Nonbank Lending and the Transmission of Monetary Policy †

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Abstract

We analyze the role of nonbank lenders in the transmission of monetary policy using data on the universe of unsecured credit to firms and households in Denmark. Nonbanks increase their credit supply after a monetary contraction, both relative to banks and in absolute terms. The increase in nonbank lending is financed through increased long-term debt. A model with segmented debt markets featuring differential investor rate sensitivities rationalizes these findings. Nonbank credit insulates corporate investment and household consumption from monetary contractions, with positive spillovers extending beyond nonbank clients through industry and geographic channels.

Keywords: Monetary Policy; Nonbanks; Shadow Banks; Banks; Real Effects.

JEL Classification: E51, E52, G23.

1 Introduction

The bank lending channel—where banks reduce lending following a monetary contraction—is well-documented (Kashyap and Stein, 1994; Bernanke and Gertler, 1995). However, despite nonbank financial intermediaries' growing importance in credit markets, their response to monetary policy remains unclear. One view suggests monetary policy affects all intermediaries' funding costs similarly, causing nonbanks to mirror banks' contractionary responses (Stein, 2013). An alternative view posits that monetary tightening shifts credit supply from banks to nonbanks (Drechsler et al., 2017; Xiao, 2020; Elliott et al., 2022; Drechsler et al., 2022; Buchak et al., 2024). This distinction matters critically for understanding monetary transmission in modern financial systems.

This paper contributes to this debate by addressing three questions. First, does a tightening of monetary policy shift the composition of credit from banks to nonbanks? Second, what explains differences in bank versus nonbank credit supply responses to monetary policy? Third, how does substitution toward nonbank lending affect real outcomes like investment and consumption? Our analysis confirms significant credit reallocation from banks to nonbanks following monetary tightening, identifies a novel long-term debt funding mechanism driving this reallocation, and documents substantial attenuation of monetary policy's contractionary effects on real economic activity.

We document empirically how nonbanks affect monetary policy transmission using comprehensive administrative data on the universe of unsecured corporate and consumer credit in Denmark between 2003 and 2018, combined with monetary policy shocks computed by Jarociński and Karadi (2020). Detailed balance sheet information on bank and nonbank lenders sheds light on how funding shapes lending decisions following monetary policy changes. Our analysis reveals substantial heterogeneity across borrower types and nonbank categories, providing insights into which economic segments benefit most from this alternative funding channel. We trace consequences for borrowers by merging loan-level data with firm balance sheets and administrative data on all Danish households.

Our first finding is that an unexpected monetary tightening triggers a significant shift in credit supply from banks toward nonbanks. A one standard deviation shock to monetary policy rates increases the nonbank credit share by approximately 5% in both corporate and consumer markets. This increased nonbank share primarily stems from intensive margin effects – greater lending to existing borrowers – rather than the formation of new lending relationships. We find no economically significant differences in interest rate responses between banks and nonbanks, suggesting monetary policy transmission occurs primarily through quantities rather than prices.

We then examine the mechanisms behind this credit reallocation using comprehensive balance sheet data across lenders. We show that monetary contractions increase long-term debt funding for nonbanks while decreasing it for banks. In contrast, equity and short-term debt exhibit uniform reactions across both lender types. Crucially, we find that nonbanks with greater ex-ante reliance on long-term debt funding are precisely those that expand lending most following a monetary tightening, providing direct evidence for this mechanism. While existing literature has focused on short-term debt funding shifts to explain nonbank lending expansion after monetary tightening (Xiao, 2020), our evidence confirms a novel, complementary channel working through long-term debt financing.

To rationalize these empirical findings, we develop a conceptual framework based on funding structure differences and segmented debt markets. While previous work examines short-term funding dynamics of banks and nonbanks (Drechsler et al., 2017; Xiao, 2020), we extend the analysis to long-term debt markets. Our model identifies two key mechanisms based on market segmentation of investors in debt markets. First, banks rely on rate-sticky deposits for short-term funding while nonbanks tap rate-sensitive wholesale markets. Second, long-term debt markets are also segmented. Banks predominantly issue debt instruments purchased by investors like insurers and pension funds (Koijen and Yogo, 2015; Ozdagli and Wang, 2019). These institutions' investments are interest-rate sensitive due to regulatory guidance on their duration

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gaps that encourages them to adjust their investments when interest rates change the duration of their liabilities. In contrast, nonbanks rely more on debt funded by specialized credit investors and private equity funds, which are less sensitive to changes in interest rates (Degerli and Monin, 2024). When monetary policy tightens, nonbanks expand lending because their long-term funding costs are relatively inelastic to interest rates, while banks face prohibitively expensive long-term debt that cannot be fully offset by substituting toward rate-sticky deposits. This framework provides a parsimonious explanation for our empirical findings, though alternative mechanisms such as regulatory differences between banks and nonbanks (Buchak et al., 2018) could also contribute to the observed patterns.

We then examine real outcomes at the borrower level. Banks reduce their total lending to individual borrowers following monetary contraction—consistent with the classic bank lending channel—while nonbanks increase their credit supply to both firms and households. Although this substitution is incomplete, nonbanks substantially attenuate monetary policy transmission, effectively serving as a "spare tire" when bank lending tightens.[1] This attenuation has significant real effects: corporate borrowers with nonbank ties maintain higher investment levels, operating profits, and wage bills after monetary tightening, while households with nonbank relationships sustain higher consumption and asset holdings. Importantly, these benefits extend beyond direct nonbank clients through positive spillovers within industries and geographic areas with greater nonbank presence. We document substantial heterogeneity in these effects: larger firms and higher-income households benefit more from nonbank relationships, while different types of nonbanks specialize in distinct borrower segments, creating uneven dampening of monetary transmission across the economy.

Identifying nonbanks' role in monetary policy transmission presents two key challenges. First, monetary policy rates often respond to macroeconomic developments

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[1]Bond financing can also supplement firm funding during monetary tightening (Holm-Hadulla and Thürwächter, 2021). As relatively few non-financial firms in Denmark issue corporate bonds, substitution into corporate bonds is unlikely to affect our results.

that directly affect credit supply. Second, monetary policy may differentially affect credit demand across bank and nonbank borrowers, especially with distinct clienteles. We address rate endogeneity by exploiting Denmark's currency peg to the Euro, which effectively delegates monetary policy decisions to the ECB regardless of Danish economic conditions. This allows us to use monetary policy shock series constructed for the euro area (Jarociński and Karadi 2020, Altavilla et al. 2019) to identify exogenous variation in Danish interest rates.

To separate credit supply from credit demand effects, we use borrower-year fixed effects to control for time-varying borrower characteristics, following the approach in Khwaja and Mian (2008).[2] This approach compares how banks and nonbanks adjust lending to the same borrower in response to monetary policy shocks. We also employ industry-location-size-time fixed effects to include borrowers with a single lender type, addressing concerns that focusing solely on multiple-lender borrowers might not capture representative policy responses (Degryse et al., 2019).

Literature review. This paper contributes to three literature strands. First, we expand research on the "shadow banking channel" of monetary policy (Chen et al. 2018; Xiao 2020; Banerjee and Serena 2024; Drechsler et al. 2022; Elliott et al. 2022; Tiza Mimun et al. 2024). The overarching finding that nonbanks attenuate monetary transmission by increasing lending when banks retreat has been attributed to funding structure changes, but previous evidence primarily focuses on U.S. mortgage market nonbanks funded by short-term debt (Jiang et al. 2023; Agarwal et al. 2023; Jiang 2023).

We contribute by showing how the "shadow banking channel" operates in corporate and consumer credit markets where nonbanks rely primarily on long-term debt. Despite fundamental funding differences from U.S. nonbank mortgage lenders, these institutions similarly soften monetary policy transmission. Our comprehensive data linking lender balance sheets to a credit register reveals that nonbanks' long-term debt

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[2]See Jiménez et al. (2012) and Chodorow-Reich (2014), among many others, for further applications of this identification strategy.

reliance is crucial for the lending expansion after monetary tightening. Our model formalizes a previously unexplored transmission channel complementary to those working through short-term funding dynamics emphasized in existing literature.

Second, we contribute to research on monetary policy's real effects. While evidence using aggregate data is abundant (Romer and Romer 2004; Coibion 2012; Gertler and Karadi 2015; Nakamura and Steinsson 2018), a growing body of work uses micro data to study these effects (Di Maggio et al. 2017; Cloyne et al. 2023; Wong 2019; Cloyne et al. 2020; Holm et al. 2021). We show that nonbanks attenuate the transmission of unexpected policy rate changes to real outcomes in both corporate and consumer markets. Notably, among borrowers with pre-existing nonbank relationships, the increase in nonbank lending nearly eliminates the credit-supply side transmission to firms' real outcomes like investment and attenuates household consumption effects. Our ability to measure consumption from tax records of incomes and wealth for all individuals is key to these findings.

Third, our paper also relates to the literature on the increasing role that nonbank financial intermediaries play in various credit markets, such as mortgage markets and the market for syndicated loans (Buchak et al., 2018, Fuster et al., 2019, Murfin and Pratt, 2019, Jiang et al., 2023, Irani et al., 2021 and Aldasoro et al., 2022). Di Maggio and Yao (2021) use data on personal loans by fintech lenders to characterize the types of borrowers these institutions provide credit to. Chernenko et al. (2022) show that nonbanks are an important source of credit in a sample of U.S. publicly-traded middle market firms and that regulatory constraints on bank lending push unprofitable firms to borrow from nonbanks. Gopal and Schnabl (2022) show that finance and fintech companies have been a major provider of credit to small businesses after 2008 in the U.S., replacing the drop in credit supply that occurred due to banks rationing of loans to smaller firms. We provide complementary evidence by studying nonbank lending in unsecured corporate and consumer credit markets in a European context (Denmark), where the literature on the role of nonbanks has been rather scarce.

2 Data and Descriptive Evidence

We use data from comprehensive administrative datasets from Statistics Denmark covering the universe of unsecured lending in Danish corporate and consumer credit markets from 2003 to 2018. This section describes our key data sources, sample construction, and provides descriptive statistics of nonbank lending in Denmark.

2.1 Data Sources and Sample Construction

Loan data. Our primary dataset comprises Danish lenders' mandatory annual reports to the Danish Tax Authority (SKAT), covering all unsecured credit issued during the previous 12 months. These reports contain detailed account-level information including borrower identity, account balances, and interest payments across various lending arrangements such as regular loans, credit card debt, commercial paper, and revolving credit facilities.[3] These high-quality tax reports ensure data accuracy. As our data does not distinguish between these credit types, we analyze the effect of monetary policy on *total* unsecured credit as explained below.[4]

For loans to individuals, we aggregate individual loans among members of the same household and perform our analysis at the household-level. We do so because borrowing decisions are often made at the household-level, and because individuals can smooth credit supply shocks within their household. For both consumer and corporate credit, we consolidate the granular account-level observations to the borrower-lender-year level by aggregating loan balances and interest payments across accounts.

Since our data lacks consistently reported contractual interest rates, we follow Jensen and Johannesen (2017) and Renkin and Züllig (2024) and approximate the effective in-

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[3]The notable exception are mortgages, which in Denmark are exclusively provided outside the banking system by specialized mortgage institutions. Due to the specific regulations applied to Danish mortgage institutions we exclude them from our analysis.

[4]Loan products offered by nonbanks may vary from those provided by banks across credit markets, which could undermine our identification strategy due to the lack of observed loan product types in our data. In Online Appendix F, we present evidence suggesting that Danish nonbanks and banks offer similar loan products and charge comparable rates.

terest rate paid by borrower b to lender l in year t as:

$$i_{b,l,t} = \frac{\text{Interest payments}_{b,l,t}}{0.5 \times (\text{Loan balance}_{b,l,t} + \text{Loan balance}_{b,l,t-1})}. \tag{1}$$

This calculation divides annual interest payments by the approximated average amount of loans outstanding during the year, assuming loan balances evolve linearly.

Borrower characteristics. We augment our loan data with information on borrowers from multiple Statistics Denmark datasets. For corporate borrowers, we use the Danish firm register ("FIRM") to obtain firms' age, location, employment, and industry classification. A six-digit industry code for each firm in the register allows us to distinguish traditional banks from nonbank lenders - non-deposit taking financial institutions. The Danish firm-level accounting statistics ("FIRE") provide detailed financial information on approximately 9,000 active businesses with more than 50 employees and a sample of smaller firms. Though representing only about 5% of all firms, these companies account for roughly two-thirds of Danish employment.

We incorporate high-quality income data from tax authority (SKAT) records, which are automated at source and free from self-reporting bias. These records provide comprehensive information on household disposable income and wealth components (dividends, capital gains). Following Browning and Leth-Petersen (2003), we impute household consumption by subtracting any changes in net worth between years from the disposable income received during that year.[5]

Lenders' funding structure. We supplement our analysis with annual balance sheet data on lenders from 2002 to 2015, obtained from a commercial data provider ("Experian"). This dataset covers both banks and nonbanks active in our loan-level data, providing detailed information on their funding structures (e.g., short- and long-term

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[5]This approach has been used previously in many studies that rely on tax registry data from Denmark to compute consumption (see for example Leth-Petersen, 2010, Jensen and Johannesen, 2017, Crawley and Kuchler, 2023, and Andersen and Leth-Petersen, 2021). Abildgren et al. (2018) show that imputed spending computed based on income and wealth data is closely aligned with measures of spending computed using survey data on spending.

debt, and equity) and their profitability.

Monetary policy shocks. Our identification strategy exploits Denmark's currency peg to the Euro, which creates exogenous variation in Danish monetary policy as the ECB sets interest rates without considering Danish economic conditions. We use the monetary policy shock series constructed by Jarociński and Karadi (2020) for the euro area, which combines high-frequency asset price responses with sign restrictions to isolate "pure" monetary policy shocks from "information effects" in ECB announcements. To match the frequency of the high-frequency shock series to our annual loan data, we follow Coibion (2012) and Nelson et al. (2018), and convert these shocks into a level measure by taking the cumulative sum. The resulting series ranges from -6.4 to 17.78 basis points (mean: 2.69 bps, standard deviation: 7.59 bps). In our analysis, we standardize these shocks and report effects based on one standard deviation increases. Section 3 discusses our identification strategy in detail, including robustness tests with alternative shock measures such as those from Altavilla et al. (2019).

Sample construction. We apply several restrictions to our dataset. From the universe of unsecured loans to Danish non-financial companies and households, we exclude state-guaranteed student loans, municipal loans, loans in arrears or debt forgiveness, and loans issued by mortgage banks, extraterritorial organizations, governmental institutions, and the Danish central bank. Our identification strategy for the baseline analysis imposes an additional restriction by focusing on borrowers who simultaneously borrow from both banks and nonbanks, which we discuss further in subsequent sections.

In our analyses of corporate credit, we include companies active during 2003-2018 with equity exceeding 1,000 USD and complete accounting information. We exclude cooperatives, NGOs, and non-profits, primarily to remove housing cooperatives that play a distinct role in Danish real estate markets.
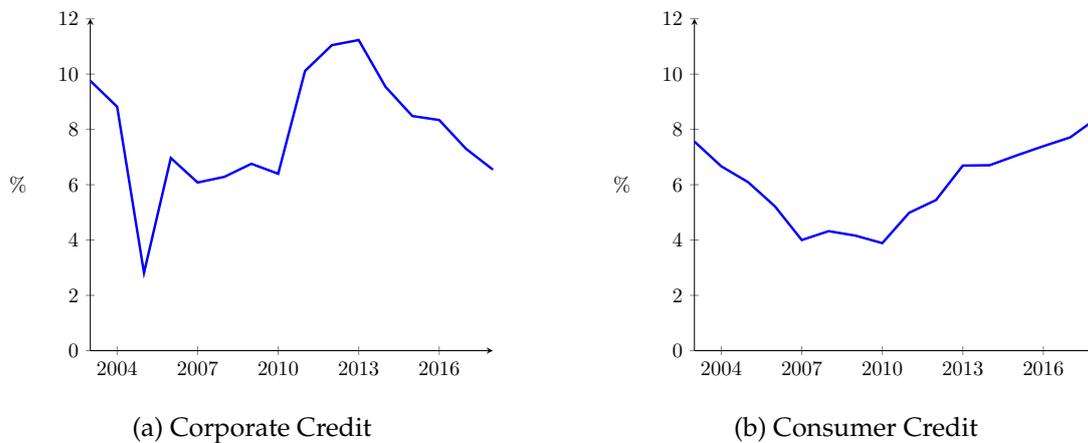
(a) Corporate Credit

(b) Consumer Credit

Figure 1: Nonbank credit share

Notes: This figure depicts the share of nonbank credit in total (unsecured) credit in the markets for corporate credit (left) and consumer credit (right) over time.

2.2 Descriptive Statistics

We now characterize nonbank lenders and their borrowers in Denmark, examining who these lenders are, their clientele, and how they compare to nonbanks in other countries such as the United States and China.

Figure 1 shows the evolution of nonbank credit shares from 2003-2018, which averaged approximately 8% in both corporate and consumer markets.[6] In the corporate credit market, this share declined before the 2008 financial crisis, rose afterward, but has trended downward since 2013. Conversely, in consumer credit, nonbank share decreased from 2003-2010 before steadily increasing thereafter. With total unsecured credit representing roughly 50% of Danish GDP, these patterns underscore nonbanks' economic significance.

Notably, nonbanks' market position in Denmark parallels their role in US markets, where they account for 9% of syndicated lending (1990-2017) (Elliott et al., 2022) and

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[6]Figure H.2 in the Online Appendix illustrates that the correlation between the monetary policy shock series and the nonbank credit shares is modest: 0.27 in the corporate credit market and 0.15 in the consumer credit market.

| | Full dataset | | | | Borrowers with bank and nonbank lenders | | | |
	Count	Mean	Std. Dev	Median	Count	Mean	Std. Dev	Median
Panel A. Households								
Unsecured debt (thsd DKK)	30,219,386	285.25	1,802.38	64.38	7,524,172	504.58	3,012.15	201.94
Interest rate	22,440,598	0.09	0.10	0.06	7,524,172	0.10	0.07	0.08
Nonbank debt share	30,219,386	0.06	0.17	0.00	7,524,172	0.10	0.17	0.01
Number of lenders	30,219,386	2.10	1.57	2.00	7,524,172	3.71	1.92	3.00
Number of nonbank lenders	30,219,386	0.43	0.82	0.00	7,524,172	1.17	1.12	1.00
Age of eldest adult (years)	30,219,386	48.19	16.30	47.00	7,524,172	48.33	12.83	48.00
Disposable income (thsd DKK)	30,216,912	346.96	656.44	289.51	7,523,712	401.03	579.88	356.55
Recently unemployed	30,219,386	0.08	0.28	0.00	7,524,172	0.10	0.30	0.00
Panel B. Firms								
Unsecured debt (m DKK)	1,037,047	5.22	81.30	0.31	158,841	20.08	199.75	1.70
Interest rate	842,925	0.11	0.30	0.05	158,841	0.12	0.24	0.05
Nonbank debt share	1,037,047	0.03	0.14	0.00	158,841	0.06	0.14	0.00
Number of lenders	1,037,047	1.61	0.99	1.00	158,841	2.99	1.38	3.00
Number of nonbank lenders	1,037,047	0.14	0.39	0.00	158,841	0.53	0.68	0.00
Firm age (Years)	1,037,047	13.29	14.41	9.00	158,841	18.00	15.16	14.00
Debt to equity ratio	616,050	4.97	86.94	1.92	115,300	5.56	39.16	2.10
Total assets (m DKK)	719,584	56.82	1,457.57	4.01	129,536	195.95	3,214.45	11.52
FTE employees	1,037,047	22.95	351.81	2.00	158,841	96.07	855.17	7.00

Table 1: Descriptive statistics

This table provides descriptive statistics of borrower characteristics in the consumer and corporate credit markets between 2003-2018. Statistics are computed at the borrower-year level. Statistics in columns (2)-(5) summarize our full dataset, while those in columns (6)-(9) focus on borrowers in our main estimation sample, that is those who receive credit from both banks and nonbanks in a given year.

15% of auto loans (since 2010) (Yao and Wang, 2024), although they dominate US residential mortgages (Buchak et al., 2018). Appendix B provides additional details, documenting that wealth managers and leasing companies are key lenders in both markets, while specialized finance companies and consumer credit companies are particularly important in corporate and consumer lending, respectively. We also analyze industry lending patterns and regional variation in nonbank debt uptake.

Table 1 presents borrower-year level summary statistics, comparing our full dataset (columns 2-5) with the subsample of borrowers who simultaneously use both bank and nonbank credit (columns 6-9). Our data encompasses 209,000 distinct firms (42,000 with dual lending relationships) and 5.7 million households (1.9 million with dual lending relationships). Panel A shows that households with dual lending relationships maintain higher unsecured debt and disposable income than the full sample,

	All lenders			Nonbanks			Banks		
	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median
Equity (yoy growth)	0.12	0.44	0.07	0.13	0.50	0.06	0.10	0.28	0.08
Short-term debt (yoy growth)	0.44	1.81	0.06	0.54	2.08	0.02	0.23	1.07	0.10
Long-term debt (yoy growth)	0.19	0.95	0.02	0.14	1.04	-0.01	0.23	0.85	0.07
Long-term funding (yoy growth)	0.17	0.62	0.06	0.17	0.66	0.05	0.17	0.51	0.08
Equity/Total assets	0.27	3.24	0.19	0.37	1.14	0.36	0.05	5.39	0.14
Short-term debt/Total assets	0.52	0.95	0.57	0.43	1.14	0.26	0.70	0.24	0.73
Long-term debt/Total assets	0.22	0.25	0.14	0.30	0.31	0.22	0.14	0.12	0.12
Long-term funding/Total assets	0.48	0.95	0.43	0.57	1.14	0.74	0.30	0.24	0.27
N	5,849			3,918			1,931		

Table 2: Descriptive statistics of lenders' balance sheets

This table provides descriptive statistics of lenders' key funding variables between 2002 and 2015. "Long-term funding" is computed as the difference between *Total assets* and *Short-term debt*. We exclude lenders with total assets below 100,000 EUR and winsorize growth rates at 2%.

while other characteristics are similar – including age of eldest adult, unemployment status, and interest rates paid. Panel B reveals parallel patterns for firms: those with dual lending relationships have greater assets, are older, and hold more unsecured debt, though they face comparable interest rates to the overall sample.

Table 2 summarizes banks' and nonbanks' funding structures based on approximately 6,000 lender-year observations, with nonbanks representing two-thirds of the sample. We report both funding growth rates and funding-to-asset ratios to examine how different institution types respond to monetary policy shocks. While banks and nonbanks show similar equity growth (10% vs. 13%), they differ in debt dynamics: banks exhibit higher long-term debt growth (23% vs. 14%), whereas nonbanks experience higher short-term debt growth (54% vs. 23%). Nonbanks consistently display greater funding volatility across all measures. The funding composition differences are striking: banks primarily rely on short-term debt (70% of assets), while nonbanks depend much more heavily on equity (37% vs. 5%) and long-term debt (30% vs. 14%).

3   Empirical Strategy and Identification

The aim of our empirical analysis is to estimate how monetary policy affects the lending decisions of nonbanks relative to banks. Analyzing the transmission of monetary

policy through financial institutions faces several challenges. Policy rate changes may be anticipated by market participants and/or driven by local lending conditions, giving rise to endogeneity concerns. Moreover, identifying the effect of monetary policy on credit supply requires distinguishing credit supply from credit demand.

We deal with the endogeneity of monetary policy by exploiting the design of the monetary policy rule in Denmark. For more than four decades, the Danish Krone has been pegged to the German Mark or the Euro and exchange rate stability has been the overriding objective of monetary policy. The key advantage of the Danish institutional setting is that the currency peg introduces a highly transparent source of exogenous variation in monetary policy: Denmark adopts the monetary policy that is decided in Frankfurt am Main, Germany, with essentially no regard to the economic conditions in Denmark.

A detailed discussion of the identification approach relying on the Danish currency peg can be found in Andersen et al. (2023).[7] Jordà et al. (2025) present a similar identification approach, exploiting the currency pegs of 17 advanced economies over more than a century to estimate the effect of monetary policy on real GDP growth. The variation in monetary policy that we rely upon is also similar to the one used in Jiménez et al. (2012), who study the transmission of monetary policy in Spain by exploiting that the monetary policy decisions made jointly by the members of the Euro Area are exogenous to the economic conditions in Spain. Similarly, Ioannidou et al. (2015) use the U.S. federal funds rate as an exogenous instrument for Bolivian interest rates to study how monetary policy affects risk-taking and pricing of loans by Bolivian banks.

To tackle the second identification challenge, separating credit supply from demand, we include granular borrower controls to capture borrowers' credit demand in our regressions. In particular, we include borrower-year fixed effects to control for

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[7]Andersen et al. (2023) show that the correlation between the business cycles in Denmark and Germany/Euro Area is rather small. The correlation between Danish GDP growth and GDP growth in Germany/Euro Area is 0.32, while the correlation with US GDP growth is 0.46. Similarly, inflation rates in Denmark are less correlated with those in Germany/Euro Area than with those in the US.

unobservable borrower characteristics as in Khwaja and Mian (2008). We also include lender fixed effects to account for time-invariant lender characteristics, such as their business model. Our fixed-effect specification thus compares lending terms to borrowers who, in a given year after a monetary policy shock, receive credit from at least one bank and one nonbank. The identification assumption is that when different lenders grant a loan to the same borrower, any differences in lending decisions are due to supply (i.e., lender characteristics) of rather than demand for credit.

Degryse et al. (2019) discuss a potential drawback of identification strategies that are based on borrower-year fixed effects: if the majority of borrowers receive credit from only one type of lender, focusing on multiple-lender-type borrowers may fail to capture the representative response to monetary policy shocks in credit markets. Table 1 showed that this concern is especially valid in the corporate credit market, where firms have on average 1.61 lenders, but less so in consumer credit markets since households have on average 2.10 lenders. We take this concern seriously, especially because of the differences we document in our summary statistics table between single-lender-type borrowers and those with multiple lender types.

To address this concern, we compare our baseline results using borrower-time fixed effect to an alternative specification in which we include borrowers with a single lender type. To do so, we replace borrower-time fixed effects with industry-location-size-time (ILST) fixed effects as a time-varying demand control. The industry bins are based on two-digit NACE classification codes; location bins are based on Denmark's 100 municipality codes and the size bins are based on deciles of total assets of the firms. In our analysis of consumer credit markets, our analog to the ILST are location-income-leverage-time fixed effects, where both income and leverage bins are based on the deciles of households' income and total leverage.

3.1 Specifications

Shadow banking channel. We begin our analysis by addressing the first empirical question we posed in the introduction: does monetary policy tightening change the composition of credit supply by shifting loans from banks to nonbanks? In particular, we study the reaction of the log credit volume and interest rates at the borrower-lender-year level to monetary policy shocks that occurred in the previous period.

Our preferred specification takes the following form:

$$y_{b,l,t} = \alpha_{b,t} + \delta_l + \beta(\text{Nonbank}_l \text{ x MP Shock}_{t-1})$$
$$+ \theta(\text{Nonbank}_l \text{ x Macro Controls}_{t-1}) + \varepsilon_{b,l,t} \tag{2}$$

where the dependent variable $y_{b,l,t}$ is either the logarithm of the credit amount or the effective interest rate paid by borrower b to lender l in year t. *Nonbank$_l$* is a dummy variable indicating non-bank lenders and *MP Shock$_{t-1}$* contains the series of lagged monetary policy shocks. We include interactions of the nonbank dummy variable with four macroeconomic controls to account for macroeconomic conditions in Denmark (GDP growth, one-quarter-ahead GDP forecast, and CPI inflation), as well as stock market uncertainty (VIX). $\alpha_{b,t}$ are borrower-year fixed effects that control for unobservable credit demand in the spirit of Khwaja and Mian (2008). δ_l are lender fixed effects to account for unobservable lender characteristics such as differences in business models. Reported standard errors are clustered at the borrower-lender level.

The main coefficient of interest is β, the coefficient on the interaction of the nonbank dummy with the lagged monetary policy shock. A positive β means that, after an unexpected monetary tightening, nonbanks increase their lending share relative to banks. When studying interest rates as the outcome variable in specification (2), a positive beta coefficient implies that the interest rate on nonbank loans increases compared to banks after a monetary tightening. Since the imputation of loan rates based on equation (1) requires observing the same lender-borrower pair for two consecu-

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tive periods, we choose to study the same sample when analyzing credit volumes. Hence, the estimated effects on credit volumes based on equation (2) represent purely intensive margin effects, that is increases in credit volumes to pre-existing borrowers. This ensures symmetry in the analyses of credit volumes and prices. We analyze the presence of extensive margin effects in credit supply separately.

In Online Appendix G.1, we additionally report a series of robustness tests in which we vary different aspects of our preferred specification in equation (2). First, we vary the granularity of our fixed effects. For example, we include borrower-lender fixed effects to account for borrower-lender specific match characteristics such as geographical distance and relationship lending (Petersen and Rajan, 1995). As discussed above, we also test ILST fixed effects to expand our sample to include borrowers who borrow only from a single lender type. Second, we show that our results are robust to various ways of clustering the standard errors and to changing the way we sample borrowers using entropy balancing. Lastly, we show that our results are robust to alternative measures of monetary policy shocks.

Mechanism. After studying changes in the composition of credit supply due to monetary policy, we next seek to explore the forces behind this shift. We first demonstrate that monetary policy shocks impact the funding of banks and nonbanks differentially. We then show that nonbank lenders' funding model crucially affects how their credit supply reacts to monetary policy changes.

Using annual balance sheet information on bank and nonbank lenders in our sample, we explore how monetary policy affects their funding. In particular, we estimate the following regressions separately for bank and nonbank lenders in our sample:

$$\Delta\text{Funding}_{l,t} = \alpha_l + \beta\text{MP Shock}_{t-1} + \theta\text{Macro Controls}_{t-1} + \varepsilon_{l,t}, \qquad (3)$$

where Δ denotes annual growth rates and α_l is a lender fixed effect. In separate regressions, $\text{Funding}_{l,t}$ denotes lender l's: equity, short- and long-term debt, as well

as long-term funding. A positive coefficient β in equation (3) indicates that an un-expected monetary tightening triggers an increase in the respective funding measure among nonbanks or banks. We report standard errors clustered at the lender level.

After illustrating how monetary policy affects the funding of banks and nonbanks, we link lenders' funding structure to their credit supply decisions in our loan-level data set. That is, for each borrower in our data, we observe the loans that it received from a given lender, as well as how much each of lenders' funding depends on equity, short- or long-term debt. We then test how borrower-lender-year-level credit is affected by unexpected changes in monetary policy conditional on lenders' funding characteristics.

We regress credit amounts on lagged monetary policy shocks, lenders' funding variables scaled by total assets, and their interaction:

$$\log(\text{credit})_{b,l,t} = \alpha_{b,t} + \delta_l + \beta \text{MP Shock}_{t-1} + \eta \text{Funding ratio}_{l,t-1} + \theta \text{Macro Controls}_{t-1}$$
$$+ \gamma \left(\text{MP Shock}_{t-1} \text{ x Funding ratio}_{l,t-1} \right) + \varepsilon_{b,l,t}.$$
(4)

The dependent variable is the logarithm of outstanding credit of borrower b from lender l in year t. *Funding ratio* denotes the ratio of lenders' *Funding* variables, studied in equation (3), to their total assets. In separate regressions, *Funding* thus represents lenders' equity, short- or long-term debt, or long-term funding. For ease of interpretation, we de-mean all *Funding ratio* variables when estimating equation (4).

Our main coefficient of interest is γ, which indicates the degree to which the effects of monetary policy shocks on credit supply are larger for lenders relying more on a given form of *Funding*. We control for credit demand by including granular borrower-year and lender fixed effects. Consequently, the coefficient γ is identified by comparing lending by two lenders with different funding structures to the same borrower in the same year. Standard errors are clustered at the lender-borrower level.

Borrower-level effects. Lastly, we provide an answer to the third question we for-

mulated in the introduction: what are the firm-level and household-level implications of changes in monetary policy in the presence of nonbanks? To answer this question, we aggregate all loans to a given firm or household in a year. We focus in particular on effects on financial variables such as total debt and real variables such as investment and consumption.

We start by estimating the implications on credit supply through the lens of the following model:

$$\log(y_{b,t}) = \alpha_b + \beta \text{MP Shock}_{t-1} + \theta \text{Macro Controls}_{t-1} + \varepsilon_{b,t}, \tag{5}$$

where $y_{b,t}$ is a measure of borrower-level credit. We use aggregate total firm/household credit, as well as total bank credit and total nonbank credit at the borrower-year level as our dependent variables in this regression. α_b is a borrower fixed effect, MP Shock$_{t-1}$ is the lagged, cumulative sum of monetary policy shocks in a given year and Macro Controls$_{t-1}$ is a vector of controls for macroeconomic conditions in Denmark (GDP growth, one-quarter-ahead GDP forecast, and CPI inflation), as well as stock market uncertainty (VIX). We cluster errors at the borrower level.[8]

We next study the real effects of monetary policy, by running the following regression at the borrower-year level:

$$\log(y_{b,t}) = \alpha_b + \beta(\text{Nonbank borrower}_{b,t-1} \text{ x MP Shock}_{t-1})$$
$$+ \gamma \text{MP Shock}_{t-1} + \theta(\text{Nonbank borrower}_{b,t-1} \text{ x Macro Controls}_{t-1}) + \varepsilon_{b,t}, \tag{6}$$

where *Nonbank borrower*$_{b,t-1}$ takes the value of one if the firm/household b borrows more than 50% of their unsecured debt from a nonbank in the previous year, $t-1$. α_b is a borrower specific fixed effect. We also add to the model the set of macro controls that

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[8]Since the estimation results for this model are obtained using borrower fixed effects, we focus only on borrowers that appear repeatedly in our sample. We show in Online Appendix G.4 that we obtain qualitatively similar results when using industry fixed effects instead that include one-time borrowers.

we described in equation (2). The dependent variable, $y_{b,t}$, represents our measure of real effects. In the case of firms, the dependent variables are the firms': (i) total assets, (ii) investment, (iii) operating profits, and (iv) wage bill. In the case of households the dependent variables are: (i) disposable income, (ii) consumption, (iii) market value of real estate, (iv) market value of new cars, and (v) market value of total assets.

We provide additional robustness tests in Online Appendix G.5, where we discuss how our results change when we include additional borrower-level characteristics as controls in equation (6), as well as when we modify our *Nonbank borrower*$_{b,t-1}$ dummy to take the value of one if the borrower had any relationship with a nonbank in the previous period, regardless of the amount of credit they received.

4   The Nonbank Channel of Monetary Policy

This section presents our empirical findings on how nonbanks influence monetary policy transmission in credit markets. We first establish that nonbanks expand their lending relative to banks following monetary policy shocks using loan-level evidence. We then examine whether these effects operate through intensive or extensive lending margins. Finally, we investigate if nonbanks' increased market share following monetary tightening is associated with higher risk-taking.

4.1   Baseline Results: Loan-Level Evidence

Tables 3 and 4 present our main results from estimating equation (2) on how monetary policy shocks affect nonbank lending in corporate and consumer credit markets, respectively. We examine both lending volumes (Panel A) and interest rates (Panel B) using different fixed-effects specifications to ensure robustness. Column (4) shows our preferred specification with borrower-year and lender fixed effects, which identifies the differential response of nonbank versus bank lending to the same borrower in the same year. Column (5) uses industry-location-size-time (ILST) fixed effects to

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	(1)	(2)	(3)	(4)	(5)
A. Outcome var: Log debt					
Nonbank x MP Shock	4.84***	4.98***	2.94***	4.09***	1.85**
	(0.73)	(0.55)	(0.59)	(1.51)	(0.94)
Observations	910,364	829,574	829,574	275,516	642,213
R2	0.19	0.80	0.80	0.65	0.40
B. Outcome var: Interest rate					
Nonbank x MP Shock	-0.004***	-0.004***	-0.002***	-0.004**	-0.003**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Observations	1,119,945	1,026,918	1,026,918	380,162	782,823
R2	0.02	0.50	0.50	0.46	0.14
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes
Year FE	Yes		Yes		
Lender FE	Yes			Yes	Yes
Lender-Borrower FE		Yes	Yes		
Borrower-Year FE				Yes	
ILST FE					Yes

Table 3: Changes in nonbank lending to corporate borrowers

This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (Panel A) and the effective interest rate (Panel B). *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *ILST* denotes industry-location-size-time fixed effects as described in section 3. Standard errors (in parentheses) are clustered at the borrower-lender level. Panel A reports transformed coefficients that indicate the percentage change in the nonbank lending share in response to a 1 standard deviation increase of the monetary policy measure.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

include borrowers with a single lender type.

In the corporate credit market (Table 3), we find that an unexpected one standard deviation increase in monetary policy rates significantly increases the nonbank debt share by about 4% in our preferred specification. This effect is consistent across alternative fixed-effect specifications (columns 1-3), though it decreases to about 2% in column (5) when including borrowers with single lender-type relationships. Panel B shows that nonbanks reduce interest rates by approximately 40 basis points relative to banks after monetary tightening—a statistically significant but economically modest

	(1)	(2)	(3)	(4)	(5)
A. Outcome var: Log debt					
Nonbank x MP Shock	7.26***	0.04	3.99***	5.77***	6.18***
	(0.08)	(0.05)	(0.07)	(0.12)	(0.08)
Observations	29,209,158	26,260,549	26,260,549	16,171,885	28,730,149
R2	0.18	0.79	0.79	0.54	0.26
B. Outcome var: Interest rate					
Nonbank x MP Shock	0.001***	0.002***	0.002***	0.003***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	33,928,411	30,696,815	30,696,815	20,285,707	33,412,275
R2	0.10	0.59	0.59	0.50	0.12
Macro Var. Interactions	Yes	Yes	Yes	Yes	
Year FE	Yes		Yes		
Lender FE	Yes			Yes	Yes
Lender-Borrower FE		Yes	Yes		
Borrower-Year FE				Yes	
ILST FE					Yes

Table 4: Changes in nonbank lending to household borrowers

This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (Panel A) and the effective interest rate (Panel B). *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *ILST* denotes location-income-leverage-time fixed effects as described in section 3. Standard errors (in parentheses) are clustered at the borrower-lender level. Panel A reports transformed coefficients that indicate the percentage change in the nonbank lending share in response to a 1 standard deviation increase of the monetary policy measure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

effect compared to the average corporate interest rate of 12%.[9]

For consumer credit (Table 4), an unexpected one standard deviation increase in monetary policy rates increases the nonbank share by approximately 6% in our preferred specification. This effect remains consistent when including households with a single lender-type through location-income-leverage-time fixed effects (column 5). Unlike in corporate lending, Panel B shows that nonbanks increase interest rates by approximately 30 basis points relative to banks after monetary tightening, though this remains economically modest compared to the average household interest rate of 10%.

We observe larger estimated coefficients in the corporate credit sample when restricting to borrowers with dual lending relationships versus including single-lender firms. This likely reflects substantial differences in borrower characteristics across these samples, as firms with both bank and nonbank relationships are considerably larger and more debt-reliant (Table 1). In contrast, coefficient estimates remain stable across household samples because multiple-lender and single-lender households exhibit similar characteristics, as shown in Table 1.

Panels B of Tables 3 and 4 show opposing signs in interest rate responses between corporate and consumer credit markets. This difference may stem from varying market power among nonbanks in these markets. As we document later, results on lending rates in the corporate market are primarily driven by nonbanks with small market shares, which likely decrease interest rates to gain market share (Yao and Wang, 2024). In contrast, Figure E.1 (panel B) shows nonbank market shares are more evenly distributed across different types in the consumer credit market, potentially reducing price-based competition. Market power appears to play a crucial role in monetary policy transmission within nonbank financial intermediaries, similar to its effect on transmission through banks (Wang et al., 2022).

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[9]The number of observations in the analysis of debt volumes in Panel A is lower than in the analysis of lending rates in Panel B. This is because the outcome variable in Panel A is the log of credit at the end of a year, which results in all observations with a zero credit balance to drop out of our sample. Our imputed measure of interest rates based on equation (1) instead includes these observations, as long as they had a positive credit balance in the previous year.

Robustness. In Online Appendix G.1, we confirm our findings remain robust to multiple alternative specifications: different monetary policy shock measures from Altavilla et al. (2019), various clustering approaches, and raw rather than standardized monetary shock series (Tables H.1-H.5). Restricting our sample to nonbanks operating in both corporate and consumer markets yields similar estimates, addressing concerns about lender heterogeneity driving our results (Tables H.6-H.7). Our findings persist with entropy balancing (Tables H.8-H.9) and alternative transformations of the dependent variables like log(1 + debt) and inverse hyperbolic sine (Table H.10) that include observations with zero outstanding debt. Moreover, as Figure H.3 shows, the differential effect of monetary policy on nonbank credit supply primarily manifests during the first two years following a monetary surprise.[10]

4.2   Extensive Margin Effects

While our baseline analysis focuses on intensive margin effects, we also examine whether monetary policy differentially affects the formation of new lending relationships between banks and nonbanks. We estimate a linear probability model following Irani et al. (2021), using our specification from equation (2) with a *new relationship* indicator as the dependent variable, which equals one in the first year of a lender-borrower relationship and zero otherwise.

Table 5 shows that monetary contractions have opposing effects across credit markets: nonbanks become significantly less likely than banks to initiate new corporate lending relationships (-1.6 percentage points), while showing a statistically significant but economically negligible increase in new consumer relationship formation (0.3 percentage points). Additional analysis in Table H.11 of the Online Appendix shows no meaningful differences in relationship termination rates between lender types after monetary tightening. These findings confirm that the differential response of nonbank versus bank lending to monetary policy operates primarily through the intensive

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[10]Online Appendix G.1 details the local projection regressions used to generate Figure H.3.

	(1)	(2)
A. Households		
Nonbank x MP Shock	0.003***	0.003***
	(0.000)	(0.000)
Observations	36,601,369	52,187,286
R2	0.59	0.09
B. Firms		
Nonbank x MP Shock	-0.016***	-0.014***
	(0.002)	(0.001)
Observations	799,874	1,290,415
R2	0.52	0.17
Macro Var. Interactions	Yes	Yes
Lender FE	Yes	Yes
Borrower-Year FE	Yes	
ILST FE		Yes

Table 5: Extensive margin - New lending relationships

This table studies the extensive margin of lending through the creation of new lending relationships by estimating a linear probability model. The equation we estimate is the same as in equation (2) of the paper. The outcome variable is an indicator variable equal to one if it is the first year that we observe a lending relationship between borrower b and lender l and zero otherwise.

rather than extensive margin.

4.3 The Risk-Taking Channel

In Appendix C, we examine whether nonbanks' increased market share following monetary tightening comes at the cost of riskier lending. Using ex-ante risk measures such as borrower leverage, we find no evidence of such a trade-off: nonbanks do not lend significantly more to higher-risk firms relative to banks in response to higher rates, and actually increase lending to lower-risk households. These patterns persist both when pooling all nonbanks together and when examining each major nonbank type separately. Moreover, loans originated by nonbanks are less likely to become delinquent after monetary tightening compared to bank-originated loans. Overall, our evidence does not support a nonbank risk-taking channel of monetary policy.

5 The Long-Term Debt Channel of Monetary Transmission

This section examines the mechanisms behind the credit reallocation documented in the previous section. We investigate whether differences in funding structures between banks and nonbanks can explain the observed patterns. Specifically, we analyze how different components of lenders' funding structures respond to monetary policy shocks using granular balance sheet data for banks and nonbanks in our sample, and examine whether nonbanks with greater reliance on certain funding sources drive the credit expansion.

To identify the differential funding responses, we estimate lender-year-level regressions described by equation (3), which links growth rates of lenders' funding components to monetary policy shocks. Table 6 presents our results for all lenders that issue credit in our loan-level data. The funding growth (outcome) variable varies across columns: i) equity growth, ii) short-term debt growth, iii) long-term debt growth, and iv) long-term funding growth (growth in all funding that is not short-term debt). We present results separately for banks (panel A) and nonbanks (panel B).

Our results indicate that a monetary contraction is associated with an increase in both banks' and nonbanks' equity and has no significant effect on their short-term debt funding.[11] However, there are striking differences in the effects on long-term debt: while banks experience a significant decline in long-term debt funding (-0.14 percentage points), nonbanks substantially increase their long-term debt (0.11 percentage points). This pattern holds when examining "Long-term funding" computed as the difference between total assets and short-term debt, confirming that nonbanks in-

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[11]We observe the book value of equity in our data and the increase in bank and nonbank equity following a monetary tightening likely stems from increased retained earnings rather than new issuance. The positive relationship between interest rate hikes and intermediaries' equity values might also be due to the fact that interest rates in our sample period were low. Wang et al. (2022) show that when rates are low, monetary policy tightening is associated with higher bank equity returns.

	(1)	(2)	(3)	(4)
	Equity	Short-term debt	Long-term debt	Long-term funding
A. Banks				
MP Shock	0.03***	0.01	-0.14***	-0.01
	(0.01)	(0.02)	(0.02)	(0.02)
Observations	1,517	1,514	1,044	1,514
R2	0.20	0.18	0.16	0.12
B. Nonbanks				
MP Shock	0.04***	0.04	0.11***	0.05***
	(0.01)	(0.05)	(0.04)	(0.02)
Observations	3,181	3,164	1,114	3,174
R2	0.17	0.14	0.20	0.14
Macro Controls	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes

Table 6: Funding growth response to changes in monetary policy

This table shows the results of estimating equation (3) for banks and nonbanks separately. The dependent variable is the change in the funding variable indicated in the respective column title. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). *Long-term funding* is the difference between lenders' *Total assets* and *Short-term debt*. Standard errors are clustered at the lender level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

crease their long-term funding after a monetary contraction.[12,13]

Having shown that nonbanks experience an increase in long-term debt funding, we now show that nonbanks relying more on long-term debt are driving the expansion of nonbank credit supply after a monetary tightening. We augment our baseline loan-level regressions on credit quantities with an interaction term between lagged monetary policy shocks and lenders' funding ratios (see equation (4)) and estimate them using only the nonbank lenders in our sample. Table 7 presents our results in the corporate and consumer credit markets in panels A and B, respectively. The results in columns (3) and (4) indicate that nonbanks which rely more on long-term (debt)

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[12]In Figure H.4 of the Online Appendix we show that there is a positive correlation between changes in long-term (debt) funding and the volume of credit extended by nonbanks, both in terms of absolute changes and in growth rates. This is additional evidence suggesting that nonbanks attracting more long-term debt are driving the credit expansion after a monetary contraction.

[13]In Online Appendix G.3, we also show that monetary contractions have a significantly larger positive impact on nonbanks' profitability relative to banks.

	(1)	(2)	(3)	(4)
	Equity/TA	STdebt/TA	LTdebt/TA	LT funding/TA
A. Corporate lending				
MP Shock x Funding ratio	-5.82	-7.57	39.05***	8.19
	(15.58)	(5.30)	(17.01)	(6.20)
Observations	9,809	9,809	2,119	9,809
R2	0.82	0.82	0.73	0.82
B. Consumer lending				
MP Shock x Funding ratio	4.66***	-7.65***	4.36***	8.28***
	(0.99)	(0.34)	(0.55)	(0.39)
Observations	2,216,448	2,216,448	1,243,764	2,216,448
R2	0.63	0.63	0.63	0.63
Macro Var. Interactions	Yes	Yes	Yes	Yes
Lower level Interactions	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes

Table 7: Nonbank lending and funding structure

This table shows the results of estimating equation (4) among nonbank lenders in corporate credit (panel A) and consumer credit (panel B) markets. The dependent variable is the log of credit at the borrower-nonbank-year level. Column names indicate the lagged variable used as *Funding ratio* in the interaction terms: "TA" refers to *Total assets*, and the abbreviations "ST" and "LT" denote, respectively, "*Short-term*" and "*Long-Term*". *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). Standard errors are clustered at the nonbank-borrower level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

financing increase their credit supply significantly following a monetary tightening.

We document in Tables H.13-H.15 of the Online Appendix that these results are robust to alternative clustering of standard errors, controlling for lagged dependent variables, and to studying contemporaneous instead of lagged monetary policy shocks. Our findings suggest that nonbanks most exposed to the inflow of long-term funding are driving the increase in the nonbank credit share, pointing to funding structure differences as a key mechanism behind the observed credit reallocation.

6 Conceptual Framework

Our empirical analysis reveals that nonbanks increase their long-term debt funding while banks reduce theirs following monetary contractions, and that nonbanks expand lending relative to banks during these periods. To rationalize these findings, we develop a stylized model of financial intermediation by banks and nonbanks. Appendix A contains the complete derivation. Our framework features risk-neutral financial intermediaries that jointly choose lending volumes and debt financing structures to maximize expected profits. While both banks and nonbanks employ identical loan production technologies—with lending returns increasing in the policy rate—they face systematically different funding costs due to segmented debt markets. These funding market differences can explain the heterogeneous lending and funding responses we document empirically.

In short-term debt markets, banks and nonbanks face markedly different funding conditions. Banks benefit from access to retail deposits, which adjust sluggishly to policy rate changes due to depositor inertia and banks' market power in concentrated deposit markets (Drechsler et al., 2017). This deposit rate stickiness provides banks with relatively stable short-term funding costs during monetary tightening cycles. In contrast, nonbanks rely on wholesale funding for short-term financing, where rates reprice immediately in response to policy changes and credit spreads widen during tightening cycles (Adrian and Shin, 2010). While this wholesale market exposure makes nonbanks more vulnerable to short-term funding cost volatility, both institution types face increasing marginal costs as they attempt to expand their short-term funding base—banks due to deposit market saturation, nonbanks due to heightened credit risk concerns in wholesale markets.

In segmented long-term debt markets, banks and nonbanks access different funding sources that respond asymmetrically to monetary policy. Banks predominantly issue debt instruments purchased by institutional investors—primarily insurance companies and pension funds—who face strict regulatory capital requirements and duration-

matching guidelines (Koijen and Yogo, 2015; Damast, 2023). In contrast, nonbanks rely more heavily on debt funded by specialized credit investors, private equity funds, and asset managers who operate with fewer regulatory constraints and different investment mandates (Degerli and Monin, 2024). Such investors have ready access to previously raised but not yet deployed capital. This segmentation across investor types proves critical for interest rate sensitivity: institutional investors holding bank debt exhibit high sensitivity to rate changes, while nonbanks' investor base demonstrates muted responses when monetary policy shifts. For example, Ozdagli and Wang (2019) show that when interest rates rise, life insurance policyholders increasingly cash out their policies early, which shortens the duration of insurers' liabilities. To satisfy their regulatory duration-matching guidelines, insurers must correspondingly reduce their holdings of long-duration assets, leading them to cut their demand for long-term debt instruments, including bank debt. This institutional behavior results in sharply rising long-term funding costs for banks during monetary contractions, in stark contrast to the more stable long-term funding costs faced by nonbanks.

We model these segmented funding markets by assuming that banks and nonbanks face systematically different interest rate sensitivities across funding types. This asymmetric sensitivity generates the lending responses we observe empirically. When monetary policy tightens, both banks and nonbanks face higher returns to lending, but their funding costs react asymmetrically. Banks experience prohibitively high long-term debt costs due to duration-sensitive investor withdrawals, while their ability to substitute toward rate-sticky deposits is limited by increasing marginal costs of deposit acquisition. Nonbanks, conversely, can substitute away from expensive wholesale short-term funding toward their relatively stable long-term debt sources. Consistently, the model shows that monetary tightening reduces bank lending and long-term debt issuance while simultaneously increasing both nonbank lending and long-term debt usage.

This framework provides a tractable explanation for the asymmetric lending re-

sponses and funding patterns we document empirically. The key insight—that non-banks' long-term funding costs are less elastic to interest rates—creates a relative funding advantage during monetary contractions that enables them to expand lending precisely when banks contract, consistent with our findings. While alternative mechanisms could also contribute to these patterns, such as regulatory capital constraints affecting banks more severely than less regulated nonbanks (Buchak et al., 2018), the funding elasticity channel offers a parsimonious explanation for our core results.

7 Financial and Real Effects of Nonbank Lending

This section analyzes the substitution between bank and nonbank lending following monetary policy shocks and documents the resulting real effects.

7.1 Credit Substitution Effects at the Borrower-Level

Having established in Section 4.1 that nonbanks increase lending relative to banks after monetary tightening, we now examine absolute credit changes at the borrower level. We aggregate borrower-lender-year data to the borrower-year level and estimate equation (5). Before presenting the results, we clarify the key differences in debt measures and sample sizes across columns of Table 8. Column (1) analyzes total debt from balance sheet data, which encompasses both secured and unsecured credit. In contrast, columns (2)-(6) focus exclusively on unsecured credit from our comprehensive loan-level dataset. The substantial variation in sample sizes across columns reflects that nonbank credit columns are estimated only on borrowers with positive nonbank credit, which represents a small fraction of our sample since approximately 80% of firms and 60% of households never borrow from nonbanks.

Table 8 shows that total debt (column 1) declines more than unsecured credit (column 2) for both firms and households, suggesting reductions in secured credit beyond the scope of our granular data on unsecured lending. Within unsecured credit, we ob-

	(1) Debt	(2) Credit	(3) Bank Credit	(4) Nonbank Credit	(5) B. Credit Pure	(6) NB. Credit Pure
Panel A. Households						
MP Shock	-3.11***	-4.52***	-5.52***	3.94***	-5.53***	1.99***
	(0.02)	(0.04)	(0.04)	(0.06)	(0.05)	(0.14)
Observations	22,955,365	19,719,374	18,375,312	6,385,964	12,857,536	1,076,038
R2	0.83	0.67	0.67	0.69	0.69	0.80
Panel B. Firms						
MP Shock	-1.66***	-0.05	-0.23	6.92***	-0.71**	3.41***
	(0.11)	(0.26)	(0.27)	(0.71)	(0.29)	(0.99)
Observations	663,349	692,464	666,066	77,278	606,986	20,891
R2	0.86	0.71	0.71	0.82	0.72	0.92
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 8: Financial effects of monetary policy

This table shows the results of estimating equation (5) for borrowing households (Panel A) and firms (Panel B). Data is collapsed to the borrower-year level. Outcome variables are in logs. *Debt* is computed as *Total Assets - Equity* from the balance sheet data for firms, and total liabilities for households. *Credit* is total unsecured debt from our loan-level data. In columns (3) and (4) we separate total unsecured credit into total unsecured credit provided by banks and nonbanks, respectively. Columns (5) and (6) re-estimate columns (3) and (4) using only those borrowers who exclusively borrow from banks and nonbanks,that is, those with a nonbank debt share equal to 0 or 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

serve consistent patterns of substitution from banks to nonbanks.

Panel A shows household outcomes. A one standard deviation increase in monetary policy rates decreases total debt by 3.11% and unsecured credit by approximately 5%. This decline in unsecured credit is driven by banks reducing their lending (column 3), while nonbanks increase their credit supply by about 4% (column 4). When examining borrowers with exclusive relationships (columns 5-6), bank-dependent households experience significant credit reductions while nonbank-dependent households see increases.

Panel B presents firm outcomes. Total debt decreases by 1.66% while aggregate unsecured credit shows no significant change (column 2). The composition of unsecured credit shifts meaningfully: bank credit remains stable while nonbank credit increases

significantly by approximately 7% (columns 3-4). Among firms with exclusive relationships, bank-dependent firms experience credit declines while nonbank-dependent firms see increases, suggesting stronger monetary policy effects among borrowers unable or unwilling to diversify across lender types.

The incomplete substitution from bank to nonbank credit means that total borrower-level credit contracts despite nonbank lending increases. Nonetheless, nonbanks substantially attenuate the transmission of monetary policy by expanding lending precisely when banks retreat.

Robustness. Our results are based on specifications with borrower fixed effects, focusing on borrowers appearing repeatedly in our sample. In Online Appendix G.4, we demonstrate the robustness of our findings when including one-time borrowers (Tables H.24 and H.25) and when examining firms that borrow primarily from nonbanks (Table H.26). To address selection concerns, Table H.27 shows that our results hold or strengthen when examining borrowers with simultaneous bank and nonbank relationships. Table H.28 confirms robustness to alternative transformations of outcome variables that accommodate zero-valued observations.

7.2   Nonbanks and The Real Effects of Monetary Policy

Having documented that monetary policy shocks induce borrowers to partially substitute bank credit with nonbank credit, we now investigate whether borrowers with pre-existing nonbank relationships capitalize on these relationships during monetary tightening to support real economic activities such as investment and consumption. We examine the impact of monetary policy shocks on various real outcomes at the borrower-year level using the specification in equation (6).

Table 9 presents our results for firm-level outcomes. A monetary policy tightening significantly reduces firms' total assets (column 1), investment (column 2), operating profit (column 3), and total wage bill (column 4). However, pre-existing nonbank rela-

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	(1) Tot. Assets	(2) Investment	(3) Oper. Profit	(4) Wage Bill
MP Shock	-3.66***	-3.95***	-5.84***	-2.50***
	(0.10)	(0.20)	(0.15)	(0.08)
Nonbank borrower x MP Shock	1.64***	7.30***	4.74***	0.81**
	(0.50)	(1.06)	(0.80)	(0.38)
Observations	486,830	350,364	404,948	379,772
R2	0.87	0.70	0.76	0.92
Macro Control Interactions	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes

Table 9: Real effects of monetary policy in corporate credit markets

This table shows the results of estimating equation (6) for non-financial firms. Data is collapsed at the firm-year level. The dependent variables are the logarithm of total assets (column 1), investment (column 2), operating profit (column 3), and wage bill (column 4). *MP Shock* represents lagged standardized monetary policy shocks from Jarociński and Karadi (2020). *Nonbank borrower* is a dummy equal to 1 if more than 50% of the firm's debt in the previous year came from nonbanks. All specifications include firm fixed effects and macroeconomic control interactions. Standard errors in parentheses are clustered at the borrower level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

tionships substantially mitigate these negative effects. Strong ties to nonbanks reduce firms' decline in total assets, operating profit, and wage bills by 40% to 80%, based on the comparison between the coefficients on MP Shock$_{t-1}$ and the interaction of MP Shock$_{t-1}$ with the nonbank borrower dummy. Most notably, firms with strong nonbank relationships even increase their investment by approximately 3% following a monetary contraction, contrasting sharply with the general investment decline.

Table 10 presents our results on the real effects of monetary policy on households. A monetary policy tightening leads to significant decreases across various outcomes for households relying primarily on bank credit: disposable income (column 1), consumption (column 2), and the market value of real estate (column 3), new cars (column 4), and total assets (column 5). Strong ties to nonbanks, however, partially shield households from these adverse effects. Households with substantial nonbank relationships experience significantly smaller declines across these measures, with particularly pronounced effects on consumption and car purchases. The resilience in car purchases likely stems from the prominent role of leasing companies in the consumer credit mar-

	(1) Disp. Income	(2) Consumption	(3) MV RE	(4) MV New Cars	(5) MV Total Assets
MP Shock	-2.05***	-2.52***	-6.02***	-1.45***	-6.81***
	(0.01)	(0.01)	(0.01)	(0.16)	(0.02)
Nonbank borrower x MP Shock	0.23***	0.94***	-0.08**	6.22***	1.21***
	(0.02)	(0.04)	(0.04)	(0.62)	(0.09)
Observations	24,302,612	23,232,087	14,850,076	131,562	24,096,429
R2	0.84	0.59	0.90	0.60	0.89
Macro Control Interactions	Yes	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes	Yes

Table 10: Real effects of monetary policy in consumer credit markets

This table shows the results of estimating equation (6) for households. Data is collapsed at the household-year level. The dependent variables are the logarithm of disposable income (column 1), consumption (column 2), market value of real estate (column 3), market value of new cars (column 4), and market value of total assets (column 5). *MP Shock* represents standardized monetary policy shocks from Jarociński and Karadi (2020). *Nonbank borrower* is an indicator equal to 1 if more than 50% of the household's debt in the previous year came from nonbanks. All specifications include household fixed effects and macroeconomic control interactions. Standard errors in parentheses are clustered at the borrower level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

ket (see Figure E.1).

In summary, nonbanks substantially diminish the credit supply-side transmission of monetary policy to firms' real outcomes such as total assets, investments, profits, and wage bills. Nonbanks also attenuate the credit supply effects of monetary policy on household consumption and saving, though to a lesser extent than for firms. Car purchases represent a notable exception, with households having substantial outstanding nonbank credit significantly increasing such expenditures following monetary tightening.

Robustness. Tables H.29 and H.30 of Online Appendix G.5 demonstrate that our results remain robust to the additional inclusion of borrower-level controls. In Tables H.31 and H.32 we show that our results are robust to varying the 50% threshold on the nonbank credit share used to classify borrowers as nonbank borrowers.

7.3 Spillover Effects and Aggregate Implications

Despite the modest nonbank market share in Denmark, nonbanks influence the aggregate transmission of monetary policy to the real economy, as we document in Appendix D. A larger presence of nonbanks in an industry or municipality benefits all borrowers in that sector or area when monetary policy tightens. Following a monetary contraction, investment by firms in industries with higher nonbank credit shares increases relative to firms in industries with lower nonbank presence. Notably, this effect persists among firms without direct nonbank lending relationships. These findings suggest positive spillover or general-equilibrium effects operating within industries and municipalities. For instance, when nonbank credit enables some firms to increase investment after monetary tightening, their competitors may be forced to boost investment as well to remain competitive, regardless of their funding sources. We document similar patterns for household consumption based on nonbank importance in credit supply at the municipality level. The evidence indicates that nonbanks have economically meaningful impacts on monetary policy transmission that extend beyond their direct borrowers. Nonbank credit not only shields borrowers with nonbank relationships from adverse effects of monetary contractions but also indirectly benefits other borrowers through positive spillovers within industries and municipalities.

8 Heterogeneity in Nonbank Monetary Transmission

The increase in nonbank lending following monetary tightening documented in section 4 may mask important heterogeneity across different segments of credit markets. Understanding the heterogeneity of effects is crucial for three reasons: (1) it reveals potential distributional effects of monetary policy, (2) it helps identify which economic actors most significantly contribute to the dampening of monetary transmission through the nonbank channel, and (3) it provides additional tests of our funding-based mechanism. We systematically analyze heterogeneity along two key dimensions: dif-

ferences across borrower types (section 8.1) and variation in responses among different nonbank types (section 8.2). These analyses complement our earlier findings by revealing which segments of the economy experience the greatest substitution toward nonbank credit during monetary contractions.

8.1 Heterogeneity Across Borrower Types

We first analyze how nonbank borrowing relationships vary across firm size and household income distributions. Figure E.4 (panel (a)) reveals that co-borrowing from banks and nonbanks rises sharply with firm size, from 3% among the smallest firms to nearly 20% among the largest. The share borrowing exclusively from nonbanks remains stable at 3-4% across all size categories. Consequently, the total nonbank credit share increases gradually with firm size, from 5% to 8%. This pattern suggests larger firms, with established dual borrowing relationships, can more readily substitute toward nonbank credit when monetary policy tightens.

Borrowing patterns among household (panel (b) of Figure E.4) reveal more complex relationships: higher-income households frequently co-borrow from banks and nonbanks (rising from 17% to over 30% across the income distribution), while lower-income households more often rely exclusively on nonbank credit (declining from 10% to 4%). The total nonbank credit share follows an inverse U-shape, peaking at approximately 20% for middle-income households. These opposing patterns suggest both high and low-income households maintain channels for accessing nonbank credit during monetary contractions.

To test whether these patterns translate into differential monetary policy transmission, we estimate borrower-year panel regressions interacting monetary policy shocks with lagged borrower size quintile indicators. Results in Table E.1 in the Appendix show that for firms, a one standard deviation monetary policy shock triggers an additional 7% increase in nonbank credit for firms in the second and third quintile compared to the smallest firms, and a 4% increase for the largest firms. This hump-shaped

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response pattern aligns with our descriptive evidence, though effects are strongest for medium-sized rather than the largest firms. For households (panel (b)), higher-income households show significantly larger increases in nonbank credit following monetary tightening (3% relative increase), despite different nonbank relationship types across the income distribution. Notably, bank credit transmission shows minimal variation across borrower size categories for both firms and households.

These findings reveal distributional effects in monetary policy transmission. Lower-income households demonstrate limited ability to substitute toward nonbank credit during monetary tightening. Meanwhile, the substantial nonbank credit response among medium-sized firms, combined with their economic importance, suggests the nonbank lending channel significantly dampens monetary policy transmission.[14]

Having established how borrower characteristics influence the nonbank lending channel, we now examine whether all nonbank lenders respond similarly to monetary policy shocks or if certain types of nonbanks drive the aggregate effects documented earlier. This analysis provides additional insight into the transmission mechanisms at work and helps evaluate the funding-based explanation developed in section 6.

8.2 Heterogeneity Across Nonbank Types

We next analyze whether nonbank institutions respond similarly to monetary policy tightening. We classify nonbanks according to their six-digit (NACE) industry codes and estimate our baseline specification for each nonbank type separately. Tables E.2 and E.3 present results for the three largest nonbank categories in corporate and consumer credit markets, as well as the combined response of smaller nonbank types.[15]

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[14]Table H.35 of the Online Appendix shows that nonbanks increase their credit share more for middle-aged and older households than younger ones. Among corporate borrowers, we do not find any evidence of heterogeneous effects in the nonbank response across firms of different ages.

[15]The smaller nonbanks in corporate credit markets include financial holding companies, venture capital funds, and other credit companies. In consumer credit markets, this group primarily consists of other credit companies and financial holding companies, with remaining categories representing negligible market shares.

The results reveal substantial heterogeneity in lending responses. In corporate credit markets, the increase in nonbank lending is primarily driven by smaller institutions outside the top three categories: venture capital funds and "other credit companies." For consumer credit, we find that consumer credit companies, leasing companies, and smaller nonbanks expand their lending shares after monetary tightening, while wealth managers reduce theirs.

We examine two potential sources of this heterogeneity. First, we analyze differences in borrower clienteles across nonbank types. Table E.4 documents substantial variation in borrower characteristics across different nonbank categories in corporate markets, but much more homogeneity in the consumer market. This pattern aligns with our finding of greater response heterogeneity in corporate versus consumer lending. Second, we investigate whether funding structures vary across nonbank types. Contrary to this hypothesis, Figure H.5 shows that funding models remain relatively similar across nonbank categories, suggesting borrower specialization rather than funding differences drives the heterogeneous responses.

Finally, we examine co-lending patterns between banks and nonbanks. Figure H.6 reveals that specialized finance companies have the highest co-lending propensity (approximately 90% of relationships involve bank borrowers), while other nonbank types maintain co-lending shares around 70%. This high prevalence of co-lending across all nonbank categories suggests it represents a fundamental characteristic of nonbank business models rather than a driver of heterogeneous responses.

To sum up, our heterogeneity analysis reveals three key patterns. First, different types of nonbanks specialize in distinct borrower segments, creating variation in which parts of the economy benefit from the nonbank lending channel. Second, despite this specialization, nonbank types exhibit remarkably similar funding structures, particularly in their reliance on long-term debt. Third, co-lending with banks is prevalent across all nonbank categories, with 70-90% of nonbank clients simultaneously maintaining bank credit relationships. These findings suggest that while nonbanks

differentiate themselves through borrower specialization rather than funding models, their uniform ability to access long-term debt during monetary tightening creates uneven dampening of monetary transmission across the economy. The differential effects are primarily determined by borrower characteristics and nonbank specialization rather than by variation in nonbank funding structures.

9 Conclusion

This paper examines how nonbank financial intermediaries influence the transmission of monetary policy to credit supply. Using comprehensive administrative data on the universe of unsecured credit to Danish firms and households from 2003 to 2018, we exploit Denmark's currency peg to the Euro – which effectively delegates monetary policy decisions to the ECB regardless of local economic conditions – to identify exogenous variation in policy rates.

Our analysis yields three main findings. First, monetary contractions trigger significant credit reallocation from banks to nonbanks, with a one standard deviation increase in policy rates leading to approximately 5% higher nonbank credit share in both corporate and consumer markets. Second, we identify a novel long-term debt funding mechanism driving this reallocation. While monetary contractions reduce long-term debt financing for banks, nonbanks exhibit significant increases in long-term debt funding. Nonbanks with greater ex-ante reliance on long-term debt are precisely those that expand lending most following monetary tightening. We rationalize these findings through segmented debt markets where banks and nonbanks access different investor bases with varying interest rate sensitivities.

Third, we document substantial real effects from this credit substitution. Although the shift from bank to nonbank credit is incomplete, nonbanks attenuate the traditional bank lending channel. Borrowers with pre-existing nonbank relationships maintain higher investment, employment, and operating profits for firms, and consumption

for households, following monetary contractions. These effects exhibit considerable heterogeneity: larger firms and higher-income households benefit more from nonbank relationships, while different nonbank types specialize in distinct borrower segments. Importantly, benefits extend beyond direct nonbank clients through positive spillovers within industries and geographic areas with greater nonbank presence.

Our findings carry important implications for monetary policy in a financial landscape increasingly populated by diverse nonbank lenders. The substantial attenuation of monetary transmission through nonbank credit suggests that central banks may need larger policy adjustments to achieve desired economic effects as nonbank market shares grow. Moreover, the considerable heterogeneity we document—across borrower types, nonbank categories, and geographic regions—implies that monetary policy will have increasingly uneven distributional effects, potentially exacerbating economic inequality. Policymakers should consider these differential impacts when designing both monetary policy and financial regulation.

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Appendix

A   Model

This appendix describes our stylized model used to rationalize the conceptual framework in Section 6. Our model captures the dynamics of financial intermediation by banks and nonbanks and highlights how heterogeneous funding structures and investor bases lead to divergent funding and lending decisions following interest rate changes.

Environment. The economy operates over two dates, $t \in \{0,1\}$, and features two types of lenders: banks and nonbanks. Each lender $i \in \{b,n\}$ (bank or nonbank) makes three key portfolio decisions at $t = 0$: they choose their loan amount L^i, short-term debt S^i, and long-term debt B^i. These choices are made based on the prevailing risk-free rate R. The balance sheet constraint requires $L^i = S^i + B^i$. For simplicity, we abstract from equity on lenders' balance sheets.

Lending technology. Both types of lenders have access to identical lending technology. Loans generate returns according to a production function $f(L^i, R)$ with standard properties: positive but diminishing marginal returns ($f_L^i \equiv \partial f / \partial L^i > 0$, $f_{LL}^i \equiv \partial^2 f / \partial (L^i)^2 < 0$), returns that increase with the interest rate, and complementarity between the interest rate and marginal return ($f_{LR}^i \equiv \partial^2 f / \partial L^i \partial R > 0$). This complementarity creates stronger lending incentives when interest rates rise.

Funding structure. The critical distinction between banks and nonbanks lies in their access to segmented funding markets. For short-term funding, banks rely on retail deposits while nonbanks access wholesale funding markets. Banks face short-term funding costs $c_S^b(S^b)$ that are concave in the interest rate due to deposit market power leading to sluggish rate adjustment (Drechsler et al., 2017), whereas nonbanks face costs $c_S^n(S^n)$ that are convex in the interest rate as wholesale funding spreads widen during monetary tightening (Adrian and Shin, 2010; Gorton and Metrick, 2012).

Both institutions face increasing marginal costs in funding volume – banks due to branch network constraints and deposit market saturation, nonbanks due to, e.g., asymmetric information (Stein, 1998; Hanson et al., 2015). We denote this convexity as $c_{S,S}^i \equiv \partial^2 c_S^i / \partial(S^i)^2 > 0$. Defining $\gamma_S^i \equiv \partial^2 c_S^i / \partial S^i \partial R$ as the sensitivity of marginal short-term cost to rate changes, we assume $\gamma_S^b < \gamma_S^n$. This lower sensitivity for banks reflects their ability to exercise market power in concentrated deposit markets, allowing them to adjust deposit rates less than one-for-one with interest rates, while nonbanks face heightened funding cost pressures in tight monetary conditions due to risk repricing in wholesale markets (Stein, 2013).

For long-term funding, banks face costs $c_B^b(B^b)$ that rise sharply with the interest rate, while nonbanks face costs $c_B^n(B^n)$ with significantly lower rate sensitivity due to segmented debt markets. Both institution types also face increasing marginal costs in long-term funding volume, which we denote as $c_{B,B}^i \equiv \partial^2 c_B^i / \partial(B^i)^2 > 0$. This asymmetry in rate sensitivity arises because bank debt is predominantly held by insurance companies (Damast, 2023) and pension funds with duration-matching requirements (Ozdagli and Wang, 2019; Koijen and Yogo, 2015; Domanski et al., 2017). When rates rise, these institutional investors mechanically reduce demand for long-duration assets like bank debt to realign their asset-liability durations—both for economic risk management and regulatory capital purposes. In contrast, nonbank debt attracts private credit funds and specialized fixed-income investors (DeMarco et al., 2020; Degerli and Monin, 2024) who typically face fewer regulatory constraints and often target absolute returns, making their demand less responsive to interest rate fluctuations. We define $\gamma_B^i \equiv \partial^2 c_B^i / \partial B^i \partial R$ as the sensitivity of marginal long-term cost to rate changes.

Given the institutional evidence on duration-sensitive investor behavior documented in the literature, we make the following assumptions regarding sensitivities of marginal costs and returns to interest rate changes: for nonbanks, we assume that marginal lending returns are more sensitive to rate changes than their long-term funding costs but less sensitive than their short-term funding costs ($\gamma_B^n < f_{LR}^n < \gamma_S^n$). Conversely, for

banks, marginal lending returns are more sensitive than short-term deposit funding costs but less sensitive than their long-term funding costs ($\gamma_S^b < f_{LR}^b < \gamma_B^b$). These orderings reflect nonbanks' reliance on interest-rate sensitive short-term wholesale market funding versus banks' exposure to duration risk in long-term funding markets.

Optimization problem. Each lender maximizes their terminal payoff by solving:

$$\max_{L^i, S^i, B^i} \quad f(L^i) - c_S^i(S^i) - c_B^i(B^i) \tag{A.1}$$

$$\text{s.t.} \quad L^i = S^i + B^i \tag{A.2}$$

The first-order conditions yield the equilibrium conditions according to which lenders equalize the marginal return on lending with the marginal cost of both funding types.

Proposition 1. *In equilibrium, an unexpected increase in interest rates leads to:*

1. *An increase in nonbank lending L^n and long-term debt issuance B^n, and a reduction in short-term funding S^n, if the advantage from their relatively insensitive long-term funding outweighs the disadvantage from their highly sensitive short-term funding:*

$$\frac{f_{LR}^n - \gamma_B^n}{c_{B,B}^n} > \frac{\gamma_S^n - f_{LR}^n}{c_{S,S}^n}. \tag{A1}$$

2. *A contraction of bank lending L^b and long-term debt issuance B^b, despite an increase in their short-term funding S^b, if the disadvantage from highly sensitive long-term funding outweighs the advantage from their relatively insensitive short-term deposit funding:*

$$\frac{\gamma_B^b - f_{LR}^b}{c_{B,B}^b} > \frac{f_{LR}^b - \gamma_S^b}{c_{S,S}^b}. \tag{A2}$$

In addition, the elasticity of their long-term funding cost to interest rates must exceed the benefits from improved lending returns and the freed-up lending capacity effect:

$$\gamma_B^b > f_{LR}^b + f_{LL}^b \frac{\partial L^b}{\partial R}. \tag{A3}$$

Proof. Let λ_{BS}^i denote the multiplier on the balance sheet constraint. The first-order conditions are:

$$L^i: \quad \frac{\partial f(L^i)}{\partial L^i} = \lambda_{BS}^i \tag{A.3}$$

$$S^i: \quad \lambda_{BS}^i = \frac{\partial c_S^i(S^i)}{\partial S^i} \tag{A.4}$$

$$B^i: \quad \lambda_{BS}^i = \frac{\partial c_B^i(B^i)}{\partial B^i} \tag{A.5}$$

Combining these equations yields the equilibrium condition:

$$\frac{\partial f(L^i)}{\partial L^i} = \frac{\partial c_S^i(S^i)}{\partial S^i} = \frac{\partial c_B^i(B^i)}{\partial B^i} \tag{A.6}$$

Equation (A.6) indicates that at the optimum, the marginal return on lending equals the marginal cost of both funding sources. Together with the balance sheet constraint, this determines the optimal portfolio allocation.

Comparative statics analysis. To analyze how both lender types respond to monetary policy tightening, we derive comparative statics with respect to the interest rate R. For notation clarity, we define:

$$f_{LL}^i = \frac{\partial^2 f(L^i)}{\partial(L^i)^2} \tag{A.7}$$

$$f_{LR}^i = \frac{\partial^2 f(L^i)}{\partial L^i \partial R} \tag{A.8}$$

$$c_{S,S}^i = \frac{\partial^2 c_S^i(S^i)}{\partial(S^i)^2} \tag{A.9}$$

$$c_{B,B}^i = \frac{\partial^2 c_B^i(B^i)}{\partial(B^i)^2} \tag{A.10}$$

Differentiating the equilibrium conditions with respect to R yields:

$$f^i_{LL}\frac{\partial L^i}{\partial R} + f^i_{LR} - c^i_{S,S}\frac{\partial S^i}{\partial R} - \gamma^i_S = 0 \tag{A.11}$$

$$f^i_{LL}\frac{\partial L^i}{\partial R} + f^i_{LR} - c^i_{B,B}\frac{\partial B^i}{\partial R} - \gamma^i_B = 0 \tag{A.12}$$

$$\frac{\partial L^i}{\partial R} - \frac{\partial S^i}{\partial R} - \frac{\partial B^i}{\partial R} = 0 \tag{A.13}$$

From equations (A.11) and (A.12), we express $\frac{\partial S^i}{\partial R}$ and $\frac{\partial B^i}{\partial R}$ in terms of $\frac{\partial L^i}{\partial R}$:

$$\frac{\partial S^i}{\partial R} = \frac{f^i_{LL}\frac{\partial L^i}{\partial R} + f^i_{LR} - \gamma^i_S}{c^i_{S,S}} \tag{A.14}$$

$$\frac{\partial B^i}{\partial R} = \frac{f^i_{LL}\frac{\partial L^i}{\partial R} + f^i_{LR} - \gamma^i_B}{c^i_{B,B}} \tag{A.15}$$

Substituting these expressions into equation (A.13) and solving for $\frac{\partial L^i}{\partial R}$:

$$\frac{\partial L^i}{\partial R} = \frac{\frac{f^i_{LR} - \gamma^i_S}{c^i_{S,S}} + \frac{f^i_{LR} - \gamma^i_B}{c^i_{B,B}}}{1 - \frac{f^i_{LL}}{c^i_{S,S}} - \frac{f^i_{LL}}{c^i_{B,B}}} \tag{A.16}$$

Given that $f^i_{LL} < 0$ and $c^i_{S,S}, c^i_{B,B} > 0$, the denominator is positive. Therefore, the sign of $\frac{\partial L^i}{\partial R}$ depends solely on the numerator, which differs between banks and non-banks due to their distinct funding sensitivities.

Nonbank Lending Response. For nonbanks to expand lending when rates rise, the numerator in equation (A.16) must be positive:

$$\frac{f^n_{LR} - \gamma^n_S}{c^n_{S,S}} + \frac{f^n_{LR} - \gamma^n_B}{c^n_{B,B}} > 0 \tag{A.17}$$

Given our established ordering $\gamma^n_B < f^n_{LR} < \gamma^n_S$, the first term in equation (A.17) is

negative while the second term is positive. This implies:

$$\frac{\partial L^n}{\partial R} > 0 \iff \frac{f_{LR}^n - \gamma_B^n}{c_{B,B}^n} > \frac{\gamma_S^n - f_{LR}^n}{c_{S,S}^n} \tag{A.18}$$

Nonbanks expand lending when the advantage from their relatively insensitive long-term funding (left side) outweighs the disadvantage from their highly sensitive short-term funding (right side).

Nonbank Short-term Funding Response. Under our ordering $\gamma_B^n < f_{LR}^n < \gamma_S^n$, nonbanks reduce short-term funding when rates rise. Formally, substituting $\frac{\partial L^n}{\partial R} > 0$ into equation (A.14) yields $\frac{\partial S^n}{\partial R} < 0$. This is because $f_{LL}^n \frac{\partial L^n}{\partial R} < 0$ (since $f_{LL}^n < 0$ and $\frac{\partial L^n}{\partial R} > 0$) and $f_{LR}^n < \gamma_S^n$, making the numerator negative.

Nonbank Long-term Funding Response. For long-term funding, we substitute $\frac{\partial L^n}{\partial R} > 0$ into equation (A.15): With $f_{LL}^n \frac{\partial L^n}{\partial R} < 0$ and $(f_{LR}^n - \gamma_B^n) > 0$, the sign is ambiguous. However, when nonbanks increase lending while decreasing short-term funding, the balance sheet constraint (A.13) mathematically requires that long-term funding must increase. This imposes the regularity condition:

$$f_{LR}^n - \gamma_B^n > |f_{LL}^n| \frac{\partial L^n}{\partial R} \tag{A.19}$$

Therefore, $\frac{\partial B^n}{\partial R} > 0$, consistent with empirical evidence that nonbanks shift toward longer-term debt during monetary tightening.

Bank Lending Response. For banks to contract lending when rates rise, the numerator in equation (A.16) must be negative. Given our established ordering $\gamma_S^b < f_{LR}^b < \gamma_B^b$, the first term is positive while the second term is negative. This implies:

$$\frac{\partial L^b}{\partial R} < 0 \iff \frac{\gamma_B^b - f_{LR}^b}{c_{B,B}^b} > \frac{f_{LR}^b - \gamma_S^b}{c_{S,S}^b} \tag{A.20}$$

Banks reduce lending when the disadvantage from their highly sensitive long-term funding (left side) outweighs the advantage from their relatively insensitive short-

term deposit funding (right side).

Bank Short-term Funding Response. Under our ordering $\gamma_S^b < f_{LR}^b < \gamma_B^b$, banks increase short-term funding when rates rise. Formally, substituting $\frac{\partial L^b}{\partial R} < 0$ into equation (A.14) yields $\frac{\partial S^b}{\partial R} > 0$ since $f_{LL}^b \frac{\partial L^b}{\partial R} > 0$ (as $f_{LL}^b < 0$ and $\frac{\partial L^b}{\partial R} < 0$) and $f_{LR}^b > \gamma_S^b$. This reflects banks' advantage in deposit markets, where they can expand short-term funding at relatively favorable rates during monetary tightening.

Bank Long-term Funding Response. For long-term funding, we substitute $\frac{\partial L^b}{\partial R} < 0$ into equation (A.15). Since $f_{LL}^b \frac{\partial L^b}{\partial R} > 0$ and $f_{LR}^b > 0$, but $\gamma_B^b > f_{LR}^b$ and γ_B^b being large, banks decrease their long-term funding after interest rate increases when

$$\frac{\partial B^b}{\partial R} < 0 \iff \gamma_B^b > f_{LL}^b \frac{\partial L^b}{\partial R} + f_{LR}^b. \tag{A.21}$$

In other words, banks reduce long-term debt when rates rise if the sensitivity of their long-term funding costs to interest rate increases exceeds the combined benefits from improved lending returns and the freed-up lending capacity effect. This condition is typically satisfied given banks' exposure to duration-sensitive investors. When rates rise, banks significantly reduce their long-term funding as the costs become prohibitively high.

B Descriptive Evidence

In this section we provide additional descriptive evidence on the Danish nonbank sector. First, we investigate which types of nonbanks are the most important lenders in Denmark. Figure E.1 depicts the share of credit to NFCs and households extended by the three largest nonbank lender industries, which we determine by using the 6-digit NACE industry codes for each lender in our sample. Figure E.1 (a) shows that financial institutions not involved in monetary intermediation, such as specialized finance companies, are the most important type of nonbank lender in the Danish corporate

credit market. They account for more than 4% of total unsecured corporate credit. Typically, these institutions finance themselves by issuing bonds and their lending can take a variety of forms, such as loans, international trade financing, and the provision of long-term finance to industry by industrial loan companies. These lenders tend to have a competitive advantage in terms of lending to particular industries, but are also likely more sensitive to idiosyncratic demand shocks due to their highly concentrated lending portfolio relative to the portfolio of a typical bank.

The second largest type of nonbanks in the Danish corporate credit market comprises wealth managers (other than insurance companies and pension funds), venture capital firms and investment funds who invest for their own account in securities, bonds and other instruments. These institutions account for nearly 2% of all unsecured corporate credit. Lastly, firms engaged in financial leasing are the third largest nonbank lender type and account for about 0.8% of unsecured corporate credit.

Figure E.1 (b) shows that in the consumer credit market, financial leasing companies dominate the list of nonbank lenders. These lenders are responsible for close to 3% of total consumer credit in Denmark. Consumer credit companies account for about 1.5%, while wealth managers, other than insurance companies and pension funds, extend around 1% of total consumer credit. Overall, our evidence suggests that a variety of nonbanks operate in consumer credit markets while the distribution of nonbank lenders in the corporate credit market is more concentrated around specialized finance companies. We document next the industries banks and nonbanks lend to the most, as well as how the uptake of nonbank debt in corporate and consumer credit markets varies across regions in Denmark.

Figure E.2 illustrates which industries banks and nonbanks lend to the most. Nonbank lending is skewed in favor of loans to the transportation and storage industry, which receives almost half of all nonbank credit. This credit is primarily channeled to firms operating sea and coastal freight water transport (not shown), which is an important sector in the Danish economy. In contrast, the distribution of bank credit

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across borrower industries is more evenly spread.

We also explore the degree to which nonbanks intermediate credit across different parts of Denmark. We use the location of borrowers, which in the case of firms is the location of their headquarters, to compute the share of nonbank credit in total unsecured credit within a municipality. Figure E.3 (a) documents how the share of nonbank corporate debt is distributed across Danish municipalities. There is some concentration of the nonbank debt share in the Danish Capital Region, where most municipalities have an above average share of nonbank credit. However, given the economic importance of the Capital Region in Denmark this does not come as a surprise.

Contrary to corporate credit, lending by nonbanks to households as a fraction of total consumer credit is somewhat more concentrated in the Eastern part of Denmark. As Figure E.3 (b) shows, nonbanks are responsible for a large share of total lending (above 10%) in the Zealand Region, the Capital Region (with the exception of the municipalities of Copenhagen, Frederiksberg and some of the wealthier municipalities North of Copenhagen), as well as many municipalities on the island of Funen and the smaller islands surrounding it. Most municipalities in Jutland have lower than average shares of nonbank lending in total consumer credit.

C   Risk-Taking Channel of Monetary Policy

In this subsection we study if nonbanks increase their share in credit supply by shifting credit to ex-ante riskier borrowers. To do so, we augment our baseline lending regressions with a triple interaction term accounting for borrower riskiness:

$$y_{b,l,t} = \alpha_{b,t} + \delta_l + \beta(\text{Nonbank}_l \text{ x MP Shock}_{t-1}) + \theta(\text{Nonbank}_l \text{ x Macro Controls}_{t-1})$$
$$+ \gamma(\text{Nonbank}_l \text{ x MP Shock}_{t-1} \text{ x Borrower Risk}_{b,t}) + \varepsilon_{b,l,t}$$
$$\text{(C.22)}$$

where *Borrower Risk*$_{b,t}$ is a measure of borrower riskiness. In the case of corporate borrowers, we use leverage, sales, and the previous year delinquency status as proxies

for ex-ante firm riskiness. The dummy variable, *Borrower Risk$_{b,t}$*, takes the value of 1 if: (i) the firms' leverage ratio is above the median ratio in a given year, (ii) the sales are higher than median sales, or (iii) the borrower was delinquent on any loan last year. In the case of households, we construct our riskiness measures using information on household leverage (debt-to-assets), disposable income, and unemployment status over the last two years. More specifically, our triple interaction term is based on a dummy variable, *Borrower Risk$_{b,t}$*, that takes the value of 1 if: (i) the households' debt-to-assets ratio is above the median ratio, (ii) the households' disposable income is higher than median income, or (iii) the likelihood that a household member was unemployed for at least 6 out of the last 24 months is above the median.

Table E.7 shows that neither the quantity nor price of nonbank credit changes significantly, relative to bank credit, among firms who appear more risky ex-ante based on their leverage (columns 1 & 2) or sales (columns 3 & 4). None of the coefficients on the triple interaction effects are statistically significant. Firms with above median sales are the exception, as nonbanks charge them significantly lower interest rates compared to banks after a monetary tightening, but the size of the coefficient appears economically insignificant. We also explore firms' history of delinquency as a proxy of riskiness. To this end, we construct for each firm a dummy that equals one if the firm has been delinquent on any of its loans in the previous year. We find no evidence that nonbank lending to firms with a history of delinquency differs from bank lending to those firms, as indicated by columns (5) and (6) in Table E.7.

In contrast, the results in Table E.8 suggest that nonbanks direct their increased share of credit supply after a monetary tightening to households who ex-ante may be perceived as less risky.[16] Column (1) shows that the increase in the nonbank debt share is about 1.5% smaller for households with leverage above the median, and similar results obtain for households with above-median disposable incomes in column (3).

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[16]Since the econometric specification is linear our results are symmetric for positive and negative monetary policy shocks. Consequently, our results imply that nonbanks reduce their share in credit supply but lend more to riskier households after an unexpected loosening of monetary policy.

Column (5) suggests that households unemployment status over the last 2 years does not seem to differentially affect nonbanks' lending decisions. Lastly, columns (2), (4), and (6) show that neither measure of borrower risk is associated with a statistically or economically significant difference between the price of nonbank vs. bank credit.

We also investigate whether loans originated by nonbanks were more likely to be in delinquency after a surprise monetary tightening compared to those originated by banks. We observe the delinquency status for the majority of loans in our data and use it as the dependent variable in KM-style and ILST-style regressions.[17] Table E.9 reports our results in both the corporate lending and consumer lending samples. Across both the KM-style and the ILST-style regression specifications, we find that loans originated by nonbanks are less likely to have a delinquency flag compared to loans originated by banks. This finding confirms our results above on the risk-lending channel of monetary policy that use ex-ante measures of riskiness to proxy for borrower risk.

Summing up, our results suggest that the growing share of nonbank debt in reaction to higher policy rates does not result in these intermediaries lending to riskier borrowers compared to banks. Instead, we find that in consumer credit markets nonbanks expand their market share especially among less risky clients. Our results on risk-taking differ from earlier evidence reported in the literature based on US data. More specifically, Elliott et al. (2022) find that nonbanks increase their credit supply relative to banks by lending more to riskier borrowers. We argue that two factors are likely driving our qualitatively different results: first, while Elliott et al. (2022) study the subset of households borrowing in the mortgage and car loan markets and a subset of larger firms borrowing in the syndicated loan market, our sample includes all firms and households borrowing irrespective of the motive, size or financial instrument. Therefore, our estimates are less prone to suffer from sample selection biases.

Furthermore, our data is based on unsecured credit, whereas the data in Elliott et al. (2022) is based on loans that are mostly backed by collateral (e.g., mortgage loans).

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[17]We do not observe the delinquency status for all small and medium sized enterprises in our data.

The existence of collateral reduces the risk associated with lending and could induce lenders to engage in riskier lending, as loss given default is lower for such loans compared to unsecured credit. Berger et al. (2011) provides evidence for this argument by showing that secured loans are twice as likely to have repayment problems compared to unsecured loans. Hence, we view our evidence on the lack of nonbank risk taking as complementary to the one in Elliott et al. (2022), because we study risk taking in the less explored market for unsecured credit.

We also provide several robustness tests of our results on nonbank risk taking in the Online Appendix G.2. First, we show that our results do not mask heterogeneity across nonbank lender types: we document in Tables H.16 to H.21 that different nonbank industries react similarly in terms of risk taking to changes in monetary policy. We focus on the three largest nonbank lender industries in each credit market and re-estimate risk taking regressions by focusing on one nonbank industry at a time. Our results remain largely unchanged irrespective of what nonbank lender industry we narrow our sample to. Tables H.22 and H.23 show that our results are robust to replacing borrower-time fixed effects in our regressions with industry-location-size time fixed effects (ILST) for firms and location-income-leverage-time fixed effects for households.

D Nonbank Credit Share and The Real Effects of Monetary Policy

In this section, we show that firms operating in industries with a larger presence of nonbank lenders fare better after a monetary contraction, regardless of whether they have previously borrowed from nonbanks or not. Moreover, we provide direct evidence that even borrowers without ties to nonbanks fare better when operating in industries receiving relatively more nonbank credit, likely due to positive spillovers or general equilibrium effects.

We first investigate the investment of firms in industries with a larger presence of nonbank lenders at the firm-year level. We run the following fixed-effects regression at the firm-year level:[18]

$$\log(\text{investment})_{ijt} = \alpha_i + \alpha_j + \alpha_t + \beta \text{Nonbank industry share}_{j,t-1} \times \text{MPshock}_{t-1}$$
$$+ \gamma \text{Macro Interactions}_{t-1} + \epsilon_{i,j,t}$$
$$(\text{D.23})$$

The outcome variable is the log of investment by firm i operating in industry j in year t. The variable Nonbank industry share$_{j,t-1}$ denotes the (lagged and standardized) share of nonbank credit in total (bank + nonbank) credit in industry j. Table E.5 (Panel A) shows that firms in industries with a larger nonbank presence are insulated from the negative effects of monetary contractions.

This result may be for one of two reasons. First, investment by nonbank borrowers may be sufficiently large to offset the decline in investment by bank-based firms. Second, there may be spillovers/general-equilibrium effects at work, which positively affect bank-financed firms despite them not directly receiving credit from nonbanks. For example, firms operating in industries with a larger share of nonbank credit provision, but without direct ties to nonbank lenders themselves, may have to increase their investment to remain competitive with nonbank-financed firms that benefit from more credit when monetary policy tightens.

We test the latter hypothesis by re-estimating equation (D.23) when including only firms who have not received any nonbank credit in the year of the monetary policy shock. The results in Table E.5 (Panel B) confirm that bank-dependent firms in industries with stronger ties to nonbanks indeed raise their investment significantly compared to bank-dependent firms in industries in which nonbanks play a more reduced role. Our results in Table E.5 are robust to including various types of fixed effects in the regression, as shown through columns (1) to (4) of this table.

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[18]We drop the macro variable interactions in equation (D.23) when running the regression with time fixed effects.

We perform next a similar analysis in consumer credit markets to test if households in municipalities receiving a larger share of nonbank credit are more insulated from monetary contractions. We present the results from estimating equation (D.23) with the outcome variable being log of household consumption for the sample of all households in Table E.6 (Panel A) and for the subsample of households without ties to nonbank lenders in Table E.6 (Panel B). We vary the number of fixed effects (year, municipality, and borrower) across the four columns of the table. Columns (1) and (2) of show a negative estimate, but once we include municipality and borrower fixed effects, our results in the household panel become consistent with our evidence on corporate investment in Table E.5. Columns (3) and (4) of Table E.6 (Panel A) show suggestive evidence that households in municipalities receiving relatively more nonbank credit increase their consumption after a monetary contraction. Again, we find that this holds also when we study exclusively borrowers who receive no credit from nonbanks themselves (Panel B).

E Figures and Tables
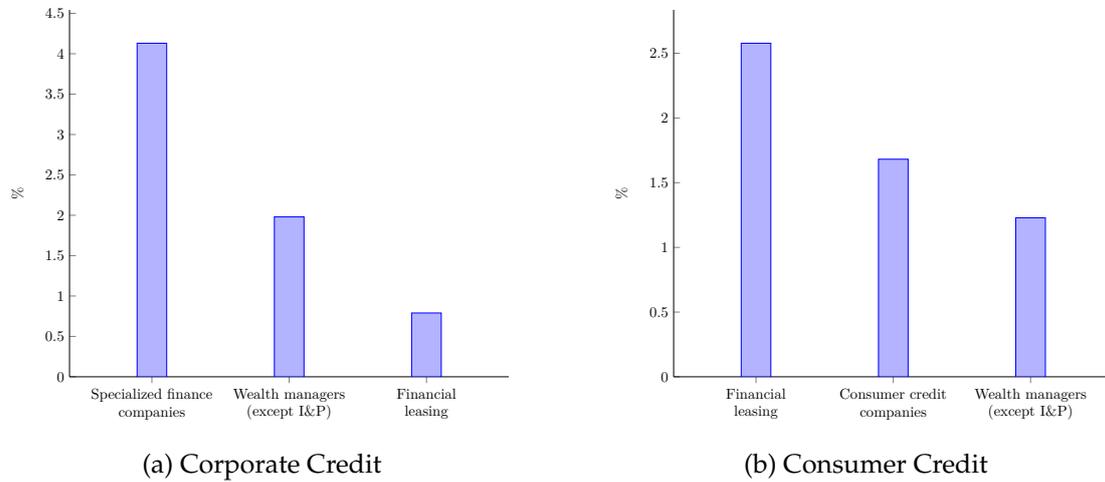

(a) Corporate Credit

(b) Consumer Credit

Figure E.1: Largest industries among nonbank lenders

This figure illustrates the three largest nonbank lender types in the markets for corporate credit (left) and consumer credit (right). Each bar represents the share of credit by the respective lender type relative to total corporate and consumer credit, respectively, pooled over our full sample period.
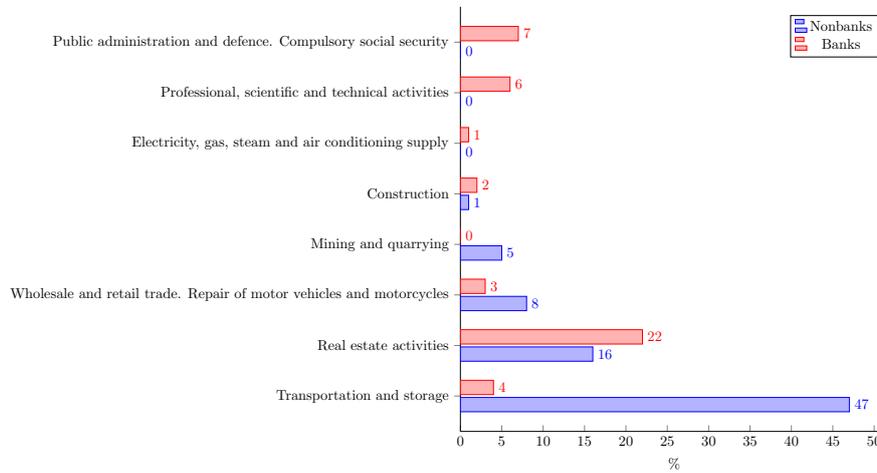
Figure E.2: Which industries borrow most from nonbanks and banks respectively?

This Figure illustrates how much different industries in Denmark borrow from nonbanks and banks, respectively. Blue bars indicate the share of nonbank lending going to each industry, while red bars indicate the share of bank lending.

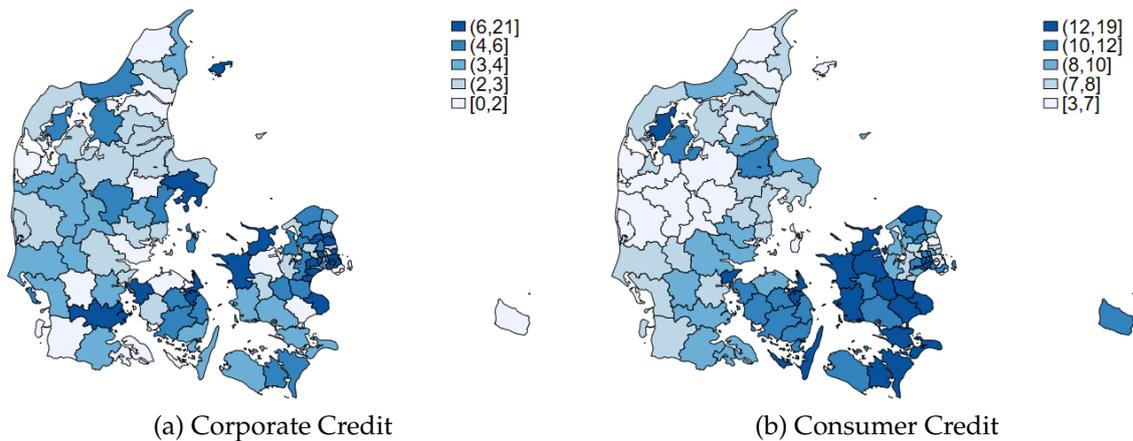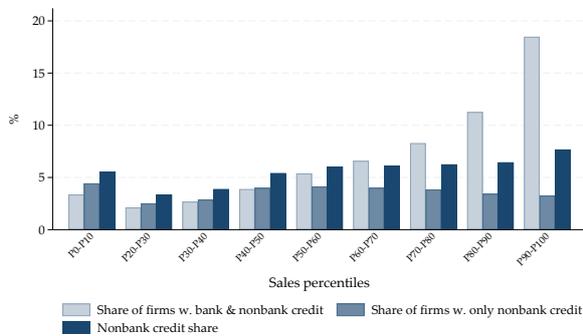(a) Corporate Credit

(b) Consumer Credit

Figure E.3: Nonbank share in credit supply by municipality

(a) Firms
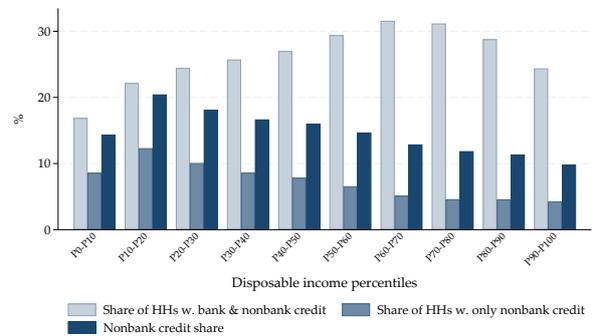
(b) Households

Figure E.4: Heterogeneity in the borrower sample

This figure illustrates variation in nonbank borrowing patterns across the firm size (panel a) and household income (panel b) distribution. Light blue shaded bars indicate the share of borrowers in the respective decile who simultaneously borrow from banks and nonbanks. Medium blue bars instead depict the share of borrowers who have only nonbank credit outstanding. Lastly, navy blue bars indicate the average nonbank credit share of borrowers in the respective decile, i.e. how much of borrowers total credit is supplied by nonbanks.

	(1) Ln Debt	(2) Ln Credit	(3) Ln Bank Credit	(4) Ln Nonbank Credit
Sales p20-p40 x MP Shock	-1.28	-0.93	-1.47*	6.74***
	(1.72)	(0.76)	(0.78)	(2.16)
Sales p40-p60 x MP Shock	3.22*	1.85***	1.56**	7.25***
	(1.77)	(0.69)	(0.72)	(1.75)
Sales p60-p80 x MP Shock	3.37*	0.48	0.28	5.78***
	(1.77)	(0.66)	(0.69)	(1.65)
Sales p80-p100 x MP Shock	1.62	-1.48**	-0.63	4.30***
	(1.73)	(0.65)	(0.67)	(1.57)
Observations	631,248	687,954	661,850	76,923
R2	0.86	0.72	0.71	0.82
Macro Var. Interactions	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes

(a) Firm-level financial outcomes

	(1) Ln Debt	(2) Ln Credit	(3) Ln Bank Credit	(4) Ln Nonbank Credit
Disp. income p20-p40 x MP Shock	0.44***	0.55***	0.60***	0.44**
	(0.09)	(0.12)	(0.13)	(0.18)
Disp. income p40-p60 x MP Shock	-0.79***	0.27**	0.32**	1.21***
	(0.09)	(0.12)	(0.13)	(0.18)
Disp. income p60-p80 x MP Shock	-0.82***	0.98***	0.97***	2.11***
	(0.08)	(0.11)	(0.12)	(0.18)
Disp. income p80-p100 x MP Shock	-0.55***	-0.30**	0.03	3.43***
	(0.08)	(0.12)	(0.13)	(0.19)
Observations	19927668	17806767	16668009	5,713,493
R2	0.83	0.68	0.68	0.70
Macro Var. Interactions	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes

(b) Household-level financial outcomes

Table E.1: Heterogeneous effects of monetary policy on bank and nonbank credit

This table reports results of borrower-level regressions based on equation (5), augmented with inter-action terms between monetary policy shocks and indicators for borrower quintiles based on sales or disposable income. Monetary policy shocks and borrower group indicators are lagged by one period relative to the dependent variables. The dependent variables are the logarithm of total debt, unsecured credit, unsecured bank credit, and unsecured nonbank credit, respectively. Macroeconomic controls include lagged values of Danish GDP, GDP forecasts, inflation, and the VIX index. Standard errors are clustered at the borrower level.

	(1)	(2)	(3)	(4)
	Fin. credit comp.	Wealth managers	Leasing	Non top three
A. Outcome var: Log debt				
Nonbank x MP Shock	-25.47	4.41	0.12	8.07***
	(17.29)	(3.38)	(2.56)	(2.23)
Observations	186,945	201,396	212,590	232,684
R2	0.63	0.63	0.63	0.65
B. Outcome var: Interest rate				
Nonbank x MP Shock	-0.045*	-0.001	-0.001	-0.008***
	(0.025)	(0.004)	(0.003)	(0.003)
Observations	260,752	280,017	298,351	319,430
R2	0.48	0.48	0.48	0.47
Macro Var. Interactions	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes

Table E.2: Corporate lending - Nonbank heterogeneity

This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (Panel A) and the effective interest rate (Panel B). *Nonbank* is a dummy variable equal to one if a lender is a financial company of the category listed in column title and equal to zero if the lender is a traditional bank. The nonbank NACE industry categories that we consider separately in each column are financial credit companies, wealth managers, leasing companies and other nonbanks which we group in one single category called non top three. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). *Macro Var. Interactions* indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. Standard errors (in parentheses) are clustered at the borrower-lender level. Panel A reports transformed coefficients that indicate the percentage change in the nonbank lending share in response to a 1 standard deviation increase of the monetary policy measure.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) Cons. credit comp.	(2) Wealth managers	(3) Leasing	(4) Non top three
A. Outcome var: Log debt				
Nonbank x MP Shock	3.20***	-2.07***	8.10***	3.78***
	(0.16)	(0.39)	(0.20)	(0.16)
Observations	12,244,070	8,258,883	10,920,303	12,465,345
R2	0.54	0.53	0.54	0.54
B. Outcome var: Interest rate				
Nonbank x MP Shock	0.002***	0.001***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	15,643,899	10,669,539	13,751,141	15,915,491
R2	0.50	0.49	0.49	0.50
Macro Var. Interactions	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes

Table E.3: Consumer lending - Nonbank heterogeneity

This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (Panel A) and the effective interest rate (Panel B). *Nonbank* is a dummy variable equal to one if a lender is a financial company of the category listed in column title and equal to zero if the lender is a traditional bank. The nonbank NACE industry categories that we consider separately in each column are consumer credit companies, wealth managers, leasing companies and other nonbanks which we group in one single category called non top three. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). *Macro Var. Interactions* indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. Standard errors (in parentheses) are clustered at the borrower-lender level. Panel A reports transformed coefficients that indicate the percentage change in the nonbank lending share in response to a 1 standard deviation increase of the monetary policy measure.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Panel A. Households

	Consumer credit comp			Wealth Managers			Leasing companies			Non top-3		
	Mean	Std. Dev.	p50	Mean	Std. Dev.	p50	Mean	Std. Dev.	p50	Mean	Std. Dev.	p50
Total unsecured debt (thsd DKK)	373.54	2,187.71	175.59	611.18	4,468.93	230.74	518.62	2,051.50	241.88	488.93	2,664.78	203.04
Nonbank debt share	0.26	0.31	0.12	0.36	0.33	0.27	0.30	0.34	0.16	0.27	0.32	0.13
Disp. income (thsd DKK)	365.45	447.03	320.02	403.98	730.42	378.02	415.56	327.61	391.93	357.22	360.40	331.33
Age of eldest adult (years)	48.33	12.77	48.00	48.30	11.48	48.00	48.20	12.58	48.00	49.34	12.35	49.00
Recently unemployed	0.11	0.32	0.00	0.08	0.27	0.00	0.09	0.28	0.00	0.11	0.31	0.00
N	3,133,623			301,403			1,747,158			212,811		

Panel B. Firms

	Specialized finance comp			Wealth Managers			Leasing companies			Non top-3		
	Mean	Std. Dev.	p50	Mean	Std. Dev.	p50	Mean	Std. Dev.	p50	Mean	Std. Dev.	p50
Total assets (m DKK)	4333.21	32822.28	6.47	50.97	266.10	10.59	32.77	195.79	5.83	329.46	2,839.34	14.79
Total unsecured debt (m DKK)	302.52	1,901.69	1.49	14.12	58.14	3.25	7.76	44.19	1.11	29.52	238.92	1.37
Nonbank debt share	0.30	0.35	0.13	0.45	0.37	0.39	0.31	0.35	0.15	0.20	0.33	0.01
FTE employees	116.37	745.92	6.00	20.38	383.86	4.00	27.35	460.80	6.95	209.00	1,338.54	13.00
Firm age (Years)	15.19	16.01	10.00	15.74	14.20	11.00	14.30	11.96	11.00	20.55	17.65	16.00
Debt to equity ratio	5.80	12.69	2.32	6.88	32.75	2.28	7.30	62.25	2.64	5.30	28.15	2.12
N	759			10,295			20,825			38,552		

Table E.4: Descriptive statistics of borrowers at different nonbank types

This table presents summary statistics at the borrower-year level for borrowers who have at least one lending relationship with a specific nonbank type indicated in the column headers. Panel A describes borrowers in the consumer credit market for the three largest nonbank types (by lending volume) active in this market. Similarly, Panel B focuses on corporate borrowers and the three largest nonbank types who lend to them.

	(1)	(2)	(3)	(4)
A. All borrowers				
Nonbank industry share x MP Shock	5.983***	5.497***	1.038***	1.255***
	(0.318)	(0.326)	(0.312)	(0.274)
Observations	658,700	658,700	658,699	613,167
R2	0.00	0.02	0.10	0.69
B. Only bank borrowers				
Nonbank industry share x MP Shock	6.484***	6.391***	1.282***	1.470***
	(0.382)	(0.390)	(0.370)	(0.330)
Observations	482,019	482,019	482,019	445,920
R2	0.00	0.02	0.10	0.69
Macro Var. Interactions	Yes	No	No	No
Year FE	No	Yes	Yes	Yes
Industry FE	No	No	Yes	Yes
Borrower FE	No	No	No	Yes

Table E.5: Corporate investment and industry-level presence of nonbanks

This table presents the results of estimating equation (D.23) in our sample of corporate borrowers. Panel A reports results based on the full sample, while Panel B restricts the sample to firms without nonbank lending relationships at the time of the monetary policy shock. The outcome variable is the log of firms' investment. "Nonbank industry share" denotes the (lagged and standardized) share of nonbank credit in total (bank + nonbank) credit in the firm's industry.

	(1)	(2)	(3)	(4)
A. All borrowers				
Nonbank municipality share x MP Shock	-0.224***	-0.163***	0.234***	0.152***
	(0.018)	(0.018)	(0.017)	(0.015)
Observations	28,559,585	28,559,585	28,559,585	27,052,173
R2	0.00	0.00	0.03	0.59
B. Only bank borrowers				
Nonbank municipality share x MP Shock	-0.075***	-0.320***	0.074***	0.043**
	(0.023)	(0.023)	(0.022)	(0.019)
Observations	17,563,151	17,563,151	17,563,151	16,669,278
R2	0.00	0.01	0.03	0.61
Macro Var. Interactions	Yes	No	No	No
Year FE	No	Yes	Yes	Yes
Municipality FE	No	No	Yes	Yes
Borrower FE	No	No	No	Yes

Table E.6: Household consumption and municipality-level presence of nonbanks

This table presents the results of estimating equation (D.23) in our sample of household borrowers. Panel A reports results based on the full sample, while Panel B restricts the sample to households without nonbank lending relationships at the time of the monetary policy shock. The outcome variable is the log of household consumption. "Nonbank municipality share" denotes the (lagged and standardized) share of nonbank credit in total (bank + nonbank) credit in the household's municipality.

	(1) ln debt	(2) int. rate	(3) ln debt	(4) int. rate	(5) ln debt	(6) int. rate
Nonbank x JK	0.51	-0.00	1.23	-0.00	3.68**	-0.00**
	(1.72)	(0.00)	(1.65)	(0.00)	(1.45)	(0.00)
Triple - Leverage	-2.25	-0.00				
	(2.59)	(0.00)				
Triple - Sales			-3.60	-0.01**		
			(2.50)	(0.00)		
Triple - Past delinquency					-2.12	-0.00
					(10.07)	(0.01)
Observations	230,349	309,780	281,161	379,426	281,161	379,426
R2	0.66	0.46	0.65	0.46	0.65	0.46
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lower-lvl interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table E.7: Risk-taking channel of monetary policy in corporate credit markets

This table illustrates the results from estimating equation (C.22) using as the dependent variable the log of outstanding debt (*lndebt*) and the effective interest rate (*intrate*). *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *Triple* corresponds to the triple interaction terms between our monetary policy shock measure, the indicator for nonbank lenders and an indicator for whether the borrower is above the median of: i) the leverage ratio, ii) total sales. We also consider an indicator variable for riskiness that is based on past delinquencies for each borrower. That variable takes the value of one if the borrower was delinquent in the previous year of observation and zero otherwise. Lower levels interactions are also included in the regression model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) ln debt	(2) int. rate	(3) ln debt	(4) int. rate	(5) ln debt	(6) int. rate
Nonbank x JK	5.85***	0.000	3.60***	0.004***	6.17***	0.003***
	(0.17)	(0.000)	(0.14)	(0.000)	(0.13)	(0.000)
Triple - Leverage	-1.47***	0.000				
	(0.21)	(0.000)				
Triple - Income			2.92***	-0.003***		
			(0.23)	(0.000)		
Triple - Unemployment					-0.27	-0.002***
					(0.41)	(0.000)
Observations	14,944,449	18,689,780	16,170,775	20,284,312	16,171,885	20,285,707
R2	0.54	0.51	0.54	0.51	0.54	0.50
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lower-lvl interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table E.8: Risk-taking channel of monetary policy in consumer credit markets

This table illustrates the results from estimating equation (C.22) using as the dependent variable the log of outstanding debt (*lndebt*) and the effective interest rate (*intrate*). *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *Triple* corresponds to the triple interaction terms between our monetary policy shock measure, the indicator for nonbank lenders and an indicator for whether: i) the household is above the median of the debt-to-assets ratio distribution in a given year, ii) the households' disposable income is above the cross-sectional median in a given year, or iii) above the median probability of having been unemployed for at least 6 months in the last 2 years. Lower levels interactions are also included in the regression model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) Delinq t	(2) Delinq t+1	(3) Delinq t	(4) Delinq t+1
A. Corporate lending				
Nonbank x MP shock	-0.002***	-0.001	-0.002***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	487,151	324,724	952,589	757,300
R2	0.50	0.51	0.13	0.15
B. Consumer lending				
Nonbank x MP shock	-0.000**	-0.003***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	25,358,680	17,628,801	39,612,124	30,738,685
R2	0.57	0.60	0.26	0.26
Macro Var. Interactions	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes		
ILST FE			Yes	Yes

Table E.9: Future delinquencies

This table illustrates the results from estimating equation (2) using as the dependent variable a dummy that takes the value of one if the firm (household) in our sample is delinquent on a given loan. Column titles indicate which delinquency dummy was used as the dependent variable, taking into account the time period of delinquency denoted by t and $t + 1$. *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). *Macro Var. Interactions* indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. Standard errors (in parentheses) are clustered at the borrower-lender level. Panel A reports the coefficients estimated in the corporate credit sample, while panel B reports those from the estimation using the consumer credit sample. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Online Appendix

F Nonbank Lending Products in Denmark

A potential concern with our identification strategy in equation (2) is that nonbank lenders may offer fundamentally different loan products compared to banks, which could confound our analysis given the absence of loan product data. This appendix provides evidence suggesting substantial similarity between bank and nonbank loan products in Denmark.

First, we examine product offerings across financial institution types. According to the European Banking Authority (EBA, 2022), nonbanks in Denmark offer three of the five major consumer lending products common throughout the European Union: buy-now-pay-later financing, balance sheet consumer loans, and pawning services. In the business lending segment, nonbanks provide five of six standard products: financial leasing, factoring, supply chain finance, merchant cash advance solutions, and debt-based securities (excluding securitization). Danish banks offer a nearly identical product mix, with the exception of buy-now-pay-later financing and pawning services, which constitute a relatively small share of aggregate lending volume.

To provide more direct evidence on product comparability, we analyze pricing data for a standardized consumer credit product: a 5-year unsecured personal loan of 40,000 DKK (approximately 6,000 USD). The pricing data is based on publicly available data from pengepriser.dk (for bank loans) and mikonomi.dk (for nonbank loans). The data was extracted from these websites on January 10, 2025. Figure H.1 demonstrates that the median annual percentage rates (APRs) are virtually identical across financial institution types—14.60% for banks versus 14.64% for nonbanks. This remarkable pricing similarity suggests that these institutions compete directly within the same market segment and offer products with comparable risk characteristics and contractual terms. These findings support our identification assumption that bank and

nonbank lenders offer sufficiently similar loan products, thereby allowing us to isolate the effect of nonbank lending through our empirical specification.

G   Robustness Tests

In this Appendix we provide a series of robustness tests for the results presented in section 4. Following the structure of our results section in the main body of the paper, we first present additional evidence that the share of nonbank debt in total debt increases after an unexpected monetary policy tightening. Subsequently, we provide robustness tests regarding the risk-taking channel of monetary policy in the presence of nonbank lending, and on our results at the borrower-level, including the real effects of monetary policy.

G.1   Robustness Tests of the Increase in the Nonbank Credit Share

To test the robustness of our baseline results based on the estimation of equation (2), we re-estimate the equation with various modifications.

Extensive margin through terminations. Our results on the dominance of the intensive margin effects over the extensive margin effects are robust to considering terminations of lending relationships. To show this, we estimate a linear probability model of lending relationship terminations. The specification is similar to our empirical model in equation (2), except that the outcome variable is an indicator variable equal to one if a relationship is being terminated during year t.

Table H.11 shows that a one standard deviation monetary tightening increases the probability that nonbanks terminate household lending relationships by 0.4 percentage points relative to banks. To assess the economic significance of this effect, we note that nonbanks have an unconditional termination rate of 31.7% compared to 27.6% for banks, a baseline difference of 4.1 percentage points. The monetary policy-induced increase of 0.4 percentage points represents only 10% of this unconditional difference,

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suggesting that while the termination effect is statistically significant, it is economically modest relative to structural differences between lender types. This small magnitude indicates that increased terminations do not meaningfully offset the substantial positive effects we document on the intensive margin and new relationship formation, confirming that nonbanks dampen monetary policy transmission.

Alternative Specifications of Monetary Policy Shocks . We demonstrate that our main findings are robust to both raw (non-standardized) monetary policy shocks and alternative shock measures. Table H.1 reports results using raw monetary policy shocks expressed in basis points, with exponentiated coefficients for ease of interpretation. A one basis point increase in the raw shock increases the nonbank share by 0.5% in corporate credit markets and 0.75% in consumer credit markets (both significant at the 5% level). The corresponding effects on interest rates, while statistically significant, remain economically negligible, consistent with our main findings.

Our results also hold across various Euro-area monetary policy shock measures. While our baseline analysis employs the Jarociński and Karadi (2020) measure that disentangles "pure" monetary policy shocks from ECB announcement "information effects," Tables H.2 and H.3 confirm robustness using: (i) Jarociński and Karadi (2020) shocks to 3-month Eonia interest rate swaps; (ii) Altavilla et al. (2019) high-frequency changes in Overnight Index Swaps (OIS) with 3-month, 1-year, and 10-year maturities around ECB announcements; and (iii) high-frequency changes in 10-year German sovereign bond yields. Sample sizes vary across specifications due to differences in the availability periods of these alternative shock measures.

Clustering of standard errors. Next, we document that the results based on our preferred specification with borrower-year and lender fixed effects are robust to different ways of clustering standard errors. In column 1 of Tables H.4 and H.5 we begin by clustering standard errors at the borrower-lender level. We additionally run our specification when clustering at the borrower level (column 2), at the lender and borrower level (column 3), the borrower, lender, and year level (column 4), and finally at

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the borrower-lender-year level (column 5). As our sample period spans only 14 years we try to avoid clustering errors at the year level due to the problems associated with using a small number of clusters.

Nonbanks active in both credit markets. A potential concern regarding our results on the different behavior of nonbanks across the corporate and consumer credit market is that the results may be driven by sample selection. In particular, it may be that the types of lenders in corporate lending markets are very different from those lending to consumers. To rule out this concern, we re-estimate our results on the nonbank lending share based on equation (2) by keeping only those nonbanks in our sample, which are active lenders in both the corporate and consumer credit market.

Tables H.6 and H.7 show that our results remain robust, as the parameter estimates remain largely unchanged with respect to those reported in the main body of the paper. Additionally, the small drop in the number of observations in our regression with respect to our baseline results shows that few nonbank lenders specialize in either the corporate or consumer credit market. Instead, the majority of nonbanks lend to both firms and households.

Alternative data preprocessing method. We re-estimated our baseline regressions using entropy balancing to check whether our results are robust to changing the way we sample borrowers. We construct the entropy-balanced weights based on the entire sample of borrowers, using borrower characteristics such as industry, location, total assets and total debt in the case of firms, and income, location, total debt and number of dependents in the case of households. We then re-estimate our baseline regression using the new weights constructed via entropy balancing. Tables H.8 and H.9 show that our benchmark results are robust to this re-weighting procedure. We still find that nonbanks increase their share of lending in both the corporate and consumer credit markets after a monetary tightening.

Accounting for zero-value credit observations. To address potential selection bias

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from excluding zero-value observations in our log-transformed dependent variable specifications, we employ alternative transformations that retain these observations. Table H.10 presents results using log(1+debt) and inverse hyperbolic sine (IHS) transformations. In corporate lending markets, coefficients in our preferred specifications (with borrower-time and lender fixed effects) increase 4-6 fold compared to baseline results, primarily due to sample size expansion from 275K to 477K observations as zero-debt relationships are now included. Consumer lending results remain robust despite sample size increasing from 16.1 million to 22.7 million observations, with the log(1+debt) coefficient at 3.99 versus the baseline 5.77. These findings confirm that our main conclusions persist when including zero-value credit observations.

Dynamic effects on credit supply. Despite our relatively short sample period, we provide evidence that monetary policy significantly influences nonbank credit share over the short-to-medium term. We estimate local projection specifications at horizons $h = 1, ..., 3$ using the following equation:

$$\log(\text{credit})_{b,l,t+h} - \log(\text{credit})_{b,l,t-1} = \alpha_{b,t+h} + \delta_{l,h} + \beta_h(\text{Nonbank}_l \text{ x MP Shock}_{t-1})$$
$$+\theta_h(\text{Nonbank}_l \text{ x Macro Controls}_{t-1}) + \gamma_h \text{Nonbank}_l + \varepsilon_{b,l,t+h}$$
(G.24)

This specification includes borrower-time fixed effects to control for credit demand. The coefficients β_h on the nonbank-shock interaction term capture the differential effect of monetary policy shocks on nonbank versus bank credit supply. This approach identifies relative effects between lender types rather than absolute effects for each type, as the latter would conflate supply and demand factors. Figure H.3 depicts the coefficients β_h. Our results suggest that nonbanks significantly increase their share in credit supply relative to banks over the first two years after an unexpected monetary contraction, both in the corporate and consumer credit market.

Specialized finance companies. We document in Table E.4 of the Appendix that borrowers differ in terms of their characteristics between nonbank types, especially in the corporate credit sample, and less so in the consumer credit sample. Specialized

finance companies lend to a limited set of borrowers in the corporate credit sample. We show in Table H.12 that our baseline results in Table 3 are robust to excluding specialized finance companies from the corporate credit sample. This is to rule out that these nonbanks, which clearly have very different borrowers compared to e.g. wealth managers and leasing companies, are driving our main result.

G.2 Risk-Taking

Top 3 nonbank industries. We also study whether different nonbank industries have markedly different responses to monetary policy shocks in terms of their risk taking. Tables H.16, H.17 and H.18 show that our benchmark results on the lack of risk taking among nonbanks in the corporate credit market are relevant even when we split the overall sample into loans provided by: (i) specialized finance companies, (ii) wealth managers, and (iii) financial leasing companies. We repeat the same exercise for the consumer credit sample, focusing on the top 3 players among nonbanks in this unsecured credit market. Tables H.19, H.20, and H.21 demonstrate that our results in the benchmark sample are also largely unchanged. As in the main text, we show that irrespective of nonbank industry we do not find any evidence of risk taking when it comes to consumer credit. On the contrary, similarly to the overall sample we find that nonbanks in top 3 industries lend to ex-ante safer consumers after a monetary policy tightening.

Fixed effects based on borrower characteristics. We also explored the robustness of our results on risk taking when we replace borrower-time fixed effects with industry-location-size-time (ILST) fixed effects as a time-varying demand control. As described in the main text, the industry bins are based on two-digit NACE classification codes; location bins are based on Denmark's 100 municipality codes and the size bins are based on deciles of total assets of the firms. The analog to the ILST for our regression using the consumer credit sample are location-income-leverage-time fixed effects, where both income and leverage bins are based on the deciles of households' income

and total leverage. Tables H.22 and H.23 show that our results hold even for the setting in which we focus on an alternative version of time-varying dummies that control for demand for credit.

G.3   Nonbank Profitability

In addition to the results using balance sheet data for banks and nonbanks in our sample, we provide suggestive evidence of increasing lenders' profitability following a monetary policy shock. Table H.33 documents that nonbanks are more profitable than banks, both on average and in the cross-section (Panel A), and that differences in profitability are persistent over time (Panel B). In addition, monetary contractions amplify the profitability gap between banks and nonbanks, and do so for several years following the shock. Table H.34 shows that a surprise monetary tightening increases the profitability of both banks and nonbanks. However, the positive impact on nonbanks' profits is significantly larger. The relative increase in nonbanks' profitability persists up to three years after the monetary contraction.[19]

G.4   Financial Effects of Monetary Policy

Financial effects with one-time borrowers. We estimate the effects of monetary policy shocks on total credit supply to borrowers using equation (5). Our baseline results are thus obtained in a specification with borrower fixed effects, which focuses only on borrowers who appear in at least two consecutive years in our sample. Here we show that we obtain qualitatively similar results when we include one-time borrowers in our estimation. To do so, we use industry fixed effects in our analysis of corporate borrowers and municipality fixed effects when studying consumer credit markets. Tables H.24 and H.25 illustrate our results from estimating equation (5) with these alternative fixed

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[19]Differences in the riskiness of lending portfolios may explain why nonbanks' profitability is higher after a monetary tightening. We show in section 4.3 that loans originated by nonbanks in our sample are relatively less likely to become delinquent after a monetary tightening. Rising interest rates may thus require banks to increase loan loss provisions, which decreases their profitability. We suspect nonbanks' superior screening technologies explain the observed differences in borrower risk (Buchak et al., 2018).

effects.

Financial effects for firms that borrow mainly from non-banks. We also investigate whether our results on financial effects for firms depend on whether the firms borrow mainly from nonbanks. Column (1) of Table H.26 shows that firms borrowing mainly from nonbanks decrease their total debt significantly after a positive monetary policy shock. Furthermore, these firms also decrease their levels of unsecured debt as well as unsecured bank credit, as evidenced by Columns (2) and (3). Nonetheless, they seem to increase their borrowing from nonbanks in response to a monetary tightening, thus attenuating the drop in total debt. Unlike our results for aggregate sample presented in the main text, all coefficients in this table are significant at the one per cent level, suggesting that firms that borrow mainly from nonbanks are particularly sensitive to the evolution of monetary policy shocks.

Robustness to zero-value treatment in financial outcome measures. Our borrower-level financial outcome estimates remain robust when employing transformations that retain zero-valued observations. Table H.28 demonstrates that using either log(1+debt) or inverse hyperbolic sine transformations yields coefficients consistent in sign and magnitude with our baseline results in Table 8. For corporate borrowers, contractionary monetary policy significantly increases nonbank credit (column 4), but given nonbanks' relatively small market share, this increase fails to offset the substantial decline in bank credit (column 3), resulting in a significant contraction of total credit (column 2).

G.5   Real Effects of Monetary Policy

Borrower-level controls. In this section, we re-estimate our models for the real effects of monetary policy at the borrower level to include additional borrower-level controls as explanatory variables. The model in corporate credit markets controls for lagged leverage, firm age, and 4-digit NACE industry code. Tables H.29 and H.30 present the results of our estimation of these extended models.

Nonbank relationships. We now test whether our results hold when we control for past nonbank relationships, as opposed to looking at nonbank dependent borrowers (i.e. those with at least 50% of their unsecured loans coming from nonbanks). Tables H.31 and H.32 show that our results are robust to this change in the nonbank dummy.

G.6 Heterogeneity in Borrower Age

As we show in Tables 3 and 4, the effects of monetary policy on nonbank lending are quite similar across these two types of borrowers. We also provide further evidence on borrower heterogeneity by estimating our baseline regression in equation (2) conditioning on a borrower characteristic that is plausibly exogenous to monetary policy – age. Table H.35 shows that, in the consumer credit sample, nonbanks increase their credit share by more for middle-aged and older households compared to younger households. In the corporate credit sample, we do not find heterogeneity in age among borrowers to make much of a difference in terms of changes in nonbank credit share after a monetary tightening.
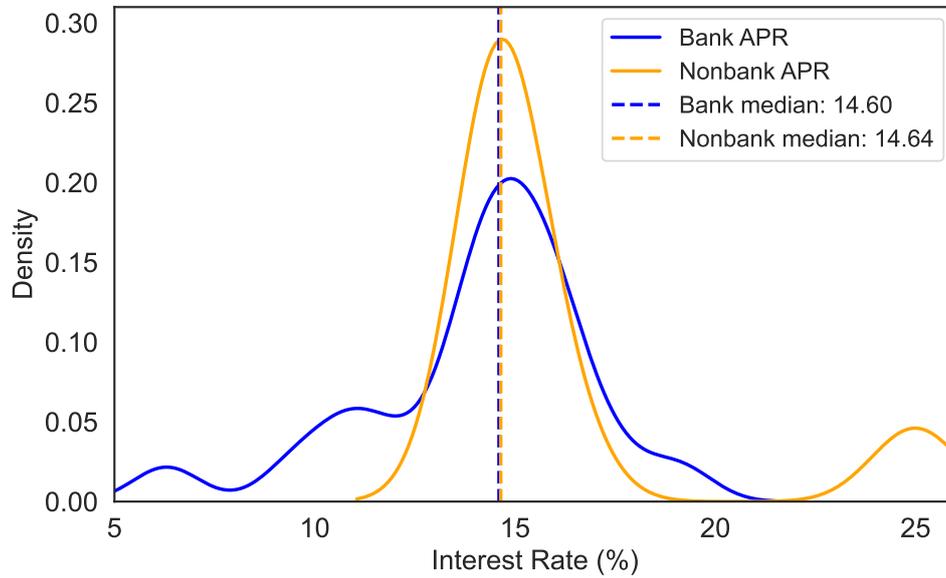
H Additional Figures and Tables

Figure H.1: Distribution of bank and nonbank Annual Percentage Rates (APRs)

This figure plots the Gaussian Kernel Density Estimate for the distribution of APRs charged by bank and nonbanks for a 5-year personal loan (unsecured) of 40,000 DKK. The underlying data is based on data from `pengepriser.dk` (bank loans) and `mikonomi.dk` (nonbank loans), which was extracted from these websites on January 10, 2025.
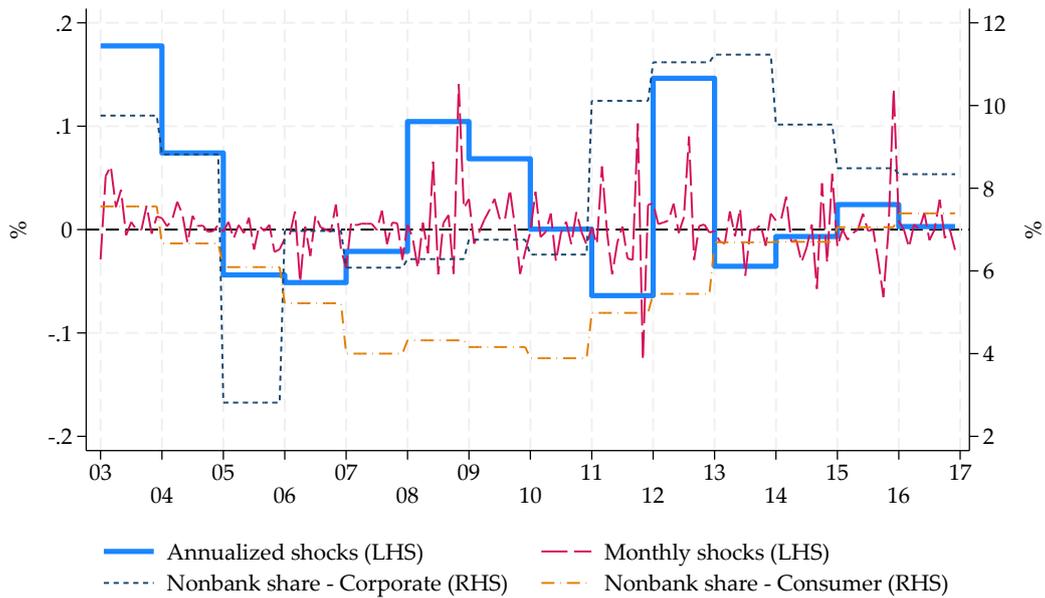
Figure H.2: Time series of monetary policy shocks with nonbank credit shares

This figure plots the time-series of the monthly shock series, its annualized version that is used in our regressions, as well as the shares of nonbank credit in total credit in the corporate and consumer unsecured credit markets shown in Figure 1.

(a) Corporate credit
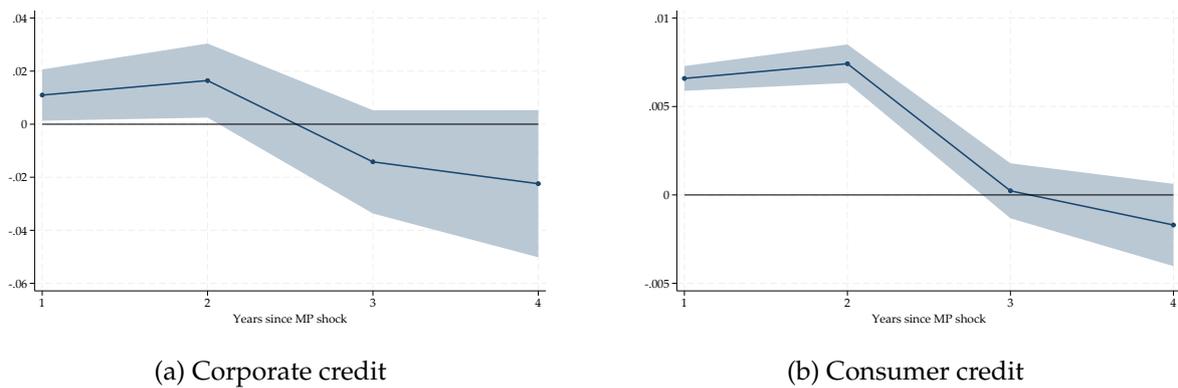
(b) Consumer credit

Figure H.3: Dynamic response of nonbank credit supply to changes in monetary policy

This figure depicts the estimated coefficients $\hat{\beta}^h$ from estimating equation (G.24) in the corporate credit (left) and consumer credit (right) data. The coefficients capture the relative effect of the monetary policy shock on nonbank credit supply, compared to bank credit supply. Shaded area represents 90% confidence bands.
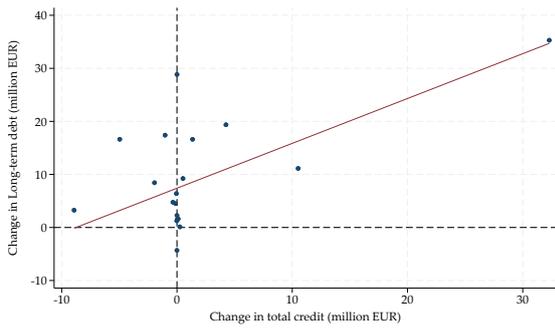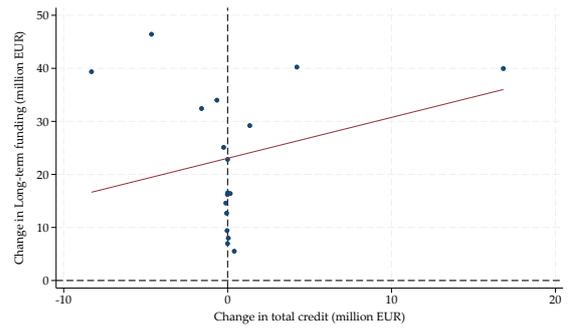
(a) LT debt　　　　　　　　　　　　　　　　(b) LT funding
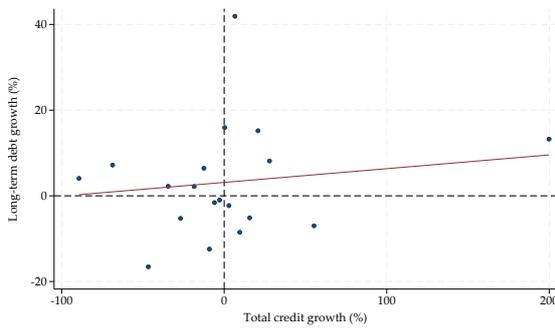
(c) LT debt - Growth rate　　　　　　　　　(d) LT funding - Growth rate
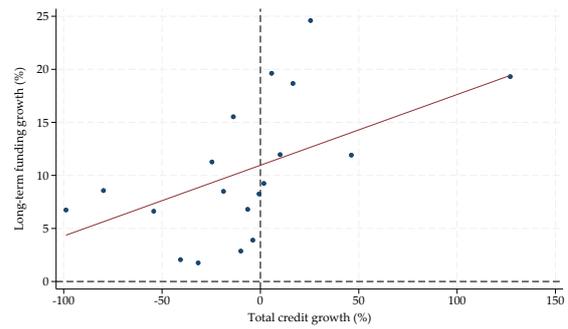
Figure H.4: Changes in nonbank funding vs. changes in lending (lender-year level)

The top row of this figure depicts binned scatterplots of changes in nonbanks' long-term debt (LT debt, left column) and long-term funding (LT funding, right column) on the y-axes against changes in lending on the x-axis. The bottom row depicts the same relationships, but in growth rates rather than levels.
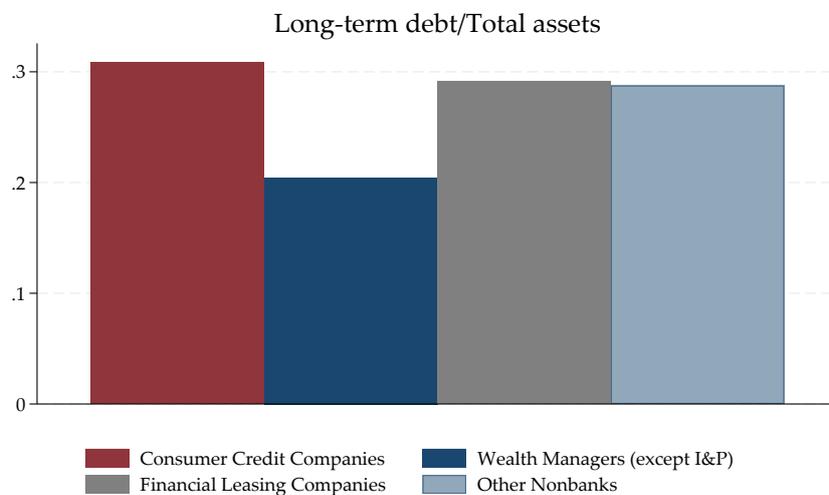
Figure H.5: Variation in long-term debt shares across nonbank types

This figure plots the share of long-term debt in total assets for various nonbank types. Each bar depicts the average of the share among nonbanks of a given type.

Figure H.6: Nonbank co-lending share across nonbanks

This figure plots the share of nonbank types that co-lend with a bank to the same borrower. For each nonbank lender, we identify borrowers who simultaneously have outstanding bank debt. The figure depicts the average share of each nonbank type.

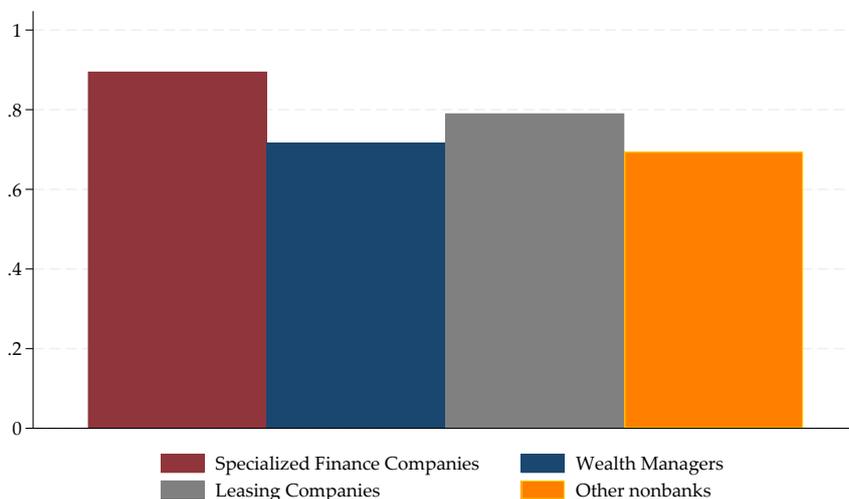|	(1)	(2)
	Corporate credit	**Consumer credit**
A. Outcome var: Log debt		
Nonbank x MP Shock (non-standardized)	0.51**	0.75***
	(0.20)	(0.02)
Observations	275,516	16,171,885
R2	0.65	0.54
B. Outcome var: Interest rate		
Nonbank x MP Shock (non-standardized)	-0.001**	0.000***
	(0.000)	(0.000)
Observations	380,162	20,285,707
R2	0.46	0.50
Macro Var. Interactions	Yes	Yes
Lender FE	Yes	Yes
Borrower-Year FE	Yes	Yes

Table H.1: Changes in nonbank lending using raw monetary policy shocks

This table replicates our baseline analysis of lending outcomes at the borrower-lender level (column 4 of Tables 3 and 4) using raw (non-standardized) monetary policy shocks. The table reports transformed coefficients that indicate the percentage change in the nonbank lending share and the level of interest rates in response to a 1 basis point increase in the monetary policy shock.

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	(1) JK (Sign)	(2) JK (HF)	(3) AL 3M	(4) AL 1Y	(5) AL 10Y	(6) AL 10Y DE
A. Outcome var: Log debt						
Nonbank x MP Shock	4.09***	4.51***	5.95***	0.64	-5.92**	-14.49***
	(1.51)	(1.55)	(1.46)	(1.71)	(2.76)	(1.65)
Observations	275,516	275,516	288,798	288,798	112,784	288,798
R2	0.65	0.65	0.65	0.65	0.62	0.65
B. Outcome var: Interest rate						
Nonbank x MP Shock	-0.004**	-0.004**	-0.005***	-0.003	0.008**	0.006**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.002)
Observations	380,162	380,162	399,907	399,907	160,655	399,907
R2	0.46	0.46	0.47	0.47	0.47	0.47
Macro Control Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.2: Corporate credit - Different MP shocks.

This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (Panel A) and the effective interest rate (Panel B) using various measures of monetary policy shocks (MP Shock). Column 1 uses the pure monetary policy shock measure by Jarociński and Karadi (2020), while column 2 reports their monetary shocks identified by high-frequency movements in 3-month Eonia interest rate swaps. Columns 3-5 are based on high-frequency changes in Overnight Index Swaps (OIS) with maturities of 3 month (3M), 1 year (1Y), and 10 years (10Y) identified by Altavilla et al. (2019). Column 6 is based on high-frequency changes in the yields of German soverign bonds with 10 year maturity. *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. Standard errors (in parentheses) are clustered at the borrower-lender level. Panel A reports transformed coefficients that indicate the percentage change in the nonbank lending share in response to a 1 standard deviation increase of the monetary policy measure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) JK (Sign)	(2) JK (HF)	(3) AL 3M	(4) AL 1Y	(5) AL 10Y	(6) AL 10Y DE
A. Outcome var: Log debt						
Nonbank x MP Shock	5.77***	4.12***	5.84***	3.75***	-0.07	-5.83***
	(0.12)	(0.13)	(0.11)	(0.14)	(0.18)	(0.12)
Observations	16,171,885	16,171,885	17,589,906	17,589,906	8,783,252	17,589,906
R2	0.54	0.54	0.54	0.54	0.55	0.54
B. Outcome var: Interest rate						
Nonbank x MP Shock	0.003***	-0.000***	0.001***	0.001***	0.002***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	20285707	20285707	22092009	22092009	11042073	22092009
R2	0.50	0.50	0.52	0.52	0.55	0.52
Macro Control Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-Year FE						
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes
LenderFE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.3: Corporate credit - Different MP shocks.

This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (Panel A) and the effective interest rate (Panel B) using various measures of monetary policy shocks (MP Shock). Column 1 uses the pure monetary policy shock measure by Jarociński and Karadi (2020), while column 2 reports their monetary shocks identified by high-frequency movements in 3-month Eonia interest rate swaps. Columns 3-5 are based on high-frequency changes in Overnight Index Swaps (OIS) with maturities of 3 month (3M), 1 year (1Y), and 10 years (10Y) identified by Altavilla et al. (2019). Column 6 is based on high-frequency changes in the yields of German soverign bonds with 10 year maturity. *Nonbank* is a dummy variable equal to one if a lender is a nonbank financial company and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)	(5)
A. Outcome var: Log debt					
Nonbank x MP Shock	4.09***	4.09***	4.09	4.09	4.09***
	(1.51)	(1.41)	(3.43)	(4.94)	(1.61)
Observations	275,516	275,516	275,516	275,516	275,516
R2	0.65	0.65	0.65	0.65	0.65
B. Outcome var: Interest rate					
Nonbank x MP Shock	-0.004**	-0.004***	-0.004***	-0.004	-0.004**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Observations	380,162	380,162	380,162	380,162	380,162
R2	0.46	0.46	0.46	0.46	0.46
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes	Yes
Clust.: Lender-Borrower	Yes				
Clust.: Lender			Yes	Yes	
Clust.: Borrower		Yes	Yes	Yes	
Clust.: Year				Yes	
Clust.: Lender-Borrower-Year					Yes

Table H.4: Corporate lending - Different clustering

This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (Panel A) and the effective interest rate (Panel B). *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. Panel A reports transformed coefficients that indicate the percentage change in the nonbank lending share in response to a 1 standard deviation increase of the monetary policy measure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)	(5)
A. Outcome var: Log debt					
Nonbank x MP Shock	5.77***	5.77***	5.77***	5.77***	5.77***
	(0.12)	(0.12)	(1.77)	(1.59)	(0.13)
Observations	16,171,885	16,171,885	16,171,885	16,171,885	16,171,885
R2	0.54	0.54	0.54	0.54	0.54
B. Outcome var: Interest rate					
Nonbank x MP Shock	0.003***	0.003***	0.003***	0.003	0.003***
	(0.000)	(0.000)	(0.001)	(0.004)	(0.000)
Observations	20,285,707	20,285,707	20,285,707	20,285,707	20,285,707
R2	0.50	0.50	0.50	0.50	0.50
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes	Yes
Clust.: Lender-Borrower	Yes				
Clust.: Lender			Yes	Yes	
Clust.: Borrower		Yes	Yes	Yes	
Clust.: Year				Yes	
Clust.: Lender-Borrower-Year					Yes

Table H.5: Consumer lending - Different clustering

This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (Panel A) and the effective interest rate (Panel B). *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. Panel A reports transformed coefficients that indicate the percentage change in the nonbank lending share in response to a 1 standard deviation increase of the monetary policy measure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)	(5)
A. Outcome var: Log debt					
Nonbank x MP Shock	5.30***	5.01***	2.94***	4.38***	1.94**
	(0.73)	(0.55)	(0.60)	(1.52)	(0.94)
Observations	908,762	828,393	828,393	273,868	641,135
R2	0.19	0.79	0.80	0.65	0.40
B. Outcome var: Interest rate					
Nonbank x MP Shock	-0.004***	-0.003***	-0.002***	-0.004**	-0.002**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Observations	1,116,868	1,025,005	1,025,005	376,788	780,932
R2	0.02	0.50	0.50	0.46	0.14
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes
Year FE	Yes		Yes		
Lender FE	Yes			Yes	Yes
Lender-Borrower FE		Yes	Yes		
Borrower-Year FE				Yes	
ILST FE					Yes

Table H.6: Corporate lending - Nonbanks active in both credit markets

This table re-estimates our baseline results on the nonbank lending share in corporate credit markets, but drops all nonbanks which are not active lenders in the consumer credit market too. This exercise allows us to check if our results in the paper may be driven by sample selection, i.e. by different nonbanks active in the two credit markets.. This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (*lndebt*) and the effective interest rate (*intrate*). *Nonbank* is a dummy variable equal to one if a lender is a nonbank financial company and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)	(5)
A. Outcome var: Log debt					
Nonbank x MP Shock	8.52***	-1.04***	2.82***	7.01***	7.27***
	(0.10)	(0.07)	(0.08)	(0.15)	(0.10)
Observations	26,615,396	23,966,180	23,966,180	13,136,567	26,185,073
R2	0.16	0.79	0.79	0.55	0.25
B. Outcome var: Interest rate					
Nonbank x MP Shock	0.000	0.000***	0.001***	0.002***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	30,743,398	27,815,849	27,815,849	16,497,900	30,285,053
R2	0.06	0.57	0.57	0.49	0.09
Macro Var. Interactions	Yes	Yes	Yes	Yes	
Year FE	Yes		Yes		
Lender FE	Yes			Yes	Yes
Lender-Borrower FE		Yes	Yes		
Borrower-Year FE				Yes	
ILST FE					Yes

Table H.7: Consumer lending - Nonbanks active in both credit markets

This table re-estimates our baseline results on the nonbank lending share in consumer credit markets, but drops all nonbanks which are not active lenders in the corporate credit market too. This exercise allows us to check if our results in the paper may be driven by sample selection, i.e. by different nonbanks active in the two credit markets.. This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (*lndebt*) and the effective interest rate (*intrate*). *Nonbank* is a dummy variable equal to one if a lender is a nonbank financial company and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jaro- ciński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)
A. Outcome var: Log debt				
Nonbank x MP Shock	4.09***	3.06*	1.85**	2.98***
	(1.51)	(1.83)	(0.94)	(0.90)
Observations	275,516	225,972	642,213	642,213
R2	0.65	0.80	0.40	0.56
B. Outcome var: Interest rate				
Nonbank x MP Shock	-0.004**	-0.005**	-0.003**	-0.003***
	(0.002)	(0.002)	(0.001)	(0.001)
Observations	380,162	308,692	782,823	782,823
R2	0.46	0.54	0.14	0.16
Macro Var. Interactions	Yes	Yes	Yes	Yes
Entropy Balanced		Yes		Yes
Lender FE	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes		
ILST FE			Yes	Yes

Table H.8: Corporate lending - Entropy balancing.

This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (Panel A) and the effective interest rate (Panel B). *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. Panel A reports transformed coefficients that indicate the percentage change in the nonbank lending share in response to a 1 standard deviation increase of the monetary policy measure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)
A. Outcome var: Log debt				
Nonbank x MP Shock	5.77***	5.77***	6.18***	6.77***
	(0.12)	(0.13)	(0.08)	(0.08)
Observations	16,171,885	15,916,441	28,730,149	28,730,149
R2	0.54	0.59	0.26	0.31
B. Outcome var: Interest rate				
Nonbank x MP Shock	0.003***	0.003***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	20,285,707	19,990,442	33,412,275	33,412,275
R2	0.50	0.58	0.12	0.20
Macro Var. Interactions	Yes	Yes	Yes	Yes
Entropy Balanced		Yes		Yes
Lender FE	Yes	Yes	Yes	Yes
Borrower-Year FE				
ILST FE	Yes	Yes		
ILSTFE			Yes	Yes

Table H.9: Consumer lending - Entropy balancing.

This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (Panel A) and the effective interest rate (Panel B). *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. Panel A reports transformed coefficients that indicate the percentage change in the nonbank lending share in response to a 1 standard deviation increase of the monetary policy measure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)
	Corporate credit	**Consumer credit**
A. Outcome var: Log (1 + debt)		
Nonbank x MP Shock	14.52***	3.99***
	(3.06)	(0.25)
Observations	477,287	22,702,970
R2	0.52	0.44
B. Outcome var: IHS(debt)		
Nonbank x MP Shock	15.208***	3.864***
	(3.231)	(0.264)
Observations	477,287	22,702,970
R2	0.52	0.44
Macro Var. Interactions	Yes	Yes
Lender FE	Yes	Yes
Borrower-Year FE	Yes	Yes

Table H.10: Borrower-lender-level regressions with alternative outcome transformations

This table replicates our baseline loan-level lending results, presented in column 4 of Tables 3 and 4 in the paper, using alternative transformations of the outcome variable. Column (1) depicts results in the corporate lending market, while results in column (2) are based on the consumer credit market.

	(1)	(2)
A. Households		
Nonbank x MP Shock	0.004***	0.003***
	(0.000)	(0.000)
Observations	36,601,369	52,187,286
R2	0.56	0.07
B. Firms		
Nonbank x MP Shock	0.000	-0.002
	(0.002)	(0.001)
Observations	799,874	1,290,415
R2	0.51	0.14
Macro Var. Interactions	Yes	Yes
Lender FE	Yes	Yes
Borrower-Year FE	Yes	
ILST FE		Yes

Table H.11: Extensive margin - Termination of lending relationships

This table presents our results on the extensive margin of lending through the termination of lending relationships by estimating a linear probability model. The equation we estimate is the same as in equation (2). The outcome variable is an indicator variable equal to one if it is the last year that we observe a lending relationship between borrower b and lender l. *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *ILST* denotes industry-location-size-time fixed effects as described in section 3. Standard errors (in parentheses) are clustered at the borrower-lender level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)	(5)
A. Outcome var: Log debt					
Nonbank x MP Shock	4.44***	4.76***	2.77***	3.81**	1.51
	(0.73)	(0.55)	(0.59)	(1.52)	(0.94)
Observations	908,931	828,306	828,306	273,908	640,952
R2	0.19	0.80	0.80	0.65	0.40
B. Outcome var: Interest rate					
Nonbank x MP Shock	-0.004***	-0.004***	-0.002***	-0.004**	-0.003**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Observations	1,117,885	1,025,006	1,025,006	377,698	781,023
R2	0.02	0.50	0.50	0.46	0.14
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes
Year FE	Yes		Yes		
Lender FE	Yes			Yes	Yes
Lender-Borrower FE		Yes	Yes		
Borrower-Year FE				Yes	
ILST FE					Yes

Table H.12: Corporate credit - Excluding specialized finance companies

This table illustrates the results from estimating equation (2) using as the dependent variable the log of outstanding debt (Panel A) and the effective interest rate (Panel B) when we exclude all loans by specialized finance companies from the corporate credit market sample. *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *ILST* denotes industry-location-size-time fixed effects as described in section 3. Standard errors (in parentheses) are clustered at the borrower-lender level. Panel A reports transformed coefficients that indicate the percentage change in the nonbank lending share in response to a 1 standard deviation increase of the monetary policy measure.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)
	Equity	Short-term debt	Long-term debt	Long-term funding
A. Banks				
MP Shock	0.03***	0.01	-0.14***	-0.01
	(0.00)	(0.02)	(0.02)	(0.01)
Observations	1,517	1,514	1,044	1,514
R2	0.20	0.18	0.16	0.12
B. Nonbanks				
MP Shock	0.04***	0.04	0.11***	0.05***
	(0.01)	(0.05)	(0.02)	(0.01)
Observations	3,181	3,164	1,114	3,174
R2	0.17	0.14	0.20	0.14
Macro Controls	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes
Industry Cluster	Yes	Yes	Yes	Yes

Table H.13: Funding growth regressions with industry clusters

This table shows the results of estimating equation (3) for banks and nonbanks separately. The dependent variable is the change in the respective funding variable listed in each column. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). *Long-term funding* is the difference between total assets and *Short-term debt*. Standard errors are clustered at the industry level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

| | (1) | (2) | (3) | (4) |
	Equity	Short-term debt	Long-term debt	Long-term funding
A. Banks				
MP Shock	0.03***	0.02	-0.15***	-0.02
	(0.01)	(0.02)	(0.03)	(0.02)
Observations	1,447	1,444	933	1,444
R2	0.23	0.15	0.19	0.17
B. Nonbanks				
MP Shock	0.04***	0.03	0.10**	0.05***
	(0.01)	(0.05)	(0.04)	(0.01)
Observations	3,014	2,993	974	3,004
R2	0.16	0.17	0.23	0.15
Macro Controls	Yes	Yes	Yes	Yes
Lagged dep var	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes
Lender Cluster	Yes	Yes	Yes	Yes

Table H.14: Funding growth regressions with lagged dependent variables

This table shows the results of estimating equation (3) for banks and nonbanks separately. The dependent variable is the change in the respective funding variable listed in each column. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). *Long-term funding* is the difference between total assets and *Short-term debt*. All regressions also include lagged dependent variables as regressors. Standard errors are clustered at the lender level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) Equity/TA	(2) STdebt/TA	(3) LTdebt/TA	(4) LT funding/TA
A. Corporate lending				
MP Shock x L.Funding ratio	21.18	-19.76***	-6.82	24.62***
	(26.15)	(5.61)	(13.26)	(8.71)
Observations	9,809	9,809	2,119	9,809
R2	0.82	0.82	0.73	0.82
B. Consumer lending				
MP Shock x L.Funding ratio	10.75***	-4.96***	2.77***	5.22***
	(1.16)	(0.37)	(0.54)	(0.41)
Observations	2,216,448	2,216,448	1,243,764	2,216,448
R2	0.63	0.63	0.63	0.63
Macro Var. Interactions	Yes	Yes	Yes	Yes
Lower level Interactions	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes

Table H.15: Nonbank lending and funding structure - Simultaneous MP shocks

This table shows the results of estimating equation (4) for corporate lending and consumer lending separately. The dependent variable is borrower-nonbank-year level credit across all columns. Column names indicate the variable used as *Funding ratio* in the interaction terms, where "TA" refers to *Total assets*. *MP Shock* are monetary policy shocks at time t from Jarociński and Karadi (2020). Standard errors are clustered at the lender-borrower level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) ln debt	(2) int. rate	(3) ln debt	(4) int. rate	(5) ln debt	(6) int. rate
Nonbank x JK	-23.261	-0.070**	-41.874*	-0.029	-24.495	-0.042*
	(21.466)	(0.032)	(16.432)	(0.026)	(16.930)	(0.024)
Triple - Leverage	16.618	0.050				
	(32.589)	(0.033)				
Triple - Sales			67.691	-0.031		
			(59.346)	(0.030)		
Triple - Past delinquency					-95.129	-0.413
					(17.799)	(0.356)
Observations	153,811	209,121	191,498	261,518	191,498	261,518
R2	0.65	0.48	0.63	0.48	0.63	0.48
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lower-lvl interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.16: Risk-taking channel - Corporate credit - Specialized finance companies

This table illustrates the results from estimating equation (C.22) using as the dependent variable the log of outstanding debt (*lndebt*) and the effective interest rate (*intrate*). *Nonbank* is a dummy variable equal to one if a lender is a specialized finance company and equal to zero if the lender is a traditional bank. Firms that have loans from other nonbanks are excluded from the sample. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *Triple* corresponds to the triple interaction terms between our monetary policy shock measure, the indicator for nonbank lenders and an indicator for whether the borrower is above the median of: i) the leverage ratio, or ii) total sales. We also consider an indicator variable for riskiness that is based on past delinquencies for each borrower. That variable takes the value of one if the borrower was delinquent in the previous year of observation and zero otherwise. Lower levels interactions are also included in the regression model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) ln debt	(2) int. rate	(3) ln debt	(4) int. rate	(5) ln debt	(6) int. rate
Nonbank x JK	8.066*	0.001	9.075**	-0.002	3.273	-0.002
	(4.447)	(0.005)	(4.013)	(0.004)	(3.243)	(0.004)
Triple - Leverage	-13.728**	0.001				
	(5.503)	(0.007)				
Triple - Sales			-13.630**	-0.001		
			(5.188)	(0.007)		
Triple - Past delinquency					22.927	-0.010
					(25.074)	(0.012)
Observations	165,759	224,712	206,240	280,689	206,240	280,689
R2	0.65	0.48	0.63	0.48	0.63	0.48
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lower-lvl interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.17: Risk-taking channel - Corporate credit - Wealth managers (except I&P)

This table illustrates the results from estimating equation (C.22) using as the dependent variable the log of outstanding debt (*lndebt*) and the effective interest rate (*intrate*). *Nonbank* is a dummy variable equal to one if a lender is a wealth management company (except for insurance companies and pension funds) and equal to zero if the lender is a traditional bank. Firms that have loans from other nonbanks are excluded from the sample. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *Triple* corresponds to the triple interaction terms between our monetary policy shock measure, the indicator for nonbank lenders and an indicator for whether the borrower is above the median of: i) the leverage ratio, or ii) total sales. We also consider an indicator variable for riskiness that is based on past delinquencies for each borrower. That variable takes the value of one if the borrower was delinquent in the previous year of observation and zero otherwise. Lower levels interactions are also included in the regression model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)	(5)	(6)
	ln debt	int. rate	ln debt	int. rate	ln debt	int. rate
Nonbank x JK	-5.181*	0.003	-2.729	0.003	-0.226	-0.001
	(2.928)	(0.003)	(2.673)	(0.003)	(2.465)	(0.003)
Triple - Leverage	-2.356	-0.007				
	(4.488)	(0.005)				
Triple - Sales			-1.474	-0.013**		
			(4.729)	(0.005)		
Triple - Past delinquency					-3.348	-0.000
					(23.973)	(0.011)
Observations	175,993	240,891	217,343	298,375	217,343	298,375
R2	0.64	0.48	0.63	0.48	0.63	0.48
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lower-lvl interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.18: Risk-taking channel - Corporate credit - Financial leasing companies

This table illustrates the results from estimating equation (C.22) using as the dependent variable the log of outstanding debt (*lndebt*) and the effective interest rate (*intrate*). *Nonbank* is a dummy variable equal to one if a lender is a financial leasing company and equal to zero if the lender is a traditional bank. Firms that have loans from other nonbanks are excluded from the sample. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *Triple* corresponds to the triple interaction terms between our monetary policy shock measure, the indicator for nonbank lenders and an indicator for whether the borrower is above the median of: i) the leverage ratio, or ii) total sales. We also consider an indicator variable for riskiness that is based on past delinquencies for each borrower. That variable takes the value of one if the borrower was delinquent in the previous year of observation and zero otherwise. Lower levels interactions are also included in the regression model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) ln debt	(2) int. rate	(3) ln debt	(4) int. rate	(5) ln debt	(6) int. rate
Nonbank x JK	8.603***	-0.000	6.130***	0.004***	8.492***	0.003***
	(0.286)	(0.000)	(0.237)	(0.000)	(0.210)	(0.000)
Triple - Leverage	-1.009***	-0.001***				
	(0.370)	(0.000)				
Triple - Income			1.847***	-0.003***		
			(0.371)	(0.000)		
Triple - Unemployment					-1.012	-0.003***
					(0.712)	(0.000)
Observations	10,251,452	12,857,818	10,919,668	13,750,341	10,920,303	13,751,141
R2	0.54	0.50	0.54	0.49	0.54	0.49
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lower-lvl interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.19: Risk-taking channel - Consumer credit - Financial leasing companies

This table illustrates the results from estimating equation (C.22) using as the dependent variable the log of outstanding debt (*lndebt*) and the effective interest rate (*intrate*). *Nonbank* is a dummy variable equal to one if a lender is a financial leasing company and equal to zero if the lender is a traditional bank. Households that have loans from other nonbanks are excluded from the sample. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *Triple* corresponds to the triple interaction terms between our monetary policy shock measure, the indicator for nonbank lenders and an indicator for whether: i) the household is above the median of the debt-to-assets ratio distribution in a given year, ii) the households' disposable income is above the cross-sectional median in a given year, or iii) above the median probability of having been unemployed for at least 6 months in the last 2 years. Lower levels interactions are also included in the regression model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) ln debt	(2) int. rate	(3) ln debt	(4) int. rate	(5) ln debt	(6) int. rate
Nonbank x JK	3.864***	-0.000***	0.995***	0.003***	3.594***	0.003***
	(0.233)	(0.000)	(0.177)	(0.000)	(0.165)	(0.000)
Triple - Leverage	-1.260***	0.001***				
	(0.278)	(0.000)				
Triple - Income			4.560***	-0.003***		
			(0.309)	(0.000)		
Triple - Unemployment					0.833	-0.002***
					(0.513)	(0.000)
Observations	11,377,965	14,498,316	12,243,240	15,642,826	12,244,070	15,643,899
R2	0.54	0.51	0.54	0.50	0.54	0.50
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lower-lvl interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.20: Risk-taking channel - Consumer credit - Consumer credit companies

This table illustrates the results from estimating equation (C.22) using as the dependent variable the log of outstanding debt (*lndebt*) and the effective interest rate (*intrate*). *Nonbank* is a dummy variable equal to one if a lender is a consumer credit company and equal to zero if the lender is a traditional bank. Households that have loans from other nonbanks are excluded from the sample. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *Triple* corresponds to the triple interaction terms between our monetary policy shock measure, the indicator for nonbank lenders and an indicator for whether: i) the household is above the median of the debt-to-assets ratio distribution in a given year, ii) the households' disposable income is above the cross-sectional median in a given year, or iii) above the median probability of having been unemployed for at least 6 months in the last 2 years. Lower levels interactions are also included in the regression model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) ln debt	(2) int. rate	(3) ln debt	(4) int. rate	(5) ln debt	(6) int. rate
Nonbank x JK	2.233***	0.000	-5.306***	0.003***	-2.070***	0.001***
	(0.662)	(0.000)	(0.441)	(0.000)	(0.403)	(0.000)
Triple - Leverage	-3.408***	-0.000				
	(0.840)	(0.000)				
Triple - Income			7.035***	-0.004***		
			(0.819)	(0.000)		
Triple - Unemployment					-0.069	-0.001
					(1.753)	(0.001)
Observations	7,679,257	9,875,419	8,258,411	10,668,916	8,258,883	10,669,539
R2	0.53	0.49	0.53	0.49	0.53	0.49
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lower-lvl interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.21: Risk-taking channel - Consumer credit - Wealth managers (except I&P)

This table illustrates the results from estimating equation (C.22) using as the dependent variable the log of outstanding debt (*lndebt*) and the effective interest rate (*intrate*). *Nonbank* is a dummy variable equal to one if a lender is a wealth management company (except for insurance companies and pension funds) and equal to zero if the lender is a traditional bank. Households that have loans from other nonbanks are excluded from the sample. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *Triple* corresponds to the triple interaction terms between our monetary policy shock measure, the indicator for nonbank lenders and an indicator for whether: i) the household is above the median of the debt-to-assets ratio distribution in a given year, ii) the households' disposable income is above the cross-sectional median in a given year, or iii) above the median probability of having been unemployed for at least 6 months in the last 2 years. Lower levels interactions are also included in the regression model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) ln debt	(2) int. rate	(3) ln debt	(4) int. rate	(5) ln debt	(6) int. rate
Nonbank x JK	1.24	-0.00**	1.25	-0.00***	1.38	-0.00***
	(1.03)	(0.00)	(1.05)	(0.00)	(0.90)	(0.00)
Triple - Leverage	0.06	-0.00				
	(1.58)	(0.00)				
Triple - Sales			-2.86*	0.00		
			(1.56)	(0.00)		
Triple - Past delinquency					12.54	0.00
					(10.41)	(0.01)
Observations	596,803	668,312	612,027	685,083	612,027	685,083
R2	0.42	0.14	0.41	0.14	0.41	0.14
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lower-lvl interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes
ILST FE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.22: Risk-taking channel of monetary policy in corporate credit markets single-lender firms

This table illustrates the results from estimating equation (C.22) using as the dependent variable the log of outstanding debt (*lndebt*) and the effective interest rate (*intrate*). *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *Triple* corresponds to the triple interaction terms between our monetary policy shock measure, the indicator for nonbank lenders and an indicator for whether the borrower is above the median of: i) the leverage ratio, or ii) total sales. We also consider an indicator variable for riskiness that is based on past delinquencies for each borrower. That variable takes the value of one if the borrower was delinquent in the previous year of observation and zero otherwise. Lower levels interactions are also included in the regression model. ILST denotes industry-location-size-time fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) ln debt	(2) int. rate	(3) ln debt	(4) int. rate	(5) ln debt	(6) int. rate
Nonbank x JK	5.494*** (0.108)	-0.000*** (0.000)	5.003*** (0.091)	0.003*** (0.000)	6.397*** (0.084)	0.002*** (0.000)
Triple - Leverage	-1.328*** (0.136)	0.000 (0.000)				
Triple - Income			0.513*** (0.147)	-0.002*** (0.000)		
Triple - Unemployment					-0.511* (0.242)	-0.001*** (0.000)
Observations	26,671,289	30,924,207	28,729,896	33,411,968	28,730,149	33,412,275
R2	0.27	0.13	0.26	0.12	0.26	0.12
Macro Var. Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lower-lvl interactions	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes
ILST FE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.23: Risk-taking channel of monetary policy in consumer credit markets single-lender households

This table illustrates the results from estimating equation (C.22) using as the dependent variable the log of outstanding debt (*lndebt*) and the effective interest rate (*intrate*). *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). "Macro Var. Interactions" indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *Triple* corresponds to the triple interaction terms between our monetary policy shock measure, the indicator for nonbank lenders and an indicator for whether the borrower is above the median of: i) the leverage ratio, or ii) total sales. Lower levels interactions are also included in the regression model. ISLT denotes location-income-leverage-time fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) Debt	(2) Credit	(3) Bank Credit	(4) Nonbank Credit	(5) Bank Credit Pure	(6) Nonbank Credit Pure
MP Shock	-1.98***	-4.42***	-3.88***	-6.59***	-5.56***	-13.01***
	(0.14)	(0.28)	(0.29)	(0.74)	(0.31)	(1.43)
Observations	808,852	885,929	790,078	94,920	723,918	24,421
R2	0.21	0.11	0.11	0.15	0.11	0.28
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.24: Financial effects with one-time borrowers in corporate credit markets.

All outcome variables are in logs. "Macro Controls" indicates that the regressions include Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. Industry FE instead of borrower FE to include one-time borrowers. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) Debt	(2) Credit	(3) Bank Credit	(4) Nonbank Credit	(5) Bank Credit Pure	(6) Nonbank Credit Pure
MP Shock	-5.72***	-8.14***	-7.67***	2.53***	-8.50***	3.13***
	(0.31)	(0.43)	(0.40)	(0.41)	(0.41)	(0.48)
Observations	23,783,146	21,959,356	19,183,927	6,879,582	13,660,031	1,026,364
R2	0.03	0.01	0.02	0.01	0.02	0.01
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.25: Financial effects with one-time borrowers in consumer credit markets.

All outcome variables are in logs. "Macro Controls" indicates that the regressions include Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. Municipality FE instead of borrower FE to include one-time borrowers. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)
	Debt	Credit	Bank Credit	Nonbank Credit
MP Shock	-3.05***	-1.94***	-3.66***	7.15***
	(0.28)	(0.57)	(0.82)	(0.67)
Observations	69,879	87,370	59,506	87,370
R2	0.92	0.84	0.75	0.82
Macro Controls	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes

Table H.26: Financial effects of monetary policy - Firms with positive nonbank credit.

All outcome variables are in logs. "Macro Controls" indicates that the regressions include Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. Data is collapsed at firm-year level. *Debt* is computed as Total Assets - Equity from the balance sheet data, *Credit* is total unsecured debt. *Bank Credit* is total unsecured credit obtained from banks, and *Nonbank Credit* is total unsecured credit obtained from nonbanks. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)
	Ln Debt	Ln Credit	Ln Bank Credit	Ln Nonbank Credit
Panel A. Households				
MP Shock	-3.94***	-3.79***	-6.11***	4.75***
	(0.03)	(0.05)	(0.06)	(0.07)
Observations	6,950,698	6,899,623	6,564,408	4,426,231
R2	0.87	0.70	0.70	0.69
Panel B. Firms				
MP Shock	-2.58***	0.23	-1.61***	9.00***
	(0.24)	(0.54)	(0.58)	(0.97)
Observations	106,326	130,868	126,192	46,202
R2	0.90	0.72	0.71	0.80
Macro Controls	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes

Table H.27: Borrower-level regressions of financial outcomes - Khwaja-Mian fixed effects sample

This table re-estimates our regressions on the effects of monetary policy on borrower-level financial outcomes in Table 8 when we include only borrowers who simultaneously borrow from banks and nonbanks in a given year.

	(1) Ln Debt	(2) Ln Credit	(3) Ln Bank Credit	(4) Ln Nonbank Credit	(5) Ln Bank Credit Pure	(6) Ln Nonbank Credit Pure
A. Households - log(1+y)						
MP Shock	-1.40***	-5.60***	-9.17***	10.07***	-5.58***	1.98***
	(0.05)	(0.08)	(0.08)	(0.09)	(0.05)	(0.14)
Observations	23,440,849	23,442,587	23,442,587	23,442,587	12,777,924	1,055,144
R2	0.75	0.61	0.62	0.60	0.69	0.80
B. Households - IHS(y)						
MP Shock	-1.25***	-5.66***	-9.42***	10.77***	-5.58***	1.98***
	(0.05)	(0.08)	(0.08)	(0.09)	(0.05)	(0.15)
Observations	23,440,849	23,442,587	23,442,587	23,442,587	12,777,924	1,055,144
R2	0.74	0.60	0.62	0.60	0.69	0.80
C. Firms - log(1+y)						
MP Shock	-1.54***	-1.16**	-5.34***	12.73***	-0.86***	3.12***
	(0.15)	(0.54)	(0.53)	(0.35)	(0.28)	(0.99)
Observations	633,744	972,149	972,149	972,149	602,840	20,645
R2	0.78	0.60	0.60	0.59	0.72	0.92
D. Firms - IHS(y)						
MP Shock	-1.53***	-1.20**	-5.63***	13.62***	-0.86***	3.14***
	(0.15)	(0.57)	(0.56)	(0.38)	(0.28)	(0.99)
Observations	633,746	972,149	972,149	972,149	602,840	20,645
R2	0.78	0.60	0.60	0.59	0.72	0.92
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes	Yes	Yes

Table H.28: Borrower-level regressions with alternative outcome transformations

This table replicates our borrower-level analysis of credit outcomes, presented in column Table 8 in the paper, using alternative transformations of the outcome variables. Panels A and B study household-level outcomes, while Panels C and D focus on corporate borrowers.

	(1) Tot. Assets	(2) Investment	(3) Oper. Profit	(4) Wage Bill
MP Shock	-2.68***	-2.82***	-5.65***	-1.64***
	(0.08)	(0.18)	(0.13)	(0.06)
Nonbank borrower x MP Shock	2.12***	3.81***	4.31***	1.05**
	(0.48)	(1.04)	(0.78)	(0.37)
Observations	753,821	487,218	588,025	613,662
R2	0.86	0.69	0.74	0.90
Macro Control Interactions	Yes	Yes	Yes	Yes
Borrower Controls	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes

Table H.29: Real effects of monetary policy in corporate credit markets with borrower controls

Data is collapsed at firm-year level. All outcome variables are in logs. Nonbank borrower is a dummy equal to 1 if more than 50% of the firms' debt in the previous year came from nonbanks. Borrower controls include lagged leverage, firm age and 4-digit NACE industry code. MV stands for Market Value.

	(1) Disp. Income	(2) Consumption	(3) MV RE	(4) MV New Cars	(5) MV Total Assets
MP Shock	-0.07***	-1.67***	-3.24***	0.60***	-2.31***
	(0.01)	(0.01)	(0.01)	(0.16)	(0.02)
Nonbank x MP Shock	-0.50***	0.79***	0.88***	-1.10	1.01***
	(0.02)	(0.05)	(0.03)	(0.58)	(0.09)
Observations	22,315,612	21,319,501	13,827,992	131,267	22,292,146
R2	0.86	0.59	0.91	0.63	0.90
Macro Control Interactions	Yes	Yes	Yes	Yes	Yes
BorrowerControls	Yes	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes	Yes

Table H.30: Real effects of monetary policy in consumer credit markets with borrower controls

Data is collapsed at firm-year level. All outcome variables are in logs. Nonbank borrower is a dummy equal to 1 if more than 50% of the households' debt in the previous year came from nonbanks. Borrower controls include lagged leverage, household head's age and municipality. MV stands for Market Value.

	(1) Tot. Assets	(2) Investment	(3) Oper. Profit	(4) Wage Bill
MP Shock	-3.16***	0.03	-5.54***	-2.06***
	(0.08)	(0.19)	(0.13)	(0.06)
Nonbank relation x MP Shock	2.25***	8.72***	5.76***	1.37***
	(0.39)	(0.86)	(0.62)	(0.31)
Observations	776,689	504,294	607,849	621,635
R2	0.86	0.68	0.74	0.90
Macro Control Interactions	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes

Table H.31: Real effects of monetary policy in corporate credit markets

Data is collapsed at firm-year level. All outcome variables are in logs. Nonbank relation is a dummy equal to 1 if the firm had at least 1 nonbank lender in the previous year.

	(1) Disp. Income	(2) Consumption	(3) MV RE	(4) MV New Cars	(5) MV Total Assets
MP Shock	-2.03***	-2.51***	-5.96***	-1.43***	-6.73***
	(0.01)	(0.01)	(0.01)	(0.16)	(0.02)
Nonbank relation x MP Shock	0.03	0.70***	-0.86***	6.15***	0.15*
	(0.02)	(0.04)	(0.03)	(0.55)	(0.08)
Observations	24,302,612	23,232,087	14,850,076	131,562	24,096,429
R2	0.84	0.59	0.90	0.60	0.89
Macro Control Interactions	Yes	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes	Yes

Table H.32: Real effects of monetary policy in consumer credit markets

Data is collapsed at firm-year level. All outcome variables are in logs. Nonbank relation is a dummy equal to 1 if the firm had at least 1 nonbank lender in the previous year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Mean	SD	p10	p25	p50	p75	p90
Panel A. Pre-tax profit/Assets (%)							
Banks	0.40	1.15	0.13	0.18	0.28	0.54	0.58
Nonbanks	0.87	2.38	0.31	0.33	0.42	0.61	1.16
Panel B. Average pre-tax profit/Assets (%)							
Banks	0.42	0.60	0.18	0.26	0.37	0.47	0.73
Nonbanks	0.82	1.97	0.22	0.30	0.33	0.49	1.51

Table H.33: Lenders' profitability - Cross-section and over time

This table provides summary statistics of lenders' profitability, measured as the ratio of pre-tax profits to total assets. Panel A summarizes profitability at the lender-year level, while Panel B first averages profitability across years for each lender, and then describes the distribution of average profitability at nonbanks and banks. All statistics are weighted by total assets.

	(1)	(2)	(3)	(4)	(5)
	Year 1	Year 2	Year 3	Year 4	Year 5
MP Shock	0.70***	1.03***	0.93***	0.64***	-0.64**
	(0.08)	(0.10)	(0.10)	(0.16)	(0.31)
Nonbank x MP Shock	0.46**	0.78***	1.01***	0.36	0.04
	(0.19)	(0.20)	(0.22)	(0.29)	(0.59)
Observations	4,696	4,069	3,516	3,056	2,589
R2	0.40	0.41	0.40	0.40	0.43
Macro Control Interactions	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes
Lender Cluster	Yes	Yes	Yes	Yes	Yes

Table H.34: Response of bank and nonbank profitability to changes in monetary policy

This table illustrates the dynamic response of lenders' profitability, measured as pre-tax profits over total assets, to unanticipated changes in monetary policy. Columns (1) to (5) depict the response of profitability h years after the monetary policy shock, where $h = 1, .., 5$. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). *Nonbank* is a dummy variable equal to one if a lender is a financial company other than a traditional bank and equal to zero if the lender is a traditional bank. *Macro Var. Interactions* indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. Standard errors are clustered at the lender level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)
A. Households (reference group: Age 18-29)		
Nonbank x MP Shock x Age 30-39	3.13***	1.52***
	(0.50)	(0.27)
Nonbank x MP Shock x Age 40-49	2.83***	0.04
	(0.47)	(0.25)
Nonbank x MP Shock x Age 50-59	2.73***	-0.40
	(0.47)	(0.25)
Nonbank x MP Shock x Age 60+	2.22***	-0.32
	(0.48)	(0.25)
Observations	16,171,883	28,729,796
R2	0.54	0.27
B. Firms (reference group: young firms)		
Nonbank x MP Shock x Mature	-3.08	-1.28
	(2.90)	(1.69)
Nonbank x MP Shock x Old	-4.95*	-1.98
	(2.59)	(1.54)
Observations	275,516	641,337
R2	0.65	0.40
Macro Var. Interactions	Yes	Yes
Lender FE	Yes	Yes
Borrower-Year FE	Yes	
ILST FE		Yes

Table H.35: Heterogeneous lending effects by age

This table illustrates the results of estimating a modified version of equation (2) where we interact our main regressors with the age of the borrower. The dependent variable in both columns is the log of outstanding debt for households (Panel A) and for firms (Panel B). *Nonbank* is a dummy variable equal to one if the lender is a nonbank and equal to zero if the lender is a bank. *MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). Age is computed in years, and borrowers are grouped into bins in each panel. Estimates are reported relative to the youngest group in each panel. Young firms in Panel B are aged between 0 and 10, mature firms are aged 11-19, and old firms are older than 20 years. *Macro Var. Interactions* indicates interaction terms of our nonbank lender dummy with Danish GDP, GDP forecast, and inflation, as well as the VIX index for stock market uncertainty. *ILST* denotes industry-location-size-time fixed effects as described in section 3. Standard errors (in parentheses) are clustered at the borrower-lender level.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.