ENFORCING MANDATORY REPORTING ON PRIVATE FIRMS: THE ROLE OF BANKS

2022

BANCO DE ESPAÑA
Eurosistema

Documentos de Trabajo
N.º 2238

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https://doi.org/10.53479/23526

Documentos de Trabajo. N.º 2238

November 2022

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ISSN: 1579-8666 (on line)

Abstract

This paper studies firm-level factors shaping the enforcement of financial reporting regulation on private non-financial firms and propose bank lending as a particularly important one. Our tests are based on a rare combination of datasets, which allows us to construct unique measures of misreporting, notably underreporting of debt. We observe that firms with bank debt are more likely to file mandatory financial reports and less likely to file information with irregularities. While we also find evidence that the need for bank financing can induce firms to misreport, this concern is mitigated by additional tests suggesting that banks detect reporting issues at firms' financial statements. Critically, we observe that firms with reporting issues obtain significantly less credit, especially when the bank has previous exposure to debt misreporting and when the bank verifies debt information using the public credit registry. Collectively, our paper documents important firm-level determinants of private non-financial firms' misreporting and highlight that banks play a significant role in the enforcement of mandatory financial reporting on these firms.

Keywords: enforcement of financial reporting, private firms, debt underreporting, financial distress, public credit registries.

JEL classification: G21, M41.

Resumen

Este trabajo estudia las características empresariales que favorecen la correcta aplicación de las obligaciones contables sobre información financiera de sociedades privadas no financieras e ilustra cómo el crédito bancario ayuda a ello. Nuestros análisis se basan en una singular combinación de bases de datos que nos permiten conocer si las empresas depositan sus cuentas anuales en el registro mercantil y construir medidas que alertan de la presencia de errores o falseamientos *(misreporting)* en las mismas, principalmente reduciendo el verdadero saldo de la deuda bancaria. Los resultados muestran que las empresas con deuda bancaria son más propensas a depositar sus cuentas anuales y menos proclives a presentar información con irregularidades. Por otra parte, también encontramos evidencia de que la necesidad de financiación bancaria puede inducir a las empresas al *misreporting*, si bien esta preocupación se mitiga posteriormente, mostrando que los bancos detectan este tipo de irregularidades en las cuentas presentadas por las empresas privadas no financieras. De hecho, observamos que compañías con este tipo de irregularidades contables obtienen significativamente menos crédito, especialmente cuando el banco ha tenido exposición previa a empresas que incurren en *misreporting* y cuando verifica el verdadero importe de la deuda bancaria usando el Registro de Crédito. En resumen, nuestro trabajo ilustra la existencia de determinados factores asociados a la empresa que determinan el cumplimiento de las obligaciones contables y enfatiza el papel esencial de los bancos en el cumplimiento y calidad de la información contable de las empresas privadas no financieras.

Palabras clave: obligaciones contables, empresas privadas, errores o falseamientos de la deuda, estrés financiero, registro de crédito.

Códigos JEL: G21, M41.

1. Introduction

There is an ongoing discussion –both in practice and in academia– on whether mandating private firms to publicly file accounting information is socially beneficial (Minnis and Shroff, 2017).[1] Some recent developments highlight the need to inform the debate, the most notable being the SEC's stated intention to narrow the disclosure gap between publicly listed and privately held companies (Kiernan, 2022; Katz and McIntosh, 2022). The complexity of the issue is reflected not only in a wide variety of theoretical argumentations, but also in the substantial cross-country variation in such disclosure requirements, which translates into stark differences in the publicly available accounting information for private firms across the world (for example, while in the U.S. private firms face almost no public disclosure requirements, most limited liability companies in Europe file financial statements).

While recent work provides evidence on several benefits and costs of requiring public disclosure for private firms (e.g., Minnis and Shroff, 2017), little is known about which mechanisms are effective in enforcing such regulation.[2] Filling this void is particularly important considering current concerns about private firms' compliance with financial reporting regulation, and could shed light on how to enforce a universal mandate to disclose carbon emissions, which is a pressing need given the current environmental concerns (Bolton et al., 2021). This paper contributes to fill this gap by examining firm-level determinants of private non-financial firms' compliance with financial reporting regulation and, more specifically, by highlighting the role banks play in disciplining these firms' reporting behavior.

The notion that banks care about the accounting information filed by borrowing firms is rooted on prior research showing an interdependence of financial reporting regulation and banking.

[1] Following Minnis and Shroff (2017) we apply the term "private" to firms with capital (e.g., debt or equity) that is *not* traded in a secondary market.

[2] Enforcement on private firms differs from that on public firms in at least two ways. First, most private firms are not monitored by capital markets and its gatekeepers (e.g., analysts, auditors). Second, because private firms are often less visible, and –individually– less systemically important than public firms, they are less subject to public scrutiny and regulatory attention.

Notably, Breuer et al. (2018) provide evidence that financial reporting regulation increases banks' reliance on firms' financial reporting and induces a shift in firms' banking from relationship toward transactional approaches. In fact, the idea that, at least to some degree, banks use accounting information to assess borrowers' credit risk is relatively uncontroversial. What is less clear is whether banks significantly affect private firms' incentives to comply with the letter and the spirit of financial reporting regulation. On the one side, it is plausible that, to justify credit decisions, banks demand accounting information with some degree of certification (if not audited, at least submitted to a public registry). On the other side, banks' incentives to monitor publicly filed information could not be strong enough; banks heavily rely on soft information for lending decisions (Petersen and Rajan, 2002; Berger et al., 2005) and benefit from an informational advantage from relationship lending that could be undermined by public disclosure.[3] Perhaps more critically, banks could even exert a negative influence on the quality of private firms' reporting; these firms could manage earnings pressured by debt obligations and/or by applications to bank credit.

To address our research question, we exploit a rare combination of datasets covering the whole population of private non-financial firms (hereafter private firms) in Spain. Our data includes debt information from the public credit registry of Spain, financial statements filed by private firms, a comprehensive list of all limited liability firms in the country, and information on banks' financials and bank's requests for information to the the public credit registry. This data allows us to construct new measures of private firms' compliance with financial reporting regulation, including whether the firm fulfils the mandate to file accounting information. Yet another unique feature is that our data includes the assessment –by the central bank– of the quality of the submitted information. But perhaps even more interestingly, our data allow us to identify misreporting of debt obligations by

[3] Private information about a client gives the bank monopoly power and the option to extract rents. This implies that incumbent banks can 'hold up' their best customers from receiving competitive financing elsewhere (Sharpe, 1990).

comparing the outstanding debt in public financial statement filings against the amounts reported by the banks to the public credit registry. This is particularly interesting from an identification perspective, as we can compare a financial item for the same firm at the same time, under two different reporting regimes.

Descriptively, our data presents remarkable patterns. To begin, our data reveals that, while we observe that most private firms submit their financial statements, we identify a non-trivial percentage of non-compliant firms.[4] We also observe a wide variation in the quality of the accounting information filed with the national trade registry. Remarkably, our data also indicates that a significant number of private firms with bank loans underreport their debt (the credit reported in public filings is lower than the corresponding amounts in the credit registry).

In our first set of tests we explore the determinants of private firms' compliance with financial reporting regulation, measured by the likelihood to file financial statements and by the presence of irregularities in the reported information. We find evidence of several firm-level factors enhancing such compliance, including the auditing of accounting information, the listing in a stock exchange, and firm characteristics plausibly related to the level of managerial sophistication. But perhaps more interestingly, we find strong evidence that the reliance on bank debt is positively associated with the degree of compliance with financial reporting regulation.

Our second set of tests aims at understanding the potential downside of the influence of bank relationships on private firms' compliance with financial reporting regulation. Focusing on debt underreporting (our setting offers a unique opportunity to measure this type of misreporting), we find evidence suggesting that misreporting is related to financial incentives (in the year of misreporting, firms apply for new credit, are more exposed to liquidity risk, and face higher

[4] Compliance with financial reporting regulation could be costly for private firms for at least two reasons. To begin, preparation costs are non-trivial, especially for relatively small firms. Moreover, prior literature suggests that financial reporting regulation imposes proprietary costs on disclosing firms (Botosan and Stanford, 2005; Berger and Hann, 2007; Dedman and Lennox, 2009; Minnis and Shroff, 2017; Bernard, 2016).

financial expenses). Additional tests are also consistent with the notion that –to a large extent– debt underreporting is driven by the need for bank financing; it is far more common among financial constrained firms and among firms that apply for credit to a "new" bank (i.e., a bank that did not previously provided credit to the firm).

Taken together, the two above-mentioned sets of results suggest that the influence of banks on private firms' financial reporting has both an upside (i.e., banks demand financial statements of certain quality) and a downside (i.e., firms misreport to obtain credit and/or better credit conditions). However, the results from our first set of tests suggest that, across the economy, the former effect is stronger than the latter. One possible explanation for why the former effect dominates is that banks detect private firms' misreporting and penalize misreporting firms.

Thus, we next explore whether banks see through misreporting. Our evidence suggests that they do. We find that financial misreporting is associated with a lower amount of bank credit for the firm. This evidence is consistent with the idea that banks detect misreporting and deny credit to misreporting firms. We fine-tune this analysis by further exploiting the granularity of our data. First, we analyze bank-firm pairs and find that banks that in the past had entered debt contracts with underreporting firms provide less credit to firms with current debt underreporting. Second, focusing on firms that obtain credit from a bank without a previous lending relationship with the firm, we document that firms exhibiting debt underreporting obtain a significantly lower amount of credit from banks that verify their creditworthiness (using the public credit registry) compared to banks that do not. Critically, these analyses include bank-year and firm-year fixed effects, and thus control for confounding variation in the supply and demand for credit. Also consistent with bank relationships playing a role in disciplining private firms' misreporting, we find that debt underreporting is transitory; it does not persist beyond two periods.

When we analyze whether misreporting is associated with firm outcomes, we find that debt underreporting is followed by payment defaults to suppliers and banks, which corroborates that

misreporting firms do not obtain new credit from banks (presumably because banks detect misreporting).

Our evidence informs the nascent empirical literature on the regulation of financial reporting for private firms. This literature has uncovered some benefits and costs of such disclosure mandates (e.g., Breuer et al., 2018; Breuer, 2021). We expand this work by taking the first step to understand the factors that determine enforcement efficacy in this context. Given the characteristics of our data, we focus on firm-level determinants. Our results highlight the importance of one of such determinants: having lending relationships with banks.

By showing that bank lending helps enforce financial reporting regulation on private non-financial firms, our paper sheds light on an overlooked aspect of the role of banks in the economy, an insight that is particularly important given the recent trend of financial disintermediation and the current transformation of the banking industry (e.g., Carletti et al., 2020). In addition, our evidence hints at a so-far unexplored instrumental role of public credit registries (PCR), namely debt misreporting by comparing the debt amounts reported by firms with the corresponding amounts in the PCR.[5]

2. Related literature

A still small but growing literature informs the debate on regulating financial reporting of private firms by providing empirical evidence on the economic consequences of mandatory disclosure for such firms. Most of these papers exploit disclosure requirements for EU member states (in Europe, all limited liability companies are required to file financial reports). Their results

[5] While our evidence does not speak to the opportunity of creating a PCR, to the extent that PCRs include comprehensive data reported through a regulatory mandate, our results suggest that PCRs can be one effective instrument to detect misreporting of credit obligations. Private credit bureaus are unlikely to play this role, as the information they contain is not comprehensive (the reporting to private credit bureaus is voluntary). Thus, it is not possible to identify debt underreporting by comparing the information in private credit bureaus to that in firms' financial reports. See Online Appendix A for background information on public credit registries and private credit bureaus.

suggest that the regulation of private firms' financial reporting induces competitive costs (Bernard, 2016), facilitates external financing (Breuer et al., 2018; Baik et al., 2022), increases market entry and lowers concentration (Breuer, 2021), and negatively affects innovation (Breuer et al., 2022). Exploiting an industry-specific regulatory development in the U.S., Aghamolla and Thakor (2022) shows that imposing disclosure requirements on private firms can increase the propensity to conduct an IPO. While this prior work sheds light on the costs and benefits of mandatory disclosure for private firms, to date, little is known about which mechanisms are effective in enforcing such regulation. This is particularly important considering that there is substantial room for improvement in the regulatory compliance of private firms regarding financial reporting (Breuer et al., 2018). Our paper contributes to fill this gap by examining firm-level determinants of private firms' compliance with financial reporting regulation and, more specifically, by highlighting the role banks play in disciplining these firms' reporting behavior.

While there is an extensive literature on the monitoring role of banks, research on the disciplining effect of these financial institutions on firms' reporting behavior is relatively limited and does not present a clear picture of whether banks help curb misreporting. Some papers suggest that banks react to misreporting after the accounting irregularity is publicly known (Chava et al., 2018). Chen (2016) finds some evidence that banks detect misreporting before it is made public, but this author also finds that banks do not fully respond to misreporting until a restatement announcement. Other papers show that having a commitment with a bank can induce firms to misreport (e.g., Efendi et al., 2007). In any case, this prior work is focused on *public* firms and thus does not speak to the role of banks on the reporting of *private* firms, much less to what relates to enforcement of mandatory financial reporting. This is not surprising given the lack of public data on private firms' financial reports and bank relationships.

More generally, our paper also adds to the literature on mandatory disclosure. Extant research documents substantial benefits of disclosure mandates in the form of lower trading costs

(see Leuz and Wysocki, 2016 for a literature review) and investment efficiency (e.g., Badertscher et al., 2013). In contrast, recent work has also studied the downside of disclosure regulation by documenting the presence of proprietary costs (e.g., Badia et al., 2021; Bonetti et al., 2020; Breuer, 2021). We contribute to this literature in two ways. First, we study the factors shaping the enforcement of mandatory disclosure on private firms. Importantly, our evidence suggests that bank lending enhances such disclosure. Second, our paper documents one benefit of mandating banks to disclose information to a credit registry: the detection of debt misreporting. In this regard, our setting differs from other disclosure mandates examined by prior work not only in its nature, but also in the dissemination of information (i.e., the credit information is not publicly released and only banks and bank supervisors have access to it).

This paper is also related to the literature on accounting misreporting (see Amiram et al., 2018, and Bao et al., 2020 for recent reviews). Our paper contributes to this literature in several ways. First, our study is related to the burgeoning literature on accounting quality in non-listed corporations (Minnis, 2011; Lisowsky and Minnis, 2020). Prior literature rarely studies misreporting behavior at non-listed companies, as in the U.S. these firms are not mandated to publicly disclose their financial reports. Our data allows us to overcome this limitation; our unique combination of data sets contains comprehensive information on private firms, including whether they file financial statements and whether the filed information contains irregularities. Second, while prior literature on misreporting generally focuses on P&L accrual manipulation, we document misreporting of a key balance sheet item: outstanding bank debt obligations. Third, our setting addresses a well-known limitation of prior literature, namely, the lack of data on *undetected* misreporting (for example, the widely used database on Accounting and Auditing Enforcement Releases issued by the SEC includes only cases of *detected* misreporting). Our dataset allows us to identify all cases of debt misreporting, regardless of whether they were detected and/or prosecuted. Fourth, we identify a new mechanism to curb misreporting; our results highlight that

credit information sharing through public credit registries can be effective in detecting debt misreporting.

3. Data and measurement

3.1. Data

Our empirical analysis combines five data sets. The first data set is the public credit registry managed by the Bank of Spain, commonly known as "Central de Información de Riesgos del Banco de España" (CIRBE).[6] The registry records all the loans (new and outstanding), credit lines, bank endorsements, and other types of lending granted by all monetary financial institutions domiciled in Spain to firms incorporated in the country. Every month, banks must report information to CIRBE about all granted corporate loans (new and outstanding) greater than €6,000.[7] The access to CIRBE is restricted to the Bank of Spain and to the financial institutions operating in Spain (both those incorporated in the country and foreign branches). Banks receive information from CIRBE on a monthly basis. The information includes data on their existing customers in an aggregated form. That is, banks observe the total amount borrowed by their customers but not the breakdown by lender in cases where the customer borrows from more than one bank. Banks can also request aggregated information on potential customers provided these potential customers are applying for a loan at the bank. Borrowers (either natural or legal persons) may request their own data from CIRBE, but they cannot access other borrowers' data.

The second database, called "Central de Balances" (CB), includes financial information mandatorily filed by Spanish firms.[8] Similar to CIRBE, CB is managed by the Bank of Spain. The third data set, called "Directorio Central de Empresas" (DIRCE), contains information on the fiscal identity, ZIP code, number of employees, and industry affiliation (NACE code) for the universe

[6] The Bank of Spain (in Spanish, "Banco de España") is the Spanish national central bank and banking system supervisor)
[7] This threshold was eliminated in Circular 1/2013 of the Bank of Spain (implemented in 2016).
[8] The information is filed with a national registry known as "Registro Mercantil".

of Spanish companies.[9] The fourth data set contains comprehensive balance sheet information on Spanish commercial banks, savings banks, credit cooperatives and financial credit establishments. Finally, our fifth data set contains all the requests for information on the credit situation of specific firms (i.e., banks' potential customers) made by banks to CIRBE.

We focus on non-financial firms that are legally defined as limited liability ("sociedades anónimas" and "sociedades limitadas"). Our sample period –which spans from 2008 to 2018– is defined based on data availability.[10]

3.2. Measuring compliance with financial reporting regulation

To gauge the extent to which the firms in our data set comply with financial reporting regulation, we use two types of metrics. First, we measure the fraction of firms in a given province and year that do not file financial statements with the national trade registry. Second, we identify cases in which the information filed contains irregularities. Our variables are based on: (i) assessments of the quality of firms' financial reports by the Bank of Spain, (ii) abnormal accruals, and (iii) differences between debt obligations in the filed financial statements and the corresponding amounts in the public credit registry.

3.2.1. Filing of financial reports

We measure the fraction of firms in a given province and year that do not file financial statements by combining data from DIRCE (i.e., the data set containing information on the identity of Spanish firms) and CB (i.e., the data set containing comprehensive information on mandatorily filed financial statements). Each year, DIRCE includes the universe of Spanish firms with more than 50 employees. While DIRCE does not include the identity of the universe of firms with less

[9] DIRCE is the equivalent of the database used by the U.S. Census Bureau to provide statistics of U.S. Businesses. DIRCE is maintained by the Instituto Nacional de Estadística (the national statistics office of Spain).

[10] Another reason to start the sample in 2008 is that, under the new Spanish Local GAAP effective from 2008, firms must mandatorily report in their balance sheets the breakdown of the different types of liabilities. This breakdown enables us to conduct more refined tests on debt underreporting (see sections below).

than 50 employees, the database does include the identity of all the firms that are created and all the firms that close each year (regardless of their size). This allows us to construct the universe of Spanish firms created since 2005 (DIRCE does not provide full coverage before that year). For each firm in DIRCE, we check whether the firm is covered by CB. Because CB is comprehensive, not being covered by CB means that the firm does not file mandatory financial statements. Accordingly, we classify such firm as "Non-filer". We then compute *Non-filers* as the fraction of "Non-filers" in each Spanish province and year.

3.2.2. Irregularities in financial reports

As a second way to measure compliance with financial reporting regulation, we identify cases in which the information filed by a firm does not meet quality standards. To do so, we gather data from CB on the assessment of the quality of each firm's accounting information by the Bank of Spain. First, CB flags some observations as "no apto", which means that the accounting information is inadequate.[11] Examples of inadequate information are financial statements with blatant accounting errors, such as large mismatches in balance sheet amounts, negative values in items that should be positive (by definition), missing headings, or figures of disproportionate magnitude. Second, among firms with adequate information, CB distinguishes between "apto" – which means that the quality of the information is adequate but not high quality– and "perfecto", meaning that it is adequate and high quality.

CB also includes information on whether the firm files financial statements in a "reduced" or "standard" format. The former includes balance sheet, income statement, and notes. The latter includes, in addition, the statement of changes in equity and the statement of cash flows. The firms in our sample are allowed to report in reduced format during our sample period if they meet two

[11] CB rates each filer between 0 and 100, in accordance with the number and materiality of errors. CB classifies the financial information based on this rating. The criterion is as follows: (i) "no apto": rating less than 20, (ii) "apto": rating between 20 and 90, (iii) "perfecto": rating higher than 90.

out of three of the following criteria at the end of the fiscal year: (i) Total assets ≤ €2,850,000 (€4,000,000 from 2013), (ii) net turnover ≤ €5,700,000 (€8,000,000 from 2013), and (iii) average number of employees during the financial year ≤ 50.[12] If any of these conditions is not met, the firm must report in standard format.

Based on the assessments by Bank of Spain, we define *Inadequate Quality* as an indicator variable for firms filing accounting information classified as "no apto" by the Bank of Spain. We define a second variable, *Adequate but not High Quality,* as an indicator variable for firms that file accounting information classified as "apto" but not "perfecto".

3.2.3. Abnormal accruals

Following Leuz et al. (2003), we measure abnormal accruals by the ratio of the absolute value of total accruals (change in non-cash current assets minus the change in current liabilities excluding the current portion of long-term debt, minus depreciation and amortization) scaled by the absolute value of cash flows from operating activities (measured as the difference between net operating income and total accruals). This measure of abnormal accruals has been used extensively by prior work as a proxy for opacity in financial statements. Based on this metric, we define *High Abnormal Accruals* as an indicator variable that equals one if the firm is in the top quintile of the sample distribution, and zero otherwise.

3.2.4. Debt underreporting

In addition to the previous variables, we introduce a novel measure of corporate misreporting, to which we refer to as "underreported debt". We identify debt underreporting by comparing data from CIRBE (i.e., the public credit registry) and accounting data from CB (i.e., our database of financial statements mandatorily filed by firms). We first compute the difference

[12] Firms in our sample may also apply for a reduced format of Profit & Loss account during our sample period if they meet two out of three of the following criteria at the end of the fiscal year: a) Total assets ≤ €11,400,000, b) net turnover ≤ €22,800,000, c) average number of employees during the financial year ≤ 250.

between the amount of bank debt reported in the firm's balance sheet and the corresponding amount of standard bank loans reported by banks to the public credit registry (i.e., the CIRBE database) as of December of year *t*, both amounts expressed as % of total assets in year *t*. We refer to this difference as *CB−CIRBE Debt*. We then define *Underreported Debt* as the absolute value of *CB−CIRBE Debt* if *CB−CIRBE Debt* < 0, and zero otherwise. We note that, in contrast to standard models based on exclusively endogenous data, this measure of misreporting enhances identification by comparing reported amounts to those from an "exogenous" dataset (a public credit registry).

To identify cases of substantial misreporting we define an alternative measure, *High Underreported Debt*, as an indicator variable that equals one if *Underreported Debt* ≥ 10%, and zero otherwise. These two previous measures are based on the reporting of standard bank loans in CIRBE to avoid measurement error. For robustness, we also define *Underreported Debt Total,* a variant of *Underreported Debt* that includes total bank debt in CIRBE (rather than just standard bank loans).

In addition to misreporting, *Underreported Debt* could also be driven by differences between the two sources of debt information (i.e., CB and CIRBE) in terms of coverage, time, accuracy, or accounting criteria. However, such differences are unlikely to be first-order. First, the coverage of CIRBE for credit granted by Spanish banks is almost universal (see Jiménez et al., 2012, 2014 for examples of papers in the economics and finance literature exploiting the unique coverage of our dataset).[13] Second, banks must report monthly to CIRBE, which allows us to match the timing of the balance sheet amounts and the CIRBE amounts, thereby excluding the possibility that this pattern is the result of comparing numbers measured at different points in time. Third, the accuracy of the CIRBE data is verified by the Bank of Spain, as this information is an important

[13] To illustrate the wide coverage of CIRBE consider that, in 2018, 216 financial entities reported information about one million non-financial corporations. The amount of outstanding credit reported to the database in that year was approximately €0.5 trillion (for reference, consider that the Spanish GDP in 2018 was roughly €1.2 trillion).

input for bank supervision, regulation, and monetary policy. Fourth, we document underreporting among standard loans, which are subject to the same accounting treatment in CIRBE and in firms' balance sheets. Online Appendix B elaborates on these arguments.

3.3 Descriptive statistics

Table 1, Panel A, describes the sample composition. Our initial dataset –which contains more than one million firms per year– corresponds to the population of non-financial limited liability firms in Spain. Our tests on financial statement reporting irregularities (Tables 2B and 3) require imposing an initial set of data requirements on firms that submit financial information (i.e., "filers"); we exclude observations from firms that are inactive or in liquidation process, firms with missing information on any of the variables used in our analyses, firms in the first year of establishment, and singletons. This process results in 7,382,065 firm-year observations.

To cleanly identify misreporting of bank debt and the effect of bank relationships, our tests on debt underreporting (Tables 4 to 11) require further data requirements. First, we exclude observations labelled as "inadequate quality" by the Bank of Spain. Second, we leave out firms that belong to a group to exclude the possibility that the patterns are driven by intra-group transactions. Third, we exclude firms that belong to holdings and shell corporations. Fourth, we leave out listed firms and audited firms, to avoid the potentially confounding monitoring effect of auditors and other gatekeepers. Fifth, we exclude firms without bank debt. Finally, we remove firms with a negative cash balance, firms with fiscal years end other than December (we do so to ensure that CIRBE and CB data are measured in the same month), and firms with only one year of data (i.e., singletons in our firm fixed effects regressions). This process results in 3,170,904 firm-year observations.

Figure 1 shows graphically the percentage of firms filing financial information in Spain in each year of the sample period. The data reveals that there is a substantial fraction of limited

liability firms in Spain that do not file financial information (the percentage ranges between 15% and 25% over the years) and more than 10% of the firms file information of inadequate quality. This suggests that, while most of the private firms comply to some degree with the disclosure mandate, there is substantial room for improvement in the enforcement of financial reporting regulation on Spanish private firms.

Table 1, Panel B, presents descriptive statistics of firms' characteristics. Table 1, Panel C, complements descriptive evidence on reporting irregularities and confirms that a substantial fraction of firms exhibit "inadequate" accounting quality, and among those with "adequate" quality, a significant percentage file reports of "adequate but not high quality". To interpret the difference in these percentages between firms that file "standard" format reports and those that use the "reduced" format, one must consider that the assessment of the former group is subject to a higher number of items, and thus subject to a higher quality threshold.

As shown in Table 1, Panel C, the mean of *Underreported Debt* is 2.94, suggesting an average underreporting of total bank credit of around 3% of assets. In 7% of our observations, we observe underreporting of more than 10% of total assets (see mean of *High Underreported Debt*). Regarding the absolute magnitude of underreporting, for bank standard loans (for *Underreported Debt*), the average is €11,793 and for total bank credit (for *Underreported Debt Total*) the average is €24,677. Restricting to observations with *Underreported Debt* > 0, the average magnitude of underreporting for bank standard loans (total bank credit) is €31,879 (€52,126).

The results from prior studies on other types of misreporting can help interpret the figures in Table 1. Regarding the incidence of misreporting, Dyck et al. (2017) estimate its frequency in a range of 5%-15%. Gerakos and Kovrijnykh (2013) find that approximately 27% of firms manipulate reported earnings. Regarding the intensity of misreporting, Gerakos and Kovrijnykh (2013) estimate the magnitude of accrual manipulation between 0.7% and 3.7% of total assets, and Hribar and Nichols (2007) report discretionary accruals of 10.1%. While these estimates are not

directly comparable to ours (the referenced papers study different settings and much larger firms), the figures in Table 1 suggest that the magnitude of misreporting among private firms is not negligible.

4. Determinants of private firms' compliance with financial reporting regulation

We start by exploring empirically the potential determinants of private firms' compliance with financial reporting regulation. To the extent that our data relates to one single country, our analysis necessarily leaves out potentially important factors that vary at the country level. We consider the following sources of firm-level variation: (i) bank relationships, (ii) monitoring by auditors and other gatekeepers, and (iii) firm sophistication in management practices and/or information systems.[14] To understand the determinants of the enforcement of financial reporting regulation, we test whether the above-mentioned sources of variation affect two key aspects of firms' reporting behavior: (a) the filing of financial information, and (b) the quality of the information filed.

To study the first aspect (i.e., point (a) above), we conduct the analysis at the province-year level and at the firm-year level. In Table 2, Panel A, we aggregate the information at the province-year level because the information of firms that do not file financial information is limited to location and industry affiliation. We estimate the following model:

$$\%\ Non\text{-}filers_{pt} = \delta_1\ \%\ Firms\ with\ Bank\ Debt_{pt} + \delta_2\ \%\ Audited/Listed_{pt} + \\ + \delta_3\ Log(Median\ Firm\ Size)_{pt} + \upsilon_t + \varepsilon_{pt} \qquad (1)$$

where % $Non\text{-}filers_{pt}$ is the percentage of firms in province p and year t that do not file financial statements (for brevity, we henceforth omit subscripts). % *Firms with Bank Debt* is the percentage

[14] Sophistication is likely related to the effort (and/or cost) required to prepare financial reports; owner-managers of small firms could lack sufficient incentives to produce high-quality information.

of firms in that province-year with bank debt. % *Audited/Listed* is the percentage of firms in that province-year that are audited or listed in the network of Spanish security exchanges (Bolsas y Mercados Españoles). % *Log(Median Firm Size)* is the logarithm of the median total assets of the firms in that province-year. We include this variable to proxy for the level firm sophistication in management practices and/or information systems in each province.

Table 2, Panel B, focuses on the quality of the information filed. We repeat the previous analysis using two alternative dependent variables. *% Inadequate Quality* is the percentage of firms in that province-year with financial statements classified as "inadequate" by the Bank of Spain. Similarly, *% Adequate but not High Quality* is the percentage of firms in that region-year with "adequate" financial statements that are classified as not being of high quality by the Bank of Spain. The analysis is conducted separately for firms filing reduced and standard financial statements.

In Table 3, we replicate the analysis in Table 2, Panel B, at the firm level. Due to data limitations (understandably, we do not have accounting data for non-filers), we cannot conduct the equivalent analysis to that in Table 2, Panel A. However, we can add an analysis of abnormal accruals. The firm-level analysis allows us to control for a variety of firm characteristics (*Firm Size*, *Subsidiary* and *Parent*, as defined in detailed in Appendix A), including firm and year-fixed effects. Importantly, these characteristics are likely related to the level of sophistication of the firm which, as previously argued, is a potential determinant of misreporting.

Tables 2 and 3 present the results of these tests. The evidence is consistent with gatekeepers playing an important role in the enforcement of financial reporting: Provinces with a higher percentages of audited and listed firms are significantly more likely to exhibit a higher degree of compliance with financial reporting regulation. Notably, the results also indicate that firms with bank debt are more likely to file financial statements and that their reports suffer from fewer

accounting issues. Finally, the evidence is consistent with the notion that lack of firm sophistication is also an important determinant of private firms' misreporting: older and larger firms as well as firms in business groups (parents and subsidiaries) exhibit more compliance with financial reporting regulation.

5. Misreporting and financial incentives

The results in the previous section point at bank relationships as an important factor in enhancing private firms' compliance with financial regulation. To improve our understanding of the influence of bank lending on private firms' reporting, in this section, we explore a potential downside of such influence: bank relationships could also induce managers of private firms to misreport with the objective of obtaining credit or better credit conditions. This possibility is supported by theoretical literature on the interplay between misreporting and debt contracting (e.g., Guttman and Marinovic, 2018), and is consistent with empirical work suggesting that managers engage in misreporting around the issuance of public debt (Efendi et al., 2007).[15]

To explore empirically whether private firms' reporting practices are affected by financial incentives, we restrict the sample to firms holding bank debt. We also focus our analysis on debt underreporting, as our data offers a unique advantage to identify this type of misreporting. Critically, a firm could understate its debt obligations to influence banks' beliefs about the firm's credit risk. There is anecdotal evidence on opportunistic underreporting of debt. An extreme and well-publicized example is the case of Pescanova. The firm was prosecuted for financial fraud on the grounds of hiding corporate debt from financial statements and accounting for false revenues. The debt reported in the 2011 financial statements of the parent company was around €393 million,

[15] Online Appendix C analyzes in depth the economic rationale of opportunistic debt underreporting. We address three questions: (i) why do firms engage in debt underreporting if banks generally see through it? (ii) why do some banks accept applications from underreporting firms?, and (iii) what is the offsetting account to the amount of outstanding debt that is not reported in the balance sheet? Our conclusion from this analysis is that opportunistic debt underreporting can exist in a rational expectations equilibrium.

whereas the corresponding amount reported to CIRBE was over €1,698 million. The fraud was discovered in 2013.[16]

5.1. Determinants of debt underreporting

As a first step to understand whether there is an association between debt underreporting and financial incentives, we conduct a descriptive analysis. We explore the empirical distribution of the differences between the debt amounts in CIRBE (i.e., reported by banks to the credit registry) and those in CB (reported by firms in filed financial statements). Figure 2 plots the histogram of the differences between CIRBE and CB amounts, partitioning the sample by whether the firm is financially constrained.[17] The difference in the skewness between the two distributions suggests that debt underreporting is particularly common among financially constrained firms.

To test formally whether debt underreporting is shaped by financial incentives, we estimate the following model:

$$Underreported\ Debt_{it} = \delta\, Financial\ Incentives_{it} + \phi\, Controls_{it} + \mu_i + \upsilon_t + \varepsilon_{it}, \qquad (2)$$

where $Underreported\ Debt_{it}$ is as previously defined. In parallel to previous tests, we repeat the analysis using *High Underreported Debt*, also as previously defined (see also Appendix A).[18]

The vector *Financial Incentives* includes variables aimed at capturing firms' financial incentives to underreport their debt. $Applications_{it}$ is an indicator variable that is equal to one if firm i has applied for a loan to a bank at any time during year t, and zero otherwise. $ST\ Credit_{it}$ is

[16] The fraud was discovered when the chairman of the board (and CEO) requested additional funds from the main shareholders (through the granting of a loan). The request was perceived as inconsistent with the information in the previously reported financial statements. According to testimonies before the court, the audit firm and most affected banks did not check the information with CIRBE. One of the affected banks did detect inconsistencies between CIRBE and balance sheet information and formally requested information from Pescanova shortly before the scandal broke. The CEO, the CFO, the person in charge of the accounting, and the auditor received prison sentences (the auditing firm was declared liable). For more details, see https://www.cnbc.com/id/100647974.

[17] In the descriptive analysis in Figure 2, a firm is defined to be financially constrained if it has above-median short-term debt and financial expenses and applies for a loan to a bank without a previous lending relationship with the firm.

[18] Online Appendix E (Table E.8) explores the sensitivity of the estimation of equation (2) to other ways of measuring the dependent variable. Inferences are unaffected.

firm i's fraction of short-term bank debt over total liabilities in year t. *Financial Exp*$_{it}$ is firm i's ratio of financial expenses over total liabilities in year t. We expect that firms are more likely to understate opportunistically their debt when they have higher financial needs, higher liquidity constraints, and higher cost of capital. That is, we expect underreporting to be more frequent among firms facing difficulties in obtaining funding.[19]

The vector *Controls* includes measures of other firm characteristics as well as variables potentially associated with misreporting: *Firm Size*, *Firm Equity*, *Firm ROA*, and *Firm Age* (see Appendix A for the definition of these variables).[20] Among other things, these metrics are likely correlated with the level of sophistication of the firm. Finally, the specification includes firm- and year-fixed effects (μ_i and υ_t, respectively). Note that the firm fixed effects also capture the (time-invariant) level of sophistication of the firm. Given the sample restrictions described in Table 1 for the tests on debt underreporting, there is no variation in other determinants of misreporting considered in prior tests (we exclude audited/listed firms).

Table 4 reports the estimation of equation (2). The results suggest that, in the year they engage in debt underreporting, firms are more likely to apply for new credit, are more exposed to liquidity risk (they exhibit higher levels of short-term bank debt), and face higher financial expenses. As shown in Online Appendix E, the association between financial incentives and debt underreporting is robust to a large battery of robustness tests (see Tables E.1 through E.10 in Online Appendix E).[21]

[19] Financial incentives to underreport debt could go beyond applications for credit. For example, as suggested by Bernard (2016), financially-constrained firms could underreport their debt to avoid predation risk (i.e., competitors lowering prices or increasing expenditures on nonprice competition with the goal of forcing a rival to exit). Consistent with this possibility, we find a positive association between debt underreporting and industry-adjusted firm leverage (see Table E.7 in Online Appendix E). An in-depth analysis of this and other potential financial incentives is beyond the scope of our paper.

[20] See, for example, Cecchini et al. (2010), and Dechow et al. (2011).

[21] We highlight here three of these tests. In Online Appendix E (Table E.5), we estimate equation (2) adding a variety of controls for firm sophistication and find that these variables are negatively and significantly correlated with underreporting. However, our measures of financial incentives remain statistically significant. In Table E.6, we obtain the same inferences when we repeat the analysis excluding micro-firms. Our inferences are also robust to excluding off-balance sheet financing (see Table E.9).

5.2. Additional evidence on firms' financial incentives to underreport debt

To complement the previous analysis on the role of financial incentives in private firms' misreporting, we next analyze whether firms that exhibit debt underreporting are more likely to apply for loans to banks without a previous relationship with the potential borrower. Debt underreporting is potentially more helpful to obtain credit from banks where no such previous relationship exists because, without information from previous relationship lending with the firm, these banks are more likely to assess credit risk based on balance sheet information.

Given the nature of this test, we focus on the subsample of firm-year observations in which the firm applies for additional credit. We identify applications for credit based on increases in the firm's credit balance with a given bank and based on CIRBE's data on banks' requests of information about firms.[22] We measure whether the firm had a previous relationship with the bank based on the credit balance of the firm with that bank in previous years (which is zero for banks with which the firm had no previous lending relationship). We next estimate the following model:

$$App\ New\ Banks_{it} = \delta_1\ Underreported\ Debt_{it-1} + \phi\ Controls_{it} + \mu_i + \upsilon_t + \varepsilon_t \qquad (3)$$

where $App\ New\ Banks_{it}$ is an indicator variable that equals one if in year t firm i applies for a loan to a "new" bank (i.e., a bank with which the firm *did not have* a previous relationship), and zero if in year t firm i applies for a loan to banks with which the firm *had* a previous relationship. $Underreported\ Debt_{it-1}$ is as previously (measured for firm i in year $t-1$). We also repeat the analysis using $High\ Underreported\ Debt_{it-1}$. For further robustness, we repeat the analysis replacing *App*

[22] Our analysis includes observations with successful applications and unsuccessful applications submitted to banks that request information to CIRBE. However, our data does not allow us to identify some potential unsuccessful applications, namely those to banks that do not request information to CIRBE and those banks with a previous relationship with the firm. While we acknowledge this limitation, we do not consider it a major concern, as the key source of variation in this analysis is not the success of the application. Rather, our focus in this section is whether the bank has a previous relationship with the firm. The analysis of whether banks are more likely to deny credit applications to underreporting firms is presented in Section 6.

New Banks$_{it}$ with *Log(1+New Banks)*$_{it}$ namely the logarithm of (one plus) the number of "new" banks to which firm *i* applies for a loan in year *t.* Table 5 reveals that, compared to other firms and conditional on applying for credit, underreporting firms are more likely to apply for loans to "new" banks. The search for new banks is also consistent with the idea that underreporting firms face difficulties in accessing finance from their usual banks. This is critical, as these firms are relatively small and thus have relatively limited financing opportunities.

Finally, we explore debt "overreporting" (i.e., cases in which the debt amount reported by a firm is *higher* than that reported by banks to the public credit registry). In contrast to debt underreporting, debt overreporting is less likely to be driven by financial incentives; overreporting would result in a less favorable credit risk assessment, thereby decreasing the probability of obtaining credit or increasing the cost of capital.[23] In Online Appendix E (Table E.10) we repeat the analysis in Table 4 replacing *Underreported Debt* with a similarly defined variable for debt overreporting (see Appendix E for details). We find no empirical association between debt overreporting and our measures of financial incentives. This evidence confirms that the results in Table 4 are attributable to financial incentives.

6. Banks' reaction to misreporting by private firms

Taken together, the evidence in the previous sections suggests that the influence of bank lending on private firms' financial reporting has both an upside (i.e., banks demand financial statements of certain quality) and a downside (i.e., firms misreport to obtain credit and/or better credit conditions). That said, the results in Tables 2 and 3 suggest that, across the economy, the

[23] Overreporting could have at least two explanations unrelated to financial incentives. One possibility is that overreporting is due to unsophisticated firms (mistakenly) keeping matured (and paid of) loans in their balance sheets. It is possible that this type of error occurs relatively often during our sample period, as between 2010 and 2015 Spanish firms made a substantial deleveraging effort (Carbó and Rodríguez (2015) document this fact (see also Figure D.2 in the Online Appendix). Another possibility is that the difference reflects that CIRBE does not include credit granted by foreign banks without Spanish branches. This second explanation is less likely given that our sample firms are mostly financed by Spanish banks.

former effect is stronger than the latter. One possible explanation for why the former effect dominates is that banks detect private firms' misreporting and penalize misreporting firms. In this section, we explore the empirical validity of this conjecture. Finding that banks detect private firms' misreporting would mitigate concerns about the downside of the influence of bank lending on private firms' financial reporting. It would also highlight the role of banks on the enforcement of financial reporting regulation.

Prior literature supports the notion that, in many cases, banks suspect the presence of financial misreporting by client firms, at least when it comes to ongoing relationships in which they can exploit their superior information about borrowers (e.g., Chen, 2016). This potential benefit is likely to be more pronounced for private borrowers, as there is little public information about these firms.

Banks' monitoring of financial statements could work in several ways. Bank employees could use their financial expertise to detect issues in the accounting information filed by private firms.[24] While the task could be challenging in some cases, detecting misreporting is relatively straightforward in the case of financial statements classified as "inadequate" by the Bank of Spain, as this accounting information often includes blatant errors that are easily identifiable by a bank employee with a minimum level of financial education. In the case of debt misreporting, banks have access to the public credit registry and can check whether the reported bank debt coincides with the information reported by other banks to the Bank of Spain.

While we do not directly observe whether/how banks monitor the financial statements filed by private firms, we conduct two types of tests that, collectively, speak to whether banks detect

[24] Borrowers do not need to submit financial reports directly to the bank. In Europe (including Spain) all firms are required to file financial statements. The filings are held in a public registry (see www.registradores.org) and anyone –including banks– can access the information. There are also vendors that make this information readily available in an standarized electronic format (see, for example, https://www.einforma.com/).

misreporting: (i) we analyze whether banks grant less credit to misreporting firms, and (ii) we analyze whether misreporting is transitory (the assumption is that misreporting by a private firm is unlikely to be persistent over time if detected by its bank).

6.1. Misreporting and lending decisions

6.1.1. Variation in the volume of bank credit at the firm level

We first examine whether our measures of misreporting are correlated with changes in outstanding bank debt. Finding a negative association would be consistent with the notion that banks see through debt misreporting and deny/decrease credit to misreporting firms. We estimate the following equation using the whole sample of firm-year observations:

$$\Delta Credit_{it} = \delta_1 \, Reporting\ Irregularities_{it-1} + \phi \, Controls_{it} + \mu_i + \upsilon_t + \varepsilon_{it} \qquad (4)$$

where $\Delta Credit_{it}$ is defined as log-change in the amount of (total) credit of firm *i* between years *t* and *t-1* (i.e., $\log(1+ Credit_{it}) - \log(1+ Credit_{it-1})$). These measures are based on information from CIRBE, which is not subject to firms' opportunistic reporting. $Reporting\ Irregularities_{it-1}$ of firm *i* in year *t-1* is one of the five previously defined variables measuring financial misreporting, namely *Adequate but not High Quality*, *High Abnormal Accruals*, *Underreported Debt*, *High Underreported Debt*, and *Underreported Debt Total.*

Table 6 reports the results of this test. Consistent with misreporting firms not being successful in their attempt to obtain new bank credit, the table shows that firms engaging in debt underreporting experience lower credit growth.

6.1.2. Banks' previous exposure to misreporting

To sharpen identification, we further exploit the granularity of our data at the firm-bank-year level. We focus on debt underreporting, as our data offers a unique advantage to identify this

type of misreporting. We first analyze cross-sectional variation in banks' previous exposure to debt underreporting. We test whether banks with more previous exposure are reluctant to grant credit to misreporting firms by estimating the following variant of equation (4) at the firm-bank-year level:

$$\Delta Credit_{ibt} = \delta_1 \, Bank\ Exposure\ UR_{bt-1} + \delta_2 \, Bank\ Exposure\ UR_{bt-1} * Underreported\ Debt_{it-1} + \\ + \phi \, Controls_{bt} + \mu_{it} + \upsilon_b + \varepsilon_{ibt} \qquad (5)$$

Following extant banking literature (e.g., Khwaja and Mian, 2008), we define $\Delta Credit_{ibt}$ as the log-change in the amount of (total) credit from bank *b* to firm *i* between years *t* and *t-1* (i.e., log(1+ $Credit_{ibt}$) – log(1+ $Credit_{ibt-1}$)). *Bank Exposure* UR_{bt-1} is defined as the fraction of the outstanding credit granted by the bank *b* to underreporting firms in year *t-1*. *Underreported* $Debt_{i,t-1}$ is as previously defined and measured in *t-1* (for robustness, we repeat the analysis replacing this variable with *High Underreported Debt*, also as previously defined). $Controls_{bt}$ is a vector of controls for bank characteristics, including *Bank Size*, *Bank Equity*, *Bank Liquidity*, *Bank Portfolio NPL*, and *Bank Portfolio Real Estate* (see Appendix A for a detailed definition of these control variables).

Equation (5) also includes a demanding fixed effect structure. By including firm-year fixed effects (μ_{it}), equation (5) exploits variation in bank credit within the same firm in a given year (a number of our sample firms borrow from more than one bank). The model also incorporates bank fixed effects to control for time-invariant variation in bank characteristics. To further tighten identification, we also estimate equation (5) replacing bank fixed effects with bank-year fixed effects. By including both firm-year and bank-year fixed effects, we isolate the variation in credit supply induced by the exposure to underreporting firms, as the model absorbs unobserved (and potentially confounding) variation in credit demand and credit supply.

Table 7 presents the results. The main effect of *Bank Exposure* UR_{bt-1} is not significantly different from zero, which means that, on average, banks more exposed to underreporting provide similar volumes of credit to firms that do not misreport as other banks. However, the coefficient on the interaction between *Bank Exposure* UR_{bt-1} and X_{it-1} (where X refers to *Underreported Debt* in columns (1) - (2) or *High Underreported Debt* in columns (3) - (4)) is negative and statistically significant. This result suggests that banks previously exposed to misreporting provide relatively less credit to misreporting firms (as compared to other firms and other banks). Table 7 also shows that this pattern is robust to including bank-year fixed effects and holds across all our measures of debt underreporting. As such, the results in Table 7 are consistent with the notion that, while perhaps not always immediately, banks eventually become aware of debt misreporting.

6.1.3. Banks' requests for information to CIRBE

As an alternative way of exploring whether banks see through debt misreporting, we analyze cross-sectional variation in banks' consultation to CIRBE (i.e., the public credit registry) about specific firms. Measuring variation in banks' consultation to CIRBE requires focusing the analysis on firms that obtain credit from a given bank without a previous lending relationship. That is, we exploit variation in the granted volume of credit, conditional on the firm applying for and obtaining a loan from a "new" bank (i.e., a bank without a previous lending relationship with the firm).

As in prior analysis, we identify applications for credit based on increases in the firm's credit balance with a given bank and based on CIRBE's data on banks' requests of information about firms. We measure whether the firm had a previous relationship with the bank based on the credit balance of the firm with that bank in previous years (which is zero for banks with which the firm had no previous lending relationship). This requirement reduces the sample to 185,487 firm-bank-year observations.

To analyze the role played by banks' consultation to CIRBE, we estimate the following model at the bank-firm-year level:

$$\Delta Credit_{ibt} = \delta_1 \, Bank\ CIRBE_{ibt} + \delta_2 \, Bank\ CIRBE_{ibt} * Underreported\ Debt_{it-1} + \\ + \phi \, Controls_{bt} + \mu_{it} + \upsilon_{bt} + \varepsilon_{ibt} \qquad (6)$$

where $\Delta Credit_{ibt}$ is as in previous tests.[25] $Bank_CIRBE_{ibt}$ is an indicator variable that equals one if bank *b* requests information from CIRBE on firm *i* in year *t*, and zero otherwise. *Underreported Debt* is as previously defined (as before, we repeat the analysis using *High Underreported Debt*). The remaining variables are as in equations (4) and (5) (see Appendix A for variable definitions). As in the previous test, we estimate equation (6) including both firm-year and bank-year fixed effects to control for the determinants of the demand and supply for credit. In this way, we empirically identify the variation in credit supply induced by banks' consultation to CIRBE.

Table 8 presents the results from estimating equation (6). The coefficient on the interaction between $Bank\ CIRBE_{ibt}$ and X_{it-1} (where *X* refers to *Underreported Debt* in column (1) or *High Underreported Debt* in column (2)) is negative and significant. The main effect of $Bank\ CIRBE_{ibt}$ is positive. That is, banks' request of information on the creditworthiness of a given firm results in a larger amount of credit granted to that firm. However, the credit amount is lower when the firm misreports its debt. The linear combination of both coefficients is negative and statistically different from zero, suggesting that firms exhibiting debt underreporting obtain lower amounts of credit from banks that verify their creditworthiness in CIRBE (as compared to the credit volume obtained from banks that do not).

[25] Note that, since this analysis is conducted on firms financed by banks with no previous relationships, this is equivalent to using the logarithm of the new credit in year *t* (given that credit in year *t-1* is zero).

6.2. Persistence of misreporting

As an alternative way of exploring whether banks see through debt underreporting, we analyze the persistence of this practice over time. If most banks detect debt misstatements and deny credit to underreporting firms, we expect that debt misreporting does not persist too long over time (i.e., misreporting firms give up after one or two tries). Table 9 repeats the analysis in Table 6 including as additional regressors the lagged values of the dependent variable, namely X_{it-1} and X_{it-2} (where X refers to *Underreported Debt* in columns (1) - (2) or *High Underreported Debt* in columns (3) - (4)).[26]

Table 10 reveals that the persistence of debt misreporting is relatively low. While the coefficient on X_{it-1} is positive and significant, the magnitude of this coefficient is relatively low (around 0.2), indicating that 80% of debt underreporting does not persist in the following period. Moreover, the coefficient on X_{it-2} is not statistically significant, which suggests that debt underreporting does not persist beyond one period. This is consistent with firms correcting the reporting issue relatively soon, conceivably because most banks see through debt misreporting. Taken together, the evidence in Tables 6 through 9 is hard to reconcile with the notion that banks overlook private firms' misreporting and highlights that banks play a significant role in the enforcement of mandatory financial reporting on these firms.

7. Misreporting and subsequent outcomes

To further corroborate our inferences from previous analyses, we explore key financial outcomes – defaults in payments to suppliers and banks – following misreporting. Finding that misreporting firms subsequently default in their payments would be consistent with our prior tests; it would indicate that these firms are financially constrained and do not obtain new credit, presumably because banks see through misreporting. In parallel to previous tests, we focus on debt

[26] Our empirical specification meets the conditions to yield reliable inferences indicated by Wooldridge (2002) for this type of model. These conditions relate to the length of the panel and the persistence of the dependent variable.

underreporting, as our data offers a unique advantage to measure this type of misreporting and to identify its potential consequences.

First, we analyze whether underreporting firms delay payments to suppliers, we re-estimate equation (4) using two alternative dependent variables. *Payment Delay*$_{it}$ is an indicator variable that equals one if the firm *i*'s average payment period to its suppliers increases from year *t-1* to year *t*, and zero otherwise. Δ*Payment Period*$_{it}$ is the increase in the average payment period (in years) of firm *i* to its suppliers from year *t-1* to year *t*. The results in Table 10 support the notion that underreporting firms subsequently delay payments to suppliers; Underreported debt is positively associated with both *Payment Delay*$_{it}$ and Δ*Payment Period*$_{it}$. This is consistent with the idea that, after being denied credit by banks, underreporting firms appear to resort to alternative sources of financing. Trade credit (i.e., delaying payments to suppliers) is one of them.

Second, we analyze whether underreporting firms honor their payment commitments with banks, we re-estimate equation (4) using five alternative dependent variables. NPL_{it} is an indicator variable that equals one if at least one loan granted to firm *i* is non-performing as of December of year *t*, and zero otherwise (a loan is considered non-performing or "NPL" if the loan is more than 90 days overdue). *NPL Recent*$_{it}$ is an indicator variable that equals one if at least one loan granted to firm *i* is non-performing as of December of year *t* and all loans were performing in year *t-1*, and zero otherwise (that is, *NPL Recent*$_{it}$ =1 if NPL_{it}=1 and NPL_{it-1}=0, and zero otherwise). *Chargeoff*$_{it}$ is an indicator variable that equals one if at least one loan granted to firm *i* is charged-off as of December of year *t*, and zero otherwise. *Chargeoff Recent*$_{it}$ is an indicator variable that equals one if at least one loan granted to firm *i* is charged-off as of December of year *t* and there were no loans charged-off in year *t-1*, and zero otherwise. *Insolvency*$_{it}$ is defined as one if firm *i* undergoes an insolvency procedure in year *t*, and zero otherwise.[27]

[27] Data on non-performing loans and charge-offs is obtained from CIRBE. Information on whether the firm is undergoing an insolvency procedure is gathered from CB.

The results in Table 11 show that debt underreporting is associated with a higher probability of financial distress. Firms engaging in this practice exhibit more subsequent overdue loans (including when these firms did not have NPLs in the past), more charged-off loans (when these firms did not have charged-off loans in the past as well), and higher probability of being involved in an insolvency procedure. This evidence is consistent with the notion that, after being denied access to credit, underreporting firms end up suffering financial distress. While they leverage on trade credit from suppliers, this additional financing is not enough to avoid financial difficulties.

8. Conclusions

This paper studies firm-level factors shaping the enforcement of financial reporting regulation on private non-financial firms. Our tests are based on a rare combination of datasets, which allow us to construct unique measures of misreporting. By merging and comparing information in these datasets we can compute the percentage of firms that do not file financial reports, measure the quality of the filed reports exploiting Bank of Spain's internal assessment of this information, and –notably– identify irregularities in reported amounts of debt.

Our results highlight a prominent role of bank lending in the enforcement of financial regulation on private firms. We document that private firms with bank debt are more likely to file financial information with the trade registry and less likely to file financial reports with irregularities. However, we also find that debt underreporting is associated with financial incentives, suggesting that pressure on private firms from bank relationships can also induce misreporting. Consistent with this issue not being critical enough to undermine the enforcement role of banks, additional tests suggest that banks detect issues in private firms' financial statements; misreporting firms obtain significantly less credit, especially when the bank has previous exposure of debt underreporting and when the bank requests information to the public credit registry.

Collectively, these results highlight important firm-level determinants of the compliance of private firms with financial regulation. Notably, our evidence suggests that banks play an important role in the enforcement of mandatory financial reporting on private firms.

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Appendix A: Variable definitions

Variable	*Definition*
Measures of compliance with financial reporting regulation:	
% Non-filers	Percentage of firms that do not report financial statements, computed at the province-year level.
% Inadequate Quality	Percentage of firms that report financial statements classified by the Bank of Spain as "inadequate" quality, computed at the province-year level.
% Adequate but not High Quality	Percentage of firms that report financial statements classified by the Bank of Spain as "adequate low" (rather than "adequate high") quality, computed at the province-year level.
Inadequate Quality	Indicator that equals one if the quality of the firm's financial statements is classified by the Bank of Spain as "inadequate", and zero otherwise.
Adequate but not High Quality	Indicator that equals one if the quality of the firm's financial statements is classified by the Bank of Spain as "adequate low" (rather than "adequate high") quality, and zero otherwise.
High Abnormal Accruals	Indicator variable that equals one if *Abnormal Accruals* is in the top quintile of the sample distribution, and zero otherwise. *Abnormal Accruals* is the ratio of the absolute value of total accruals scaled by the absolute value of cash flows from operating activities. Total accruals are computed as the change in non-cash current assets minus the change in current liabilities excluding the current portion of long-term debt, minus depreciation and amortization. Cash flows from operating activities are measured as the difference between net operating income and total accruals.
Underreported Debt	Absolute value of *CB−CIRBE Debt*, if *CB−CIRBE Debt*<0, and zero otherwise. *CB−CIRBE Debt* is the difference between the amount of total bank debt reported in the firm's balance sheet (i.e., the source is the CB database) and the amount of standard bank loans reported by banks to the public credit registry (i.e., the source is the CIRBE database) as of December of year *t*, both amounts expressed as % of total assets in year *t*.
High Underreported Debt	Indicator variable that equals one if *Underreported Debt* ≥ 10%, and zero otherwise.
Underreported Debt Total	Absolute value of *CB−CIRBE Debt Total*, if *CB−CIRBE Debt Total*<0, and zero otherwise. *CB−CIRBE Debt Total* is the difference between the amount of total bank debt reported in the firm's balance sheet (i.e., the source is the CB database) and the corresponding amount reported by banks to the public credit registry (i.e., the source is the CIRBE database) as of December of year *t*, both amounts expressed as % of total assets in year *t*.
Overreported Debt	Absolute value of *CIRBE−CB Debt*, if *CIRBE−CB Debt*<0, and zero otherwise. *CIRBE−CB Debt* is the difference between the amount of standard bank loans reported by banks to the public credit registry (i.e., in the CIRBE database) and the amount of total bank debt reported in the firm's balance sheet (i.e., in the CB database) as of December of year *t*, both amounts expressed as % of total assets in year *t*.
High Overreported Debt	Indicator variable that equals one if *Overreported Debt* ≥ 10%, and zero otherwise.
Other variables:	
% Firms with Bank Debt	Percentage of firms with bank debt, computed at the province-year level.
% Audited/Listed	Percentage of firms that are audited or listed in a stock exchange, computed at the province-year level.
% Log(Median Firm Size)	Logarithm of the median total assets, computed at the province-year level.
Has Bank Debt	Indicator variable that equals one if firm *i* has bank debt, and zero otherwise.

Audited	Indicator variable that equals one if firm *i* is audited, and zero otherwise.
Listed	Indicator variable that equals one if firm *i* is listed, and zero otherwise.
Subsidiary	Indicator variable that equals one if firm *i* is the subsidiary of a group, and zero otherwise.
Parent	Indicator variable that equals one if firm *i* is the parent of a group, and zero otherwise.
Applications	Indicator variable that is equal to one if firm *i* has applied for a loan to a bank at any time during year *t*, and zero otherwise.
ST Credit	Firm's short-term bank debt over total liabilities (in %).
Financial Exp	Firm's financial expenses over total liabilities (in %).
Large Firm	Indicator variable that is equal to one if firm *i* is a large corporation according to the European Commission classification, and zero otherwise.
Firm Size	Logarithm of firm total assets (in thousands of euros).
Firm Equity	Firm equity over total assets (in %).
Firm ROA	Firm earnings before interest and taxes over total assets (in %).
Firm Age	Logarithm of (one plus) firm age in years.
App New Banks	Indicator variable that is equal to one if firm *i* has applied for a loan to a bank with which the firm *did not* have a previous relationship at any time during year *t*, and zero if firm *i* has received a loan from any bank with which the firm *had* a previous relationship at any time during year *t.*
Log(1+New Banks)	Logarithm of (one plus) the number of banks without a previous relationship to which firm *i* has applied for a loan at any time during year *t*.
$\Delta Credit_{ibt}$	Log-change of the amount of total bank credit of firm *i* between year *t* and *t-1,* when we use information at the firm level, and log-change of the amount of total credit from bank *b* to firm *i* between year *t* and *t-1,* when we use information at the firm-bank level.
Bank Size	Logarithm of bank total assets (in thousands of euros).
Bank Equity	Bank equity over total assets (in %).
Bank Liquidity	Bank cash and cash equivalents over total assets (in %).
Bank Portfolio NPL	Ratio of NPL over total loans (in %).
Bank Portfolio RE	Volume of bank credit to construction and real estate over total assets (in %).
Payment Delay	Indicator variable that is equal to one if there is an increase in the average payment period of firm *i* to its suppliers in year *t* as compared to year *t-1*, and zero otherwise.
Bank Exposure UR	Fraction of the outstanding credit granted by the bank *b* to underreporters in year *t-1*.
Bank CIRBE	Indicator variable that is equal to one if bank *b* requests information to CIRBE about firm *i*, a firm that applies for credit in that bank in year *t*.
Δ*Payment Period*	Increase in the average payment period (in years) of firm *i* to its suppliers in year *t* as compared to year *t-1*.
NPL	Indicator variable that is equal to one if according to CIRBE any loan of firm *i* is more than 90 days overdue as of December of year *t*, and zero otherwise.
NPL Recent	Indicator variable that is equal to one if according to CIRBE any loan of firm *i* is more than 90 days overdue as of December of year *t* but none in year *t-1*, and zero otherwise.
Chargeoff	Indicator variable that is equal to one if according to CIRBE any loan of firm *i* is charged-off as of December of year *t*, and zero otherwise.
Chargeoff Recent	Indicator variable that is equal to one if according to CIRBE any loan of firm *i* is charged-off as of December of year *t* but none in year *t-1*, and zero otherwise.
Insolvency	Indicator variable that is equal to one if firm *i* is under insolvency proceedings as of December of year *t*, and zero otherwise.

Figure 1. Compliance with mandatory reporting

This figure reports statistics related to the compliance with mandatory reporting of the universe of limited liability firms in Spain. The y axis indicates the percentage of firms in each category. "Non-filers" refers to the proportion of firms that do not file regulatory financial statements. "Filers (Adequate quality)" and "Filers (Inadequate quality)" refer to the percentage of firms that file accounting information classified by the Bank of Spain as "adequate-quality" and "inadequate-quality", respectively.

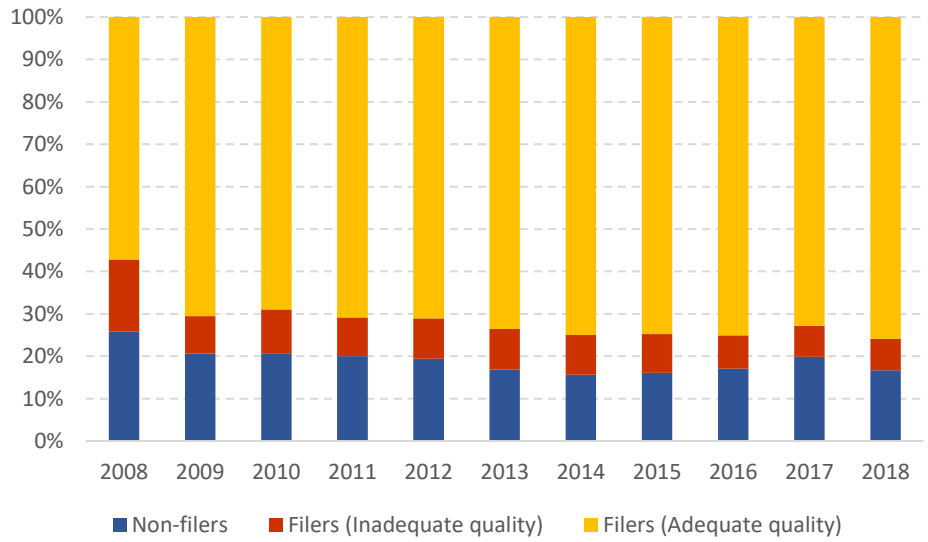

Figure 2. CIRBE vs. financial statements: Difference in reported debt amounts

This figure presents the frequency distribution firm-level differences between the amount of bank debt reported by banks to CIRBE and the corresponding balance sheet amount reported by the firm, both scaled by total assets. We split the firms in two groups: (i) financially constrained firms (i.e., those with above-median short-term debt or financial expenses that apply for a loan to a bank without a previous lending relationship with the firm) and (ii) non-financially constrained firms (i.e., the rest of sample firms).

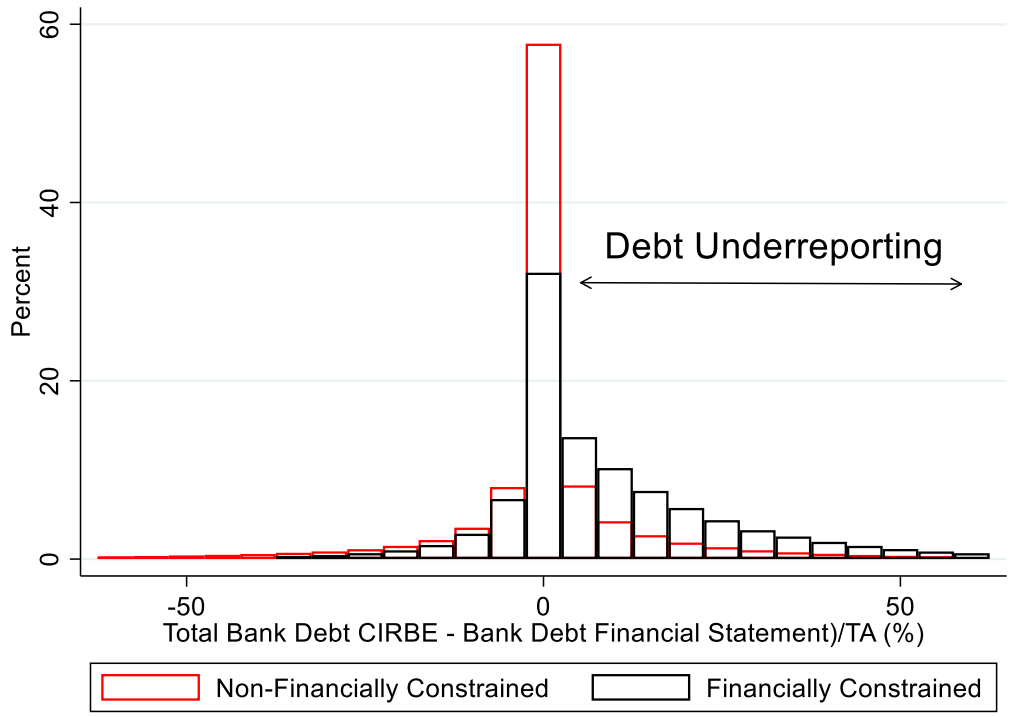

Table 1. Sample composition and descriptive statistics

Panel A reports information on the observations included in our tests. Panel B presents descriptive statistics for the characteristics of the firms in our combined datasets. Panel C presents descriptive statistics for the measures of reporting irregularities we use in our tests.

Panel A. Sample composition

	#firm-years
Spanish population of limited liability corporations (Table 2A)	13,623,953
(−) Firms that do not submit financial information ("non-filers")	−2,565,005
(−) Firms that are inactive or in liquidation process or with missing information	−2,080,154
(−) Firms in the first year of establishment	−1,302,518
(−) Firms with only one year of data	−294,211
Total "filers" (tests on financial statement reporting irregularities: Tables 2B and 3)	**7,382,065**
Firms that submit the "reduced" format of financial statements	*7,152,467*
Firms that submit the "standard" format of financial statements	*229,598*
(−) Firms with "inadequate" quality	−849,138
(−) Firms from business groups	−660,408
(−) Firms without holdings and "shell" corporations	−197,227
(−) Firms with audited financial statements or listed on a stock exchange	−53,800
(−) Firms without bank debt	−2,310,528
(−) Firms with negative cash	−41
(−) Firms whose fiscal month-end is not December	−18,463
(−) Firms with only one year of data	−121,556
Total (tests on debt underreporting: Tables 4 to 11)	**3,170,904**

Panel B. Descriptive statistics – Firm characteristics

	Units	*#Obs.*	*Mean*	*P50*	*SD*	*P10*	*P90*
Tests on financial statement reporting irregularities ("filers")							
a) Firms reporting in "reduced" format							
Has Bank Debt	%	7,152,467	51.14	100.00	49.99	0.00	100.00
Firm Age	Years	7,152,467	12.38	11.00	9.27	2.00	24.00
Large Firm	%	7,152,467	0.09	0.00	3.08	0.00	0.00
Subsidiary	%	7,152,467	9.25	0.00	28.97	0.00	0.00
Parent	%	7,152,467	0.32	0.00	5.64	0.00	0.00
b) Firms reporting in "standard" format							
Has Bank Debt	%	229,598	87.57	100.00	32.99	0.00	100.00
Listed	%	229,598	0.49	0.00	6.95	0.00	0.00
Audited	%	229,598	85.45	100.00	35.26	0.00	100.00
Firm Age	Years	229,598	22.40	20.00	13.39	8.00	38.00
Large Firm	%	229,598	24.08	0.00	42.76	0.00	100.00
Subsidiary	%	229,598	54.99	100.00	49.75	0.00	100.00
Parent	%	229,598	5.12	0.00	22.04	0.00	0.00
Tests on debt underreporting							
Applications	%	3,170,904	26.13	0.00	43.93	0.00	100.00
ST Credit	%	3,170,904	18.57	0.00	33.06	0.00	88.51
Financial Exp	%	3,170,904	2.24	1.56	2.58	0.00	5.06
Firm Size	,000	3,170,904	766.99	322.25	1,966.04	56.91	1,760.23
Firm Equity	%	3,170,904	17.09	25.14	76.63	−24.46	75.12
Firm ROA	%	3,170,904	−2.48	0.71	24.93	−17.38	12.74
Firm Age	Years	3,170,904	12.60	11.00	8.45	3.00	24.00

Panel C. Descriptive statistics – Measures of reporting irregularities

	Units	#Obs.	Mean	P50	SD	P10	P90
Tests on financial statement reporting irregularities ("filers")							
a) Firms reporting in "reduced" format							
Inadequate Quality	%	7,152,467	10.87	0.00	31.13	0.00	100.00
Adequate but not High Quality	%	7,152,467	23.88	0.00	42.64	0.00	100.00
High Abnormal Accruals	%	7,139,697	20.86	0.00	40.63	0.00	100.00
b) Firms reporting in "standard" format							
Inadequate Quality	%	229,598	16.20	0.00	36.85	0.00	100.00
Adequate but not High Quality	%	229,598	41.76	0.00	49.32	0.00	100.00
High Abnormal Accruals	%	229,558	19.89	0.00	39.92	0.00	100.00
Tests on debt underreporting							
Underreported Debt	%	3,170,904	2.94	0.00	11.80	0.00	5.30
High Underreported Debt	%	3,170,904	7.00	0.00	25.51	0.00	0.00
Underreported Debt Total	%	3,170,904	5.00	0.00	15.26	0.00	14.00

Table 2. Compliance with financial reporting regulation – Province-level tests

This table presents results of aggregate-level tests of the determinants of filing financial information (Panel A) and of the presence of reporting irregularities in the information filed (Panel B). The analysis is conducted at the province-year level. % *Non-filers* is the percentage of firms that do not report financial statements by province and year; % *Inadequate Quality* is the percentage of firms with financial statements classified by the Bank of Spain as "inadequate" quality computed at the province-year level. *% Adequate but not High Quality* is the percentage of firms with financial statements classified by the Bank of Spain as "adequate low" (rather than "adequate high") quality, computed at the province-year level. The analysis in Panel B is conducted separately for firms filing reduced (columns (1) and (3)) and standard financial statements (columns (2) and (4)). The explanatory variables of interest: *% Firms with Bank Debt*, *% Audited/Listed*, and *% Log(Median Firm Size)* are defined in Appendix A. All columns in Panels A and B include year fixed effects. Standard errors (in brackets) are robust to heteroscedasticity. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Panel A. Filing of financial statements (sample of "filers" and "non-filers")

Dep. Var.:	*% Non-filers*		
Indep. variables:	(1)	(2)	(3)
% Firms with Bank Debt	−0.690***	−0.688***	−0.664***
	[0.081]	[0.081]	[0.082]
% Audited/Listed		−0.943**	−1.059***
		[0.366]	[0.378]
Log(Median Firm Size)			−0.002
			[0.001]
Year FE	YES	YES	YES
Observations	543	543	543
R-squared	0.347	0.356	0.358

Panel B. Reporting irregularities (sample of "filers")

Dep. var.:	*% Inadequate Quality*		*% Adequate but not High Quality*	
Reporting method:	*Reduced*	*Standard*	*Reduced*	*Standard*
Indep. variables	(1)	(2)	(3)	(4)
% Firms with Bank Debt	−0.441**	−0.526***	−0.658***	−0.267**
	[0.215]	[0.078]	[0.150]	[0.120]
% Audited/Listed		0.070		−0.473**
		[0.148]		[0.221]
Log(Median Firm Size)	−0.014**	−0.005	−0.031	−0.007
	[0.004]	[0.019]	[0.024]	[0.029]
Year FE	YES	YES	YES	YES
Observations	543	543	543	543
R-squared	0.800	0.508	0.929	0.876

Table 3. Compliance with financial reporting regulation – Firm-level tests

This table presents results of firm-year level tests on the determinants of the quality of filed accounting information. *Inadequate Quality* (in columns (1) and (2)) is an indicator variable for whether the quality of the firm's financial statements is classified by the Bank of Spain as "inadequate". *Adequate but not High Quality* (in columns (3) and (4)) is an indicator for whether the quality of the firm's financial statements is classified by the Bank of Spain as "adequate low" (rather than "adequate high"). *High Abnormal Accruals* (in columns (5) and (6)) is an indicator variable that equals one if the firm's abnormal accruals are in the top quintile in the sample distribution, and zero otherwise. The coefficients in columns (1) and (2) are estimated for the whole sample of firms whereas those in columns (3) – (6) are estimated for the subsample of firms with an adequate quality. The analysis is conducted separately for firms filing reduced (columns (1), (3) and (5)) and standard financial statements (columns (2), (4), and (6)). The variable of interest *Has Bank Debt, Listed* and *Audited* and all control variables (*Firm Size, Firm Age, Subsidiary* and *Parent)* are defined in Appendix A. All columns include firm and year fixed effects. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	*Inadequate Quality*		*Adequate but not High Quality*		*High Abnormal Accruals*	
Reporting method:	*Reduced*	*Standard*	*Reduced*	*Standard*	*Reduced*	*Standard*
Indep. variables:	(1)	(2)	(3)	(4)	(5)	(6)
Has Bank Debt	−0.003***	−0.004**	−0.016***	−0.012***	−0.001***	0.044***
	[0.000]	[0.002]	[0.000]	[0.002]	[0.000]	[0.002]
Listed		−0.075**		−0.021		−0.000
		[0.033]		[0.040]		[0.050]
Audited		−0.054***		0.002		0.000
		[0.004]		[0.005]		[0.005]
Firm Size	−0.028*	−0.009	−0.001	−0.037***	−0.055***	−0.010
	[0.014]	[0.007]	[0.015]	[0.008]	[0.015]	[0.007]
Firm Age	−0.011***	−0.035***	0.024***	0.040***	0.033***	0.001
	[0.001]	[0.011]	[0.001]	[0.013]	[0.001]	[0.011]
Subsidiary	−0.005***	−0.010***	0.012***	−0.012***	0.008***	0.003
	[0.001]	[0.004]	[0.001]	[0.004]	[0.001]	[0.004]
Parent	−0.016***	−0.043***	0.075***	−0.089***	0.011*	−0.011
	[0.005]	[0.009]	[0.006]	[0.010]	[0.006]	[0.009]
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	7,152,459	229,597	6,340,772	189,929	6,326,093	189,885
R-squared	0.455	0.514	0.689	0.557	0.238	0.253

Table 4. Determinants of debt underreporting

This table analyzes the hypothesized determinants of debt underreporting. The analysis is conducted at the firm-year level. The dependent variables, *Underreported Debt* and *High Underreported Debt* are as defined in Appendix A. *Applications* is an indicator variable equal to one if the firm applies for a loan to a bank in that year, and zero otherwise. *ST Credit* is short-term bank debt over total liabilities. *Financial Exp* is financial expenses over total liabilities. *Firm Size*, *Firm Equity*, *Firm ROA*, and *Firm Age* are defined in Appendix A. All columns include firm and year fixed effects. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	*Underreported Debt*	*High Underreported Debt*
Indep. variables:	(1)	(2)
Applications	0.466***	0.982***
	[0.024]	[0.057]
ST Credit	0.005***	0.017***
	[0.000]	[0.001]
Financial Exp	0.082***	0.196***
	[0.014]	[0.022]
Firm Size	−4.051***	−5.870***
	[0.229]	[0.257]
Firm Equity	0.001	0.010***
	[0.001]	[0.001]
Firm ROA	−0.003***	0.000
	[0.001]	[0.001]
Firm Age	0.691***	1.477***
	[0.197]	[0.308]
Firm FE	YES	YES
Year FE	YES	YES
Observations	3,170,904	3,170,904
R-squared	0.673	0.576

Table 5. Debt underreporting and application for credit to new banks

This table analyzes the relation between underreporting and the probability of choosing a "new" bank when applying for new credit (the language "new" is used to refer to banks without a previous lending relationship with the firm). The analysis is conducted at the firm-year level. The sample is restricted to firms that request new credit in year *t*. *App New Banks* is an indicator variable that equals one if the firm applied for credit to a "new" bank, and zero if the firm receives a loan from any bank with a previous relationship with the firm. *Log(1+New Banks)* is the logarithm of (one plus) the number of "new" banks from which the firm applies for credit in year *t*. $X_{i,t-1}$ is one of two measures of underreporting, *Underreported Debt* (columns (1) and (3)) or *High Underreported Debt* (columns (2) and (4)), as defined in Appendix A and divided by 100 to minimize the number of decimal places in the coefficients. *Firm Controls* includes *Firm Size*, *Firm Equity*, *Firm ROA*, and *Firm Age* (also defined as in Appendix A). All columns include firm and year fixed effects. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var:	*App New Banks*		*Log(1+NewBanks)*	
	X= Underreported Debt	*X= High Underreported Debt*	*X= Underreported Debt*	*X= High Underreported Debt*
Indep. variables:	(1)	(2)	(3)	(4)
X_{it-1}	0.047***	0.014**	0.034**	0.013***
	[0.013]	[0.004]	[0.011]	[0.004]
Firm Controls	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	685,447	685,447	685,447	685,447
R-squared	0.465	0.465	0.465	0.465

Table 6. Bank credit and reporting irregularities

This table analyzes the association between the quality of filed accounting information and subsequent changes in firms' outstanding total bank credit as a function of several measures of reporting irregularities. The analysis is conducted at the firm-year level. The dependent variable is the log-change of the amount of total bank credit of firm *i* between year *t* and *t-1* ($\Delta Credit_{it}$). The explanatory variables of interest *Adequate but not High Quality*, *High Abnomal Accruals, Underreported Debt, High Underreported Debt*, and *Underreported Debt Total* are defined in Appendix A. All columns include firm and year fixed effects, and the following *Firm Controls*: *Applications, ST Credit, Financial Exp.*, *Firm Size*, *Firm Equity*, *Firm ROA*, and *Firm Age* (see Appendix A for variable definitions). Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	$\Delta Credit_{it}$				
Indep. variables:	(1)	(2)	(3)	(4)	(5)
Adequate but not High Quality$_{it-1}$	−0.002**				
	[0.001]				
High Abnormal Accruals$_{it-1}$		0.000			
		[0.001]			
Underreported Debt$_{it-1}$			−0.349***		
			[0.019]		
High Underreported Debt$_{it-1}$				−0.070***	
				[0.003]	
Underreported Debt Total$_{it-1}$					−0.446***
					[0.015]
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Firm Controls	YES	YES	YES	YES	YES
Observations	2,179,650	2,172,871	2,179,650	2,179,650	2,179,650
R-squared	0.313	0.313	0.326	0.317	0.313

Table 7. Variation in credit based on bank's previous exposure to debt underreporting

This table analyzes the association between underreporting and subsequent changes in firms' outstanding bank credit as a function of banks' previous exposure to underreporting. The analysis is conducted at the bank-firm-year level. The dependent variable is the log-change of the amount of total credit from bank *b* to firm *i* between year *t* and *t-1* ($\Delta Credit_{ibt}$). *Bank Exposure* UR_{bt-1} is the fraction of the outstanding credit granted by the bank *b* to underreporters in year *t-1*. $X_{i,t-1}$ is one of two measures of underreporting, *Underreported Debt* (columns (1) and (2)) and *High Underreported Debt* (columns (3) and (4)), as defined in Appendix A. Columns (1) and (3) include the following bank controls: *Bank Size*, *Bank Equity*, *Bank Liquidity*, *Bank Portfolio NPL*, and *Bank Portfolio RE* (see Appendix A for variable definitions). All columns include firm-year fixed effects, columns (1) and (3) include bank fixed effects and columns (2) and (4) include bank-year fixed effects, which prevents us from the use of bank controls. Standard errors (in brackets) are clustered by firm and bank. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	$\Delta Credit_{ibt}$			
	X= Underreported Debt		*X= High Underreported Debt*	
Indep. variables:	(1)	(2)	(3)	(4)
Bank Exposure UR_{bt-1}	−0.643		−0.650	
	[2.429]		[2.424]	
Bank Exposure UR_{bt-1} * X_{it-1}	−1.632**	−2.267***	−0.541*	−0.944***
	[0.672]	[0.561]	[0.318]	[0.212]
Bank Controls	YES	NO	YES	NO
Firm-Year FE	YES	YES	YES	YES
Bank FE	YES	NO	YES	NO
Bank-Year FE	NO	YES	NO	YES
Observations	2,544,608	2,544,608	2,544,608	2,544,608
R-squared	0.328	0.433	0.328	0.433

Table 8. CIRBE information and credit supply to underreporters

This table analyzes changes in credit supply to underreporters based on whether the bank requests information from CIRBE. The analysis is based on firm-bank-year observations where the firm obtains credit from a bank without a previous relationship with the firm. The dependent variable is the log-change in the amount of total credit from bank *b* to firm *i* between years *t* and *t-1* ($\Delta Credit_{ibt}$). *Bank* $CIRBE_{bit}$ equals one if bank *b* requests information to CIRBE about firm *i*, a firm that applies for credit in that bank in year *t*. $X_{i,t-1}$ is one of two measures of underreporting, *Underreported Debt* (column (1)) and *High Underreported Debt* (column (2)), as defined in Appendix A. The specifications include both firm-year and bank-year fixed effects. Standard errors (in brackets) are clustered by firm and bank. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	$\Delta Credit_{ibt}$	
	X=Underreported Debt	*X=High Underreported Debt*
Indep. variables:	(1)	(2)
Bank $CIRBE_{bit}$	0.154***	0.150***
	[0.020]	[0.026]
Bank $CIRBE_{bit} * X_{it-1}$	−0.244***	−0.123***
	[0.065]	[0.043]
Firm-Year FE	YES	YES
Bank-Year FE	YES	YES
Observations	185,487	185,487
R-squared	0.701	0.701

Table 9. Persistence of debt underreporting

This table analyzes the persistence of underreporting over time. The analysis is conducted at the firm-year level. The dependent variables, *Underreported Debt* and *High Underreported Debt* are as defined in Appendix A. X_{it-1} and X_{it-2} are the first and second lag of the corresponding dependent variable, respectively. *Firm Controls* includes *Firm Size*, *Firm Equity*, *Firm ROA*, and *Firm Age* (defined as in Appendix A). All columns include firm and year fixed effects. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var. (X_{it}):	X_{it} = *Underreported Debt*		X_{it} = *High Underreported Debt*	
Indep. variables:	(1)	(2)	(3)	(4)
X_{it-1}	0.230***	0.239***	0.144***	0.140***
	[0.023]	[0.030]	[0.023]	[0.030]
X_{it-2}		−0.031		−0.051*
		[0.021]		[0.025]
Firm Controls	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	2,179,650	1,678,924	2,179,650	1,678,924
R-squared	0.727	0.740	0.614	0.626

Table 10. Debt underreporting and payments to suppliers

This table analyzes the association between underreporting and subsequent payments to suppliers. The analysis is conducted at the firm-year level. The dependent variables are as follows: *Payment Delay* is an indicator variable that equals one if there is an increase in the average payment period of firm *i* to its suppliers in year *t* as compared to year *t-1*, and zero otherwise. Δ*Payment Period* is the annual change in the average payment period (in years) to suppliers. X_{it-1} is one of two measures of underreporting, *Underreported Debt* (columns (1) and (3)) and *High Underreported Debt* (columns (2) and (4)), as defined in Appendix A and divided by 100 to minimize the number of decimal places in the coefficients. *Firm Controls* includes *Firm Size*, *Firm Equity*, *Firm ROA*, and *Firm Age* (defined as in Appendix A). All columns include firm and year fixed effects. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	*Payment Delay*		*ΔPayment Period*	
	X= Underreported Debt	*X= High Underreported Debt*	*X= Underreported Debt*	*X= High Underreported Debt*
Indep. variables:	(1)	(2)	(3)	(4)
X_{it-1}	0.067***	0.014***	0.030***	0.004***
	[0.008]	[0.003]	[0.005]	[0.001]
Firm Controls	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	1,652,803	1,652,803	1,652,803	1,652,803
R-squared	0.239	0.239	0.142	0.142

Table 11. Debt underreporting and payments to banks

This table analyzes the association between debt underreporting and subsequent bank payment issues. The analysis is conducted at the firm-year level. In Panel A, *NPL* is an indicator variable that equals one if the firm has non-performing loans or "NPL" (i.e., overdue by more than 90 days) in that year, and zero otherwise. *NPL Recent* is an indicator variable that equals one if the firm has NPL in that year but not in the prior year, and zero otherwise. In Panel B, *Chargeoff* is an indicator variable that equals one if the firm has loan charge-offs in that year, and zero otherwise. *Chargeoff Recent* is an indicator variable that equals one if the firm has charge-offs in that year but not in the prior year, and zero otherwise. In Panel C, *Insolvency* is an indicator variable that equals one if the firm is under insolvency proceedings in that year, and zero otherwise. X_{it-1} is one of two measures of underreporting, *Underreported Debt* and *High Underreported Debt*, as defined in Appendix A and divided by 100 to minimize the number of decimal places in the coefficients. *Firm Controls* includes *Firm Size*, *Firm Equity*, *Firm ROA*, and *Firm Age* (defined as in Appendix A). All columns include firm and year fixed effects. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Panel A. NPL

Dep. var.:	*NPL*		*NPL Recent*	
	X= Underreported Debt	*X= High Underreported Debt*	*X= Underreported Debt*	*X= High Underreported Debt*
Indep. variables:	(1)	(2)	(3)	(4)
X_{it-1}	0.029***	0.011***	0.010***	0.004***
	[0.004]	[0.002]	[0.001]	[0.001]
Firm Controls	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	2,176,260	2,176,260	2,176,260	2,176,260
R-squared	0.584	0.310	0.584	0.310

Panel B. Charge-off

Dep. var.:	*Chargeoff*		*Chargeoff Recent*	
	X= Underreported Debt	*X= High Underreported Debt*	*X= Underreported Debt*	*X= High Underreported Debt*
Indep. variables:	(1)	(2)	(3)	(4)
X_{it-1}	0.022***	0.008***	0.007***	0.002***
	[0.002]	[0.001]	[0.001]	[0.000]
Firm Controls	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	2,176,260	2,176,260	2,176,260	2,176,260
R-squared	0.605	0.298	0.605	0.298

Panel C. Insolvency

Dep. var.:	*Insolvency*	
	X= Underreported Debt	*X= High Underreported Debt*
Indep. variables:	(1)	(2)
X_{it-1}	0.005***	0.002***
	[0.001]	[0.000]
Firm Controls	YES	YES
Firm FE	YES	YES
Year FE	YES	YES
Observations	2,176,260	2,176,260
R-squared	0.686	0.686

Online Appendix A. Sources of information about firm credit risk

Across the world there are two types of institutions specialized in collecting credit information: public credit registries and private credit bureaus. The former are generally operated by a country's central bank and require mandatory information exchange from lenders. The latter are private arrangements that emerge when lenders exchange their data voluntarily.

Public credit registries (PCRs) do not exist in every country; major economies such as Canada, India, Japan, the U.K., and the U.S. have not established a mandatory information sharing mechanism. However, several countries in continental Europe (e.g., Austria, Belgium, Germany, France, Italy, Portugal, and Spain) have PCRs managed by the central bank. Credit registries are also common in South America, Africa, Asia, and Oceania (International Finance Corporation, 2012). Over the last decades, there has been a significant growth in the number of PCRs around the world. According to the World Bank's "2004 Doing Business Database on Public Credit Registries", the number of PCRs worldwide increased from 13 in 1964 to 57 in 2002. Beyond 2002, there have been a number of other milestones in the development of PCRs around the world.[28]

There are two types of private credit bureaus (PCBs); those set up by a coalition of lenders and those set up by third-party private companies. Prominent examples of the former include the Association of Banks in Singapore, as well as credit bureaus in Poland, Brazil, and Turkey (International Finance Corporation, 2012). Examples of the latter include Experian, Equifax, and TransUnion for consumer credit and Dun & Bradstreet (D&B) for corporate payments. The credit bureaus operated by private companies are for-profit and thus have incentives to innovate and specialize in detailed information and value-added services (e.g., credit scoring, portfolio monitoring, and fraud detection).

Because disclosure from lenders is mandatory, PCRs have the advantage of holding comprehensive information. However, the credit information contains limited detail (PCRs generally present aggregate loan information). Furthermore, even when PCRs contain relatively sophisticated information such as debt exposure, they often set a minimum reporting threshold and only collect information for borrowers with outstanding debt above that threshold.

Several considerations suggest that PCBs are unlikely to contain comprehensive information on corporate debt. First, the formation of PCBs is subject to a collective action dilemma and is influenced by the degree of competition, asymmetric information in the credit market, and technology (Pagano and Jappelli, 1993).[29] Second, the cost of reporting incomplete or untruthful information to a PCR is higher than that of misreporting to a PCB (there is a legal mandate to report to PCRs). Third, oftentimes the information at PCBs relates to trade payment history (e.g., D&B's PAYDEX), not to outstanding debt (Kallberg and Udell, 2003). These issues suggest that it is difficult to identify debt underreporting by comparing the information in PCBs to that in firms' financial reports.

Online Appendix B. Potential data issues in the measurement of debt underreporting

We further examine whether the determinants of the differences between the amounts in filed financial statements and amounts reported to the public credit registry, which are illustrated in Table 4, are driven by discrepancies between the two data sources in terms of coverage, time,

[28] In 2003, the governors of central banks of several European countries signed a Memorandum of Understanding (MoU) for the cross-border exchange of information on borrowing. The Central Bank of Ireland established the Irish central credit register under the Credit Reporting Act of 2013. In 2016, the ECB launched the "AnaCredit" project, namely the creation of a cross-country registry containing detailed information on bank loans to firms in the euro area.

[29] Critically, incumbent lenders that make up the credit bureau may block new members from joining or boycott the formation of new credit bureaus, essentially using exclusive information sharing arrangements as a barrier to entry. This creates a perverse market structure that discourages expanded coverage and competition. Jappelli and Pagano (2006) describe one such case in Mexico where a pre-existing credit bureau, (the Buró de Crédito) formed by the

accuracy, or accounting criteria. Regarding coverage, one potential concern is that, prior to 2016, CIRBE was subject to the policy of not including exposures of less than €6,000. Several considerations suggest that this issue does not affect the conclusions of our analysis of debt underreporting. First off, incomplete information at CIRBE cannot result in balance sheet amounts being lower than CIRBE amounts; if anything, it would explain the opposite pattern. Moreover, as shown in Online Appendix E.1, we also find similar patterns from 2016 onwards (i.e., when the coverage of CIRBE was expanded to exposures of less than €6,000).

The differences between the CIRBE and CB amounts cannot be explained by these amounts being measured at different points in time, as our analysis is restricted to firms with fiscal year-end in December (this restriction imposes very little sample attrition).[30] To address the concern that banks and CIRBE might not be timely in recording loans or in removing loans that have matured, we also recompute our measures of underreporting using CIRBE data from January and March of year *t+1* (instead of data from December of year t). As shown in Figure D.1 and Table E.2 in the Online Appendix, we obtain the same empirical patterns.

It is also unlikely that the differences between CIRBE and CB respond to deficiencies in the quality/accuracy of our data. Our data sources –CIRBE and CB– are both verified by the Bank of Spain, as this information is an important input for bank supervision, regulation, and monetary policy.[31] Moreover, to eliminate any remaining concerns about the quality of the information contained in the CB database, our tests exclude firms with only one year of data, observations labelled as "Inadequate" by the Bank of Spain, and firms with a negative cash balance.[32]

The difference between CIRBE and CB debt amounts are unlikely to be driven by different accounting criteria. While this concern could apply to the classification of leasing contracts or to the valuation/recognition of sophisticated instruments, it does not apply to standard loans, which are measured at amortized cost both by banks reporting to CIRBE and by firms issuing financial statements.[33] Moreover, firms and banks must use the same mandatory format to report standard bank loans. We also note that most of the credit granted to our sample firms is in the form of standard loans (leasing amounts are comparatively small and debt securities and other more sophisticated debt vehicles are rare).[34]

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[31] We conduct four additional robustness tests to further mitigate any concerns on the quality of our data. In Online Appendix D (Panel C of Figure D.1) and Online Appendix E (Table E.4), we restrict the sample to firms that in a given year hold credit exclusively from the ten largest Spanish banks in terms of credit to non-financial firms during the sample period. To the extent that they have more resources, the reporting of these banks is likely to be more sophisticated and accurate. Moreover, in Online Appendix D (Panel D of Figure D.1) and Online Appendix E (Table E.4), we exclude from the analysis firms that obtain credit in the last quarter of the fiscal year. We exclude these observations because it is possible that, in some cases, the credit recently obtained by these firms has still not been accounted for in these firms' financial statements. The results reported in these figures and tables suggest that our inferences are not sensitive to these modifications of our main analysis. In addition, to confirm that our results are not affected to any extent by the existence of credit lines, we reestimate Table 4 excluding firms with credit lines (Table E.9). Lastly, we run an additional robustness test of Table 4 excluding firms with non-performing or defaulted loans, because these firms could (wrongly) assume its debt obligations do not exist or will be restructured. Our (untabulated) results also hold.

[32] In addition, we verified manually the quality of our data by comparing the information in CB with that in the original financial statements filed with the Spanish Commercial Registry and with the information collected by SABI (a database owned by Bureau Van Dijk that contains financial information on Spanish private firms).

[33] As in balance sheets, in CIRBE debt amounts include the total sum of outstanding principal, and interests and commissions due. It does not include accrued interests and commissions not due. In any case, the omission of these amounts would lead to bank debt overreporting, instead of underreporting.

[34] Spanish nonfinancial firms are rarely dependent on debt securities financing. Arce et al. (2021) document that only 94 non-financial companies issued a bond at any time between 2006 and 2015. Moreover, the securitization of commercial and industrial loans is very low, 4.8 percent in 2006 (see Jiménez et al., 2014).

Online Appendix C. The economics of opportunistic debt underreporting

Our previous results raise the question of why firms engage in debt underreporting if banks generally see through it. One possible explanation is that sometimes this reporting strategy appears to be effective. The aggregated credit obtained by our sample firm-year observations exhibiting underreporting is an average of more than €5 billion per year. While this is a relatively small percentage (around 1.5%) of the corresponding amount aggregated across all firm-year observations, this figure suggests that banks approve a non-negligible number of applications for new credit filed by underreporting firms. On the cost side, the probability of prosecution for debt underreporting is relatively small. According to studies based on U.S. public firms, the revelation of a misstatement by the SEC is a rare event, and even rarer when it comes to misstatement of liabilities (Dyck et al., 2017; Dechow et al., 2011). The probability of prosecution is likely to be even lower among private, unaudited firms in jurisdictions with weaker institutions and less intensive enforcement. In fact, there are very few cases of prosecution for debt underreporting in our sample. Even if firms with debt underreporting do not obtain future funding from banks that detect these firms' misreporting, they could obtain credit from other banks. As such, it is likely that, ethical considerations aside, debt underreporting is an optimal strategy for firms facing urgent financial needs.

A related question is why some banks accept applications from underreporting firms. One possibility is that, at these banks, the employees in charge of granting new credit do not always check the CIRBE. Such omission could be due to work overload or malpractice. Indeed, prior literature documents substantial time-series and cross-sectional variation in the intensity of banks' financial statement verification.[35]

Yet another natural question about debt underreporting relates to the offsetting account of the amount of outstanding debt that is not reported on the balance sheet. To shed some light on the issue, we explore empirically the possibility that firms make up for the underreported debt by booking lower inventories. To have a sense of the validity of this conjecture, we compute the correlation between the reported (ending) inventory amounts and a synthetic measure of the inventory account designed to filter out potential manipulation. This synthetic measure is computed as beginning inventory plus purchases minus sales. We compute this correlation separately for the subsample of observations with substantial debt underreporting (*High Underreported Debt*) and for the rest of observations. We find that the correlation between reported inventories and synthetic inventories is substantially lower for debt-underreporting firms than for other firms (p-value < 0.001).[36] While descriptive, this evidence is consistent with the notion that firms with debt underreporting exercise more discretion in the valuation of inventories. That said, we concede that firms could hide debt using other accounting procedures. Unfortunately, a detailed empirical study of all possible accounting mechanisms to offset a lower reported level of debt is unfeasible; it would require access to firms' ledger accounts.

[35] See, for example, Cole et al. (2004), Cassar et al. (2015), Berger et al. (2017), Lisowsky et al. (2017), Minnis and Sutherland (2017).

[36] The correlations for the observations with *High Underreported Debt* =1 and *High Underreported Debt* =0 is 0.33 and 0.40, respectively. Both correlations are statistically significant at the 1% level. The fact that these correlations are not close to 1 is not surprising. Our synthetic measure does not consider spoilage and measure changes in inventories based on sales, which are valued at selling price rather than at cost.

Online Appendix D. Additional figures

Figure D.1. Variant of Figure 2

This figure presents four variants of Figure 2 (in red) for the subsample of firms that are financially constrained (i.e., firms with above-median short-term debt or financial expenses that apply for a loan to a bank without a previous lending relationship with the firm). Panels A and B recompute the measures of underreporting using CIRBE data from January and March of year t+1 (instead of data from December of year t), respectively. Panel C restricts the sample to firms that in a given year hold credit exclusively from the ten largest Spanish banks (i.e., "sophisticated" banks) in terms of credit to non-financial firms during the sample period. Panel D excludes from the analysis firms that obtain credit in the last quarter of the fiscal year. The data in Figure 2 is superimposed in black with the expression "Baseline".

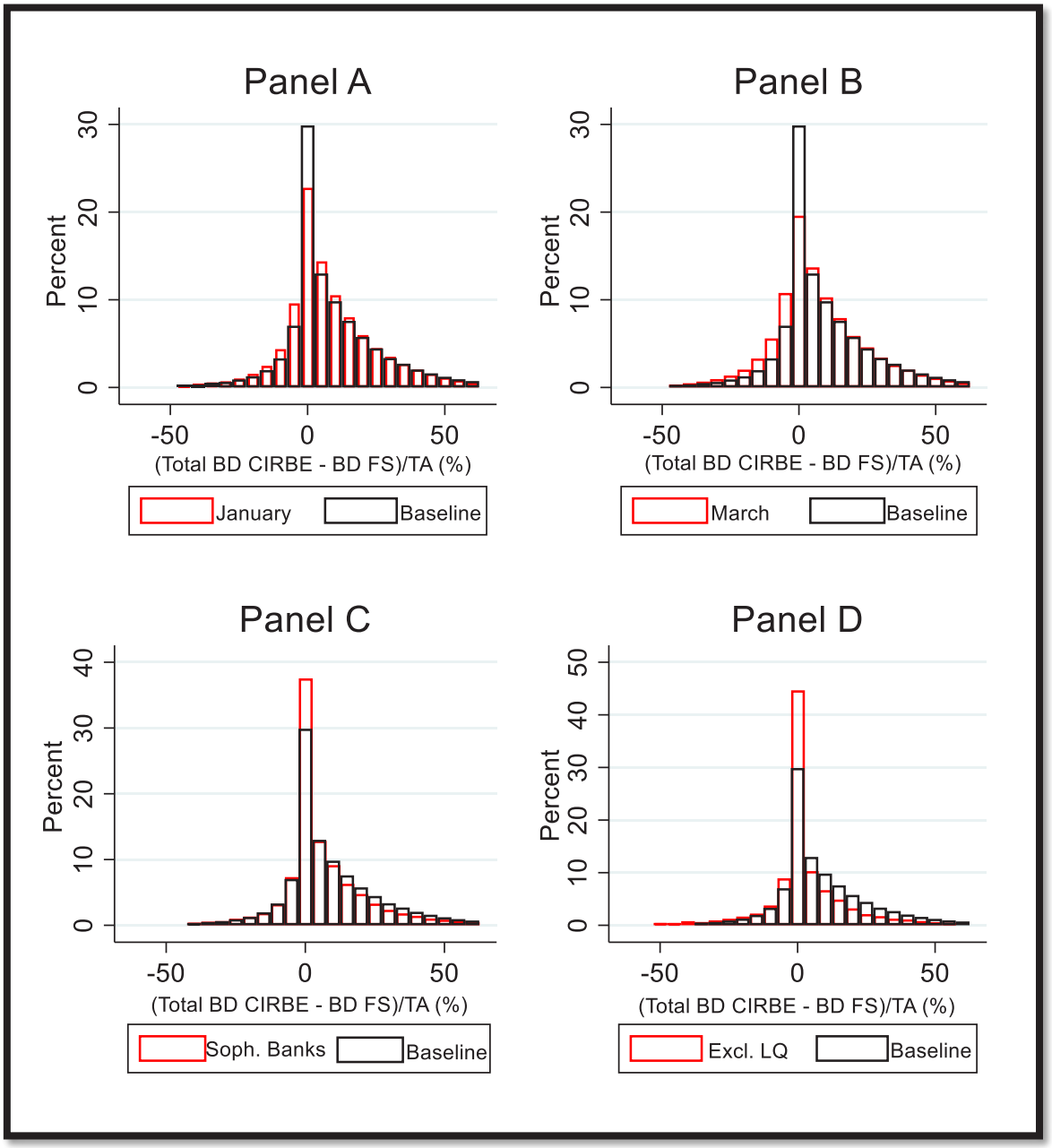
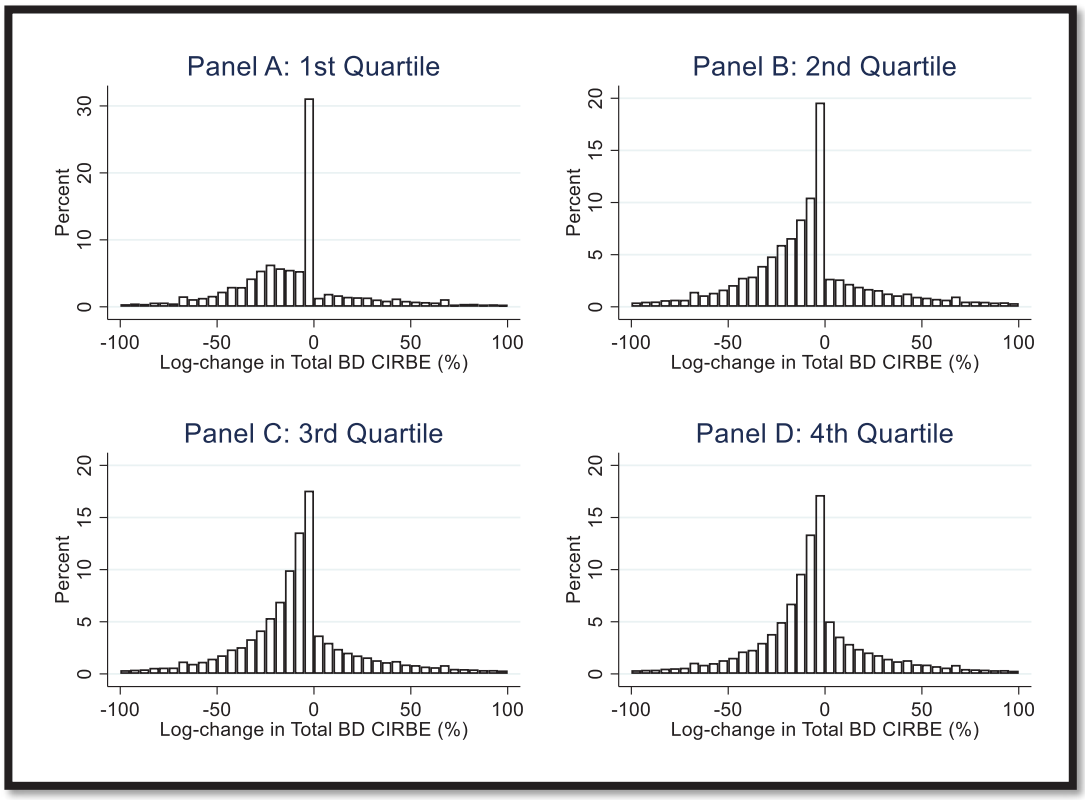


Figure D.2. Change in bank credit by firm size

This figure presents log-change of the amount of total bank credit (computed based on CIRBE data) by quartiles of firms' total assets.



Online Appendix E. Additional tests on the determinants of debt underreporting

To mitigate concerns on alternative explanations for our findings in Table 4 (rather than underreporting being driven -at least in part- by financial incentives), we conduct a series of variants of this analysis aimed at addressing them.

E.1. Before and after 2016

We repeat the analysis in Table 4 distinguishing between observations before and after 2016. As shown in Table E.1, our inferences remain when we restrict the sample to the period from 2016 onwards. This mitigates the potential concern that our inferences could be affected by the fact that, prior to 2016, CIRBE was subject to the policy of not including exposures of less than €6,000.

E.2. Timing of the measurement of debt from CIRBE

To mitigate the concern that banks and CIRBE might not be timely in recording loans or in removing loans that have matured, we also recompute our measures of underreporting using CIRBE data from January and March of year t+1 (instead of data from December of year t). As shown in Table E.2, our inferences are unaffected.

E.3. Restricting to firms borrowing from sophisticated banks

To further mitigate any concerns on the quality of our data, in Table E.3 we restrict the sample to firms that in a given year hold credit exclusively from the ten largest Spanish banks in terms of credit to non-financial firms during the sample period. To the extent that they have more resources, the reporting of these banks is likely to be more sophisticated and accurate. Our inferences remain.

E.4. Excluding firms that obtain credit in the last quarter of the fiscal year

We also exclude from the analysis firms that obtain credit in the last quarter of the fiscal year. We exclude these observations because it is possible that, in some cases, the credit recently obtained by these firms has still not been accounted for in these firms' financial statements. Table E.4 shows that our inferences are not sensitive to this exclusion.

E.5. Controlling for financial sophistication

We repeat the analysis in Table 4 adding a variety of controls for firm sophistication. As shown in Table E.5, the variables capturing financial incentives remain statistically significant.

E.6. Excluding micro-firms

We also repeat the analysis in Table 4 excluding micro-firms. We use two criteria to define microfirms; number of employees and sales volume. The results are presented in Table E.6. Our inferences are robust. We use different numerical thresholds for these measures.

E.7. Debt underreporting and industry-adjusted leverage

Following Bernard (2016), we define *Industry Adjusted Leverage* as the firm's total debt net of cash, scaled by total assets, minus the mean of this ratio for all other private limited liability firms in the same four-digit NACE code. We include this variable in the analysis of Table 4. The results are presented in Table E.7. Consistent with firms facing predation risk being more likely to underreport debt, this variable is positively associated with our measures of debt underreporting. However, our measures of financial incentives remain positive and statistically significant.

E.8. Alternative definitions of the dependent variable

To address this point, we repeat our analysis using the alternative dependent variables. As shown in Table E.8, our inferences remain. These metrics are not deflated by total assets, which mitigates the concern that underreporting firms also understate their assets

E.9. Excluding credit lines

To confirm that our results are not affected by off-balance sheet financing (i.e., lines of credit which are not necessarily used by the firm but are reported to the credit registry), we repeat the analysis of the determinants of debt underreporting excluding firms with credit lines. As shown in Table E.9, our inferences are unaffected.

E.10. Determinants of debt overreporting

We conduct a parallel analysis to Table 4 focusing on cases in which the debt reported to CIRBE is *lower* (rather than *higher*) than the debt reported in financial statements. *Overreported Debt and High Overreported Debt* are defined in a similar way to *Underreported Debt* and *High Underreported Debt.* As shown in Table E.10, we find no association between our measures of financial incentives and these alternative dependent variables.

Table E.1. Before and after 2016

This table repeats the analysis in Table 4 restricting the sample to observations before 2016 (Panel A) and from 2016 onwards (Panel B). See Appendix A for variable definitions. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Panel A. Restricting the sample to observations before January 2016

Dep. var.:	*Underreported Debt*	*High Underreported Debt*
Indep. variables:	(1)	(2)
Applications	0.433***	0.905***
	[0.025]	[0.055]
ST Credit	0.005***	0.014***
	[0.001]	[0.001]
Financial Exp	0.069***	0.172***
	[0.014]	[0.022]
Firm Controls	YES	YES
Firm FE	YES	YES
Year FE	YES	YES
Observations	2,252,216	2,252,216
R-squared	0.709	0.611

Panel B. Restricting the sample to observations after January 2016

Dep. var.:	*Underreported Debt*	*High Underreported Debt*
Indep. variables:	(1)	(2)
Applications	0.458**	0.932**
	[0.052]	[0.125]
ST Credit	0.009***	0.028***
	[0.001]	[0.002]
Financial Exp	0.014	0.068
	[0.020]	[0.049]
Firm Controls	YES	YES
Firm FE	YES	YES
Year FE	YES	YES
Observations	795,309	795,309
R-squared	0.811	0.743

Table E.2. Timing of the measurement of debt from CIRBE

This table repeats the analysis in Table 4 measuring outstanding debt at CIRBE in January of year t+1 (Panel A) and March of year t+1 (Panel B) instead of December of year t. See Appendix A for variable definitions. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Panel A. Measuring CIRBE debt in January

Dep. var.:	*Underreported Debt*	*High Underreported Debt*
Indep. variables:	(1)	(2)
Applications	0.626***	1.444***
	[0.035]	[0.073]
ST Credit	0.009***	0.028***
	[0.000]	[0.001]
Financial Exp	0.088***	0.218***
	[0.011]	[0.019]
Firm Controls	YES	YES
Firm FE	YES	YES
Year FE	YES	YES
Observations	3,359,995	3,359,995
R-squared	0.653	0.544

Panel B. Measuring CIRBE debt in March

Dep. var.:	*Underreported Debt*	*High Underreported Debt*
Indep. variables:	(1)	(2)
Applications	0.798***	1.833***
	[0.054]	[0.131]
ST Credit	0.011***	0.032***
	[0.001]	[0.001]
Financial Exp	0.051***	0.121***
	[0.013]	[0.022]
Firm Controls	YES	YES
Firm FE	YES	YES
Year FE	YES	YES
Observations	3,357,942	3,357,942
R-squared	0.622	0.514

Table E.3. Restricting to firms borrowing from sophisticated banks

This table repeats the analysis in Table 4 restricting the sample to firms that in a given year borrow exclusively from the ten banks with the largest share in credit to non-financial firms. See Appendix A for variable definitions. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	*Underreported Debt*	*High Underreported Debt*
Indep. variables:	(1)	(2)
Applications	0.451***	0.908***
	[0.030]	[0.068]
ST Credit	0.001	0.005***
	[0.001]	[0.001]
Financial Exp	0.043**	0.158***
	[0.017]	[0.026]
Firm Controls	YES	YES
Firm FE	YES	YES
Year FE	YES	YES
Observations	1,213,382	1,213,382
R-squared	0.729	0.638

Table E.4. Excluding firms that obtain credit in the last quarter of the fiscal year

This table repeats the analysis in Table 4 excluding firms that obtain credit in the last quarter of the fiscal year. See Appendix A for variable definitions. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	*Underreported Debt*	*High Underreported Debt*
Indep. variables:	(1)	(2)
Applications	0.352***	0.659***
	[0.020]	[0.060]
ST Credit	0.014***	0.038***
	[0.001]	[0.001]
Financial Exp	0.062***	0.125***
	[0.015]	[0.029]
Firm Controls	YES	YES
Firm FE	YES	YES
Year FE	YES	YES
Observations	1,830,788	1,830,788
R-squared	0.729	0.661

Table E.5. Controlling for firm sophistication

This table analyzes the hypothesized determinants of debt underreporting controlling for firm financial sophistication. The analysis is conducted at the firm-year level. The dependent variable *High Underreported Debt* is as defined in Appendix A. The variables which measure financial sophistication are the following: *Size* is the log of a firm's total assets. *Level of Financial Instruments* is the level of financial instruments of a firm over its total assets. *Intangible Assets* is the level of intangible assets over its total assets. *Log (Average Wage by Employee)* is the log of the wage expenses of a firm over its total number of employees. The variables measuring financial incentives are the following: *Applications* is an indicator variable equal to one if the firm applies for a loan to a bank in that year, and zero otherwise. *ST Credit* is short-term bank debt over total liabilities. *Financial Exp* is financial expenses over total liabilities. All columns include firm and year fixed effects. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	*High Underreported Debt*			
Indep. variables:	(1)	(2)	(3)	(4)
Applications	0.982***	0.719***	0.721***	0.727***
	[0.057]	[0.048]	[0.049]	[0.049]
ST Credit	0.017***	0.019***	0.019***	0.019***
	[0.001]	[0.002]	[0.002]	[0.002]
Financial Exp	0.196***	0.299***	0.300***	0.301***
	[0.022]	[0.016]	[0.016]	[0.017]
Firm Size	−5.870***			
	[0.257]			
Level of Financial Instruments		−0.335**		
		[0.121]		
Intangible Assets			−0.629***	
			[0.067]	
Log (Average Wage by Employee)				−0.077***
				[0.012]
Firm Controls	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	3,170,904	3,170,904	3,170,904	3,170,904
R-squared	0.576	0.572	0.572	0.572

Table E.6. Excluding micro-firms

This table analyzes the hypothesized determinants of debt underreporting excluding micro-firms by number of employees (Panel A) or sales volume (Panel B). The analysis is conducted at the firm-year level. The dependent variables *Underreported Debt* and *High Underreported Debt* are as defined in Appendix A. *Applications* is an indicator variable equal to one if the firm applies for a loan to a bank in that year, and zero otherwise. *ST Credit* is short-term bank debt over total liabilities. *Financial Exp* is financial expenses over total liabilities. All columns include firm and year fixed effects. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Panel A. Excluding micro-firms (by number of employees)

	Firms with >10 employees		*Firms with >1 employee*	
Dep. var.:	*Underreported Debt*	*High Underreported Debt*	*Underreported Debt*	*High Underreported Debt*
Indep. variables:	(1)	(2)	(3)	(4)
Applications	0.131***	0.339***	0.387***	0.887***
	[0.026]	[0.092]	[0.024]	[0.065]
ST Credit	0.003***	0.013***	0.003***	0.014***
	[0.001]	[0.002]	[0.000]	[0.001]
Financial Exp	0.119***	0.314***	0.108***	0.261***
	[0.017]	[0.038]	[0.012]	[0.023]
Firm Controls	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	412,621	412,621	2,163,257	2,163,257
R-squared	0.645	0.565	0.662	0.559

Panel B. Excluding micro-firms (by sales)

	Firms with Sales >1 million euros	
Dep. var.:	*Underreported Debt*	*High Underreported Debt*
Indep. variables:	(1)	(2)
Applications	0.115***	0.430***
	[0.015]	[0.070]
ST Credit	0.005***	0.016***
	[0.001]	[0.002]
Financial Exp	0.159***	0.417***
	[0.014]	[0.041]
Firm Controls	YES	YES
Firm FE	YES	YES
Year FE	YES	YES
Observations	447,905	447,905
R-squared	0.655	0.551

Table E.7. Debt underreporting and product market predation

This table analyzes the hypothesized determinants of debt underreporting, controlling for product market predation. The analysis is conducted at the firm-year level. The dependent variable *Underreported Debt* and *High Underreported Debt* are as defined in Appendix A. *Industry Adjusted Leverage* is the firm's total debt net of cash, scaled by total assets, minus the mean of this ratio for all other private limited liability firms in the same four-digit NACE code. *Applications* is an indicator variable equal to one if the firm applies for a loan to a bank in that year, and zero otherwise. *ST Credit* is short-term bank debt over total liabilities. *Financial Exp* is financial expenses over total liabilities. *Firm Controls* includes *Firm Size*, *Firm Equity*, *Firm ROA*, and *Firm Age* (defined as in Appendix A). All columns include firm and year fixed effects. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	*Underreported Debt*	*High Underreported Debt*
Indep. variables:	(1)	(2)
Industry Adjusted Leverage	0.092***	0.052**
	[0.019]	[0.022]
Applications	0.465***	0.982***
	[0.024]	[0.058]
ST Credit	0.005***	0.017***
	[0.000]	[0.001]
Financial Exp	0.081***	0.195***
	[0.013]	[0.021]
Firm Controls	YES	YES
Firm FE	YES	YES
Year FE	YES	YES
Observations	3,170,904	3,170,904
R-squared	0.673	0.576

Table E.8. Alternative measures of debt underreporting

This table analyzes the hypothesized determinants of debt underreporting using alternative dependent variable choices. The analysis is conducted at the firm-year level. The dependent variable *Log (Underreported Debt)* is the log of the absolute value of *CB−CIRBE Debt*, if *CB−CIRBE Debt*<0, and zero otherwise. *Log (Misreported Debt)* is the log of the absolute value of *CB−CIRBE Debt* multiplied by the sign of *CB−CIRBE Debt*. *CIRBE Debt over CB Debt* is *CIRBE Debt over CB Debt*. *CIRBE Debt Total over CB Debt* is *CIRBE Debt Total over CB Debt*. *Applications* is an indicator variable equal to one if the firm applies for a loan to a bank in that year, and zero otherwise. *ST Credit* is short-term bank debt over total liabilities. *Financial Exp* is financial expenses over total liabilities. *Firm Controls* includes *Firm Size*, *Firm Equity*, *Firm ROA*, and *Firm Age* (defined as in Appendix A). All columns include firm and year fixed effects. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	*Log (Underreported Debt)*	*Log (Misreported Debt)*	*CIRBE Debt over CB Debt*	*CIRBE Debt Total over CB Debt*
Indep. variables:	(1)	(2)	(3)	(4)
Applications	0.088***	0.038**	0.027***	0.053***
	[0.009]	[0.014]	[0.003]	[0.005]
ST Credit	0.006***	0.003***	0.003***	0.007***
	[0.000]	[0.000]	[0.000]	[0.001]
Financial Exp	0.014***	0.006	0.014***	0.030***
	[0.003]	[0.005]	[0.001]	[0.002]
Firm Controls	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	3,170,904	3,170,904	2,940,143	2,940,143
R-squared	0.552	0.642	0.536	0.509

Table E.9. Excluding credit lines

This table repeats the analysis in Table 4 excluding firms that obtain credit lines. See Appendix A for variable definitions. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	*Underreported Debt*	*High Underreported Debt*
Indep. variables:	(1)	(2)
Applications	0.506***	1.029***
	[0.025]	[0.060]
ST Credit	0.011***	0.032***
	[0.001]	[0.003]
Financial Exp	0.042**	0.099***
	[0.015]	[0.025]
Firm Controls	YES	YES
Firm FE	YES	YES
Year FE	YES	YES
Observations	2,303,330	2,303,330
R-squared	0.709	0.632

Table E.10. Determinants of debt overreporting

This table analyzes whether the hypothesized determinants of debt underreporting are also significant determinants of debt overreporting. The analysis is conducted at the firm-year level. The dependent variables, *Overreported Debt* and *High Overreported Debt* are defined in Appendix A. *Applications* is an indicator variable equal to one if the firm applies for a loan to a bank in that year, and zero otherwise. *ST Credit* is short-term bank debt over total liabilities. *Financial Exp* is financial expenses over total liabilities. *Firm Controls* includes *Firm Size*, *Firm Equity*, *Firm ROA*, and *Firm Age* (defined as in Appendix A). All columns include firm and year fixed effects. Standard errors (in brackets) are clustered by firm. *, **, and *** denote significance at the 10%, 5%, and 1% level (two-tail) respectively.

Dep. var.:	*Overreported Debt*	*High Overreported Debt*
Indep. variables:	(1)	(2)
Applications	0.055	0.274
	[0.099]	[0.171]
ST Credit	−0.012	−0.025***
	[0.007]	[0.006]
Financial Exp	0.026	0.066
	[0.051]	[0.105]
Firm Controls	YES	YES
Firm FE	YES	YES
Year FE	YES	YES
Observations	3,170,904	3,170,904
R-squared	0.737	0.616

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