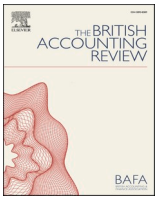
The British Accounting Review 57 (2025) 101552

Contents lists available at ScienceDirect

The British Accounting Review

journal homepage: www.elsevier.com/locate/bar



Reprint of: The hidden cost of organisation capital: Evidence from trade credit☆

Joye Khoo [a], Adrian (Wai Kong) Cheung [b,*]

[a] School of Accounting, Economics and Finance, Curtin University, Australia
[b] Faculty of Finance, City University of Macau, Macao

ARTICLE INFO

JEL classification:
G23
G32

Keywords:
Organisation capital
Trade credit

ABSTRACT

Organisation capital is an important firm-specific resource that is linked to value created by key talents, and the risk arising from the unexpected departure of key talents is detrimental to the firm. We find that trade credit decreases with organisation capital, particularly when labour mobility is greater or employees have more outside opportunities. This supports the *agency view* of organisation capital. However, when the threat of losing key talents is low, such as during the global financial crisis, the *efficiency view* of organisation capital prevails, making firms with high organisation capital more attractive customers for suppliers. The evidence is robust to endogeneity tests.

1. Introduction

Organisation capital has been described as one of the most valuable intangible assets, vital for a firm's growth. Organisation capital is defined as the accumulated stock of knowledge and capabilities embodied in firms' key talents (Eisfeldt & Papanikolaou, 2013), and is an important input in the production process. On the one hand, by making resources more productive, organisation capital leads to increased operational efficiency and superior performance (Lev et al. 2009; Lev & Radhakrishnan, 2005). Studies show evidence that organisation capital is a crucial element closely related to productivity (Atkeson & Kehoe, 2005), resource-sustainable competitive advantage (Hasan & Cheung, 2018), and cash holdings (Marwick et al. 2020), which allow firms to have stable future cash flows and possess a competitive position in the market. On the other hand, investments (including those in organisation capital) are known to suffer from agency problems and are risky for shareholders. Eisfeldt and Papanikolaou (2013) show that, because organisation capital is embodied in the firm's key talents which are movable across firms, shareholders are exposed to the risk that these key talents take their valuable organisation capital and expertise with them to another firm when they pursue outside options. Recent work, such as Lim et al. (2020) and Ge et al. (2022), explores the association between intangible assets and financial decisions such as on leverage ratio and debt structure. Motivated by these views, we examine whether firms having more organisation capital affects their access to

DOI of original article: https://doi.org/10.1016/j.bar.2023.101238.

This article is a reprint of the premature publication, now in the correct volume and issue. This error bears no reflection on the article or its authors. The publisher apologizes to the authors and the readers for this unfortunate error. For citation purposes, please use the current publication details; Journal of Econometrics, 57/1, 101552.**DOI of current item: 10.1016/j.bar.2025.101552☆ We thank Mostafa Hasan, Bin Li, Tianpei Luo, and Shams Tabrize Pathan for helpful comments and suggestions provided on earlier versions of this manuscript. We also thank the participants at the seminars at City University of Macau, Curtin University, and Griffith University for their comments and suggestions. Any errors are our own.

* Corresponding author. Faculty of Finance, City University of Macau, Taipa, Macao.
E-mail address: adriancheung@cityu.mo (A.(W.K. Cheung).

https://doi.org/10.1016/j.bar.2025.101552
Received 12 January 2023; Received in revised form 3 May 2023; Accepted 15 July 2023
Available online 12 February 2025

short-term liquidity, in the form of corporate trade credit granted by suppliers.

Trade credit is a form of loan from the suppliers to customer firms, which allows the customer firms to delay payment and reduce their short-term liquidity constraint. Cao et al. (2022) show that future stock returns are asymmetrically related to asset growth as a function of the source of funds such as trade credit. Given the non-trivial role of trade credit in both firms' financing decision and future stock returns, understanding the potential factors that influence its supply and demand is important. Prior studies show that suppliers, who possess comparative advantages over financial institutions, such as banks, in acquiring information about the credit quality of their customer firms, are willing to offer trade credit to financially constrained firms (Cuñat, 2007; Love & Zaidi, 2010) and to those with good reputations in order to foster long-lasting customer relationships (Khoo & Cheung, 2021; Zhang et al. 2014). However, suppliers are concerned about the long-term sustainability of customer firms, because customer firms' default on the fulfilment of trade credit obligations can invoke sudden liquidity shortages and a potential series of liquidity shocks along the supply chain (Jacobson & Von Schedvin, 2015). Despite recent investigations on exploring the influence of organisation capital on corporate financing decisions (Ge et al. 2022; Lim et al. 2020), organisation capital and corporate trade credit have mostly been explored separately, while the extent to which these two could be related remains largely unexplored. Our primary objective in the present study is thus to understand whether and how organisation capital and trade credit are related. One example of these impacts is the extent to which suppliers respond to organisation capital and their willingness to extend credit (that is, accounts payable offered by suppliers) to their customer firms. This issue is crucial because, while the literature has established tangibility as one of the determinants of trade credit, the impact of intangible assets on trade credit remains unexplored, an especially important issue considering that intangible assets have begun to dominate tangible assets. We contribute insights to the discussion on the prospects of organisation capital through investigation of the strategic perception of suppliers on customer firms' organisation capital.

We present arguments for two competing hypotheses. Based on the *efficiency view* of organisation capital, we contend that organisation capital is likely to induce an increase in the use of trade credit extended by suppliers, for two reasons. Firstly, organisation capital enables the firm to achieve efficient production and a stable business operation, leading to higher productivity (Atkeson & Kehoe, 2005) and better firm performance (Attig & Cleary, 2014; Lev et al. 2009). Stable operation and better performance are likely to lower future cash flow uncertainty and improve the long-term sustainability of firms with more organisation capital, which in turn can uplift their capacity to fulfil the financial obligations of trade credit. Secondly, organisation capital captures firm-specific elements such as the unique business processes firms have developed and the key talents of employees with difficult-to-replicate characteristics, both of which have strong bonds with future growth, such as more innovation (Francis et al. 2021) and lower managerial turnover (Carlin et al. 2012). Organisation capital thus encourages employees to participate in long-term-oriented activities and improve the long-term competitive position of firms. Aforementioned discussions reveal that suppliers are willing to extend more trade credit to firms with more organisation capital, the latter reflected in highly efficient business processes and systems as well as higher growth opportunities. Suppliers can thus share in the future growth opportunities of firms with more organisation capital through the provision of trade credit.

The *agency view* of organisation capital, however, predicts a negative impact of organisation capital on the use of trade credit. Firstly, organisation capital is a firm-specific production factor that is embedded in a firm's superior talents, who typically have outside options and can move across firms (Eisfeldt & Papanikolaou, 2013). Given this, losing such talents is a key risk of firms investing in organisation capital. When key talents depart, they tend to take their valuable organisation capital contribution and expertise with them to another firm. Firms with more organisation capital are therefore exposed to the loss of key talents as well as the threat of losing business secrets to their competitors, which further increases the volatility of firms' future cash flow stemming from such losses. Secondly, some features of organisation capital are noteworthy such as the low redeployability of organisation capital with greater uncertainty of liquidation value, which makes such capital difficult to pledge as collateral to raise external funds, and agency problems between key talents and shareholders, such as over-investment behaviour in organisation capital to maximize self-interests within the firm. As such, firms with high organisation capital are likely to be subject to financial constraint and severe agency problems. From the perspective of suppliers, they take cognizance of the sources of risk associated with the loss of key talents embodied in organisation capital, as well as these financial constraint and agency problems of organisation capital, and thus lessen the provision of trade credit to firms holding a high level of organisation capital.

Using a sample of US firms over the period 1981 to 2017, organisation capital is found to be negatively associated with the incremental use of trade credit granted by suppliers, after controlling for firm-level characteristics, year effects, and industry-specific, time-invariant unobserved heterogeneity. In terms of economic significance, the estimated results presented in this study show that incremental use of trade credit decreases by 6.73%–15.67% for a one standard deviation increase in organisation capital, depending on the proxy of organisation capital. This evidence is consistent with the *agency view*. The negative relation is also robust to endogeneity concerns and alternative measures, and not driven by specific industry groups (non-high-technology versus high-technology firms).

We also find that the negative relation is more prominent when employees have more outside opportunities or when firms are in flexible labour markets that face fewer restrictions. These findings lend support to the view that less restrictive labour regulations are associated with greater job and work flows and labour mobility. The greater the labour mobility and employee outside opportunities, the higher the cost of retention to shareholders, therefore suppliers face higher levels of risk associated with the loss of key talents embodied in organisation capital of customer firms.

This negative relation, however, does not apply to the global financial crisis (2007–2009), during which job vacancies were low and unemployment rate surged high (Afonso & Blanco-Arana, 2022; Colombo et al. 2019), representing major shocks to both stock and labour markets. Put differently, employee outside opportunities were severely hit during the global financial crisis. Furthermore, we find evidence supporting the *efficiency view* that the linkage between trade credit and organisation capital is positive, particularly for those in a better financing situation during the global financial crisis. Our interpretation of this is that, during the global financial crisis, in the eyes of suppliers, the threat of losing key talents becomes less important and concern about trading with creditworthy and financial healthier customer firms becomes the utmost priority. Thus, as the probability of the unexpected departure of key talents is slim during the global financial crisis, the *efficiency view* of organisation capital prevails.

Furthermore, we conduct robustness checks using the supplier-customer pairs from the Compustat Segment file. Controlling for the characteristics of both suppliers and customers, we obtain similar results that are consistent with our baseline analysis. Lastly, we also explore the association between trade credit provision (accounts receivable) and organisation capital. In particular, we examine whether supplier firms with more organisation capital are less likely to offer trade credit to their customers, given that organisation capital cannot easily be liquidated. We find supportive evidence for this view.

This study contributes to the literature in three major ways. Firstly, the linkage between trade credit and organisational capital is mainly missing in the existing literature. This study is the first to investigate the role of organisational capital in influencing a firm's crucial working capital sources. Prior studies find that organisation capital heightens cash holdings (Marwick et al. 2020) and enhances firm performance (Lev et al. 2009). However, the extent to which organisation capital influences the trade credit offered by suppliers remains unexplored. We clarify dual views (*agency* vs *efficiency*) on organisation capital to understand how it affects the trade credit granted by suppliers, which has not been explored before. Our paper complements the *agency* view of organisation capital advanced by Eisfeldt and Papanikolaou (2013), by showing evidence that investment in organisation capital is riskier not only for shareholders but also for suppliers. Secondly, prior research investigates the use of trade credit for firms with more or less tangibility (for example, Hasan & Alam, 2022). Organisation capital, which is embodied in key talents and vital for firms' growth, has a significant impact on the use of trade credit; which finding is new to the literature on trade credit financing, and deepens the understanding of trade credit policies. Lastly, we present new evidence that the negative association between organisation capital and the use of trade credit is more pronounced in more flexible labour markets, consistent with the view that greater labour mobility and competition for key talents render organisational capital investment riskier for both suppliers and shareholders. When the threat of losing key talents becomes trivial, the efficiency view on organisation capital prevails, making customer firms with more organisation capital more attractive partners for suppliers to do business with.

The rest of this paper proceeds as follows. Section 2 reviews studies on organisation capital and develops hypotheses about organisation capital and trade credit. Sections 3 and 4, respectively, introduce the sample and present the methodology. Section 5 reports the empirical tests; and Section 6 concludes.

2. Literature review and hypotheses development

2.1. Organisation capital

Research on organisation capital has received growing attention in the literature, and the role of organisation capital has been explored in a variety of ways. As defined by Lev et al. (2009, p. 277), organisation capital is the accumulation of firm-specific knowledge that "enables superior operating, investment and innovation performance, represented by the agglomeration of technologies, business practices, processes and designs". Some examples are Dell's build-to-order system that offers customised services to best suit their customers' needs, and Walmart's supply chain management system that further smoothens their inventory management system.

There are two general views on organisation capital in the literature. The first is the *efficiency view* of organisation capital, which emphasises that it is a durable input used to integrate both physical capital and human skills in the production process, thus leading to increased operational efficiency (Evenson & Westphal, 1995; Lev et al. 2009; Lev & Radhakrishnan, 2005). Similarly, as documented by Eisfeldt and Papanikolaou (2013), organisation capital represents the intangible capital of firms that is embodied in the firms' talents such as managers and executives, and that has an efficiency that is specific to the firm. Several studies provide evidence that organisation capital empowers firms to attain stable business operations with efficient production, which results in positive firm-level outcomes such as increased productivity (Atkeson & Kehoe, 2005), better operating stock performance (Lev et al. 2009), better merger and acquisition decisions (Li et al. 2018), more cash holdings (Marwick et al. 2020), more innovation (Francis et al. 2021), lower employee turnover (Carlin et al. 2012), lower investment-cash flow sensitivity (Attig & Cleary, 2014), and less likelihood of moving to unfavourable life cycle stages (Hasan & Cheung, 2018).

The other view is the *agency* view of organisation capital advanced by Eisfeldt and Papanikolaou (2013). Considering that efficiency attributed to organisation capital is embodied in the firms' key talents, shareholders are exposed to additional cash flow risk when key talents pursue outside options to leave the firm, thereby taking valuable organisation capital and expertise with them to another firm. In addition, Leung et al. (2018) show supportive evidence that the positive relation between organisation capital and expected returns

increases with labour market flexibility. Greater labour mobility and competition in flexible labour markets intensify organisation capital investment, the latter which becomes riskier from the shareholders' perspective.

2.2. Corporate trade credit extended by suppliers

Trade credit is one of the most important sources of short-term liquidity (Petersen & Rajan, 1997), and many firms rely on trade credit to finance their input purchases. Ample studies investigate the features of trade credit contracts offered and show evidence that trade credit is associated with various firm-specific characteristics such as social capital (Hasan & Habib, 2019), life cycle (Hasan, Cheung, et al., 2021), Hasan, Habib, & Zhao, 2021ccounting quality (Chen et al. 2017), bargaining power (Fabbri & Klapper, 2016) and CEO risk-taking (Elsilä, 2015). Prior studies document that suppliers have advantages over financial institutions and are incentivised to offer trade credit, with such advantages including generating informational advantages associated with customer firms (Biais & Gollier, 1997), evaluating creditworthiness of customer firms (Biais & Gollier, 1997), collecting debt (Cuñat, 2007) and mitigating customer firms' opportunistic behaviour (Fabbri & Menichini, 2010). Moreover, suppliers derive competitive benefits from trade credit provision, such as strengthening their bonds with customer firms (Kim & Shin, 2012), improving the sharing of demand risk (Yang & Birge, 2018), and enhancing favourable price discrimination (Brennan et al. 1988). Granting trade credit to customer firms can thus be perceived as a way of signalling their product quality, through allowing customer firms to use the products before payment (Lee & Stowe, 1993).

2.3. Organisation capital and trade credit

It is unclear whether, and to what extent, firms with more organisation capital are associated with the use of trade credit. We develop two competing hypotheses to corroborate the association between organisation capital and trade credit granted by suppliers. Building on the *efficiency view* of organisation capital, we support this view for two reasons. Firstly, prior evidence documents that organisation capital enables firms to attain a stable business operation with efficient production, which leads to higher productivity (Atkeson & Kehoe, 2005), better firm performance (Attig & Cleary, 2014), better access to external financing (Cui et al. 2021), lower leverage (Lim et al. 2020) [1] and more cash holdings (Marwick et al. 2020). The prospects of stable operation and better performance are likely to reduce the uncertainty of future cash flows and improve the long-term sustainability of firms, which signal their credit quality and capacity to fulfil the trade credit as agreed. Thus, firms with more organisation capital are likely to be assessed as more creditworthy and receive more trade credit from suppliers. Although one may argue that organisation capital is non-identifiable (Lim et al. 2020), we expect that economically linked firms, such as suppliers, hold better information about their customer firms' operations, businesses and prospects than do other parties such as banks and financial markets (e.g., Biais & Gollier, 1997). One example is Walmart's supply chain management systems which allow their suppliers to access information related to the sales or inventory turnover of their goods. As such, their suppliers are in a privileged position of obtaining superior information related to the growth opportunity of Walmart while such information is not available to other external stakeholders such as banks and outside investors.[2] Supporting this view, Khoo and Cheung (2021) find that firms with high-ability managers (that cannot be directly observed) receive more trade credit from their suppliers. In view of stable future cash flows owing to organisation capital, we argue that suppliers can recognise the potential associated with organisation capital and can be reasonably certain that firms with more organisation capital will have the capacity to fulfil the trade credit as agreed.

Secondly, organisation capital is a critical resource that is difficult to imitate and that enhances firms' growth and productivity (Eisfeldt & Papanikolaou, 2013; Lev & Radhakrishnan, 2005). It captures a set of standardised practices, processes and capacities that develop systems of production and integrate employees' skills and physical capital, enabling firms to achieve efficient production and stable operation. These attributes of highly skilled employees and unique business processes have strong bonds with future growth opportunities, such as more innovation (Francis et al. 2021) which is vital to the development of firms' core competitive advantage, and lower managerial turnover (Carlin et al. 2012) which encourages employees to participate in long-term-oriented activities and improve their long-term competitive position and future firm value (Attig & Cleary, 2014). Through the provision of trade credit, suppliers thus can build good relationships with firms with more organisation capital and share in their future growth opportunities. Therefore, we predict that suppliers are more prone to granting trade credit to customer firms with more organisation capital as they appear to be more trustworthy with better growth opportunities (Hasan & Habib, 2019). The first hypothesis is thus as follows:

Hypothesis 1a. organisation capital is associated positively with the use of trade credit.

Building on the *agency view* of organisation capital, we offer two arguments supporting the view that organisation capital and the use of trade credit are negatively associated. Firstly, a firm's superior talents and shareholders both have a claim on its cash flows, because organisation capital is a firm-specific production factor that is embedded in the firms' key talents, who typically have an outside option. Hence, losing talents is the key risk of firms investing in organisation capital. As documented by Eisfeldt and Papanikolaou (2013), shareholders of firms with more organisation capital are exposed to additional risks because their share of

[1] Lim et al. (2020) show that the measure of Peters and Taylor's (2017) organisation capital is negatively associated with firms' leverage ratio.

[2] We argue that banks may be reluctant to extend loans to firms incurring substantial costs in developing organisation capital, fearing that these firms might put their funding into unprofitable projects at the expense of the banks themselves and, meanwhile, the financial market could hold little and limited information about the future prospects of these firms.

organisation capital rent is reduced when key talents pursue outside options and take their valuable organisation capital contribution and expertise with them to another firm. Firms with a high level of organisation capital are therefore exposed to the loss of key talents as well as the threat of losing invaluable information or business secrets to their competitors, which further increase the uncertainty of firms' future cash flow stemming from such losses. Supportively, Leung et al. (2018) argue that the increased labour mobility and greater competition for key talents that would improve key talents' outside options can increase the cost of retaining key talents and reduce the rent that shareholders can extract from organisation capital. Yildirim and Allen (2021) find that non-portable organisation capital rents are a source of systematic risk. Boguth et al. (2022) find that organisation capital is fragile owing to the departure of key executives, thereby exposing the firm to the risk of loss. Thus, we predict that suppliers are reluctant to grant trade credit to firms with more organisation capital, to circumvent the risk associated with loss of key talents.

Secondly, some notable features of organisation capital can exert a considerable negative impact on firms. It is difficult for firms to pledge organisation capital as collateral for fund raising, because organisation capital cannot be liquidated easily. In addition, key talents in firms with more organization capital are incentivised to over-invest in organisation capital and other investment projects to further improve their outside options or to maximize their private benefits (Eisfeldt & Papanikolaou, 2013). Thus, the possible loss of key talents and business secrets, and over-investment behaviour of key talents in firms with more organisation capital, are likely to heighten uncertainty about future cash flow. Suppliers, through regular interactions with their customers, can recognise the risk exposure associated with this potential unstable future performance and are sensitive to the continued service of key talents embedded in organisation capital, causing them to become more prudent with customer firms' future performance and capacity to fulfil the trade credit. Following this line of reasoning, suppliers are reluctant to granting trade credit to customer firms with more organisation capital, resulting in the following hypothesis:

Hypothesis 1b. organisation capital is associated negatively with the use of trade credit.

3. Data and key variables

3.1. Data

Data are collected from the Compustat and Centre for Research in Security Prices (CRSP) databases, through Wharton Research Data Services (WRDS), for the period 1981–2017.[3] Firms operating in the financial and utility sector are excluded from the sample. Following Peters and Taylor (2017) and Marwick et al. (2020), firms with physical capital lower than $5 million are excluded to eliminate the potential bias resulting from smaller firms. Furthermore, observations with missing variables are excluded. All variables are winsorized at the 1% level on both sides to minimise the potential impact of outliers. The final sample consists of 79,667 firm-year observations pertaining to 8,152 unique firms.

Panel A of Online Appendix Table A reports the sample distribution by year, and each year accounts for less than 3.5 percent of the firm-year observations. The number of firm-year observations increases monotonically from 1981 to 1998 and then reduces. Panel B in Online Appendix Table A presents the sample distribution by industry using the Fama and French (1997) 48-sector classifications. The sample covers 44 industries, and the industries that are most represented in the sample are business services (10.59%), electronic equipment (8.39%), and retail (6.83%). Other industries account for less than 5 percent of the firm-year observations, suggesting a wide distribution within our sample.

3.2. Key variables

3.2.1. Measures of organisation capital

Ample studies document that substantial portions of selling, general and administrative (*sga*) expenditures are invested into items that generate firms' organisation capital, including labour costs such as wages, employee incentives, marketing expenses, recruiting and consulting costs, employee training costs, and investments in information and distributing systems (Eisfeldt & Papanikolaou, 2013; Lev et al. 2009; Lev & Radhakrishnan, 2005). Peters and Taylor (2017) argue that *sga* captures expenditures both on employee training and advertising, which strengthen, respectively, human capital and brand reputation. This implies that any value gained through these expenditures is firm-specific and attributable to firms' key talents, and, in turn, heightens firms' organisation capital.

Following Peters and Taylor (2017), we measure organisation capital based on *sga* expenditure using the perpetual inventory method as follows:

$$OC_{i,t} = (1 - \delta_0)OC_{i,t-1} + sga_{i,t} \times \theta_0$$

where $sga_{i,t}$ denotes firm i's selling, general and administrative expenditure at time t. δ_0 denotes the depreciation rate of organisation capital. θ_0 represents the percentage of *sga* expenditure invested into organisation capital, and $OC_{i,t}$ denotes firm-specific organisation capital at time t. The initial stock of organisation capital for each firm is computed as follows:

$$OC_{i,t0} = \frac{sga_{i,t} \times \theta_0}{g + \delta_0}$$

[3] The data on the organisation capital measure by Peters and Taylor (2017) in WRDS are available up to 2017.

Table 1
Summary statistics
This table reports the summary statistics of the key variables used in this study. The definitions of the variables used in this table are presented in the Appendix. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Variable	Mean	Median	S.D.	25%	75%
oc_ta	0.3425	0.2568	0.3060	0.1323	0.4462
oc_ep_ta	0.9367	0.6939	0.8980	0.3556	1.1902
Δtc_purchase	0.8215	0.3634	3.8009	−0.7358	1.9021
Δtc_cogs	1.6060	0.5860	8.1347	−1.1839	2.9031
Δtc_ta	1.7175	0.5941	8.8061	−1.1918	2.9328
Δtr_sale	1.5979	0.6717	6.6740	−0.9878	3.2328
ap	208.5763	18.8120	700.3384	5.2830	85.7300
at	2,657.4840	296.1870	8,337.8250	82.6470	1,297.4000
purchase	1,520.5660	190.8150	4,627.5740	52.1250	804.7790
ap_at	0.0899	0.0711	0.0719	0.0409	0.1162
tr	0.1615	0.1538	0.0966	0.1038	0.2061
tp	0.1499	0.1079	0.1769	0.0707	0.1617
fsize	5.8644	5.6910	1.9474	4.4146	7.1681
lev	0.2342	0.2061	0.2035	0.0609	0.3487
mb	1.6806	1.3307	1.1082	1.0138	1.9260
cash	0.1422	0.0819	0.1583	0.0253	0.2046
roa	0.1120	0.1222	0.1187	0.0677	0.1758
ppe	0.3037	0.2512	0.2176	0.1328	0.4239
rating	0.2393	0	0.4267	0	0
cap	0.0619	0.0440	0.0591	0.0233	0.0790
rd_dummy	0.5117	1	0.4999	0	1
zscore	1.6371	1.9277	2.0076	0.9989	2.7471
vol	0.0715	0.0375	0.0978	0.0188	0.0814
sg	0.1007	0.0686	0.2812	−0.0285	0.1818
loc ratio	0.0081	0	0.0278	0	0
age	2.6381	2.6391	0.7773	2.0794	3.1781

where *g* represents the growth in the flow of organisation capital, estimated as the average growth of firm-level *sga* expenditure. Following the literature (Eisfeldt & Papanikolaou, 2013; Peters & Taylor, 2017), we assume 30% of *sga* spending as the investment into organisation capital. Following Peters and Taylor (2017), we assume a 20% depreciation rate for organisation capital. Lastly, the stock of organisation capital is scaled by firms' total assets, and denoted as *oc_ta.* This is widely used in the literature (Francis et al. 2021; Gao et al. 2021; Kim et al. 2021).

As an alternative measure, we employ the organisation capital measure by Eisfeldt and Papanikolaou (2013) which is also widely used in prior studies (Francis et al. 2021; Hasan & Cheung, 2018). Similar to Peters and Taylor (2017), Eisfeldt and Papanikolaou (2013) measure firms' stock of organisation capital by capitalising *sga* expenditures, as follows:

$$OC_{i,t} = (1 - \delta_{0C})OC_{i,t-1} + \frac{sga_{i,t}}{cpi_t}$$

Most variables are discussed earlier, except cpi_t, which denotes the consumer price index. The initial stock of organisation capital for each firm is computed based on the growth rate of 10%, and the depreciation rate for organisation capital is to be assumed to be 15%, following Francis et al. (2021) and Kim et al. (2021). The Eisfeldt and Papanikolaou (2013) measure of organisation capital scaled by total assets is denoted as *oc_ep_ta*. Both *oc_ta* and *oc_ep_ta* are the proxies for organisation capital used in the baseline regression. We also follow Marwick et al. (2020) and use the ratio of organisation capital to total capital, denoted as *oc_tc*, as alternative measures of organisation capital in the present study.

3.2.2. Measures of trade credit

Inspired by Dass et al. (2015), Fontaine and Zhao (2021) and other studies, to incisively capture the funds obtained from the suppliers, we focus on the change in trade credit extended by suppliers. Hence, the focal variable in our study is the incremental use of trade credit, i.e., the difference of accounts payable between time *t* and *t-1*, scaled by total purchase and multiplied by 100 (*Δtc_purchase*), where purchase is measured as the cost of goods sold and adjusted for year-to-year changes in inventory. The scalar of purchase is well adopted in the literature such as in Zhang, García Lara, and Tribó (2020) and Hasan and Habib (2019). We also employ two alternative measures of trade credit, *Δtc_cogs* (the ratio of change in accounts payable to cost of goods sold); and *Δtc_at* (the ratio of change in accounts payable to total assets), which are also widely used in the literature (for example, Love et al. 2007; Garcia-Appendini & Montoriol-Garriga, 2013; Garcia-Appendini & Montoriol-Garriga, 2020; Gyimah et al. 2020).

4. Empirical model

To empirically examine the association between firms' organisation capital and the use of trade credit, we estimate the following model:

$$\Delta trade\ credit_{i,t} = \alpha_0 + \alpha_1 oc_{i,t} + \sum \theta_i x_{i,t} + \delta_{ind \times year} + \varepsilon_{i,t} \quad (1)$$

where subscripts *i* and *t* represent firm *i* and year *t*, respectively. Following Fontaine and Zhao (2021), the dependent variable is the incremental use of trade credit (proxied by *Δtc_purchase*), and the key independent variable is organisation capital (proxied by *oc_ta* and *oc_ep_ta*). The slope (α_1) provide estimates of how firms' organisation capital pushes the issuance of trade credit from the suppliers away from the average. $\delta_{ind \times year}$ indicates the interactive industry (SIC 3-digit) and year fixed effects, while $\varepsilon_{i,t}$ signifies the idiosyncratic error term. As Abdulla et al. (2020) highlight, the highest (lowest) volumes of trade credit offered are to the energy and business equipment (retail and wholesale) industries. In general, products in the business equipment industry require a quality guarantee, implying that suppliers often offer trade credit to these firms. There are varying differences in the amount of trade credit provided to firms across different industries. To account for such differences, we include industry fixed effects in our regression analysis.

Following prior studies (for example, Abdulla et al. 2020; D'Mello & Toscano, 2020), we incorporate a set of firm-specific control variables that could influence trade credit: market to book ratio, leverage ratio, firm size, tangibility, profitability, capital expenditure, cash holdings, cash flow volatility, z-score, firm age, and research and development. Following Shenoy and Williams (2017), Petersen and Rajan (1997) and Garcia-Appendini and Montoriol-Garriga (2013), we also incorporate trade receivables, sales growth, credit rating, and bank lines of credit.

5. Empirical results

5.1. Summary statistics

The summary statistics of the key variables are reported in Table 1. The average of *oc_ta* is 0.3425, with a standard deviation of 0.3060, while the average of *oc_ep_ta* is 0.9367 with standard deviation of 0.8980. These results are consistent with those of Marwick et al. (2020) and Francis et al. (2021). In line with Fontaine and Zhao (2021), the incremental use of trade credit (*Δtc_purchase*), on average, is 0.8215 of the total purchase. The averages of *Δtc_cogs* and *Δtc_at* are 1.6060 and 1.7175, respectively.

Table 2 reports the correlation matrix. We find that the correlations between organisation capital (*oc_ta* and *oc_ep_ta*) and proxies for trade credit (*Δtc_purchase*, *Δtc_cogs* and *Δtc_at*) are negative and significant, implying that organisation capital plays a role in determining the use of trade credit, which provides preliminary support to the *agency view* of organisation capital. With respect to the control variables, organisation capital is positively correlated with cash holdings, market-to-book ratio, volatility, firm age and bank line of credit, whereas it is negatively correlated and statistically significant with the other control variables. These results imply that the integration of these control variables is important to validate our conclusion.

5.2. Organisation capital and trade credit: baseline results

Table 3 reports the results of the estimation of Equation (1). The coefficients on *oc_ta* and *oc_ep_ta* are negative (−0.5122 and −0.2200 in Columns (1) and (2), respectively) and statistically significant at the 1% level, suggesting that the use of trade credit reduces with higher organisation capital.[4] To gauge economic significance, these coefficients reveal that a one standard deviation increase in a firm's organisation capital (*oc_ta* and *oc_ep_ta*) induces the firm to reduce its use of trade credit by 15.67% (−0.5122 × 0.3060) and 19.76% (−0.2200 × 0.898), all else being equal. The coefficients on the control variables are in line with prior studies. For instance, the positive and significant coefficients on market to book ratio are consistent with the finding by Cuñat (2007) that high growth firms tend to rely on trade credit.

In summary, the estimated results presented in Table 3 lend support to the *agency view* hypothesis, as they show clearly that there is a negative and direct impact of organisation capital on the incremental use of trade credit granted by suppliers. This is in line with the view that, when key talents pursue outside options and take their valuable organisation capital contribution and expertise with them to another firm, firms with more organisation capital are exposed to the loss of key talents and the threat of losing invaluable business secrets to competing firms, which further increases the volatility of these firms' future cash flow stemming from such losses. This

[4] We check the results when *oc_ta* or *oc_ep_ta* are measured at *t-1* (which is lagged one year) and find supportive findings. The estimated coefficients on oc_ta_{t-1} (−0.5194) or $oc\_ep\_ta_{t-1}$ (−0.2780) remain negative and statistically significant at the 1% level.

Table 2
Correlation
This table presents the Pearson's pair-wise correlation matrix between the variables used in the regressions. Definitions of the variables used in this table are presented in the Appendix. Correlation coefficients are bold to demonstrate their statistical significance at the 1% or better.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) *oc_ta*	1															
(2) *oc_ep_ta*	**0.919**	1														
(3) *Δtc_purchase*	**−0.104**	**−0.116**	1													
(4) *Δtc_cogs*	**−0.127**	**−0.125**	**0.681**	1												
(5) *Δtc_ta*	**−0.125**	**−0.123**	**0.668**	**0.971**	1											
(6) *Δtr_sale*	**−0.177**	**−0.176**	**0.432**	**0.469**	**0.472**	1										
(7) *tr*	**−0.193**	**−0.123**	**0.072**	**0.159**	**0.164**	**0.339**	1									
(8) *tp*	**−0.070**	**−0.033**	**0.177**	**0.400**	**0.427**	**0.140**	**0.312**	1								
(9) *fsize*	**−0.344**	**−0.374**	**0.027**	**0.036**	**0.033**	**0.038**	**−0.051**	**0.025**	1							
(10) *lev*	**−0.088**	**−0.084**	**−0.026**	**−0.011**	**−0.008**	**−0.025**	**−0.045**	**0.044**	**0.090**	1						
(11) *mb*	**0.033**	**0.039**	**0.078**	**0.108**	**0.107**	**0.157**	**0.004**	**0.085**	**0.082**	**−0.165**	1					
(12) *cash*	**0.025**	**0.088**	**−0.045**	**0.012**	**0.012**	0.004	**0.047**	**0.068**	**−0.084**	**−0.394**	**0.350**	1				
(13) *roa*	**−0.138**	**−0.218**	**0.069**	**0.034**	**0.028**	**0.118**	**−0.163**	**−0.117**	**0.235**	**−0.085**	**0.218**	**−0.145**	**1**			
(14) *ppe*	**−0.234**	**−0.230**	**−0.031**	**0.022**	**0.029**	**−0.051**	**−0.230**	**0.131**	**0.037**	**0.267**	**−0.171**	**−0.370**	**0.104**	**1**		
(15) *rating*	**−0.173**	**−0.188**	**−0.009**	−0.003	−0.004	**−0.015**	**−0.075**	**0.011**	**0.590**	**0.265**	**−0.013**	**−0.164**	**0.115**	**0.091**	1	
(16) *cap*	**−0.148**	**−0.146**	**0.084**	**0.142**	**0.151**	**0.069**	**−0.086**	**0.208**	**−0.019**	**0.076**	**0.040**	**−0.167**	**0.167**	**0.607**	0.000	1
(17) *rd_dummy*	**−0.052**	**0.054**	**−0.028**	0.001	−0.003	**0.034**	**0.250**	0.002	**0.067**	**−0.197**	**0.166**	**0.263**	**−0.072**	**−0.318**	0.000	**−0.181**
(18) *zscore*	**−0.008**	**−0.129**	**0.087**	**−0.010**	**−0.019**	**0.048**	**−0.178**	**−0.265**	**0.122**	**−0.262**	**−0.028**	**−0.151**	**0.624**	**−0.071**	0.005	0.000
(19) *vol*	**0.217**	**0.288**	**−0.055**	**−0.009**	−0.003	**−0.045**	**0.047**	**0.135**	**−0.260**	**0.045**	**0.133**	**0.244**	**−0.396**	**−0.085**	**−0.128**	**−0.031**
(20) *sg*	**−0.206**	**−0.213**	**0.397**	**0.401**	**0.406**	**0.586**	**0.046**	**0.079**	**0.040**	**−0.014**	**0.198**	**0.028**	**0.197**	**0.002**	**−0.012**	**0.146**
(21) *loc ratio*	**0.025**	**0.047**	**−0.018**	**−0.019**	**−0.018**	**−0.017**	**0.092**	−0.005	**−0.079**	**0.139**	**−0.102**	**−0.141**	**−0.025**	**0.015**	**−0.034**	**0.007**
(22) *age*	**0.069**	**0.012**	**−0.051**	**−0.074**	**−0.077**	**−0.094**	−0.061	−0.101	**0.258**	**−0.049**	**−0.071**	**−0.141**	**0.114**	**−0.016**	**0.214**	**−0.108**

Variables	(17)	(18)	(19)	(20)	(21)
(18) *zscore*	**−0.117**				
(19) *vol*	**0.083**	**−0.573**			
(20) *sg*	−0.006	**0.079**	**−0.035**	1	
(21) *loc ratio*	**0.020**	**0.030**	**−0.059**	**−0.034**	1
(22) *age*	**0.085**	**0.178**	**−0.195**	**−0.136**	**0.039**

Table 3
Relation between organisation capital and the use of trade credit
This table presents the regression results of the relation between organisation capital (*oc_ta* and *oc_ep_ta*) and trade credit (*Δtc_purchase*) (see Equation (1)). Robust standard errors (in brackets) are clustered at the firm level. The definitions of the variables used in this table are presented in Appendix. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	Dependent variables: *Δtc_purchase*	
	(1)	(2)
oc_ta	−0.5122***	
	(0.1486)	
oc_ep_ta		−0.2200***
		(0.0494)
tr	13.2682***	13.2185***
	(0.7406)	(0.7366)
fsize	0.1382***	0.1331***
	(0.0273)	(0.0266)
lev	−0.2524	−0.2751
	(0.2124)	(0.2124)
mb	0.3357***	0.3378***
	(0.0454)	(0.0453)
cash	−0.7682***	−0.7573***
	(0.2962)	(0.2938)
roa	−4.8689***	−4.8918***
	(0.4800)	(0.4798)
ppe	−0.8220***	−0.8471***
	(0.3016)	(0.3014)
rating	−0.1461*	−0.1388
	(0.0864)	(0.0863)
cap	12.4121***	12.3824***
	(1.0659)	(1.0656)
rd_dummy	−0.2433***	−0.2190***
	(0.0817)	(0.0830)
zscore	0.0711**	0.0601*
	(0.0311)	(0.0309)
vol	−1.0198*	−0.9528*
	(0.5411)	(0.5413)
sg	10.3734***	10.343***
	(0.2538)	(0.2538)
loc	−4.1639***	−4.1454***
	(1.1106)	(1.1069)
age	−0.1079***	−0.1103***
	(0.0399)	(0.0395)
constant	−2.1556***	−2.0665***
	(0.2817)	(0.2778)
Industry × Year effects	Yes	Yes
Observations	79,667	79,667
Adjusted R^2	0.1919	0.1921

Table 4
Endogeneity concern: accounting for omitted variables bias
This table presents the regression results of the relation between organisation capital and trade credit (see Equation (1)) after including additional control variables that may affect organisation capital (i.e., managerial ability (*ma_score*) and intangibile asset (*intan*)). Robust standard errors (in brackets) are clustered at the firm level. The definitions of the variables used in this table are presented in the Appendix. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Dependent variables: *Δtc_purchase*	
	(1)	(2)
oc_ta	−0.5701***	
	(0.1514)	
oc_ep_ta		−0.2634***
		(0.0523)
ma_score	5.0154***	5.1223***
	(0.5816)	(0.5836)
intan	3.2826***	3.2151***
	(0.3389)	(0.3374)
constant	−2.6599***	−2.4922***
	(0.3223)	(0.3193)
Control variables	Yes	Yes
Industry × Year effects	Yes	Yes
Observations	72,008	72,008
Adjusted R^2	0.1925	0.1927

reduces the incentive for suppliers to extend trade credit to these firms.[5]

5.3. Addressing endogeneity concerns

5.3.1. Additional control variables

We include additional control variables that may affect trade credit. Khoo and Cheung (2021) show that managerial ability affects trade credit granted by suppliers; and Marwick et al. (2020) suggest that omitting intangible assets reported in the balance sheet may bias the estimated results. The inclusion of two additional control variables (managerial ability (*ma_score*) and intangible assets (*intan*)) reduces the sample size to 72,008 firm-year observations. Incorporating the additional control variables, the coefficients on organisation capital remain negative and significant at the 1% level in Table 4.[6] Collectively, we present evidence that our main finding is not driven by omitted variable bias.

5.3.2. Two-stage least squares (2sls) – Lewbel (2012) approach

To further mitigate endogeneity concerns, we perform 2sls analyses using the Lewbel (2012) approach which is developed to address the endogeneity concern when external instruments are not available. Several recent studies employ the Lewbel (2012) technique and show supportive evidence that the generated instruments perform well (Fortin & Ragued, 2017; Hasan, Lobo, & Qiu, 2021; Millimet & Roy, 2016). The estimated results of second-stage regression results are reported in Table 5. The significant coefficients on selected *IVs* reflect that they are useful in explaining organisation capital. We find supportive evidence from both under-identification (the Kleibergen-Paap rk LM statistic is significant, thus, selected *IVs* are relevant) and weak identification (the

[5] One may contend that this negative relation could only persist up to a certain level of organisation capital and may turn positive after that. For example, if organisation capital goes beyond a certain level, it could escalate firms' trustworthiness due to its operational efficiency and superior performance inherited from organisation capital, suggesting that the *efficiency view* countervails the *agency view* of organisation capital. Given this, the negative effect of organisation capital on trade credit may be dampened as the level of organisation capital increases, resulting in a non-linear relationship. To examine this potential non-linearity, we conduct two analyses. We first include both *oc_ta* and oc_ta^2 or *oc_ep_ta* and $oc\_ep\_ta^2$ in Equation (1) and re-estimate the (quadratic) regression. The coefficients on oc_ta^2 or $oc\_ep\_ta^2$ are significantly positive, which apparently depicts a U shape relation between organisation capital and incremental use of trade credit. However, quadratic regression only captures a certain amount of curvature in a non-linear relation. Therefore, we then estimate the spline regression, which allows the slope coefficient to vary with different levels of organisation capital. Spline regressions can explicitly model a slope change in a regression equation at a certain threshold (Greene, 2003). The regression equation consists of a number of line segments, varying with respect to the slope parameter. The use of a quadratic regression model implies a gradually changing impact of organisation capital on trade credit instead of a break at a certain threshold. Thus, it appears to be less accurate; whereas on the other hand, the spline regression explicitly models the threshold at which the effect of organisation capital on trade credit changes, which allows a closer approximation. Using the spline regression, we document a downward sloping curve (untabulated finding), which supports the agency view on organisation capital and the main story of our study. In the untabulated results, we find that the marginal effect on the incremental use of trade credit remains negative when organisation capital is small (that is, when value of *oc_ta* or *oc_ep_ta* is around the range of its average). When the organisation capital is large in value (exceeds its 75th percentile), the marginal effect become insignificant.

[6] One may argue that it is imperative to control selling, general and administrative expenditure (*sga*), given that organisation capital is constructed based on the fraction of *sga* (Hasan and Uddin, 2022). When *sga* is controlled for, the coefficients on organisation capital remain negative and significant.

Table 5
Endogeneity concern: two-stage least-squares estimation using Lewbel approach
This table presents the two-stage least-squares regression results of the relation between organisation capital and trade credit. Following Lewel (2012), we generate instrumental variables as per discussion in Section 5.3.2. Columns (1) to (4) present regression results using the Lewbel (2012) approach that exploits the heterogeneity in the error term of the first stage regression to generate instruments from within the existing model. Robust standard errors (in brackets) are clustered at the firm level. The definitions of the variables used in this table are presented in the Appendix. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	Dependent variables: *Δtc_purchase*	
	(1)	(2)
oc_ta	−6.1903*	
	(3.3248)	
oc_ep_ta		−2.0912*
		(0.9691)
Control variables	Yes	Yes
Firm and year effects	Yes	Yes
Observations	79,667	79,667
Under-identification test:		
Kleibergen-Paap rk LM statistic	43.383	55.402
p-value	0.000	0.000
Weak identification test:		
Kleibergen-Paap rk LM F Statistic	29.949	40.974
Stock and Yogo (2005) 10% maximal IV size (critical value)	19.93	19.93
Over-identification test:		
Hansen J statistic	2.765	2.767
p-value	0.10	0.10

Table 6
Endogeneity concern: entropy balancing method
This table presents the entropy balancing regression results. Robust standard errors (in brackets) are clustered at the firm level. The definitions of the variables used in this table are presented in the Appendix. *, ** and *** denote statistical significance at the 10%, 5% and 1%, levels respectively.

	Dependent variables: *Δtc_purchase*	
	(1)	(2)
oc_ta	−0.4890***	
	(0.1017)	
oc_ep_ta		−0.3228***
		(0.1041)
constant	−4.3345***	−4.5932***
	(0.6005)	(0.5848)
Control variables	Yes	Yes
Firm and year effects	Yes	Yes
Observations	79,667	79,667
Adjusted R^2	0.2153	0.2555

Kleibergen-Paap rk LM exceeds the Stock and Yogo (2005) critical value, thus, the selected *IVs* are correlated with our endogenous regressors) testing. In addition, the p-value of Hansen's J over-identification test statistic is large, indicating that the selected *IVs* do not suffer any over-identification issues. In Columns (1) and (2), the estimated coefficients on *oc_ta* and *oc_ep_ta* are significantly negative (−6.1903 in Column (1); −2.0912 in Column (2)).[7] Estimated results from the second stage regression show that the negative association between organisation capital and the incremental use of trade credit remains robust after addressing the endogeneity concerns.

5.3.3. Entropy balancing method

Entropy balancing regression is a generalised, multivariate propensity-score weighting approach to address the endogeneity concern arising from an imbalance between treatment and control groups. This technique relies on a maximum entropy reweighting scheme that calibrates unit weights, and thus the distribution moments between the treatment and control groups are equalised. As noted by Hainmueller (2012), the entropy balancing technique adjusts for random and systematic inequalities in the covariate distributions between the treatment and control groups and mitigates the risk that these inequalities could influence our estimated results.

[7] Note that the coefficients on organisation capital in the 2sls regression are greater than those reported in baseline analysis, which is consistent with Li et al. (2018) and Hasan, Lobo, and Qiu (2021). These larger coefficients are not surprising, given that the 2sls estimator is biased and inefficient but consistent.

Moreover, McMullin and Schonberger (2020) highlight that entropy balancing improves covariate balance, compared with the propensity-score weighting approach.

Following recent studies (Arifin et al. 2020; Hasan et al. 2021b, 2021c), we employ the entropy balancing method. Firstly, the sample is split into two groups, treatment (firms with high levels of organisation capital) and control (firms with low levels of organisation capital), based on the median value of organisation capital in each year. Next, the entropy balancing method re-weights each firm-year observation of the control group, thus the distributions (e.g., mean, variance, and skewness) of covariates are balanced across the treatment and control groups. Using the entropy balanced sample, we report the estimated results in Table 6. We continue to find that, regardless of which measure of organisation capital is used (*oc_ta* or *oc_ep_ta*), the coefficients on organisation capital remain negative and statistically significant at the 1% level (−0.4890 in Column (1); −0.3228 in Column (2)). These empirical findings further confirm that the documented inverse linkage between organisation capital and the incremental use of trade credit are not driven by endogeneity.

5.4. Sensitivity tests

5.4.1. Alternative measures of organisation capital and trade credit

We adopt two alternative measures of trade credit, *Δtc_ta* (the change in accounts payable scaled by total assets) and *Δtc_cogs* (the change in accounts payable scaled by cost of goods sold), and one alternative measure of organisation capital, *oc_tc* (organisation capital measure of Peters and Taylor (2017) scaled by total capital). Using these alternative measures of organisation capital and trade credit, we re-estimate Equation (1) and report the results in Online Appendix Table B. Columns (1)–(3) show estimated results when the dependent variable is *Δtc_ta*. The coefficients on *oc_tc* (−0.6274), *oc_ta* (−0.8485) and *oc_ep_ta* (−0.2781) are negative and statistically significant at the 1% level. Columns (5)–(6) report estimated results when the dependent variable is *Δtc_cogs*, showing that the coefficients on *oc_tc* (−0.6555), *oc_ta* (−0.3207) and *oc_ep_ta* (−0.1626) remain negative and statistically significant at the 5% level. Taken together, we observe that the results remain robust with these variants of organisation capital and trade credit measures. Thus, this sub-section provides evidence that the negative relation between organisation capital and incremental use of trade credit is not driven by any specific measure of organisation capital or trade credit.

5.4.2. Alternative specification – firm fixed effects regression

One may argue that our baseline regression may not be sufficient to remove potential effects arising from firm-specific characteristics. Thus, we incorporate firm fixed effects to control for any firm-specific, time-invariant omitted variables that could affect the linkage between organisation capital and trade credit. Online Appendix Table C reports the estimated results. In Table C, we find supportive evidence that, regardless of which measurement of organisation capital is used, the coefficients on organisation capital remain negative and significant when the dependent variable is *Δtc_purchase, Δtc_cogs* or *Δtc_ta*, except for an insignificant and negative coefficient on *oc_ta* when the dependent variable is *Δtc_cogs*. Taken together, we confirm that our main results are robust to the inclusion of firm fixed effects.

5.4.3. Subsample analyses

Taking into consideration that high-technology firms generally hold more intangible assets (Carpenter & Petersen, 2002), we split the sample into two groups, non-high-technology firms and high-technology firms, following the industry classifications by Barton and Waymire (2004) [8], and report the results in Panel A and B of Online Appendix Table D. The finding that the use of trade credit reduces with organisation capital remains negative and statistically significant at the 1% level for both subsamples, high-technology firms (Panel A) and non-high-technology firms (Panel B). In addition, Table 1 shows that 10.59% of the firms belong to the business services sector. One may argue that the documented relation could be affected by this disproportionate representation of certain industries, thus we re-estimate Equation (1) excluding the business services sector. The results in Panel C show that the negative relationship between organisation capital and incremental use of trade credit remains significant after excluding the business services sector. Collectively, we find evidence that our main finding is not driven by high-technology firms or the business services sector.

5.5. Channel analyses

5.5.1. Employee outside opportunities

To further explore our Hypothesis 1b which is based on the *agency view* of organisation capital, we examine whether the finding that incremental use of trade credit reduces with high organisation capital would change with employees' outside options in the customer firms. Employees with more valuable outside options now are more likely to leave the firm and join another firm later (Peng & Yin, 2021). When skilled employees depart, the loss of certain employees or the inability to attract and retain qualified personnel in the future is likely to have a materially adverse effect on the firms' business, financial condition and results of operations (Belo et al. 2017; Israelsen & Yonker, 2017), particularly if key individuals are subsequently employed by a competitor. In the eyes of the supplier, they are thus receptive to the employees' outside option and view it as a detrimental signal of customer firms' future operation. Given this,

[8] Using 3-digit SIC codes, high-technology firms are defined as firms operating in the following industries: 372 (aircraft), 371 (automotive), 481–482 and 489 (communications), 363, 366 and 369 (electronics), 781, 783 and 791 (film and entertainment), 351–356 (industrial machinery), 357 (office equipment), 381, 383–384, 387 (photography), and 491 and 493 (electrical utilities).

Table 7
The moderating role of employee outside option: organisation capital and the use of trade credit
This table presents the regression results with an interactive term between organisation capital (*oc_ta* and *oc_ep_ta*) and employee outside option (*HHI* and *oo*). The main variables of interest are the interaction terms between organisation capital and the proxy for employee outside option. Panel A (Panel B) shows the estimated results from the proxy of *HHI* (*oo*). Robust standard errors (in brackets) are clustered at the firm level. The definitions of the variables used in this table are presented in the Appendix. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	Dependent variables: *Δtc_purchase*	
	(1)	(2)
Panel A: HHI (lower HHI implies more outside options)		
oc_ta	−3.5392***	
	(0.2617)	
oc_ep_ta		−1.2291***
		(0.0886)
HHI-TNIC3	−0.5386***	−0.5272***
	(0.1319)	(0.1275)
oc_ta × *HHI-TNIC3*	1.113***	
	(0.2627)	
oc_ep_ta × *HHI-TNIC3*		0.3721***
		(0.0960)
constant	0.4643	0.4736
	(0.3632)	(0.3580)
Control variables	Yes	Yes
Industry × Year effects	Yes	Yes
Observations	58,133	58,133
Adjusted R^2	0.0883	0.0892
Panel B: employee outside option (*oo*)		
oc_ta	−0.3019*	
	(0.1630)	
oc_ep_ta		−0.0965*
		(0.0563)
oo	0.2814***	0.3496***
	(0.1071)	(0.1017)
oc_ta × *oo*	−0.7018***	
	(0.2276)	
oc_ep_ta × *oo*		−0.3254***
		(0.0804)
constant	−1.9448***	−1.8935***
	(0.3278)	(0.3249)
Control variables	Yes	Yes
Industry × Year effects	Yes	Yes
Observations	58,262	58,262
Adjusted R^2	0.1835	0.1844

we expect the relation between organisation capital and the incremental use of trade credit to be more pronounced for customer firms whose employees have more outside opportunities.

Following prior literature (Faleye et al. 2013; Wang et al. 2021), we employ two measures of employee outside opportunities: (1) industry concentration (*HHI*) and (2) employee outside option (*oo*). *HHI* measures the extent to which the industry is dominated by a few firms, which potentially diminishes employees' outside options and their relative bargaining power (Faleye et al. 2013). The construction of *oo* relies on the concept that it is easier for employees to find new jobs near their original jobs. It is measured the total number of firms in the same industry and under the same city scaled by the total number of firms within the same city (Wang et al. 2021; Zhang, Wang, & Kong, 2020). Higher value of *oo* reveals that there are more similar firms with the same city and thus more outside employment opportunities. For each proxy, we construct a dummy variable equal to one when the proxy's value is greater than the sample median, and zero otherwise.

Table 7 reports the estimated results for the subsamples of firms with *HHI* and *oo* values below and above the median. Panel A shows the estimated results using the proxy of *HHI*. The estimated coefficients on *HHI* are negative and statistically significant at the 1% level (−0.5386 and −0.5272), which is in line with the finding in Wilner (2000) that customer firms with less bargaining power receive trade credit from their suppliers. The coefficients on the interaction term are positive and significant, meanwhile the coefficients on *oc_ta* (−3.5392) and *oc_ep_ta* (−1.2291) are negative and statistically significant at the 1% level. The negative coefficients support our view that the negative documented relation is more pronounced for firms whose employee have more outside opportunities. Panel B reports the estimated results obtained from the proxy of *oo*. Similarly, the coefficients on interaction terms (*oc_ta* × *oo* = −0.7018 and *oc_ep_ta* × *oo* = −0.3254) are negative and significant at the 1% level, indicating that, *ceteris paribus*, customer firms whose employees have more outside options receive less trade credit than those with less outside options. Consistent with our

Table 8
The moderating role of labour mobility: organisation capital and the use of trade credit
This table presents the regression results with an interactive term between organisation capital (*oc_ta* and *oc_ep_ta*) and labour mobility (*NEI* and *IDD*). The main variables of interest are the interaction terms between organisation capital and the proxy for labour mobility. Panel A (Panel B) shows the estimated results from the proxy of *NEI* (*IDD*). Robust standard errors (in brackets) are clustered at the firm level. The definitions of the variables used in this table are presented in the Appendix. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	Dependent variables: *Δtc_purchase*	
	(1)	(2)
Panel A: non-compete enforcement index (NEI) (lower NEI implies higher labor mobility)		
oc_ta	−0.8858***	
	(0.2092)	
oc_ep_ta		−0.3701***
		(0.075)
NEI	−0.292**	−0.2885**
	(0.1206)	(0.1164)
oc_ta × *NEI*	0.4972**	
	(0.225)	
oc_ep_ta × *NEI*		0.1852**
		(0.0872)
constant	−1.7648***	−1.658***
	(0.3424)	(0.338)
Control variables	Yes	Yes
Industry × Year effects	Yes	Yes
Observations	51,044	51,044
Adjusted R^2	0.189	0.1893
Panel B: inevitable disclosure doctrine (IDD) (lower IDD implies higher labor mobility)		
oc_ta	−0.6379***	
	(0.1823)	
oc_ep_ta		−0.2703***
		(0.0605)
IDD	−0.1286*	−0.1505
	(0.0959)	(0.0933)
oc_ta × *IDD*	0.2775*	
	(0.1828)	
oc_ep_ta × *IDD*		0.1223*
		(0.0675)
constant	−2.0868***	−1.9907***
	(0.2891)	(0.2829)
Control variables	Yes	Yes
Industry × Year effects	Yes	Yes
Observations	79,667	79,667
Adjusted R^2	0.1923	0.1925

expectation, the concern that employee outside opportunities adversely influences customer firms' trustworthiness is particularly relevant for suppliers.

5.5.2. Restrictions on labour mobility

When there are restrictions that limit employees' mobility, employees respond less to their outside career opportunities. However, under no or few restrictions on mobility, employees can actively respond to incentives from labour market opportunities. Under this condition, suppliers are receptive to the threat of losing skilled labour and thus reluctant to provide trade credit. We therefore expect the association between organisation capital and incremental use of trade credit to be more pronounced when firms are in flexible labour markets and/or faced with fewer restrictions – that is, where employees can freely move in the labour market. We use two settings. Firstly, we use the state-level recognition of inevitable disclosure doctrine (*IDD*). The recognition of *IDD* reduces labour mobility by prohibiting an employee from joining competing firms if the new position inevitably requires disclosure of the former employer's trade secrets. Secondly, we use state-level non-compete enforcement (*NEI*), which is a contractual agreement between employee and employer that directly prohibits employees from joining competing firms. Following Garmaise (2011), Kini et al. (2020)

Table 9
The exogenous shock of global financial crisis
This table presents the regression results of the effect of the global financial crisis on the relation between organisation capital and trade credit. Panel A reports the estimated results with an interactive term between organisation capital and *gfc*. The main variables of interest are the interaction terms between organisation capital and the proxy for *gfc*. Panel B shows the estimated results from subsamples of firms with low level of external financing and high level of external financing. Panel C shows the estimated results from subsamples of financially unconstrained and constrained firms. Robust standard errors (in brackets) are clustered at the firm level. The definitions of the variables used in this table are presented in the Appendix. *, ** and *** denote statistical significance at the 10%, 5% and 1%, levels respectively.

Panel A:	Dependent variables: *Δtc_purchase*	
	(1)	(2)
oc_ta	−0.3565**	
	(0.1409)	
oc_ep_ta		−0.1760***
		(0.0463)
gfc	−0.4092***	−0.3821***
	(0.1332)	(0.1295)
oc_ta × *gfc*	0.7532***	
	(0.2831)	
oc_ep_ta × *gfc*		0.2468**
		(0.1134)
constant	−2.4139***	−2.3014***
	(0.2679)	(0.2645)
Control variables	Yes	Yes
Industry effects	Yes	Yes
Observations	79,667	79,667
Adjusted R^2	0.2018	0.2019

Panel B:	Dependent variables: *Δtc_purchase*			
	(1)	(2)	(3)	(4)
	Low external finance		High external finance	
oc_ta	−0.3149**		−0.4820*	
	(0.1563)		(0.2466)	
oc_ep_ta		−0.1553***		−0.2074**
		(.0582)		(0.0816)
gfc	−0.5457***	−0.5444***	−0.4482*	−0.3938*
	(0.1495)	(0.1480)	(0.2434)	(0.2281)
oc_ta × *gfc*	0.8449***		0.5181	
	(0.2835)		(0.5774)	
oc_ep_ta × *gfc*		0.3283***		0.1181
		(0.1270)		(0.2052)
constant	−1.5503***	−1.4645***	−2.3207***	−2.2308***
	(0.2984)	(0.2939)	(0.4458)	(0.4422)
Control variables	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Observations	34,194	34,194	34,194	34,194
Adjusted R^2	0.0956	0.0958	0.2253	0.2253

Panel C:	Dependent variables: *Δtc_purchase*			
	(1)	(2)	(3)	(4)
	unconstrained		Financially constrained	
oc_ta	0.2562		−0.6073***	
	(0.1806)		(0.1830)	
oc_ep_ta		0.0122		−0.2118***
		(0.0717)		(0.0565)
gfc	−0.4096**	−0.4082**	−0.4602*	−0.4404*
	(0.1600)	(0.1652)	(0.2607)	(0.2427)
oc_ta × *gfc*	0.8851***		0.6748	
	(0.3212)		(0.4737)	
oc_ep_ta × *gfc*		0.3662**		0.2134
		(0.1481)		(0.1644)
constant	−1.6755***	−1.5765***	−3.0721***	−3.0164***
	(0.3714)	(0.3693)	(0.4171)	(0.4140)
Control variables	Yes	Yes	Yes	Yes

(*continued on next page*)

Table 9 (*continued*)

Panel C:	Dependent variables: *Δtc_purchase*			
	(1)	(2)	(3)	(4)
	unconstrained		Financially constrained	
Industry effects	Yes	Yes	Yes	Yes
Observations	39,802	39,802	39,801	39,801
Adjusted R^2	0.2409	0.2408	0.1864	0.1865

and Klasa et al. (2018), we employ *NEI* and *IDD* as proxies for restrictions on labour mobility. The enforceability of *NEI* and *IDD* varies across states, and labour mobility is more restricted when the firm's headquarter state is in recognition of *IDD* or has stricter *NEI* enforcement. For a proxy of *NEI*, we construct a dummy variable equal to one when *NEI* is greater than the sample median, and zero otherwise. For a proxy of *IDD*, we construct a dummy variable equal to one for firms located in those states that recognise the *IDD*, and zero otherwise.

Table 8 reports the estimated results for this analysis.[9] Panel A shows the estimated results using the proxy of *NEI*. The positive coefficients on interaction terms are significant at the 1% level, meanwhile the coefficients on organisation capital (*oc_ta* = −0.8858; *oc_ep_ta* = −0.3701) are negative and significant at the 1% level. The negative coefficients lend support to our argument that the use of trade credit reducing with organisation capital is more pronounced when there are few restrictions on labour mobility as measured by low *NEI* enforcement. Panel B shows the estimated results using the proxy of *IDD*. As expected, the magnitude of the coefficients of organisation capital (*oc_ta* = −0.6379 and *oc_ep_ta* = −0.2703) is larger than the coefficients of the interaction terms (*oc_ta* × *IDD* = 0.2775 and *oc_ep_ta* × *IDD* = 0.1223), indicating that the impact of organisation capital on the use of trade credit is stronger when employees can move freely in the labour market. The above findings suggest that labour market mobility plays a role in determining the link between customer firms' organisation capital and trade credit.

5.5.3. Exogenous shock of global financial crisis

Lopez and Olivella (2018) document that intangible capital plays an important role in propagating financial shocks to labour markets. When facing an adverse shock, firms prioritize investment in pledgeable assets to counterbalance their financial inflexibility, and cut back investment in intangible capital, which in turn leads to a decline in the marginal product of labour, vacancies and employment. In line with this view, the global economic downturn due to the global financial crisis (2007–2009) severely hurt the performance of many firms and banks, and generated a drastic contraction in investment that was associated with a large and persistent fall in production output. The contraction in economic activity induced firms to post fewer vacancies and caused an increase in unemployment (Afonso & Blanco-Arana, 2022; Colombo et al. 2019). This may have limited the outside options or opportunities for key talents to move in the labour market during the global financial crisis. In the eyes of the supplier, the concern about trading with creditworthy and financially healthier customer firms was prioritised over the threat of their employees' outside option, given that job vacancies and employment opportunities were severely hit during this difficult period. Thus, it is difficult to imagine that the *agency view* of organisation capital prevails in this situation, because the value of outside options is low and the risk of losing key talents is small. Instead, the relation between organisation capital and the incremental use of trade credit is expected to be positive, because suppliers have more concern over whether their customer firms can perform well in this difficult situation. Therefore, the efficiency view is expected to prevail during the global financial crisis.

Table 9 shows the estimated results of this analysis. In Panel A, the coefficients on interaction terms (*oc_ta* × *gfc* = 0.7532 and *oc_ep_ta* × *gfc* = 0.2468) are positive and significant at the 1% level, indicating that suppliers offer more trade credit to their customers during the global financial crisis.[10] More importantly, Panel A highlights that suppliers are receptive to customer firms' organisation capital which is a critical resource that is difficult to imitate and that enhances firms' growth and productivity (Eisfeldt & Papanikolaou, 2013; Lev & Radhakrishnan, 2005). Through the provision of trade credit, suppliers can build good relationships with firms with a high level of organisation capital and share in their future growth opportunities.

Next, to explore under what circumstances customer firms with a high level of organisation capital receive more trade credit from their suppliers, we partition the sample into subsamples based on customer firms' financing situation: external financing and financial constraint. We follow Bhandari et al. (2022) to measure firms' external financing.[11] To measure firms' financial constraint, we employ

[9] One may argue that we could adopt the staggered difference-in-difference estimation approach for making causal inferences. However, Baker et al. (2022) point out that such approach is biased. That is, the difference-in-difference regression estimates with staggered treatment timing do not provide valid estimates of the causal estimands of interest. We thus acknowledge the limitations of the staggered difference-in-difference estimation approach. We also redo the analysis with the DiD with multiple periods estimator proposed by Callaway and Sant'Anna (2021) and obtain results supporting our baseline analysis.

[10] The incremental use of trade credit during global financial crisis period is 0.7802, which is significantly lower than the average value during the non-global financial crisis period (1.6858). Such a finding is consistent with the view that suppliers are likely to be liquidity-constrained during the global financial crisis. Thus, they are cautious with their decisions on granting trade credit.

[11] A firm's external financing is measured as the sum of equity finance (change in book value of equity + change in deferred taxes – change in retained earnings between *t-1* and *t*, scaled by total asset in time *t-1*) and debt finance (change in total debt between *t-1* and *t*, scaled by total asset in time *t-1*).

three widely used measures of financial constraints: *WW* (Whited & Wu, 2006), *SA* (Hadlock & Pierce, 2010) and *KZ* (Kaplan & Zingales, 1997) indices. We extract the first principal component from these three measures using factor analysis and use this component as the proxy of financial constraint. In Panels B and C, the positive coefficients on interaction terms are statistically significant at the 1% level for the subsamples with better financing situation and low external financing burden ($oc\_ta \times gfc = 0.8449$ and $oc\_ep\_ta \times gfc = 0.3283$) and those that are financially flexible or unconstrained ($oc\_ta \times gfc = 0.8851$ and $oc\_ep\_ta \times gfc = 0.3662$). In sum, the estimated results reported in Panels B and C show that suppliers offer trade credit to customer firms with a high level of organisation capital during the global financial crisis when these customer firms could afford to do so, that is, when they are in a better financing situation. Taken together, these findings indicate that the incremental use of trade credit increases with organisation capital during the global financial crisis. That is, the *efficiency view* on organisation capital kicks in when the uncertainty of losing key talents is mitigated during the global financial crisis. The *efficiency view* of organisation capital prevails during a difficult period, such as global financial crisis, when the value of outside options is low and the risk of losing key talents is small. Despite that all customer firms were risky as they had the potential to default during the global financial crisis, suppliers may have inferred from the interactions with customer firms their financial conditions and creditworthiness, and thus grant trade credit to those with a better financing situation.

5.6. Additional analyses

5.6.1. Sub-period test

One may argue that a specific period within our sample may drive the inverse relation between organisation capital and trade credit. The sample is separated into two groups (1981–1999 and 2000–2017) based on the median year of our sample (i.e., year 1999), and we report the results in Online Appendix Table E. We observe that the negative linkage remains significant for both sub-sample periods, regardless of which proxy of organisation capital is used. For instance, the negative coefficients on *oc_ta* are significant during the periods of 1981–1999 (−0.3961 in Column (1)) and 2000–2017 (−0.6289 in Column (2)). Notably, the negative coefficients on *oc_ta* in the latter period (2000–2017) are not much stronger than in the early period of the sample (1981–1999), given that the differences in coefficients are not statistically significant. We find similar results when the proxy of *oc_ep_ta* is used.

5.6.2. Organisation capital, tangibility and trade credit

Prior work shows evidence that tangibility is associated with the corporate trade credit extended by suppliers. For example, Almeida and Campello (2007) document that pledgeable assets support more borrowing, because tangibility increases the value that suppliers can salvage if a default takes place; but Hasan and Alam (2022) find that firms with more redeployable assets undertake less trade credit. Assuming that firms having more organisation capital implies posing a low level of tangibility, one may argue that the association between organisation capital and trade credit could be driven by the relation between asset tangibility and trade credit. To address this concern, we examine the association between organisation capital and trade credit among firms with different levels of tangibility. Using the proxy of tangibility (*ppe*), we split the sample into two groups based on the sample median, firms with high or low levels of tangibility, re-estimate Equation (1), and report in Online Appendix Table F.[12] In Columns (1) and (3) of Table F, the estimated coefficients on *oc_ta* and *oc_ep_ta* in firms with low tangibility are negative and significant at the 1% level (−1.4532 and −0.5319, respectively). In Columns (2) and (4), the estimated coefficients *oc_ta* and *oc_ep_ta* in firms with high tangibility are also negative and significant at the 1% level (−0.7923 and −0.2762, respectively). These results reflect that an increase in organisation capital is associated with a reduction in trade credit extended by suppliers, regardless of the level of asset tangibility. That is, the inverse relation between organisation capital and trade credit is unlikely be driven by asset tangibility.

5.6.3. Accounts receivable

Next, we explore the association between organisation capital and trade credit provision, that is, whether firms with more organisation capital offer more or less trade credit to their customers. We propose a negative relation between organisation capital and trade credit provision, following the *agency view* of organisation capital. Key talents at firms with more organisation capital are incentivised to over-invest in organisation capital and other investment projects that are likely to improve their outside options or to pursue private objectives at the expense of shareholders (i.e., empire building and consumption of perks) (Eisfeldt & Papanikolaou, 2013; Yildirim & Allen, 2021). In addition, investment in organisation capital generates additional risk for shareholders and is exposed to adverse financial shocks, for example, when skilled employees pursue outside opportunities, which can directly increase cash flow risk. Given these considerations, firms with more organisation capital are prudent with their liquidity, leading them to curtail the trade credit offered to their customers. We re-estimate Equation (1) using the incremental of accounts receivable (*Δtr_sale*) as the dependent variable, and report the estimated results in Online Appendix Table G.[13] In Panel A, we find that the coefficients on organisation capital are negative and statistically significant at the 1% level (−1.8107 in Column (1); −0.5778 in Column (2)), which is consistent with our expectation that the nature of organisation capital is susceptible to agency problems, which adversely influences the incentives for trade credit provision.

Next, we explore whether the negative relation between organisation capital and trade credit provision varies according to the

[12] Note that the variable *ppe* (a commonly used control variable in the literature of trade credit) is removed.

[13] In the regression model, we include the additional control variable of short-term liquidity (short term debt maturing within 1 year). The coefficient on short term debt is positive and significant. The positive coefficient lends support to the view on financial inflexibility that firms with a worse financing situation undertake more short-term liquidity to support their trade credit provision.

Table 10
Robustness check: control for supplier & customer characteristics – paired sample
This table presents the results after inclusion of controls for both supplier and customer characteristics. In Panel A, the dependent variable is suppliers' account receivables and robust standard errors (in brackets) are clustered at supplier level. In Panel B, the dependent variable is customers' account payables and robust standard errors (in brackets) are clustered at customer level. The definitions of the variables used in this table are presented in the Appendix. *, ** and *** denote statistical significance at the 10%, 5% and 1%, levels respectively.

Panel A:	Supplier's account receivables					
	(1)	(2)	(3)	(4)	(5)	(6)
customer's oc_ta	−0.0246**	−0.0219***	−0.0169*			
	(0.0099)	(0.0084)	(0.0096)			
customer's oc_ep_ta				−0.0046*	−0.0054**	−0.0017*
				(0.0027)	(0.0022)	(0.0009)
constant	0.1802***	0.1944***	0.1669***	0.1771***	0.1907***	0.1653***
	(0.0028)	(0.0140)	(0.0281)	(0.0024)	(0.0131)	(0.0271)
Customer & suppliers control variables	No	Yes	Yes	No	Yes	Yes
Supplier industry effects × Year effects	Yes	Yes	No	Yes	Yes	No
Year effects	No	No	Yes	No	No	Yes
Pair effects	No	No	Yes	No	No	Yes
Observations	57,574	57,574	57,574	57,574	57,574	57,574
Adjusted R^2	0.3078	0.3934	0.7752	0.3064	0.3464	0.7755

Panel B:	*Customer's account payable*					
	(1)	(2)	(3)	(4)	(5)	(6)
supplier's oc_ta	−0.0130**	−0.0141*	−0.001			
	(0.0051)	(0.0072)	(0.0057)			
supplier's oc_ep_ta				−0.0029**	−0.003*	0.0015
				(0.0014)	(0.0017)	(0.0017)
constant	0.162***	0.1085***	−0.0522	0.1608***	0.1059***	−0.0574
	(0.0043)	(0.0375)	(0.075)	(0.0041)	(0.0375)	(0.0751)
Customer & suppliers control variables	No	Yes	Yes	No	Yes	Yes
Customer industry effects × Year effects	Yes	Yes	No	Yes	Yes	No
Year effects	No	No	Yes	No	No	Yes
Pair effects	No	No	Yes	No	No	Yes
Observations	26,939	26,939	26,939	26,939	26,939	26,939
Adjusted R^2	0.4164	0.4984	0.8769	0.4161	0.4982	0.8769

degrees of the financing situation of the firm. As mentioned before, intangible assets are not often accepted as collateral, and organisation capital cannot be verified or liquidated easily which makes it more difficult to pledge as collateral for fund raising (Marwick et al. 2020). If the reduction in trade credit provision is driven by financial inflexibility, we would expect the negative relation between organisation capital and trade credit provision to be more pronounced for those firms with worse financing situation. We augment the model with interactive terms between organisation capital and firms' financing situation, external financing and financial constraint, and report the estimated results in Panel B. We find that the coefficients on interaction terms are negative and statistically significant, indicating that the negative relation between organisation capital and trade credit provision is stronger for those firms with a poor financing situation, i.e., that are financially constrained ($oc\_ta \times fc = -0.2924$) and heavily reliant on external financing ($oc\_ta \times ef = -1.8128$ and $oc\_ep\_ta \times ef = -0.5040$). Taken together, the estimated results reported in Panel B lend support to our expectation that the reduction in trade credit provision is more pronounced when firms are in a worse financing situation.

5.6.4. Supplier-customer pairs

In this subsection, we test for the robustness of our earlier estimated results using data on actual pairs of supplier-customer firms. We collect data on supplier-customer pairs from the Compustat Segment files, which report the customers that account for 10% or more of a firm's sales, to identify the suppliers/customers of a given firm.[14] Considering the shortcoming that the data on supplier-customer pairs are arguably incomplete, we regard the estimated results using the supplier–customer pairs as a robustness check. Note that the supplier–customer pairs datasets have been widely used in previous studies such as Dass et al. (2015) and Zhang, García Lara, and Tribó (2020).

Using the data on supplier–customer pairs, two analyses are conducted. Firstly, we replicate our baseline analysis and investigate the trade credit provided by suppliers in response to the organisation capital in customer firms, and estimate the regression as follows:

$$tr_{j,t} = \rho_0 + \rho_1 oc_{i,t} + \sum \theta_i x_{i,t} + \sum \beta_j x_{j,t} + \omega_{ind\times year} + \varepsilon_{j,t} \quad (2)$$

[14] The Statement of Financial Accounting Standard No. 131 requires suppliers to disclose their major customers whose purchases exceed 10% of sales. Note that some firms voluntarily disclose customers whose purchases are less than 10% of sales.

where subscripts *i* and *j* refer, respectively, to the customer and supplier in a given pair of supplier–customer firms. In addition to the customer and supplier firm characteristics (denoted by $x_{i,t}$ and $x_{j,t}$, respectively), we also include $\omega_{ind\times year}$ to control for the interactive supplier's industry (SIC 3-digit) and year fixed effects.[15] The independent variable of interest is the customer firms' organisation capital (*oc*), while the dependent variable is suppliers' accounts receivable (*tr*). The estimated results of Equation (2) are reported in Panel A of Table 10. The estimated results using the proxy of *oc_ta* (*oc_ep_ta*) are reported in the first (last) three columns. In both Columns (1) and (2), interactive fixed effects are incorporated, and the coefficients on customer firms' organisation capital are negative and significant (−0.0246 in Column (1); −0.0219 in Column (2)). In Column (3) we include supplier-customer pair fixed effects to control for unobserved supplier-customer time-invariant factors (e.g., relative risk of each pair), and continue to observe negative and significant coefficients on customer firms' organisation capital (−0.0169 in Column (3)). As expected, we find supportive evidence from Columns (4)–(6) using the proxy of *oc_ep_ta*. These results lend support to our baseline analysis that the use of trade credit offered by suppliers decreases with organisation capital in the customer firms.

Secondly, we replicate the preceding analysis and estimate Equation (3) to examine the trade credit granted to their customers when suppliers hold a high level of organisation capital, as follows:

$$tp_{i,t} = \tau_0 + \tau_1 oc_{j,t} + \sum \theta_i x_{i,t} + \sum \beta_j x_{j,t} + \mu_{ind\times year} + \varepsilon_{j,t} \quad (3)$$

The independent variable of interest is the suppliers' organisation capital (*oc*), while the dependent variable is customers' accounts payable (*tp*).[16] The estimated results of Equation (3) are reported in Panel B of Table 10. The coefficients on suppliers' organisation capital are negative and mostly significant, which is in line with the findings that firms with more organisation capital are reluctant to offer trade credit to their customers.

6. Conclusion

Organisation capital is one of the most valuable forms of intangible capital, embodied in key talents, and provides firms with sustainable comparative advantages such as efficient production and superior performance. These attributes are closely linked to reinforcing future financial stability and lowering future cash flow uncertainty. Because organisation capital is embodied in the firms' key talents, both shareholders and key talents have claims on the cash flow stemming from organisation capital. Give this, when key talents switch from one firm to another and use their expertise at another firm, this is likely to aggravate the firm's future growth opportunities and heighten the volatility of future cash flows, as well as unfavourably affect its financial stability.

This paper attempts to further knowledge on whether suppliers value customer firms' organisation capital, by investigating the association between trade credit and organisation capital. We find strong evidence that incremental use of trade credit decreases with customer firms' organisation capital, suggesting that there is a hidden cost of organisation capital for the firms to bear. One may wonder why firms are inclined to invest in organisation capital despite this hurting their capacity to obtain trade credit from their suppliers. One possible explanation is that the literature on organisation capital has clearly pointed out the benefits of spending money on organisation capital. In particular, the increased operational efficiency and superior firm performance induced by organisation capital cannot be overlooked. Some examples of organisation capital are: Apple's creative corporate culture, innovation, and product development systems; Walmart's unique supply chain including vendor-managed inventory and electronic data exchange system; Coca-Cola's knowledge-sharing systems; and Southwest Airlines' highly efficient business process. This is consistent with the view that the increase in operational efficiency is likely to outweigh the cost of losing trade credit, resulting in superior firm performance. The negative relation between organisation capital and use of trade credit is more pronounced when employees have more outside opportunities, and when fewer restrictions are imposed on labour mobility. These findings indicate that suppliers are reluctant to grant trade credit to customer firms with more organisation capital because suppliers take cognizance of the risk associated with the loss of key talents. That is, talented employees take out their value-enhancing contribution and use their expertise at another firm, which would aggravate suppliers' concerns about customer trustworthiness and future growth opportunities, thus impeding the provision of trade credit.

Furthermore, we also conduct an analysis based on the global financial crisis situation when job vacancies were fewer and unemployment rates surged high. The estimated results show that customer firms with more organisation capital received more trade credit granted by suppliers, particularly when they were financially healthy. We interpret these results as evidence that, when the risk exposure from the loss of key talents is low, suppliers view customer firms' organisation capital as a signal of growth opportunities which they want to share in. We also conduct additional tests, such as accounting for endogeneity issues and alternative measures, to further corroborate the impact of organisation capital on firms' trade credit.

This study contributes to an emerging literature exploring the importance of firms' intangible capital on trade credit policy-making, and provides important managerial implications. Trade credit is an expensive form of short-term liquidity if the payment is not made on time. There remains a gap between academia and industry in understanding why suppliers are willing to act as financial

[15] The standard error is clustered at the supplier level because the dependent variable is suppliers' accounts receivable. In addition, the correlation between suppliers' industry effects and customers' industry effects is very high as there are serious overlaps between them. Thus, we only control for suppliers' industry effects, not both the suppliers' and customers' industry effects.

[16] The standard error is clustered at the customer level because the dependent variable is customers' accounts payable. As discussed in Footnote 15, we only control for customers' industry effects, not both the suppliers' and customers' industry effects.

intermediaries and under which circumstances they become prudent with their liquidity provisions. This study contributes to this discussion by highlighting the role of intangible assets that are embodied in key talents. Our results show that, in flexible labour markets, organisation capital halts the use of trade credit in the corporate sector. Therefore, firms should consider the labour-related institutional features when investing or managing their portfolio risk. Moreover, this study also provides valuable implications that emphasise the role of organisation capital in formulating deal contracts between customer firms and supplier. For supplier firms, recognition of organisation capital in customer firms may provide an effective way to check the long-term sustainability of these customer firms.

Declaration of competing interest

None.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bar.2023.101238.

Appendix

Details of the variables constructed for analyses.

Variable	Definition	Source
Dependent variables:		
Δtc_purchase	The change in accounts payable (item AP) scaled by total purchase, where purchase is calculated as the cost of goods sold (item COGS) and adjusted for year-to-year changes in inventory (item INVT)	Compustat
Δtc_cogs	The change in accounts payable (item AP) scaled by cost of goods sold (item COGS)	Compustat
Δtc_ta	The change in accounts payable (item AP) scaled by total assets (item AT)	Compustat
Δtr_sale	The change in accounts receivable (item RECT) scaled by sale (item SALE)	Compustat
Independent variables:		
oc_ta	Organisation capital estimated by Peters and Taylor (2017) scaled by total assets (item AT)	WRDS (Peters and Taylor Total Q)
oc_ep_ta	Organisation capital following Eisfeldt and Papanikolaou (2013) scaled by total assets (item AT)	Compustat
oc_tc	Organisation capital estimated by Peters and Taylor (2017) scaled by total capital, measured as the total of physical capital (item PPEGT) and intangible capital.	WRDS (Peters and Taylor Total Q)
Control variables:		
Accounts receivable *(tr)*	Accounts receivable (item RECT) scaled by sale revenue (item SALE)	Compustat
Accounts payable *(tp)*	Accounts payable (item AP) scaled by sale revenue (item COGS)	Compustat
Firm size *(fsize)*	Natural logarithm of total assets (item AT)	Compustat
Leverage *(lev)*	The sum of debt in current liabilities (item DLC) and total long-term debt (item DLTT), scaled by total assets (item AT)	Compustat
Market-to-book ratio *(mb)*	Market value of assets (item PRCC_F multiplied by item CSHO plus item AT minus item CEQ), scaled by total assets (AT)	Compustat
Cash holdings (*cash*)	Cash and marketable securities (item CHE), scaled by total assets (item AT)	Compustat
Profitability (*roa*)	Operating income before depreciation (item OIBDP), scaled by total assets (AT)	Compustat
Tangibility (*ppe*)	Total property, plant and equipment (item PPENT), scaled by total assets (AT)	Compustat
Rating dummy (*rating*)	A dummy variable taking a value of unity if the firm has an S&P credit rating (item SPLTICRM) on long term debt, and zero otherwise	Compustat
Capital expenditure (*cap*)	Capital expenditure (item CAPX), scaled by total assets (AT)	Compustat
Research and development (*rd_dummy*)	A dummy variable taking a value of unity if research and development expense (item XRD) is non-missing, and zero otherwise	Compustat
Altman-*z* (*zscore*)	Measure of firms' financial distress estimated by Altman's Z-score (Altman, 1977)	Compustat
Cash flow	Income before extraordinary items (item IB) minus common dividends (item DVC), scaled by the total assets (AT)	Compustat
Cash flow volatility (*vol*)	Standard deviation of cash flow over 5 years, scaled by total assets	Compustat
Sales growth (*sg*)	Difference between the current and the prior level of sales (item SALE), scaled by the prior level of sales	Compustat
Bank line of credit *(loc)*	Following D'Mello and Toscano (2020), it is defined as average short term borrowings (item BAST) scaled by sales (item SALE)	Compustat
Firm age (*age*)	The natural log of the difference between the first year when the firm appears in CRSP and the current year	Compustat

(*continued on next page*)

(*continued*)

Variable	Definition	Source
z-score (*z_dummy*)	A dummy variable taking a value of unity if Altman's Z-score is greater than 1.81, and zero otherwise (Altman, 1977)	Compustat
Variables used in further analyses:		
Shareholder base (*base*)	Natural logarithm of one plus common shareholders (item CSHR)	Compustat
Free cash flow (*fcf*)	Operating income before depreciation (item OIBDP) minus interest and related expenses (item XINT) minus income taxes (item TXT) minus common dividends (item DVC), scaled by total assets (item AT)	Compustat
Acquisition (*aqc*)	Acquisitions (item AQC) scaled by total assets (item AT)	Compustat
Capital expenditure (*Δcap*)	Growth in capital expenditure (item CAPX)	Compustat
External finance (*ef*)	Sum of equity finance (change in book value of equity + change in deferred taxes – change in retained earnings between *t-1* and *t*, scaled by total asset in time *t-1*) and debt finance (change in total debt between *t-1* and *t*, scaled by total asset in time *t-1*)	Compustat
Dividend (*dv*)	Dividend dummy, measured as a dummy variable equal to one if the firm pays a dividend (item DVT) and zero otherwise.	Compustat
HHI-TNIC3	Industry concentration estimated by Hoberg and Phillips (2016)	Hoberg and Phillips (2016)
Employee outside opportunity (*oo*)	The number of firms in the same city and industry divided by the total number of firms within the same city.	Compustat
Non-compete enforcement index (*NEI*)	Non-compete agreement enforcement from Kini et al. (2020)	Kini et al. (2020)
Inevitable disclosure doctrine (IDD)	State-level recognition of inevitable disclosure doctrine (IDD)	
SA index (*sa*)	We follow Hadlock and Pierce (2010) to construct SA financing constraints index	Compustat
WW index (*ww*)	We follow Whited and Wu (2006) to construct WW financing constraints index	Compustat
KZ index (*kz*)	We follow Kaplan and Zingales (1997) to construct KZ financing constraints index	Compustat
Financial constraint dummy (*fc*)	We extract the first principal component from *SA*, *WW* and *KZ* indices using factor analysis and use this component as the proxy of financial constraint.	Compustat
Managerial ability score (*ma_score*)	Residual of firm efficiency score estimated by Demerjian et al. (2012)	Demerjian et al. (2012)
Intangible (*intan*)	Intangibles (item INTAN) scaled by total assets (item AT)	Compustat

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