Redistribution Channel of Monetary Policy: Evidence from Bank Lending*

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ABSTRACT

Using the employer-employee survey data and the granular loan-level data from China, this paper explores the redistribution effect of monetary policy through bank lending. The main findings show that the expansionary monetary policy would reduce inequality through the sample bank lending, both within-firm and between-firm. The redistribution effect is stronger in less-developed areas, and in labor-intensive and financially constrained industries. We also find strong spill-over effects of the bank lending through the supplies chains.

Key Words: Monetary policy transmission, Redistribution effect, Bank lending, Loan rate, Income inequality

JEL classification: E52, D31, G21.

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I. Introduction

Rising income inequality has attracted much attention among policy circles and academics (Card et al., 2013; Mueller et al., 2017; Song et al., 2019; Biasa et al., 2021; Bena et al., 2021; Ma et al., 2022). Some research has explored the impact of the monetary policy shock on income inequality (Coibion et al., 2017; Andersen et al., 2021; Moser et al., 2021; Alfaro et al., 2022). Recent theory highlights the role of heterogeneous households in monetary policy transmission (Baker, 2018; Cloyne et al., 2020; Holm et al., 2021). For instance, when the monetary policy stance changes, individuals may response differently, which would affect income, debt and income inequality (Baker, 2018; Andersen et al., 2021). Despite the importance of the redistribution effects of monetary policy for theory and policy, the empirical evidence is far to reach the consensus. One reason for this is that the empirical investigation requires detailed wage and other income information between and within firm.

Using the unique employer-employee survey data and loan-level data from China, we explore the redistribution effects of monetary policy through the bank lending. Our main findings can be summarized as follows. We find that the expansionary monetary policy would reduce inequality by favoring the lower-income workers, both within and across firms. This redistribution effect is more pronounced in less-developed areas, as well as in more labor-intensive and financially constrained industries. We also find strong spillover effects of the bank loan through the supply chains: more bank loan outstanding, or lower loan rate in the upstream (downstream) industry would also reduce income inequality in the downstream (upstream) industry.

Our research may have the following contribution. For the data, We employ the employer-employee survey data to further explore the redistribution effects of the monetary policy through the bank lending. The data contains detailed firm-worker level income information, including both the wage and bonus.we make use of several highly detailed micro data from China. Besides, We also utilize highly detailed loan-level data directly from a large bank. The data contains detailed loan-level information, especially loan rates. For monetary policy measurement, we make use of the monetary policy indicator constructed in Xu and Jia (2019), which could summarize the policy stance of PBOC, and can be regarded as the analog of the Federal Funds Rate (Miranda-Agrippino et al., 2020). For robustness, we also measure monetary policy shocks by the exogenous component of the M_2 growth rate estimated from the regime-switching model of Chen et al. (2018). For the inequality measure, we explore the impact of the monetary policy shock on inequality from city level, between-firm level and within-firm level. Finally, we demonstrate strong heterogeneity of monetary policy transmission, both cross time, industry and regions.

Related Literature. The research contributes to the literature on monetary policy transmission (Bernanke, 1991; Bernanke and Blinder, 1988, 1992; Kashyap and Stein, 1994, 2000; Bernanke and Gertler, 1995; Drechsler et al., 2017; Chen et al., 2018; Auclert, 2019; Beraja et al., 2019; Amir-Ahmadi et al., 2020; Dias et al., 2020; Fang et al., 2020; Miranda-Agrippino et al., 2020; Li et al., 2020; Chen et al., 2021, 2022). Different from the lending channel, the balance sheet channel, and the deposit channel of monetary policy transmission which are well-identified in previous studies,

our paper uses employer-employee survey data and loan-level data with price information, and a novel Chinese monetary policy measure to identify the impact of monetary policy fluctuation on worker income inequality.

The paper further contributes to a recent body of research on government credit, or the government bank loan (Bertay et al., 2012; Carvalho, 2014; Brei and Schclarek, 2013, 2015; Coleman and Feler, 2015; Cortes et al., 2019; Ru, 2018; Cai et al., 2020; Huang et al., 2020; Gao et al., 2021). Government banks play a positive role in mitigating economic fluctuations, especially during the financial crisis period (Bertay et al., 2012; De Haas et al., 2012; Allen et al., 2013; Brei and Schclarek, 2013; Coleman and Feler, 2015; Brei and Schclarek, 2015; Lin et al., 2017). However, some research points out that government credit usually prefers the state-owned sector, which may crowd out the investment of private firms and reduce the efficiency of resource allocation (King and Levine, 1993a,b; Ru, 2018). In addition, government credit is usually accompanied by interest rate subsidies (Carvalho, 2014; Lazzarini et al., 2015; Cai et al., 2020). Finally, some research highlights that government credit is characterized by political color, and is used by politicians as an election tool (Carvalho, 2014; Coleman and Feler, 2015). Our paper finds that the government credit improves distribution and reduces inequality.

Finally, our paper complements an important literature on finance and inequality (Mueller et al., 2017; Biasa et al., 2021; Bena et al., 2021; Moser et al., 2021; Andersen et al., 2021; Ma et al., 2022; Alfaro et al., 2022). Rising income inequality has garnered much attention in the academics. Recent literature has explored the driving force of income inequality using the micro employer-employee survey data, such as Card et al. (2013) using the Germany data, Song et al. (2019) using the US data, and the Alvarez et al. (2018) using the Brazil data. Song et al. (2019) find that the rise in the dispersion between firms in firm average annual earnings accounts for the majority of the increase in total earnings inequality.

Closely related to our paper, a few research has studied the relationship between finance and inequality, especially the role of monetary policy. Based on the comprehensive firm-level data on employee pay for a broad cross section of UK firms for the years 2004 to 2013, Mueller et al. (2017) find that firms with higher pay inequality are larger and have higher valuations and stronger operating performance. Using administrative household-level data covering the entire population in Denmark from 1987-2014, Andersen et al. (2021) find that the gains from softer monetary policy in terms of income, wealth and consumption are monotonically increasing in the initial income. In such case, the softer monetary policy would increase inequality. Using the Germany employer-employee data from 2021 to 2017, Biasa et al. (2021) decompose the within-Firm wage Inequality and find that the horizontal wage inequality (HWI) and the vertical wage inequality (VWI) contribute equally to the overall wage inequality within firms. Moser et al. (2021) also uses the Germany employer-employee data, and find that that a monetary policy-induced reduction in credit leads to lower wage inequality within and between firms. Our paper stands out by using the Chinese employer-employee and bank loan data to explore the real effects of the monetary policy shock through the policy bank lending.

II. Data, Variable and Specification

A. Data

A.1. Loan data

We mainly rely on the loan-level data from a large Chinese bank from the year 2010 to the year 2018 (approval date from 2006 to 2018). This is a large, comprehensive, and unique loan dataset directly from the sample bank, including approximately 60,000 loan projects and 15,000 firms. The dataset contains detailed contract level information about the approval date, loan volume, loan maturity, loan rate, collateral, internal rating (loan quality), and borrower information (such as the industry, location, and ownership). Meanwhile, it not only includes the new-issued loans, but also records the disbursement history for each loan project.

A.2. Employer-employee data

The second database we rely on is the employer-employee survey data from the year 2015 to 2017. The database contains detailed matched firm-worker information, including the location, industry and accounting information (including asset, debt, fixed asset, number of workers, total wage, revenue, profit, etc.) at firm level, as well as the income (including wage and bonus), personal information (including the age, gender, position, education, party, hometown, families, tenure, etc.) at worker level.

Besides the employer-employee survey data, we also use China Family Panel Studies (CFPS) survey data for robustness check when analysing the city-level inequality. The CFPS dataset contains detailed household income and asset information. The data period is 2012, 2014, 2016 and 2018.

B. Variable

(1) Monetary policy

To measure the Chinese monetary policy stance, we make use of the monetary policy indicator constructed in Xu and Jia (2019). This index could summarize the policy stance of PBOC and can be regarded as the analog of the Federal Funds Rate (Miranda-Agrippino et al., 2020). Figure 3 shows the revolution of monetary policy index and the one-year deposit rate.

For robustness, we also employ three alternative measures, 7-day reverse repo rate, 30-day shibor rate and the exogenous component of the M_2 growth rate estimated from the regime-switching model of Chen et al. (2018).

(2) Inequality measures

To measure the between-worker inequality, we explore the heterogeneous response of workers with different initial income (Moser et al., 2021). To measure the between-firm inequality, we explore the heterogeneous response of firms with different initial wage (Andersen et al., 2021). For measuring within-firm inequality, we mainly employ the worker pay ranking within the firm (Moser

et al., 2021). For the city-level inequality, we use the log variance of worker income (Bena et al., 2021; Ma et al., 2022) within the city.

(3) Bank lending measure and bond financing costs

Our city-level bank lending measures are aggregated using the detailed loan-level data. The city-level bank loan outstanding is constructed by aggregating all the outstanding of the the sample loans to the city. The city-level bank loan rate is defined as the weighted average of all the loan rate of the sample bank loans to the city.

To measure the bond financing cost of the sample bank. we use both the yield of bond issuance (10-year) and yields of bond Yield to maturity (YTM, 10-year) as the proxies of funding costs. The bond issuance yield shows the funding costs in the first bond market, while the YTM of the bond represents the funding costs in the secondary bond market.

(4) Heterogeneity measure

We conduct a series of heterogeneity analyses in our empirical part, including the cross-time, cross-region, cross-industry, and firm heterogeneity.

For cross-region heterogeneity, we mainly focus on three dimensions, economic development, fiscal capacity, and financial development. We use the GDP per capita to measure the local economic development level. We then use the local fiscal deficit rate to measure fiscal capacity, which is defined as the difference between fiscal expenditure and fiscal revenue, divided by fiscal expenditure. A larger fiscal deficit rate means a more financially constrained local government. We finally employ the bank penetration indicator to measure the financial development level, which is defined as the total number of bank branches divided by the population. A larger bank penetration indicates more credit supplies and a more financially developed city. In order to mitigate the endogeneity problem, we use the value of all three indicators in the initial year (2006).

For cross-industry heterogeneity, we focus on the industrial capital intensity and financial constraint. The industrial capital intensity is defined as the average of firm-level capital intensity within each CIC-2 industry. The firm-level capital intensity is defined as the fixed capital divided by number of workers (in logs), using the firm-level data from the ASIF database. In order to mitigate endogeneity, we also employ the industrial capital intensity in year 2006. To measure the Chinese industrial financial constraint, we construct the industrial level external finance dependence measure following Rajan and Zingales (1998) and Huang et al. (2020), using the ASIF database. The industries that rely more on external finance are generally more financially constrained.

(5) Control variables We control a series of firm-level and city-level control variables. For firm-level controls, we mainly control for firm revenue and firm profit rate. For city-level variables, we control the local GDP, local population, and local fiscal revenue divided by local GDP.

C. *Research design*

In order to explore the redistribution effects of the monetary policy, we conduct the following regression:

$$Income_{ijct} = \alpha + \beta_1 * MP_{t-1} + \beta_2 * MP_{t-1} * Income_i + \varphi * X_{ct} + \mu_i + \theta_t + \epsilon_{ijct} \quad (1)$$

Where i, j, c and t stand for worker, firm, city and year. The $Income_{ijct}$ stands for the worker income, which could be further decomposed into wage and bonus. The MP_{t-1} stands for the monetary policy index. The $Income_i$ is the initial income for worker i. The X_{ct} are a series of city-level time-varying control variables, including the GDP, population and revenue-to-GDP ratio. The μ_i is worker fixed effects, θ_t is the year dummy. Standard errors are clustered at the worker level. We mainly focus on the β_2, which demonstrates the heterogeneous impact of the monetary policy shock on worker income.

D. *Summary statistics*

Table 1 shows the summary statistics of key variables.

III. Empirical Results

Huang et al. (2024) have studied the bond financing channels of monetary policy. In this part, we explore the redistribution effects of the monetary policy through the bank lending. Specifically, we focus on the impact of the monetary policy on income inequality.

A. *City level evidence*

To explore the impact of the monetary policy on income inequality through bank lending, we firstly study the relationship at city level. Figure 8 shows the relationship between the bank lending (including the city loan outstanding and the city loan rate) and city income inequality. The city loan outstanding is defined as the sum of all the outstanding loan value within the city. The city loan rate is defined as the weighted loan rate of each outstanding loan within the city, with the loan volume as the weight. Following Song et al. (2019), the city income inequality is defined as the log variance of household income within the city. The inequality measure is constructed using the CFPS dataset in year 2016. Each dot refers to a city. Results indicate that there is significant negative relationship between city loan outstanding and income inequality, as well as significant positive relationship between city loan rate and city income inequality.

We also run regressions to explore the correlation between monetary policy index and city income inequality, as well as the relationship between bank lending and inequality at the city level. Results are reported at table 2.

In column (1), we find that there is significant positive correlation between monetary policy index and the city income inequality, indicating that the expansionary monetary policy would

reduce city income inequality. In columns (2) and (3), we directly test the relationship between city loan price and income inequality, including the city loan rate and city loan spread. Results show that there are positive correlations between the city loan rate (spread) and city income inequality. Column (4) shows significant negative relationship between city loan outstanding and city income inequality. The results are consistent with the conclusion in Figure 1. Figure 1 and Table 2 give suggestive evidence that the expansionary monetary policy could reduce city income inequality through the bank lending, such as reducing loan rate and increasing loan outstanding .

B. Firm level evidence

Next, we study the impact of the monetary policy shock on inequality at the firm level. To explore the impact of monetary policy shock on the between-firm inequality, we run the following firm level regression. Specifically, if the expansionary monetary policy reduces between-firm inequality, we would observe that the decrease of monetary policy index would favor firms with lower initial firm wage. Table 3 reports the results. The dependent variable is the firm wage, defined as the total income of workers within the firm (including wage and bonus) divided by the number of workers.

In column (1), we find that the coefficient of the monetary policy index is significantly negative, while the coefficient of the interaction term of monetary policy index and the initial firm wage is significantly positive, indicating that the decrease of monetary policy index (expansionary monetary policy) would have a larger positive impact on firms with lower initial wage. This pattern would reduce the between-firm income inequality. In column (2), we further control the year dummies to absorb the macro shocks. Results indicate that the interaction term is still significantly positive. In columns (3) – (6), we further employ alternative monetary policy measures, such as shibor rate and reverse repo rate. Results suggest that the coefficients of the interaction terms are all significantly positive, implying that the decrease of the shibor rate or reverse repo rate would also favor the initial lower wage firms. This pattern would cause the reduction of between-firm inequality.

Besides affecting the income inequality, the monetary policy could also cause misallocation between firms (Hsieh and Klenow, 2009; Song et al., 2011). For example, low productivity firms may be characterized with lower wage, while at the same time they benefit more from the monetary policy. In such case, our results may be driven by the misallocation. In order to rule out this possibility, we conduct the following tests. Table 4 shows the heterogeneous effect monetary policy shock on firms with different initial productivity. Following Ru (2018), the labor productivity is defined as the firm revenue divided by employers (in logs). In columns (1)- (3), results show that when the monetary policy index decreases, firms with low initial productivity would benefit more. For example, their wage, revenue and labor productivity increase more when faced with expansionary monetary policy. These results are robust when we further control the year dummies. Firm-level evidence shows that the expansionary monetary policy would favor low-productivity firms, which may cause misallocation. In columns (4), we at the same time add both interactions into the estimation. We find that, after controlling the misallocation, the interaction terms of

monetary policy index and the initial firm wage are still significantly positive, indicating that the monetary policy shock would still have an impact on income inequality after we consider the possible misallocation hypothesis.

C. Worker level evidence

Evidence from the city-level and firm-level regressions show that expansionary monetary policy would reduce income inequality by favoring low-income household or firms. In this section, we further discuss the topic using more detailed worker level data. Specifically, we explore the heterogeneous effect of the monetary policy shock on worker with different initial income level. Table 5 shows the baseline results at worker level. The monetary policy index represents the monetary policy stance of the PBOC, and a larger value indicates more tighter monetary policy. In order to alleviate endogeneity, we use the one-year lagged monetary policy index.

In column (1), we explore the heterogeneous effect of monetary policy shock on worker income. Results show that the coefficient of the lagged MP index is significantly negative, while the interaction term of MP index and the initial worker income is significantly positive. The results indicate that the decrease of monetary policy index (expansionary) is more favorable to low-income workers, thus reducing the income inequality among workers. The results remain robust when we further control the year dummies in column (2). Although the year dummies absorb the effect of the monetary policy, the coefficient of the interaction term is still significant and positive in column (2). In columns (3) - (6), we further decompose the worker income into worker wage (monthly) and worker bonus (yearly). We find similar pattern for both worker wage and bonus. These results indicate that the expansionary monetary policy would reduce income inequality by favoring the low-income workers. This is also driven by the variation of both wages and bonus.

For robustness, we also employ additional measures of monetary policy in Table 6, including the 30-day shibor rate, 7-day reverse repo rate, and the exogeneous component of M_2 growth rate estimated following the regime-switching model of Chen et al. (2018). The increase of 30-day Shibor rate and 7-day reverse repo rate indicate contractive monetary policy, while the increase of the M_2 growth rate indicates expansionary monetary policy. Results in column (1) show that the coefficient of the shibor rate is significantly negative, while the coefficient of the interaction term is significantly positive, consistent with the baseline results. In column (2), we further control the year dummies and obtain robust results. In columns (3) and (4), we find similar pattern using the reverse repo rate as the monetary policy measure. In columns (5) and (6), we further employ the exogeneous M_2 growth rate measure. We find that the coefficients of the exogeneous M_2 growth rate and the initial worker income interactions are significantly negative, indicating that the low-income workers benefit more from increasing money supply. These results are consistent with the baseline results. When faced with the expansionary monetary policy, the low-income workers would benefit more. Thus, the expansionary monetary policy would reduce inequality by favoring the low-income workers.

In Table 7, we further replace the initial worker income with the within-firm pay rank measure,

following Moser et al. (2021). The indicator could capture the within-firm inequality. Specifically, following Moser et al. (2021), we set the following specification. We firstly calculate the initial within-firm pay rank (1,2,. . . , n, and n is the number of workers for each firm in the initial year) for each worker which shows their relative income within the firm. A larger value of within-firm pay rank indicates relatively larger worker income within the firm (the worker with the lowest income would be defined as rank 1). We then add the interaction term of the monetary policy index and the within-firm pay rank into estimation. Results in column (1) show that the coefficient of the monetary policy index is significantly negative, while the interaction term is significantly positive, indicating that there is stronger positive impact of expansionary monetary policy on worker income for the worker with smaller pay rank (lower relative worker income) within the firm. This indicates that the expansionary monetary policy would reduce the within-firm inequality. In column (2), we further add the year dummies which would absorb the impact of the monetary policy index. Meanwhile, the coefficient of the interaction term of monetary policy index and worker within-firm pay rank is still significantly positive. Considering that some firm-level factors would cause endogeneity, in column (3), we further control the firm-year fixed effects to absorb any firm-level time-varying shocks which could bias our results. Results show that the coefficients of the interaction terms remain stable under the stricter fixed effects, and our main results still hold.

D. Heterogeneity tests

In Table 8 and 9, we compare the impact of the monetary policy shock on inequality among different industries. Specifically, we explore the industrial heterogeneity from two dimensions, the industrial capital intensity and financial constraint.

Firstly, we explore the role of industrial capital intensity in Table 8. The rationale is that the bargaining power of the worker may depend on the labor intensity, which might affect the impact of the monetary policy shock on worker income and the inequality. In order to testify this hypothesis, we construct the industry level capital intensity measure. It is defined as the mean capital intensity of all firms within each CIC 2-digit industry. The firm-level capital intensity is defined as the fixed capital divided by the number of workers (in logs) using the ASIF industrial firm data. We also use the industrial capital intensity measure in the initial year to alleviate endogeneity problem. In column (1), we find that the coefficient of the interaction term of monetary policy index and the initial worker income is significantly positive, while the triple interaction term of the monetary policy index, the initial worker income and the industrial initial capital intensity are significantly negative. These results imply that the decrease of monetary policy index would favor low income workers and reduce inequality, especially in more labor-intensive industries. Columns (2)-(3) show similar patterns for worker wage and worker bonus. One possible reason behind the phenomenon is that in more labor-intensive industries, workers play a more important role in the firm production, and the bargaining power is larger. Thus, they show stronger response to the expansionary monetary policy.

Then, in Table 9, we further explore the role of industrial financial constraint. We expect that

the impact of the expansionary monetary policy on worker income inequality would be more evident in more financially constrained industries, such as industries that rely more on external finance. Following Rajan and Zingales (1998) and Huang et al. (2020), we construct the industrial external finance dependence indicator using the Chinese industrial firm data. Results in column (1) shows that the interaction term of the monetary policy index and the initial worker income is significantly positive, while the triple interaction term of monetary policy index, initial worker income and the industrial external finance dependence indicator is significantly positive, indicating that the impact of the expansionary monetary policy on worker income inequality is more pronounced in industries that rely more on the external finance dependence. This is consistent with our hypothesis, that the expansionary would reduce income inequality through alleviating financial constraint. In columns (2) and (3), we further decompose the worker income into worker wage and worker bonus. Results show that the role of industrial financial constraint is more evident in worker wage, instead of worker bonus.

In Table 10, we further explore the regional heterogeneity of our baseline results. We mainly focus on three city-level heterogeneity, city income (GDP per capita), deficit rate and bank penetration. Consistent with the specification in the first part, we also use the value of all three indicators in initial year. In column (1), we test the heterogeneous impact of monetary policy shock on inequality among cities with different economic development level. Results show that the interaction term of the monetary policy index and initial worker income is significantly positive, while the triple interaction term of monetary policy index, initial worker income and city income is significantly negative, indicating that the impact of the expansionary monetary policy on worker income inequality is more evident among cities with lower level of economic development. In columns (2) and (3), we also find that the inequality-reducing effect of the expansionary monetary policy is stronger in areas with tighter fiscal budget and smaller bank penetration. One possible reason is that in those areas, as the economic development and the financial development level is lower, and the local government is more fiscal binding, the inequality problem could be more severe.

E. Channel test: Monetary policy shock, bank lending and income inequality

So far, we have found that the expansionary monetary policy would reduce worker income inequality by favoring low-income workers. Besides, in the first empirical part, results demonstrate that expansionary monetary policy would reduce the loan rate and increase the loan volume. In this section, we aim to combine those results, and explore whether the bank lending could be a possible channel of the redistribution effects of the monetary policy.

(1) Bond financing cost and inequality

Firstly, as we have argued before, the bond financing costs is the channel of the monetary policy transmission to the bank lending, such as the loan rate. So, in this section, we directly use the bond financing costs measure to replace the monetary policy index and explore the heterogeneous effect of the bank financing cost on worker income in Table 11. We expect that similar to the monetary policy shock, the decrease of the bond financing cost of the bank would also benefit workers with

lower initial income. We also use two indicators to measure the bond financing cost, the bond YTM in the second market, and the bond issuing rate in the first market. Results in column (1) shows that the coefficient of the bond YTM of the sample bank is significantly negative, while the coefficient of the bond YTM and the worker initial income is significantly negative. This relationship remains robust when we further control the year dummies in column (2). These results indicate that the decrease of the bond YMT would also favor low-income workers. In columns (3) and (4), we further employ the bond issuing rate of the bank in the first bond market, and obtain similar results. We also find that the decrease of the bond issuing rate would reduce income inequality by favoring the low-income workers. The results in Table 11 show that the bank financing cost could actually be a channel of monetary policy transmission to income inequality.

(2) Bank lending and inequality

Next, we test whether the bank lending contributes to the redistribution effects by directly exploring the impact of the sample bank loan on income inequality. As we have found that the expansionary monetary policy would reduce the bank loan rate and increase bank loan volume, we would expect that the increase of the bank loan outstanding and the decrease of the bank loan rate would reduce income inequality.

Table 12 shows the heterogeneous effects of the city bank loan outstanding on worker income. In column (1), we directly test the impact of loan outstanding on worker income. The coefficient of loan outstanding is insignificant, indicating that there may not be significant impact of loan outstanding on firm income averagely. However, as we have emphasized before, the impact could be highly heterogeneous, thus affecting the income inequality. In column (2), we add the interaction term of loan outstanding and the worker initial income. We find that the coefficient of the interaction term is significantly negative, while the coefficient of the loan outstanding is significantly positive. These results indicate that the increase of the bank loan outstanding is more favorable to low-income workers, thus reducing the income inequality among workers. In columns (3) and (4), we further decompose the income into monthly wage and yearly bonus. We find similar pattern for worker wage, yet not for bonus. When the loan outstanding increases, the wage of low-income workers increase more, alleviating the income inequality.

In Table 13, we further explore the impact of loan price on income inequality. In columns (1), we explore the heterogeneous impact of loan rate movement on worker income. Results show that when loan rate decreases, low-income workers will benefit more. Thus, the decrease of loan rate would reduce inequality by favoring low-income workers. In columns (2)-(3), we respectively use the worker wage and worker bonus as the dependent variable, and find that the inequality-reducing effect could be driven by the variation of both worker wage and worker bonus. In columns(4)-(6), we replace the loan rate with loan spread, and obtain very similar results. The decrease of loan spread would also favor low-income workers, including both the wage and bonus.

Consistent with the previous settings, we also explore the role of within-firm pay rank in Table 14. Results in column (1) show that the coefficient of the loan outstanding is significantly positive, while the interaction term of the loan outstanding and the within-firm pay rank is significantly

negative, indicating that there is stronger positive impact of loan outstanding on worker income for the worker with smaller pay rank (lower relative worker income) within the firm. This proves that the bank loan would reduce the within-firm inequality. In column (2), we further control the firm-year fixed effects to absorb any firm-level time-varying shocks which could bias our results. Results show that the coefficients of the interaction terms remain stable under the stricter fixed effects, and our main results still hold. In columns (3) and (4), we further explore the impact of the loan rate on within-firm inequality. Results indicate that the coefficient of the loan rate is significantly negative, and the coefficient of the interaction term of loan rate and worker within-firm pay rank is significantly positive. This implies that the decrease of loan rate would favor those workers with smaller within-firm pay rank (lower income), thus reducing inequality. This result is also robust after we control the firm-year fixed effects.

Secondly, to explore the impact of the bank loan on the between-firm inequality, we also run the following firm level regression. Table 15 reports the results. The dependent variable is the firm-level wage. In column (1), we find that the coefficient of the loan outstanding is significantly positive, while the coefficient of the interaction term of loan outstanding and the initial firm wage is significantly negative, indicating that the increase of loan outstanding would have a larger positive impact on firms with lower initial income. This pattern would reduce the between-firm income inequality. In columns (2) and (3), we further explore the impact of loan rate and loan spread on between-firm inequality. Results suggest that the coefficients of the loan rate (spread) are significantly negative, while the coefficients of the interaction terms are significantly positive, implying that the decrease of loan rate (spread) would also favor the lower initial wage firms. This would also cause the reduction of between-firm inequality.

(3) Bank lending and inequality: Heterogeneity

Next, we also further analyze the heterogeneity of the impact of the bank lending on worker income inequality, including the industrial heterogeneity and the regional heterogeneity.

In Table 16, we compare the impact of the bank loan on inequality among industries with different capital intensity. In column (1), we find that the coefficient of the interaction term of loan outstanding and the initial worker income is significantly negative, while the triple interaction term of the loan outstanding, the initial worker income and the industrial initial capital intensity are significantly positive. This result implies that the increase of loan outstanding would favor low income workers and reduce inequality, especially in more labor-intensive industries. We also obtain similar conclusion in column (2) using the loan rate as the bank lending measure. One possible reason behind the phenomenon is that in more labor-intensive industries, workers play a more important role in the firm production, and the bargaining power is larger. Thus, they show stronger response to the bank lending.

Table 17 further explores the role of industrial financial constraint. We also employ the industrial external finance dependence indicator to measure the industrial financial constraint, and find that the impact of the bank lending on inequality is concentrated in more financially constrained industries, consistent with the previous results.

In Table 18, we explore the regional heterogeneity. In column (1), we test the heterogeneous impact of loan outstanding on inequality among cities with different economic development level. Results show that the interaction term of loan outstanding and initial worker income is significantly negative, while the triple interaction term of loan outstanding, initial worker income and city GDP per capita is significantly positive, indicating that the impact of the loan outstanding on the worker income inequality is more evident among cities with lower level of economic development. In columns (2) and (3), we also find that the inequality-reducing effect of the bank lending is stronger in areas with tighter fiscal budget and smaller bank penetration. The policy nature of the bank lending helps to alleviate the inequality problem by favoring the low-income workers, especially in those poorer areas. In columns (4)-(6), we further explore the role of loan rate on inequality. We find consistent results with loan outstanding. The decrease of loan rate would reduce worker income inequality, and this pattern is concentrated in areas with lower economic development, weaker fiscal capacity and smaller bank penetration.

F. Spillover effects

Besides the direct effect of the bank lending on income inequality, we also explore the spillover effect along the supply chains. Specifically, the increase of the bank lending to the upstream industries may also affect the worker income and inequality of the downstream industries through production network (Ru, 2018). To study the spillover effect through the input-output table, following Ru (2018), we define the upstream industry for each CIC 2-digit industry as the industry that provides the most intermediate input for it. The input-output data between industries comes from the the Chinese input-output table in year 2007. We then explore the impact of the bank loan movement in the upstream industry on the worker income and inequality in the downstream industry. The results are reported in Table 19.

In column (1), we use the upstream loan outstanding, as well as its interaction term with initial worker income to explain the worker income movement in the downstream industry. Results show that the coefficient of the upstream loan outstanding is significantly positive, while the coefficient of the interaction term is significantly negative, indicating that the increase of the upstream loan outstanding would benefit the worker income in the downstream industry, and more so for the initial low-income workers. In such case, the bank loan to the upstream industries would also help to alleviate the inequality of the downstream industries, thus implying the spillover effect of the bank lending along supply chains. In columns (2) and (3), we separately use the worker wage and bonus as the dependent variable, and find similar results. In columns (4)-(6), we further study the spillover effect of the bank loan rate on worker income and inequality in the downstream industries, and find consistent results. The decrease of the loan rate in the upstream industries would also reduce income inequality of the downstream industries.

Table 20 further studies the spillover effect by exploring the impact of the downstream industry loan on upstream inequality. The identification of the downstream industry also follows Ru (2018).

We define the downstream industry for each CIC 2-digit industry as the industry that absorbs the most intermediate input it produces. Results in column (1) show that the bank loan of the downstream industry would also reduce the income inequality in the upstream industry by favoring the low-income workers in the upstream industry. In columns (2) and (3), we decompose the worker income into worker wage and bonus, and find that the spillover effect is mainly driven by the worker wage. In columns (4) – (6), we further employ the loan rate and find consistent results. The decrease of the loan rate in the downstream industry would also reduce the income inequality of the upstream industry.

IV. Conclusion

In this paper, we explore the redistribution effect of monetary policy through the bond financing channel. Our empirical specification relies on two detailed micro datasets, the bank loan dataset as well as the employer-employee survey dataset. We firstly explore the bond financing channel of the monetary policy to the bank lending, and find that expansionary monetary policy would decrease loan rate and spread of the bank lending through the bond financing channel. Besides, it would also increase loan volume and decrease loan quality. We also find vast heterogeneity of the monetary policy transmission. We find stronger transmission in the contractive monetary policy period, and also in areas with lower level of economic development, weaker fiscal capacity, and less bank penetration.

We then explore the redistribution effects of the monetary policy and study the impact of the monetary policy shock on income inequality. City-level, firm-level and worker-level results demonstrate that expansionary monetary policy could reduce income inequality, both within and between firm. This effect is more evident in less developed areas, labor-intensive and financially constrained industries. Channel tests indicate that the bond financing costs and bank lending also matter for the income inequality. The increase of the bank loan or the decrease of the loan rate would reduce inequality. We also find strong spillover effect of the bank lending on inequality among supply chains.

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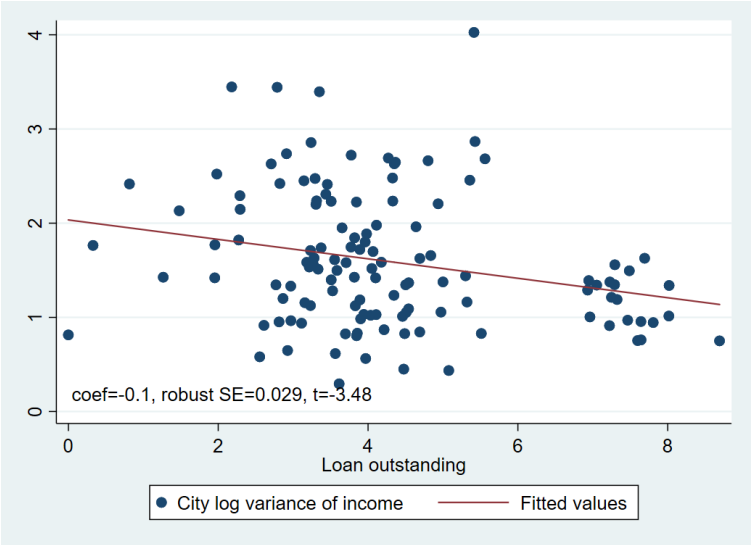
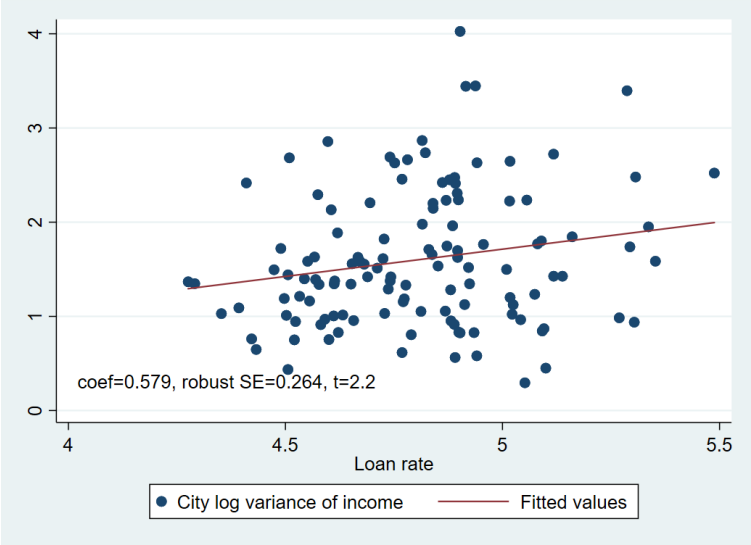
Table I:Summary statistics of key variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Employee level					
Ln worker income	37,543	10.815	0.598	2.303	16.396
Ln worker wage	38,337	8.092	1.015	0.000	13.816
Ln worker bonus	37,930	6.856	3.471	0.000	13.998
Firm level					
Ln Firm average income	4,990	10.646	1.701	6.876	19.545
Ln Firm revenue	5,222	8.476	2.337	0.000	22.824
Firm profit rate	5,066	0.032	0.179	-0.907	0.500
City level					
Ln GDP	47,404	7.808	1.275	2.303	13.731
Ln Population	47,131	8.607	0.924	5.048	14.147
Rev.to GDP	44,851	0.090	0.039	0.011	0.238
Ln City loan outstanding	37,543	4.519	2.157	0.000	8.122
City loan rate (%)	33,753	4.811	0.255	4.276	5.731
City loan spread (%)	33,753	-0.056	0.251	-0.623	0.905

Notes: This table shows the summary statistcis of key variables, including the employee level, firm level and city level variables.



(a) Loan outstanding and city income inequality



(b) Loan rate and city income inequality

Figure 1. The relationship between bank lending and city income inequality

Notes: This figure shows the relationship between the sample bank loan outstanding (rate) and inequality. Each dot refers to a city in year 2016.

Table II Monetary policy, bank lending and city level income inequality

	(1)	(2)	(3)	(4)
	City income inequality			
L. MP index	0.366**			
	(0.142)			
City loan rate		0.081**		
		(0.035)		
City loan spread			0.242**	
			(0.119)	
City loan outstanding				-0.068***
				(0.018)
Constant	1.482***	1.134***	1.583***	1.876***
	(0.051)	(0.199)	(0.031)	(0.084)
Observations	495	495	495	495
R-squared	0.013	0.011	0.008	0.027

Notes: This table shows the relationship between monetary policy, bank lending and city income inequality. *, **, *** denote significance level at 10%, 5% and 1%.

Table III The heterogeneous effect of monetary policy shock on firm wage

	(1)	(2)	(3)	(4)	(5)	(6)
	Firm wage					
L. MP index	-0.294***					
	(0.057)					
L. MP*Initial firm wage	0.021***	0.021***				
	(0.005)	(0.005)				
L. Shibor30			-0.208***			
			(0.037)			
L. Shibor30*Initial firm wage			0.015***	0.015***		
			(0.003)	(0.003)		
L. Repo07					-0.186***	
					(0.035)	
L. Repo07*Initial firm wage					0.014***	0.014***
					(0.003)	(0.003)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	Yes	No	Yes
Observations	3,644	3,644	3,644	3,644	3,644	3,644
R-squared	0.977	0.977	0.977	0.977	0.977	0.977

Notes: This table shows the effect of the monetary policy shock on between-firm inequality. The dependent variable is the firm wage. The initial firm wage refers to the firm wage in the first year of the sample. The control variables include the firm controls such as firm revenue and firm profit rate, as well as city controls such as GDP, population and fiscal revenue to GDP. Robust standard errors are clustered at firm level. *, **, *** denote significance level at 10%, 5% and 1%.

Table IV Heterogeneous effect of monetary policy shock: firm productivity

	(1)	(2)	(3)	(4)	(5)
	Firm wage	Firm revenue	Labor prod.	Firm wage	
L.MP index	-0.143***	-0.563***	-0.147***	-0.357***	
	(0.038)	(0.106)	(0.034)	(0.071)	
L.MP*Firm initial prod.	0.021**	0.100***	0.029***	0.019**	0.020**
	(0.009)	(0.027)	(0.008)	(0.009)	(0.009)
L.MP*Firm initial wage				0.021***	0.021***
				(0.005)	(0.005)
Controls	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	No	No	Yes
Observations	3,592	3,878	3,878	3,582	3,582
R-squared	0.976	0.984	0.990	0.976	0.977

Notes: This table shows the heterogeneous effect of the monetary policy shock on firm performance. The dependent variable is the firm wage, firm revenue and firm productivity. In all columns except for column (2), the control variables include firm revenue, firm profit rate, as well as city controls such as GDP, population and fiscal revenue to GDP. In column (2), the control variables include firm profit rate, as well as city controls. The initial firm productivity refers to the firm labor productivity in the first year of the sample. Robust standard errors are clustered at firm level. *, **, *** denote significance level at 10%, 5% and 1%.

Table V Monetary policy and inequality

	(1)	(2)	(3)	(4)	(5)	(6)
	Worker income		Worker wage		Worker bonus	
L. MP index	-2.572***		-2.554***		-1.150**	
	(0.237)		(0.355)		(0.542)	
L. MP*Initial income	0.234***	0.221***	0.235***	0.228***	0.106**	0.096*
	(0.022)	(0.022)	(0.033)	(0.033)	(0.050)	(0.050)
GDP	0.526***	0.242***	0.371***	0.226***	0.706***	0.490**
	(0.037)	(0.041)	(0.065)	(0.075)	(0.204)	(0.241)
Population	-0.491***	-0.253**	-0.230	-0.109	0.467	0.648
	(0.126)	(0.124)	(0.154)	(0.159)	(0.637)	(0.642)
RevtoGDP	0.113	0.728*	0.299	0.614	-2.624	-2.156
	(0.370)	(0.371)	(0.613)	(0.617)	(1.920)	(1.945)
Worker FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	Yes	No	Yes
Observations	23,417	23,417	23,501	23,501	23,473	23,473
R-squared	0.879	0.881	0.706	0.706	0.907	0.907

Notes: This table shows the heterogeneous effect of the monetary policy shock on worker income. MP index is the monetary policy index reflecting the Chinese monetary policy index. Worker initial income refers to the worker's income level in the first year of the sample. Worker income consists of worker wage and bonus. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table VI Alternative monetary policy measure

	(1)	(2)	(3)	(4)	(5)	(6)
			Worker income			
L. Shibor30	-1.240***					
	(0.097)					
L. Shibor30*Initial income	0.110***	0.110***				
	(0.009)	(0.009)				
L. Repo07			-1.505***			
			(0.117)			
L. Repo07*Initial income			0.134***	0.134***		
			(0.011)	(0.011)		
L. Exo.M_2g					6.435***	
					(0.627)	
L. Exo.M_2g*Initial income					-0.575***	-0.575***
					(0.059)	(0.059)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	Yes	No	Yes
Observations	23,417	23,417	23,417	23,417	15,906	15,906
R-squared	0.884	0.884	0.883	0.883	0.925	0.925

Notes:This table shows the robustness results using alternative monetary policy shock measures. All regressions include the controls used in Table 18. Robust standard errors are clustered at the borrower level. *, **, *** denote significance level at 10%, 5% and 1%.

Table VII The role of within-firm pay rank

	(1)	(2)	(3)
		Worker income	
L. MP index	-0.128***		
	(0.010)		
L. MP*Initial within-firm pay rank	0.011***	0.008***	0.017***
	(0.002)	(0.002)	(0.002)
Controls	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes
Year FE	No	Yes	No
Firm-Year FE	No	No	Yes
Observations	27,907	27,907	27,535
R-squared	0.873	0.875	0.901

Notes: This table shows the effect of the monetary policy shock on within-firm inequality. The initial within-firm pay rank (1,2,. . . , n) for each worker shows their relative income within the firm. A larger value of within-firm pay rank indicates relatively larger worker income within the firm (the worker with the lowest income would be defined as rank 1). All regressions include the controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table VIII Monetary policy and inequality: Industrial heterogeneity (capital intensity)

	(1) Worker income	(2) Worker wage	(3) Worker bonus
L.MP*Initial income	0.260***	0.269***	0.130**
	(0.027)	(0.039)	(0.061)
L.MP*Initial income*Ind. KL	-0.006***	-0.006**	-0.012*
	(0.001)	(0.003)	(0.007)
Controls	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	19,800	19,873	19,848
R-squared	0.878	0.709	0.907

Notes: This table shows the industrial heterogeneity results. Industrial KL refers to the industrial capital intensity in year 2006. Industrial capital intensity is defined as the mean value of the firm capital intensity within the industry. The firm-level capital intensity is constructed using the ASIF database. All regressions include the controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table IX Monetary policy and inequality: Industrial heterogeneity (financial constraint)

	(1) Worker income	(2) Worker wage	(3) Worker bonus
L. MP*Initial income	0.212***	0.239***	0.128*
	(0.027)	(0.048)	(0.074)
L. MP*Initial income*Ind. EF	0.001***	0.001**	0.001
	(0.000)	(0.000)	(0.001)
Controls	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	12,332	12,371	12,365
R-squared	0.890	0.720	0.905

Notes: This table shows the industrial heterogeneity results. Industrial External Finance Dependence (Ind. EF) refers to the industrial financial constraint level in year 2006. Industrial external finance dependence measure is constructed following Rajan and Zingales (1998) and Huang et al. (2020), using the ASIF database. All regressions include the controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table X Monetary policy and inequality: Regional heterogeneity

	(1)	(2)	(3)
	Worker income		
L. MP*lnitial income	0.345***	0.230***	0.253***
	(0.031)	(0.022)	(0.023)
L. MP*lnitial income*GDP per	-0.010***		
	(0.001)		
L. MP*lnitial income*Deficit rate		0.023***	
		(0.003)	
L. MP*lnitial income*Bank			-0.012***
			(0.001)
Controls	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	23,417	23,417	22,857
R-squared	0.881	0.881	0.881

Notes: This table shows the regional heterogeneity results. GDP per, deficit rate and bank refers to the GDP per capita, the fiscal deficit rate and the bank penetration of each city in the first year of the sample. All regressions include the controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table XI Heterogeneous effect of bank financing cost on worker income

	(1)	(2)	(3)	(4)
	Worker income			
L. Bond YTM	-1.483***			
	(0.116)			
L. Bond YTM*Initial income	0.132***	0.132***		
	(0.011)	(0.011)		
L. Bond cost			-1.325***	
			(0.104)	
L. Bond cost*Initial income			0.118***	0.118***
			(0.010)	(0.010)
Controls	Yes	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	23,417	23,417	23,417	23,417
R-squared	0.884	0.884	0.884	0.884

Notes: This table shows the heterogeneous effect of bank financing cost on worker income. Bond cost is the issuing rate of the 10-year bonds issued by the sample bank in the first market. Bond YTM is the yield to maturity of the 10-year bonds issued by the sample bank in the second market. All regressions include the controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table XII Loan outstanding and worker income inequality

	(1) Income	(2) Income	(3) Wage	(4) Bonus
Loan outstanding	-0.007	1.406***	1.323**	1.255
	(0.007)	(0.327)	(0.588)	(0.840)
Loan outstd.*Initial income		-0.132***	-0.124**	-0.112
		(0.031)	(0.055)	(0.078)
Controls	Yes	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	27,907	23,417	23,501	23,473
R-squared	0.874	0.877	0.704	0.907

Notes: This table shows the impact of the bank loan outstanding on worker income inequality. Initial income refers to the worker's income level in the first year of the sample. Worker income consists of worker wage and bonus. The income, wage, bonus, loan outstanding, GDP, population are in logs. All regressions include the controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table XIII Loan rate and worker income inequality

	(1) Income	(2) Wage	(3) Bonus	(4) Income	(5) Wage	(6) Bonus
Loan rate	-3.216***	-3.828***	-1.585**			
	(0.315)	(0.533)	(0.765)			
Loan rate*Initial income	0.307***	0.363***	0.165**			
	(0.030)	(0.050)	(0.072)			
Loan spread				-3.235***	-3.788***	-1.833**
				(0.319)	(0.525)	(0.768)
Loan spread*Initial income				0.309***	0.360***	0.187***
				(0.030)	(0.050)	(0.072)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	23,417	23,501	23,473	23,417	23,501	23,473
R-squared	0.880	0.707	0.907	0.880	0.707	0.907

Notes: This table shows the impact of the city loan rate on worker income inequality. Initial income refers to the worker's income level in the first year of the sample. Worker income consists of worker wage and bonus. All regressions include controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table XIV Bank loan and within-firm inequality

	(1)	(2)	(3)	(4)
	Worker Income			
Loan outstanding	0.041***			
	(0.013)			
Loan outstanding*	-0.012***	-0.019***		
Initial within-firm pay rank	(0.002)	(0.003)		
Loan rate			-0.053**	
			(0.021)	
Loan rate*			0.023***	0.044***
Initial within-firm pay rank			(0.003)	(0.004)
Controls	Yes	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes	Yes
Year FE	Yes	No	Yes	No
Firm-year FE	No	Yes	No	Yes
Observations	27,907	27,535	27,907	27,535
R-squared	0.875	0.900	0.875	0.901

Notes:This table shows the effect of the bank loan on within-firm inequality. The initial within-firm pay rank (1,2,. . . , n) for each worker shows their relative income within the firm. A larger value of within-firm pay rank indicates relatively larger worker income within the firm (the worker with the lowest income would be defined as rank 1). All regressions include the controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table XV Bank loan and between-firm inequality

	(1)	(2)	(3)
		Firm wage	
Loan outstanding	0.210*		
	(0.116)		
Loan outstanding*Initial firm wage	-0.020**		
	(0.010)		
Loan rate		-0.336***	
		(0.112)	
Loan rate*Initial firm wage		0.042***	
		(0.011)	
Loan spread			-0.348***
			(0.113)
Loan spread*Initial firm wage			0.043***
			(0.011)
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	3,644	3,644	3,644
R-squared	0.977	0.977	0.977

Notes: This table shows the effect of the bank loan on between-firm inequality. The dependent variable is the firm wage, which is defined as the total income of workers divided by the number of workers. The initial firm wage refers to the firm wage in the first year of the sample. The control variables include the firm revenue, firm profit rate, city GDP, population and revenue-to-GDP ratio. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table XVI Bank loan and inequality: Industrial heterogeneity (capital intensity)

	(1)	(2)
	Worker income	
Loan outstanding	1.633***	
	(0.346)	
Loan outstd*Initial income	-0.170***	
	(0.034)	
Loan outstd*Initial income *Ind. KL	0.004**	
	(0.002)	
Loan rate		-3.251***
		(0.348)
Loan rate*Initial income		0.331***
		(0.034)
Loan rate*Initial income*Ind. KL		-0.006***
		(0.002)
Controls	Yes	Yes
Worker FE	Yes	Yes
Year FE	Yes	Yes
Observations	19,800	19,800
R-squared	0.874	0.877

Notes: This table shows the industrial heterogeneity results. Industrial KL refers to the industrial capital intensity in year 2006. Industrial capital intensity is defined as the mean value of the firm capital intensity within the industry. The firm-level capital intensity is constructed using the ASIF database. All regressions include the controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table XVII Bank loan and inequality: Industrial heterogeneity (financial constraint)

	(1)	(2)
	Worker income	
Loan outstanding	2.327***	
	(0.421)	
Loan outstanding*Initial income	-0.218***	
	(0.039)	
Loan outstanding*Initial income*Ind. EF	-0.001***	
	(0.000)	
Loan rate		-3.225***
		(0.445)
Loan rate*Initial income		0.306***
		(0.042)
Loan rate*Initial income*Ind. EF		0.001**
		(0.000)
Controls	Yes	Yes
Worker FE	Yes	Yes
Year FE	Yes	Yes
Observations	12,332	12,332
R-squared	0.888	0.890

Notes: This table shows the industrial heterogeneity results. Industrial External Finance Dependence (Ind. EF) refers to the industrial financial constraint level in year 2006. Industrial external finance dependence measure is constructed following Rajan and Zingales (1998) and Huang et al. (2020), using the ASIF database. All regressions include the controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table XVIII Bank loan and inequality: Regional heterogeneity

	(1)	(2)	(3)	(4)	(5)	(6)
			Worker income			
Loan outstanding	1.509***	1.533***	1.468***			
	(0.344)	(0.347)	(0.348)			
Loan out.*Initial income	-0.190***	-0.138***	-0.145***			
	(0.043)	(0.031)	(0.034)			
Loan out.*Initial income	0.004***					
*GDP per	(0.001)					
Loan out.*Initial income		-0.011***				
*Deficit		(0.003)				
Loan out.*Initial income			0.005***			
*Bank			(0.002)			
Loan rate				-3.527***	-3.597***	-3.551***
				(0.329)	(0.331)	(0.327)
Loan rate*Initial income				0.493***	0.320***	0.365***
				(0.043)	(0.030)	(0.032)
Loan rate*Initial income				-0.015***		
*GDP per				(0.002)		
Loan rate*Initial income					0.036***	
*Deficit					(0.004)	
Loan rate*Initial income						-0.020***
*Bank						(0.002)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	23,417	23,417	22,857	23,417	23,417	22,857
R-squared	0.877	0.877	0.877	0.881	0.881	0.881

Notes: This table shows the regional heterogeneity results. GDP per, deficit and bank refers to the GDP per capita, the deficit rate and the bank penetration of each city in the first year of the sample. All regressions include the controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table XIX The impact of the upstream industry loan on downstream inequality

	(1) Income	(2) Wage	(3) Bonus	(4) Income	(5) Wage	(6) Bonus
Upstream Loan outstanding	5.789***	6.148***	3.829*			
	(0.687)	(1.004)	(2.010)			
Upstream Loan outstanding	-0.553***	-0.587***	-0.390**			
*Initial income	(0.065)	(0.094)	(0.189)			
Upstream Loan rate				-6.196***	-6.996***	-3.861**
				(0.566)	(1.073)	(1.643)
Upstream Loan rate				0.585***	0.664***	0.333**
*Initial income				(0.054)	(0.100)	(0.153)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,800	19,873	19,848	19,800	19,873	19,848
R-squared	0.876	0.708	0.907	0.879	0.711	0.907

Notes:This table shows the spillover effects of the bank loan. Upstream loan outstanding and loan rate refer to the loan outstanding and weighted loan rate in the upstream industry. The identification of the upstream industry follows Ru (2018). All regressions include the controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.

Table XX The impact of the downstream industry loan on upstream inequality

	(1) Income	(2) Wage	(3) Bonus	(4) Income	(5) Wage	(6) Bonus
Downstream Loan outstd.	2.648***	2.957***	1.339			
	(0.340)	(0.652)	(1.105)			
Downstream Loan outstd.	-0.249***	-0.277***	-0.142			
*Initial income	(0.032)	(0.060)	(0.103)			
Downstream Loan rate				-4.916***	-5.230***	-2.471*
				(0.519)	(1.118)	(1.479)
Downstream Loan rate				0.462***	0.496***	0.232*
*Initial income				(0.048)	(0.103)	(0.138)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,800	19,873	19,848	19,800	19,873	19,848
R-squared	0.875	0.707	0.907	0.877	0.709	0.907

Notes: This table shows the spillover effects of the bank loan. Downstream loan outstanding and loan rate refer to the loan outstanding and weighted loan rate in the downstream industry. All regressions include the controls used in Table 18. Robust standard errors are clustered at worker level. *, **, *** denote significance level at 10%, 5% and 1%.