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Intra-group trade credit and monetary policy: The case of China

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Abstract

Using panel data from Chinese listed firms, this study investigates how monetary tightening and firm-specific characteristics influence trade credit received from different sources. The analysis categorizes trade credit into three groups: related parties, non-related parties, and controlling shareholders. The findings reveal that during periods of monetary tightening, Chinese firms receive more trade credit from related parties and less from non-related parties. This shift is particularly pronounced when the related party is a controlling shareholder. This asymmetry underscores the strategic importance of intra-group financing in mitigating liquidity constraints during monetary tightening. Furthermore, the impact of firm-specific characteristics on related-party trade credit differs markedly from their influence on non-related-party credit. These effects are more pronounced when controlling shareholders are the providers reflecting the unique dynamics of intra-group trust and reduced information asymmetry. The study sheds light on the distinctive mechanisms of corporate financing in China's underdeveloped financial systems and advances the literature on the role of trade credit as a buffer during monetary contractions.

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Monetary policy
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1. Introduction

China stands as a remarkable example of a transition economy, having been the fastest-growing economy for over three decades. Its unique institutional environment offers a rich setting to study trade credit dynamics. Despite significant progress, the country's financial and capital markets remain underdeveloped, with institutional and legal frameworks still evolving. Moreover, many Chinese firms are "spin-off" from state-owned enterprises (SOEs). This environment compels Chinese firms to rely heavily on alternative financing methods, such as trade credit, to sustain their operations. Furthermore, Chinese government instituted the "bright-line"

rules for share issuance and delisting[1]. These rules create incentives for controlling shareholders to provide trade credit regardless of firms' financial health (Jian & Wong, 2010).

Firms use trade credit to overcome financial constraints (Danielson & Scott, 2004; Nilsen, 2002; Petersen & Rajan, 1997) and to lower transaction costs (Wilson & Summers, 2002). Trade credit is a vital source of external financing for businesses globally. In 1991, the ratio of aggregate trade credit to total assets was 17.8% for US firms, and more than 25% for countries such as Italy, France, and Germany. During the period from 1992 to 2007, this ratio was almost 10% for US listed firms (Aktas, De Bodt, Lobez, & Statnik, 2012). Similarly, Chinese firms exhibit high usage of trade credit. Accounts payables represented 11% of the total assets of Chinese firms over the period from 1999 to 2009 (Wu, Rui, & Wu, 2012). According to our data, from 2004 to 2013, Chinese suppliers financed approximately 17% of listed firms' assets. Notably, over half of these firms engage in trade credit transactions with related parties, including controlling shareholders, setting China apart from other economies. This reliance underscores the pivotal role of intra-group relationships in corporate financing. Studies (Chang & Hong, 2000; Dow & McGuire, 2009; Jian & Wong, 2010) show the intra-group relationship plays a unique role in corporate financing.

Firms receive trade credit from their suppliers in the form of accounts payable. This paper investigates the intricate interplay between monetary policy, firm-specific characteristics, and trade credit usage among Chinese listed firms. By distinguishing between trade credit from related parties, non-related parties, and controlling shareholders, the research sheds light on the role of intra-group relationships in corporate financing. It also examines how these dynamics influence the transmission of monetary policy, offering valuable insights for policymakers and financial practitioners.

This research contributes to the literature by uncovering the distinct mechanisms through which trade credit operates in China. By addressing the differences between related-party and non-related-party trade credit, it highlights the unique financing strategies employed by Chinese listed firms in response to monetary tightening. Furthermore, it provides evidence on how intra-group relationships and ownership structures shape the financing strategies of firms to external financial shocks. These insights enhance our understanding of corporate financing in China and inform policymakers the impact of trade credit on monetary policy.

The rest of this paper is organized as follows: Section 2 provides a literature review and outlines research hypotheses. Section 3 discusses the data. Section 4 presents the model and the results of empirical analyses. Conclusions follow in Section 5.

2. Literature Review and Research Hypotheses

2.1. Related Party and Controlling Shareholders' Trade Credit

In China, many listed firms are offshoots of state-owned enterprises (SOEs), which creates distinct trade credit dynamics compared to independent firms. These firms often engage in intra-group trade credit activities facilitated by shared trust, reduced information asymmetry, and aligned mutual interests, which differentiate them from non-related party transactions.

Cheung, Qi, Rau, and Stouraitis (2009) examine the characteristics of Hong Kong firms that conducted related party asset transfers to either tunnel or to prop up their listed firms. They found that state-owned firms, firms cross-listed on two stock exchanges, and those with foreign shareholders are more likely to be propped up using trade credit. Similarly, Jian and Wong (2010) demonstrate that listed Chinese firms use related-party trade credit as a management tool to boost earnings. Using data from 2000-2007, Guariglia and Mateut (2006) show that politically affiliated Chinese firms extend more trade credit than their non-affiliated peers. Kohlbeck and Mayhew (2017) found a positive correlation between restatements and related party transactions using data from S&P 1500.

Listed Chinese companies face two major threats when operating at a loss: (1) delisting and (2) losing the right to issue new shares according to the bright-line rules (Jian & Wong, 2010). Given the difficulty of gaining stock exchange listings, controlling shareholders are highly motivated to avoid delisting or restricted capital market access. Related-party trade credit serves as a tool to address these risks. In addition, related-party trade credit serves to reduce transaction costs, resolve production and ownership challenges Fisman and Khanna (2004) and improve business performance (Chang & Hong, 2000). Consequently, related party is less concerned about the firm's financial health when offering trade credit. This study explores the distinct trade credit usage of related versus non-related parties.

Fisman and Love (2003) show that controlling shareholders may choose to either tunnel or prop up their listed companies in countries with weak legal systems. Using data from Chinese listed companies, Peng, Wei, and Yang (2011) find that controlling shareholders conduct connected transactions to either prop up or tunnel their listed companies, depending on the companies' financial health. Jia, Shi, and Wang (2013) find that controlling shareholders provide more non-loan-based transactions to listed firms when these firms experience operational difficulties. This paper further studies whether trade credit usage from controlling shareholders differs from that of other related parties.

[1] Chinese securities regulators have set "bright-line" rules. Specifically, a firm must report no lower than 0% return on equity (ROE) to maintain its listing status and 6% ROE to issue new shares.

2.2. Trade Credit and Monetary Policy

Monetary policy influences trade credit usage through its impact on liquidity and credit availability. Tight monetary policy often restricts bank lending and intensifies credit rationing, making external finance more costly and difficult to obtain. Consequently, financially constrained firms turn to trade credit to support their operations (Guariglia & Mateut, 2006; Kashyap, Stein, & Wilcox, 1993). Nilsen (2002) shows that during monetary contractions, both small and large firms with no credit ratings increase their accounts payable. Analyzing disaggregated panel data from 1975 to 1997, Choi and Kim (2005) show that U.S. companies increase accounts payable in response to monetary tightening. Mateut, Bougheas, and Mizen (2006) provide a theoretical model and empirical evidence. They find that when monetary policy tightens and bank lending declines, British firms increase accounts payable. Developing a switching model, Atanasova (2007) finds that UK firms increase their reliance on trade credit during tight monetary policy, despite it being more expensive than conventional bank loans. Using data from Czech firms for the period of 2003-2011, Ruslan, Hájková, and Kubicová (2015) found that monetary contraction leads to an increase in trade credit.

In China, the response of trade credit to monetary policy is nuanced. Due to weaker institutional frameworks and higher reliance on intra-group financing, Chinese firms, particularly those with related party, exhibit asymmetric responses. Our analysis aligns with Mateut et al. (2006) who found that firms in credit-constrained environments turn to trade credit as a buffer against monetary shocks, with related parties playing a more significant role. The results provide policymakers with insights into how the trade credit channel may mitigate the effects of monetary policy.

2.3. Trade Credit Received and Firm-Specific Characteristics

Firm-specific factors significantly influence trade credit dynamics. To explore how firm-specific characteristics affect trade credit dynamics, we include the following variables in our analyses: bank credit, market power, ownership, age, size, earnings, growth, and corporate governance, industry, year.

Financial constraints often compel firms to seek trade credit to maintain production activities (Biais & Gollier, 1997; Meltzer, 1960; Petersen & Rajan, 1997) even when trade credit is a more expensive alternative. Additionally, research (Fisman & Love, 2003; Ge & Qiu, 2007) indicates that in countries with underdeveloped financial and capital markets, including China, firms tend to receive more trade credit because banks are reluctant to offer sufficient lending due to asymmetric information problems.

Firms may use trade credit from related parties even when not financially constrained, due to better trade credit terms provided by related parties, particularly controlling shareholders. We hypothesize that Chinese firms increase their usage of trade credit when bank credit is difficult to obtain. However, the substitutive relationship between trade credit and bank credit is significantly weakened when trade credit comes from related parties or controlling shareholders.

Firms with unfettered financial constraints and good credit can obtain suppliers' liquidity at low cost by using trade credit (Fabbri & Menichini, 2010; Fisman & Raturi, 2004; Giannetti, Burkart, & Ellingsen, 2011). Consequently, firms with market power can require suppliers to provide more trade credit through deferred payment (Summers & Wilson, 2002). However, when the supplier of trade credit is a related party, the mutual understanding and trust reduce asymmetric information problems and transaction costs, making the receiving firm's market power less important. We examine whether this relationship changes when trade credit is from related parties or controlling shareholders.

Ownership and governance structures further shape trade credit behaviors. State-owned enterprises (SOEs) and firms with strong governance tend to rely more heavily on related-party trade credit. Cull, Xu, and Zhu (2009) note that poorly performing SOEs redistribute credit to weaker customers, while non-state firms with robust governance leverage trade credit more efficiently. Profitability, growth potential, and firm size also determine a firm's capacity to use trade credit, with larger and more profitable firms generally receiving better terms.

3. Data and Summary Statistics

3.1. Data

The data used in this paper consist of all A-share listed companies on the Shanghai and Shenzhen Stock Exchanges for the years 2004–2013. These exchanges have grown exponentially to become two of the largest stock markets in the world. As of May 2017, the Shanghai Stock Exchange had a market capitalization of approximately US$4.96 trillion, with 1,284 listed firms, while the Shenzhen Stock Exchange had a market capitalization of US$3.7 trillion with 1,985 listed companies.

For this study, we excluded companies in the financial industry and firms with missing data. The dataset used for estimation contains a total of 15,429 firm-year observations of 2,035 non-financial Chinese listed firms between 2004 and 2013. Accounts payable represent approximately 17% of total assets. Data on corporate governance were obtained from the China Center for Economic Research (CCER) database, while other control variables were sourced from the China Stock Market and Accounting Research (CSMAR) database.

We conducted a Winsorization process (Dixon, 1960) to control for potential outliers with extreme values. Observations in the 1st and 99th percentiles were assigned the same values as those at the borders of these

percentiles. All financial variables were normalized by the firm's total assets, as assets offer an advantage over sales as a scaling variable due to their stability and reduced susceptibility to short-term fluctuations.

3.2. Measurement of the Key Variables

3.2.1. Trade Credit

Trade credit received, or accounts payable (AP), is categorized into two groups: related-party and non-related party. AP is defined as the ratio of the sum of accounts payable, notes payable, and cash advances from suppliers to total assets. Related party accounts payable (APRPT) is calculated as the ratio of accounts payable from related parties to total assets. Non-related party accounts payable (APNRPT) is the difference between AP and APRPT. Related party accounts payable (APRRP) is further divided into controlling shareholders and other related party accounts payable.

3.2.2. Monetary Policy

Monetary policy stance (MP) is represented by a dummy variable indicating tight monetary policy. In the long run, the growth rate of nominal GDP measures the money supply growth required to accommodate economic growth. Therefore, the difference between the growth rates of nominal GDP and money supply reflects the intensity of monetary policy. A positive number indicates that the money supply growth is insufficient to support nominal economic growth, representing a period of tight monetary policy, and MP is set to 1. Conversely, a negative number indicates that the money supply is more than enough to support economic activities, representing a period of loose monetary policy, MP is set to 0.

The differences between the growth rates of nominal GDP and money supply for the years 2004-2013 are as follows: 0.033, -0.023, 0.013, 0.061, 0.004, -0.199, -0.012, 0.005, -0.045, and -0.041. Therefore, MP is 1 for the years 2004, 2006, 2007, 2008, and 2011, and MP is 0 for the other years.

3.2.3. Firm-Specific Characteristics

The firm-specific variables reflect various theories of trade credit. We follow the methodologies of Petersen and Rajan (1997); Fisman and Love (2003); Choi and Kim (2005) and Cull et al. (2009) in selecting these variables.

Bank credit (BANK): This is the ratio of the sum of short-term and long-term loans to a firm's total assets. According to credit channel theory, firms with less bank credit increase their reliance on trade credit as an alternative source of funds when institutional credit is scarce (Danielson & Scott, 2004). We expect firms with lower bank credit during periods of tight monetary policy to rely more on funding from their suppliers.

Market power (MPOWER): This binary variable proxies for a firm's market power. If the ratio of a firm's sales to the industry's total sales is greater than the median industry market share, MPOWER is set to 1; otherwise, it is 0. We expect firms with market power to be more likely to receive trade credit.

Firm size (SIZE): Defined as the natural log of year-end total assets, firm size is indicative of an established reputation, which reduces default risk (Choi & Kim, 2005). Thus, firm size may positively affect suppliers' willingness to provide trade credit, increasing accounts payable. However, Nilsen (2002) finds that both small and large firms increase trade credit during monetary contractions, making the impact of firm size on accounts payable unclear.

The years of establishment (AGE): This is the natural log of the years since the firm's establishment. More established firms are less likely to default on their borrowing and are therefore more likely to receive trade credit.

A firm's profitability (EBIT): The ratio of earnings before interest and taxes to total assets. Earnings can have a positive or negative effect on accounts payable. Suppliers may be more willing to extend trade credit to firms with high EBIT due to lower default risk. However, according to Pecking Order Theory (Myers, 1977) firms use external credit only when internal funds are unavailable, making highly profitable firms less likely to use trade credit.

Firms' potential to grow (GR): Calculated as the growth rate of operating income. Fast-growing firms may use more trade credit as they are likely to utilize all available funds for investment opportunities.

State Ownership (STATE): This variable controls for ownership effects, with 1 indicating state-owned enterprises and 0 indicating otherwise. Yano and Shiraishi (2012) show that trade credit is more efficient than bank finance for non-state-owned enterprises in China, where formal financial markets are less developed. Ge and Qiu (2007) find that non-state-owned Chinese firms use more trade credit than their state-owned counterparts. However, Cull et al. (2009) find that poorly performing state-owned enterprises are more likely to use trade credit from customers, while Guariglia and Mateut (2006) show that state-owned firms have easier access to external finance and use less trade credit.

Corporate Governance (GOVINDEX): We include corporate governance in our analysis. Firms with stronger corporate governance may use either more or less trade credit. Firms with better governance may find it easier to receive trade credit from suppliers. Conversely, firms may use trade credit as a substitute for improved corporate governance. Friedman, Johnson, and Mitton (2003) find that firms with low governance are associated with higher debt levels. Using principal component analysis on several governance variables, we construct a

governance index, GOVINDEX, to reflect corporate governance strength. Variables used include: the shareholding ratio of the first major shareholder (TOP1), ownership concentration of the second to tenth largest shareholders (Cstr2_10), shareholding ratio of senior management (Mana), dual role of board chairman and CEO (Dual), proportion of independent directors (Indratio), listing status on B-share or H-share markets (HB_share), and ownership by a parent company (Parent). The first principal component from the analysis is defined as GOVINDEX.

We include two additional variables to account for fixed effects: The sampling period, represented by the variable YEAR, and the firm's industry, represented by the variable IND. Our sample covers 10 years and 18 industries.

Table 1 provides the definition of variables used in our analysis.

Table 1. Definitions of the variables.

Type	Variables	Name	Definition
Dependent variables	AP	Accounts payable	(Accounts Payable + Notes Payable + Cash Advances from Customers) / Total Assets
	APRPT	Related party accounts payable	(Accounts Payable from Related Party + Notes Payable from Related Party + Cash Advances from Related Party） / Total Assets
	APNRPT	Non-related party accounts payable	AP - APRPT
Explanatory variables	BANK	Bank credit	(Short-term loans + long-term loans)/ Total Assets
	MPOWER	Market power	If a company's market share (sales revenue/entire industry sales revenue) is greater than the median of the industry, MPOWER = 1; 0 otherwise
	MP	Monetary policy	If $\triangle GDP/GDP_{t-1} - \triangle M2/M2_{t-1} > 0$, then MP=1; 0 otherwise
	STATE	State Owned enterprise	If a company is state-owned, STATE = 1; 0 otherwise
	AGE	Age of the firm	The natural logarithm of the years of establishment
	SIZE	Size of the firm	The natural logarithm of total assets at the end of the year
	EBIT	Profitability	Earnings before interest and taxes /total assets
	GR	Growth rate	The growth rate of operating income
	GOVINDEX	Index of corporate governance	The first principal component obtained through the principal component analysis using several governance variables described in the text
	YEAR	Year	Year dummy variables; 2004-2013
	IND	Industry	Industry dummy variables; 18 industries

3.3. Summary Statistics

Table 2 provides the summary statistics. On average, accounts payable (Usage of trade credit) represent 17.1% of total assets. Although most trade credit comes from non-related parties, more than 50% of the listed firms in our sample receive trade credit from related parties. For the period 2004-2013, bank credit averages 20.7% of firms' assets. This confirms that trade credit, alongside bank credit, is the most important source of external financing for listed Chinese firms.

During the period 2004-2013, there were five years of tight monetary policy (MP), with a standard deviation of 50%. Approximately 58% of the sample consists of state-owned enterprises (SOEs). The average total assets of firms (SIZE) are about 2.2 million yuan. The sample mean of the EBIT to assets ratio is about 5%, with a standard deviation of 0.077. The maximum and minimum EBIT ratios are 0.285 and -0.317, respectively. The average growth rate of operating income (GR) over the sample period is about 23%.

Table 2. Descriptive Statistics.

Variables	N	Mean	Min.	Q1	Median	Q3	Max.	Std
AP	15429	0.171	0.004	0.075	0.14	0.235	0.593	0.127
APRPT	15429	0.008	0	0	0	0.004	0.134	0.021
APNRPT	15429	0.163	0.002	0.07	0.133	0.224	0.575	0.123
BANK	15429	0.207	0	0.067	0.191	0.312	0.744	0.164
MPOWER	15429	0.505	0	0	1	1	1	0.5
MP	15429	0.459	0	0	0	1	1	0.498
STATE	15429	0.577	0	0	1	1	1	0.494
AGE	15429	2.541	0	2.303	2.565	2.833	3.584	0.4
SIZE	15429	21.64	18.73	20.81	21.53	22.34	25.38	1.244
EBIT	15429	0.051	-0.314	0.028	0.051	0.082	0.283	0.077
GR	15429	0.23	-0.775	-0.021	0.129	0.304	5.187	0.681
GOVINDEX	15429	-0.037	-2.745	-0.972	-0.132	0.747	4.084	1.311

Table 3 presents the correlation coefficients of variables included in our study. The accounts payable (AP) and AP from non-related parties are negatively correlated with tight monetary policy in both Spearman and Pearson correlation tests. This indicates that firms receive less trade credit from suppliers during periods of monetary tightening. However, this negative correlation either disappears or reverses when the trade credit is from related parties.

The AP and AP from non-related parties are also negatively correlated with bank credit (BANK) in both Spearman and Pearson correlation tests. This indicates that firms that obtain less bank credit use more trade credit from suppliers, supporting the theory that trade credit is an alternative source of financing to institutional credit. This substitution effect becomes either insignificant (Pearson test) or significantly positive (Spearman test) when AP is from related parties.

Table 3. Correlation matrix.

Variables	AP	APRPT	APNRPT	BANK	MPOWER	MP	STATE	AGE	SIZE	EBIT	GR	GOVINDEX
AP		0.253***	0.980***	-0.067***	0.276***	-0.023***	0.054***	0.020**	0.175***	-0.087***	0.101***	-0.052***
APRPT	0.270***		0.159***	0.031***	0.252***	0.002	0.306***	-0.008	0.266***	-0.030***	0.024***	-0.257***
APNRPT	0.978***	0.085***		-0.068***	0.261***	-0.027***	0.030***	0.020**	0.161***	-0.080***	0.102***	-0.031***
BANK	-0.120***	-0.009	-0.124***		0.116***	0.088***	0.091***	0.036***	0.168***	-0.214***	-0.008	-0.036***
MPOWER	0.263***	0.121***	0.251***	0.080***		0.003	0.213***	-0.001	0.665***	0.166***	0.170***	-0.192***
MP	-0.020**	0.023***	-0.025***	0.082***	0.003		0.075***	-0.181***	-0.114***	0.031***	0.105***	-0.040***
STATE	0.066***	0.150***	0.042***	0.075***	0.213***	0.075***		0.019**	0.260***	-0.073***	0.022***	-0.533***
AGE	0.030***	0.009	0.030***	0.074***	0.013	-0.158***	0.039***		0.109***	-0.062***	-0.125***	-0.066***
SIZE	0.173***	0.103***	0.163***	0.114***	0.624***	-0.116***	0.268***	0.073***		0.134***	0.137***	-0.257***
EBIT	-0.068***	-0.042***	-0.062***	-0.258***	0.164***	0.01	-0.035***	-0.052***	0.158***		0.323***	0.017**
GR	0.067***	0.040***	0.060***	-0.023***	0.074***	0.051***	-0.022***	-0.006	0.053***	0.195***		0.015*
GOVINDEX	-0.057***	-0.127***	-0.037***	-0.045***	-0.189***	-0.040***	-0.518***	-0.107***	-0.240***	-0.004	0.003	

Note: Spearman correlation coefficients are provided in the upper right; and Pearson correlation coefficients are in the lower left.
* 10% significance level; ** 5% significance level; *** 1% significance level.

4. Empirical Analysis

4.1. Regression Models

Our empirical tests evaluate whether related party accounts payable respond to monetary tightening and firm-specific characteristics differently from those of non-related counterparts. Furthermore, within related party trade credit, we assess whether controlling shareholders behave differently from other related parties. Following Friedman et al. (2003) and Choi and Kim (2005) our model is specified as follows: For firm *i* at time *t*.

$$TC = \beta_0 + \beta_1 MP_{i,t} + \beta_2 BANK_{i,t} + \beta_3 MPOWER_{i,t} + \beta_4 STATE_{i,t} + \beta_5 AGE_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 EBIT_{i,t} + \beta_8 GR_{i,t} + \beta_9 EGOVINDEX_{i,t} + \beta_{10} Year\ dummies_t + \beta_{11} Industy\ dummies_i + \varepsilon_{i,t} \quad (1)$$

The dependent variable, $TC_{i,t}$ represents usage of trade credit, accounts payable (AP). AP is categorized into five groups: total accounts payable (AP); accounts payable from related parties (APRPT), accounts payable from non-related parties (APNRPT), accounts payable from controlling shareholders (APRPT controlling), and accounts payable from other related party. All trade credit variables are scaled by total assets.

The year dummies and industry dummies take care of the year fixed-effect and industry-fixed effect.

In the above model, a negative β_1 (coefficient on tight monetary policy) indicates that firms receive less trade credit during monetary tightening. A negative β_2 (coefficient on bank credit) indicates that trade credit and bank credit are substitutes; a positive β_2 implies a complementary relationship between trade credit and bank loans. The coefficients on MPOWER, STATE, AGE, SIZE, EBIT, GR, and GOVINDEX reflect the impacts of these firm-specific characteristics on usage of trade credit from various forms of suppliers, namely, total, related party, non-related party, controlling shareholders, and non-controlling related party.

4.2. Empirical Results

4.2.1. Accounts Payable Received from Related Parties, Non-Related Parties, and Controlling Shareholders

Using the model specified in Equation 1, we analyze how monetary policy and firm-specific characteristics affect firms' usage of trade credit from related parties, non-related parties, controlling shareholders, and other related parties. All coefficient estimates are adjusted for heteroscedasticity and firm clustering[2] to obtain robust standard errors. Table 4 presents the results of accounts payable received from: all parties, related parties, non-related parties, controlling shareholders and other related parties (Excluding controlling shareholders).

Table 4. Accounts payable received from related parties, non-related parties, controlling shareholders.

Variables	AP	APNRPT	APRPT	APRPT (Controlling shareholder trade credit)	APRPT (Other related-party trade credit)
MP	-0.0142***	-0.0141***	0.0012*	0.0005**	0.0004
	(-7.23)	(-7.16)	(1.93)	(2.58)	(0.87)
MPOWER	0.0618***	0.0583***	0.0028***	0.0002	0.0025***
	(12.51)	(12.09)	(3.69)	(0.91)	(4.09)
BANK	-0.1293***	-0.1231***	-0.0064**	-0.0008	-0.0054***
	(-7.47)	(-7.73)	(-2.56)	(-1.62)	(-2.63)
STATE	0.00095**	0.0056	0.0036***	0.0011***	0.0023***
	(1.97)	(1.21)	(4.81)	(6.13)	(3.73)
AGE	0.0043	0.0027	0.0017**	-0.0001	0.0016**
	(0.79)	(0.51)	(2.06)	(-0.58)	(2.36)
SIZE	0.0071***	0.0065**	0.0009**	0.0003**	0.0005
	(2.59)	(2.41)	(2.02)	(2.19)	(1.47)
EBIT	-0.2670***	-0.2427***	-0.0217***	-0.0018**	-0.0182***
	(-11.97)	(-11.52)	(-6.22)	(-2.37)	(-6.15)
GR	0.0143***	0.0123***	0.0015***	0.0003***	0.0009***
	(7.93)	(7.43)	(3.74)	(3.00)	(3.09)
GOVINDEX	-0.0003	0.0006	-0.0010***	-0.0003***	-0.0006***
	(-0.25)	(0.57)	(-5.78)	(-5.32)	(-4.59)
Year	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes
Cluster at firm	Yes	Yes	Yes	Yes	Yes
N	15429	15429	15429	15429	15429
adj. R2	0.251	0.250	0.054	0.034	0.044

Note: All coefficient estimates are adjusted for heteroscedasticity and company clustering to obtain robust standard errors. Numbers in parentheses are adjusted t-values.
* 10% significance level; ** 5% significance level; *** 1% significance level.

[2] Petersen (2008) demonstrated that standard errors clustered by firm are unbiased when residuals are not independent, which is often the case for panel data. The standard errors reported are clustered by firm.

4.2.2. Trade Credit Received and Monetary Tightening

The results reveal an asymmetrical response of trade credit usage to monetary tightening among groups. During periods of tight monetary policy, firms significantly reduce trade credit from non-related parties, while trade credit from related parties increases slightly, with a more pronounced rise in credit from controlling shareholders. The tests for the differences in coefficients are statistically significant at the 1% level.

These findings contrast with the behavior of U.S. firms, as documented by Nilsen (2002) and Choi and Kim (2005). They found that U.S. firms increased accounts payable during monetary tightening. While our results are consistent with theirs for trade credit from related parties and controlling shareholders, Chinese firms in our sample receive less accounts payable from all suppliers and non-related parties.

This divergence may stem from Chinese financial and legal systems. During monetary tightening, non-related parties may be hesitant to extend credit due to significant asymmetric information problems and high transaction costs. However, these challenges are mitigated within intra-group firms, particularly with controlling shareholders.

The findings highlight the critical role of related-party trade credit in buffering firms against the financial pressures of monetary tightening. While non-related parties retract credit due to heightened risk and information asymmetry, related parties and controlling shareholders step in as reliable sources of support, ensuring financial stability during tight monetary conditions.

4.2.3. Trade Credit Usage and Firm-Specific Characteristics

Firm-specific characteristics significantly influence the dynamics of trade credit, with their effects varying across sources of credit.

Bank Credit (BANK): Trade credit often acts as a substitute for bank loans, especially in economies with underdeveloped financial markets. Consistent with prior studies (Fisman & Love, 2003; Ge & Qiu, 2007) a strong substitutional relationship is observed between bank credit and trade credit. Firms with reduced bank credit rely more on trade credit from non-related parties. However, this substitution effect diminishes for related-party trade credit and becomes statistically insignificant when the credit is provided by controlling shareholders. These distinctions are statistically significant at the 1% level.

Market Power (MPOWER): Firms with greater market power are better positioned to secure trade credit, particularly from non-related parties, where the impact is significant. Related parties also extend more credit to firms with market power, though the effect is smaller. For controlling shareholders, market power has little influence, with the impact being statistically insignificant.

State-owned enterprises (STATE) and years of establishment (AGE): State-owned enterprises are more likely to receive trade credit, particularly from related parties. However, they do not enjoy the same advantage with non-related parties. A firm's years of establishment have no significant impact on trade credit from non-related parties but positively influence credit from related parties, likely reflecting trust built through long-term intra-group relationships.

Size of assets (SIZE): Firms with larger assets receive more trade credit in general, which is consistent with other studies (Choi & Kim, 2005; Nilsen, 2002). However, the size is not as important when accounts payable are from related parties or controlling shareholders.

Profitability (EBIT): Profitability inversely affects trade credit usage. Firms with higher profitability rely less on trade credit from both related and non-related parties. This relationship is less pronounced when trade credit is from related parties or controlling shareholders. One possible explanation is that higher profitability increases a firm's internal funding ability, thus decreasing the need of external trade credit.

Growth potential (GR): Rapidly growing firms use more trade credit reflecting their greater financing needs. However, the effect weakens for trade credit provided by related parties and controlling shareholders.

Overall, the influence of firm-specific characteristics such as market power, size, and profitability are less pronounced or reversed for related-party trade credit compared to non-related sources. These findings underscore the unique dynamics of intra-group financing, which play a vital role in maintaining corporate stability during periods of economic uncertainty.

4.3. Robustness Checks

In this section, we conduct two robustness checks to ensure the reliability of our results under different conditions and variable definitions. The first check involves using an alternative measure of monetary policy, and the second excludes observations with zero related-party trade credit. Both checks yield results that are consistent with our initial findings in Table IV, confirming the robustness of the conclusions drawn.

4.3.1. Alternative Measure of Monetary Policy

To test the robustness of our results to alternative definitions of monetary policy, we use a different measure of monetary policy, specifically the tightness index (MPINDEX) from the People's Bank of China. This index is derived from a national bankers' survey, which categorizes the current monetary policy as "loose," "moderate," or "tight." The survey data is available for the years 2004 to 2009, and we assign a value of 1 to years with tightening monetary policy (2004, 2007, and 2008) and 0 for the other years. This alternative measure of

monetary policy replaces the original measure (MP) in our model. The number of observations reduces to 8,066 due to shorter sample period.

Table 5 presents the results using the MPINDEX as a proxy for monetary policy. The coefficients for MPINDEX, as well as those for other key variables such as bank credit (BANK), market power (MPOWER), profitability (EBIT), and growth potential (GR), exhibit consistent patterns with those reported in Table 4. Specifically, during periods of monetary tightening, firms tend to decrease their accounts payable from non-related parties while increasing trade credit from controlling shareholders. This pattern is in line with our initial findings. Moreover, bank credit serves as a substitute for trade credit from non-related parties, but this substitution effect disappears when the trade credit is from related parties or controlling shareholders.

Further, the results also reveal that when using the MPINDEX measure, ownership (STATE), firm age (AGE), and firm size (SIZE) do not have a significant impact on the receipt of trade credit from any group. This suggests that these firm-specific characteristics, which were influential in the original model, play a less prominent role when the monetary policy measure is altered. Overall, the effects of monetary policy remain robust, and the firm-specific factors continue to exhibit similar patterns regardless of the measure used.

Table 5. Alternative measure of monetary policy: accounts payable.

Variables	AP	APNRPT	APRPT	APRPT (Controlling shareholder trade credit)	APRPT (Other related-party trade credit)
MPINDEX	-0.0244***	-0.0240***	0.0012	0.0005*	0.0004
	(-9.01)	(-9.04)	(1.59)	(1.80)	(0.79)
MPOWER	0.0676***	0.0632***	0.0038***	0.0002	0.0034***
	(11.57)	(11.13)	(3.36)	(0.88)	(3.76)
BANK	-0.1055***	-0.1022***	-0.0048	-0.001	-0.004
	(-4.79)	(-5.31)	(-1.32)	(-1.58)	(-1.30)
STATE	-0.002	-0.0009	-0.0005	0.0003	-0.0005
	(-0.32)	(-0.15)	(-0.43)	(1.20)	(-0.53)
AGE	-0.0018	-0.0025	0.0011	-0.0005	0.0013
	(-0.25)	(-0.36)	(0.84)	(-1.50)	(1.24)
SIZE	0.0026	0.0022	0.0008	0.0004**	0.0002
	(0.77)	(0.66)	(1.3)	(2.39)	(0.49)
EBIT	-0.2058***	-0.1882***	-0.0166***	-0.0019**	-0.0131***
	(-8.63)	(-8.68)	(-3.72)	(-2.08)	(-3.54)
GR	0.0204***	0.0171***	0.0025***	0.0008***	0.0011**
	(7.13)	(6.92)	(3.36)	(3.63)	(2.3)
GOVINDEX	0.0002	0.0022	-0.0019***	-0.0006***	-0.0010***
	(0.08)	(0.99)	(-5.21)	(-5.15)	(-3.82)
Year	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes
Cluster at firm	Yes	Yes	Yes	Yes	Yes
N	8066	8066	8066	8066	8066
adj. R^2	0.235	0.233	0.044	0.041	0.031

Note: All coefficient estimates are adjusted for heteroscedasticity and firm clustering to obtain robust standard errors. Numbers in parentheses are adjusted t-values.
* 10% significance level; ** 5% significance level; *** 1% significance level.

4.3.2. Excluding Observations with Zero Related Party Trade Credit

In the second robustness check, we address the presence of observations with zero related-party trade credit. These observations could either be due to firms receiving no trade credit from related parties or simply because the firms do not have related parties. By excluding these observations, we reduce the number of data points from 15,429 to 9,320 and re-estimate the model. The results are presented in Table 6.

The exclusion of observations with zero related-party trade credit intensifies the effects observed in the original model. For instance, the negative relationship between monetary policy (MP) and accounts payable becomes even more pronounced, and the substitution effect between bank credit (BANK) and trade credit from non-related parties is more evident. In contrast, the substitution effect between bank credit and related-party trade credit remains absent. Additionally, the relationship between state ownership (STATE) and trade credit from related parties becomes more significant, indicating that state-owned firms are more likely to receive trade credit from related parties but none from non-related parties.

Moreover, the influence of firm age (AGE) and growth potential (GR) also increases in significance when we exclude the zero-related party observations. Firm's age becomes more strongly related to the receipt of trade credit from related parties, and growth potential exhibits a more significant effect on the firm's trade credit

decisions. These results suggest that excluding firms without related-party trade credit strengthens the role of firm-specific characteristics in determining trade credit behavior.

The results from both robustness checks provide strong support for the reliability of our findings. The use of the alternative monetary policy measure (MPINDEX) and the exclusion of observations with zero-related-party trade credit both yield results that align with those presented in Table IV. These robustness checks confirm that the relationships between monetary policy, bank credit, and trade credit hold under different definitions and sample conditions. Furthermore, while some firm-specific characteristics lose their significance under certain specifications, the general patterns remain consistent, underscoring the robustness of our conclusions.

Table 6. Accounts Payable (Excluding observations with zero AP from related party).

Variables	AP	APNRPT	APRPT	APRPT (Controlling shareholder trade credit)	APRPT (Other related-party trade credit)
MP	-0.0171***	-0.0170***	0.0023**	0.0010***	0.0009
	(-5.32)	(-5.32)	(2.23)	(2.7)	(1.18)
MPOWER	0.0557***	0.0516***	0.0032***	0.0001	0.0030***
	(9.05)	(8.63)	(2.78)	(0.32)	(3.23)
BANK	-0.1688***	-0.1590***	-0.0105***	-0.0012	-0.0093***
	(-7.47)	(-7.82)	(-2.62)	(-1.37)	(-2.80)
STATE	0.0079	0.0047	0.0028**	0.0013***	0.0013
	(1.29)	(0.82)	(2.37)	(4.74)	(1.39)
AGE	0.0075	0.0044	0.0033**	-0.0001	0.0029**
	(0.98)	(0.61)	(2.33)	(-0.23)	(2.55)
SIZE	0.0047	0.005	0	0.0002	-0.0003
	(1.39)	(1.54)	(0.00)	(1.05)	(-0.48)
EBIT	-0.3609***	-0.3205***	-0.0362***	-0.0026*	-0.0310***
	(-11.64)	(-11.31)	(-5.96)	(-1.85)	(-6.00)
GR	0.0179***	0.0145***	0.0024***	0.0005***	0.0014***
	(7.08)	(6.28)	(3.55)	(2.8)	(2.86)
GOVINDEX	0.0004	0.0014	-0.0011***	-0.0005***	-0.0005**
	(0.26)	(0.86)	(-3.58)	(-4.63)	(-2.07)
Year	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes
Cluster at firm	Yes	Yes	Yes	Yes	Yes
N	9320	9320	9320	9320	9320
adj. R^2	0.256	0.259	0.037	0.031	0.03

Note: All coefficient estimates are adjusted for heteroscedasticity and firm clustering to obtain robust standard errors. Numbers in parentheses are adjusted t-values.
* 10% significance level; ** 5% significance level; *** 1% significance level.

5. Conclusions

This paper provides a comprehensive analysis of the dynamics of trade credit usage among Chinese listed firms, focusing on the interplay between monetary policy and firm-specific characteristics. Our findings underscore the critical role of related parties, particularly controlling shareholders, in mitigating the effects of monetary tightening.

The results demonstrate that during periods of tight monetary policy, related parties, particularly controlling shareholders, are more are more inclined to provide trade credit to Chinese firms, whereas non-related parties tend to reduce such financing. This highlights the strategic importance of intra-group financing networks in sustaining financial stability under constrained monetary conditions.

Bank credit and trade credit exhibit a substitutional relationship for Chinese firms, though this effect diminishes when trade credit is provided by related parties and disappears entirely in the case of controlling shareholders.

Firm-specific characteristics, such as profitability, size, market power, and ownership, significantly influence trade credit dynamics, with distinct effects across different trade credit sources. State-owned enterprises and firms with long-term intra-group relationships are more likely to receive trade credit from related-party and controlling shareholders. This illustrates the distinctive financing mechanisms in China, shaped by its underdeveloped financial systems and unique institutional frameworks.

These findings carry significant policy implications. Policymakers should recognize the vital role of intra-group financing in buffering firms against external adverse financial shocks. Furthermore, reliance on related-party trade credit also raises concerns about transparency and resource allocation efficiency.

In sum, this study highlights the distinctive mechanisms of trade credit in Chinese listed firms. By addressing the differences between related and non-related party transactions, our research contributes to a deeper understanding of corporate financing strategies and the transmission of monetary policy in China.

References

Aktas, N., De Bodt, E., Lobez, F., & Statnik, J.-C. (2012). The information content of trade credit. *Journal of Banking & Finance*, *36*(5), 1402-1413. https://doi.org/10.1016/j.jbankfin.2011.12.001

Atanasova, C. (2007). Access to institutional finance and the use of trade credit. *Financial Management*, *36*(1), 49-67. https://doi.org/10.1111/j.1755-053X.2007.tb00164.x

Biais, B., & Gollier, C. (1997). Trade credit and credit rationing. *The review of Financial Studies*, *10*(4), 903-937.

Chang, S. J., & Hong, J. (2000). Economic performance of group-affiliated companies in Korea: Intragroup resource sharing and internal business transactions. *Academy of Management Journal*, *43*(3), 429-448. https://doi.org/10.5465/1556403

Cheung, Y.-L., Qi, Y., Rau, P. R., & Stouraitis, A. (2009). Buy high, sell low: How listed firms price asset transfers in related party transactions. *Journal of Banking & Finance*, *33*(5), 914-924. https://doi.org/10.1016/j.jbankfin.2008.10.002

Choi, W. G., & Kim, Y. (2005). Trade credit and the effect of macro-financial shocks: Evidence from US panel data. *Journal of Financial and Quantitative Analysis*, *40*(4), 897-925. https://doi.org/10.1017/S0022109000002027

Cull, R., Xu, L. C., & Zhu, T. (2009). Formal finance and trade credit during China's transition. *Journal of Financial Intermediation*, *18*(2), 173-192. https://doi.org/10.1016/j.jfi.2008.08.004

Danielson, M. G., & Scott, J. A. (2004). Bank loan availability and trade credit demand. *Financial Review*, *39*(4), 579-600. https://doi.org/10.1111/j.0732-8516.2004.00089.x

Dixon, W. J. (1960). Simplified estimation from censored normal samples. *The Annals of Mathematical Statistics*, *31*(3), 385-391.

Dow, S., & McGuire, J. (2009). Propping and tunneling: Empirical evidence from Japanese keiretsu. *Journal of Banking & Finance*, *33*(10), 1817-1828. https://doi.org/10.1016/j.jbankfin.2009.05.012

Fabbri, D., & Menichini, A. M. C. (2010). Trade credit, collateral liquidation, and borrowing constraints. *Journal of Financial Economics*, *96*(3), 413-432.

Fisman, R., & Khanna, T. (2004). Facilitating development: The role of business groups. *World Development*, *32*(4), 609-628. https://doi.org/10.1016/j.worlddev.2003.08.012

Fisman, R., & Love, I. (2003). Trade credit, financial intermediary development, and industry growth. *The Journal of Finance*, *58*(1), 353-374.

Fisman, R., & Raturi, M. (2004). Does competition encourage credit provision? Evidence from African trade credit relationships. *Review of Economics and Statistics*, *86*(1), 345-352. https://doi.org/10.1162/003465304323023859

Friedman, E., Johnson, S., & Mitton, T. (2003). Propping and tunneling. *Journal of comparative economics*, *31*(4), 732-750.

Ge, Y., & Qiu, J. (2007). Financial development, bank discrimination and trade credit. *Journal of Banking & Finance*, *31*(2), 513-530. https://doi.org/10.1016/j.jbankfin.2006.07.009

Giannetti, M., Burkart, M., & Ellingsen, T. (2011). What you sell is what you lend? Explaining trade credit contracts. *The Review of Financial Studies*, *24*(4), 1261-1298.

Guariglia, A., & Mateut, S. (2006). Credit channel, trade credit channel, and inventory investment: Evidence from a panel of UK firms. *Journal of Banking & Finance*, *30*(10), 2835-2856. https://doi.org/10.1016/j.jbankfin.2005.11.002

Jia, N., Shi, J., & Wang, Y. (2013). Coinsurance within business groups: Evidence from related party transactions in an emerging market. *Management Science*, *59*(10), 2295-2313.

Jian, M., & Wong, T. J. (2010). Propping through related party transactions. *Review of Accounting Studies*, *15*(1), 70-105. https://doi.org/10.1007/s11142-008-9081-4

Kashyap, A. K., Stein, J. C., & Wilcox, D. W. (1993). Monetary policy and credit conditions: Evidence from the composition of external finance. *American Economic Review*, *83*(1), 78-98.

Kohlbeck, M., & Mayhew, B. W. (2017). Are related party transactions red flags? *Contemporary Accounting Research*, *34*(2), 900-928.

Mateut, S., Bougheas, S., & Mizen, P. (2006). Trade credit, bank lending and monetary policy transmission. *European Economic Review*, *50*(3), 603-629. https://doi.org/10.1016/j.euroecorev.2005.01.002

Meltzer, A. H. (1960). Mercantile credit, monetary policy, and size of firms. *The review of Economics and Statistics*, *42*(2), 429-437.

Myers, C. R. (1977). Comment: an economic model of trade credit. *Journal of Financial and Quantitative Analysis*, *12*(3), 519-524. https://doi.org/10.2307/2330553

Nilsen, J. H. (2002). Trade credit and the bank lending channel. *Journal of Money, Credit and Banking*, *34*(1), 226-253.

Peng, W. Q., Wei, K. J., & Yang, Z. (2011). Tunneling or propping: Evidence from connected transactions in China. *Journal of Corporate Finance*, *17*(2), 306-325. https://doi.org/10.1016/j.jcorpfin.2010.08.002

Petersen, M. A. (2008). Estimating standard errors in finance panel data sets: Comparing approaches. *The Review of Financial Studies*, *22*(1), 435-480.

Petersen, M. A., & Rajan, R. G. (1997). Trade credit: theories and evidence. *The Review of Financial Studies*, *10*(3), 661-691. https://doi.org/10.1093/rfs/10.3.661

Ruslan, A., Hájková, D., & Kubicová, I. (2015). The impact of monetary policy on financing of Czech firms. *Journal of Economics and Finance*, *65*(6), 455-476.

Summers, B., & Wilson, N. (2002). An empirical investigation of trade credit demand. *International Journal of the Economics of Business*, *9*(2), 257-270.

Wilson, N., & Summers, B. (2002). Trade credit terms offered by small firms: survey evidence and empirical analysis. *Journal of Business Finance & Accounting*, *29*(3-4), 317-351. https://doi.org/10.1111/1468-5957.00434

Wu, W., Rui, O. M., & Wu, C. (2012). Trade credit, cash holdings, and financial deepening: evidence from a transitional economy. *Journal of Banking & Finance*, *36*(11), 2868-2883.

Yano, G., & Shiraishi, M. (2012). Efficiency of trade credit finance in China. *Comparative Economic Studies*, *54*(1), 203-225. https://doi.org/10.1057/ces.2011.30