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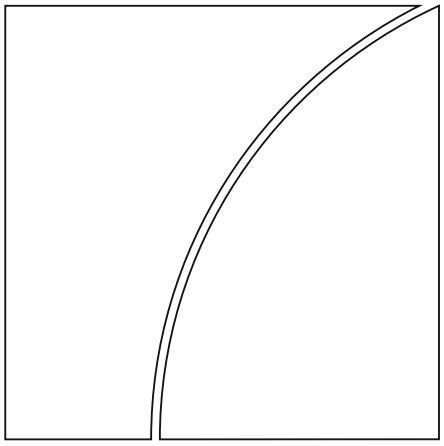

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by Ryan Banerjee and Jose-Maria Serena

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Dampening the financial accelerator? Direct lenders and monetary policy *

Ryan Banerjee[†] and Jose-Maria Serena[‡]

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Abstract

Direct lenders, non-bank credit intermediaries with low leverage, have become increasingly important players in corporate loan markets. In this paper we investigate the role they play in the monetary policy transmission mechanism, using syndicated loan data covering the 2000-2018 period. We show that direct lenders are more likely to join loan syndicates whenever monetary policy announcements trigger a contraction in borrowers' net worth irrespective of the directional change in interest rates. Thus, our findings suggest that direct lenders dampen the financial accelerator channel of monetary policy.

Key words: Direct lending; monetary policy; financial accelerator; credit channel

JEL: G21, G32, F32, F34

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[†]Bank for International Settlement. E-mail address: ryan.banerjee@bis.org

[‡]Bank of Spain. E-mail address: josemaria.serena@bde.es.

1 Introduction

Over the past two decades, direct lending by non-bank financial institutions, ranging from business development companies (BDCs) to insurance companies, has mushroomed in US corporate credit markets. Covid-19 does not appear to have stopped its growth, with fund raising by such direct lenders exceeding $300 billion in 2020 (FT [2020]). As direct lenders become more important intermediaries, how they respond to monetary policy will be of growing relevance for the transmission of monetary policy to the real economy.

There are several aspects which suggest that the influence of monetary policy on their lending may be different from the more widely studied effects on banks. First, direct lenders are less leveraged than banks (Figure 1, Panel A). Second, they are less reliant on short-term debt, thus their business models are less dependent on maturity mismatch (Panel B). Third, direct lenders' lending technology may also differ from that of banks. In particular, Chernenko et al. [2020] show that compared to banks, direct lenders are less likely to engage in ex-post monitoring of their loans, but instead appear to engage in more ex-ante screening prior to loan origination.

Crucially, these three characteristics suggest that monetary policy may have less impact on direct lenders through the credit channel of monetary policy. Within the credit channel, this could occur by weakening the bank lending channel and/or the financial accelerator channel (Bernanke and Gertler [1995]).[1] Under the bank lending channel of monetary transmission (Bernanke and Blinder [1988] and Kashyap and Stein [1995]), tight monetary policy drains deposits from the system which in turn reduces bank lending if banks face frictions in issuing uninsured liabilities to replace the shortfall in deposits. Since direct lenders business models are less dependent on short-term debt and are not dependent on deposit funding, this channel could be weaker.

[1]The financial accelerator channel is also called the balance sheet channel in some studies.

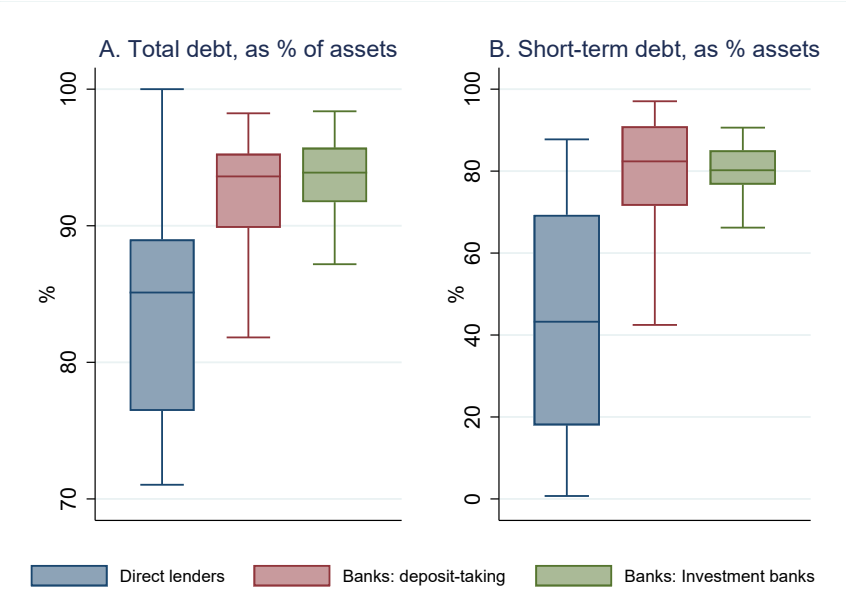

Figure 1: **Funding model of direct lenders and banks:** Box plot showing the interquartile range of debt (Panel A), and short-term debt (Panel B) to total assets. Data are obtained from Fitch, on annual basis, for the period 1994-2018, and covers all the lenders in the syndicated loan market with available financial data. Metrics for direct lenders are shown in the blue box plot. Banks are split into two categories: deposit-taking (i.e. commercial banks), in the red box plot; and investment banks, in the green box plot.

The strength of the financial accelerator channel may also be weaker for direct lenders. Under the financial accelerator channel, changes in borrower net worth influences their incentives to make good investment choices and hence their ability to repay debts. This in turn affects the willingness of lenders to extend credit because they can only imperfectly monitor borrowers actions (Bernanke and Gertler [1989]). If direct lenders are less dependent on borrowers' skin-in-the game and monitoring compared to banks, but instead rely more on ex ante screening (Chernenko et al. [2020]), their lending may be less sensitive to monetary-policy-induced changes in borrower net worth. The strength of the financial accelerator could also been weaker due to differences in financial intermediary net worth. As the impact of monetary policy on lending also depends on financial intermediary leverage (Gambacorta and Shin [2018]), lower leverage of direct lenders may mean that their own net worth and hence their lending capacity is less sensitive to monetary policy shocks compared with more leveraged banks.

Against this backdrop, we explore if lending by direct lenders is less sensitive to monetary policy, and whether this relates to the weaker influence of the bank lending and financial accelerator channels. To conduct our investigation we use a dataset comprising 63,338 syndicated loans originated between 2000 and 2018 matched to borrower and lender characteristics. The syndicated loan market is a suitable venue to conduct this investigation, for several reasons. First, unlike bilateral direct loans, syndicated loan data are publicly available, as they are disseminated by lead arrangers to produce lenders' league tables. Second, syndicated loans are simultaneously granted by various types of lenders which allows a comparison between direct lenders and banks in the same market. Typically, a lead arranger of the loan (the "relational bank") engages with the borrower, and it is in charge of finding other participants to close the deal. Lead arrangers can reach out to either other banks, or direct lenders, as all are active in the market.

We classify direct lenders as the subset of non-bank financial intermediaries engaged in primary market loan origination which are not subject to bank regulation nor similar supervisory oversight. Closed-end funds and BDCs are the most important group, followed by specialised financial entities, insurance companies and pension funds, financial branches of non-financial firms and other credit intermediaries. Despite their differences, this classification of direct lenders results in the two common functional features that set them apart from banks as outlined above: they operate with little leverage and conduct limited maturity transformation. Importantly our definition does not include most investment banks, which operate with high leverage and conduct maturity transformation similar to traditional (deposit-taking) banks. This distinction differentiates our paper from other studies of non-bank lending which typically include investment bank-originated loans as non-bank lending e.g. Elliot et al. [2020].

To study the effect of monetary policy on lending decisions, we use an empirical model that links direct lender involvement in a syndicated loan to loan, firm, and macro determi-

nants. We classify loans into two groups, one where the syndicates of lenders includes a direct lender and another where they do not, similar to Lim et al. [2012]. We then use monetary policy shocks obtained through intraday high-frequency identification methods around the Federal Reserves' monetary policy announcements to assess the impact of monetary policy on the probability that direct lenders join syndicates.

To uncover differences between banks and direct lenders across the bank lending and financial accelerator channels we conduct two exercises sequentially. First, we assess whether direct lenders attenuate the transmission of monetary policy through the bank lending channel. To this end we test if direct lenders are more (less) likely to engage in loan syndicates in response to an unexpected tightening (loosening) in interest rates. For these monetary policy shocks we do not observe any difference in the propensity of direct lenders to engage in loan syndicates compared to banks. To the extent that such monetary policy surprises result in a drain in loanable funds, this indicates that direct lenders do not smooth the traditional bank lending channel of monetary policy. This finding may also indicate that there may be limited frictions for banks, especially investment banks, to raise wholesale funding when interest rates rise, consistent with previous work showing the fading importance of deposit drains when lenders can access other short-term liabilities (Chen et al. [2018],Elliot et al. [2020]).

Second, we explore if direct lenders attenuate the transmission of monetary policy through the financial accelerator channel. To this end, we exploit the fact that not all monetary policy announcements display a negative correlation between short-term interest rate surprises and equity market returns that would result in a reduction (increase) in corporate sector net worth when interest rates rise (fall). Rather, some instances of surprise interest rate tightening (loosening) are accompanied by positive (negative) equity market returns during tight intraday windows around monetary policy announcements. Following the literature we classify such monetary announcements that display a positive correlation between

interest rate changes and equity returns as central bank "information shocks", while referring to monetary policy announcements that display the more standard negative correlation as "pure monetary shocks". This partitioning enables us to examine how monetary policy driven changes in net worth affect lending by direct lenders relative to banks, hence, uncovering the role of the financial accelerator in driving differences between direct lenders and banks following monetary policy shocks.[2]

For "pure monetary policy shocks", we observe that direct lenders are more (less) likely to join loan syndicates in response to an unexpected monetary tightening (loosening). Thus we document that the negative impact of rising interest rates on bank lending relative to direct lenders occurs only when borrowers' net worth worsens. For "information shocks", we observe that direct lenders are more likely to join loan syndicates in response to negative shocks, i.e. when an interest rate loosening is concurrent with a decline in equity prices.

Taking the impact of both pure monetary policy shocks and information shocks together, our main finding is that compared to banks, direct lenders are more likely to join syndicates when monetary policy announcements trigger a decline in aggregate corporate sector net worth, irrespective of the directional change in short-term interest rates.

Given the fact that direct lenders step in when borrower net worth deteriorates, our results suggest that direct lenders actions and their strong growth in recent years could dampen financial accelerator mechanisms in the economy. These results are robust to a variety of alternative checks, including sensitivity to the lender definition, type of loan demand, and exclusion of influential sectors.

Our findings contribute to three strands of the literature. First, our paper adds to the literature on direct lenders and how they differ from banks. Previous research has analysed

[2]Such partitioning of high-frequency identified monetary policy shocks has been shown to solve a number of puzzles in the monetary economics literature. For example Jarociński and Karadi [2020] show that ignoring the differences between pure monetary shocks and central bank information shocks biases the inference on monetary policy nonneutrality.

the type of borrowers catered for by direct lenders, finding that they specialise in lending to risky firms (Lim et al. [2014]). Chernenko et al. [2020] relates this greater risk appetite to regulatory factors, and to direct lenders' lending technology that relies on ex-ante screening. We contribute to this literature by analysing how these differences vis-a-vis banks impact their reaction to monetary policy.[3]

Second, we add to the literature on nonbanks and monetary policy. Previous research has shown that nonbanks smooth the bank lending channel of monetary policy because they are able to smooth shifts in bank deposits instrumented by monetary policy (Chen et al. [2018] and Elliot et al. [2020]). Our paper departs from these studies by investigating the role played by direct lenders, which excludes investment banks, whereas the nonbank definition in Chen et al. [2018] and Elliot et al. [2020] includes them. Relative to Chen et al. [2018] and Elliot et al. [2020], we show that direct lending is less sensitive to changes in borrowers' net worth. Hence, direct lenders smooth the financial accelerator channel of monetary policy. This appears to derive at least in part from lower leverage of direct lenders compared with investment banks, as well as commercial banks, but could also reflect differences in lending technology.

Finally, our results contribute to the literature on the financial accelerator and monetary policy (Bernanke [2007]). In the seminal contributions of Bernanke and Gertler [1989] and Bernanke and Gertler [1995], they argued that changes in net worth affect lending conditions, which is supported by empirical evidence (Ciccarelli et al. [2015]). By diminishing borrowers' "skin-in-the-game", a decline in net worth exacerbates moral hazard problems, and lenders react by increasing the external finance premium. The net worth of financial intermediaries also matters for the financial accelerator, not least because financial intermediaries with low net worth have more costly access to debt (Gambacorta and Shin [2018]).

[3]It is important to note that our paper differs from the literature analysing CLOs or loan mutual funds activitiy in loan markets (Fleckenstein et al. [2020], Niepmann and Schmidt-Eisenlohr [2019]). These are nonbank investors in loans, often securitised and tranched, in secondary markets. By contrast, the direct lenders we analyse extend loans in primary markets, and hence actively screen borrowers.

Thus changes in financial intermediaries net worth could also affect their lending capacity. We show that direct lenders' lending is less affected by both financial accelerator mechanisms, either because of their low leverage or because they rely more on ex ante monitoring than banks and less on borrower net worth. Hence their growing importance could attenuate the financial accelerator channel of monetary policy.

The rest of the paper is structured as follows. Section 2 discusses the data. In section 3 we present our model. Section 4 shows the main results. Section 5 discusses our robustness checks. Section 6 inspects the mechanism between direct lenders and the financial accelerator. We provide the conclusions in section 7.

2 Data

2.1 Dataset construction

We construct a dataset which matches syndicated loan data from Refinitiv SDC Platinum, to borrower and lender characteristics from Refinitiv Eikon.

Our building block is the syndicated loan dataset, which includes 262,527 syndicated loans closed in the period 1985-2020. It provides information on a number of loan attributes including amount, maturity, currency, plus the list of lenders as well as their role in the deal. We expand the syndicated loan dataset with lender reference data, sourced from Refinitiv Eikon and Bloomberg, and financial data from Fitch.

Using these inputs we classify each lender as either a bank, or a direct lender. We classify direct lenders as the subset of non-bank financial intermediaries engaged in the primary syndicated loan market which are not subject to bank regulation nor similar supervisory oversight. We operationalise this definition in four steps. First, we consolidate all branches

and supported-affiliates into their immediate parent. Second, we classify as banks those entities treated as such by either the NAICS or the Refinitiv Business Classification (which is broader). Third, we classify as banks any remaining entity which at any time during its existence disclosed data on Tier 1 capital to risk weighted assets.[4] Finally, we do manual checks on the group of entities not disclosing data on Tier 1 capital to risk weighted assets, or with unavailable sectoral data, and when needed reclassify them as banks. All lenders not classified as a bank under these steps are classed as direct lenders. In our final sample of lenders we keep only institutions that have taken part in more than 50 loans.

After applying these filters, we identify 1,129 banks, and 400 direct lenders. Direct lenders can be classified into different categories, according to their type of economic activity. Using the NAICS subsector of each lender we identify five main clusters which together account for 72% of the direct-lender loans. Closed-end funds and BDCs are the most important group, accounting for 24% of the loan participations. Specialised financial entities rank second, and account for 21% of the transactions. Next, insurance companies represent 9% of direct loan participations. Financial branches of non-financial firms originate 9% of the direct loans. Credit intermediaries account for 7% of the loans.[5]

It is important to note that the major investment banks are not classified as direct lenders. Functionally, investment banks are very different from direct lenders and in some aspects similar to banks taking deposits. Indeed, they operate with higher leverage than deposit-taking institutions, are are more engaged in maturity transformation (Figure 1).

[4]For example, this step classifies firms such as Goldman Sachs and Morgan Stanley as a banks for our entire sample.

[5]The five groups correspond, respectively, to the NAICS subcode "Funds, Trusts, and Other Financial Vehicles"; "Securities, Commodity Contracts, and Other Financial Investments and Related Activities"; "Insurance Carriers and Related Activities"; "Machinery Manufacturing", and "Credit Intermediation and Related Activities". Prime examples of entities in each group are, respectively: (1) Heller Financial Inc, Golub Capital and Ares Capital; (2) Oddo BHF SCA, Jefferies Group LLC and Antares Capital Corp; (3) Cathay Financial Holding Co Ltd, Nippon Life Insurance Co and Massachusetts Mutual Life Insurance Co; (4) General Electric and Siemens; (5) Alberta Treasury Branches and Madison Capital Funding LLC. The remaining 28% of loans are either granted by entities without a NAICS subsector, or clusters which represent less than 2% of the direct loans.

We further match the syndicated loan dataset with borrower information, sourced from Refinitiv Eikon. For each borrower, we obtain key financial items and construct standard measures of leverage, risk (Altman Z-score), profitability (EBITDA ratio), liquidity (quick ratio), collateral (fixed-asset ratio) and size.

Additionally, we use macroeconomic variables to assess GDP growth, inflation expectations, credit spreads (Merril-Lynch index), and US interest rates.

Finally, we obtain monetary policy shocks following Cieslak and Schrimpf [2019]. The shocks are changes in interest rates relative to Treasury futures within a -15 to +15 minute window around monetary policy announcements. For press conferences and release of minutes they are computed over a slightly longer window, from -15 to +90 minutes, given that these communications tend to be more extensive and contain broader information, and hence, may take longer for investors to process. We classify these shocks as "monetary policy shocks".

As part of our analysis of the impact of monetary policy we follow Cieslak and Schrimpf [2019] and further partition monetary policy shocks into two groups based on their correlation with equity market price changes measured over the same announcement window using S&P 500 E-mini futures. Following Jarociński and Karadi [2020] we classify events with a negative correlation between stocks and yields over the announcement window as "pure monetary shocks". Shocks which display a positive correlation are classified as "information shocks".[6]

In our empirical analysis we measure interest rate surprises as the change in the 2-year US Treasury futures contract over the intraday announcement window. This decision is motivated by the fact that over a significant period of our sample short-term interest rates were at the effective lower bound. Thus, short-term interest rates did not necessarily capture the impact of monetary policy announcements and actions over this period. By using the

[6]Cieslak and Schrimpf [2019] call these "growth shocks".

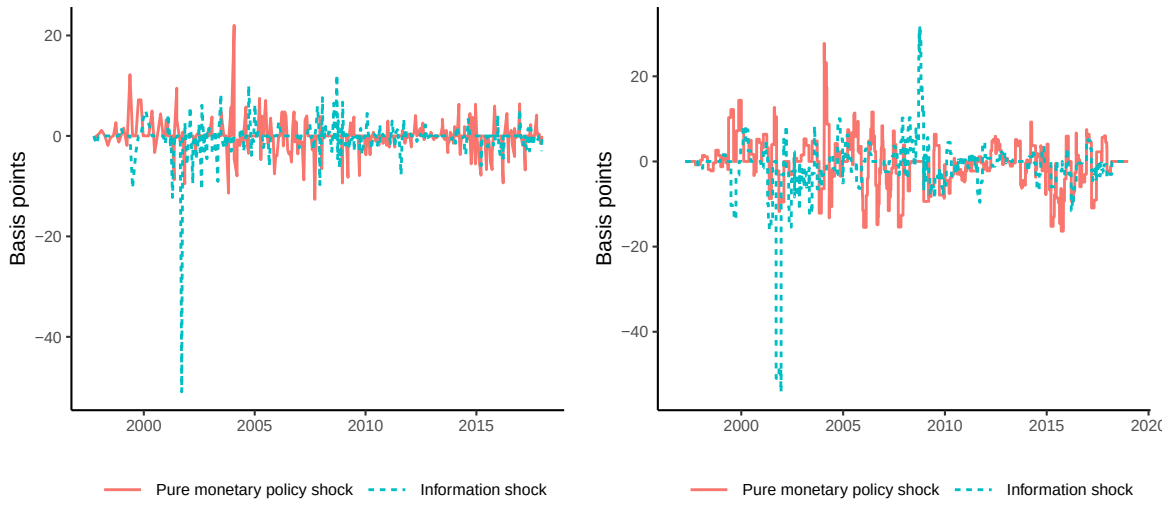

Figure 2: **Pure monetary policy and information shocks.** This figure shows the time series of pure monetary shocks (defined as monetary announcements where changes in 2-year yields and equity index returns are negatively correlated over the event window) and information shocks (where 2-year yields and equity index returns are positively correlated). The left panel shows the high-frequency identified shocks. The right-hand panel shows the surprises aggregated over a 90 day trailing window.

longer-term rate we capture the impact of unconventional monetary policy, in particular those signalling the future path of short-term interest rates. A number of studies have used 2-year rates to measure the monetary policy stance since short-term interest rates reached the effective lower bound following Hanson and Stein [2015].

For our empirical analysis, we aggregate interest rate shocks over a 90 day window before the loan was granted to account for lags in the process between initial loan application and the granting a syndicated loan.[7] Figure 2 shows time series of the pure monetary and information shocks series. In general, pure monetary policy shocks are on average larger in absolute value than information shocks. That said, information shocks appear to more prominent during the recession periods of 2008-09 and also in the early 2000s recession in the United States.

[7]There is not a clear rule-of-thumb to select this window. We choose 90 days to take into account that syndicating a loan takes around 30 days (Ivashina and Sun [2011], Bruche et al. [2020]), and acknowledging the lags in the transmission of monetary policy decisions to lending decisions. The 90 day window is also similar to that used in Ottonello and Winberry [2020], who aggregate high-frequency identified monetary policy shocks to the quarterly frequency to analyse the impact of such shocks on corporate investment.

2.2 Sample description

Our initial sample of 262,527 syndicated loans includes 69,728 with participation of direct lenders ("direct lender loans"), and 192,799 bank loans (no involvement of direct lenders). Thus, direct lenders take part in around one-quarter of all the syndicated loans in our sample. Through the paper, we focus on the 63,338 dollar loans for which we are able to match to firm-level data. 15,302 of these have direct lender involvement (Table 1).

Table 1: **Attributes of direct lender involvement in syndicated loan markets:** the table provides the count of the syndicated loans denominated in dollars, for which we are able to source firm-level data. The loans as classified across several key dimensions: (1) term loans vs credit lines; (2) bank term (labelled Term. and Term "A", or institutional term (Term "B", "C", or "D") loans; (3) credit segment, either leveraged or investment grade. In the second and third column we show the fraction that are financed by at least one direct lender (Direct lenders) and by banks only (No direct lenders)

	Count	Direct lenders	No direct lenders
Grand total	63,338	24.2	75.8
Term loans	23,997	30.2	69.8
Credit lines	39,347	20.5	79.5
Leveraged loans	29,468	31.5	68.5
Investment grade loans	22,391	17.1	82.9

Term loans represent 40% of the loans in our sample, and credit lines the remaining 60%. Direct lenders have a greater involvement in term funding, and take part in 30% of the transactions, relative to just 20% of the credit lines. Direct lenders are more present in the riskier leveraged loan segment, taking part in 32% of loans compared with just 17% of investment grade loans.

The terms and conditions of the loans with direct lender participation differ only slightly from those of bank only syndicates. Differences in maturity and size are negligible, as shown in Table 2. Nevertheless, spreads as are significantly higher for loans with direct lender involvement.[8] This may signal that these deals are riskier (Chernenko et al. [2020]),

[8]Median tests indicate a statistically significant difference between the maturity and spread of both type of loans.

Table 2: **Loan attributes:** the table provides summary statistics, namely the maturity at origination (in years), the amount (in US mn), and the spread (in bp) for loans where at least one direct lender participated in the syndicate (Direct lenders) and where only banks participated in the syndicate (No direct lenders). p25, p50 and p75 refer to the 25th, median and 75th percentiles of the distribution.

A. Direct lenders

	mean	p25	p50	p75	count
Maturity	9	6.1	10.0	11.8	14,528
Amount	365	45.0	135.0	350.0	15,301
Spread	253	125.0	225.0	325.0	12,486

B. No direct lenders

	mean	p25	p50	p75	count
Maturity	9	6.0	10.0	10.0	43,423
Amount	387	50.0	137.0	375.0	48,026
Spread	187	100.0	162.5	250.0	35,374

Table 3: **Firm attributes:** The table provides summary statistics of firms which received loans where at least one direct lender participated in the syndicate (panel A) and where only banks participated in the syndicate (panel B).p25, p50 and p75 refer to the 25th, median and 75th percentiles of the distribution.

A. Borrowers from direct lenders.

	mean	p25	p50	p75	count
Total assets	10,775	635	2,087	8,770	15,302
EBITDA ratio	11	6.6	10.4	15.2	14,917
Quick ratio	118	70.6	102.0	144.9	14,272
Leverage ratio	40	25.5	38.0	53.1	12,561
Fixed assets ratio	54	22.1	48.7	81.8	13,964

B. Borrowers from bank only loans.

	mean	p25	p50	p75	count
Total assets	11,130	655	2,432	9,537	48,036
EBITDA ratio	12	7.1	10.7	15.4	46,743
Quick ratio	120	71.9	103.5	146.6	43,228
Leverage ratio	35	22.0	33.5	46.5	37,447
Fixed assets ratio	58	23.8	53.6	88.4	43,419

but could also indicate that they join syndicates when bank funding is more scarce (Lim et al. [2014]).

Panels A and B in Table 3 provide a univariate comparison of direct-lender and bank borrowers. Comparison of medians show that direct-lender borrowers are smaller than bank borrowers, operate with higher leverage, lower liquidity, and have a low fixed-assets ratio. These patterns are broadly in line with the findings of Carey et al. [1998], which indicate that direct-lender borrowers are riskier according to observable metrics.[9]

3 Empirical model

To analyse the impact of monetary policy on direct lenders, we estimate a logit model which relates the participation of direct lenders in syndicated loans to a number of determinants:

$$Pr(DL_{i,j,t,s} = 1) = F(\alpha X_i + \beta Y_{j,t-1} + \gamma Z_{t-1} + \delta_1 MP_s) \tag{3.1}$$

The dependent variable $DL_{i,j,t,s}$ takes the value of one if there is a direct lender in the syndicate loan i, to firm j, signed in calendar year t at date s, and zero if all lenders are banks. F is a logistic function, so that $F(z) = e^z/(1 + e^z)$. The log-likelihood is given by:

$$lnL = \sum_{DL=1} *ln(F_1(z) + \sum_{DL=1} *ln(1 - F_0(z)) \tag{3.2}$$

in this equation the vector z denotes the three vectors of covariates X_i, $Y_{j,t-1}$, Z_{t-1},

[9]Median tests indicate a statistically significant difference between the attributes of borrowers from banks and direct lenders. These differences are in many instances similar to Chernenko et al. [2020]. However, we do not find that direct lender borrowers exhibit negative EBITDA. While we cannot fully compare our sample with theirs, we think this reflects that we look at much broader sample of firms, which are larger. By contrast, they look at middle-market firms with assets comprised between 10 US bn and 1 US bn.

which include, respectively, loan, borrower, and macro variables.

We include a number of loan controls, X_i, to control for differences in the terms and conditions of the loans. This way we acknowledge that firms may borrow from direct lenders or banks due to difference in the types of loans offered (Chernenko et al. [2020]). Specifically, we include the loan maturity, as direct lenders are less engaged in maturity transformation and hence better suited to lend long term. In addition, we include the loan amount, as we expect direct lenders to join syndicates when deals are larger because of constraints on banks' capital.

The inclusion of borrower controls, follows previous research investigating the role played by non-bank lenders in credit markets (Carey et al. [1998], Denis and Mihov [2003], Chernenko et al. [2020], Loumioti [2019] or Jang [2020]). To this end, we include in vector $Y_{j,t-1}$ various firm-level measures of observable risk, including: leverage; EBITDA ratio; fixed-assets ratio; and quick ratio. Based on previous research, our expectation is that direct lenders cater to more levered and less profitable firms with fewer fixed-assets and low liquidity. In addition, we include firm total assets.

We also include a vector of macro controls, Z_{t-1}, which include global GDP growth and inflation expectations, credit spreads (Merril-Lynch HY index), and the 2-year US treasury rate. While we observe the exact date in which loans are closed denoted with the subscript s, both borrower controls $Y_{j,t}$ and global factors Z_t are measured at the previous calendar year, except the 2-year rate which is measured at the previous month.[10]

Finally, our main interest is on the impact of monetary policy shocks, MP_s on the participation of direct lenders in syndicated loans. To test the impact of interest rate shocks, we first use raw "monetary policy shocks" defined as the change in interest rates relative to Treasury futures within a short intraday window around monetary policy announcements,

[10]This implies that when a loan is signed in March 2017, we assess borrower information and macro variables in 2016.

irrespective of the concurrent change in equity returns.

In further analysis, we go on to split these "monetary policy shocks", MP_s, into "pure monetary shocks", MP_s^{PM}, and "information shocks", MP_s^{IS}, to assess the financial accelerator channel of monetary policy, where MP_s^{PM} denotes the set of monetary policy shocks in which changes in interest rates and equity returns are negatively correlated within a tight intraday window, while MP_s^{IS} are those where the correlation is positive.

We first modify equation 3.1 and instead include pure monetary shocks as our measure of monetary policy tightening/loosening instead of the composite monetary policy shock MP_s:

$$Pr(DL_{i,j,t,s}) = F(\alpha X_i + \beta Y_j + \gamma Z_t + \delta_2 MP_s^{PM}) \tag{3.3}$$

We then go on to include information shocks, MP_s^{IS}, to assess the overall impact of monetary policy announcements on direct lenders

$$Pr(DL_{i,j,t,s}) = F(\alpha X_i + \beta Y_j + \gamma Z_t + \delta_2 MP_s^{PM} + \delta_3 MP_s^{IS}) \tag{3.4}$$

Firm and loan-level controls are winsorised at the 2.5 and 97.5 percentiles. We report Huber-White standard errors.

4 Results

4.1 Bank lending channel

Our baseline results are shown in Table 4, covering term loans in both the investment grade and lower rated segments of the syndicated term loan market. Direct lenders take part in one-third of the 13,586 syndicated term loans analysed in these regressions.[11] In this table we report results estimating model 3.1 which uses the high-frequency identified "monetary policy shocks" based on changes in interest rates without taking into account the concurrent equity market return.

The main insight from Table 4 is that these raw monetary policy shocks do not have any impact on the likelihood that direct lenders join syndicates. The coefficient of the monetary policy shock variable is not statistically significant in column I. It remains statistically insignificant in columns II and III where we add firm controls, and macro controls. To the extent that increases in interest rates also capture unexpected contractions in deposits, this result indicates that direct lenders do not appear to smooth the traditional bank lending channel of monetary policy.

Otherwise, the involvement of direct lenders in the loan market is consistent with previous research. We observe that direct lenders are more likely to join syndicates financing longer-term loans. This potentially reflects the fact that direct lenders are less engaged in maturity transformation. In addition, they join syndicates when loans are large. In terms of borrower attributes, we find that direct lenders engage in lending to firms which are ex-ante riskier, such as high leverage firms, or firms with low fixed assets to total assets. This is consistent with Chernenko et al. [2020] who argue that direct lenders are well-suited to lend to firms with poor balance-sheet metrics. Unlike Chernenko et al. [2020], we do not find that

[11] The regressions cover the period 2000-2018, which explains that the number of observations drops relative to Table 1. In addition some observations drop due to lack of information in some firm-level controls.

they lend to less profitable firms, as the coefficient on the EBITDA ratio is not statistically significant.[12] In addition, we find that direct lenders are less likely to lend to large firms.

Turning to macro variables, neither US inflation expectations nor global GDP growth play any significant role. That said, we find that direct lenders are more likely to engage in syndicates when high-yield corporate bond spreads are wider. This finding squares well with aggregate findings underscoring the higher volatility of bank finance compared with non-bank credit, both during the 2007-2009 (Adrian et al. [2012]) and the Covid-19 crisis (Goel and Serena [2020]).

4.2 Financial accelerator channel

Pure monetary shocks

To explore if direct lenders attenuate the financial accelerator channel of monetary policy we estimate equation 3.3, which utilises the "pure monetary" policy shocks which purge the raw shocks of events when there were positive correlations between interest rate changes and equity returns. In contrast to the insignificant results based on the raw monetary policy shocks, our results in Table 5 show that the coefficient on the pure monetary shock is positive and statistically significant. We observe this result in column I, in which the model includes loan covariates. This result holds when we add firm-level controls (column II), and macro controls (column III). For the sake of brevity we do not report the coefficients of the rest of covariates, which remain similar to the estimates in Table 4.

Thus, once we purge the raw monetary policy shocks from events when changes in interest rates were positively correlated with equity market returns, we do indeed find that direct lenders are more (less) likely to step into syndicates when interest rates increase (de-

[12] This confirms the insights from the univariate analysis shown in section 2, and may be due to differences between the syndicated loan data we use and their loan sample, which covers middle-market firms only.

Table 4: **Direct lenders and monetary policy:** This table reports results of a logit model of direct lenders' participation in syndicated loans. The dependent variable is a categorical variable taking value 1 if a direct lender takes part in a syndicate, 0 otherwise. Dollar loans only. TL stands for "Term loan". All models cover both the investment grade and leveraged loan segment. Robust standard errors in parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

	I	II	III
Loan maturity	0.037*	0.043*	0.054**
	(0.02)	(0.02)	(0.02)
Loan amount	0.083***	0.093***	0.108***
	(0.02)	(0.02)	(0.02)
Firm assets		−0.080***	−0.076***
		(0.02)	(0.02)
Firm EBITDA ratio		0.004	0.006
		(0.02)	(0.02)
Firm quick ratio		0.037*	0.040**
		(0.02)	(0.02)
Firm leverage		0.159***	0.159***
		(0.02)	(0.02)
Firm fixed assets ratio		−0.079***	−0.083***
		(0.02)	(0.02)
Inflation expectations			−0.002
			(0.02)
Global GDP growth			−0.005
			(0.02)
Merril-Lynch HY spread			0.110***
			(0.03)
2 year interest rates	0.313***	0.290***	0.353***
	(0.02)	(0.02)	(0.02)
Monetary policy shock	0.044	0.091	0.180
	(0.26)	(0.26)	(0.27)
Observations	13586	13586	13586
Adjusted R-squared	0.013	0.020	0.022
Type loan	TL	TL	TL
Segment	All	All	All

Table 5: **Direct lenders and pure monetary policy shocks:** This table reports results of a logit model of direct lenders' participation in syndicated loans. The dependent variable is a categorical variable taking value 1 if a direct lender takes part in a syndicate, 0 otherwise. Dollar loans only. TL stands for "Term loan". All models cover both the investment grade and leveraged loan segment. Robust standard errors in parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

	I	II	III
Pure monetary shock	0.047**	0.049***	0.049***
	(0.02)	(0.02)	(0.02)
Observations	13586	13586	13586
Adjusted R-squared	0.013	0.021	0.022
Type loan	TL	TL	TL
Segment	All	All	All
Firm controls		X	X
Loan controls	X	X	X
Macro controls			X

crease). Taking together results of Tables 4 and 5, we conclude that direct lenders attenuate the impact of an interest rate tightening on loan supply, but only when there is a concurrent decline in equity prices.

Information shocks

We now further test the impact of central bank information shocks on direct lenders estimating equation 3.4. We report the results in Table 6, where for the sake of brevity we also omit the coefficients on the rest of the covariates.

In Table 6, the coefficient on information shocks is negative and statistically significant when we estimate the model with loan controls only (column I). This result holds when we add firm controls (column II) and macro variables (column III). The negative coefficient on the information shock shows that direct lenders join loan syndicates when a fall in interest rates is concurrent with a worsening of borrowers' net worth. The coefficient on the pure monetary shock remains positive and statistically significant, as in Table 5.

Table 6: **Direct lenders and information shocks:** This table reports results of a logit model of direct lenders' participation in syndicated loans. The dependent variable is a categorical variable taking value 1 if a direct lender takes part in a syndicate, 0 otherwise. Dollar loans only. TL stands for "Term loan". All models cover both the investment grade and leveraged loan segment. Robust standard errors in parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

	I	II	III
Pure monetary shock	0.051***	0.053***	0.052***
	(0.02)	(0.02)	(0.02)
Information shock	−0.060***	−0.057***	−0.050***
	(0.02)	(0.02)	(0.02)
Observations	13586	13586	13586
Adjusted R-squared	0.014	0.021	0.023
Type loan	TL	TL	TL
Segment	All	All	All
Firm controls		X	X
Loan controls	X	X	X
Global controls			X

Taking the coefficients on the pure monetary shocks and information shocks together, our results suggest that when central bank announcements are followed by a decline (increase) in borrower net worth direct lenders are more (less) likely to step in and fill the gap. Importantly, this occurs irrespective of the sign on the change in interest rates around central bank announcements.

4.3 Type of loans and credit market segments

We now turn to analyse direct lenders' reaction to monetary policy shocks in various segments of the loan market in Table 7. To ease reading the results, column I replicates our baseline results (i.e. those in column III of Table 6).

We first split loans into its two main categories based on the riskiness of the loan, namely leveraged transactions (which include also highly-leveraged transactions) and investment grade loans. These labels are attached by market participants at origination, and

Table 7: **Credit market segments:** This table reports results of a logit model of direct lenders' participation in syndicated loans. The dependent variable is a categorical variable taking value 1 if a direct lender takes part in a syndicate, 0 otherwise. Dollar loans only. Column I replicates the baseline results based on term loans only. Column II and III analyse, respectively, leveraged and investment grade loans. Column IV analyses credit lines. Column V analyses term loans classified as cash flow loans following Lian and Ma [2020]. Robust standard errors in parentheses. All models include the loan, borrower, and macro covariates described in Section 3. Coefficients on controls are not shown for the sake of brevity. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

	I	II	III	IV	V
Pure monetary shock	0.052***	0.047**	0.064	−0.005	0.056***
	(0.02)	(0.02)	(0.05)	(0.02)	(0.02)
Information shock	−0.050***	−0.055***	−0.041	0.002	−0.053***
	(0.02)	(0.02)	(0.05)	(0.02)	(0.02)
Observations	13586	10946	2640	20500	13364
Adjusted R-squared	0.023	0.020	0.041	0.027	0.024
Loan type	Temloan	Termloan	Termloan	Creditline	Cashflowloan
Quality	All	Leveraged	Invgrade	All	All

summarise the riskiness of the loans.[13] We observe that the results remain broadly similar for the segment of leveraged loans (column II), i.e. direct lenders join syndicates in response to positive pure monetary shocks, and negative information shocks. However, the coefficients are statistically insignificant when we analyse investment grade loans (column III). That said, the point estimates remain broadly similar. Moreover, this result may lack power due to the smaller sample of loans and lower involvement of direct lenders in investment grade loans.

Our second exercise consists of analysing credit lines instead of term loans (column IV). We find that direct lenders do not join syndicates financing credit lines in response to any type of monetary shock. This is consistent with their subdued activity in credit line provision, which remains the realm of deposit-taking institutions (Kashyap et al. [2002]), and other financial intermediaries raising short-term funding (Serena and Tsoukas [2020]).

[13]Relative to investment grade loans, leveraged transactions pay higher spreads, are granted to firms with higher credit risk, have longer maturities, and smaller amounts. See Avdjiev and Serena [2020] for further details.

Our third exercise is to analyse if the direct lender response to monetary policy shocks is stronger for cash-flow loans. These are loans secured on the value of the firm, and not by specific assets (Lian and Ma [2020]). They differ from asset-backed loans, which are secured by specific assets (as e.g. second-lien term loans, project financing, acquisition financing and capital expenditure facilities). We expect that a decrease in borrowers' net worth should have a stronger effect on banks' supply for cash-flow based lending, but have a weaker effect on asset-backed lending. Data constraints prevent us from running a proper subsample estimation, as the majority of term loan are cash-flow loans (Lian and Ma [2020]).[14] Therefore, in column V we estimate equation 3.4 for cash-flow loans only. The results are consistent with our expectation, as the impact of pure monetary and growth shocks remain negative and positive, respectively; and the point estimate increases around 10%. The results squares well with previous findings showing that monetary policy shocks have a stronger impact on banks' cash-flow loans than on asset-based credit (Ivashina et al. [2020]).

5 Robustness checks

We now conduct a number of robustness tests, modifying our baseline results along several dimensions. We first examine differences between types of direct lenders, second we examine if our results are driven by specific sectors and finally whether there are differences depending on the use of proceeds.

5.1 Type of lenders

In our first robustness check we explore if our results hold across groups of direct lenders. This is important, in so far as our baseline regressions cover a wide range of financial in-

[14] In our sample less than 300 term loans are classified as asset-backed.

stitutions ranging from BDCs to insurance companies. Two issues suggest that insurance company lending could be somewhat more sensitive to net worth effects. For one, insurance companies are subject to solvency rules and may retrench when credit risks become material. In addition, regulation may discourage them from taking too much credit risk (e.g. holding high-yield corporate bonds). Yet, insurance companies are similar to other direct lenders in important dimensions, as they exhibit low leverage and do not engage in maturity transformation.

Table 8: **Type of lenders:** This table reports results of a logit model of direct lenders' participation in syndicated loans. The dependent variable is a categorical variable taking value 1 if a direct lender takes part in a syndicate, 0 otherwise. Dollar loans only. Robust standard errors in parentheses. All models include the loan, borrower, and macro covariates described in Section 3. Coefficients on controls are not shown for the sake of brevity. Column II (III) shows results for loans without (with) participation of insurance companies. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

	I	II	III
Pure monetary shock	0.050***	0.048**	0.121***
	(0.02)	(0.02)	(0.04)
Information shock	−0.051***	−0.054***	−0.068**
	(0.02)	(0.02)	(0.03)
Observations	13586	13345	9816
Adjusted R-squared	0.023	0.025	0.032
Type loan	TL	TL	TL
Type direct lender	ALL	Othr	IC
Role deal	ALL	ALL	ALL

We therefore conduct a subsample estimation, analysing separately the response of insurance companies, and other direct lenders in our sample. The results are reported in Table 8. To ease reading the results, column I in Table 8 displays the baseline results (column III of Table 6).

The estimates based on direct lenders excluding insurance companies behave similarly to the full sample results (column II in Table 8). Column III presents the results covering insurance companies only. We find that insurance companies respond similarly to the rest

of direct lenders, i.e. they join syndicates in response to to positive pure monetary shocks and negative information shocks. Interestingly, the size of the coefficients increases in both instances. The results suggest that insurance companies do not differ from the rest of direct lenders and, if anything, may be an even greater attenuating force on the financial accelerator channel. That said, we acknowledge that the sample of insurance company loans is smaller, and the results may exhibit a small sample bias.[15]

5.2 Influential sectors

Next we explore if our results are driven by specific sectors, which could be the case if monetary policy hits direct lending to specific industries more strongly.

To this end, we re-run our baseline model by removing each sector of the ten Thomson Reuters classification one at a time.[16] To summarise the results, we plot the point estimates, plus the 95% confidence intervals, in Figure 3. The dashed blue line plots the results obtained in the baseline model. Panel A plots the results of the pure monetary shocks, while Panel B displays the information shocks.

The results suggests that there is no specific sector whose deletion would significantly change the coefficients on the pure monetary and information shocks. Our general reading is therefore that our results are not driven by specific sectors. In one instance, though, the coefficient on information shocks becomes statistically insignificant. This happens when we exclude the technology sector, which indicates that direct lending to technological firms is somewhat more strongly sensitive to monetary policy announcements. The response to positive pure monetary shocks also weakens when we exclude the technology sector but

[15]The number of observations drops by one-third, reflecting that insurance companies are a small group, within the sample of direct lenders. In addition, insurance companies participate in only 10% of the loans analysed in the regressions (well below the one-third they represent in both columns I and II).

[16]The ten sectors are the following: Basic Materials, Consumer Cyclicals, Consumer Non-Cyclicals, Energy, Real Estate, Healthcare, Industrials, Technology, Telecommunications Services, Utilities.

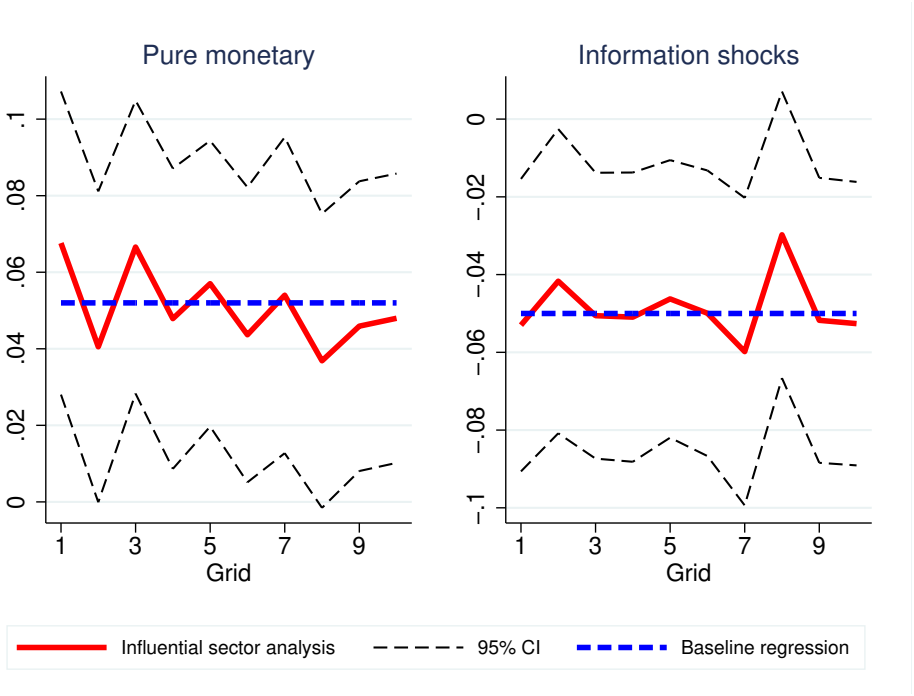

Figure 3: **Influential sector analysis:** Each point in the grid represents the point estimate of the baseline model given by equation 3.1, estimated excluding each of the sectors at a time, which are respectively (1) Basic Materials; (2) Consumer Cyclicals; (3) Consumer Non-Cyclicals; (4) Energy; (5) Real Estate; (6) Healthcare; (7) Industrials (8) Technology; (9) Telecommunications Services; and (10) Utilities. The dash black lines are the 95% confidence intervals. The dash blue line plots the results obtained in the baseline model.

remains positive and significant.

5.3 Use of proceeds

Finally we explore if our results are driven by loans arranged for specific uses. Monetary policy could potentially have a stronger effect on certain uses of credit that are correlated with direct lenders lending preferences. To this end, we classify the loans according to the uses of proceeds disclosed when closing the transaction into four categories, respectively (1) financial reasons (e.g. debt management, acquisitions); (2) fixed capital formation; (3) general corporate purposes; (4) working capital. Then we run our baseline model by removing each one at a time. In Figure 4 we plot the point estimates, plus the corresponding 95% confidence intervals. The dashed blue line plots the results obtained in the baseline model. The results show that the impact of the shocks on direct lending does not depend on the specific use of proceeds.

6 Direct lenders and the financial accelerator

The evidence presented so far indicates that direct lenders fill the gap left by banks in loan syndicates, when corporate sector net worth worsens around monetary policy announcements. It suggests that banks' lending become constrained by the workings of the financial accelerator. In this section we conduct three exercises to establish the links between corporate net worth, bank lending constrains, and direct lending triggered by monetary policy announcements.

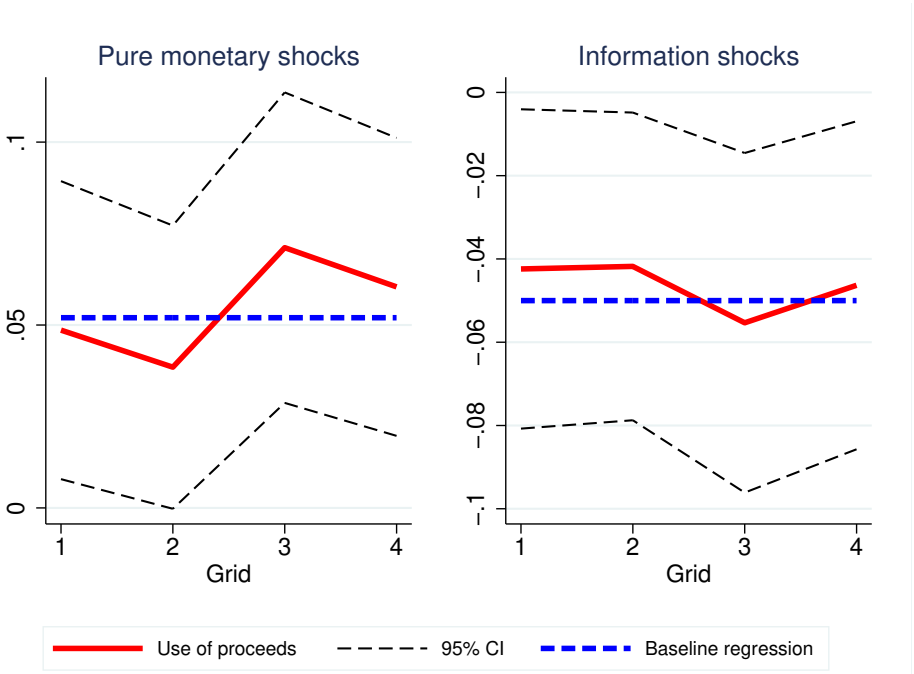

Figure 4: **Influential use of proceeds analysis:** Each point on the grid represents the point estimate of the baseline model given by equation 3.1, estimated excluding each of the uses of proceeds at a time. The points reflect respectively (1) debt management; (2) fixed capital formation; (3) general corporate purposes; (4) working capital. The dash black lines are the 95% confidence intervals. The dash blue line plots the results obtained in the baseline model.

6.1 Corporate outlook

We have interpreted that the increase in direct lending triggered by negative information shocks may relate to the impact of borrowers' net worth on bank lending. However, this result could also reflect that banks suffer themselves a decline in valuations, restraining their lending ability (Disyayat [2010]).

To explore if the financial accelerator really operates through borrowers' balance sheets, we identify a subset of "information shocks" in which the decline in non-financial corporate stocks outpaces that of the general index. We call them "corporate outlook" shocks. Since the general index includes financial institutions, "corporate outlook shocks" are events in which changes in the net worth of borrowers dominate those of the financial sector.

Consequently, we modify equation 3.4 including as a covariate the corporate outlook shock which we denote as MP_s^{CS}, together with the pure monetary shocks and information shocks (respectively, MP_s^{PM} and MP_s^{IS}):

$$Pr(DL_{i,j,t,s}) = F(\alpha X_i + \beta Y_j + \gamma Z_t + \delta_2 MP_s^{PM} + \delta_3 MP_s^{IS} + \delta_4 MP_s^{CS}) \tag{6.1}$$

Table 9 summarises the results. To ease comparison, columns I replicates the baseline results (column III in Table 5). In column II, we analyse together the impact of information shocks and the corporate outlook shocks. Consistent with the notion that our results are triggered by the impact of monetary policy announcements on borrower net worth, we observe that direct lenders particularly react to corporate outlook shocks. The coefficient of "information shocks" becomes statistically insignificant. Both results hold when we include also the pure monetary shocks (column III); in addition, the positive impact of pure monetary shocks continues to hold.

Table 9: **Corporate information shocks:** This table reports results of a logit model of direct lenders' participation in syndicated loans. The dependent variable is a categorical variable taking value 1 if a direct lender takes part in a syndicate, 0 otherwise. Dollar loans only. Column I shows the baseline results from column III of Table 6. In column II, we analyse the impact of information shocks, and the corporate outlook shocks. In column III we include also the "pure monetary shocks". Robust standard errors in parentheses. All models include the loan, borrower, and macro covariates described in Section 3. Coefficients on controls are not shown for the sake of brevity. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

	I	II	III
Pure monetary shock	0.050***		0.060***
	(0.02)		(0.02)
Corporate outlook shock		−0.048***	−0.045***
		(0.01)	(0.01)
Information shock	−0.051***	−0.004	−0.004
	(0.021)	(0.02)	(0.02)
Observations	13586	13586	13586
Adjusted R-squared	0.023	0.023	0.024
Type loan	TL	TL	TL
Segment	All	All	All

6.2 Leverage vs liquidity

In the introduction we noted that direct lenders differ from banks by (a) having lower leverage and (b) undertaking less maturity transformation. In this section we investigate which of these two factors is more important in explaining differences between direct lenders and banks by using the sample of loans granted by banks alone. To do so, we first examine if banks with low leverage (highly-capitalised) behave in a similar manner to direct lenders. Then second, we examine if high liquidity banks behave in a similar way to direct lenders.

In this exercise, we drop all loans in which there is a direct lender in the syndicate. We first isolate the subset of highly capitalised banks, as institutions with a high Tier 1 capital to risk-weighted assets (RWA) ratio at a quarterly level. Specifically, highly-capitalised banks have a Tier 1 to RWA above the percentile 75th of the distribution of banks.

Highly capitalised banks take part in around two-thirds of the 8,611 loans without participation of direct lenders in our sample. The results we show in Table 10 indicate that highly-capitalised banks react in a very similar manner to direct lenders, i.e. they join syndicates when equity markets decline around monetary policy announcements. In contrast to direct lenders, the bank-only sample shows that the coefficient on the raw monetary policy shocks is now positive and statistically significant.

Table 10: **Highly capitalised banks:** This table reports results of a logit model of highly capitalised banks' participation in syndicated loans. The dependent variable is a categorical variable taking value 1 if a highly capitalised bank takes part in a syndicate, 0 otherwise. Highly capitalised banks are those with a high Tier 1 to RWA ratio at a quarterly level (above the percentile 75th of the distribution). Dollar term loans only. In columns I, we estimate equation 3.1 to asess responses to "monetary policy shocks". In columns II and III, we analyse the impact of "pure monetary policy shocks" and "information shocks". In column IV we estimate equation 3.4, which simultaneously examines both. Robust standard errors in parentheses. All models include the loan, borrower, and macro covariates described in Section 3. Coefficients on controls are not shown for the sake of brevity. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

	I	II	III	IV
Monetary policy shock	0.125***			
	(0.02)			
Pure monetary shock		0.214***		0.224***
		(0.02)		(0.02)
Information shock			−0.068***	−0.091***
			(0.02)	(0.02)
Observations	8611	8611	8611	8611
Adjusted R-squared	0.074	0.078	0.072	0.080
TypeLoan	TL	TL	TL	TL

Next we conduct a similar exercise, isolating highly liquid banks. Again, we drop all loans in which there is a direct lender in the syndicate. We then isolate the subset of highly liquid banks, as institutions with a high net stable funding ratio (NSFR), at a quarterly level. Specifically, highly-liquid banks have a NSFR above the percentile 75th of the distribution, in our sample of banks.

In column I we observe that highly liquid banks join syndicates in response to raw monetary policy shocks, with a strong and statistically significant coefficient. Yet, this

reflects a strong response to "pure monetary shocks", apparent in column II. In contrast the coefficient on information shocks is insignificant. High liquidity banks do not step in when interest rate declines go hand-in-hand with declines in borrowers' net worth (column III).

The results in Tables 10 and 11 underscore that direct lenders response to monetary policy more closely resembles those of banks with high capital. Their activity however, appears less similar to highly liquid banks, at least in terms of information shocks.

Table 11: **Highly liquid banks:** This table reports results of a logit model of highly liquid banks' participation in syndicated loans. The dependent variable is a categorical variable taking value 1 if a highly liquid bank takes part in a syndicate, 0 otherwise. Highly liquid banks are those with a high NSFR ratio at a quarterly level (above the percentile 75th of the distribution). Dollar term loans only. In columns I, we estimate equation 3.1 to asess responses to "monetary policy shocks". In columns II and III, we analyse the impact of "pure monetary policy shocks" and "information shocks". In column IV we estimate equation 3.4, which simultaneously examines both. Robust standard errors in parentheses. All models include the loan, borrower, and macro covariates described in Section 3. Coefficients on controls are not shown for the sake of brevity. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

	I	II	III	IV
Monetary policy shock	0.840**			
	(0.36)			
Pure monetary shock		1.607***		1.674***
		(0.47)		(0.47)
Information shock			−0.570	−0.870
			(0.69)	(0.69)
Observations	7245	7245	7245	7245
Adjusted R-squared	0.065	0.066	0.065	0.066
TypeLoan	TL	TL	TL	TL

6.3 Institutional vs bank term loans

As a final exercise to examine the mechanism we check whether direct lenders fill the gap left by banks in primary markets, and not by institutional investors in secondary loan markets who may purchase loans originated by banks. This exercise is important, as many loans are originated by banks but subsequently sold to end-investors (so called institutional loans).

Previous research has shown that the origination of these loans by banks is driven by loan demand from institutional investors (Niepmann and Schmidt-Eisenlohr [2019], Fleckenstein et al. [2020] or Bruche et al. [2020]). Loan demand by end-investors is likely to be driven by different factors compared with bank loans that are held on their balance sheet. Consistent with this expectation, typically their investments are more resilient than bank lending during downturns (Adrian et al. [2012]).

Following Fleckenstein et al. [2020], we define bank term loans as those labelled as "Term" or "Term A" loans. Institutional loans are defined as those labelled "Term B", "Term C", "Term D", and "Term D". While banks originate both, they hold bank loans after their origination, and rapidly sell institutional loans to institutional investors.[17] Overall, we observe that direct lenders are more involved in institutional term loans, taking part in 40% of the transactions; by contrast, they only take part in 28% of the bank loans.

Table 12: **Institutional investors:** This table reports results of a logit model of direct lenders' participation in syndicated loans. The dependent variable is a categorical variable taking value 1 if a direct lender takes part in a syndicate, 0 otherwise. Dollar loans only. Column I replicates the baseline results of Column IV in Table 6, which over all term loans (TL). Column II analyses the subsample of bank term loans (BTL), whereas column III focuses on institutional term loans (ITL). Bank term loans are those labelled as "Term" or "Term A". Institutional loans are those labelled "Term B", "Term C", "Term D", and "Term D". Robust standard errors in parentheses. All models include the loan, borrower, and macro covariates described in Section 3. Coefficients on control variables are not shown for the sake of brevity. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

	I	II	III
Pure monetary shock	0.052***	0.049**	0.015
	(0.02)	(0.02)	(0.04)
Information shock	−0.050***	−0.058***	0.064
	(0.02)	(0.02)	(0.05)
Observations	13586	11163	3026
Adjusted R-squared	0.023	0.033	0.045
Type loan	TL	BTL	ITL
Segment	All	All	All

[17] As such, bank and institutional term loans differ in their terms and conditions. For instance, bank loans are amortising, while institutional loans are structured with a bullet payment (lump-sum at maturity).

We then examine whether the response of direct lenders to monetary policy shocks differs across bank and institutional term loans. If direct lenders step in the place of banks, but not for buyers of institutional term loans, we would expect the impact of monetary policy on direct lender participation to be weaker for institutional loans, but continue to hold for bank loans.

The results in Table 12 are consistent with our prior. Column II shows that direct lending is very sensitive to monetary policy shocks for bank term loans: the probability that a direct lender participates in bank loan increases after a positive pure monetary shock, and diminishes in response to a negative information shock. Both results are weaker for institutional term loans and become statistically insignificant. These findings suggest that our results do not reflect direct lenders stepping into the gap left by institutional investors in the loan market but rather that they fill the gap left by banks.

7 Conclusions

Direct lenders are increasingly important players in the US corporate loan market, and the fallout from the Covid-19 pandemic has if anything boosted their growth. Direct lenders differ from banks as they have low leverage, limited maturity mismatches, and are not subject to bank supervision.

In this paper we provide new evidence on the role they play in the monetary policy transmission mechanism. Our results suggest that direct lenders do not smooth the impact of monetary policy through the bank lending channel. We posit that certain lenders, e.g. investment banks that do not take deposits, may already play this role. Rather, direct lenders appear to smooth the impact of the financial accelerator channel of monetary policy. We find that direct lenders step in to syndicates when monetary policy announcements are associated

with a fall in equity prices, irrespective of the directional impact of these announcements on interest rates. We conclude that this could reflect their low leverage or differences in their lending technology. Both of which may allow them to keep on lending to firms when net worth worsens, just as banks step back. In this sense, direct lenders are akin to other sources of non-bank credit which operate with low leverage (Adrian et al. [2012]).

An implication of this analysis is that direct lenders can dampen financial accelerator mechanisms in the economy (Carlstrom and Fuerst [1997] and Bernanke et al. [1999]), should they keep on growing at a rapid pace. Another implication is that the growing presence of direct lenders increases the ability of borrowers to substitute between bank vs non-bank credit as risk increases. This could enhance the robustness of the syndicated loan market, but only if direct lender leverage remains low.

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A Data appendix

Table 1: **Variables description**

A. Firm-level variables		
Variable	Description	Source height
Total assets	Logarithm of total assets, in US bn.	Refinitiv Eikon.
EBITDA ratio	EBITDA to total assets, in pp.	Refinitiv Eikon.
Fixed assets ratio	Fixed assets to total assets, in pp.	Refinitiv Eikon.
Quick ratio	Current assets minus inventory to current liabilites, in pp.	Refinitiv Eikon.
Leverage ratio	Debt to total assets, in pp.	Refinitiv Eikon.
TRBC Economic sector	Economic sector given by the Thomson Reuters Business Classification scheme. Classifies firms into ten sectors.	Refinitiv Eikon.
Country	Country of incorporation.	Refinitiv Eikon.
B. Loan-level variables		
Variable	Description	Source
Direct lender loan	1 if at least one lender is a direct lender, 0 otherwise.	Refinitiv SDC Platinum.
Loan without direct lender participation	1 if there is not any direct lender in the loan syndicate, 0 otherwise	Refinitiv SDC Platinum.
Term loan	Term, Term A, B, C, D, E loans	Refinitiv SDC Platinum.
Credit line	Liquidity facilities.	Refinitiv SDC Platinum.
Bank term loan	Term and Term A loans.	Refinitiv SDC Platinum.
Institutional term loan	Term B, C, D or E.	Refinitiv SDC Platinum.
Leveraged loan	leveraged, or highly leveraged loans.	Refinitiv SDC Platinum.
Investment grade loan	Investment grade, or near investment grade loans.	Refinitiv SDC Platinum.
Dollar loan	Dollar denominated in loans.	Refinitiv SDC Platinum.
Non dollar loan	Loans in currencies other than the dollar.	Refinitiv SDC Platinum.
Spread	Basis points over LIBOR, for dollar loans.	Refinitiv SDC Platinum.
Maturity	Years to maturity, at origination.	Refinitiv SDC Platinum.
Amount	Loan amount in US mn.	Refinitiv SDC Platinum.
Use of proceeds	Use of proceeds, as described at origination.	Refinitiv SDC Platinum.

Table 2: **(Cont.) Variables description**

C. Lender-level variables		
Variable	Description	Source
Debt ratio	Total assets minus equity	Fitch
	, to total assets, in pp.	
Short-term debt ratio	Total assets minus equity	Fitch
	and long-term debt, to total assets, in pp.	
Direct lender	Lender that is not subject to	Refinitiv SDC Platinum.
	bank capital requirements.	
Bank	Lender subject to bank capital requirements.	Refinitiv SDC Platinum.
Lead arranger	Lender involved in arranging the loan	Refinitiv SDC Platinum.
	,i.e. gathering participants in the syndicated loan.	
Participant	Members of the loan syndicate	Refinitiv SDC Platinum.
	, other than the lead arranger.	
Tier 1 to RWA	Ratio of equity Tier 1 to risk-weighted assets.	Fitch
NSFR	Net stable funding ratio.	Fitch
Highly capitalised bank	Bank with a Tier 1 to RWA above the percentile 75th	Fitch,Refinitiv SDC Platinum, ov
	of the distribution in a given quarter	Fitch,Refinitiv SDC Platinum, ov
	, on a sample of 135 global banks.	
Highly liquid bank	Bank with a NSFR above the percentile 75th	Fitch
	of the distribution in a given quarter	Fitch
	, on a sample of 135 global banks.	
Insurance company	Lender classified as Insurance Carriers and Related Activities.	Refintiv Eikon.
Investment bank	Bank which does not take deposits	Refintiv Eikon.

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