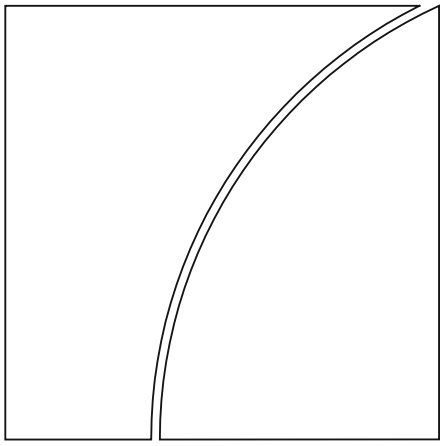

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Non-bank lending and the transmission of monetary policy

by Dominic Cucic and Denis Gorea

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Keywords: Monetary policy, nonbanks, shadow banks, banks, real effects

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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 nonbank credit expansion is driven by long-term debt funding flowing to nonbanks. The attenuation of the traditional bank lending channel of monetary policy has real effects: nonbank credit insulates corporate investment and household consumption from adverse consequences of monetary contractions.

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

JEL Classification: E51, E52, G23.

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1 Introduction

A vast literature on the bank lending channel documents that traditional banks reduce their lending in response to a monetary tightening (Kashyap and Stein, 1994, and Bernanke and Gertler, 1995). While the reduction in bank credit supply has received considerable attention in the literature, evidence on the reaction of the increasingly important nonbank financial intermediaries to changes in monetary policy is rather scarce. Some have argued that monetary policy changes the funding cost of all financial intermediaries who borrow short-term, and therefore, nonbanks should react similarly to banks to changes in policy (Stein, 2013). Others have argued recently that monetary tightening shifts the supply of credit from banks to nonbanks (Drechsler et al., 2017; Xiao, 2020; Elliott et al., 2022; Drechsler et al., 2022; Buchak et al., 2022).

This paper contributes to this debate by answering three questions. First, does a tightening of monetary policy change the composition of credit supply by shifting credit from banks to nonbanks? Second, what explains differences in the reactions of nonbanks' and banks' credit supply to changes in monetary policy? Lastly, how does the substitution into more nonbank lending affect the transmission of monetary policy to real outcomes such as firm investment and household consumption?

We answer these questions empirically using comprehensive 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 their funding shapes lending decisions after changes in monetary policy. We study the consequences of nonbank lending for firms and households by combining loan-level data with data on borrowers' real outcomes, namely firm balance sheets and income statements, as well as administrative data on every household in Denmark.

We begin by investigating if an unexpected monetary tightening induces a shift of credit supply from banks towards nonbanks at the borrower-lender-year level. We

find that a positive one standard deviation shock to monetary policy rates increases the nonbank credit share by about 5% in both corporate and consumer markets. The increased share of nonbank credit is largely due to intensive margin effects, that is, because of increased lending to existing nonbank borrowers rather than the formation or termination of lending relationships. Additionally, we find no economically significant differences in the reaction of interest rates set by nonbanks vis-a-vis banks, suggesting that most of the transmission of the monetary policy shock occurs through quantities rather than prices.

We proceed by examining a mechanism that explains the differential reaction of nonbanks and traditional banks to monetary policy. Utilizing comprehensive balance sheet data across all lenders, we demonstrate that monetary contractions increase long-term (debt) funding for nonbanks while decreasing it for banks. Equity and short-term debt exhibit uniform reactions across both lender types. While the existing literature has focused on the role of short-term debt funding in explaining the expansion of nonbank lending after a monetary tightening, we uncover a novel, complementary channel working through long-term debt financing. We provide suggestive evidence that monetary contractions increase nonbanks' profitability relative to banks, thereby rationalizing their inflow of long-term (debt) funding. Moreover, nonbanks who fund a larger share of their operations with long-term financing are driving the increase in the nonbank credit share after a monetary contraction.

How does monetary policy affect borrowers' financial and real outcomes in the presence of nonbanks? We find that banks reduce their lending after a monetary tightening, in line with the classic bank lending channel. The supply of nonbank credit, however, increases significantly to both firms and households. Although the substitution away from bank credit to nonbank credit is incomplete, nonbanks significantly attenuate the transmission of monetary policy to credit supply. This result shows that

nonbank credit acts as a "spare tire" when bank lending tightens.[1]

The attenuation of the bank lending channel by nonbanks has real effects: our results show that borrowers with pre-existing nonbank relationships ("nonbank borrowers") are insulated from adverse consequences of unexpected interest rate hikes. On the corporate side, nonbank borrowers are able to sustain relatively higher investment, operating profit, and wage bills after a monetary tightening compared to borrowers without ties to nonbanks. Similarly, consumers with ties to nonbanks are able to consume more, purchase more valuable cars and have more valuable total asset holdings compared to households without nonbank ties. Moreover, the nonbank credit expansion generates positive spillover effects benefiting borrowers without direct ties to nonbanks: Specifically, such firms in industries where nonbanks hold a larger share of credit increase investment compared to similar firms in industries with a smaller nonbank credit share. We show similar effects on household consumption based on the importance of nonbanks in local credit supply.

Identifying the role of nonbanks in the transmission of monetary policy on credit supply is challenging for two reasons. First, changes in monetary policy rates are often shaped by macroeconomic developments, which are likely to directly affect credit supply too. Second, monetary policy may affect credit demand of borrowers at banks and nonbanks differently, especially if these two lenders have distinct clienteles. We deal with the first challenge - the endogeneity of monetary policy rates - by exploiting the long-standing Danish currency peg to the Euro. The fixed-exchange rate policy implies that Denmark effectively adopts the monetary policy decisions made by the ECB for the euro area with essentially no regard for the economic conditions in Denmark. This allows us to utilize monetary policy shocks series that were previously constructed for the euro area (Jarociński and Karadi, 2020, and Altavilla et al., 2019) to identify exogenous variation in Danish monetary policy rates. In addition to these

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

shocks, in our regressions we control for local macroeconomic conditions in Denmark and stock market uncertainty to ensure that those economic factors are not driving our results on the shifts in credit supply.

To isolate credit supply effects, we use information from the annual reports of all lenders in Denmark to the Danish Tax Authority ("SKAT"). Each year, all entities in Denmark having issued credit over the previous 12 months are required to report account-level information to SKAT, which is used to determine tax obligations. We combine this account-level data with information from the Danish firm register to identify banks and nonbank financial intermediaries. Our empirical analysis follows the approach popularized by Khwaja and Mian (2008) and compares how lending decisions by banks and nonbanks to the same borrower differ in response to a monetary policy shock. Specifically, we utilize borrower-year fixed effects to control for time-varying borrower characteristics such as credit demand.[2]

In addition, we use the accounting statistics and tax records for the entire population in Denmark to obtain detailed information about income and balance sheets of borrowers in both corporate and consumer credit markets. Our full dataset covers the period 2003-2018 and features nearly 1.9 million firm-lender-year observations in the corporate credit market and 73 million household-lender-year observations in the consumer credit market. Focusing on borrowers with both bank and nonbank lenders in a given year reduces our samples to around 25% of their original size. To ensure that we capture the overall effect of monetary policy on credit supply in an economy where the majority of borrowers do not deal with banks and nonbanks simultaneously, we follow Degryse et al. (2019) and re-estimate our empirical models to include borrowers with only one type of lender (bank or nonbank) by replacing borrower-year fixed effects with fixed effects based on borrower types with similar credit demand.

Literature review. This paper contributes to three strands of literature. First, we

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

add to the literature on the "shadow banking channel" of monetary policy that explores how changes in monetary policy affect credit market outcomes in the presence of nonbank financial institutions (Chen et al., 2018; Xiao, 2020; Banerjee and Serena, 2022; Drechsler et al., 2022; Elliott et al., 2022). The overarching finding in this literature is that nonbanks attenuate the monetary transmission by providing more credit when banks retreat from lending after a monetary tightening. Increased lending by nonbanks is attributed to changes in their funding, but there is limited evidence in the literature on their funding structure. Importantly, Jiang et al. (2023), Agarwal et al. (2023) and Jiang (2023) show using shadow bank "call reports" that nonbanks operating in the U.S. mortgage market are funded primarily through *short-term* debt.

We contribute to this literature by providing novel evidence on how the "shadow banking channel" of monetary policy operates in corporate and consumer credit markets where nonbanks are financed primarily through *long-term* debt. Despite fundamental differences in funding structure compared to US nonbank mortgage lenders, we show that nonbanks funded by long-term debt also soften the transmission of monetary policy to credit supply. Exploiting balance sheet data on lenders matched to a loan register, we find that nonbanks' reliance on long-term debt funding is crucial to rationalize their lending expansion after a monetary tightening. Nonbanks that rely more on long-term funding are the ones experiencing an inflow of long-term debt and, consequently, lend more to consumers and firms following a monetary tightening. This is a novel, complementary channel to the one working through short-term funding, which the existing literature has largely focused on.

Second, due to the richness of our data, we can explore in great detail how monetary policy affects real-economic outcomes, such as corporate investment and household consumption. While empirical evidence on the real effects of monetary policy using aggregate data is rather abundant (Romer and Romer, 2004, Coibion, 2012, Gertler and Karadi, 2015, and Nakamura and Steinsson, 2018), there is a growing body of work that uses micro data to study such effects (Di Maggio et al., 2017, Cloyne et al.,

2023, Wong, 2019, Cloyne et al., 2020, and Holm et al., 2021). We provide complementary evidence to this literature by showing that nonbank lenders attenuate the transmission of policy rate changes to borrowers' real outcomes in both corporate and consumer credit markets. In particular, the increased credit supply by nonbanks after a monetary tightening largely eliminates the credit supply-side transmission to firms' real outcomes, such as investment, but only marginally attenuates the transmission to household consumption. Our ability to measure consumption based on tax records of incomes and wealth for all individuals in Denmark is key to uncovering these results.

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

Our analysis is based on several administrative datasets collected by Statistics Denmark. We combine data from the universe of unsecured lending agreements in both consumer and corporate credit markets in Denmark with additional information on borrowing firms and households as well as on lenders. In this section we provide a

brief overview of our data and the sample restrictions we impose. Subsequently, we also provide descriptive statistics of our sample and describe some characteristics of the nonbank lending sector in Denmark.

2.1 Data sources and sample restrictions

Loan data. Our data on corporate and consumer loans is based on Danish lenders' annual account-level reports of all loans to the Danish Tax Authority (SKAT) between 2003 and 2018. Each year, all entities in Denmark having issued unsecured credit over the previous 12 months are required to report information on each account that is active during the year, including the identity of the account holder, the account number, balance, and the sum of interest payments made on the account over the course of the year. The reporting covers any type of lending arrangement, including regular loans, credit card debt, commercial paper, and accounts with variable utilization such as revolving loans or overdraft deposit accounts.[3] As our data does not allow to distinguish between these types of credit, we study the effect of monetary policy on the *overall* unsecured credit of each borrower. These lender reports are used to determine tax obligations and are of accordingly high quality. We collapse the raw data at the borrower-lender-account-year level to the borrower-lender-year level by summing balances and interest payments across accounts held by the same borrower at the same lender in each year. Importantly, borrowers in our dataset are firms or individuals, which allows us to draw conclusions regarding the effects of monetary policy for both the unsecured *corporate* credit market and the unsecured *consumer* credit market.

In addition to outstanding loans and interest payments, our data also covers loan maturity and the contractual interest rate for some observations. However, these variables are not relevant for taxes and are not systematically reported by most lenders.

[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. Hence our paper has little to say on how nonbanks affect the transmission of monetary policy in secured credit markets.

Therefore, we follow Jensen and Johannesen (2017), and Renkin and Züllig (2023), and calculate the effective interest rate paid by borrower b to lender l in year t as:

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

The effective interest rate is calculated as the sum of interest payments made in year t divided by the average outstanding loan balance at the end of the current and previous years. The denominator is an approximation of the average amount of loans outstanding during the current year and implicitly assumes that loan balances evolve linearly over the course of a year.

Borrower characteristics. We complement our data on loans with detailed information on borrowers and lenders from various datasets compiled by Statistics Denmark. We use the Danish firm register ("FIRM") to obtain information on lenders and corporate borrowers. The register contains information on firms' age, location and employment. 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.

We obtain detailed accounting information on corporate borrowers from the Danish firm-level accounting statistics ("FIRE"). FIRE covers active businesses in Denmark with more than 50 employees as well as some information on smaller businesses, which are sampled less frequently by Statistics Denmark. The accounting data excludes firms in the governmental, financial, and agricultural sectors. Although the accounting data covers only 9,000 firms out of a total of around 190,000, these firms account for roughly two-thirds of total employment in Denmark.

While our loan-level data records loans for each individual, we aggregate up 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-household. We augment our data on loans with information on household income

from the administrative records of the tax authority (SKAT). Incomes in Denmark are reported with little to no errors, as the reporting system is automated at source of income and subject to no self-reporting bias. The information recorded in tax records allows us to compute disposable income at the household level. While wealth is not taxed in Denmark, any incomes arising from it such as dividends and capital gains are taxed. As a consequence, we also have detailed information on the wealth of Danish households which we also use in our analysis. 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.[4]

Lenders' funding structure. We augment our loan-level data with detailed data on the funding of lenders between 2002 and 2015. Specifically, we obtain annual balance sheet data covering both banks and nonbanks that are active lenders in our loan-level data from a commercial data provider ("Experian"). The data includes information on, for example, lenders' short- and long-term debt as well as equity. It also includes information on lenders' profitability.

Monetary policy shocks. To identify monetary policy shocks, we exploit the fact that Denmark's monetary policy is effectively aligned to that of the ECB due to its currency peg. This introduces exogenous variation in policy rates, as the ECB does not set interest rates in the euro area based on economic conditions in Denmark. Therefore, we use shocks to monetary policy computed for the euro area as instruments for monetary policy shocks in Denmark. Section 3 discusses our identification strategy in more detail.

Our main measure of monetary policy is the time series of monetary policy shocks constructed by Jarociński and Karadi (2020) for the euro area. This measure is based on a combination of high-frequency responses of asset prices and sign restrictions,

[4]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.

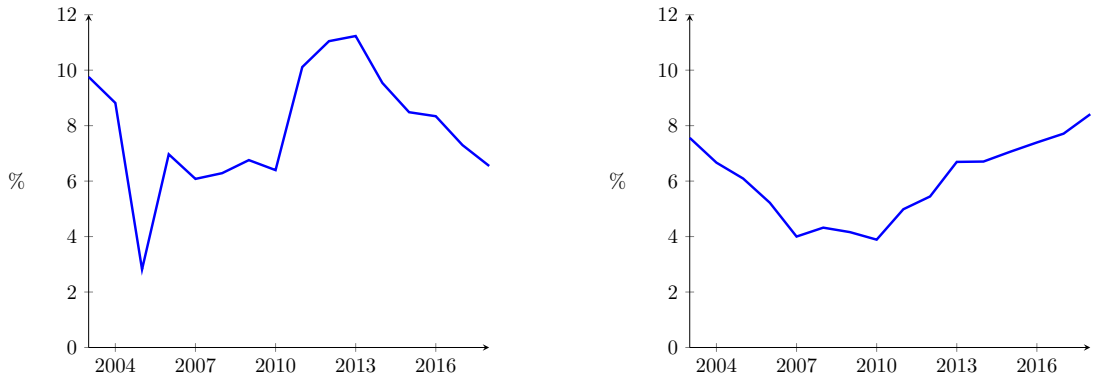
and aims to separates "pure" monetary policy shocks from the "information effect" conveyed in the ECB's monetary policy announcements. To match the frequency of this shock series to our annual data on loans, we follow Coibion (2012) and Nelson et al. (2018), and convert this measure of monetary shocks into a level measure by taking the cumulative sum. Our annual shock measure ranges from -6.4 bps to 17.78 bps, with a mean of 2.69 bps and a standard deviation of 7.59 bps. We perform several robustness tests showing that our results are not affected by using other euro area monetary policy shocks such as those computed by Altavilla et al. (2019).

Sample construction. We restrict the data in a number of ways. For both the corporate and consumer loans, we begin with the universe of unsecured loans to Danish non-financial companies and households. We drop state-guaranteed student loans and loans granted by municipalities. We also drop all loans that are in some form of arrears or debt forgiveness. Lastly, we drop loans by mortgage banks, extraterritorial as well as governmental institutions and the Danish central bank. It should be noted that our identification strategy imposes an additional sample restriction: our baseline analysis focuses on borrowers who borrow from both banks and nonbanks in the same year. We expand on this in the following sections.

At the firm-level, we begin with all firms that were active during any year in the period 2003-2018. We then drop firms whose equity is below 1,000 USD. Further, we drop all firms with missing survey information in the accounting statistics. Lastly, we drop cooperatives, NGOs and other non-profits from our sample, mostly to exclude housing cooperatives, which are important players in Danish real estate markets.

2.2 Descriptive statistics

In this subsection we provide a series of descriptive statistics about our data, and in particular about nonbank lenders and their borrowers in Denmark. The goal of this exercise is to gain a better understanding of who nonbank lenders are, who they lend to, and whether these aspects differ from the existing evidence on nonbank lenders



(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.

coming mainly from the United States and China.

We start by describing how the share of nonbank credit in total credit has evolved between 2003 and 2018. Figure 1 shows that, in both the case of the corporate credit market and the consumer credit market, the share of nonbanks has been hovering at around 8% during our sample period. In the corporate credit market, this share dropped prior to the financial crisis of 2008, increased shortly thereafter, but has been on a declining trend after 2013. The picture is somewhat different in the consumer credit market. The share on nonbanks has decreased between 2003 and 2010, but has been climbing steadily since. Considering that total unsecured credit in Denmark equals approximately 50 per cent of Danish GDP, the evidence presented in Figure 1 highlights the economic importance of nonbanks for Danish credit markets. Interestingly, the relative importance of nonbanks in Danish credit markets is comparable to their role in US credit markets: while nonbanks nowadays dominate the residential mortgage market (Buchak et al., 2018), they accounted for 9% of lending in the U.S. syndicated loan market between 1990-2017 (Elliott et al., 2022), and for 15% in the US auto lending market since 2010 (Yao, 2022).

	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.

We provide additional descriptive evidence on nonbank lenders in Denmark in Appendix A. In particular, we describe which types of nonbanks account for most unsecured credit in Denmark. We document that wealth managers and financial leasing companies are important lenders in both corporate and consumer credit markets. Additionally, specialized finance companies and consumer credit companies are key lenders in the corporate and consumer credit market, respectively. Moreover, we document to which 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.

Table 1 presents summary statistics of our loan-level data at the borrower-year level. Panel A summarizes our sample of households, while Panel B reports statistics for firms included in our corporate credit sample. For each of the two panels, we report

	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%.

separately across columns statistics based on our full dataset and on the sample of borrowers that receive credit from both banks and nonbanks in a given year. Our data spans ca. 209,000 distinct firms, of which 42,000 simultaneously borrow from banks and nonbanks in at least one year. For comparison, our consumer lending data features 5.7 million distinct households, of which 1.9 million borrow from both banks and nonbanks at least once during our sample period. Panel A shows that households that borrow from both banks and nonbanks have on average more unsecured debt and disposable income, but are otherwise similar to households in the full sample in terms of the age of the oldest adult in the household, unemployment status and the interest rate paid on unsecured debt. Panel B presents similar descriptive statistics for firms in the full sample of borrowers with unsecured credit and in the sample of firms with simultaneous lending relationships with banks and nonbanks. Firms that borrow from banks and nonbanks in the same year have more assets, are relatively older, have more unsecured debt but are charged similar interest rates as firms in the overall sample.

Table 2 summarizes the balance sheet data on banks' and nonbanks' funding structure. Our sample includes about 6,000 observations at the lender-year level, with entries for nonbanks representing around 2/3 of this sample. Since we are interested in how the funding structure of nonbanks and banks changes in response to monetary policy shocks, we report first summary statistics on growth rates of short-term debt,

equity, long-term funding and long-term debt. Then, we report ratios of each of these funding variables scaled by lenders' total assets.

While banks and nonbanks exhibit similar average growth rates of equity, banks exhibit higher inflows of long-term debt while the growth rate of short-term debt is higher among nonbanks. All growth rates of funding variables are more dispersed for nonbanks than banks. When scaling the funding variables with lenders' total assets, stark differences in the funding structure of banks and nonbanks emerge: while banks fund most of their assets with short-term debt (70%), nonbanks rely largely on equity and long-term debt funding.

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 three 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 with essentially no regard to the economic conditions in Denmark.

A detailed discussion of our identification approach relying on the Danish currency

peg can be found in Andersen et al. (2022).[5] Jordà et al. (2020) 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 unobservable borrower and loan 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) rather than demand.

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

[5] Andersen et al. (2022) 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.

of the differences we document in our summary statistics table between single-lender-type borrowers and those with multiple lender types.

Therefore, we compare our baseline results 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 Specification

Shadow banking channel. We begin our analysis by addressing our first empirical question: 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:

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

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 consecutive 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 E.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 demon-

strate 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:

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

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 unexpected 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 affecting 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:

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

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 our third question: 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 $\text{Macro Controls}_{t-1}$ 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.[6]

[6]Since the estimation results for this model are obtained using borrower fixed effects, we focus only on borrowers who appear in at least two consecutive years in our sample. We show in Online Appendix E.3 that we obtain qualitatively similar results when using industry fixed effects instead, in order to include one-period borrowers.

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 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 E, where we discuss how our results change when 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 Results

In this section we present our results based on the regression models discussed in Section 3. We first test if nonbanks expand their lending relative to banks after a monetary policy shock. Then, we analyze the role that differences in lenders' funding structure play in shaping their credit supply response to monetary policy. We conclude by testing how nonbanks affect the transmission of monetary policy to financial and real outcomes, such as total debt, household consumption, and firm investment.

4.1 The bank lending channel in the presence of nonbanks

Our main regression results for the effect of monetary policy shocks on nonbank lending in corporate and consumer credit markets, respectively, are presented in Tables 3 and 4. We alter the composition of our fixed effects across columns to ensure that our results are not affected by the choice of fixed effects. Results in column (1) are based on a specification with lender and year fixed effects. Column (2) instead features lender-borrower fixed effects to account for factors such as relationship lending that are specific to each lender-borrower pair, to which we add year fixed effects in column (3). Column (4) presents our preferred specification with borrower-year and lender fixed effects, with which we study lending decisions by nonbanks and banks to the same borrower in the same year. Finally, column (5) replaces borrower-year fixed effects with industry-location-size-time (ILST) fixed effects to include borrowers with a single lender-type (Degryse et al., 2019). The effects of monetary policy shocks on the quantity and price of credit are summarized in Panel A and Panel B, respectively.

We first discuss our results for the corporate credit market which are summarized in Table 3. We find that a one standard deviation increase of monetary policy rates increases the nonbank debt share significantly by about 4% based on our preferred specification in column (4) of Panel A. We obtain similar estimates when we vary the specification of our fixed effects in columns (1) to (3). Our results are also significant at the 5% level and the coefficient is halved when we use the less conservative specification in column (5), which is based on the sample that also includes borrowers with a single lender-type. The results in Panel B suggest that a one standard deviation increase of the monetary policy measure reduces the interest rate charged by nonbanks relative to the one charged by banks by about 40 basis points.[7] While the effect on interest rates is statistically significant, its economic magnitude is minuscule relative to

[7]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.

	(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.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

the average interest rate of 12 percent for corporate borrowers. Overall, the evidence in Table 3 suggests that nonbanks increase their market share in the corporate credit market significantly after a monetary tightening.

Table 4 presents the results of our analysis of consumer credit. In our preferred specification in column (4), a one standard deviation increase of monetary policy rates increases the share of nonbanks in the consumer credit market significantly by about 6%. Column (5) shows that this result is robust to including households with a single lender-type by creating household-types based on their location, income and time period. The results in Panel B document that nonbank credit becomes slightly more expensive for households after a surprise tightening of monetary policy. However, against a backdrop of a 10 percent average interest rate on household credit, the economic magnitude of the effect is very small: a one standard deviation size shock to monetary policy increases the price of nonank credit by 0.3% relative to bank credit.

Our analysis of credit volumes results in larger estimated coefficients in the sample of corporate borrowers with both bank and nonbank lending relationships compared to the sample that includes firms with a single lender type (Table 3, columns 4 and 5). We attribute this difference in effect sizes to differences in borrower types across the two samples of borrowers: Table 1 illustrates that firms with both bank and nonbank lenders are, amongst other differences, substantially larger and rely more heavily on debt financing compared to firms that only borrow from one lender. In contrast, households borrowing from both banks and nonbanks are more similar to households in the population of borrowers. The fact that our point estimates across the two samples of borrowers in the consumer credit market are very similar (Table 4, columns 4 and 5), suggest that the differences in the corporate credit market are indeed driven by differences in borrower characteristics.

Panels B of Tables 3 and 4 show a difference in signs of the interest rate responses in the corporate and the consumer credit market. Opposing signs may be explained by differences in market power of nonbanks in these two markets. As we document later,

results on lending rates in the corporate credit market are mainly driven by nonbanks with very small market shares. These nonbanks likely decrease their interest rates significantly to gain market shares (Yao, 2022). In contrast, the distribution of nonbank market shares is more evenly spread across different nonbank types in the consumer credit market (Figure D.1, panel B). As a consequence, there may be less competition for market shares via lending rates. Overall, market power likely plays an important role in the transmission of monetary policy within the segment of nonbank financial intermediaries, as it does in the case of monetary transmission through banks (Wang et al., 2022).

Extensive margin. Since the imputed lending rates require two consecutive observations of a borrower-lender pair, our baseline results in Tables 3 and 4 are exclusively driven by intensive margin effects. We now analyze the presence of extensive margin effects. We estimate a linear probability model to test if banks and nonbanks differ in their likelihood to form new lending relationships after a monetary contraction (Irani et al., 2021). To do so, we revisit the empirical model in equation (2) with a new outcome variable – a *new relationship* indicator variable which is equal to one in the first year that we observe a lender-borrower relationship and zero otherwise.

Results in Table 5 suggest that, following a monetary contraction, nonbanks are slightly less likely to start a new lending relationship than banks in the corporate credit market. In the consumer credit market they are marginally more likely to start new relationships, but the economic significance of the estimate is minuscule. In Table F.1 of the Online Appendix we show that there is no economically meaningful difference in the likelihood to terminate lending relationships between banks and nonbanks after a monetary tightening, confirming that the intensive margin effects dominate the extensive ones.

Nonbank heterogeneity. We also investigate if the response of nonbanks to changes in monetary policy varies across different nonbank types. To this end, we differentiate nonbanks in our data based on their six digit (NACE) industry code and re-run our

	(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.

baseline regressions underlying the results reported in Tables 3 and 4 (columns 4) using only nonbanks in a given six digit industry code. We present the results for each of the largest three nonbank lender categories within the market for corporate and consumer credit, as well as a pooled analysis for the nonbank types that fall outside the top three category, in Tables D.1 and D.2 of the Appendix.[8]

There is sizable heterogeneity in lending responses across groups of nonbanks. In the corporate credit market, most of the increase in nonbank credit supply is driven by nonbanks with smaller market shares, i.e., those not belonging to the top three categories: venture capital funds and "other credit companies". In consumer lending, we find that consumer credit companies, leasing companies and nonbanks outside the top three nonbank industries increase their share in credit supply after a monetary tightening. Wealth managers, however, reduce their lending share.

[8]Outside the top three, the next most important nonbank lenders in the corporate credit market are: i) financial holding companies, ii) venture capital funds, and iii) other credit companies. In the consumer credit market, the "non-top three" group mainly consists of: i) other credit companies, and ii) financial holding companies; with other nonbank industries representing negligible shares of overall credit by nonbanks.

There are various potential explanations for the heterogeneity we document: as discussed above, differences in market power among nonbanks may matter (Yao, 2022). We explore two additional channels: heterogeneity in borrower clienteles and differences in funding models across nonbank types. First, we document in Table D.4 of the Appendix that borrowers differ in terms of their characteristics between nonbank types. This holds especially in the corporate credit sample, and less so in the consumer credit sample. The fact that borrowers are more homogeneous across nonbank types in the consumer credit market may explain why we document less heterogeneity in credit supply responses across nonbank types in Table D.2. Second, differences in funding models across nonbank types could explain the heterogeneity in credit supply responses. As we document in the next section, nonbanks financed predominantly by long-term debt supply relatively more credit following a monetary tightening. However, Figure F.1 of the Online Appendix illustrates that funding models do not vary much across nonbank types. In other words, variation in funding models within nonbank types rather than across types drives the heterogeneity in credit responses.

Borrower heterogeneity. The monetary transmission through nonbanks might have heterogeneous effects across borrower types. We tackled the issue of heterogeneity among borrowers until now by estimating effects for households and firms separately. 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 D.3 of the Appendix 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.

Robustness. In Online Appendix E.1 we document that our results on the non-

bank lending channel of monetary policy are robust along multiple dimensions. First, we replace our preferred measure of monetary policy shocks with alternative shock series, e.g. those by Altavilla et al. (2019), and show that our results remain largely unchanged in Tables F.3 and F.4. Next, we document in Tables F.5 and F.6 that our results are robust to different ways of clustering standard errors.

One may be concerned that our differences in point estimates between corporate and consumer credit markets are driven by differences in the set of nonbanks active in these markets. We show in Tables F.7 and F.8 that our estimates remain largely unchanged when we keep only nonbanks who are active lenders in both the corporate and consumer credit markets. We also re-estimate our baseline regressions using entropy balancing. Tables F.9 and F.10 show that our results are robust to using this alternative data preprocessing procedure. Finally, Figure F.2 in Online Appendix E.1 depicts dynamic impulse response functions to document that the differential effect of monetary policy on nonbank credit supply occurs mostly over over the first two years after the monetary surprise.

4.2 Mechanism

Having shown that nonbanks increase their share in credit supply after a monetary tightening, we now investigate a mechanism which can explain this result. Motivated by evidence in Drechsler et al. (2017) and Xiao (2020), we hypothesize that a monetary contraction triggers a funding increase for nonbanks, allowing them to lend more. We test this hypothesis by studying how lenders' funding reacts to monetary policy shocks using data on balance sheets for lenders in our sample.

We start by estimating lender-year-level regressions described by equation (3), which links changes in lenders' funding to monetary policy shocks. Table 6 presents our results for all lenders that issue credit in our loan-level data. The funding (outcome) variable varies across columns: i) equity, ii) short-term debt, iii) long-term debt, and iv) long-term funding (all funding that is not short-term debt). We present results for

	(1) Equity	(2) Short-term debt	(3) Long-term debt	(4) 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
Lender Cluster	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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

banks in panel A and for nonbanks in panel B.

The results indicate that a monetary contraction leads both banks and nonbanks to raise additional equity and has no significant effect on their short-term debt funding.[9] However, there are remarkable differences in the effects on long-term debt: while banks experience an outflow of long-term debt funding, nonbanks are able to significantly increase their long-term debt. Since not all financial institutions in our sample report long-term debt, we also compute lenders' "Long-term funding" as the difference between total assets and short-term debt. Column (4) of Table 6 shows that this funding measure confirms our result that nonbanks attract an inflow of long-term

[9]We attribute the increase in equity for banks and nonbanks to higher franchise values stemming from expectations of larger margins and profits by financial intermediaries during episodes of increasing interest rates (Demirgüç-Kunt and Huizinga, 1999). The positive relationship between interest rate hikes and intermediaries' equity values that we uncover might also be due to the fact that initial 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.

funding after a monetary contraction.[10]

Our results point to differential changes in long-term (debt) financing between nonbanks and banks as a driving force for the increased nonbank credit share after monetary contractions. This finding mirrors the evidence on the role of a financing channel for US banks and shadow banks in Drechsler et al. (2017) and Xiao (2020). However, previous research focused on the role of short-term debt funding flowing from traditional banks to shadow banks through money market mutual funds. We provide novel evidence of a complementary channel involving long-term (debt) funding. While we cannot pinpoint long-term debt origination or flows to address if it is the same funding that flows out of banks and into nonbanks, we believe that our complementary long-term debt financing channel is important. We show that, contrary to evidence on selected types of nonbanks in the US such as mortgage lenders and hedge funds, many nonbanks rely largely on long-term (debt) financing, and this has important implications for the transmission of monetary policy.

What explains the difference in long-term funding between banks and nonbanks? A leading explanation for this difference are the well-studied regulatory differences between banks and nonbanks. In addition to governmental guarantees subsidizing banks' access to deposit funding (Jiang et al., 2023), numerous regulatory requirements (capital, leverage and stable-funding ratios) aim to make banks' funding structure more resilient. In the absence of such regulatory subsidies and regulations, nonbanks tend to adopt a capital structure emphasizing longer-term debt and equity. Nonbanks incur the higher cost associated with long-term funding to ensure a resilient funding base.

In addition, we provide suggestive evidence of an another channel based on the link between lenders' profitability and their funding mix. Nonbanks may be able to

[10] In Figure F.3 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.

	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 7: 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.

raise additional debt after monetary contractions because they are perceived as higher quality borrowers in competitive funding markets, such as long-term debt markets. We focus on lenders' profitability, defined as the ratio of pre-tax profits to total assets, as a signal for their quality as borrowers on long-term debt markets. Table 7 documents that nonbanks are more profitable compared to 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, and do so for several years: Table 8 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.[11]

Having shown that nonbanks experience an inflow of 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 mon-

[11]Differences in the riskiness of lending portfolios may explain why nonbanks' profitability is higher after a monetary tightening. We show in section 4.4 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).

	(1) Year 1	(2) Year 2	(3) Year 3	(4) Year 4	(5) 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 8: 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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

etary policy shocks and lenders' funding ratios (see equation (4)) and estimate them using only the nonbank lenders in our sample. Table 9 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) financing increase their credit supply significantly following a monetary tightening. We document in Tables F.11-F.13 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 support the hypothesis that the nonbanks most exposed to the inflow of long-term funding are driving the increase in the nonbank credit share.

4.3 Borrower-level effects of monetary policy

In this section we first analyze the overall strength of the substitution of lending from banks to nonbanks in response to monetary policy shocks and subsequently document the real effects of these shocks in the presence of nonbanks.

	(1) Equity/TA	(2) STdebt/TA	(3) LTdebt/TA	(4) LT funding/TA
A. Corporate lending				
L.MP Shock x L.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				
L.MP Shock x L.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 9: 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 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*". *L.MP Shock* are lagged monetary policy shocks from Jarociński and Karadi (2020). Standard errors are clustered at the nonbank-borrower level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.3.1 Nonbanks and the financial effects of monetary policy

Having shown in section 4.1 that nonbanks increase their lending *relative* to banks after an unexpected monetary tightening, we now investigate absolute changes in various measures of credit at the borrower-level. To this end we aggregate our borrower-lender-year data up to the borrower-year level and estimate equation (5). Table 10 consolidates our estimation results for both household and corporate borrowers. Panel A presents the results of our analysis of financial outcomes at the household-level. In column (1), we use the detailed information from the tax registry on total liabilities, including secured and unsecured credit, as our dependent variable. We find that a one standard deviation increase in the monetary policy measure decreases total debt by 3.11%, while unsecured credit (column 2) decreases by about 5%. Column (3) shows

	(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 10: 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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

that banks are driving the drop in unsecured credit, as column (4) illustrates a strong increase in nonbank credit supply of about 4%. In columns (5) and (6) we separate our sample between households that borrow solely from either banks or nonbanks. We find a significant decrease in unsecured credit among bank-dependent borrowers (column 5), and a significant increase among nonbank borrowers (column 6).

Panel B shows our estimates of financial effects for firms. The dependent variable in column (1) is total debt as reported in the balance sheets of firms, which includes both secured and unsecured debt. We find that a one standard deviation increase of the monetary policy measure decreases total debt at the firm-level by 1.66%. Column (2) shows that a monetary policy tightening leads to a drop in unsecured credit, but the effect is insignificant at the 10% level. Columns (3) and (4) study the effect on total

bank and nonbank credit at the firm-level respectively. Our results in these columns suggest that bank credit does not react in a significant way to changes in monetary policy, while nonbank credit increases significantly by about 7%. Firms' reduction of total debt (column 1) suggests that the substitution away from bank towards nonbank credit in response to monetary policy shocks is incomplete. In columns (5) and (6) we restrict our samples to firms that obtain credit solely from either banks or nonbanks. Among these firms, we find a significant decrease in unsecured credit among bank-dependent borrowers (column 5), and a significant increase among nonbank borrowers (column 6). These results suggest that the effects of monetary policy on credit supply seem to be stronger among borrowers that are unwilling, or unable, to obtain credit from alternative lender types.

To sum up, we find that when monetary policy is tightened, total bank lending to firms does not react significantly while bank lending to consumers decreases substantially. These results are consistent with the classic bank lending channel of monetary policy. Nonbanks, on the other hand, increase their lending in both credit markets but are unable to fully neutralize the effects of monetary policy on total borrower-level credit. We also show that the financial effects of monetary policy are somewhat stronger for households than for firms which is likely due the fact that households borrow more from nonbanks than firms, as described in section 2.2.

Robustness. Note that our results above are based on our empirical specification with borrower fixed effects, which focuses on borrowers who appear in at least two consecutive periods in our sample. In Tables F.22 and F.23 of the Online Appendix E.3 we show that our results are robust to the inclusion of one-time borrowers. As our borrower-level estimates might be subject to selection, we also show in Table F.25 that, in a sample of borrowers who receive credit from *both* banks and nonbanks in the same year, our results in Table 10 remain nearly unchanged or become stronger.

	(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 11: Real effects of monetary policy in corporate credit markets

This table shows the results of estimating equation (6) for borrowing non-financial firms. Data is collapsed at the 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.

4.3.2 Nonbanks and the real effects of monetary policy

In the previous section, we documented that monetary policy shocks induce borrowers to (partially) substitute bank credit with nonbank credit. Next, we investigate if borrowers with pre-existing nonbank relationships are able to capitalize on these relationships by taking on more nonbank credit after a monetary tightening and channeling these funds to real economic activities such as investment and consumption. To answer this question, we examine the impact of monetary policy shocks on various real outcomes at the borrower-year level using the specification in equation (6).

Table 11 summarizes our results when studying firm-level outcomes. As expected, we find that an unexpected tightening of monetary policy leads to a significant decrease in firms' total assets (column 1), investment (column 2), operating profit (column 3), and total wage bill (column 4). However, pre-existing nonbank relationships help firms significantly in withstanding the rise in policy rates. In particular, a strong tie to nonbanks lowers firms' decline in total assets, operating profit, and their wage bill by between 40% and 80% (based on a comparison between the estimated coefficients on MP Shock$_{t-1}$ and the interaction of MP Shock$_{t-1}$ and the nonbank borrower dummy). Furthermore, corporate investment by these firms even increases by about

	(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 12: Real effects of monetary policy in consumer credit markets

This table shows the results of estimating equation (6) for borrowing households. Data is collapsed at the household-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. MV stands for market value. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3% after a monetary contraction.

Table 12 illustrates our results on the real effects of monetary policy on households. An unexpected monetary tightening leads to a significant drop across various real outcomes among households relying mostly on bank credit: columns (1)-(6), respectively, document this effect on disposable income, consumption, and the market value of their real estate, new cars and total assets. Strong ties to nonbanks, however, insulate households from the adverse consequences of unexpected rate hikes. Households with strong ties to nonbanks experience significantly smaller declines of these real outcomes, but the effect is most notable on household consumption and especially on car purchases. Nonbank ties likely sustain car purchases as a large fraction of nonbanks in the consumer credit market are represented by leasing companies (see Figure D.1).

Summing up, the evidence presented in this section shows that nonbanks nearly eliminate the transmission of monetary policy to firms' real outcomes such as total assets, investments, profits and the wage bill. Nonbanks also seem to attenuate the real effects of monetary policy on household consumption and saving, albeit to a lesser extent. An exception is households' spending on new car purchases, which increase significantly for nonbank borrowers in response to a monetary policy tightening.

Robustness. In Tables F.26 and F.27 of Online Appendix E.3 we show that our results remain robust to the additional inclusion of borrower-level controls. In Tables F.28 and F.29 we show that our results are robust to varying the 50% threshold on the nonbank credit share used to classify borrowers as nonbank borrowers.

4.3.3 Spillover effects of the shadow banking channel of monetary policy

While the nonbank market share in Denmark might be perceived as small, we document that nonbanks significantly affect the aggregate transmission of monetary policy to the real economy in section B of the Appendix. We show that a larger presence of nonbanks in an industry or municipality benefits borrowers in that industry or municipality when monetary policy tightens. After a monetary contraction, investment by firms in industries with a higher nonbank credit share increases relative to firms in industries with a lower nonbank credit share. This holds even among the set of firms with no direct lending relationships with nonbanks. We interpret these findings as signs of positive spillover or general-equilibrium effects that occur within industry or municipality. For example, nonbank credit may allow nonbank borrowers to increase their investment, which forces firms without ties to nonbanks to raise their investment too in order to remain competitive within industry. We show similar effects for household consumption based on the importance of nonbanks in credit supply at the municipality level. These results suggest that nonbanks have an economically meaningful impact on the transmission of monetary policy: nonbank credit not only insulates nonbank borrowers from the adverse consequences of monetary contractions, but indirectly also benefits borrowers without nonbank credit through positive spillovers that occur within-industry and within-municipality.

4.4 Risk-taking channel of monetary policy

In section C of the Appendix we also show that the increase in the nonbank market share following a monetary policy tightening does not come at the cost of riskier lend-

ing by nonbanks. We find that, relative to banks, nonbanks do not lend significantly more to riskier firms in response to higher rates. Instead, nonbanks seem to increase lending to households that can ex-ante be perceived as less risky. Importantly, we obtain these results not only for the aggregate nonbank sector, but also when separately studying the largest types of nonbanks. Furthermore, we also show that loans originated by nonbanks are less likely to be in delinquency after a surprise monetary tightening compared to those originated by banks. Hence, the evidence provided in our paper is not indicative of a nonbank risk-taking channel of monetary policy.

5 Conclusion

We study how nonbank lenders affect the transmission of monetary policy using data on the universe of unsecured credit to Danish firms and households. We identify changes in monetary policy by exploiting exogenous variation in Danish policy rates due to the long-standing currency peg to the Euro, which effectively ties Danish monetary policy to the one in the euro area. We find that a one standard deviation surprise increase in the monetary policy rate increases the share of nonbank credit supply by 4% in the corporate credit market and by about 6% in the consumer credit market.

Using lender-level balance sheet information, we show that the increase in the nonbank credit share after a monetary contraction is driven by differential reactions of funding flows among banks and nonbanks. In particular, we show that a monetary tightening leads to an outflow of long-term (debt) financing from banks and a significant increase in such funding for nonbanks. We confirm that it is indeed the nonbanks most reliant on long-term (debt) financing who drive the expansion of lending after a monetary tightening. These results provide novel evidence on the role of long-term debt financing in explaining the differential response of nonbank vis-a-vis bank credit supply to monetary policy.

We close our paper with an analysis of how nonbank lending affects the transmis-

sion of monetary policy to real and financial outcomes at the firm and household level. While banks reduce their credit supply after an unexpected tightening, nonbanks increase their supply of credit, thereby attenuating the traditional bank lending channel of monetary policy. The substitution from bank to nonbank credit, however, is incomplete, meaning that total credit at the borrower-level still decreases. Nevertheless, the increase in nonbank credit supply after monetary contractions has real effects: borrowers with pre-existing nonbank relationships fare significantly better after a monetary contraction across a wide range of real outcomes such as corporate investment, employment and firm growth, as well as households' consumption, and real estate and car purchases. Quantitatively, our results show that nonbanks nearly eliminate the supply-side transmission of monetary policy to real outcomes in the corporate sector and significantly attenuate the transmission to the household sector. The attenuated transmission of monetary contractions to real outcomes benefits not only recipients of nonbank credit. Due to positive spillover effects occurring within industry and within municipality, borrowers in industries and municipalities with a larger presence of nonbanks are insulated from contractions compared to similar borrowers in industries and municipalities with a smaller presence of nonbanks, even if the borrower does not receive any nonbank credit themselves.

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Appendix

A 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 D.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 D.1 (a) shows that nonbanks 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 D.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 to which industries banks and nonbanks lend to most, as well as how the uptake of nonbank debt in corporate and consumer credit markets varies across regions in Denmark.

Figure D.2 illustrates to 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 across borrower industries is more evenly.

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 D.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 D.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.

B 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:[12]

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

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 D.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

[12] We drop the macro variable interactions in equation (B.1) when running the regression with time fixed effects.

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 (B.1) when including only firms who have not received any nonbank credit in the year of the monetary policy shock. The results in Table D.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 minor role. Our results in Table D.5 are robust to including various types of fixed effects in the regression, as shown through columns (1) to (4) of this table.

We performed 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 (B.1) with the outcome variable being household consumption (log) for the sample of all households in Table D.6 (Panel A), and for the subsample of households without ties to nonbank lenders in Table D.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 D.5. Columns (3) and (4) of Table D.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).

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:

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

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 D.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 D.7.

In contrast, the results in Table D.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.[13] 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). 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.[14] Table D.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

[13] 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.

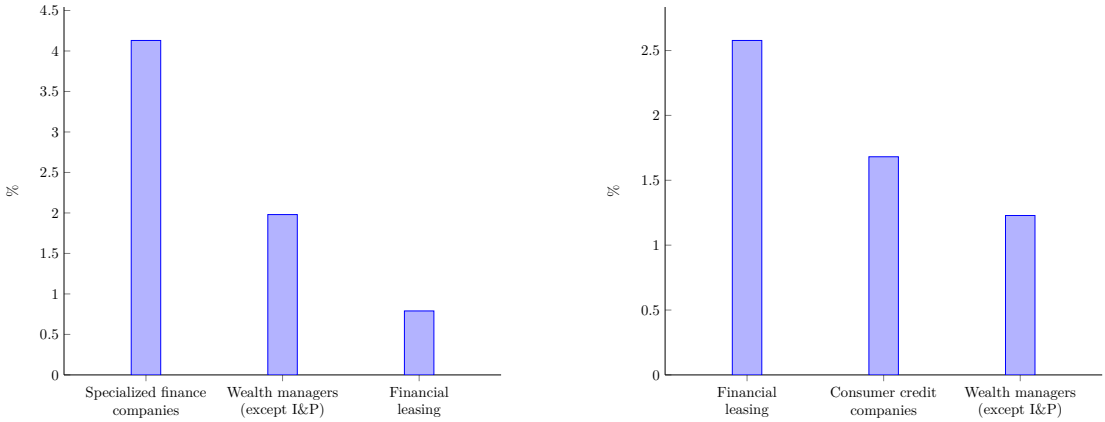
[14] We do not observe the delinquency status for all small and medium sized enterprises in our data.

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 Elliott et al. (2022) is based on loans that are mostly backed by collateral (e.g., mortgage loans). 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 so far less explored market for unsecured credit.

We also provide several robustness tests of our results on nonbank risk taking in the Online Appendix E.2. First, we show that our results do not mask heterogeneity across nonbank lender types: we document in Tables F.14 to F.19 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 F.20 and F.21 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 Figures and tables



(a) Corporate Credit

(b) Consumer Credit

Figure D.1: Largest industries among nonbank lenders

Notes: 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.

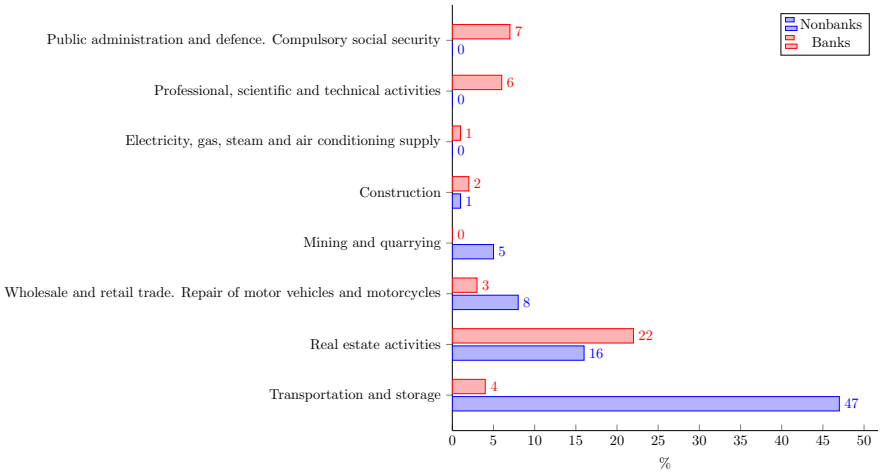
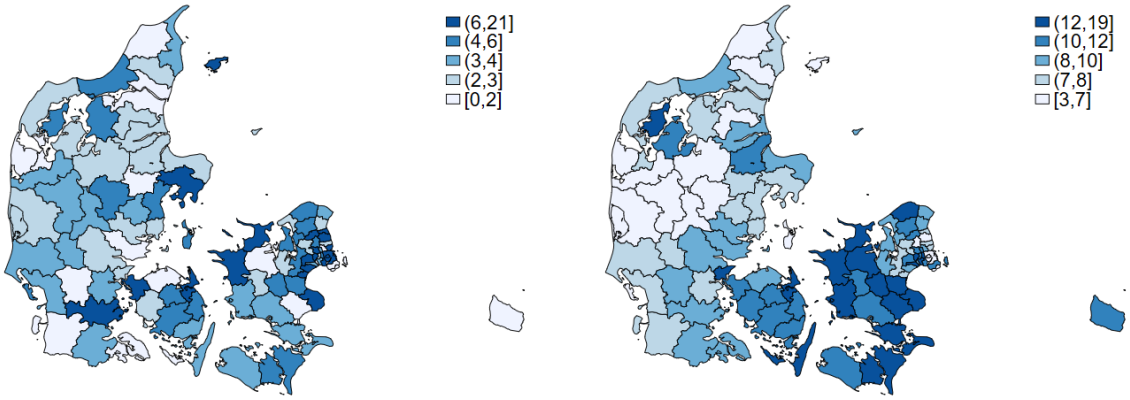


Figure D.2: Which industries borrow most from nonbanks and banks respectively?

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 D.3: Nonbank share in credit supply by municipality

	(1) Fin. credit comp.	(2) Wealth managers	(3) Leasing	(4) 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 D.1: 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 D.2: 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.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(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 D.3: 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.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Consumer credit comp			Wealth Managers			Leasing companies		
	Mean	Std. Dev.	p50	Mean	Std. Dev.	p50	Mean	Std. Dev.	p50
Panel A. Households									
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
Nonbank debt share	0.26	0.31	0.12	0.36	0.33	0.27	0.30	0.34	0.16
Disp. income (thsd DKK)	365.45	447.03	320.02	403.98	730.42	378.02	415.56	327.61	391.93
Age of eldest adult (years)	48.33	12.77	48.00	48.30	11.48	48.00	48.20	12.58	48.00
Recently unemployed	0.11	0.32	0.00	0.08	0.27	0.00	0.09	0.28	0.00
N	3,133,623			301,403			1,747,158		
Panel B. Firms	Specialized Finance Companies			Wealth Managers			Leasing companies		
Total assets (m DKK)	4,333.21	32,822.28	6.47	50.97	266.10	10.59	32.77	195.79	5.83
Total unsecured debt (m DKK)	302.52	1,901.69	1.49	14.12	58.14	3.25	7.76	44.19	1.11
Nonbank debt share	0.30	0.35	0.13	0.45	0.37	0.39	0.31	0.35	0.15
FTE employees	116.37	745.92	6.00	20.38	383.86	4.00	27.35	460.80	6.95
Firm age (Years)	15.19	16.01	10.00	15.74	14.20	11.00	14.30	11.96	11.00
Debt to equity ratio	5.80	12.69	2.32	6.88	32.75	2.28	7.30	62.25	2.64
N	759			10,295			20,825		

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

This table presents the results of estimating equation (B.1) 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 D.6: Household consumption and municipality-level presence of nonbanks

This table presents the results of estimating equation (B.1) 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 D.7: Risk-taking channel of monetary policy in corporate credit markets

This table illustrates the results from estimating equation (C.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 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 D.8: Risk-taking channel of monetary policy in consumer credit markets

This table illustrates the results from estimating equation (C.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 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 D.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

E Robustness tests

In this online 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.

E.1 Robustness tests of the nonbank debt 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 F.1 illustrates our results and shows that, once granular fixed effects are introduced, there is no economically meaningful difference in the likelihood to terminate lending relationships between banks and nonbanks.

Specialized finance companies. We document in Table D.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 F.2 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.

Alternative monetary policy shocks. Our results are robust to changes in our baseline measure of monetary policy shocks. Recall that the results in the main body of the paper are based on the time series of monetary policy shocks constructed by Jarociński and Karadi (2020) for the Euro-area. This measure is based on a VAR with sign restrictions and separately identifies "pure" monetary policy shocks from the "information effect" conveyed in the ECB's monetary policy announcements. In Tables F.3 and F.4, we show that our baseline results in corporate and consumer credit markets, respectively, hold when using various other measures of Euro-area monetary policy shocks. In particular, results in column 2 are based on the Jarociński and Karadi (2020) shocks to the 3-month Eonia interest rate swaps induced by ECB announcements. Columns 3-5 are based on the monetary policy shocks constructed by Altavilla et al. (2019), who identify high-frequency changes in Overnight Index Swaps (OIS) with maturities of 3 months (3M), 1 year (1Y) and 10 years (10Y) around monetary announcements by the ECB. Column 6 is based on high-frequency changes in the yields of German soverign bonds with 10 year maturity. As these alternative measures of monetary policy shocks are available for varying time periods the sample size in this robustness test varies across the different models.

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 F.5 and F.6 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 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 F.7 and F.8 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 F.9 and F.10 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.

Dynamic effects on credit supply. Despite the relatively short time horizon of our sample, we document below that we obtain evidence consistent with a significant ef-

fect of monetary policy on nonbank vis-a-vis bank credit supply over the short-to-medium term. The results in Figure F.2 depict a dynamic version of our lending regressions in equation (2) of the paper that is rooted in the local projections literature (Jordà, 2005). In particular, for each horizon $h = 0, .., 3$ we estimate a local projection of the following form:

$$\begin{aligned}\log(\text{credit})_{b,l,t+h} - \log(\text{credit})_{b,l,t-1} = \alpha_{b,h} + \delta_l + \beta^h(\text{Nonbank}_l \text{ x MP Shock}_{t-1}) \\ +\theta^h(\text{Nonbank}_l \text{ x Macro Controls}_{t-1}) + \gamma^h \text{Nonbank}_l + \varepsilon_{b,l,h}\end{aligned} \tag{E.3}$$

The results in Figure F.2 suggest that the nonbank share in credit supply increases significantly over the first two years after an unexpected monetary contraction, both in the corporate and consumer credit market.

E.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 F.14, F.15 and F.16 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 F.17, F.18, and F.19 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 F.20 and F.21 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.

E.3 Aggregate-level 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 F.22 and F.23 illustrate our results from estimating equation (5) with these alternative fixed 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 F.24 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 tight-

ening, 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.

E.4 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 F.26 and F.27 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 F.28 and F.29 show that our results are robust to this change in the nonbank dummy.

F Additional figures and tables

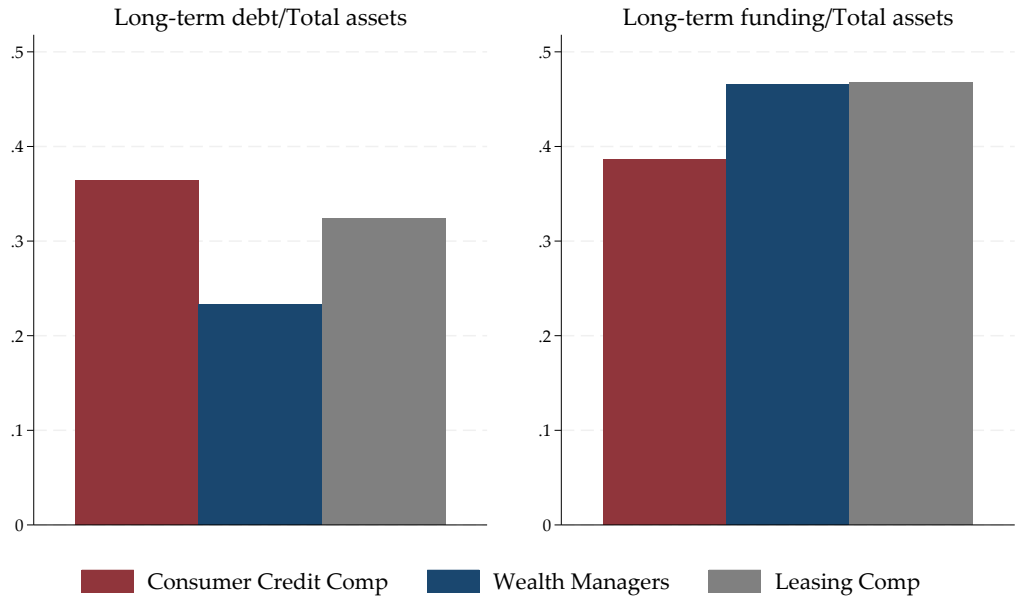
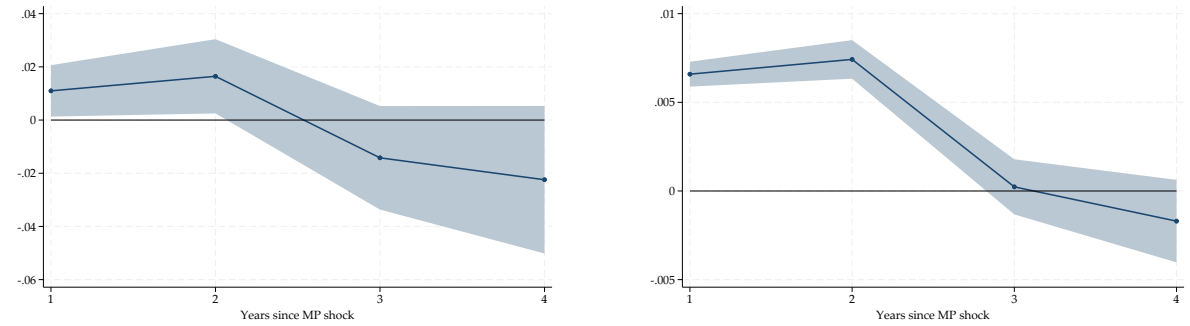


Figure F.1: Nonbank funding heterogeneity

This figure illustrates differences in long-term debt (left) an long-term funding (right) ratios across three major types of nonbank lenders. Each bar depicts the weighted average of the respective funding ratio among nonbanks of a given type, with weights given by lenders' total assets. The three nonbank types correspond to the largest nonbank credit providers in our data.

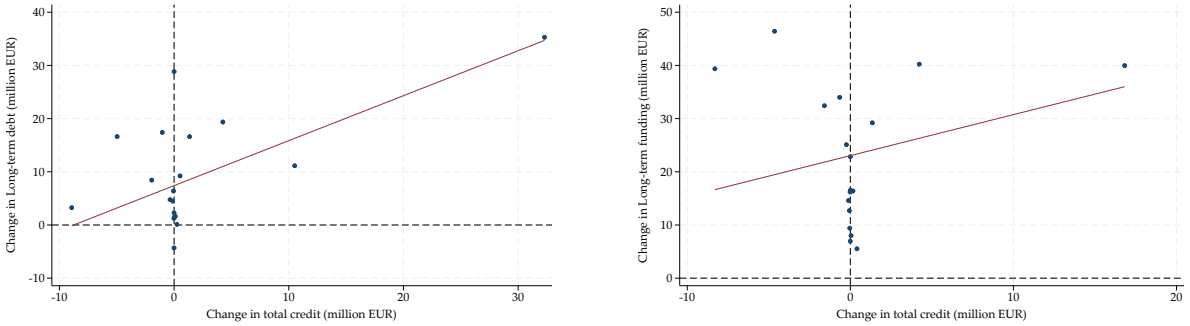


(a) Corporate credit

(b) Consumer credit

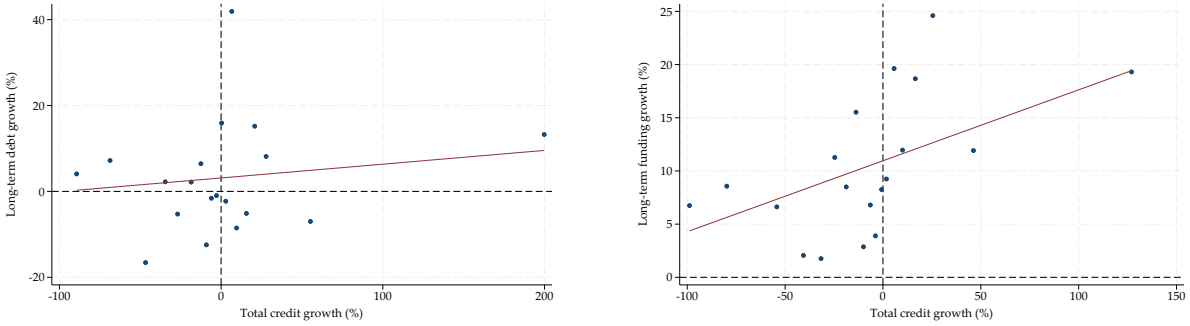
Figure F.2: Dynamic response of nonbank credit supply to changes in monetary policy

This figure depicts the estimated coefficients $\hat{\beta}^h$ from estimating equation (E.3) in the corporate credit (left) and consumer credit (right) data. Shaded area represents 90% confidence bands.



(a) LT debt

(b) LT funding



(c) LT debt - Growth rate

(d) LT funding - Growth rate

Figure F.3: 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.

	(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 F.1: 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. 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	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 F.2: 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) 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 F.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 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 F.4: 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 F.5: 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 F.6: 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 F.7: 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 F.8: 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 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)
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 F.9: 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 F.10: 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) Equity	(2) Short-term debt	(3) Long-term debt	(4) 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 F.11: 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) Equity	(2) Short-term debt	(3) Long-term debt	(4) 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 F.12: 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 F.13: 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 F.14: Risk-taking channel - Corporate credit - Specialized finance companies

This table illustrates the results from estimating equation (C.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 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 F.15: Risk-taking channel - Corporate credit - Wealth managers (except I&P)

This table illustrates the results from estimating equation (C.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 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) ln debt	(2) int. rate	(3) ln debt	(4) int. rate	(5) ln debt	(6) 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 F.16: Risk-taking channel - Corporate credit - Financial leasing companies

This table illustrates the results from estimating equation (C.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 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 F.17: Risk-taking channel - Consumer credit - Financial leasing companies

This table illustrates the results from estimating equation (C.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 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 F.18: Risk-taking channel - Consumer credit - Consumer credit companies

This table illustrates the results from estimating equation (C.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 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 F.19: Risk-taking channel - Consumer credit - Wealth managers (except I&P)

This table illustrates the results from estimating equation (C.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 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 F.20: Risk-taking channel of monetary policy in corporate credit markets single-lender firms

This table illustrates the results from estimating equation (C.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 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***	-0.000***	5.003***	0.003***	6.397***	0.002***
	(0.108)	(0.000)	(0.091)	(0.000)	(0.084)	(0.000)
Triple - Leverage	-1.328***	0.000				
	(0.136)	(0.000)				
Triple - Income			0.513***	-0.002***		
			(0.147)	(0.000)		
Triple - Unemployment					-0.511*	-0.001***
					(0.242)	(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 F.21: Risk-taking channel of monetary policy in consumer credit markets single-lender households

This table illustrates the results from estimating equation (C.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 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 F.22: Total credit supply 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 F.23: Total credit supply 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) Debt	(2) Credit	(3) Bank Credit	(4) 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 F.24: 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) Ln Debt	(2) Ln Credit	(3) Ln Bank Credit	(4) 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 F.25: 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 10 when we include only borrowers who simultaneously borrow from banks and nonbanks in a given year.

	(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 F.26: 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 F.27: 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 F.28: 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 F.29: 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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

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