cash-deficit risk. The better estimates, *ceteris paribus*, reduce the incentives for accumulating a costly cash buffer.

On the other hand, the level of transparency might also affect cash policies 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 of information asymmetries reduces agency-related financing costs. However,

the disclosure regulation 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 in the investors' assessment of the 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.

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 of 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 larger 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, Tapia, and Urzúa I.

2017)², the number of firm-year observations is approximately 3.5 million. The average firm size in the sample is 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 FDE transparency

To capture the level of transparency in the financial disclosure environment, I measure the percentage of 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 (B. Badertscher, Shroff, and White 2013; Christensen, Hail, and Leuz 2016) or private firms (Breuer, Hombach, and Müller 2017; Breuer 2017) to the information environment. However, the combination of both more completely describes the disclosure environment in which private firms operate. To compute this percentage, we need first to identify the number of active firms and then identify the subset of those firms that disclose extended financial reports.

Number of Active Firms:

For identifying 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 positive total assets and 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

² Specifically, the cleaning process drops firm-year observations with negative value in total assets, turnover, or fixed assets, as well as truncates the distribution of ROA (=EBITDA / total assets) and the annual growth in total assets at -100% and 100%.

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.

% Full Disclosure:

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 the European Commission Directives. As a result, the set of country-specific disclosure regulations has three common characteristics, which provide a suitable cross-country setting to evaluate the consequences of the financial disclosure regulations of private firms (Bernard, Burgstahler, and Kaya 2018; Breuer 2017). First, most of the regulations classify firms according to three size-based groups using at least two of the three 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 firm are mandated to disclose only abbreviated financial statements, and in some countries (e.g., Austria, Germany, 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's reports, as well as file their documents in a reduced period. Therefore, the number of private peers being forced to provide extended disclosures varies at the country-level due to the different country-specific firm-size thresholds, and it also varies at the industry-level owing to different firm-size distributions across industries within the same country. Arguably, each firm individually cannot manage the intersection between the regulatory threshold and the industry firm-size distribution, and therefore, this number constitutes an exogenous measure of the information provided by private peers to the FDE in the industry.

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). As mentioned before, 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 of 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). 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.

On the other hand, as in most of the world, in the EU, the financial disclosure regulations force publicly listed firms to disclose extended and standardized financial statements, as well as detailed analysis about their strategy, past performance and the expected outlook for the future (De George, Li, and Shivakumar 2016; Christensen, Hail, and Leuz 2016). Additionally, public firms usually complement the report requirements with additional voluntary disclosures that may be beneficial for external stakeholders (Balakrishnan et al. 2014; Shroff et al. 2013). To quantify the presence of public firms, I count the number of publicly listed firms from 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 of 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 quite 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 5-7%, while the percentage of public firms varies between 0.8-1.3%.

3.3 Baseline Regression

To evaluate the effect of the transparency in the FDE on cash holding, I estimate the following regression:

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

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 the liquidity management: (1) $\log(\text{assets})$ (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 absorb 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, Harford, and Li 2013).

The specification also controls for characteristics of the industry, such as the (8) Average firm size ($\log(\text{average firm size})$) and (9) Number of firms ($\log(\text{number of active firms})$). These

additional variables control the heterogeneity in the firm-size distribution and level of competition across industries.³

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 (3-digit SIC codes), such as industry business cycle and cash flow fluctuations. As mentioned before, 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 firms heterogeneity and therefore, the 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 FDE predicts a positive β_h , indicating that firms hold more cash in a context with lower information asymmetries. In contrast, the learning argument predicts a negative β_h , implying that firms hold less cash in industries with a more detailed and transparent FDE.

4. EMPIRICAL RESULTS

4.1 Descriptive statistics

The sample composition in terms of the exposure to peers' extended reports is in Panel B of Table 1. 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.

³ 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.

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 FDE Transparency and Cash Holding

Table 4 evaluates the effect of the FDE on cash holdings. Model 1 tests the relationship between *% Full Disclosure* and the cash ratio, controlling for the 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 allow 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, 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 testing if the result holds with more stringent specifications. In all models, the liquidity-risk-assessment effect predominates over the cost-of-capital effect. In Model 1, the coefficient of *% Full Disclosure* is negative and statistically significant ($\beta_h = -0.103$, $p < 0.01$), 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 of *% 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 a similar economic magnitude and significance across the different specifications, even with the substantial decline of 42% in the sample size between Model 1 and 3.

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

4.3 Cross-industry variation in the cash-deficit risk

The incentive for cash accumulation is determined by the joint distribution of investment opportunities and cash flows (Acharya, Almeida, and Campello 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 the cash-deficit risk. This higher risk strengthens the incentives to postpone the use of the cash (e.g., investment, 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, Almeida, and Campello 2007). As mentioned before, industries are defined using the 3-digit SIC codes. Previous studies have named this measure of cash-deficit risk as “hedging need” (Acharya, Almeida, and Campello 2007; 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 the 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, Almeida, and Campello 2007). Finally, to facilitate the interpretation, the measure of liquidity risk is defined as the correlation coefficient multiplied by minus one.

Table 5 includes the industry measure of the hedging need. Model 1 interacts this measure with *% Full Disclosure*. As expected, the effect of the Industry Hedging Need on cash holding is positive (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 the cash-flow risk in industries with higher incentives for cash accumulation.

To quantify the difference in the impact of the FDE transparency across different liquidity risk contexts, 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 that 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 if, given the same peer disclosures, all firms in a given industry reduce their cash holding 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 the firm age for two reasons. First, from the learning hypothesis, 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 rely more on their accumulated knowledge to estimate future cash flow needs. Secondly, from the cost-of-capital approach, younger private firms suffer more information friction with lenders. As a result, younger private firms have stronger financing constraints than older firms (Gao, Harford, and Li 2013). Henceforth, the focus on firm age helps us to stress both contradicting hypotheses.

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. 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 FDE transparency having a stronger effect in younger firms, i.e., the longer the business experience of the firm, 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 softer as the firm accumulates more business experience.

Arguably, two firms with (1) the same age and (2) operating in the same level of transparency but (3) in different liquidity-risk 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 the industries with high liquidity risk, the effect might be focalized in younger firms in the industries with lower liquidity risk. I test this idea by splitting the sample in industries with high and low liquidity risk, using as cutoffs 0.2 and -0.2, respectively. Models 3 and 4 of Table 6 present the results. To ease the interpretation of the triple interaction, Figure 3 plots the conditional marginal effect 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 impact of the reporting environment is more distributed across different firm ages in the industries with more cash-deficit risk.

4.5 FDE Decomposition: The role of 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 (B. Badertscher, Shroff, and White 2013; Shroff, Verdi, and Yu 2014; Shroff, Verdi, and Yost 2017); therefore, it is important to evaluate if the previous results are solely driven by the disclosures of public firms. However, since the level of financing constraint differs sharply between private and public peers, private firms might be reluctant to use public peers' report as a guide for cash-deficit risk. Additionally, agency conflicts in public firms seem to lead to excessive cash accumulation (Gao, Harford, and Li 2013), which can be economically unbearable to imitate for private peers (Mortal, Nanda, and Reisel 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 (B. Badertscher, Shroff, and White 2013). Thus, while the liquidity-risk profile 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 the 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 the one 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 positives externalities. In line with this, Table 7 (as well as Table B2) provides evidence supporting the existence of an externality; i.e., the financial disclosures of private firms can generate a market-wide reduction of cash accumulation for precautionary reasons, especially in contexts without public peers.

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

In sum, the previous cash holdings' analyses generate multiple results consistent with the hypothesis of private firms being able to use peers' reports to learn about liquidity risk. However, these analyses do not provide an answer regarding what financing or investment policy is driving the lower cash holding.

To shed some light in this direction, this subsection analyzes the liquidity management from the perspective of the cash-flow sensitivities. By doing so, I can evaluate how private firms allocate internally-generated cash-flows among its various uses depending 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). Instead, I evaluate the cash-flow sensitivity of cash, investment, and debt. By doing so, I can evaluate whether firms are more prone to use their cash-flows to invest, save, or reduce

debt when they operate in a more transparent reporting environment. In particular, I estimate the following set of panel regressions:

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

$$+ Controls_{ijt-1} + \alpha_i + \alpha_{ct} + \varepsilon_{ijct}$$

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) Leverage growth (the one-year change in the value of long-term debt divided by the lagged assets). Following the literature of cash flow sensitivity (Duchin 2010; Chang et al. 2014), 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 (as previously defined. See Appendix A for the variable definitions). The difference with 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 coefficients of $\% Full Disclosure$ and its interaction with cash-flow are both non-significant. This result is not consistent with a stronger allocation of cash to invest when the firms operate in more transparent industries. Model 2 presents the cash-flow sensitivity of cash. In this case, both the direct effect of $\% Full Disclosure$ as well as its interaction are negative and significant, indicating that private firms are less prone to save cash out of cash flows when more peers disclose extended reports. Finally, Model 3 documents the cash flow sensitivity of debt. The coefficients of interest are nonsignificant. As in the case of investment, this last result is not consistent with firms using more cash flows to reduce debt as the more transparent is the reporting environment.

Overall, the results in Table 8 seem to indicate that FDE transparency shapes the cash accumulation decision but does not fuel more cash spending in productive assets. However, this conclusion has to be considered cautiously for two reasons. First, I cannot evaluate the effects in other cash uses such as R&D, dividend payout or equity repurchases. Thus, Table 8 cannot rule out effects

on these alternative cash usages. Secondly, 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 the FDE transparency does have an effect on the cash allocation in investment or debt but only for smaller firms, which, as mentioned before, are the firms with stronger financial constraints and incentives to learn from peers.

5. DISCUSSION AND CONCLUSION

Cash accumulation is the main risk-management tool used for private firms, and this tool is particularly costly for those ones facing stronger financial constraints. This paper evaluates two possible effects of the transparency in the FDE on the corporate cash policies 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 of non-operative cash in the economy, it is important to evaluate which one predominates.

This paper documents a robust negative association between the level of transparency in the FDE and the cash ratio of private firms, especially for the firms facing stronger financial constraints. The findings are consistent with the argument that a more transparent FDE facilitates the elaboration of more accurate estimates of future liquidity needs, therefore, discourages cash accumulation.

Previous studies have argued that a richer information environment increases the responsiveness of investment to investment opportunities (B. Badertscher, Shroff, and White 2013; Shroff, Verdi, and Yu 2014). The evidence of this paper complements this argument since it documents an overlooked mechanism by which the reporting environment affects the cash policies of financially constrained firms. This effect seems especially relevant for small private firms since they might lack the access to or expertise regarding alternative instruments for managing their cash-deficit risk.

The findings documented in this paper also contribute to the open debate regarding the role of mandatory disclosure regulations in the socially-desirable level of transparency. There is a need to include externalities in the economic evaluation of the disclosure regulations. In this context, the evidence provided in this paper suggests that the mandated disclosures play an informational role in the liquidity risk assessment.

This study relied on the public disclosure of financial statements to estimate the impact of the FDE 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 be underestimating the total effect of disclosure regulations on the overall uncertainty reduction.

Finally, further studies might investigate the effect of the FDE on trade-credit risk management. Trade-credit represents an important source of external finance provided by trading partners (Love, Preve, and Sarria-Allende 2007; Shenoy and Williams 2017). The variation in FDE transparency through the supply chain seems to be an interesting question to tackle.

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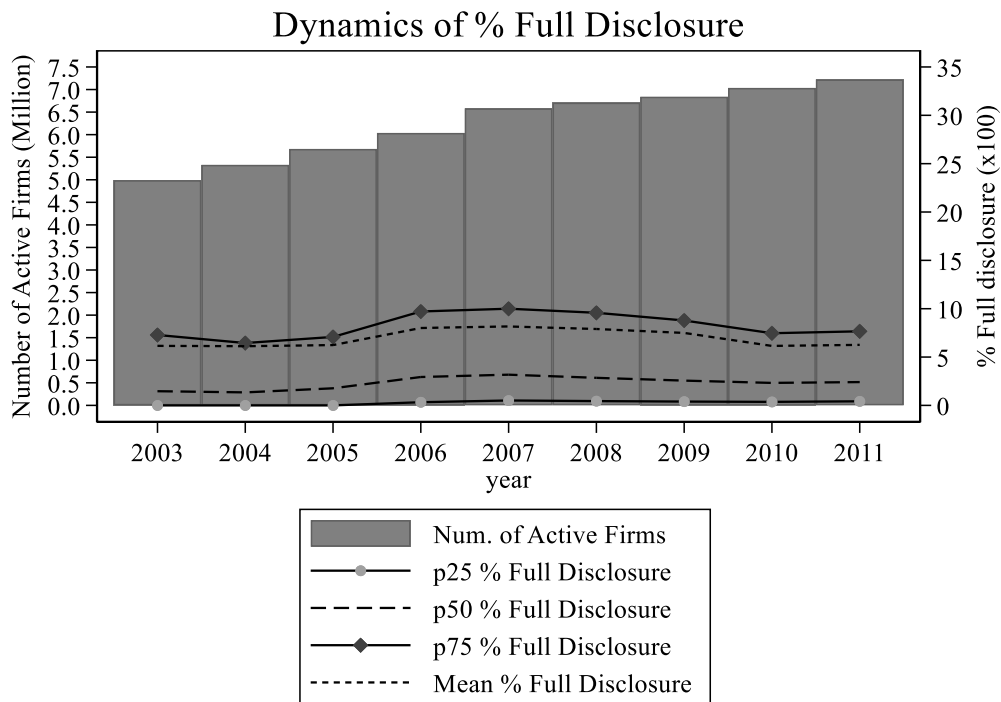
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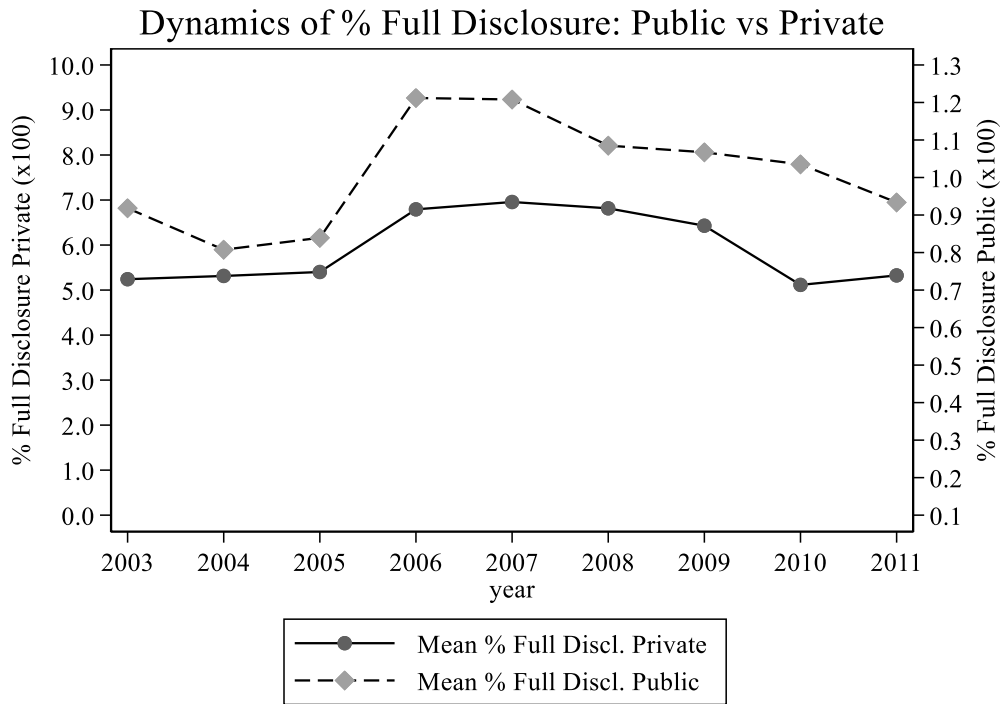
Shroff, Nemit, Rodrigo S. Verdi, and Gwen Yu. 2014. “Information Environment and the Investment Decisions of Multinational Corporations.” *Accounting Review* 89 (2): 759–90. <https://doi.org/10.2308/accr-50643>.

Figure 1



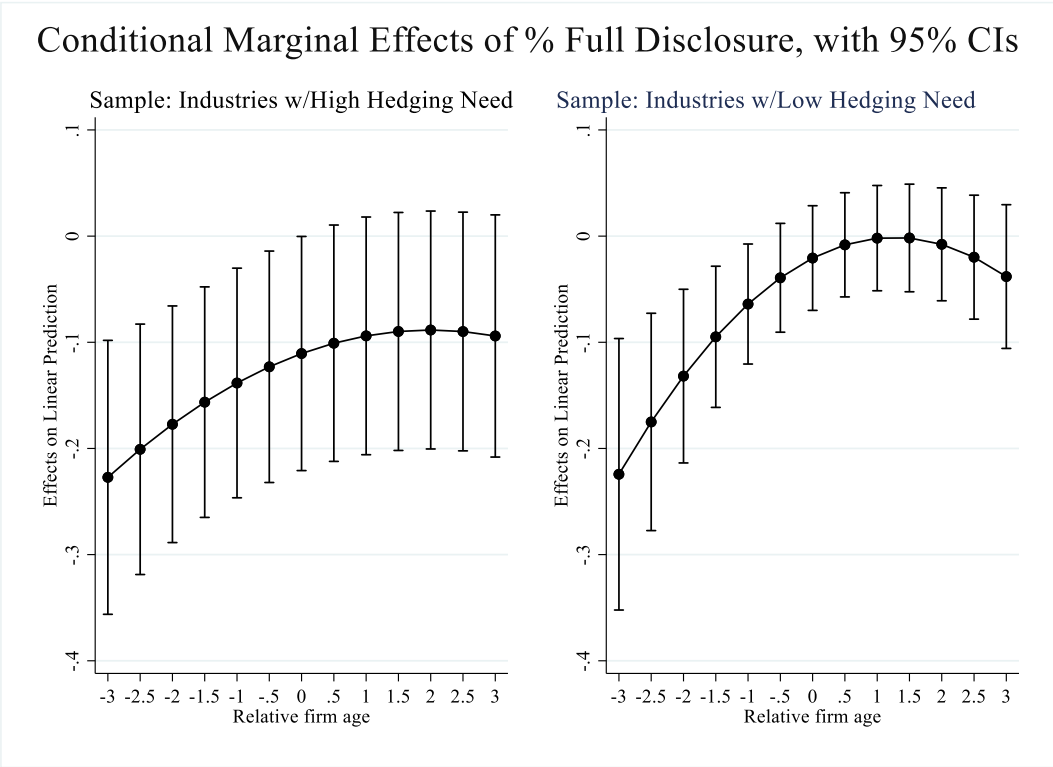
The data are from Amadeus for the period of 2003-2011 and exclude companies from the financial (SIC 6000-6999), utility (SIC 4910-4939), not-for-profit and public administration (SIC 8000-9999) industries, and from industries with only one firm. See the text for a description of the methodology used 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. The bars represent the number of active firms for each year. The lines represent the 25th, 50th and 75th percentile, as well as the mean of the empirical distribution of *% Full Disclosure* for every year.

Figure 2



The data are from Amadeus for the period of 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 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. The lines represent the mean of the empirical distribution of each variable for every year.

Figure 3



The data are from Amadeus for the period of 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. Industries with High (Low) Hedging Need are the industries with Ind. Hedging Need greater than 0.2 (lower than -0.2).

Table 1**A) Sample Composition by Country and Firm size.**

Country	Obs.	Mean	Total assets (in millions of euros)			
			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%

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 2
FDE transparency 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

The data are from Amadeus for the period of 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
<i>Firm characteristics:</i>				
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
Leverage growth	3,528,305	0.022	0.000	0.188
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
#empl	2,038,509	57.137	15.000	670.451
<i>Country-Industry (3-digits) characteristics:</i>				
% 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

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
FDE transparency and Cash Holding

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

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. 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 sum of the number of public and private firms disclosing full 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

FDE Transparency and the Cross-Industry variation in cash-deficit risk

	Sample:	Sample:		Sample:	
	All	Firms in Ind. Hedging Need >0.2		Firms in 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

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. It also excludes firm 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 sum of 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). See Table A1 for the definitions of the control variables. Additional Industry Controls include Log(average firm size), and Log(num. of firms). 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
FDE Transparency and Firm Age

Dependent Var: Cash Ratio	Sample: All		Sample: Firms in Ind. Hedging Need >0.2	Sample: Firms in Ind. Hedging Need < -0.2
	(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

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. 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 sum of the number of public and private firms disclosing full 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 7
Private peers' disclosures

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

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. The dependent variable is cash ratio (the ratio of cash and cash equivalent to total assets). The primary variables of interest are (1) % Private Full Disclosure, 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. See Table A1 for the definitions of the control variables. Additional industry controls include Log(average firm size) and Log(num. of firms). 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 sensitivities

Dependent Variable:	Investment (1)	Cash Growth (2)	Leverage growth (3)
Cash flow	0.026*** (0.003)	0.035*** (0.003)	-0.038*** (0.005)
Cash flow x % Full Disclosure	0.006 (0.022)	-0.102*** (0.022)	-0.019 (0.022)
% Full Disclosure	0.003 (0.004)	-0.013* (0.007)	0.024 (0.022)
Ind. Sales Growth	0.011*** (0.002)	0.005* (0.002)	0.006 (0.006)
Log(assets)	-0.038*** (0.002)	-0.038*** (0.003)	-0.041*** (0.006)
Tangibility	-0.279*** (0.010)	0.000 (0.001)	0.027*** (0.003)
Leverage	-0.004*** (0.001)	-0.006*** (0.001)	-0.616*** (0.007)
Cash ratio	0.021*** (0.001)	-0.652*** (0.007)	-0.013*** (0.003)
Working capital	-0.000 (0.002)	0.023*** (0.001)	-0.002 (0.003)
Additional Industry Controls	yes	yes	yes
Firm FE	yes	yes	yes
Country-Year FE	yes	yes	yes
Observations	1,981,101	1,956,021	1,953,650
Adjusted R-squared	0.237	0.277	0.285

The data are from Amadeus for the period of 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) Leverage growth (the one-year change in the value of long-term debt divided by the lagged assets). The primary variable of interest are (1) % *Full Disclosure* (the percentage of private (publicly-listed) limited liability firms disclosing full financial statements), and (2) *Cash flow* (the ratio of net earning plus depreciation to total assets). See Table A1 for the definitions of the control variables.

Additional Industry Controls include Log(average firm size), and Log(num. of firms).

Robust standard errors, clustered at the Country-Industry(3-digits) level, are in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Appendix

Appendix A: Table A1

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
Leverage Growth	the one-year change in long-term debt 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
# empl	the number of employees
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

Appendix B: 2008-2009 Financial Crisis and the German Enforcement Reform

FDE transparency and the 2008-2009 Financial Crisis

Previous studies have documented the fall in the credit market during the 2008-2009 financial crisis (Almeida et al. 2014; Goldstein 2013; Bliss, Cheng, and Denis 2015). The scarcity of external funding during this period represents an ideal framework to evaluate the role of transparency in the FDE since it stresses the precautionary incentives of the firms. The main objective is to evaluate whether the information environment affected the firms' financial policies during the crisis. I do so by estimating a set of panel regressions for the period of 2006-2009 with firm and industry-year fixed effects, as follows:

$$Decision_{ijct} = \beta_h Crisis_t \times \% Full Disclosure_{jc(2006)} + Controls_{ijt} + \alpha_i + \alpha_{jt} + \varepsilon_{ijct} \quad (B1)$$

where *Decision* is *Investment* (the one-year change in tangible assets divided by the lagged assets), *Cash Growth* (the one-year change in cash and cash equivalents divided by the lagged assets), or *Leverage Growth* (the one-year change in long-term debt divided by the lagged assets). *Crisis* is a dummy variable with a value of one for the years 2008 and 2009, and zero for the years 2006 and 2007. Since the financial crisis may have affected the firm-size distribution, I measure *% Full Disclosure* two years before the crisis (2006).⁵ *Crisis* is not included as a stand-alone variable since it is subsumed by the industry-year fixed effects. Similarly, *% Full Disclosure* is not included as a stand-alone variable since it is absorbed by the firm fixed effects. Additionally, the panel regressions include a set of control variables at the firm level used in previous empirical studies evaluating the effects of the financial crisis on financing policies (Log(assets), Leverage, Tangibility, Working Capital and Cash Ratio) (Lins, Volpin, and Wagner 2013; Attig et al. 2016). Finally, the specifications also include control variables that can be related to the growth opportunities or the firm-size

⁵ The results hold when *% Full Disclosure* is measured yearly.

distribution at the industry level (Ind. Sales Growth, Log(average firm size), Log(num. of firms)). As before, standard errors are clustered at the country-industry level.

Table B1 reports the results for Investment (Model 1), Cash Growth (Model 2), and Leverage Growth (Model 3). Model 1 shows that when capital markets fail, the higher the FDE transparency is, the more the firms invest in tangible assets. Model 2 documents that during the crisis, firms in more transparent industries reduced their cash holding more. Model 3 reports no statistically significant effect of the FDE transparency on firms' leverage during the financial crisis. Altogether, the results of Table B1 document how the transparency in the FDE shapes liquidity management and corporate investment, i.e., when external funding is scarce, firms in more transparent industries seem to be more prone to use cash for financing investment, instead of cutting or postponing investments to maintain a cash buffer.

FDE transparency and the Disclosure Enforcement Reform in Germany

This section focuses on evaluating the effect of an exogenous shock in the transparency of the FDE. For this purpose, I focus on an enforcement reform of private firms' financial disclosure in Germany in 2006, which has been previously studied in the accounting literature (Laschewski and Nasev 2017; Noack 2007; Bernard 2016).

Regardless of the existence of firm-size reporting requirements in Germany, the enforcement of these requirements was weak until 2006, resulting in a compliance rate of 16% (Laschewski and Nasev 2017). Due to the pressure from the EU commission and the EU Directives⁶, in 2005, the German government introduced the draft bill for the enforcement reform, which was finally enacted as a law in November 2006. This reform created a new Federal Agency responsible for the disclosure enforcement, introduced fines between 2.500 and 25.000 euros and improves the public access to firm specific information. The new disclosure regime became effective for the financial statements of the

⁶ See 68/151/EEC, 2001/34/EC, 2003/58/EC and 2004/109/EC.

fiscal year ending on December 31, 2006, which were publicly available for peers and investors during 2007 (Bernard 2016; Shroff 2016).

Figure B1 plots the number of reports of private firms mandated to disclose extended financial reports in Germany during the period of 2004-2007. It shows a sharp increase in the disclosure compliance among these firms between 2004 and 2006. Similar to previous studies, Figure B1 documents that a relevant group of firms filed their financial reports during the period of debate and revision of the bill (e.g., 2005), before the reform went into effect in 2006 (Bernard, Burgstahler, and Kaya 2016).

I restricted the sample to the period of 2005-2008 and to the set of private firms that met the disclosure requirement in 2006 or before. Similar to the specification of the previous section, I estimate a set of panel regressions with firm and year fixed effects, as well as the same control variables, as follows:

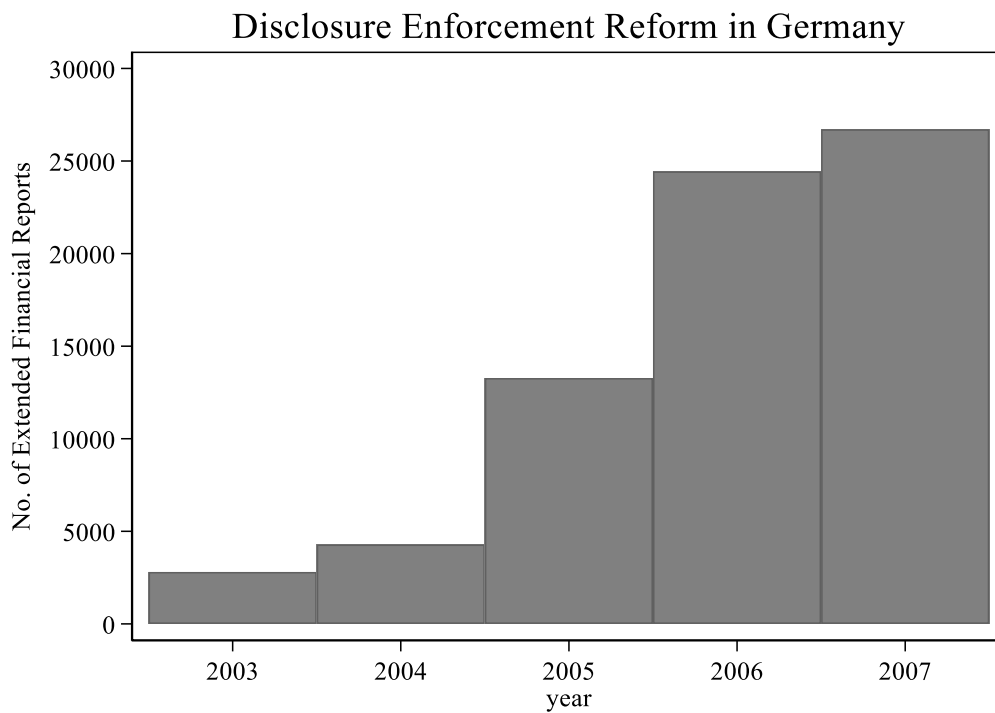
$$Decision_{ijct} = \beta_h Post Reform_t \times New Full Disclosures_{jc} + Controls_{ijt} + \alpha_i + \alpha_t + \varepsilon_{ijct} \quad (B2)$$

where *Post Reform* is a dummy variable with a value of one for the years 2007 and 2008, and zero for the years 2005 and 2006. *New Full Disclosures* is the difference in the number of private firms' extended disclosures between 2004 and 2006 scaled by the number of active private firms in 2004 (e.g., the number of new extended disclosures due to the disclosure reform in 2006). As before, *Post Reform* and *New Full Disclosures* are not included as stand-alone variables since they are subsumed by the year fixed effects and absorbed by the firm fixed effects, respectively. Additionally, standard errors are clustered at the industry level.

Table B2 reports the results for Investment (Model 1), Cash Growth (Model 2), and Leverage Growth (Model 3). Model 1 shows no significant change in investment after the transparency shock. Models 2 and 3 show that firms held less cash and more debt after the shock of peer extended reports,

especially in those industries with more new financial reports publicly available. In line with the previous results, the estimates in Model 2 of Table C2 are consistent with the liquidity-risk-assessment effect outweighing the cost-of-capital effect. However, the result in Model 3 of Table C2 suggests that the cost-of-capital effect can also play an underlying role, i.e., while firms in more transparent industries have reduced incentives for precautionary cash, they are also more prone to use their debt capacity due to the lower informational friction with external capital providers.

Figure B1



The data are from Amadeus for the period of 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. The bars represent the number of German private firms disclosing extended financial reports for each year. See the text for a description of the methodology used for classifying extended financial reports.

Table B1**FDE Transparency and the 2008-2009 Financial Crisis**

Dependent Variable:	Investment (1)	Cash Growth (2)	Leverage Growth (3)
Crisis x % Full Disclosure_2006	0.014*** (0.003)	-0.024*** (0.005)	0.006 (0.007)
Ind. Sales Growth	0.079*** (0.009)	-0.008* (0.005)	0.041** (0.016)
Log(assets)	0.055*** (0.005)	0.053*** (0.003)	0.074*** (0.009)
Leverage	-0.001* (0.001)	0.010*** (0.001)	0.767*** (0.010)
Tangibility	0.327*** (0.009)	-0.011*** (0.002)	-0.056*** (0.005)
Working capital	-0.018*** (0.001)	-0.014*** (0.002)	0.002 (0.004)
Cash Ratio	-0.014*** (0.003)	0.841*** (0.010)	0.018 (0.011)
Additional Industry Controls	yes	yes	yes
Firm FE	yes	yes	yes
Industry(3-digits)-Year FE	yes	yes	yes
Observations	1,233,087	1,219,235	1,215,869
Adjusted R-squared	0.250	0.340	0.320

The data are from Amadeus for the of period 2006-2010. 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 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) *Leverage growth* (the one-year change in the value of long-term debt divided by the lagged assets). The primary variables of interest are (1) *% Full Disclosure_2006* (the sum of the number of public and private firms disclosing extended financial reports scaled by the number of active firms in 2006), and (2) *Crisis* (a dummy variable with the value of one for years 2008 and 2009 and zero for years 2006 and 2007). See Table A1 for the definitions of the control variables. Additional Industry Controls include Log(average firm size), and Log(num. of firms). Robust standard errors, clustered at the Country-Industry(3-digits) level, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

*Table B2***FDE Transparency and the Disclosure Enforcement Reform in Germany**

Dependent Variable:	Investment (1)	Cash Growth (2)	Leverage growth (3)
Post Reform x New Full Disclosures	0.000	-0.004*	0.009**
	(0.001)	(0.002)	(0.003)
Ind. Sales Growth	0.000	0.028***	-0.094***
	(0.005)	(0.008)	(0.015)
Log(assets)	0.071***	0.072***	0.150***
	(0.005)	(0.003)	(0.006)
Leverage	0.003***	0.006***	0.789***
	(0.001)	(0.001)	(0.010)
Tangibility	0.486***	-0.030***	-0.113***
	(0.022)	(0.005)	(0.017)
Working capital	-0.018***	-0.003	0.014*
	(0.002)	(0.003)	(0.007)
Cash Ratio	-0.002	0.977***	0.022***
	(0.003)	(0.014)	(0.008)
Additional Industry Controls	yes	yes	yes
Firm FE	yes	yes	yes
Year FE	yes	yes	yes
Observations	193,206	192,934	193,814
Adjusted R-squared	0.357	0.415	0.373

The data are from Amadeus for the period of 2005-2008. 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 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) Leverage growth (the one-year change in the value of long-term debt divided by the lagged assets). The primary variables of interest are (1) New Disclosures (the difference in the number of private firms' extended disclosures between 2004 and 2006, scaled by the number of active firms in 2004), and (2) Post Reform (a dummy variable with value of one for years 2007 and 2008 and zero for years 2005 and 2006). See Table A1 for the definitions of the control variables. Additional Industry Controls include Log(average firm size), and Log(num. of firms). Robust standard errors, clustered at the Industry(3-digits) level, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.