Corporate Debt Structure over the Global Credit Cycle*

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Abstract

We study the determinants of active debt management through issuance and refinancing decisions for firms around the world. We leverage instrument-level data to create a comprehensive picture of the maturity, currency, and security type composition of firms' debt for a large cross-section of countries. At the instrument level, we estimate a predictive model of prepayment as a function of interest costs savings and maturity lengthening motives. We document that there is substantial heterogeneity in prepayment across bonds and loans and across firms, depending on their reliance on bank lending. While debt prepayment is generally successful at extending average maturities and lowering interest rate costs at the firm level, these benefits appear smaller for issuers in emerging market economies. Tight global credit conditions reduce both the ability to prepay debt early and the effectiveness of debt refinancing in reducing interest costs and rollover risk. Put together, our results show that the impact of global credit conditions on firms' debt structure can be traced back to how instrument-level prepayment incentives change over the global credit cycle.

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1 Introduction

The corporate finance literature has long understood that firms' capital structure affects a multitude of firm and aggregate-level outcomes. While a number of papers have explored a variety of different dimensions of capital structure, we know surprisingly little about the determinants of the overall structure of debt, and the interplay between choices along different dimensions of debt characteristics. Furthermore, firms make *active* decisions to adjust the structure of their debt, choosing when and what to issue, and when and what instruments to prepay ahead of maturity, tailoring the composition of debt to both their own needs but also to the (potentially time-varying) demands of lenders both domestically and abroad. In this paper, we study the structure of firms' debt – on a granular level – as an outcome of active debt prepayment.

We view prepayment as a crucial mechanism through which firms manage their interest costs and their rollover risk. As such, we model prepayment as a function of interest cost saving and maturity lengthening motives. A key innovation of our study is the use of comprehensive instrument-level data on firms' debt liabilities. This allows us to fully map how prepayment activity varies across different security types, denomination currencies, and original maturity for a large cross-section of firms across the world. In particular, we exploit the rich nature of these data to explore how prepayment motives, and the interactions between them, depend on security type – bond vs. loans – security currency, and firm characteristics to more thoroughly understand how non-financial corporations manage their debt structure through prepayment. Furthermore, we study the role of the global credit cycle in driving firms' ability to capitalize on prepayment incentives and, thereby, their ability to manage their debt structure.

We document three facts related to how firms manage their debt structure. First, we show that, on average, firms prepay a substantial share of their instruments before their contractual maturity. For both bonds and fixed coupon loans, debt prepayment occurs for both

maturity lengthening and interest cost reducing motives. However, bond prepayment is more sensitive to the interest costs savings incentive than loan prepayment, while loan prepayment is more sensitive to the maturity lengthening incentive. Figure 1 plots average propensities to prepay for bonds and fixed coupon loans as a function of the interest costs savings and maturity lengthening incentives, illustrating the sensitivity differences across the two types of instruments. Comparing prepayment sensitivities across firm types – grouping firms into loan-only issuers, bond-only issuers, and firms that access both bond and loan markets – we find that loan-only issuers are the most sensitive to the maturity incentive, and bond-only issuers are the least sensitive to the interest cost incentive, suggesting that the sensitivity to both types of incentives decreases with firm size.

Second, we show that these debt management choices have a substantial impact on debt structure and that the impact aligns with the "motives" we identify as prompting the prepayment. We find that maturity extension-motivated prepayments are particularly successful at extending maturities and lowering firm risk while interest cost saving-motivated prepayments are particularly successful at lowering average coupons. We further show that debt management in emerging market economies is less effective in extending average maturities and in lowering interest costs, suggesting that, even with active debt management, issuers in emerging market economies may be more exposed to rollover risk than their advanced economy counterparts.

Third, we show that the global credit cycle substantially affects firms' ability to actively manage debt. Tight global credit conditions lower average prepayment probabilities but, importantly, they also affect prepayment sensitivity to the cost-saving and maturity-extending incentives, as can be seen in Figure 2. Finally, we also show that even conditional on being able to prepay, tight global conditions reduce firms' ability to affect their maturity structure. That is, prepayment in tight periods is less successful in extending maturities, reducing average coupons, or reducing overall firm risk.

Put together, our results highlight the importance of understanding the determinants of firms' maturity structure decisions. Firms actively manage their maturity structure through both prepayment and issuance decisions. When the global credit cycle impedes their ability to refinance and issue at their preferred rates, debt instruments reach maturity with much higher probability, exposing firms to rollover risk. The global credit cycle can thus create financial fragilities at the firm level.

A key element of the analysis in this paper is the comprehensive international debt market data collected in Boyarchenko and Elias (2023), which puts together primary and secondary corporate bond market data together with data on corporate debt outstanding, firm balance sheets, and firm default probabilities across a number of countries. In this paper, we focus on the *instrument*-level debt securities outstanding data from the Capital IQ Debt Capital Structure dataset, which allow us to construct granular measures of the maturity, currency, and security type composition of firms' debt outstanding and issuance. As such, Capital IQ offers an improvement over studies that focus on Mergent FISD data, which includes data on corporate bonds only, issued overwhelmingly by U. S. issuers, primarily in USD.

This level of granularity is also a substantial improvement over papers that study debt maturity structure using only on balance sheet data. First, balance sheet data does not contain any information on the currency or security type composition of outstanding liabilities. Second, even along the maturity dimension, the available information is limited. For instance, international balance sheet data only differentiates between long-term debt coming due over the next year versus the rest of long-term debt. That is, balance sheet data provides no information on the share of debt coming due at any other horizon. Even for the U. S., balance sheet data provides precise information on maturities of up to 5 years but not any other horizons.

This paper is related to several strands of literature. First, it closely relates to recent studies that explore debt maturity decisions explicitly. Choi et al. (2018) show that, following a

shock to rollover risk, firms increase the dispersion of their maturity structure so as to avoid having large amounts of debt coming due in any given year. Moreover, they also show that the existing maturity structure of a firm affects the maturity of newly issued bonds as firms seem to avoid issuing new bonds that mature in years in which they have debt instruments maturing. In a similar vein, Xu (2018) shows that high yield firms actively refinance their bonds to extend their maturities, especially when credit supply conditions are lax. In related work, Ma et al. (2023) show that high yield firms systematically exercise the call option in corporate bonds to manage rollover risk and interest costs. Li and Su (2022) argue that surges in international capital flows lead firms to reduce the maturity of their debt.

Second, it relates to the literature that explores the importance of corporate debt maturity structure and rollover risk. Almeida et al. (2011) show that U. S. firms with high shares of long term debt coming due immediately after the 2007 credit supply shock contracted investment more than similar firms with lower rollover risk. Similarly, in a large panel of countries, Elias (2021) shows that firms with high exposure during episodes of large reversals in international capital flows also had to contract investment more than less exposed firms. Relatedly, a number of theoretical papers (see e.g. Brunnermeier and Yogo, 2009; Chen et al., 2021; He and Milbradt, 2014, 2016; He and Xiong, 2012; Diamond and He, 2014) study various aspects of rollover risk and its interplay with firm characteristics as well as its real effects.

Third, this paper is related to a number of studies that explore various aspects of firms' debt structure. One dimension to consider is the types of instruments firms use to finance themselves. Rauh and Sufi (2010) show that there is substantial cross-firm heterogeneity in the complexity of debt structure, with lower-credit-quality firms more likely to have subordinated marketable debt. Using a broad cross-section of firms in the U. S., Colla et al. (2013) argue that debt specialization of U. S. firms has also increased over time, with more than three quarters of firms borrowing using only one type of debt instrument. In the in-

ternational context, John et al. (2021) link the degree of debt specialization to country-level creditor protection, with firms in countries with stronger creditor protection having more concentrated debt structures. More closely related to our paper, Becker and Ivashina (2014) study the substitution between borrowing through corporate bonds and borrowing through the syndicated loan markets, focusing in particular on the determinants of firms' choice to issue one or the other type of instrument. In contrast, we focus on the differences between refinancing activity across different types of securities, and show that differences in prepayment behavior affect the share of loans (relative to bonds and loans outstanding) in firms' balance sheets more so than differences in issuance do. As we discuss in Boyarchenko and Elias (2024c), differences in the share of intermediated credit across firms are not innocuous, as bond and loan financing are differentially affected by credit market conditions and the health of the banking sector.

Another dimension that the literature explores is the currency composition of debt. Du and Schreger (2022) find that a higher reliance on foreign currency debt by the corporate sector is associated with higher risk of sovereign default. Bruno and Shin (2017) document that non-financial corporates around the world engage in carry trades by issuing USD-denominated bonds and using the proceeds to hold local currency instruments. Similarly, using instrument-level amount outstanding to accurately measure the currency composition of debt outstanding, Adams and Verdelhan (2022) argue that firms' exposure to currency risk through their liabilities passes-through to their profits and creates a strong correlation of their equity prices with exchange rates. In a somewhat counterintuitive result, Bleakley and Cowan (2008) find that following a depreciation, firms with higher foreign currency exposure do not seem to be more affected.

This paper also contributes to the literature on the Global Financial Cycle (GFCy) which highlights the importance of global factors in driving local credit and business cycles. Rey (2013) discusses the existence of a GFCy in capital flows, asset prices, and credit growth and

the effect this has on other countries' monetary policy independence. Miranda-Agrippino and Rey (2020) discuss the importance of U. S. monetary policy as a driver of the GFCy, and Miranda-Agrippino and Rey (2015) study the importance of the GFCy as a driver of world assets returns. We capture global conditions using the Global Credit Cycle introduced in Boyarchenko and Elias (2024d), and show that changes in the global credit cycle differentially explain changes in prepayment activity between periods of tight and loose global conditions, relative to both the Miranda-Agrippino et al. (2020) factor and the VIX. Like Mian and Santos (2018), we are interested in how credit cycles affect the ability and willingness of firms to refinance debt ahead of maturity. While Mian and Santos (2018) find that syndicated loan refinancing by higher quality firms is more sensitive to the U. S. credit cycle, we do not see differences in the sensitivity of prepayment activity to the global credit cycle across firm riskiness but rather across borrower countries.

The rest of the paper is organized as follows. In Section 2, we describe the data we use and discuss some patterns in corporate debt structure around the world. Section 3 presents overall results on debt prepayment at the instrument level. Section 4 documents the effect of debt management decisions on firms' overall debt structure. We study the role of the global credit cycle in shaping debt maturity structure in Section 5. Section 6 concludes.

2 Data

We rely on the comprehensive international debt market data collected in Boyarchenko and Elias (2023), which puts together primary and secondary corporate bond market data together with data on corporate debt outstanding, firm balance sheets, and firm default probabilities across a number of countries. This paper focuses on the *instrument*-level debt securities outstanding data from the Capital IQ Debt Capital Structure dataset, which allows us to track the lifecycle of debt securities at the instrument level. We match the instrument-

level data on debt structure with firm-level balance sheet data from consolidated Compustat and Worldscope,[1] and firm-level expected default frequencies (EDFs) from Moody's KMV CreditEdge. Throughout, we consolidate firms to the ultimate parent level, avoiding double-counting of instruments that appear on balance sheets of both the ultimate parent and the issuing subsidiary. As a consequence of this consolidation procedure, we map instruments to countries based on the country of domicile of the ultimate parent.[2]

For each instrument captured in the Capital IQ Debt Capital Structure dataset, we observe a number of security characteristics including maturity, currency, security type, interest rate, and amount outstanding. In both the instrument-level and firm-level analysis in our paper, we consider separately corporate bonds ("bonds") and fixed and variable rate bank debt ("loans").[3] We define loans to be instruments described as either bank loans or term loans, and bonds to be instruments described as either bonds and notes, debentures, or notes payable. Likewise, in studying how the currency composition of firms' debt changes over time, we consider local currency and foreign currency denominated debt separately.

We exploit the granular nature of our data to track instruments throughout their lifetime. Of particular interest to us are debt issuances, debt prepayments, and debt maturities. We define an issuance as a debt instrument appearing for the first time in the debt structure for a given firm, a debt maturity as an instrument observed for the last time in the debt structure for a given firm within 12 months of the contractual maturity date, and a debt prepayment as an instrument observed for the last time in the debt structure for a given firm more than 12 months earlier than the contractual maturity date.

[1] Compustat includes Compustat North America and Compustat Global. For firm-years that are available in both Compustat and Woldscope, we use data from Compustat. If firm-years are unavailable in Compustat, we use Worldscope. Boyarchenko and Elias (2023), Appendix D, reports the match rate between Compustat and Worldscope and compares the information provided in both datasets for a number of key firm characteristics. See Boyarchenko and Elias (2023) also for a detailed description of the data sources and the matching procedure between debt amount outstanding, balance sheet data, and expected default frequencies.

[2] This is similar to the mapping of international capital flows undertaken in Coppola et al. (2021) and subsequent papers.

[3] Note that debt instruments overall include additional types of borrowing, including revolving credit (bank overdrafts, revolving credit, or letters of credit outstanding) commercial paper, mortgages, convertible debt, and capital leases.

While Capital IQ provides identifiers for individual instruments, these identifiers may sometimes be unreliable in tracking an instrument over time as we discuss in greater detail in Boyarchenko and Elias (2023). Since we are interested in understanding how firms manage their debt structure, we err on the side of caution in identifying issuances and prepayments. In particular, we exclude from our instrument-level sample instruments that either first appear in debt structure together with a large number of other instruments or last appear in debt structure together with a large number of other instruments. To give a concrete example of a situation in which this may happen, if an operating subsidiary were to be spun-off from a parent company, their debt instruments would disappear from the parent company's debt structure but would not necessarily have been fully prepaid. Because multiple debt securities (belonging to the operating subsidiary) leave the parent company debt structure all the same time, we would flag these instrument disappearances as potentially suspect and exclude them from our instrument-level regressions.

Previous studies on debt prepayment have often used data from Mergent FISD and hence, it is worth highlighting the differences between the Capital IQ Debt Capital Structure data and said dataset. Mergent FISD includes data on corporate bonds only, issued overwhelmingly by U. S. issuers, primarily in USD. Instead, Capital IQ includes data on multiple types of instruments (e.g. bonds and loans), in various currencies, across a large set of countries. As we show in our paper, there are important differences in prepayment behavior across different type of instruments. Furthermore, we show that, for the same type of instrument, firms that have access to more than one credit market prepay in a different way than firms that have access to only one market, highlighting the importance of capturing a holistic view of debt outstanding.

These benefits in more comprehensive debt coverage around the world come at the cost of some data quality. Of note, Capital IQ data do not include information on the contractual call provisions and covenants in debt instruments, and have sparsely populated information

on issuance dates. Capital IQ data also have a shorter history (comprehensive coverage starts in 2002 relative to 1995 for Mergent FISD) and, since Capital IQ data come from financial statements, less precise information on the timing of capital actions (Mergent FISD dates actions that affect amount outstanding to the effective date).

In addition to tracking the same instrument over its lifetime, we also use the detailed debt structure information to construct firm-level measures that capture key aspects of firms' debt structure. In particular, measuring remaining time to maturity as the difference between the reported maturity date and the fiscal period end date, we construct measures of amount outstanding by maturity bucket.[4] While firm-level balance sheet data from Compustat and Worldscope provides information on long-term debt coming due in the following 12 months,[5] our firm-level measure of amount outstanding by maturity bucket allows us to have a more comprehensive view of the term structure of debt outstanding. Moreover, the granularity of the instrument-level dataset enables us to build the term structure of debt outstanding by security type and currency. That is, we can measure, for example, the amount outstanding of corporate bonds denominated in USD that each firm has due in 5 years.

We compute the weighted average maturity (WAM) of firm debt outstanding, as well as the weighted average coupon (WAC) of fixed-coupon debt outstanding and the weighted average spread (WAS) of variable rate debt. We leverage the granularity of our data and construct these measures for both the overall debt structure and, importantly, also by currency and security type.

Finally, we obtain firm characteristics from the consolidated Compustat and Worldscope financial statements data. We construct standard firm characteristics, including log size (total assets in USD terms), leverage, profitability (EBITDA over lagged total assets), cash

[4] For remaining time to maturities up to and including 10 years, we construct one year buckets. We bucket maturities between 10 and 30 years into three buckets: between 11 and 15 years, between 16 and 20 years, and between 20 and 30 years. Debt securities may also have remaining time to maturity greater than 30 years, or have perpetual maturity, or have missing maturity information.

[5] Compustat North America includes also measures of long-term debt coming due in each following year up to 5 years.

holdings (cash + short-term investments) over lagged total assets, and operating income over lagged total assets. We measure firm riskiness using the one year expected default frequency (EDF) from Moody's KMV CreditEdge. We assign firms into three credit risk buckets based on the percentiles of the log EDF distribution within a country, with the lowest risk firms corresponding to the P25 of the log EDF distribution and the riskiest firms corresponding to the P75 of the log EDF distribution within a country.

We restrict our sample to 44 countries – 24 advanced and 20 emerging market economies – for which we have a sufficient number of firms and individual instruments to measure prepayment at the instrument level. We further restrict our sample to non-financial firms at the ultimate parent level. Given these restrictions, the initial sample is comprised of 1,826,163 unique instruments corresponding to 61,906 unique firms (610,853 firm-years). Out of these instruments, 1,327,477 have an initial time-to-maturity of more than one year, of which we use 108,090 for our measurement of prepayment probabilities.[6] In our firm-level regressions, we additionally restrict our sample to firms matched to balance sheet data (43,433 firms corresponding to 367,565 firm-years), for which the discrepancy between total debt reported in balance sheet data and total debt reported in debt structure data is no more than 10% in either direction.

Table 1 reports the distribution of instruments in our sample across countries, while Table 2 displays key statistics on the sample of instruments used for the prepayment model. Across all types of instruments, the average original time-to-maturity is almost 6 years, with bonds having an average original maturity of more than 1.25 years longer than the average maturity of loans. Instruments appear in our estimation sample for an average of around 3.7 years, suggesting that we track instruments well over their lifetime. Bonds are prepaid at a lower average rate than either floating rate or fixed coupon loans, especially if we also consider

[6] We restrict the sample of instruments for which we estimate prepayment probabilities to (1) only fixed coupon bonds, fixed coupon loans, and variable rate loans; (2) with no more than 30 years of original time-to-maturity; (3) with more than one observation in our sample; (4) whose interest cost incentive to prepay is less than 5% in absolute value terms.

partial prepayments of at least 30% of amount outstanding.

Turning to firm-level summary statistics in Table 3, we see similar patterns of average prepayments at the firm level, with bonds less likely to be prepaid by the average firm in our sample than loans. Unsurprisingly, bonds are a less prevalent form of financing than loans in our sample, with the average firm having 11% of debt outstanding in bonds (and around 1 bond outstanding on average) but 17% of debt outstanding in fixed coupon loans (around 1.7 loans outstanding on average) and 15% of debt outstanding in variable rate loans (around 1 loan outstanding on average). The average firm in our sample has a weighted average maturity of slightly more than 4 years across its outstanding debt instruments, 5.5% weighted average coupon across its fixed coupon debt, and 2.25% weighted average spread across its variable rate debt. However, there is substantial variation in both standard firm characteristics and the composition of their debt across firms in our sample.

3 Debt prepayment

We argue that firms proactively manage their debt structure through prepayment decisions that allow them to change the composition of their debt along a number of dimensions instead of passively waiting for their instruments to mature. In this section, we leverage instrument-level data to explore how firms manage their interest costs and their rollover risk through prepayment.

To that end, we model prepayment as a function of "interest cost saving" and "maturity lengthening" motives. Firms can lower their interest costs by prepaying a high coupon instrument and replacing it with a new lower coupon instrument. The incentive to prepay for interest cost management purposes will thus crucially depend on the gap between rates on existing debt and prevailing market rates at which the firm could hypothetically issue, the "moneyness" of the instrument.

Firms may also be interested in prepaying their debt early to manage the maturity composition of their debt structure and, in particular, to mitigate their rollover risk. As with the interest cost incentive, the incentive to prepay for maturity management motives will depend crucially on the difference between the remaining time-to-maturity of existing debt and the maturity at which the firm could hypothetically issue new debt. In general, the interest cost and maturity management incentives may interact: securities issued during periods of high interest rates will both have a positive interest cost incentive to prepay and maturity incentive to prepay if interest rates decline during its lifetime. While we first focus on these two incentives separately to understand how prepayment behavior changes across instrument types, firms, and countries, in subsection 3.3, we explore how the two incentives interact.

Our measures of the "interest cost" incentive and the "maturity" incentive are constructed under the assumption that firms have a preferred maturity habitat. That is, when firms prepay an instrument of a given original maturity, they issue a new instrument of a similar (original) maturity. This assumption allows us to identify a set of comparable instruments being issued at any given point in time that we can use to compute prevailing market rates.

Importantly, the rich nature of our dataset allows us to compare how the prepayment sensitivities to both motives vary across security type (bond vs. fixed/variable loans). Furthermore, we can compare prepayment sensitivities not only across firms but also within firms. This allows us to abstract from potential differences in preferences for prepayment across firms.

3.1 Interest rate incentive to prepay

We begin by considering the incentive to prepay as a function of instrument moneyness. We define moneyness as the difference between the instrument's coupon rate and the average coupon rate of comparable instruments being issued in the same country-year. We consider instruments to be comparable to each other if they are the same instrument type (fixed-coupon bonds, fixed-coupon loans, and variable-coupon loans), same currency type (local

vs. foreign), have the same original time to maturity bucket (buckets are defined as: 1-3, 3-5, 5-10, 10-20, 20-30, and 30-50 years), and are issued by firms with similar credit risk (same tercile of the log-EDF distribution at the country level). For variable-rate loans, we also require the comparable instruments to be issued with the same (broad) benchmark index (e.g. LIBOR, EURIBOR, FHLB, prime rate).

We estimate a linear predictive prepayment probability model:

$$Prepayment_{i,t+1} = \beta_0 + \beta_R \underbrace{\left(IR_{i,t} - \overline{IR}_{c,t}\right)}_{\text{Moneyness}_{i,t}} + \ldots + \epsilon_{i,t} \tag{1}$$

where $IR_{c,t}$ is the average interest rate of issuances in country c, year t, for comparable instruments. We include country, firm, currency type fixed effects. We estimate β_R as a step function to allow for potential non-linearity in the effect of interest incentive on prepayment probability. We only include securities with at least 1.5 years remaining time to maturity (so that securities are prepaid at least 6 months prior to their contractual maturity) and with absolute moneyness lower than 5%.

Table 4 reports the estimated coefficients from the model above. Starting with the prepayment probability for bonds, Table 4a shows that prepayment probability increases with moneyness. The relationship is markedly non-linear: while negative moneyness does not have a significant effect on prepayment probability, positive moneyness does. Moreover, the additional effect on probability increases as we move further into the money. The effects are also economically significant: while on average around 8.6% of bonds are prepaid in a given year, the probability jumps by over 3 percentage points (over a 30% increase) for the instruments with a moneyness over 2.5%.

The remaining columns of Table 4a show that these results are robust: Column 2 adds year and country-year fixed effects, column 3 excludes the global financial crisis and the Covid-19 period from the sample. Column 4 restricts the sample to bonds for which we have

firm-level characteristics. Finally, column 5 controls for a set of firm-level controls (log size, profitability, leverage, log investment). The only difference across columns worth noting is that restricting the sample to instruments for which we have firm-level data (columns 4 and 5) leads to a higher interest rate sensitivity, suggesting that larger firms are more sensitive.

Table 4b and Table 4c explore the sensitivity of prepayment to the interest rate incentive for fixed coupon and variable rate loans, respectively. Starting with fixed coupon loans, we observe that their average probability of prepayment is higher than that of bonds. However, differently than in the case of bonds, the sensitivity in the interest rate incentive is observed mostly in the negative buckets. That is, fixed coupon loan prepayment is lower when the interest rate incentive is substantially negative but it is not higher when the interest rate incentive is positive. As in the case of bonds, columns 2 – 5 show that alternative specifications do not alter these conclusions. Finally, Table 4c shows that prepayment of variable rate loans is mostly insensitive to moneyness. This is perhaps not surprising as most of the variation in coupons paid on variable rate loans comes from a variation in the level of the benchmark rate rather than changes in the spread.

Overall, the results in Table 4 suggest significant differences in the sensitivity of prepayment to the interest cost saving incentive between bonds and loans. We formally test for differences between bonds and fixed coupon loans in Table 5 where we pool bonds and loans and then interact moneyness with a dummy indicating whether an instrument is a bond or a loan. In order to capture the non-linearity between positive and negative values of moneyness, we estimate the slope separately between positive and negative moneyness. This allows us to explore the interactions in a more parsimonious way (at the cost of potentially missing some of the non-linearities).

Consistent with the results discussed above, column 1 shows that the bond prepayment probability increases the more in the money a bond is. Similarly, column 2 shows that loan prepayment probability decreases more the more out of the money an instrument is. In

column 3, we pool the two sets of instruments and find that the differences in both the average probability of prepayment and the sensitivity to the interest rate incentive between bonds and loans are statistically significant. Loans are prepaid at a higher rate and are less sensitive to positive moneyness and more sensitive to negative moneyness. These results hold even when we restrict the sample to firms that have access to both bonds and loans: column 4 displays results for instruments of firms that have accessed bonds and loan markets at least once in our sample, while column 5 further restricts the sample to instruments of firms in years in which they have both bonds and loans outstanding.

Table 6 explores how a number of bond/firm characteristics affect the interest rate incentive to prepay explored above. In particular, we consider whether prepayment behavior differs across issuers in advanced and emerging market economies (column 2), across issuers with different credit risk (column 3), across securities issued in domestic versus foreign currency (column 4), and across issuers that have experienced a large change in credit risk over the previous year (column 5). Columns 6 – 10 and 11 – 15 repeat the exercise for fixed coupon loans and variable rate loans. Overall, the results in the table show that the baseline results are similar across the different categories explored in each column. This suggests that our main results are not driven by instruments of a particular currency or those issued by a particular type of firm/country.

Our discussion so far has focused on a strict definition of prepayment – instruments leaving the balance sheet at least a year before contractual maturity. We now consider two alternative definitions of prepayment activity. First, we expand the definition of prepayment to also include "partial prepayments", which we define to be observations in which the instrument's amount outstanding declines year-on-year by more than 30% (without reaching 0). Second, we focus on observations in which a prepayment is accompanied by an issuance (of the same type of instrument at the firm level). This attempts to more precisely capture early refinancing behavior rather than early retirement of securities.

Table 7 reports the estimated coefficients for each definition of an event. Column 1 shows our baseline definition, while column 2 adds partial prepayments, and column 3 only considers refinancings. Across instruments, we observe that partial prepayments and refinancings exhibit similar sensitivity to the interest rate incentive as the baseline prepayment results discussed above.

3.2 Maturity management incentive to prepay

We now turn to exploring the maturity lengthening incentive to prepay. As with the interest cost savings incentive, we maintain the assumption that firms aim to refinance prepaid debt with instruments of the same type and similar original maturity so that, for example, a bond issued with 10 years original time to maturity and prepaid with 2 years of maturity left will be refinanced with a new 10 year bond, while a loan issued with 5 years original time to maturity and likewise prepaid with 2 years of maturity left will be refinanced with a new 5 year bond. We thus measure the maturity incentive to prepay as the ratio between the instrument's age – how long has passed since the instrument first appeared on the firm's balance sheet – and its original time-to-maturity.

As with the interest cost incentive, we estimate a linear predictive prepayment probability model as a function of the maturity incentive:

$$Prepayment_{i,t+1} = \beta_0 + \beta_M \underbrace{\frac{\text{Age}_{i,t}}{\text{Original maturity}_{i,t}}}_{\text{Maturity incentive}_{i,t}} + \ldots + \epsilon_{i,t}. \tag{2}$$

As before, we include country, firm, and currency type fixed effects, and estimate β_M as a step function to allow for potential non-linearity in the effect of the maturity incentive on prepayment probability. As explained above, we only include securities with at least 1.5 years remaining time to maturity.

Table 8 reports the estimated coefficients from the model above, where 0.5 is the omitted category. Starting with the results for bonds, Table 8a shows that prepayment increases as the age of the instrument increases. Comparing the coefficient in the first and the last row, we see that the probability of prepayment in a given year increases by over 23% as the bond goes from origination to maturity. Similar to the results discussed in the context of the interest rate incentive in Section 3.1, columns 2 – 5 show that the results in column 1 are robust to different specifications and subsamples.

Table 8b and Table 8c report similar results but for fixed coupon loans and variable rate loans respectively. Both types of loans exhibit a significantly larger sensitivity to the maturity incentive than bonds do. This is noteworthy, considering that, as Table 4 shows, loans are not particularly sensitive to the interest rate incentive.

Table 9 more formally tests whether bonds and fixed coupon loans have different prepayment probabilities and different sensitivities to the maturity incentive. Columns 1 and 2 run the prepayment dummy against the maturity incentive measure separately for bonds and loans and find a higher coefficient for loans. Column 3 pools both types of instruments and shows that, on average, firms have a 14 percentage points higher probability of prepaying loans than bonds (third row). Perhaps more importantly, the positive and statistically significant coefficient on the loan-maturity incentive interaction (second row) confirms that loans have a higher sensitivity to the maturity incentive than bonds do. As with the differential sensitivity of bond and loan prepayment to the interest cost incentive, a natural question to ask is whether these results driven by differences in characteristics and prepayment behavior between firms that issue only loans and the rest of the firms. Column 4 restricts the sample to firms that issue at least one bond and at least one loan in the sample and finds similar results, while column 5 further restricts the sample to instruments of firms in years in which they have both bonds and loans outstanding. The results are virtually unchanged, suggesting that the results are indeed driven by instrument characteristics and not by firm

characteristics.

Table 10 explores how a number of bond/firm characteristics affect the maturity incentive to prepay. As discussed in the context of Table 6, the baseline results do not seem driven by any particular instrument/firm characteristics. The main difference seems to be that upgraded firms seem to exhibit a higher probability of loan prepayment (columns 10 and 15).

Finally, Table 11 explores different definitions of prepayment activity. Column 1 shows our baseline definition, while column 2 adds partial prepayments, and column 3 only includes refinancings. In all three panels, column 2 shows that adding partial prepayment to full prepayments leads to significantly higher sensitivity to the maturity incentive as well as a significantly higher probability of prepayment. On the other hand, column 3 shows that refinancings exhibit a significantly smaller sensitivity to the maturity incentive as well as significantly smaller probability of occurring. Both sets of results are somewhat intuitive: adding partial prepayments to the prepayment definition expands the number of events identified as a prepayment and hence increases the average probability of occurrence. At the same time, restricting the sample to only firm-years with issuance observations (refinancings) restricts the number of events and hence leads to a lower average probability of the event occurring.

3.3 Interest cost – maturity incentive interactions

The results in Tables 4 and 8 highlight that firms' prepayment is consistent with both an interest cost saving and a maturity extension motive. We now examine how these two incentives interact.

Table 12 studies how prepayment sensitivity to moneyness changes with the (relative) age of the instrument. In particular, we split the sample of instruments into those with low maturity incentive (no more than a quarter of the contractual lifetime of the security has passed),

medium maturity incentive (more than a quarter but less than half of the contractual lifetime of the security has passed), and high maturity incentive (at least half of the contractual lifetime of the security has passed). Comparing the estimated bond prepayment sensitivities to the interest cost savings incentive across columns 2 – 4 of Table 12a, we see that the securities with either low or medium incentive to prepay for maturity extension reasons are more sensitive to moneyness (columns 2 and 3) while securities that have the most incentive to prepay for maturity extension reasons appear largely insensitive to moneyness. In other words, for bonds close to their contractual maturity, the maturity extension incentive seems to dominate the interest cost savings incentive. We see similar patterns of changes in the prepayment sensitivity to moneyness for fixed coupon loans in Table 12b, with only the loans closest to issuance exhibiting sensitivity to the interest cost saving incentive.

Turning to how the moneyness of the instrument affects the prepayment sensitivity to the maturity incentive, in Table 13 we see that, for bonds, the probability of prepayment is less sensitive to maturity incentives below 70% for out-of-the-money (moneyness less than -0.5%) securities than for in-the-money (moneyness above 0.5%) securities but more sensitive to the maturity incentives for high values of the maturity incentive. This again highlights the result from above: when a bonds gets closer to maturity, the firm has an incentive to refinance the bond regardless of the interest cost savings motive. At the same time, in-the-money securities are less disincentivized by low maturity incentives. That is, firms appear to be willing to prepay relatively "young" securities if the interest cost savings so warrants it. In Table 13b, we see that the impact of moneyness on the prepayment sensitivity to the maturity incentive is larger, with in-the-money loans insensitive to what fraction of contractual maturity remains, as long as that fraction is 50% or less.

Overall, Tables 12 and 13 show that extending maturities when an instrument is close to maturity takes priority over the interest cost savings but that the relative sensitivity to maturity extension and interest cost saving incentives is different across bonds and loans. These

stark differences in the sensitivity to prepayment incentives between bonds and loans could be explained by firm-level differences if firms that issue bonds are substantially different that firms that issue loans. Table 14 explores this possibility by studying prepayment behavior across different types of firms. In particular, we classify firms into those that only ever issue bonds in our sample, firms that only ever issue loans (whether fixed coupon or variable rate), and firms that issue both types of instruments at some point in the sample.

Starting with the differential sensitivity of bond prepayment to the interest rate incentive in column 1, we see that firms that issue both bonds and loans are more sensitive to the moneyness incentive than firms that only issue bonds. In column 2, we see that bond-only firms and firms that issue both bonds and loans have similar sensitivities to the maturity extension incentive. Finally, putting the two sets of incentives together in column 3, we see that these conclusions are not driven by the two incentives being considered separately: firms that access both loan and bond markets at least once in our sample are more likely to prepay bonds on average, are more sensitive to the interest cost savings incentive but are not more sensitive to the maturity incentive.

In columns 4 – 6, we see that the picture is reversed for fixed coupon loans. While firms that issue both bonds and loans are not differentially sensitive to the moneyness incentive in choosing when to prepay a fixed coupon loan relative to firms that only issue loans, they are less sensitive to the maturity incentive. Finally, columns 7 – 9 show that prepayment of variable rate loans is similar across loan-only firms and firms that issue both bonds and loans.

One potential explanation for these findings is the role of the relative sizes of different types of firms and the alternative sources of funding that different types of firms have. Firms that have access to both the bond and loan markets are likely to be larger than loan-only borrowers. Furthermore, to the extent that credit conditions in bond and loan markets are not perfectly synchronized, access to the bond market provides such firms with a natural

hedge to loan rollover risk, making loan prepayment less sensitive to the maturity incentive.

In contrast, bond-only firms are likely to be larger than firms that access both bond and loan markets. As such, bond-only firms are likely to be less credit-constrained than firms that use both bonds and loans to borrow. The interest cost savings incentive is thus potentially less salient for bond-only borrowers. Putting these results together, we thus have that loan-only firms – likely to be the smallest in size across the three groups of borrowers – are most sensitive to the maturity extension motive. The firms that have access to both bond and loan markets are, instead, more sensitive to the interest rate incentive than the bond-only firms, which are likely to be the largest firms in our sample. In other words, the relative importance of the maturity lengthening and interest costs savings incentives changes across different firm sizes.

4 Debt management and firm-level outcomes

The previous section provides suggestive evidence that firms actively manage the composition of their debt through debt prepayment. We now explore whether debt issuance, retirement, and refinancing decisions affect the overall debt structure and cost of debt.

In particular, we estimate how firm-level characteristics change in years in which firms make active debt management decisions across different types of instruments by regressing year-over-year changes in firm characteristics on event dummies, lagged firm characteristics, and firm, country, and year fixed effects

$$\Delta\text{Debt char}_{f,t} = \alpha_f + \alpha_t + \alpha_c + \nu_d Event_{f,t} + \gamma \mathbf{X}_{f,t-1} + \epsilon_{f,t}, \tag{3}$$

where $Event_{f,t}$ is a categorical variable capturing the type of debt management activity done by firm f in year t. We define issuance as a firm-year observation in which at least

one instrument of a given type (bond, fixed coupon loans, variable rate loans) is issued but no instrument of the same type is either prepaid or matures; a retirement as a firm-year observation in which at least one instrument of a given type is prepaid or matures without a corresponding instrument issuance; an early refinancing as a firm-year observation in which at least one instrument of a given type is issued and an instrument of the same type is prepaid early; and a refinancing as a firm-year observation in which at least one instrument of a given type is issued and an instrument of the same type matures.

Table 15 reports the estimated coefficients from regression (3). Starting with bond management events in Table 15a, we see in the first two columns that new issuance of bonds increases both the total amount of debt outstanding (normalized to lagged total assets) and the (log) one year expected default frequency, while bond retirement decreases total debt outstanding and the one year EDF. This is unsurprising given the close relationship between firm leverage and firm credit risk. Relative to firm-years in which no management of bond outstanding occurs, all bond management events increase the weighted average maturity of bonds outstanding (column 3), with the largest increases occurring when issuance is coupled with either bond prepayment or maturity. That is, maturity lengthens particularly when old debt is retired and new debt is issued at the same time. The weighted average coupon of bonds likewise decreases more in years with active debt management (column 4), but the biggest coupon savings occur when old debt is prepaid early and new debt is issued in its place.

The other two panels of Table 15 show that similar results hold around events that manage the amount of fixed coupon (Table 15b) or variable rate (Table 15c) loans. Total debt and firm default probabilities increase with new issuances and decline with debt retirement, weighted average maturity increases especially when debt is refinanced, and weighted average coupons on fixed coupon loans decline especially when loans are refinanced early. Consistent with the spread on variable rate loans primarily being a function of the firm's credit risk

rather than the overall interest rate environment and with the lack of prepayment sensitivity for variable rate loans to the moneyness incentive noted in the previous section, we do not observe significant changes in the weighted average spread around variable rate loan debt management events.

We have so far focused our discussion on firm-level outcomes around firm risk (total debt and EDFs), average maturities, and average coupons as they are directly related to the prepayment incentives described in the previous section. However, as column 5 in all panels show, prepayment activity also affects the share of intermediated credit – the ratio between loans and the sum of loans and bonds outstanding. The share of intermediated credit decreases when bonds are retired and increases when bonds are issued or refinanced (either early or at maturity). For loans, instead, only new issuances increase the share of intermediated credit while retirements decrease it. The fact that loan refinancings do not affect the share of intermediated credit – while bond refinancings do – suggests that loan amounts refinanced are closer to parity. The differential impact on the share of intermediated credit is not innocuous. As we discuss in Boyarchenko and Elias (2024a,b,c), bond and loan financing are differentially affected by credit market conditions and the health of the banking sector.

Turning to the relationship between changes in firm characteristics and the quantity of debt issued, prepaid early, or matured, we see in Table 16 that the more bonds (as a fraction of total outstanding) are prepaid, the more the weighted average maturity of bonds decreases. In contrast, maturing bonds increase the weighted average maturity of bonds outstanding, highlighting the rollover risk management incentive of bond prepayment. Similar results hold when fixed coupon loans are prepaid, with the larger the fraction of loans prepaid, the greater the shortening in weighted average maturity of fixed coupon loans.

We investigate how the motives for early refinancing affect firm-level outcomes in more detail in Table 17. In particular, we define "interest" early refinancings as those in which the instruments refinanced have positive moneyness but less than half of their contractual

lifetime has passed; "maturity" refinancings as those in which the instruments refinanced have negative moneyness but more than half of their contractual lifetime has passed; "both" refinancings as those in which the instruments refinanced have positive moneyness and more than half of their contractual lifetime has passed; and "neither" refinancings as those in which the instruments refinanced have a negative moneyness and less than half of their contractual lifetime has passed. Importantly, we identify these prepayment motives using previous period information. That is, for example, refinancings identified as being done for interest costs savings motives are identified as such because the instrument was in-the-money the previous year, not because the refinancing lowered overall interest costs.

While total debt and firm default probabilities are not differentially affected by refinancing for different motives, we see that refinancings that occur for maturity lengthening motives – either in isolation or coupled with an interest cost savings motive – are particularly effective in lengthening maturities across all three types of instruments. Likewise, refinancings that occur for interest cost savings motives are particularly effective in lowering weighted average coupons and weighted average spreads. These results suggest that the prepayment motives we identify at an instrument-level translate into effective interest cost and rollover risk management at the firm level.

Finally, in Table 18 we consider whether firm-level characteristics are differentially affected by debt management decisions for firms in advanced and emerging market economies. We see that debt management in emerging market economies is less effective in extending weighted average maturities and early debt refinancing is less effective in lowering interest costs for bonds. However, these effects do not translate into a differential impact on total debt and firm risk between advanced and emerging market economy issuers.

To sum up, the results in this section show that firms actively manage the composition of their debt through debt issuance, retirement, and refinancing. These debt management choices have consequences for the firms' credit and rollover risk, the composition of their

debt across maturities, instrument types, and currency, and the interest expense borne by the firms.

5 Global credit conditions and debt management

In the previous sections, we explore the drivers of prepayment behavior at the instrument level and how such prepayment affects firm-level debt structure. We now move beyond the micro-level drivers of debt management to explore how global credit conditions affect firms' ability to actively manage their capital structure.

We proxy for global credit conditions using the global credit cycle (GCC) as in Boyarchenko and Elias (2024d), where we identify a global credit factor from monthly return predictability regressions in a large, global security-level cross-section of corporate bond returns. We aggregate the monthly factor to an annual frequency by compounding monthly returns. Figure 3 plots the resulting annual time series of the global factor along with two often used proxies for global financial conditions: the VIX and the global financial cycle (GFC) as in Miranda-Agrippino et al. (2020).

We begin by providing evidence that global credit conditions comove with issuance characteristics. Columns 1 and 2 in Table 19 find a positive correlation between global credit conditions and the coupon rate of newly issued bonds and fixed coupon loans. That is, bonds and fixed coupon loans issued in periods of tighter credit conditions exhibit higher coupon rates. Moreover, column 4 shows that bonds issued in periods with tight credit conditions have a slightly lower original time to maturity. Together, these results suggest that, especially for bonds, issuance during tight periods is more costly (higher coupons) as well as potentially associated with higher rollover risk (shorter maturities).

5.1 Prepayment over the global credit cycle

We then explore how the sensitivity of prepayment to the interest cost saving and maturity incentives vary across the global credit cycle. We augment the probability model discussed in Section 4 to include the global credit cycle:

$$Prepayment_{i,t+1} = \beta_0 + \beta_I \left(Incentive_{i,t}\right) + \beta_G \left(GCC_t\right) + \beta_{IG} \left(Incentive_{i,t} \times GCC_t\right) + \ldots + \epsilon_{i,t}$$

where $Incentive_{i,t}$ is the incentive to prepay (either moneyness or the age of the instrument) and GCC_t is our measure of global credit conditions. We include country, firm, and currency type fixed effects. β_G then captures the sensitivity of prepayment to global credit conditions, while β_{IG} captures the additional sensitivity of prepayment to the incentive under consideration due to the global credit cycle.

We start by exploring how the interest cost saving incentive is affected by global credit conditions. Table 20 presents the results of the estimation above, including a number of additional specifications. Starting with column 2, we see that tight global credit conditions (positive GCC) lower the probability of bond prepayment. Importantly, the statistically insignificant coefficient on the interaction suggests that global credit conditions do not alter the sensitivity of prepayment to moneyness. However, the inclusion of the EM dummy and the corresponding interactions (column 3) show that, in emerging economies, tight global credit conditions reduce the sensitivity of prepayment to the moneyness incentive. Column 5 shows that medium and high risk firms have a higher sensitivity to moneyness than safe firms. Importantly, column 6 suggests that only the sensitivity of medium risk firms is affected by global credit conditions.

The results displayed in columns 7 – 12 (fixed coupon loans) and 13 – 18 (variable rate loans) show a more muted effect of global credit conditions on the sensitivity of prepayment to the interest cost saving incentive. While tight global credit conditions do reduce the probability

of prepayment (columns 8 and 14), the interactions between GCC and moneyness are mostly insignificant.

Table 21 extends the analysis to the maturity incentive. As observed in the context of the interest cost saving incentive, tight global conditions reduce average prepayment probability across security types (second row, columns 2, 8, and 14). However, different from what we observe for the moneyness incentive, the interaction between the maturity incentive and global credit conditions is significant for all instrument types. The positive coefficient on the interaction can be understood as an increase in the prepayment sensitivity to the maturity incentive as global credit conditions tighten up. This result is intuitive: while firms prepay fewer instruments on average when conditions are tight, they are more sensitive to the maturity incentive. That is, they are more likely to react to the incentive to extend maturities, and hence reduce rollover risk.

As in the case of the moneyness incentive discussed in the context of Table 20, the interactions with risk dummies are largely insignificant, suggesting that global credit conditions do not affect the maturity incentive differently for firms depending on their risk level (columns 6, 12, and 18).

Finally, in Table 22 and Table 23 we explore how the main prepayment results discussed in the previous two tables depend on the measure of global financial conditions used. We compare the results obtained using the global credit factor of Boyarchenko and Elias (2024d) with results using the VIX and the global financial cycle factor (GFC) as in Miranda-Agrippino et al. (2020), two frequently used proxies of global financial conditions.

Starting with the moneyness incentive for bonds, Table 22 column 4 shows that the GFC factor exhibits similar behavior than the GCC: tight GFC lowers prepayment overall but the interaction of the cycle factor with moneyness is not significant. Moreover, running a horse race between the two factors, column 5 shows that both GCC and GFC stay significant, suggesting that these two factors are relevant in capturing global conditions that do not

fully overlap. In terms of the results for loans (columns 6 – 15), the GFC is insignificant across specifications and type of loan (columns 9 – 10 and 14 – 15). On the other hand a high VIX does appear to reduce overall loan prepayment (columns 7 and 12).

Turning to the maturity incentive, Table 23 shows that while the GFC factor captures similar dynamics than GCC (columns 1 and 4), the VIX does not (column 2). Similar to the results for the interest cost saving motive, column 5 shows that GCC and GFC stay significant when included together. It is important to notice than in both cases, the interaction between the factor and the maturity incentive is not significant, suggesting that while tight global conditions reduce prepayment probability, they do not affect the sensitivity to the maturity incentive.

Turning to loans, columns 8 and 13 show that the VIX is an important factor driving prepayment even after controlling for the GCC. However, once we control for the GCC, the sign of the coefficients on the VIX is counterintuitive. Higher levels of VIX appear to predict a *higher* average probability of loan prepayment once we control for the GCC, suggesting that the VIX is a less precise proxy of global credit conditions even for the loan market.

Overall, the results in this section suggest that the GCC factor – as constructed in Boyarchenko and Elias (2024d) – is a more consistent driver of prepayment than either the VIX or the GFC across specifications and type of instrument.

5.2 Firm-level outcomes over the global credit cycle

As discussed in the previous section, firms' debt management decisions in the form of debt issuance, prepayment, and refinancing, have consequences for the overall amount and composition of debt. In Table 24, we investigate how the various debt management decisions over the global credit cycle differentially affect firm-level debt aggregates. Starting with column 1 in Table 24a, we observe that changes in global credit conditions do not affect the

sensitivity of total debt to each of the firm actions explored (insignificant coefficients on the interactions). However, tightenings in global credit reduce the effectiveness of each type of decision to affect debt structure. That is, the decrease in EDFs is more muted when credit conditions are tightening (column 2), average maturities increase by less (column 3), and average coupons decrease by less (column 4). Together, columns 2 – 4 show that prepayment decisions are less effective in reducing overall risk (EDFs), rollover risk (maturities), or interest costs (coupons) during periods in which credit conditions are tigthening.

While the results in Table 24a highlight that the effectiveness of active debt management in affecting overall debt structure is impaired by tight global credit conditions, Table 24b and Table 24c show a more muted role for loan events. A tightening in the global credit factor does not materially change the effectiveness of loan refinancing in extending maturities or lowering average interest costs. Despite the lack of differential impact on the WAM and WAC, Table 24b shows that loan refinancings during tight global credit conditions do differentially increase firm risk, suggesting that global credit conditions may be detrimental to firms' overall balance sheet health even when they do not affect the effectiveness of debt management actions.

Finally, Table 25 explores how firm-level debt structure is affected by the different motives behind prepayment depending on global credit conditions. As discussed in the context of the previous table, tight global credit conditions reduce firms' ability to achieve the intended goal of each type of active debt management decision. For instance, column 3 of Table 25a shows that when conditions are tightening and firms prepay for maturity reasons, the effect on average maturities is reduced – as evidenced by the negative coefficient on the interactions with the "maturity" and the "both" motive. That is, even though firms still manage to extend the overall maturity structure of their debt, the increase is smaller than it would be in looser periods. This is consistent with new issuances being of shorter maturity during tight credit periods.

Overall, the results in this section suggest that tight global credit conditions impair firms' ability to manage their debt structure through prepayment. As shown above, firms are less able to prepay as a response to the interest cost and maturity saving motives and even when they do prepay, the effect on overall debt structure is more muted. As a consequence of lower rates of prepayment and lower effectiveness of prepayment, firms find themselves with higher rollover risk (shorter average maturities) and higher costs (higher average coupons).

6 Conclusion

In this paper, we study the determinants of prepayment at the instrument level for a large cross-section of firms around the world, how such prepayment affects firm-level debt structure, and how global credit conditions affect the ability and willingness of firms to refinance their debt early. We show that firms prepay bonds and loans differently, and that there is substantial heterogeneity in debt prepayment patterns between firms that only issue loans, firms that only issue bonds, and firms that access both bond and loan markets. While debt prepayment is generally successful at extending average maturities and lowering interest rate costs at the firm level, these benefits appear smaller for issuers in emerging market economies. Tight global credit conditions reduce both the ability to prepay debt early and the effectiveness of debt refinancing in reducing interest costs and rollover risk.

Put together, our results highlight the importance of understanding the determinants of firms' debt structure decisions. Firms actively manage their debt structure through both prepayment and issuance decisions. When the global credit cycle impedes their ability to refinance and issue at their preferred rates, debt instruments reach maturity with much higher probability, exposing firms to rollover risk. The global credit cycle can thus create financial fragilities at the firm level.

In Boyarchenko and Elias (2024d), we show that global credit conditions matter for local

pricing of debt instruments. The results in this paper provide evidence that the negative effects of global credit tightening are not confined to secondary market pricing but have consequences at the firm level, impairing firms' ability to optimally manage their debt structure.

References

Adams, P. and A. Verdelhan (2022): "Exchange Rate Risk in Public Firms," Working paper, MIT Sloan.

Almeida, H., M. Campello, B. Laranjeira, and S. Weisbenner (2011): "Corporate debt maturity and the real effects of the 2007 credit crisis," *Critical Finance Review*, 1: 3-58.

Becker, B. and V. Ivashina (2014): "Cyclicality of credit supply: Firm level evidence," *Journal of Monetary Economics*, 62, 76–93.

Bleakley, H. and K. Cowan (2008): "Corporate dollar debt and depreciations: much ado about nothing?" *The Review of Economics and Statistics*, 90, 612–626.

Boyarchenko, N. and L. Elias (2023): "Corporate Credit Conditions Around the World: Novel Facts Through Holistic Data," Staff Report N. 1074, Federal Reserve Bank of New York.

——— (2024a): "The Changing Landscape of Corporate Credit," Liberty Street Economics.

——— (2024b): "The Disparate Outcomes of Bank and Nonbank Financed Private Credit Expansions," Liberty Street Economics.

——— (2024c): "Financing Private Credit," Staff Report N. 1111, Federal Reserve Bank of New York.

——— (2024d): "The Global Credit Cycle," Staff Report N. 1094, Federal Reserve Bank of New York.

Brunnermeier, M. K. and M. Yogo (2009): "A note on liquidity risk management," *American Economic Review*, 99, 578–583.

Bruno, V. and H. S. Shin (2017): "Global dollar credit and carry trades: a firm-level analysis," *The Review of Financial Studies*, 30, 703–749.

Chen, H., Y. Xu, and J. Yang (2021): "Systematic risk, debt maturity, and the term structure of credit spreads," *Journal of Financial Economics*, 139, 770–799.

Choi, J., D. Hackbarth, and J. Zechner (2018): "Corporate debt maturity profiles," *Journal of Financial Economics*, 130, 484–502.

Colla, P., F. Ippolito, and K. Li (2013): "Debt specialization," *The Journal of Finance*, 68, 2117–2141.

Coppola, A., M. Maggiori, B. Neiman, and J. Schreger (2021): "Redrawing the map of global capital flows: The role of cross-border financing and tax havens," *The Quarterly Journal of Economics*, 136, 1499–1556.

Diamond, D. W. and Z. He (2014): "A theory of debt maturity: the long and short of debt overhang," *The Journal of Finance*, 69, 719–762.

Du, W. and J. Schreger (2022): "Sovereign risk, currency risk, and corporate balance sheets," *The Review of Financial Studies*, 35, 4587–4629.

Elias, L. (2021): "Capital Flows and the Real Effects of Corporate Rollover Risk," Working paper, Federal Reserve Bank of New York.

He, Z. and K. Milbradt (2014): "Endogenous liquidity and defaultable bonds," *Econometrica*, 82, 1443–1508.

——— (2016): "Dynamic debt maturity," *The Review of Financial Studies*, 29, 2677–2736.

He, Z. and W. Xiong (2012): "Rollover risk and credit risk," *The Journal of Finance*, 67, 391–430.

John, K., M. S. Kaviani, L. Kryzanowski, and H. Maleki (2021): "Do country-level creditor protections affect firm-level debt structure concentration?" *Review of Finance*, 25, 1677–1725.

Li, X. and D. Su (2022): "Surges and instability: The maturity shortening channel," *Journal of International Economics*, 139, 103679.

Ma, L., D. Streitz, and F. Tourre (2023): "The art of timing: Managing sudden stop risk in corporate credit markets," *Available at SSRN 4602788*.

Mian, A. and J. A. Santos (2018): "Liquidity risk and maturity management over the credit cycle," *Journal of Financial Economics*, 127, 264–284.

Miranda-Agrippino, S., T. Nenova, and H. Rey (2020): "Global footprints of monetary policies," Working paper, London School of Economics.

Miranda-Agrippino, S. and H. Rey (2015): "World asset markets and the global financial cycle," Working paper n. 21722, National Bureau of Economic Research.

——— (2020): "US monetary policy and the global financial cycle," *The Review of Economic Studies*, 87, 2754–2776.

Rauh, J. D. and A. Sufi (2010): "Capital structure and debt structure," *The Review of Financial Studies*, 23, 4242–4280.

Rey, H. (2013): "Dilemma not trilemma: the global financial cycle and monetary policy independence," Tech. rep., In: Proceedings - Economic Policy Symposium - Jackson Hole.

Xu, Q. (2018): "Kicking maturity down the road: early refinancing and maturity management in the corporate bond market," *The Review of Financial Studies*, 31, 3061–3097.

Table 1: Instrument counts by country. This table reports the number of unique instruments by instrument type and country.

	Overall			Prepayment estimation sample		
Country	Bonds	Loans, fixed	Loans, variable	Bonds	Loans, fixed	Loans, variable
US	45,504	15,809	11,289	17,408	3,167	2,421
KR	12,763	24,384	6,066	4,041	3,233	463
JP	16,823	17,422	269	9,915	1,753	7
CA	7,200	8,675	5,083	2,590	1,595	770
GB	3,437	2,804	4,390	2,060	472	578
NL	801	955	807	435	115	142
FR	2,343	2,616	1,591	1,380	680	183
AU	996	3,174	906	335	264	22
TW	2,067	13,508	15,063	847	3,375	70
DE	1,694	2,444	1,429	945	569	70
CH	1,442	986	315	908	50	19
IT	576	1,422	2,670	291	338	615
SG	474	2,991	2,994	155	362	144
SE	437	1,005	771	154	71	19
HK	1,413	3,242	3,368	499	267	85
ES	738	1,296	1,577	342	254	166
NO	500	680	583	140	71	77
IE	639	227	310	380	28	26
BE	276	410	291	148	75	40
FI	429	452	307	145	20	4
PT	114	511	524	27	46	36
DK	163	313	298	47	27	-
GR	143	450	1,995	32	21	309
IL	851	1,824	2,272	450	269	243
CN	19,804	81,285	13,606	9,929	10,649	267
MY	970	3,522	2,848	393	390	133
TH	2,141	2,504	6,442	882	413	894
IN	3,645	15,011	8,566	1,168	3,344	1,127
ID	1,090	3,426	2,176	402	933	285
MX	958	1,638	3,103	390	262	721
BR	504	2,495	4,835	191	454	755
RU	787	1,799	816	279	169	87
CL	2,289	28,604	1,237	507	1,041	113
AR	323	854	357	77	25	14
PH	411	1,332	1,074	196	362	44
PE	297	2,110	540	102	264	53
CO	62	714	1,479	8	16	39
ZA	297	1,163	1,827	93	180	132
TR	136	2,602	970	6	114	55
VN	235	2,862	1,305	16	259	30
PL	415	1,098	3,340	19	59	146
PK	36	1,284	5,989	1	338	1,650
LK	116	1,499	1,960	11	140	176
BD	16	786	287	-	99	1

Table 2: Instrument-level summary statistics. This table reports the summary statistics for instrument-level outcomes for instruments issued by non-financial firms in our sample. "Partially prepaid" are instruments for which the year-over-year decline in amount outstanding is at least 30% and that decline occurs more than a year before contractual maturity. "Fully prepaid" are instruments for which amount outstanding reaches 0 more than a year before contractual maturity; partially prepaid instruments include fully prepaid instruments. "Matured" are instruments that reach the final year of maturity with a positive amount outstanding. "Unknown" are instruments that leave the sample before the final year of maturity but the firm as a whole also leaves the sample.

(a) All

	mean	sd	p5	p25	p50	p75	p95	count
N. of obs years	3.71	2.24	2.00	2.00	3.00	5.00	8.00	184,564
Original ttm (years)	5.84	4.72	1.92	2.92	4.58	7.00	14.83	184,564
Partially prepaid	54.15	49.83	0.00	0.00	100.00	100.00	100.00	184,564
Fully prepaid	32.16	46.71	0.00	0.00	0.00	100.00	100.00	184,564
Matures	40.87	49.16	0.00	0.00	0.00	100.00	100.00	184,564
Unknown	27.00	44.39	0.00	0.00	0.00	100.00	100.00	184,564

(b) Bonds

	mean	sd	p5	p25	p50	p75	p95	count
N. of obs years	4.26	2.54	2.00	2.00	3.00	5.00	9.00	78,734
Original ttm (years)	6.55	5.48	2.00	3.00	4.92	7.92	19.25	78,734
Partially prepaid	38.78	48.72	0.00	0.00	0.00	100.00	100.00	78,734
Fully prepaid	23.68	42.51	0.00	0.00	0.00	0.00	100.00	78,734
Matures	43.29	49.55	0.00	0.00	0.00	100.00	100.00	78,734
Unknown	33.06	47.04	0.00	0.00	0.00	100.00	100.00	78,734

(c) Fixed coupon loans

	mean	sd	p5	p25	p50	p75	p95	count
N. of obs years	3.15	1.74	2.00	2.00	3.00	4.00	6.00	62,382
Original ttm (years)	5.27	4.37	1.83	2.50	4.00	6.08	14.67	62,382
Partially prepaid	62.52	48.41	0.00	0.00	100.00	100.00	100.00	62,382
Fully prepaid	36.22	48.07	0.00	0.00	0.00	100.00	100.00	62,382
Matures	42.00	49.36	0.00	0.00	0.00	100.00	100.00	62,382
Unknown	21.80	41.29	0.00	0.00	0.00	0.00	100.00	62,382

(d) Variable rate loans

	mean	sd	p5	p25	p50	p75	p95	count
N. of obs years	3.54	2.08	2.00	2.00	3.00	4.00	8.00	43,448
Original ttm (years)	5.38	3.37	2.00	3.00	4.75	6.58	12.00	43,448
Partially prepaid	69.98	45.83	0.00	0.00	100.00	100.00	100.00	43,448
Fully prepaid	41.68	49.30	0.00	0.00	0.00	100.00	100.00	43,448
Matures	34.88	47.66	0.00	0.00	0.00	100.00	100.00	43,448
Unknown	23.47	42.38	0.00	0.00	0.00	0.00	100.00	43,448

Table 3: Firm-level summary statistics. This table reports summary statistics for the sample of firms included in our estimation sample. "Number [...] used" reports counts of individual instruments at the firm level that satisfy our prepayment model sample selection criteria: observed more than one period, have at least 1.5 years to maturity left, are issued with at most 10 years initial maturity, absolute moneyness does not exceed 5%, and do not leave the sample at the same time as the entire firm leaves the sample. "Percent [...] prepaid" reports the percent of instruments included in our prepayment model that are ever fully prepaid (amount outstanding reaches zero more than a year before contractual maturity). In Table 3b, "WAM" is the weighted average maturity on all instruments, "WAC" is the weighted average coupon on fixed rate instruments, and "WAS" is the weighted average spread on variable rate instruments.

(a) Instrument related

	mean	sd	p5	p25	p50	p75	p95	count
N. instruments	14.19	28.50	1.00	3.00	7.00	16.00	47.00	609,146
N. instruments used	0.52	2.50	0.00	0.00	0.00	0.00	3.00	609,146
N. bonds	0.99	4.10	0.00	0.00	0.00	0.00	5.00	609,146
N. bonds used	0.32	1.84	0.00	0.00	0.00	0.00	2.00	609,146
N. fixed rate loans	1.69	8.07	0.00	0.00	0.00	1.00	7.00	609,146
N. fixed rate loans used	0.15	1.52	0.00	0.00	0.00	0.00	1.00	609,146
N. variable rate loans	1.09	4.25	0.00	0.00	0.00	1.00	5.00	609,146
N. variable rate loans used	0.05	0.53	0.00	0.00	0.00	0.00	0.00	609,146
Pct. prepaid	11.82	29.17	0.00	0.00	0.00	0.00	100.00	101,507
Pct. bonds prepaid	8.52	24.88	0.00	0.00	0.00	0.00	100.00	56,462
Pct. fixed coupon loans prepaid	14.93	33.55	0.00	0.00	0.00	0.00	100.00	42,143
Pct. variable rate loans prepaid	16.47	35.16	0.00	0.00	0.00	0.00	100.00	15,214

(b) Balance sheet related

	mean	sd	p5	p25	p50	p75	p95	count
Total debt/Total assets	0.25	0.19	0.01	0.09	0.22	0.37	0.61	361,333
Share LTD	0.49	0.35	0.00	0.13	0.50	0.81	1.00	359,655
Log size	4.96	2.24	1.20	3.51	4.96	6.43	8.71	361,333
Leverage	0.54	0.81	0.14	0.34	0.51	0.66	0.92	361,109
Profitability	0.06	0.22	-0.23	0.03	0.09	0.15	0.28	330,831
Cash holdings/Total assets	0.19	0.24	0.01	0.04	0.11	0.24	0.61	339,540
Operating income/Total assets	0.06	0.23	-0.23	0.03	0.09	0.15	0.28	331,599
WAM	4.39	3.30	1.00	2.00	3.64	5.78	10.80	293,652
WAC	5.54	3.62	0.85	2.75	5.10	7.51	12.00	185,532
WAS	2.25	2.22	-0.45	1.05	2.00	3.00	5.88	58,586
Pct. bond	11.30	24.96	0.00	0.00	0.00	2.54	79.08	239,915
Pct. fixed loan	16.92	30.24	0.00	0.00	0.00	19.30	98.99	239,915
Pct. var loan	14.85	28.73	0.00	0.00	0.00	12.93	91.78	239,915

Table 4: Interest cost incentive to prepay. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument moneyness. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Moneyness measured as the difference between the instrument's coupon (spread in the case of variable rate loans) and the average coupon (spread) of newly issued securities, in the same country-year, with the same currency and same original time-to-maturity. Positive moneyness indicates that the instrument is "in-the-money", with the instrument's coupon higher than the prevailing market rate on comparable instruments. The omitted category is moneyness between -0.5% and 0.5%. Column (3) restricts the sample to non-crisis periods (excludes 2007 – 2008, GFC; 2020 – 2022, COVID-19). Column (4) restricts the sample to observations matched to firm characteristics. Column (5) controls for firm characteristics (log size, profitability, leverage, log PPE). All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Bonds

	(1)	(2)	(3)	(4)	(5)
< -1.5	0.89	0.60	0.24	0.36	0.35
	(0.71)	(0.86)	(0.91)	(0.48)	(0.48)
$[-1.5, -.5)$	0.35	-0.36	-0.39	0.04	0.05
	(0.35)	(0.27)	(0.26)	(0.28)	(0.28)
$[.5, 1.5)$	0.85	0.91	0.56	1.24	1.22
	(0.35)**	(0.26)***	(0.33)*	(0.41)***	(0.40)***
$[1.5, 2.5)$	1.47	1.71	1.39	3.16	3.09
	(0.57)**	(0.52)***	(0.84)	(1.03)***	(1.02)***
≥ 2.5	2.98	3.47	4.04	6.61	6.49
	(0.86)***	(0.88)***	(1.30)***	(1.76)***	(1.74)***
Constant	8.62	8.67	8.47	7.82	29.70
	(0.27)***	(0.27)***	(0.35)***	(0.39)***	(4.18)***
Year FE		✓	✓	✓	✓
Country× Year FE		✓	✓	✓	✓
Adj. R-sqr	0.15	0.18	0.19	0.17	0.18
W/in adj. R-sqr.	0.00	0.00	0.00	0.00	0.00
N. of obs	142,069	142,042	109,198	71,106	71,106
N. of clusters	42	42	41	40	40

(b) Fixed coupon loans

	(1)	(2)	(3)	(4)	(5)
< -1.5	-4.58	-4.00	-4.38	-4.84	-4.80
	(0.94)***	(1.02)***	(1.05)***	(1.02)***	(1.03)***
$[-1.5, -.5)$	-2.32	-1.23	-1.49	-1.67	-1.64
	(0.93)**	(0.93)	(0.76)*	(1.09)	(1.08)
$[.5, 1.5)$	2.78	2.76	2.93	1.68	1.69
	(1.19)**	(1.03)**	(1.04)***	(1.04)	(1.03)
$[1.5, 2.5)$	0.87	1.54	1.70	1.11	1.15
	(1.10)	(0.87)*	(0.63)***	(0.97)	(0.98)
≥ 2.5	3.14	3.23	3.56	1.32	1.35
	(1.97)	(2.01)	(1.67)**	(2.23)	(2.25)
Constant	26.77	26.40	26.21	23.34	8.42
	(0.57)***	(0.59)***	(0.40)***	(0.51)***	(8.26)
Year FE		✓	✓	✓	✓
Country× Year FE		✓	✓	✓	✓
Adj. R-sqr	0.24	0.29	0.29	0.25	0.25
W/in adj. R-sqr.	0.00	0.00	0.00	0.00	0.00
N. of obs	54,684	54,605	40,794	37,786	37,786
N. of clusters	44	44	44	41	41

(c) Variable rate loans

	(1)	(2)	(3)	(4)	(5)
< -1.5	0.09	-2.02	-1.21	-1.11	-0.98
	(2.32)	(1.67)	(2.33)	(1.83)	(1.80)
$[-1.5, -.5)$	0.86	0.08	0.91	0.37	0.47
	(0.98)	(0.85)	(0.81)	(0.94)	(0.95)
$[.5, 1.5)$	1.86	1.41	3.32	1.72	1.62
	(1.13)	(0.94)	(1.21)***	(0.92)*	(0.91)*
≥ 1.5	4.58	4.73	4.90	5.00	4.85
	(2.34)*	(2.45)*	(2.20)**	(2.41)**	(2.42)*
Constant	21.09	21.61	21.16	21.13	36.95
	(0.68)***	(0.55)***	(0.66)***	(0.51)***	(10.01)***
Year FE		✓	✓	✓	✓
Country× Year FE		✓	✓	✓	✓
Adj. R-sqr	0.18	0.24	0.24	0.26	0.27
W/in adj. R-sqr.	0.00	0.00	0.00	0.00	0.00
N. of obs	19,359	19,266	15,615	15,412	15,412
N. of clusters	41	41	40	40	40

Table 5: Differential sensitivity of prepayment to interest cost incentive across bonds and fixed coupon loans. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument moneyness, comparing bonds and fixed coupon loans. "Both bonds and loans" restricts the sample to instruments of firms that accessed both the bond and the loan market at least once in our sample. "Both bonds and loans in same year" restricts the sample to instruments of firms that have a non-zero amount outstanding of both bonds and fixed coupon loans in the same year. "Moneyness, > 0" is the slope coefficient for positive moneyness observations; a positive coefficient indicates a higher probability of prepayment when an instrument is further in-the-money. "Moneyness, < 0" is the slope coefficient for negative moneyness observations, in absolute value terms; a negative coefficient indicates a lower probability of prepayment when an instrument is further out-of-the-money. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Moneyness measured as the difference between the instrument's coupon (spread in the case of variable rate loans) and the average coupon (spread) of newly issued securities, in the same country-year, with the same currency and same original time-to-maturity. Positive moneyness indicates that the instrument is "in-the-money", with the instrument's coupon higher than the prevailing market rate on comparable instruments. All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

	(1)	(2)	(3)	(4)	(5)
	Bonds	Loans	Baseline	Both bonds and loans	Both bonds and loans in same year
Moneyness, <0	0.35	-1.43	0.67	0.61	0.55
	(0.41)	(0.41)***	(0.40)*	(0.30)*	(0.46)
Moneyness, >0	1.12	0.77	1.35	1.38	1.28
	(0.26)***	(0.57)	(0.23)***	(0.23)***	(0.43)***
Loans, fixed × Moneyness, <0			-2.85	-3.06	-2.93
			(0.60)***	(0.61)***	(1.10)**
Loans, fixed × Moneyness, >0			-1.41	-1.82	-1.85
			(0.54)**	(0.55)***	(0.86)**
Loans, fixed			23.73	23.98	22.41
			(5.93)***	(5.84)***	(4.27)***
Constant	8.37	26.84	7.07	8.40	10.28
	(0.35)***	(0.57)***	(1.53)***	(1.16)***	(1.54)***
Year FE	✓	✓	✓	✓	✓
Country× Year FE	✓	✓	✓	✓	✓
Adj. R-sqr	0.18	0.29	0.25	0.25	0.33
W/in adj. R-sqr.	0.00	0.00	0.02	0.03	0.04
N. of obs	142,050	54,618	197,882	142,541	55,705
N. of clusters	42	44	44	44	43

Table 6: Interest cost incentive to prepay and firm and security characteristics. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument moneyness and firm/instrument characteristics. "EM" is an indicator for issuers in emerging market economies. "Medium risk" are firms in the middle two quartiles of the country-level log EDF distribution and "high risk" are firms in the top quartile of the country-level log EDF distribution. "Fgn" is an indicator for instruments issued in foreign currency. "Upgraded" is an indicator equal to 1 if a firm moves to a lower quartile of the country-level log EDF distribution and "downgraded" is an indicator equal to 1 if a firm moves to a higher quartile of the country-level log EDF distribution. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Moneyness measured as the difference between the instrument's coupon (spread in the case of variable rate loans) and the average coupon (spread) of newly issued securities, in the same country-year, with the same currency and same original time-to-maturity. Positive moneyness indicates that the instrument is "in-the-money", with the instrument's coupon higher than the prevailing market rate on comparable instruments. All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

	Bonds					Fixed Loans					Variable Loans				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Moneyness, > 0	1.67	1.86	1.24	1.62	1.58	0.79	-0.37	0.89	0.77	1.00	1.41	0.37	3.72	1.13	1.14
	(0.33)***	(0.26)***	(0.21)***	(0.38)***	(0.36)***	(0.56)	(0.64)	(0.71)	(0.65)	(0.55)*	(0.96)	(1.81)	(1.37)***	(1.15)	(1.21)
Moneyness, < 0	0.68	0.97	0.72	0.64	0.61	-1.44	-2.03	-1.45	-1.83	-1.21	-0.67	0.37	-0.20	-0.67	-0.93
	(0.42)	(0.31)***	(0.46)	(0.45)	(0.43)	(0.41)***	(0.58)***	(0.58)**	(0.47)***	(0.49)**	(0.68)	(1.22)	(1.81)	(0.71)	(0.71)
EM × Moneyness, > 0		-1.19					2.22					1.64			
		(0.46)**					(0.76)***					(1.91)			
EM × Moneyness, < 0		-1.41					1.10					-1.90			
		(0.56)**					(0.70)					(1.40)			
Medium risk			1.74					-1.33					4.50		
			(1.31)					(2.30)					(1.84)**		
High risk			5.17					-1.05					2.24		
			(3.13)					(1.92)					(2.75)		
Medium risk × Moneyness, > 0			1.40					-0.17					-3.74		
			(0.31)***					(0.71)					(1.85)*		
High risk × Moneyness, > 0			0.91					-0.27					-1.64		
			(0.73)					(0.72)					(3.03)		
Medium risk × Moneyness, < 0			0.29					-0.96					-1.61		
			(0.44)					(0.82)					(2.09)		
High risk × Moneyness, < 0			0.70					-0.21					-0.21		
			(0.95)					(1.21)					(1.75)		
Fgn				-0.70					-2.42					-1.78	
				(1.12)					(2.29)					(2.47)	
Fgn × Moneyness, > 0				0.29					0.34					1.28	
				(0.31)					(1.08)					(2.23)	
Fgn × Moneyness, < 0				0.23					2.41					0.06	
				(0.36)					(0.74)***					(1.39)	
Upgraded					0.65					3.55					2.21
					(1.36)					(1.43)**					(2.68)
Downgraded					-0.47					1.01					0.80
					(0.88)					(1.33)					(1.44)
Upgraded × Moneyness, > 0					0.59					-1.13					1.93
					(0.47)					(0.57)*					(1.93)
Downgraded × Moneyness, > 0					0.18					-0.64					-0.26
					(0.50)					(0.75)					(1.18)
Upgraded × Moneyness, < 0					0.39					-1.11					-0.00
					(0.62)					(1.27)					(1.95)
Downgraded × Moneyness, < 0					0.55					-0.79					2.11
					(0.43)					(0.76)					(1.56)
Constant	7.98	8.02	5.59	8.08	7.97	26.82	26.83	24.40	27.07	26.27	21.88	21.84	18.90	22.25	21.50
	(0.44)***	(0.28)***	(0.87)***	(0.47)***	(0.46)***	(0.57)***	(0.38)***	(1.54)***	(0.77)***	(0.59)***	(0.70)***	(0.73)***	(1.36)***	(1.12)***	(0.93)***
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country× Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Adj. R-sqr	0.05	0.05	0.06	0.05	0.05	0.29	0.29	0.25	0.29	0.29	0.24	0.24	0.25	0.24	0.24
W/in adj. R-sqr.	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N. of obs	143,548	143,548	99,184	143,548	143,548	54,605	54,605	32,699	54,605	54,605	19,266	19,266	12,609	19,266	19,266
N. of clusters	42	42	42	42	42	44	44	41	44	44	41	41	40	41	41

Table 7: Interest cost incentive and other event definitions. This table reports the estimated coefficients from the linear probability regression of instruments outstanding events on instrument moneyness. Prepayment ("baseline") is defined as the amount outstanding reaching 0 more than a year before contractual maturity. "Partial prepayment" also includes year-over-year declines in amount outstanding of more than 30% as events. "Refinancing" only considers prepayments that occur in the same year as an issuance of a new security (of the same instrument type) by the same firm. Moneyness measured as the difference between the instrument's coupon (spread in the case of variable rate loans) and the average coupon (spread) of newly issued securities, in the same country-year, with the same currency and same original time-to-maturity. Positive moneyness indicates that the instrument is "in-the-money", with the instrument's coupon higher than the prevailing market rate on comparable instruments. The omitted category is moneyness between -0.5% and 0.5%. All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Bonds

	(1) Baseline	(2) Partial prepayment	(3) Refinancing
< -1.5	0.60	1.48	0.51
	(0.86)	(1.31)	(0.38)
$[-1.5, -.5)$	-0.36	0.45	-0.29
	(0.27)	(0.64)	(0.23)
$[.5, 1.5)$	0.91	1.80	0.66
	(0.26)***	(0.48)***	(0.20)***
$[1.5, 2.5)$	1.71	2.82	1.11
	(0.52)***	(0.50)***	(0.46)**
≥ 2.5	3.47	4.56	2.25
	(0.88)***	(0.73)***	(0.49)***
Constant	8.67	14.77	5.33
	(0.27)***	(0.28)***	(0.17)***
Year FE	✓	✓	✓
Country× Year FE	✓	✓	✓
Adj. R-sqr	0.18	0.21	0.14
W/in adj. R-sqr.	0.00	0.00	0.00
N. of obs	142,042	142,042	142,042
N. of clusters	42	42	42

(b) Fixed coupon loans

	(1) Baseline	(2) Partial prepayment	(3) Refinancing
< -1.5	-4.00	-2.64	-2.28
	(1.02)***	(1.00)**	(0.83)***
$[-1.5, -.5)$	-1.23	-0.33	-0.59
	(0.93)	(1.15)	(0.69)
$[.5, 1.5)$	2.76	2.02	1.22
	(1.03)**	(1.10)*	(0.73)
$[1.5, 2.5)$	1.54	0.40	0.87
	(0.87)*	(0.82)	(0.62)
≥ 2.5	3.23	3.32	1.40
	(2.01)	(1.59)**	(1.12)
Constant	26.40	44.14	12.50
	(0.59)***	(0.57)***	(0.36)***
Year FE	✓	✓	✓
Country× Year FE	✓	✓	✓
Adj. R-sqr	0.29	0.21	0.27
W/in adj. R-sqr.	0.00	0.00	0.00
N. of obs	54,605	54,605	54,605
N. of clusters	44	44	44

(c) Variable rate loans

	(1) Baseline	(2) Partial prepayment	(3) Refinancing
< -1.5	-2.02	-0.46	-1.65
	(1.67)	(1.88)	(1.08)
$[-1.5, -.5)$	0.08	0.42	0.07
	(0.85)	(1.22)	(0.84)
$[.5, 1.5)$	1.41	0.76	1.29
	(0.94)	(1.39)	(0.91)
≥ 1.5	4.73	2.70	2.94
	(2.45)*	(2.30)	(1.63)*
Constant	21.61	42.88	12.91
	(0.55)***	(0.61)***	(0.35)***
Year FE	✓	✓	✓
Country× Year FE	✓	✓	✓
Adj. R-sqr	0.24	0.17	0.22
W/in adj. R-sqr.	0.00	-0.00	0.00
N. of obs	19,266	19,266	19,266
N. of clusters	41	41	41

Table 8: Maturity incentive to prepay. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument maturity incentive. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Maturity incentive measured as age as a fraction of original time-to-maturity; age is measured as the difference between current period end date and period end date at issuance. The omitted category is fractional age rounded to 0.5 (half of original time-to-maturity). Column (3) restricts the sample to non-crisis periods (excludes 2007 – 2008, GFC; 2020 – 2022, COVID-19). Column (4) restricts the sample to observations matched to firm characteristics. Column (5) controls for firm characteristics (log size, profitability, leverage, log PPE). All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Bonds

	(1)	(2)	(3)	(4)	(5)
0	-13.66	-16.08	-16.31	-16.99	-17.00
	(2.01)***	(1.38)***	(1.58)***	(1.33)***	(1.31)***
0.1	-5.61	-6.93	-6.93	-8.26	-8.20
	(1.01)***	(1.33)***	(1.68)***	(2.36)***	(2.35)***
0.2	-5.55	-6.30	-6.39	-7.24	-7.22
	(1.30)***	(1.47)***	(1.72)***	(2.50)***	(2.49)***
0.3	-3.28	-3.94	-3.95	-4.84	-4.82
	(0.88)***	(0.92)***	(1.21)***	(1.64)***	(1.63)***
0.4	-0.82	-1.10	-1.00	-1.41	-1.41
	(0.30)***	(0.39)***	(0.43)**	(0.47)***	(0.47)***
0.6	0.34	0.42	0.61	0.07	0.06
	(0.65)	(0.54)	(0.72)	(0.59)	(0.59)
0.7	2.24	2.85	3.83	2.43	2.38
	(0.62)***	(0.60)***	(0.67)***	(0.94)**	(0.92)**
≥ 0.8	4.65	5.96	6.64	7.15	7.06
	(1.21)***	(1.31)***	(1.30)***	(1.50)***	(1.49)***
Constant	12.32	12.85	12.62	12.96	32.66
	(0.61)***	(0.70)***	(0.90)***	(1.11)***	(3.91)***
Year FE		✓	✓	✓	✓
Country× Year FE		✓	✓	✓	✓
Adj. R-sqr	0.16	0.20	0.20	0.19	0.19
W/in adj. R-sqr.	0.02	0.02	0.02	0.02	0.02
N. of obs	141,983	141,956	109,124	71,039	71,039
N. of clusters	42	42	41	40	40

(b) Fixed coupon loans

	(1)	(2)	(3)	(4)	(5)
0	-40.54	-38.75	-40.38	-40.95	-40.78
	(3.24)***	(2.09)***	(2.92)***	(3.60)***	(3.55)***
0.1	-16.15	-16.36	-17.91	-16.18	-16.20
	(2.31)***	(1.53)***	(2.63)***	(1.59)***	(1.61)***
0.2	-11.67	-12.04	-13.03	-12.86	-12.88
	(1.09)***	(1.00)***	(1.50)***	(1.12)***	(1.12)***
0.3	-6.02	-6.45	-6.71	-6.55	-6.58
	(1.01)***	(0.89)***	(1.27)***	(0.95)***	(0.96)***
0.4	-2.86	-3.30	-2.99	-3.55	-3.56
	(1.12)**	(0.99)***	(1.07)***	(1.19)***	(1.18)***
0.6	3.07	3.09	4.60	3.53	3.55
	(1.15)**	(1.13)***	(1.13)***	(1.69)**	(1.71)**
0.7	3.26	3.99	5.34	3.74	3.79
	(1.63)*	(1.74)**	(2.10)**	(1.98)*	(2.02)*
≥ 0.8	4.08	4.02	10.66	4.22	4.20
	(2.62)	(2.66)	(3.68)***	(2.72)	(2.72)
Constant	36.74	36.77	36.48	31.17	20.35
	(1.08)***	(0.83)***	(1.17)***	(0.85)***	(7.50)***
Year FE		✓	✓	✓	✓
Country× Year FE		✓	✓	✓	✓
Adj. R-sqr	0.28	0.33	0.33	0.28	0.28
W/in adj. R-sqr.	0.07	0.05	0.05	0.04	0.04
N. of obs	54,655	54,576	40,768	37,770	37,770
N. of clusters	44	44	44	41	41

(c) Variable rate loans

	(1)	(2)	(3)	(4)	(5)
0	-42.05	-42.80	-43.81	-40.89	-40.94
	(4.25)***	(4.00)***	(4.45)***	(4.15)***	(4.21)***
0.1	-15.62	-14.25	-15.89	-14.05	-13.75
	(3.81)***	(3.60)***	(4.02)***	(4.09)***	(4.09)***
0.2	-12.49	-11.85	-12.87	-10.63	-10.48
	(3.24)***	(2.98)***	(3.32)***	(2.88)***	(2.85)***
0.3	-6.82	-6.73	-7.17	-5.88	-5.75
	(2.07)***	(1.84)***	(2.11)***	(1.85)***	(1.82)***
0.4	-5.48	-5.05	-5.28	-4.39	-4.33
	(1.51)***	(1.43)***	(1.59)***	(1.53)***	(1.53)***
0.6	0.99	1.16	0.41	1.63	1.62
	(1.49)	(1.30)	(1.73)	(1.41)	(1.44)
0.7	5.89	6.58	6.98	7.44	7.40
	(3.45)*	(3.28)*	(3.29)**	(2.89)**	(2.92)**
≥ 0.8	5.85	6.64	7.08	7.57	7.50
	(3.62)	(3.78)*	(4.00)*	(3.29)**	(3.26)**
Constant	30.67	30.28	30.98	28.05	38.17
	(1.82)***	(1.67)***	(1.99)***	(1.61)***	(10.78)***
Year FE		✓	✓	✓	✓
Country× Year FE		✓	✓	✓	✓
Adj. R-sqr	0.22	0.27	0.28	0.29	0.29
W/in adj. R-sqr.	0.05	0.04	0.04	0.03	0.03
N. of obs	19,347	19,254	15,603	15,403	15,403
N. of clusters	41	41	40	40	40

Table 9: Differential sensitivity of prepayment to maturity incentive across bonds and fixed coupon loans. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument maturity incentive, comparing bonds and fixed coupon loans. "Both bonds and loans" restricts the sample to instruments of firms that accessed both the bond and the loan market at least once in our sample. "Both bonds and loans in same year" restricts the sample to instruments of firms that have a non-zero amount outstanding of both bonds and fixed coupon loans in the same year. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Maturity incentive measured as age as a fraction of original time-to-maturity; age is measured as the difference between current period end date and period end date at issuance. All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

	(1)	(2)	(3)	(4)	(5)
	Bonds	Loans	Baseline	Both bonds and loans	Both bonds and loans in same year
Maturity incentive	19.79	49.57	19.53	19.17	14.09
	(3.37)***	(5.09)***	(3.21)***	(3.99)***	(2.06)***
Loans, fixed × Maturity incentive			23.25	14.74	3.93
			(4.93)***	(5.22)***	(3.96)
Loans, fixed			14.77	17.08	18.49
			(6.08)**	(5.87)***	(5.49)***
Constant	2.63	12.07	1.88	3.34	6.89
	(1.15)**	(1.48)***	(1.99)	(1.60)**	(1.56)***
Year FE	✓	✓	✓	✓	✓
Country× Year FE	✓	✓	✓	✓	✓
Adj. R-sqr	0.19	0.32	0.26	0.26	0.33
W/in adj. R-sqr.	0.02	0.04	0.04	0.04	0.04
N. of obs	141,882	54,570	197,666	142,384	55,666
N. of clusters	42	44	44	44	43

Table 10: Maturity incentive to prepay and firm and security characteristics. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument maturity incentive and firm/instrument characteristics. "EM" is an indicator for issuers in emerging market economies. "Medium risk" are firms in the middle two quartiles of the country-level log EDF distribution and "high risk" are firms in the top quartile of the country-level log EDF distribution. "Fgn" is an indicator for instruments issued in foreign currency. "Upgraded" is an indicator equal to 1 if a firm moves to a lower quartile of the country-level log EDF distribution and "downgraded" is an indicator equal to 1 if a firm moves to a higher quartile of the country-level log EDF distribution. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Maturity incentive measured as age as a fraction of original time-to-maturity; age is measured as the difference between current period end date and period end date at issuance. All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates.

	Bonds					Fixed Loans					Variable Loans				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Maturity incentive	11.77	10.68	7.30	12.03	11.28	49.57	49.85	33.49	50.09	51.83	43.08	65.61	27.69	43.02	46.52
	(2.01)***	(2.30)***	(1.10)***	(2.21)***	(1.78)***	(5.09)***	(4.62)***	(5.68)***	(5.04)***	(5.31)***	(10.14)***	(13.53)***	(15.11)*	(11.76)***	(9.77)***
EM × Maturity incentive		6.91					-0.59					-35.45			
		(4.15)					(10.66)					(14.41)**			
Medium risk			0.53					-5.26					-0.94		
			(0.49)					(2.26)**					(3.43)		
High risk			3.07					-9.93					-7.67		
			(0.71)***					(4.69)**					(4.51)*		
Medium risk × Maturity incentive			6.46					8.20					7.13		
			(3.95)					(2.41)***					(8.65)		
High risk × Maturity incentive			9.23					23.32					25.78		
			(6.77)					(7.10)***					(10.40)**		
Fgn				0.36					1.70					-1.06	
				(0.64)					(3.73)					(4.32)	
Fgn × Maturity incentive				-1.83					-6.29					0.30	
				(2.84)					(8.36)					(13.98)	
Upgraded					-0.19					3.76					10.18
					(1.08)					(1.37)***					(3.23)***
Downgraded					-0.88					4.69					3.34
					(1.20)					(2.65)*					(1.77)*
Upgraded × Maturity incentive					4.04					-5.07					-20.82
					(3.82)					(4.37)					(6.21)***
Downgraded × Maturity incentive					1.37					-13.76					-5.71
					(3.97)					(5.79)**					(4.32)
Constant	5.57	5.51	4.23	5.52	5.65	12.07	12.07	13.72	11.95	11.13	8.07	7.52	11.07	8.29	6.40
	(0.69)***	(0.68)***	(1.03)***	(0.64)***	(0.65)***	(1.48)***	(1.50)***	(3.35)***	(1.52)***	(1.60)***	(3.32)**	(2.04)***	(5.04)**	(3.67)**	(3.01)**
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country× Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Adj. R-sqr	0.05	0.05	0.07	0.05	0.05	0.32	0.32	0.27	0.32	0.32	0.26	0.26	0.27	0.26	0.26
W/in adj. R-sqr.	0.01	0.01	0.01	0.01	0.01	0.04	0.04	0.03	0.04	0.04	0.03	0.04	0.02	0.03	0.03
N. of obs	143,383	143,383	99,065	143,383	143,383	54,570	54,570	32,682	54,570	54,570	19,251	19,251	12,602	19,251	19,251
N. of clusters	42	42	42	42	42	44	44	41	44	44	41	41	40	41	41

Table 11: Maturity incentive and other event definitions. This table reports the estimated coefficients from the linear probability regression of instruments outstanding events on instrument maturity incentive. Prepayment ("baseline") is defined as the amount outstanding reaching 0 more than a year before contractual maturity. "Partial prepayment" also includes year-over-year declines in amount outstanding of more than 30% as events. "Refinancing" only considers prepayments that occur in the same year as an issuance of a new security (of the same instrument type) by the same firm. Maturity incentive measured as age as a fraction of original time-to-maturity; age is measured as the difference between current period end date and period end date at issuance. The omitted category is fractional age rounded to 0.5 (half of original time-to-maturity). All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Bonds

	(1) Baseline	(2) Partial prepayment	(3) Refinancing
0	-16.08	-24.01	-8.90
	(1.38)***	(2.67)***	(1.08)***
0.1	-6.93	-13.36	-4.27
	(1.33)***	(1.48)***	(0.97)***
0.2	-6.30	-15.44	-3.99
	(1.47)***	(3.34)***	(1.03)***
0.3	-3.94	-8.21	-2.43
	(0.92)***	(1.23)***	(0.58)***
0.4	-1.10	-3.10	-0.71
	(0.39)***	(0.66)***	(0.18)***
0.6	0.42	3.98	0.27
	(0.54)	(1.49)**	(0.33)
0.7	2.85	6.10	2.09
	(0.60)***	(1.15)***	(0.55)***
≥ 0.8	5.96	8.74	4.11
	(1.31)***	(1.97)***	(1.10)***
Constant	12.85	23.08	7.89
	(0.70)***	(1.06)***	(0.47)***
Year FE	✓	✓	✓
Country× Year FE	✓	✓	✓
Adj. R-sqr	0.20	0.25	0.15
W/in adj. R-sqr.	0.02	0.05	0.01
N. of obs	141,956	141,956	141,956
N. of clusters	42	42	42

(b) Fixed coupon loans

	(1) Baseline	(2) Partial prepayment	(3) Refinancing
0	-38.75	-49.56	-17.53
	(2.09)***	(2.16)***	(1.70)***
0.1	-16.36	-34.49	-7.56
	(1.53)***	(2.15)***	(1.16)***
0.2	-12.04	-29.16	-5.50
	(1.00)***	(3.25)***	(0.99)***
0.3	-6.45	-14.31	-2.59
	(0.89)***	(1.09)***	(1.02)**
0.4	-3.30	-6.54	-1.45
	(0.99)***	(0.80)***	(0.82)*
0.6	3.09	8.58	1.56
	(1.13)***	(0.98)***	(0.95)
0.7	3.99	16.65	1.49
	(1.74)**	(1.81)***	(0.74)*
≥ 0.8	4.02	23.13	1.64
	(2.66)	(3.47)***	(0.86)*
Constant	36.77	62.89	17.07
	(0.83)***	(1.27)***	(0.77)***
Year FE	✓	✓	✓
Country× Year FE	✓	✓	✓
Adj. R-sqr	0.33	0.28	0.28

(c) Variable rate loans

	(1) Baseline	(2) Partial prepayment	(3) Refinancing
0	-42.80	-63.79	-20.75
	(4.00)***	(2.57)***	(2.42)***
0.1	-14.25	-38.09	-7.61
	(3.60)***	(1.74)***	(2.85)**
0.2	-11.85	-36.48	-5.56
	(2.98)***	(2.29)***	(1.64)***
0.3	-6.73	-18.58	-2.93
	(1.84)***	(1.47)***	(1.27)**
0.4	-5.05	-9.80	-2.83
	(1.43)***	(1.51)***	(1.35)**
0.6	1.16	11.17	0.97
	(1.30)	(2.85)***	(1.09)
0.7	6.58	19.03	4.38
	(3.28)*	(2.84)***	(2.73)
≥ 0.8	6.64	24.45	5.38
	(3.78)*	(3.49)***	(4.59)
Constant	30.28	62.16	17.13
	(1.67)***	(0.97)***	(1.17)***
Year FE	✓	✓	✓
Country× Year FE	✓	✓	✓
Adj. R-sqr	0.27	0.29	0.23

Table 12: Interest cost incentive to prepay and instrument age. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument moneyness by age bucket. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Moneyness measured as the difference between the instrument's coupon (spread in the case of variable rate loans) and the average coupon (spread) of newly issued securities, in the same country-year, with the same currency and same original time-to-maturity. Positive moneyness indicates that the instrument is "in-the-money", with the instrument's coupon higher than the prevailing market rate on comparable instruments. The omitted category is moneyness between -0.5% and 0.5%. Column (2) considers observations with low age (25% or less of original time-to-maturity has passed). Column (3) considers observations with medium age (more than 25% but less than 50% of original time-to-maturity has passed). Column (4) considers observations with high age (50% or more of original time-to-maturity has passed). All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Bonds

	(1) Baseline	(2) Low age	(3) Medium age	(4) High age
< -1.5	0.60	-0.21	0.96	1.26
	(0.86)	(1.26)	(1.04)	(0.93)
$[-1.5, -.5)$	-0.36	-0.42	-0.13	0.26
	(0.27)	(0.41)	(0.46)	(0.55)
$[.5, 1.5)$	0.91	0.17	0.93	0.69
	(0.26)***	(0.28)	(0.52)*	(0.48)
$[1.5, 2.5)$	1.71	0.84	1.89	0.81
	(0.52)***	(0.41)**	(1.05)*	(0.55)
≥ 2.5	3.47	2.71	4.81	-0.72
	(0.88)***	(0.77)***	(1.61)***	(0.78)
Constant	8.67	7.23	9.14	10.17
	(0.27)***	(0.30)***	(0.41)***	(0.26)***
Year FE	✓	✓	✓	✓
Country× Year FE	✓	✓	✓	✓
Adj. R-sqr	0.18	0.23	0.24	0.23
W/in adj. R-sqr.	0.00	0.00	0.00	0.00
N. of obs	142,042	53,855	51,688	31,798
N. of clusters	42	41	39	41

(b) Fixed Loans

	(1) Baseline	(2) Low age	(3) Medium age	(4) High age
< -1.5	-4.00	-2.54	-5.21	-3.03
	(1.02)***	(1.20)**	(1.55)***	(3.08)
$[-1.5, -.5)$	-1.23	-0.48	-2.75	1.42
	(0.93)	(1.27)	(0.92)***	(1.80)
$[.5, 1.5)$	2.76	3.04	0.29	4.23
	(1.03)**	(1.52)*	(1.01)	(1.68)**
$[1.5, 2.5)$	1.54	2.55	-1.63	4.12
	(0.87)*	(1.07)**	(1.40)	(3.02)
≥ 2.5	3.23	5.05	0.04	2.83
	(2.01)	(2.02)**	(2.45)	(3.91)
Constant	26.40	25.65	30.53	20.83
	(0.59)***	(0.78)***	(0.53)***	(1.09)***
Year FE	✓	✓	✓	✓
Country× Year FE	✓	✓	✓	✓
Adj. R-sqr	0.29	0.41	0.35	0.31
W/in adj. R-sqr.	0.00	0.00	0.00	0.00
N. of obs	54,605	23,709	17,436	7,231
N. of clusters	44	43	41	37

(c) Variable Loans

	(1) Baseline	(2) Low age	(3) Medium age	(4) High age
< -1.5	-2.02	-1.43	-1.92	2.21
	(1.67)	(2.60)	(2.34)	(3.48)
$[-1.5, -.5)$	0.08	-0.14	-0.12	-0.11
	(0.85)	(1.11)	(1.22)	(2.59)
$[.5, 1.5)$	1.41	3.33	2.42	-2.55
	(0.94)	(1.76)*	(2.20)	(3.61)
≥ 1.5	4.73	3.17	8.19	4.72
	(2.45)*	(3.42)	(3.76)**	(5.38)
Constant	21.61	17.71	23.56	21.28
	(0.55)***	(0.79)***	(1.00)***	(1.54)***
Year FE	✓	✓	✓	✓
Country× Year FE	✓	✓	✓	✓
Adj. R-sqr	0.24	0.30	0.37	0.29
W/in adj. R-sqr.	0.00	0.00	0.00	0.00
N. of obs	19,266	6,839	6,760	3,213
N. of clusters	41	39	38	34

Table 13: Maturity incentive to prepay and instrument moneyness. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument maturity incentive by moneyness bucket. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Maturity incentive measured as age as a fraction of original time-to-maturity; age is measured as the difference between current period end date and period end date at issuance. The omitted category is fractional age rounded to 0.5 (half of original time-to-maturity). Column (2) considers observations that are "out-of-the-money" (moneyness below -0.5%). Column (3) considers observations that are "at-the-money" (moneyness between -0.5% and 0.5%). Column (4) considers observations that are "in-the-money" (moneyness above 0.5%). All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Bonds

	(1) Baseline	(2) OTM	(3) ATM	(4) ITM
0	-16.08	-15.92	-12.26	-19.86
	(1.38)***	(0.75)***	(1.02)***	(2.54)***
0.1	-6.93	-5.85	-3.95	-10.66
	(1.33)***	(0.93)***	(0.78)***	(2.06)***
0.2	-6.30	-5.73	-3.45	-9.32
	(1.47)***	(0.52)***	(1.40)**	(1.89)***
0.3	-3.94	-3.33	-1.79	-6.15
	(0.92)***	(0.77)***	(0.54)***	(1.15)***
0.4	-1.10	-1.57	-0.61	-1.30
	(0.39)***	(1.03)	(0.40)	(0.37)***
0.6	0.42	1.87	1.01	-0.52
	(0.54)	(2.16)	(0.30)***	(0.44)
0.7	2.85	3.29	4.21	1.98
	(0.60)***	(1.28)**	(1.72)**	(0.53)***
≥ 0.8	5.96	7.46	9.20	4.56
	(1.31)***	(1.10)***	(2.51)***	(1.13)***
Constant	12.85	13.01	8.96	15.30
	(0.70)***	(0.67)***	(0.49)***	(0.89)***
Year FE	✓	✓	✓	✓
Country× Year FE	✓	✓	✓	✓
Adj. R-sqr	0.20	0.23	0.23	0.21
W/in adj. R-sqr.	0.02	0.02	0.02	0.03
N. of obs	141,956	35,391	45,554	58,069
N. of clusters	42	41	40	41

(b) Fixed Loans

	(1) Baseline	(2) OTM	(3) ATM	(4) ITM
0	-38.75	-34.95	-35.48	-39.85
	(2.09)***	(2.31)***	(3.65)***	(2.64)***
0.1	-16.36	-14.69	-19.16	-17.61
	(1.53)***	(1.70)***	(3.67)***	(1.79)***
0.2	-12.04	-10.82	-14.53	-13.14
	(1.00)***	(2.13)***	(1.81)***	(1.72)***
0.3	-6.45	-6.00	-4.65	-7.51
	(0.89)***	(1.67)***	(1.73)**	(1.62)***
0.4	-3.30	-1.14	-4.84	-5.22
	(0.99)***	(1.84)	(2.22)**	(2.37)**
0.6	3.09	4.68	3.71	1.72
	(1.13)***	(1.91)**	(2.00)*	(2.37)
0.7	3.99	7.17	6.57	1.34
	(1.74)**	(1.92)***	(2.06)***	(3.77)
≥ 0.8	4.02	12.90	1.08	3.36
	(2.66)	(4.82)**	(5.30)	(2.76)
Constant	36.77	30.98	43.08	36.46
	(0.83)***	(1.42)***	(2.01)***	(1.38)***
Year FE	✓	✓	✓	✓
Country× Year FE	✓	✓	✓	✓
Adj. R-sqr	0.33	0.36	0.42	0.35
W/in adj. R-sqr.	0.05	0.05	0.04	0.04
N. of obs	54,576	17,315	15,166	17,750
N. of clusters	44	42	39	44

(c) Variable Loans

	(1) Baseline	(2) OTM	(3) ATM	(4) ITM
0	-42.80	-38.58	-39.38	-50.43
	(4.00)***	(3.33)***	(5.49)***	(5.76)***
0.1	-14.25	-12.81	-5.79	-27.32
	(3.60)***	(4.11)***	(4.99)	(3.74)***
0.2	-11.85	-13.90	-6.86	-18.97
	(2.98)***	(2.79)***	(3.03)**	(5.10)***
0.3	-6.73	-8.79	-1.96	-11.85
	(1.84)***	(2.04)***	(3.01)	(4.19)***
0.4	-5.05	-7.60	-2.97	-7.80
	(1.43)***	(2.19)***	(2.08)	(2.98)**
0.6	1.16	-2.92	4.26	0.25
	(1.30)	(3.93)	(1.42)***	(3.84)
0.7	6.58	7.43	5.44	4.86
	(3.28)*	(7.12)	(2.86)*	(4.22)
≥ 0.8	6.64	7.12	0.59	9.10
	(3.78)*	(5.25)	(6.12)	(6.59)
Constant	30.28	29.35	22.75	38.41
	(1.67)***	(1.78)***	(2.12)***	(3.05)***
Year FE	✓	✓	✓	✓
Country× Year FE	✓	✓	✓	✓
Adj. R-sqr	0.27	0.34	0.30	0.33
W/in adj. R-sqr.	0.04	0.04	0.03	0.07
N. of obs	19,254	3,839	5,932	2,992
N. of clusters	41	36	39	34

Table 14: Interest rate and maturity incentives to prepay across different types of firms. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument moneyness and maturity incentive. "Both bonds and loans" is an indicator equal to 1 for firms that accessed both the bond and the loan market at least once in our sample; omitted category is bond-only issuers in the bond regressions and loan-only issuers in the loans regressions. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Moneyness measured as the difference between the instrument's coupon (spread in the case of variable rate loans) and the average coupon (spread) of newly issued securities, in the same country-year, with the same currency and same original time-to-maturity. Positive moneyness indicates that the instrument is "in-the-money", with the instrument's coupon higher than the prevailing market rate on comparable instruments. Maturity incentive measured as age as a fraction of original time-to-maturity; age is measured as the difference between current period end date and period end date at issuance. All regressions include country and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

	Bonds			Fixed Loans			Variable Loans		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Moneyness	0.22		0.02	0.91		0.79	1.14		1.17
	(0.06)***		(0.08)	(0.27)***		(0.28)***	(0.32)***		(0.30)***
Both bonds and loans × Moneyness	0.59		0.65	-0.66		-0.63	0.14		0.26
	(0.10)***		(0.12)***	(0.38)*		(0.40)	(0.45)		(0.47)
Maturity incentive		13.47	13.47		27.49	27.14		24.35	24.42
		(1.99)***	(2.01)***		(3.79)***	(3.84)***		(4.66)***	(4.81)***
Both bonds and loans × Maturity incentive		-2.24	-2.83		-9.85	-9.60		4.17	4.67
		(3.44)	(3.49)		(4.58)**	(4.50)**		(3.21)	(3.28)
Both bonds and loans	1.66	2.64	2.56	4.08	6.92	6.87	3.62	1.80	1.80
	(1.23)	(0.53)***	(0.51)***	(1.80)**	(3.10)**	(3.05)**	(1.24)***	(1.67)	(1.65)
Constant	7.99	3.50	3.52	24.84	16.93	17.00	21.62	13.88	13.89
	(0.98)***	(0.65)***	(0.63)***	(0.93)***	(1.75)***	(1.75)***	(0.59)***	(1.66)***	(1.72)***
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country× Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Adj. R-sqr	0.05	0.05	0.05	0.12	0.12	0.12	0.09	0.10	0.10
W/in adj. R-sqr.	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01
N. of obs	143,548	143,383	143,383	57,665	57,615	57,615	20,439	20,425	20,425
N. of clusters	42	42	42	44	44	44	41	41	41

Table 15: Debt management and firm-level outcomes. This table reports the estimated coefficients from the regression of year-over-year changes in firm-level outcomes on security-type-level debt issuances, debt retirements and debt refinancings. Weighted average maturity (WAM) and weighted average coupon/spread (WAC/WAS) measured at the security-type level. "Share of int. credit" defined as the ratio between loans (both fixed coupon and variable rate) and the sum of bonds and loans outstanding. A debt issuance is an issuance of a new instrument in a given year without a debt retirement occurring in the same year; a debt retirement is an instrument leaving the debt structure in a given year without a corresponding issuance in the same year; a debt refinancing is issuance and retirement happening in the same year. The omitted category are periods with no change to the debt structure. All regressions include firm characteristics, and firm, year, country, and country-year fixed effects. Standard errors clustered at the firm level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Bonds

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAC	(5) Share int. credit
Issuance	1.25	0.05	1.18	-0.14	-18.97
	(0.38)***	(0.01)***	(0.03)***	(0.02)***	(0.44)***
Retirement	-1.23	-0.05	0.95	-0.09	13.92
	(0.19)***	(0.01)***	(0.03)***	(0.02)***	(0.45)***
Early refinancing	0.48	-0.02	1.86	-0.40	-0.95
	(0.27)*	(0.02)	(0.05)***	(0.04)***	(0.42)**
Refinancing	-1.45	-0.00	2.36	-0.25	-1.14
	(0.34)***	(0.02)	(0.04)***	(0.04)***	(0.38)***
Adj. R-sqr	0.37	0.21	0.16	0.02	0.07
W/in adj. R-sqr.	0.32	0.04	0.20	0.01	0.11
N. of obs	272,071	199,938	39,267	41,029	129,051
N. of clusters	30,868	21,769	5,997	6,315	18,846

(b) Fixed coupon loans

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAC	(5) Share int. credit
Issuance	0.45	0.05	0.53	-0.01	5.98
	(0.24)*	(0.01)***	(0.04)***	(0.03)	(0.26)***
Retirement	-1.08	-0.03	0.62	-0.11	-8.14
	(0.23)***	(0.01)***	(0.03)***	(0.02)***	(0.27)***
Early refinancing	0.61	0.07	0.95	-0.19	0.20
	(0.23)***	(0.02)***	(0.05)***	(0.03)***	(0.28)
Refinancing	-0.04	0.02	1.74	-0.16	0.11
	(0.18)	(0.01)	(0.04)***	(0.03)***	(0.22)
Adj. R-sqr	0.37	0.21	0.02	-0.04	-0.02
W/in adj. R-sqr.	0.32	0.04	0.07	0.00	0.03
N. of obs	272,071	199,938	47,416	59,270	129,051
N. of clusters	30,868	21,769	9,521	11,351	18,846

(c) Variable rate loans

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAS	(5) Share int. credit
Issuance	0.71	0.06	0.57	-0.00	7.98
	(0.37)*	(0.01)***	(0.04)***	(0.02)	(0.30)***
Retirement	-0.86	-0.04	0.78	-0.03	-6.34
	(0.18)***	(0.01)***	(0.04)***	(0.03)	(0.28)***
Early refinancing	0.07	0.03	1.34	-0.02	0.52
	(0.70)	(0.02)	(0.05)***	(0.04)	(0.30)*
Refinancing	-0.45	0.02	1.82	-0.04	0.37
	(0.38)	(0.01)	(0.05)***	(0.03)	(0.21)*
Adj. R-sqr	0.37	0.21	0.07	-0.02	-0.03
W/in adj. R-sqr.	0.32	0.04	0.10	0.00	0.03
N. of obs	272,071	199,938	35,157	22,422	129,051
N. of clusters	30,868	21,769	6,570	4,343	18,846

Table 16: Quantities of debt management actions and firm-level outcomes. This table reports the estimated coefficients from the regression of year-over-year changes in firm-level outcomes on the quantity of security-type-level debt issuances, debt prepayment, and debt maturements, all measured as a fraction of lagged total assets. Weighted average maturity (WAM) and weighted average coupon/spread (WAC/WAS) measured at the security-type level. "Share of int. credit" defined as the ratio between loans (both fixed coupon and variable rate) and the sum of bonds and loans outstanding. All regressions include firm characteristics, and firm, year, country, and country-year fixed effects. Standard errors clustered at the firm level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Bonds

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAC	(5) Share int. credit
Issued/TA	40.25	0.39	1.14	0.28	-66.75
	(6.33)***	(0.08)***	(0.39)***	(0.14)**	(4.99)***
Prepaid/TA	-63.52	-0.58	-2.80	-0.54	107.14
	(10.07)***	(0.13)***	(0.60)***	(0.22)**	(8.00)***
Matured/TA	-11.02	-0.67	6.98	0.09	16.06
	(3.80)***	(0.16)***	(1.41)***	(0.33)	(3.70)***
Adj. R-sqr	0.38	0.21	-0.00	0.01	0.01
W/in adj. R-sqr.	0.33	0.04	0.04	0.00	0.06
N. of obs	272,071	199,938	39,267	41,029	129,051
N. of clusters	30,868	21,769	5,997	6,315	18,846

(b) Fixed coupon loans

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAC	(5) Share int. credit
Issued/TA	1.53	0.02	2.25	-0.07	11.68
	(1.34)	(0.01)	(0.48)***	(0.06)	(4.64)**
Prepaid/TA	-9.72	-0.03	-2.68	-0.06	-24.48
	(6.31)	(0.05)	(0.54)***	(0.15)	(6.05)***
Matured/TA	-2.31	-0.08	0.45	0.02	-7.07
	(1.05)**	(0.03)***	(0.22)**	(0.04)	(4.74)
Adj. R-sqr	0.38	0.21	-0.02	-0.04	-0.04
W/in adj. R-sqr.	0.32	0.04	0.03	0.00	0.01
N. of obs	272,071	199,938	47,416	59,270	129,051
N. of clusters	30,868	21,769	9,521	11,351	18,846

(c) Variable rate loans

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAS	(5) Share int. credit
Issued/TA	7.99	0.34	3.66	0.27	10.18
	(5.68)	(0.07)***	(0.44)***	(0.14)*	(6.72)
Prepaid/TA	-3.11	-0.24	1.70	-0.34	-38.11
	(3.02)	(0.09)***	(0.41)***	(0.25)	(5.95)***
Matured/TA	-7.98	-0.09	1.64	-0.26	-11.49
	(4.92)	(0.13)	(1.31)	(0.26)	(6.90)*
Adj. R-sqr	0.38	0.21	0.02	-0.02	-0.04
W/in adj. R-sqr.	0.32	0.04	0.06	0.00	0.01
N. of obs	272,071	199,938	35,157	22,422	129,051
N. of clusters	30,868	21,769	6,570	4,343	18,846

Table 17: Motives to refinance and firm-level outcomes. This table reports the estimated coefficients from the regression of year-over-year changes in firm-level outcomes on security-type-level debt issuances, debt retirements and debt refinancings. Weighted average maturity (WAM) and weighted average coupon/spread (WAC/WAS) measured at the security-type level. "Share of int. credit" defined as the ratio between loans (both fixed coupon and variable rate) and the sum of bonds and loans outstanding. "Interest" indicates that at least one instrument prepaid had positive moneyness but less than half of its lifetime passed; "Maturity" indicates that at least one instrument prepaid had more than half of its lifetime passed but negative moneyness; "Both" indicates that at least one instrument prepaid had positive moneyness and more than half of its lifetime passed; "Neither" indicates that at least one instrument prepaid had neither positive moneyness nor had more than half of its lifetime passed. The omitted category are periods with no refinancings. All regressions include firm characteristics, and firm, year, country, and country-year fixed effects. Standard errors clustered at the firm level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Bonds

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAC	(5) Share int. credit
Interest	0.56	-0.02	0.99	-0.46	-0.87
	(0.32)*	(0.03)	(0.10)***	(0.04)***	(0.68)
Maturity	-0.84	-0.12	1.70	0.07	1.50
	(0.74)	(0.10)	(0.22)***	(0.07)	(1.80)
Both	0.46	-0.05	1.65	-0.35	-0.01
	(0.42)	(0.04)	(0.10)***	(0.04)***	(0.69)
Neither	-0.32	-0.11	0.80	-0.01	-1.97
	(0.52)	(0.06)*	(0.16)***	(0.06)	(1.13)*
Adj. R-sqr	0.60	0.24	0.05	0.12	-0.04
W/in adj. R-sqr.	0.56	0.05	0.08	0.02	0.00
N. of obs	44,321	35,515	24,981	25,219	42,806
N. of clusters	8,382	6,521	4,103	4,154	8,050

(b) Fixed coupon loans

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAC	(5) Share int. credit
Interest	0.04	0.09	-0.00	-0.25	-0.21
	(0.52)	(0.05)*	(0.14)	(0.09)***	(0.70)
Maturity	0.45	0.01	1.47	0.02	0.30
	(0.69)	(0.09)	(0.29)***	(0.15)	(1.52)
Both	-0.52	-0.05	0.52	-0.38	0.74
	(0.61)	(0.08)	(0.19)***	(0.13)***	(0.79)
Neither	0.27	0.05	0.62	-0.05	0.73
	(0.27)	(0.03)	(0.12)***	(0.07)	(0.77)
Adj. R-sqr	0.60	0.24	-0.04	-0.03	-0.04
W/in adj. R-sqr.	0.56	0.05	0.01	0.00	0.00
N. of obs	44,321	35,515	19,350	20,250	42,806
N. of clusters	8,382	6,521	4,707	4,883	8,050

(c) Variable rate loans

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAS	(5) Share int. credit
Interest	0.85	0.05	0.93	-0.21	-2.50
	(0.64)	(0.07)	(0.15)***	(0.07)***	(1.18)**
Maturity	1.08	-0.02	1.52	0.06	2.81
	(1.31)	(0.10)	(0.17)***	(0.11)	(1.05)***
Both	0.15	0.28	1.18	-0.11	-0.63
	(0.79)	(0.09)***	(0.17)***	(0.10)	(1.21)
Neither	0.07	-0.05	0.68	0.10	-0.04
	(0.33)	(0.04)	(0.13)***	(0.05)**	(0.70)
Adj. R-sqr	0.60	0.24	0.01	0.00	-0.04
W/in adj. R-sqr.	0.56	0.05	0.04	0.00	0.00
N. of obs	44,321	35,515	10,448	8,358	42,806
N. of clusters	8,382	6,521	2,505	1,989	8,050

Table 18: Debt management and firm-level outcomes across country types. This table reports the estimated coefficients from the regression of year-over-year changes in firm-level outcomes on security-type-level debt issuances, debt retirements and debt refinancings, interacted with the country-type of issuers. Weighted average maturity (WAM) and weighted average coupon/spread (WAC/WAS) measured at the security-type level. "Share of int. credit" defined as the ratio between loans (both fixed coupon and variable rate) and the sum of bonds and loans outstanding. A debt issuance is an issuance of a new instrument in a given year without a debt retirement occurring in the same year; a debt retirement is an instrument leaving the debt structure in a given year without a corresponding issuance in the same year; a debt refinancing is issuance and retirement happening in the same year. The omitted category are periods with no change to the debt structure. All regressions include firm characteristics, and firm, year, country, and country-year fixed effects. Standard errors clustered at the firm level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Bonds

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAC	(5) Share int. credit
Issuance	1.45	0.04	1.21	-0.13	-16.75
	(0.42)***	(0.01)***	(0.03)***	(0.02)***	(0.49)***
Retirement	-1.07	-0.06	0.98	-0.09	12.75
	(0.23)***	(0.01)***	(0.03)***	(0.02)***	(0.50)***
Early refinancing	0.57	-0.02	1.89	-0.42	-0.67
	(0.28)**	(0.02)	(0.05)***	(0.04)***	(0.45)
Refinancing	-1.32	-0.01	2.40	-0.23	-0.72
	(0.39)***	(0.02)	(0.04)***	(0.04)***	(0.44)
Issuance × EM	-0.87	0.04	-0.22	-0.03	-10.23
	(0.61)	(0.03)	(0.09)**	(0.05)	(1.07)***
Retirement × EM	-0.67	0.01	-0.20	0.02	6.24
	(0.37)*	(0.03)	(0.07)***	(0.05)	(1.11)***
Early refinancing × EM	-0.43	0.01	-0.29	0.20	-1.04
	(0.96)	(0.07)	(0.24)	(0.10)**	(1.25)
Refinancing × EM	-0.53	0.04	-0.28	-0.06	-1.90
	(0.52)	(0.04)	(0.11)**	(0.08)	(0.90)**
Adj. R-sqr	0.37	0.21	0.16	0.02	0.07
W/in adj. R-sqr.	0.32	0.04	0.21	0.01	0.12
N. of obs	272,071	199,938	39,267	41,029	129,051
N. of clusters	30,868	21,769	5,997	6,315	18,846

(b) Fixed coupon loans

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAC	(5) Share int. credit
Issuance	0.35	0.05	0.59	-0.02	7.78
	(0.34)	(0.01)***	(0.05)***	(0.03)	(0.37)***
Retirement	-1.10	-0.03	0.54	-0.12	-10.67
	(0.36)***	(0.01)**	(0.05)***	(0.03)***	(0.37)***
Early refinancing	0.44	0.08	0.91	-0.17	-0.03
	(0.22)**	(0.02)***	(0.06)***	(0.03)***	(0.34)
Refinancing	-0.09	0.01	1.78	-0.17	0.05
	(0.24)	(0.02)	(0.06)***	(0.03)***	(0.30)
Issuance × EM	0.24	0.02	-0.15	0.02	-4.28
	(0.33)	(0.02)	(0.08)**	(0.06)	(0.50)***
Retirement × EM	0.08	-0.02	0.20	0.04	7.10
	(0.41)	(0.02)	(0.07)***	(0.05)	(0.50)***
Early refinancing × EM	0.65	-0.06	0.13	-0.09	0.86
	(0.72)	(0.04)	(0.10)	(0.09)	(0.62)
Refinancing × EM	0.12	0.01	-0.11	0.02	0.37
	(0.33)	(0.02)	(0.08)	(0.06)	(0.42)
Adj. R-sqr	0.37	0.21	0.02	-0.04	-0.01
W/in adj. R-sqr.	0.32	0.04	0.07	0.00	0.04
N. of obs	272,071	199,938	47,416	59,270	129,051
N. of clusters	30,868	21,769	9,521	11,351	18,846

(c) Variable rate loans

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAS	(5) Share int. credit
Issuance	0.65	0.03	0.54	0.07	11.04
	(0.52)	(0.02)**	(0.06)***	(0.04)*	(0.44)***
Retirement	-1.08	-0.04	0.81	-0.05	-8.32
	(0.28)***	(0.01)***	(0.05)***	(0.04)	(0.39)***
Early refinancing	-0.04	0.02	1.44	0.01	0.71
	(1.01)	(0.02)	(0.07)***	(0.06)	(0.38)*
Refinancing	-0.23	0.02	1.98	-0.03	0.23
	(0.60)	(0.02)	(0.08)***	(0.05)	(0.28)
Issuance × EM	0.15	0.06	0.02	-0.14	-7.14
	(0.47)	(0.02)**	(0.07)	(0.05)***	(0.57)***
Retirement × EM	0.56	0.02	-0.09	0.02	4.88
	(0.37)	(0.02)	(0.07)	(0.05)	(0.53)***
Early refinancing × EM	0.31	0.03	-0.31	-0.06	-0.56
	(1.04)	(0.04)	(0.10)***	(0.08)	(0.60)
Refinancing × EM	-0.45	-0.01	-0.35	-0.01	0.09
	(0.61)	(0.03)	(0.10)***	(0.06)	(0.42)
Adj. R-sqr	0.37	0.21	0.07	-0.02	-0.02
W/in adj. R-sqr.	0.32	0.04	0.10	0.00	0.03
N. of obs	272,071	199,938	35,157	22,422	129,051
N. of clusters	30,868	21,769	6,570	4,343	18,846

Table 19: Issuance characteristics over the global credit cycle. This table reports the estimated coefficients from the regression of instrument-level coupons (for bonds and fixed rate loans) and spread (for variable rate loans), as well as time-to-maturity at issuance, on the global credit factor of Boyarchenko and Elias (2024d). All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

	Coupon			Maturity		
	(1) Bonds	(2) Fixed loans	(3) Variable loans	(4) Bonds	(5) Fixed loans	(6) Variable loans
Global credit	0.41	0.11	0.03	-0.21	0.03	0.06
	(0.07)***	(0.05)*	(0.03)	(0.04)***	(0.07)	(0.05)
Constant	4.32	5.71	2.27	7.05	5.46	5.30
	(0.05)***	(0.04)***	(0.02)***	(0.02)***	(0.05)***	(0.03)***
Adj. R-sqr	0.71	0.61	0.63	0.35	0.33	0.35
W/in adj. R-sqr.	0.06	0.00	0.00	0.00	0.00	0.00
N. of obs	60,243	39,752	14,241	61,420	41,514	19,639
N. of clusters	43	44	44	43	44	44

Table 20: Interest cost incentive to prepay over the global credit cycle. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument moneyness, the global credit factor of Boyarchenko and Elias (2024d) and firm characteristics. "EM" is an indicator for issuers in emerging market economies. "Medium risk" are firms in the middle two quartiles of the country-level log EDF distribution and "high risk" are firms in the top quartile of the country-level log EDF distribution. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Moneyness measured as the difference between the instrument's coupon (spread in the case of variable rate loans) and the average coupon (spread) of newly issued securities, in the same country-year, with the same currency and same original time-to-maturity. Positive moneyness indicates that the instrument is "in-the-money", with the instrument's coupon higher than the prevailing market rate on comparable instruments. All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates.

	Bonds						Fixed Loans						Variable Loans					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Moneyness	0.52	0.27	0.31	0.18	0.14	0.03	1.09	1.12	0.82	0.60	1.08	1.06	1.04	0.53	-0.69	-0.57	0.89	0.67
	(0.11)***	(0.12)**	(0.12)**	(0.10)*	(0.11)	(0.10)	(0.25)***	(0.33)***	(0.36)**	(0.43)	(0.49)**	(0.69)	(0.51)**	(0.67)	(0.75)	(0.83)	(1.23)	(1.52)
Global credit		-0.92		-0.70		-0.92		-4.45		-3.08		-3.57		-2.71		-5.17		-2.53
		(0.32)***		(0.19)***		(0.48)*		(1.60)***		(1.71)*		(1.32)***		(1.15)**		(0.73)***		(1.54)
Moneyness × Global credit		0.05		0.14		0.23		0.04		0.27		0.11		0.07		-0.10		0.74
		(0.14)		(0.10)		(0.14)		(0.19)		(0.20)		(0.58)		(0.39)		(0.44)		(1.52)
EM × Moneyness			0.19	0.62					0.66	0.89					2.32	2.16		
			(0.29)	(0.45)					(0.51)	(0.59)					(0.90)**	(1.10)*		
EM × Global credit				-2.66						-4.05						4.58		
				(1.99)						(2.83)						(0.96)***		
EM × Moneyness × Global credit				-0.60						-0.42						0.13		
				(0.22)***						(0.41)						(0.64)		
Medium risk					0.61	0.88					-4.33	-3.70					0.36	0.39
					(0.60)	(0.68)					(2.17)*	(1.97)*					(2.96)	(2.49)
High risk					1.21	1.91					-4.42	0.06					0.66	4.38
					(1.68)	(1.93)					(2.45)*	(3.40)					(3.35)	(4.36)
Medium risk × Moneyness					0.29	0.33					0.19	0.12					-0.15	-0.91
					(0.12)**	(0.12)**					(0.33)	(0.46)					(1.34)	(1.89)
High risk × Moneyness					0.69	0.86					-0.20	-0.03					-1.08	-0.30
					(0.28)**	(0.27)***					(0.39)	(0.69)					(1.93)	(2.55)
Medium risk × Global credit						0.26						1.27						0.91
						(0.52)						(1.66)						(1.68)
High risk × Global credit						0.32						-1.64						-1.78
						(0.74)						(3.09)						(2.11)
Medium risk × Moneyness × Global credit						-0.21						0.05						0.77
						(0.09)**						(0.53)						(1.91)
High risk × Moneyness × Global credit						-0.31						-0.41						-1.26
						(0.21)						(0.69)						(1.83)
Constant	9.20	9.78	9.27	9.81	7.82	8.09	26.39	28.93	26.38	28.99	26.04	26.93	22.28	23.93	22.11	23.85	21.49	22.42
	(0.04)***	(0.16)***	(0.04)***	(0.14)***	(0.37)***	(0.49)***	(0.01)***	(0.91)***	(0.02)***	(0.78)***	(1.68)***	(1.46)***	(0.05)***	(0.68)***	(0.08)***	(0.30)***	(2.09)***	(2.14)***
Year FE	✓						✓						✓					
Country× Year FE	✓						✓						✓					
Adj. R-sqr	0.18	0.15	0.15	0.15	0.14	0.14	0.29	0.24	0.24	0.25	0.18	0.19	0.24	0.18	0.18	0.19	0.19	0.19
W/in adj. R-sqr.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	-0.00	0.01
N. of obs	142,034	142,061	142,061	142,061	98,412	98,412	54,601	54,680	54,680	54,680	32,780	32,780	19,260	19,349	19,349	19,349	12,665	12,665
N. of clusters	42	42	42	42	42	42	44	44	44	44	42	42	41	41	41	41	40	40

Table 21: Maturity incentive to prepay over the global credit cycle. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument maturity incentive, the global credit factor of Boyarchenko and Elias (2024d) and firm characteristics. "EM" is an indicator for issuers in emerging market economies. "Medium risk" are firms in the middle two quartiles of the country-level log EDF distribution and "high risk" are firms in the top quartile of the country-level log EDF distribution. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Maturity incentive measured as age as a fraction of original time-to-maturity; age is measured as the difference between current period end date and period end date at issuance. All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates.

	Bonds						Fixed Loans						Variable Loans					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Maturity incentive	19.78	15.50	15.28	13.14	10.08	9.22	49.56	41.33	47.27	39.09	33.08	29.01	43.07	41.11	67.44	66.09	31.04	28.12
	(3.37)***	(3.27)***	(3.70)***	(3.28)***	(1.92)***	(1.96)***	(5.10)***	(5.65)***	(5.35)***	(3.96)***	(5.79)***	(5.32)***	(10.13)***	(10.77)***	(9.80)***	(10.27)***	(14.72)**	(17.88)
Global credit		-1.47		-1.59		-1.25		-6.13		-4.32		-4.53		-2.55		-1.74		-3.32
		(0.14)***		(0.09)***		(0.52)**		(2.00)***		(2.32)*		(2.31)*		(0.65)***		(0.76)**		(3.82)
Maturity incentive × Global credit		2.57		3.38		1.75		14.73		10.80		9.60		6.68		-2.85		7.24
		(1.38)*		(0.98)***		(0.35)***		(3.72)***		(3.40)***		(5.68)*		(3.29)**		(3.60)		(15.32)
EM × Maturity incentive			11.88	13.15					9.32	4.16					-36.09	-38.96		
			(7.31)	(6.64)*					(13.74)	(10.73)					(12.26)***	(11.72)***		
EM × Global credit				-0.11						-5.10						-0.44		
				(1.22)						(3.77)						(1.50)		
EM × Maturity incentive × Global credit				-4.76						11.56						13.68		
				(2.41)*						(7.07)						(5.45)**		
Medium risk					-1.65	-1.27					-5.98	-6.28					-1.83	-1.84
					(1.16)	(1.21)					(2.71)**	(2.58)**					(4.63)	(4.80)
High risk					-3.96	-3.95					-11.34	-6.04					-6.53	-1.12
					(2.54)	(2.24)*					(4.73)**	(6.25)					(4.64)	(6.39)
Medium risk × Maturity incentive					7.31	6.71					9.30	9.08					8.37	8.06
					(4.78)	(4.68)					(2.49)***	(3.20)***					(9.29)	(11.66)
High risk × Maturity incentive					14.79	16.61					28.13	20.70					28.05	17.08
					(10.51)	(9.65)*					(7.85)***	(9.92)**					(11.14)**	(13.91)
Medium risk × Global credit						0.22						1.79						1.05
						(0.52)						(2.59)						(4.37)
High risk × Global credit						1.06						-1.01						-1.61
						(1.09)						(4.76)						(4.35)
Medium risk × Maturity incentive × Global credit						0.09						-1.16						-0.75
						(0.55)						(5.03)						(14.52)
High risk × Maturity incentive × Global credit						-2.65						-2.40						3.88
						(1.93)						(7.58)						(15.85)
Constant	2.63	4.45	3.42	4.43	4.24	4.73	12.08	15.85	11.46	15.91	14.08	16.11	8.07	9.17	7.06	8.53	9.92	11.26
	(1.15)**	(1.16)***	(1.11)***	(1.08)***	(0.98)***	(1.14)***	(1.48)***	(1.55)***	(1.93)***	(1.52)***	(3.40)***	(3.06)***	(3.32)**	(3.22)***	(1.93)***	(1.83)***	(5.19)*	(5.92)*
Year FE	✓						✓						✓					
Country× Year FE	✓						✓						✓					
Adj. R-sqr	0.19	0.16	0.16	0.16	0.15	0.15	0.32	0.28	0.27	0.28	0.21	0.22	0.26	0.22	0.22	0.22	0.21	0.21
W/in adj. R-sqr.	0.02	0.02	0.02	0.02	0.01	0.01	0.04	0.06	0.05	0.06	0.04	0.05	0.03	0.04	0.05	0.05	0.03	0.03
N. of obs	141,874	141,901	141,901	141,901	98,296	98,296	54,566	54,645	54,645	54,645	32,763	32,763	19,247	19,336	19,336	19,336	12,660	12,660
N. of clusters	42	42	42	42	42	42	44	44	44	44	42	42	41	41	41	41	40	40

Table 22: Interest cost incentive to prepay and alternative measures of the global financial cycle. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument moneyness and measures of the global financial cycle. "Global credit" is the global credit factor of Boyarchenko and Elias (2024d); higher levels of the global credit factor correspond to tighter credit conditions. "GFC" is the global financial cycle factor of Miranda-Agrippino et al. (2020); lower levels of GFC correspond to tighter credit conditions. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Moneyness measured as the difference between the instrument's coupon (spread in the case of variable rate loans) and the average coupon (spread) of newly issued securities, in the same country-year, with the same currency and same original time-to-maturity. Positive moneyness indicates that the instrument is "in-the-money", with the instrument's coupon higher than the prevailing market rate on comparable instruments. All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates.

	Bonds					Fixed Loans					Variable Loans				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Moneyness	0.27	0.58	1.18	0.37	0.34	1.12	1.84	2.24	1.37	1.46	0.53	0.51	0.87	0.62	0.46
	(0.12)**	(0.30)*	(0.42)***	(0.18)**	(0.16)**	(0.33)***	(0.56)***	(0.56)***	(0.27)***	(0.30)***	(0.67)	(1.46)	(1.33)	(0.56)	(0.74)
Global credit	-0.92		-1.36		-0.69	-4.45		-4.58		-5.34	-2.71		-2.98		-3.71
	(0.32)***		(0.51)**		(0.30)**	(1.60)***		(1.42)***		(2.05)**	(1.15)**		(1.46)**		(1.64)**
Moneyness × Global credit	0.05		0.26		0.01	0.04		0.25		-0.18	0.07		0.13		0.11
	(0.14)		(0.20)		(0.07)	(0.19)		(0.25)		(0.18)	(0.39)		(0.42)		(0.48)
VIX		-0.02	0.12				-0.40	0.04				-0.20	0.08		
		(0.05)	(0.07)*				(0.19)**	(0.12)				(0.11)*	(0.14)		
Moneyness × VIX		-0.01	-0.06				-0.03	-0.07				0.00	-0.02		
		(0.01)	(0.02)**				(0.03)	(0.04)*				(0.07)	(0.08)		
GFC				2.15	1.90				0.23	-3.27				-0.77	-2.68
				(0.44)***	(0.52)***				(1.78)	(2.57)				(1.75)	(2.49)
Moneyness × GFC				0.07	0.09				-0.02	-0.08				-0.08	0.19
				(0.12)	(0.11)				(0.29)	(0.29)				(0.62)	(0.55)
Constant	9.78	9.64	7.71	8.99	9.50	28.93	34.01	28.32	25.98	30.17	23.93	25.91	22.53	22.70	25.47
	(0.16)***	(0.90)***	(1.12)***	(0.09)***	(0.29)***	(0.91)***	(3.64)***	(2.61)***	(0.07)***	(1.63)***	(0.68)***	(1.99)***	(2.04)***	(0.05)***	(1.19)***
Adj. R-sqr	0.15	0.15	0.15	0.14	0.14	0.24	0.24	0.24	0.22	0.23	0.18	0.18	0.18	0.18	0.19
W/in adj. R-sqr.	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01
N. of obs	142,061	142,061	142,061	117,789	117,789	54,680	54,680	54,680	43,727	43,727	19,349	19,349	19,349	16,529	16,529
N. of clusters	42	42	42	41	41	44	44	44	44	44	41	41	41	41	41

Table 23: Maturity incentive to prepay and alternative measures of the global financial cycle. This table reports the estimated coefficients from the linear probability regression of prepayment on instrument maturity incentive and measures of the global financial cycle. "Global credit" is the global credit factor of Boyarchenko and Elias (2024d); higher levels of the global credit factor correspond to tighter credit conditions. "GFC" is the global financial cycle factor of Miranda-Agrippino et al. (2020); lower levels of GFC correspond to tighter credit conditions. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Maturity incentive measured as age as a fraction of original time-to-maturity; age is measured as the difference between current period end date and period end date at issuance. All regressions include country, firm, and currency fixed effects. Variable rate loan regressions additionally include benchmark index fixed effects. Standard errors clustered at the country level reported in parentheses below point estimates.

	Bonds					Fixed Loans					Variable Loans				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Maturity incentive	15.50	12.17	16.61	19.42	17.93	41.33	40.41	64.81	62.47	52.67	41.11	46.68	58.68	50.74	47.09
	(3.27)***	(5.50)**	(5.29)***	(3.51)***	(3.41)***	(5.65)***	(11.31)***	(10.38)***	(8.76)***	(8.34)***	(10.77)***	(12.66)***	(13.39)***	(10.53)***	(11.07)***
Global credit	-1.47		-1.90		-0.83	-6.13		-7.44		-4.27	-2.55		-4.03		-1.79
	(0.14)***		(0.39)***		(0.21)***	(2.00)***		(1.81)***		(2.11)**	(0.65)***		(1.30)***		(0.76)**
Maturity incentive × Global credit	2.57		2.97		1.90	14.73		18.96		8.81	6.68		10.37		3.39
	(1.38)*		(0.83)***		(1.32)	(3.72)***		(3.87)***		(3.14)***	(3.29)**		(4.03)**		(3.33)
VIX		-0.10	0.11				-0.48	0.41				-0.05	0.42		
		(0.10)	(0.13)				(0.26)*	(0.19)**				(0.11)	(0.21)*		
Maturity incentive × VIX		0.26	-0.07				0.55	-1.35				-0.07	-1.07		
		(0.24)	(0.21)				(0.47)	(0.35)***				(0.39)	(0.48)**		
GFC				3.36	3.10				-0.60	-3.04				0.99	0.25
				(0.49)***	(0.53)***				(2.52)	(3.05)				(1.37)	(1.49)
Maturity incentive × GFC				-1.44	-0.99				16.03	18.92				3.79	4.34
				(1.34)	(1.41)				(6.38)**	(6.44)***				(4.21)	(3.72)
Constant	4.45	5.43	2.60	2.52	3.20	15.85	20.91	8.78	8.24	12.71	9.17	8.31	2.38	6.52	8.32
	(1.16)***	(2.47)**	(2.72)	(1.20)**	(1.21)**	(1.55)***	(4.40)***	(3.23)***	(2.43)***	(2.61)***	(3.22)***	(3.62)**	(4.84)	(3.39)*	(3.11)**
Adj. R-sqr	0.16	0.16	0.16	0.16	0.16	0.28	0.27	0.28	0.27	0.27	0.22	0.21	0.22	0.22	0.22
W/in adj. R-sqr.	0.02	0.01	0.02	0.02	0.02	0.06	0.05	0.06	0.07	0.07	0.04	0.04	0.04	0.05	0.05
N. of obs	141,901	141,901	141,901	117,629	117,629	54,645	54,645	54,645	43,691	43,691	19,336	19,336	19,336	16,514	16,514
N. of clusters	42	42	42	41	41	44	44	44	44	44	41	41	41	41	41

Table 24: Debt management and firm-level outcomes over the global credit cycle. This table reports the estimated coefficients from the regression of year-over-year changes in firm-level outcomes on security-type-level debt issuances, debt retirements and debt refinancings, and year-over-year changes in the global credit cycle. Weighted average maturity (WAM) and weighted average coupon/spread (WAC/WAS) measured at the security-type level. "Share of int. credit" defined as the ratio between loans (both fixed coupon and variable rate) and the sum of bonds and loans outstanding. "Global credit" is the global credit factor of Boyarchenko and Elias (2024d); higher levels of the global credit factor correspond to tighter credit conditions. A debt issuance is an issuance of a new instrument in a given year without a debt retirement occurring in the same year; a debt retirement is an instrument leaving the debt structure in a given year without a corresponding issuance in the same year; a debt refinancing is issuance and retirement happening in the same year. The omitted category are periods with no change to the debt structure. All regressions include firm characteristics, and firm and country fixed effects. Standard errors clustered at the firm level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Bonds

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAC	(5) Share int. credit
Issuance	1.32	0.05	1.17	-0.13	-19.01
	(0.37)***	(0.01)***	(0.03)***	(0.02)***	(0.45)***
Retirement	-1.18	-0.07	0.91	-0.08	13.80
	(0.19)***	(0.01)***	(0.03)***	(0.02)***	(0.45)***
Early refinancing	0.18	-0.05	1.77	-0.39	-0.96
	(0.27)	(0.02)**	(0.05)***	(0.04)***	(0.41)**
Refinancing	-1.34	-0.01	2.32	-0.26	-1.28
	(0.34)***	(0.02)	(0.04)***	(0.04)***	(0.38)***
Δ global credit	0.46	0.19	-0.01	-0.00	0.06
	(0.05)***	(0.00)***	(0.01)*	(0.00)	(0.03)*
Issuance × Δ global credit	0.14	0.01	-0.06	0.06	-0.28
	(0.17)	(0.01)	(0.02)***	(0.01)***	(0.30)
Retirement × Δ global credit	-0.12	0.09	-0.04	0.01	0.11
	(0.14)	(0.01)***	(0.02)	(0.01)	(0.32)
Early refinancing × Δ global credit	-0.24	0.15	-0.18	0.10	0.75
	(0.16)	(0.02)***	(0.04)***	(0.02)***	(0.30)**
Refinancing × Δ global credit	0.06	0.11	-0.08	0.11	0.67
	(0.15)	(0.01)***	(0.03)***	(0.02)***	(0.28)**
Adj. R-sqr	0.37	0.06	0.16	0.01	0.06
W/in adj. R-sqr.	0.32	0.10	0.20	0.01	0.11
N. of obs	272,073	199,942	39,322	41,081	129,054
N. of clusters	30,868	21,770	6,003	6,320	18,846

(b) Fixed coupon loans

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAC	(5) Share int. credit
Issuance	0.26	0.05	0.55	-0.01	5.92
	(0.24)	(0.01)***	(0.04)***	(0.03)	(0.26)***
Retirement	-1.15	-0.07	0.59	-0.11	-8.30
	(0.24)***	(0.01)***	(0.03)***	(0.02)***	(0.27)***
Early refinancing	0.00	0.07	1.05	-0.17	0.36
	(0.21)	(0.02)***	(0.05)***	(0.03)***	(0.27)
Refinancing	-0.20	-0.01	1.73	-0.15	0.14
	(0.19)	(0.01)	(0.04)***	(0.03)***	(0.21)
Δ global credit	0.45	0.19	0.04	-0.01	0.19
	(0.06)***	(0.00)***	(0.01)***	(0.00)*	(0.04)***
Issuance × Δ global credit	-0.24	0.00	0.01	-0.01	0.18
	(0.11)**	(0.01)	(0.03)	(0.02)	(0.19)
Retirement × Δ global credit	0.28	-0.01	0.01	0.02	-0.60
	(0.14)**	(0.01)*	(0.03)	(0.02)	(0.20)***
Early refinancing × Δ global credit	-0.01	0.11	0.04	-0.03	0.02
	(0.14)	(0.01)***	(0.03)	(0.02)*	(0.17)
Refinancing × Δ global credit	0.12	0.05	-0.01	-0.06	0.15
	(0.12)	(0.01)***	(0.03)	(0.02)***	(0.15)
Adj. R-sqr	0.37	0.06	0.01	-0.06	-0.02
W/in adj. R-sqr.	0.32	0.10	0.08	0.00	0.04
N. of obs	272,073	199,942	47,447	59,286	129,054
N. of clusters	30,868	21,770	9,526	11,353	18,846

(c) Variable rate loans

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAS	(5) Share int. credit
Issuance	0.70	0.06	0.61	0.01	7.93
	(0.35)**	(0.01)***	(0.04)***	(0.03)	(0.30)***
Retirement	-0.97	-0.07	0.80	-0.02	-6.29
	(0.18)***	(0.01)***	(0.04)***	(0.03)	(0.27)***
Early refinancing	-0.11	0.00	1.36	-0.03	0.59
	(0.70)	(0.02)	(0.05)***	(0.03)	(0.29)**
Refinancing	-0.55	0.01	1.88	-0.03	0.40
	(0.37)	(0.02)	(0.05)***	(0.03)	(0.21)*
Δ global credit	0.44	0.20	0.01	0.01	0.13
	(0.06)***	(0.00)***	(0.01)	(0.01)	(0.04)***
Issuance × Δ global credit	-0.13	0.02	0.05	-0.03	0.44
	(0.13)	(0.01)	(0.04)	(0.02)	(0.22)**
Retirement × Δ global credit	0.22	-0.00	0.05	0.05	0.39
	(0.11)*	(0.01)	(0.03)	(0.03)*	(0.22)*
Early refinancing × Δ global credit	0.43	0.07	-0.04	0.04	-0.03
	(0.25)*	(0.02)***	(0.04)	(0.02)	(0.19)
Refinancing × Δ global credit	-0.13	-0.02	0.11	0.03	-0.06
	(0.12)	(0.01)	(0.04)***	(0.02)	(0.13)
Adj. R-sqr	0.37	0.06	0.05	-0.08	-0.03
W/in adj. R-sqr.	0.32	0.10	0.11	0.00	0.03
N. of obs	272,073	199,942	35,182	22,479	129,054
N. of clusters	30,868	21,770	6,573	4,354	18,846

Table 25: Motives to refinance and firm-level outcomes over the global credit cycle. This table reports the estimated coefficients from the regression of year-over-year changes in firm-level outcomes on security-type-level debt issuances, debt retirements and debt refinancings, and year-over-year changes in the global credit cycle. Weighted average maturity (WAM) and weighted average coupon/spread (WAC/WAS) measured at the security-type level. "Share of int. credit" defined as the ratio between loans (both fixed coupon and variable rate) and the sum of bonds and loans outstanding. "Global credit" is the global credit factor of Boyarchenko and Elias (2024d); higher levels of the global credit factor correspond to tighter credit conditions. "Interest" indicates that at least one instrument prepaid had positive moneyness but less than half of its lifetime passed; "Maturity" indicates that at least one instrument prepaid had more than half of its lifetime passed but negative moneyness; "Both" indicates that at least one instrument prepaid had positive moneyness and more than half of its lifetime passed; "Neither" indicates that at least one instrument prepaid had neither positive moneyness nor had more than half of its lifetime passed. The omitted category are periods with no refinancings. All regressions include firm characteristics, and firm and country fixed effects. Standard errors clustered at the firm level reported in parentheses below point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Bonds

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAC	(5) Share int. credit
Interest	0.18	-0.10	0.93	-0.45	-0.47
	(0.30)	(0.04)***	(0.09)***	(0.04)***	(0.67)
Maturity	-0.94	-0.05	1.91	0.10	1.20
	(0.73)	(0.12)	(0.25)***	(0.07)	(1.85)
Both	0.48	-0.04	1.66	-0.36	0.24
	(0.41)	(0.04)	(0.10)***	(0.04)***	(0.66)
Neither	-0.80	-0.16	0.75	0.00	-1.76
	(0.45)*	(0.06)**	(0.16)***	(0.06)	(1.09)
Δ global credit	0.46	0.19	-0.01	0.02	0.26
	(0.04)***	(0.00)***	(0.01)	(0.00)***	(0.08)***
Interest × Δ global credit	-0.46	0.17	-0.16	0.03	-0.02
	(0.21)**	(0.04)***	(0.09)*	(0.04)	(0.69)
Maturity × Δ global credit	0.14	0.12	-0.49	0.01	0.70
	(0.50)	(0.09)	(0.13)***	(0.03)	(0.88)
Both × Δ global credit	0.03	0.07	-0.25	0.05	0.15
	(0.22)	(0.03)**	(0.07)***	(0.03)**	(0.40)
Neither × Δ global credit	0.14	0.13	-0.10	0.05	1.78
	(0.37)	(0.05)***	(0.13)	(0.04)	(0.85)**
Adj. R-sqr	0.59	0.07	0.05	0.11	-0.05
W/in adj. R-sqr.	0.57	0.12	0.08	0.02	0.00
N. of obs	44,386	35,588	25,061	25,302	42,872
N. of clusters	8,395	6,535	4,114	4,163	8,060

(b) Fixed coupon loans

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAC	(5) Share int. credit
Interest	-0.21	0.12	0.05	-0.23	0.11
	(0.53)	(0.06)**	(0.13)	(0.08)***	(0.68)
Maturity	0.41	0.08	1.43	0.04	0.02
	(0.66)	(0.09)	(0.30)***	(0.15)	(1.49)
Both	-0.74	-0.02	0.49	-0.36	0.85
	(0.61)	(0.09)	(0.18)***	(0.13)***	(0.73)
Neither	-0.32	0.04	0.61	-0.01	2.20
	(0.23)	(0.04)	(0.11)***	(0.07)	(0.69)***
Δ global credit	0.45	0.19	0.02	-0.02	0.24
	(0.05)***	(0.00)***	(0.01)	(0.01)**	(0.09)***
Interest × Δ global credit	0.51	0.14	0.04	0.00	-0.96
	(0.31)	(0.05)***	(0.10)	(0.06)	(0.54)*
Maturity × Δ global credit	0.27	0.18	-0.18	0.10	-1.49
	(0.62)	(0.12)	(0.29)	(0.10)	(0.72)**
Both × Δ global credit	0.19	0.14	0.16	0.10	-0.81
	(0.72)	(0.09)	(0.16)	(0.10)	(0.95)
Neither × Δ global credit	-0.04	0.14	0.15	-0.06	0.50
	(0.16)	(0.02)***	(0.07)**	(0.04)*	(0.45)
Adj. R-sqr	0.59	0.07	-0.04	-0.05	-0.05
W/in adj. R-sqr.	0.57	0.12	0.02	0.00	0.00
N. of obs	44,386	35,588	19,476	20,369	42,872
N. of clusters	8,395	6,535	4,737	4,908	8,060

(c) Variable rate loans

	(1) Total Debt	(2) Log EDF	(3) WAM	(4) WAS	(5) Share int. credit
Interest	1.02	0.01	0.88	-0.22	-2.69
	(0.61)*	(0.08)	(0.14)***	(0.07)***	(1.14)**
Maturity	1.35	-0.08	1.52	0.10	2.78
	(1.30)	(0.12)	(0.17)***	(0.10)	(1.01)***
Both	0.75	0.16	1.12	-0.10	-0.68
	(0.76)	(0.11)	(0.18)***	(0.09)	(1.15)
Neither	0.06	-0.04	0.70	0.02	0.20
	(0.35)	(0.04)	(0.11)***	(0.04)	(0.68)
Δ global credit	0.44	0.20	0.01	0.00	0.30
	(0.04)***	(0.00)***	(0.02)	(0.01)	(0.08)***
Interest × Δ global credit	0.23	0.04	-0.12	0.02	-0.96
	(0.43)	(0.08)	(0.12)	(0.06)	(0.91)
Maturity × Δ global credit	0.56	-0.26	-0.03	0.12	0.28
	(0.97)	(0.13)*	(0.19)	(0.06)**	(0.74)
Both × Δ global credit	-0.78	0.11	0.18	-0.01	1.05
	(1.43)	(0.19)	(0.47)	(0.15)	(1.30)
Neither × Δ global credit	0.31	0.07	-0.08	0.04	0.26
	(0.29)	(0.04)*	(0.10)	(0.04)	(0.53)
Adj. R-sqr	0.59	0.07	-0.02	-0.05	-0.05
W/in adj. R-sqr.	0.57	0.11	0.04	0.00	0.00
N. of obs	44,386	35,588	10,576	8,495	42,872
N. of clusters	8,395	6,535	2,532	2,019	8,060

Figure 1. Incentives to prepay. This figure plots the average probability of prepayment by security type as a function of interest cost and maturity incentive. Figure 1a plots the probability against instrument moneyness (in percentage points). Figure 1b plots the probability of prepayment against the maturity incentive. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Moneyness measured as the difference between the instrument's coupon (spread in the case of variable rate loans) and the average coupon (spread) of newly issued securities, in the same country-year, with the same currency and same original time-to-maturity. Positive moneyness indicates that the instrument is "in-the-money", with the instrument's coupon higher than the prevailing market rate on comparable instruments. Maturity incentive measured as age as a fraction of original time-to-maturity; age is measured as the difference between current period end date and period end date at issuance. All estimates include country, year, country-year, firm, and currency fixed effects.

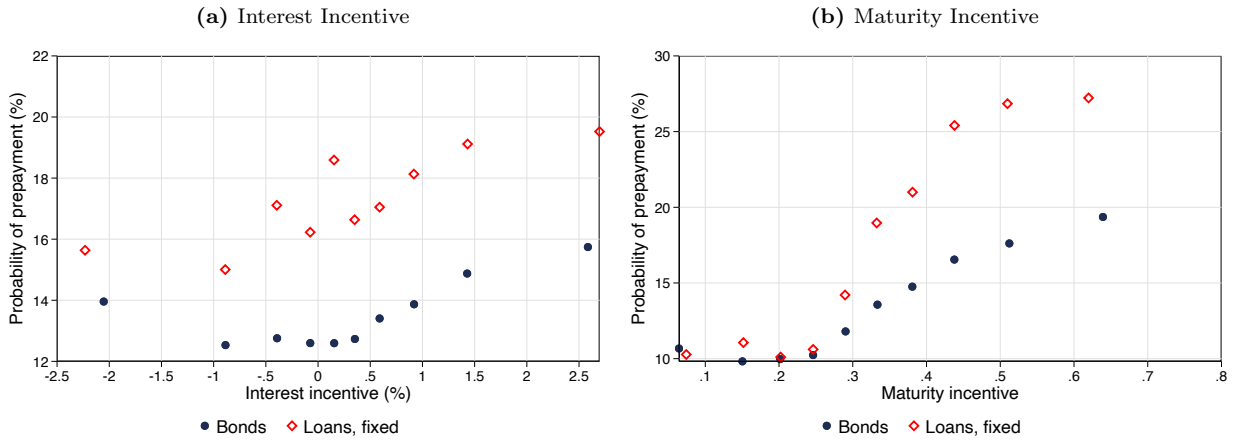


Figure 2. Incentives to prepay bonds over the global credit cycle. This figure plots the average probability of bond prepayment by the state of the global credit cycle as a function of interest cost and maturity incentive. Figure 2a plots the probability against instrument moneyness (in percentage points). Figure 2b plots the probability of prepayment against the maturity incentive. "GCC" refers to the global credit factor as constructed in Boyarchenko and Elias (2024d). "Tight GCC" is defined as the bottom quartile of the GCC distribution between 2002–2022. Conversely, "Loose GCC" is defined as the top quartile of the GCC distribution between 2002–2022. Prepayment is defined as the amount outstanding reaching 0 more than a year before contractual maturity. Moneyness measured as the difference between the instrument's coupon (spread in the case of variable rate loans) and the average coupon (spread) of newly issued securities, in the same country-year, with the same currency and same original time-to-maturity. Positive moneyness indicates that the instrument is "in-the-money", with the instrument's coupon higher than the prevailing market rate on comparable instruments. Maturity incentive measured as age as a fraction of original time-to-maturity; age is measured as the difference between current period end date and period end date at issuance. All estimates include country, firm, and currency fixed effects.

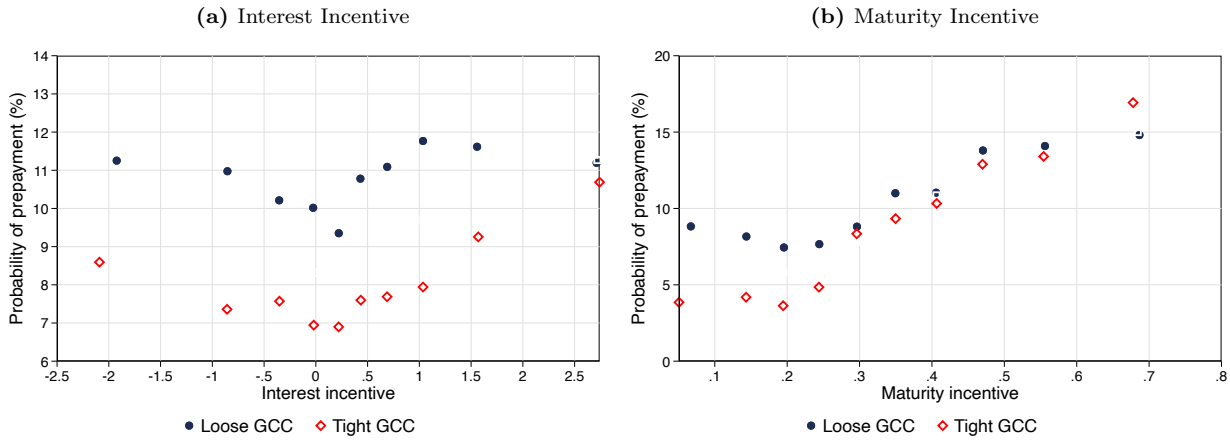


Figure 3. Measures of global cycles. This figure plots the time series of the annualized global credit factor of Boyarchenko and Elias (2024d), together with the VIX and the global financial cycle factor (GFC) of Miranda-Agrippino et al. (2020). The annualized global credit factor computed as an annual cumulant of the monthly global credit factor. VIX and GFC annualized as within-year averages.

