

The relationship between digital finance and capital structure: A conceptual paper

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Abstract: The rapid development of digital finance has significant implications for corporate capital structure decisions. This conceptual paper explores the influence of digital finance on capital structure in the new digital environment, focusing on how digital finance innovations impact firms' financing decisions. Digital finance, including innovations like mobile banking and blockchain, has transformed the financial market. It has profoundly changed traditional financial institutions and enterprises by providing broader access to financial services at lower costs and easing financial constraints. Capital structure, the combination of debt and equity financing, significantly affects a firm's risk and financial performance. Traditional capital structure theories may need re-examination due to digital finance's impact. Through a synthesis of existing literature, the study reveals that digital finance enhances firms' access to external financing, reduces financing costs, and strengthens governance through improved transparency and monitoring. These mechanisms enable firms to optimize capital structure, spur innovation, and improve ESG performance. The study further highlights digital finance in fostering entrepreneurial activity. Based on the findings, this paper proposes a theoretical framework to understand digital finance's role in capital structure, providing valuable insights for academics and practitioners in corporate finance, such as the role of digital finance in deleveraging campaigns.

Keywords: Capital structure, Digital finance, Financial constraints, Information asymmetry.

1. Introduction

The digital finance has transformed the financial market and brought new financial services. Digital finance includes innovations such as mobile banking, digital payments, Blockchain, and big data. While improving financial services and efficiency, these advancements also present new challenges and opportunities for corporate finance, particularly in capital structure.

Capital structure, or financial leverage, is the combination of debt and equity financing to fund corporate business activities [1, 2]. It affects a firm's risk [3, 4] and financial performance significantly [5, 6]. Traditional capital structure theories, such as pecking order theory and trade-off theory, provide a basis for understanding firms' capital structure decision. These theories may need to be re-examined since the advent of digital finance has profoundly changed the operating environment and functions of the traditional financial system [7, 8].

This conceptual paper aims to explore the influence of digital finance on capital structure in this new digital environment. By synthesising existing literature and proposing a conceptual framework, it contributes to a deeper understanding of capital structure, offering valuable insights for both academics and practitioners in corporate finance.

2. Overview of Digital Finance

2.1. The Concept of Digital Finance

The integration of technology and finance has given rise to various emerging finance service

modes; Internet finance, Fintech, and digital finance are the prominent concepts and terms to understand this emerging mode. These terms refer to the different aspects of “Technology+Finance”. Internet finance represents a novel financial business mode, Internet technology and information and communication technology (ICT) are employed to facilitate financing activities, payment processing, investment activities, and information intermediary services by conventional financial institutions and Internet enterprises. Internet finance includes a wide range of financial services, such as Internet payment, Internet lending, equity crowdfunding and Internet insurance. Internet finance leverages Internet technology and ICTs to change the way financial services are delivered. At this stage, Artificial Intelligence (AI), Blockchain, cloud computing, big data and the Internet of Things (ABCDI) have not yet been fully developed and utilised.

Internet finance is seen as the first stage of the development of Fintech [9]. With respect to Fintech, Financial Stability Board [10] defines it as an innovation derived by technology advancement in financial services, which could create a new business models, applications, processes or products that significantly impact the manner in which financial services are provided. Digital finance is a new financial model in which tech firms and financial institutions offer financial services by adopting digital technology [11]. Fintech highlights technological advancements such as big data and Blockchain could enhance and revolutionise the financial industry [12]. In contrast, digital finance is a broader concept. Along with a wide spectrum of financial products, digital finance also encompasses financial institutions, finance-related software and innovative forms of delivering financial service to customers, generally referring to the digital transformation of the financial sector [13]. Hence, digital finance typically manifests the attributes of finance and the application of emerging technologies. Internet finance, Fintech and digital finance are distinct from traditional financial services, as they employ technologies to innovate and transform financial services. They emphasise on the application of technologies to improve efficiency and reduce costs.

Although there are subtle nuances between Internet finance, Fintech, and digital finance, they share a common emphasis on technologies as a way to improve the delivery of financial services. Therefore, in this paper, digital finance is defined as a novel financial business mode that is reliant on digital technology to facilitate financial activities. Similar to Ji, et al. [14] this paper considers digital finance as a broader concept, including Fintech and Internet finance.

2.2. Impact of Digital Finance on Traditional Financial Institutions

Digital finance has profoundly changed the traditional financial industry [15, 16]. The extant literature focuses on digital finance's competitive and complementary effects on traditional financial institutions.

Digital finance and traditional finance have similar functions in the capital market, offering similar financial services such as payments, savings, lending, and investment [17, 18]. However, digital finance has more extensive coverage and offer the services at lower costs, providing financial services to more individuals and small-scale enterprises who are previously unbanked or underserved. Gopal and Schnabl [19] use three natural experiments in the United States to investigate the substitution from banks to nonbank lenders from 2007 to 2017. Their finding demonstrates a decrease in small businesses' reliance on banks to obtain funds. It may be attributed to the emergence of alternative financing source, which provide small businesses with more accessible and affordable financing choices.

Compared to traditional financial institutions, digital lenders are digitally (automated) equipped to efficiently handle a surge in credit applications [20]. The digitalisation speed up application processes with accuracy, leading to a considerable reduction in the time required to review and approve the grant of funds [21]. Moreover, digital lenders could attract more customers and crowd out traditional financial institutions' market share. Buchak, et al. [22] reveal that Fintech lenders have penetrated the residential mortgage market, thereby diminishing the market share of banks. In addition, digital finance does not rely on traditional intermediaries [23, 24], which further reduce the expenses of financial service, and ultimately improving customer well-being. Digital finance has some negative impacts on

traditional banks [25]. The disintermediation threatens and challenges traditional financial intermediaries.

On the other hand, digital finance also intensifies the competition and creates a catfish effect in the traditional financial sector, as it expands the scope of traditional financial services and products [18, 26]. The expanded scope of digital finance forces traditional banks to improve their services and products. Joe-Wong and Sen [27] find that Fintech has accelerated the development and integration of information recording systems, lowered the cost of information validation, and streamlined data organisation. It has facilitated quicker data collection and organisation while reducing credit risk. As a result, digital finance enables lenders to process and originate a loan faster while reducing the potential for human error, therefore improving operation efficiency [20, 28]. Moreover, Cheng and Qu [9] and Li, et al. [29] argue that bank Fintech reduces credit risk by improving risk management efficiency and banks' internal governance and control.

2.3. Impact of Digital Finance on Enterprises

The focus of past studies has been on the impact of digital finance on credit supply, innovation, firm performance, and risk for enterprises. Firstly, digital finance could reduce information friction between stakeholders and enterprises by increasing access to accurate and rich information and expanding the availability of information channels and sources [30, 31]. Digital finance promotes information sharing between lenders in the capital market, which enables lenders to reduce the cost of monitoring and screening as well as the default risk [32, 33]. Therefore, digital finance increases credit supply to borrowers who are suffering financial constraints due to information asymmetry.

Digital finance also provides funds to enterprises during a crisis. Gopal and Schnabl [19] find that digital finance alleviates financial constraints of small and medium-sized enterprises (SMEs) by providing credit to businesses that banks are not willing to lend after the 2008 financial crisis; it becomes a vital alternative source of financing for firms. The authors elucidate that the utilisation of digital technology and online credit contributes to the rise of digital finance because the new technology reduces the cost of processing applications and serves a larger pool of potential borrowers, which enables digital lenders to lend to small, young, and non-transparent companies that may not meet the stringent requirements of traditional banks. This finding is aligned with the result of a previous study conducted by Jagtiani and Lemieux [34] who find fintech lenders have assisted particular consumers with below-average credit scores in obtaining broader access to credit at a reduced capital cost than traditional financial institutions. In terms of traditional financial institutions, Sheng [35] demonstrates that the role of digital finance in facilitating credit supply to SMEs is more prominent in large banks than in small banks.

Second, previous literature investigates the role of digital finance in corporate innovation from the angle of credit providers, digital finance fuels innovation by relieving financing constraints. Dong and Yu [36] find that the Fintech development, measured by the number of Fintech companies, is a significant driver of innovation in firms by reducing their information asymmetry and financing constraints, particularly for non-state-owned enterprises. In contrast, Tan, et al. [37] focus on banks; they find that bank Fintech improves corporate innovation by alleviating the inhibiting influence of financial constraints and managerial expenses. Furthermore, Ding, et al. [38] point out that the increasing competition in digital lending and bank loans increases credit supply to firms and stimulates R&D investment, thus promoting corporate innovation.

Third, a strand of literature examines the relationship between digital finance and firm performance, and also explores the underlying mechanism. Wu and Huang [39] suggest that digital finance has a beneficial impact upon new energy enterprises' financial performance, because digital finance enables firms to improve their access to capital and resources allocation. They also show that financial constraints weaken the positive impact of digital finance on financial performance. Then, scholars further expand the scope of research. Instead of only focusing on Chinese listed new energy companies and financial performance, subsequent studies expand the sample to all Chinese listed companies and

economic, social, and environmental (ESG) performance [40-43]. By using data of public-listed companies in China, Mo, et al. [42] and Mu, et al. [40] show that digital finance enhances corporate ESG performance by alleviating financing constraints. Ren, et al. [41] find that firms' ESG performance improves through saving transaction costs, including financing costs and information costs, thereby enabling firms to have sufficient funds to boost green innovation. Subsequently, the mediating role of green innovation on ESG performance is confirmed by Wu, et al. [43].

Lastly, several studies have found that digital finance reduces firm risk from external and internal environmental perspectives. In terms of the external environment, digital finance improves the financing environment and increases the availability of funds. Chen, et al. [44] conclude that digital finance could reduce firm sale volatility as well as bankruptcy possibility for firms with limited credit resources, thereby decreasing the risk of a company. They show that digital finance enables firms to increase advertising and promote product/sector diversification. This, in turn, serves as a mechanism for reducing firm volatility. While Ji, et al. [14] consider digital finance as a mechanism to improve internal governance, they point out digital finance curbs opportunistic activities in firms and prevents firms from overleverage by gathering more accurate information, thereby reducing the bankruptcy risk of firms.

3. Determinants of Capital Structure

Previous studies have discovered various factors that determine capital structure. These factors can be classified into three categories: firm-specific, industry and macroeconomic factors. Firm-specific factors include profitability [45-50]. Firm size [51-55]. Tangible assets [49, 56-60]. Earnings volatility [49, 52, 61-63]. Firm age [59, 64-67]. Earning and non-debt tax shield [68-70]. The industry factors would include munificence [71, 72] and competition [73-75]. Meanwhile, macro factors include economic growth [76-78] and inflation [46, 79-81].

4. Conceptual Framework

Although there are a variety of determinants of capital structure that have been investigated, a new emerging factor, which is digital finance, should be considered. Capital structure theories indicates that financial constraints and information asymmetry are the factors that affecting capital structure. Previous studies suggest that digital finance is capable of alleviating information asymmetry and financial constraints [82-85]. Therefore, digital finance may impose impact on capital structure through two variables. This study's conceptual framework is demonstrated in Figure 1.

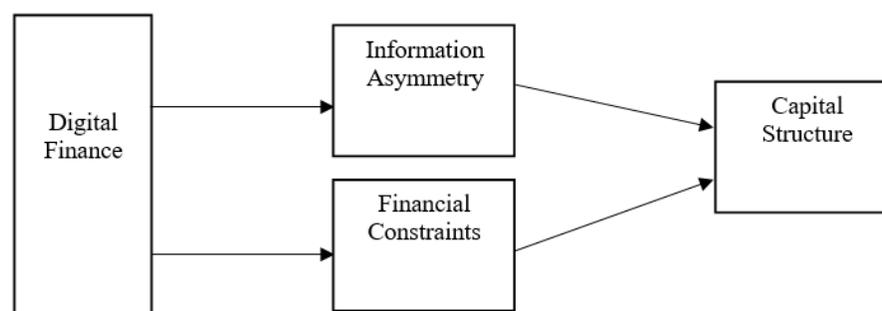


Figure 1.
Conceptual Framework.

4.1. The Impact of Digital Finance on Capital Structure

Relying on ABCDI, digital finance enhances the quality of information disclosure between financial institutions and enterprises, reducing the information search cost and credit assessment cost [86, 87]. In addition, digital finance could improve the trust and understanding among financial institutions and

enterprises by the information transparency, thereby addressing the financial mismatch between credit supply and real enterprises' demand [88]. Therefore, based on the information, financial institutions could estimate a firm's performance, identify potential risks and reduce debt losses [9]. Since financial institutions could control default risks effectively, they may be more willing to expand credit at lower interest rates due to reduced uncertainty about enterprises' financial positions [89]. The reduction of financing costs and the easing of financial constraints means enterprises can secure funds for their investment at a lower interest expense timely, which would enable firms to maximise their value by increasing leverage. However, this may improve enterprise profitability, thereby having surplus funds to repay debt and invest. In addition to debt, enterprises can also rely on equity crowdfunding for financing, reducing their reliance on debt financing.

Additionally, digital finance could also alleviate the principal-agent problem by improving the information sharing between shareholders and management, strengthening the supervision of shareholders on the behaviour of the management, weaken the opportunistic activities of the management, resulting in the decrease of bankruptcy risk of the firm [14]. Moreover, digital finance could improve total factor productivity digital finance could improve total factor productivity through the alleviation of financing constraints, the improvement of human capital level and the enhancement of capacity for enterprise risk-taking [90]. With access to advanced information technology, enterprises could better understand market trends and customer value, allowing them to identify inefficient projects in advance, which helps firms recover funds and improve the overall efficiency of capital use [91]. The reduction of business risks and the improvement of total factor productivity will increase enterprises' profit and debt repayment ability and thus reduce enterprises' leverage ratio.

4.2. Digital Finance, Information Asymmetry and Capital Structure

Information asymmetry refers to the information gap between the parties involved in market transactions. The information gap gives one party which has better or more comprehensive information an advantage during the transaction, in contrast, the other party, which has inferior or incomplete information, is placed at a disadvantage [92]. Information asymmetry is associated with market inefficiencies and failures due to adverse selection and moral hazard. Considering the impact of information asymmetry in capital market, it is perceived as a vital factor in understanding financial behaviour. The role of information asymmetry in firms' financing decisions was first explored by Myers and Majluf [93]. Previous studies indicate that information asymmetry influences financing choice [94, 95], stock market efficiency [96] and investor behaviour [97, 98]. In terms of capital structure, Modigliani and Miller [99] propose that firms' leverage does not affect firm performance in a perfect market which does not have asymmetric information. Based on the perfect market assumptions, Myers and Majluf [93] suggest that information asymmetry affects the firms' financing choice, thus leading to different leverage.

Existing research on digital finance indicates that digital finance could improve information transparency. By enhancing the capability of searching and collecting borrowers' information, digital finance not only allow financial institutions to effectively controlled credit risk but also improved the efficiency of capital allocation. Digital finance improves the capability in two ways. First, digital finance could collect both hard and soft information related to borrowers. It obtains detailed information on the company's fundamentals [82] as well as its business operation, such as real-time transactions [100]. Traditional financial institutions generally rely on this kind of information, also known as hard information, to conduct credit assessments. Hence, more precise and accurate information accumulated by digital finance is beneficial for the improvement of credit rating accuracy.

In addition, digital finance is capable of acquiring a vast amount of alternative information, such as social media activity [101] and digital footprint [33]. Using alternative information in credit rating could assist borrowers, particularly those who are rated poorly according to traditional information, in obtaining credit [102]. Hence, in conjunction with hard information, digital finance offers a more comprehensive borrowers' profiles in accordance with these multidimensional data, which could reduce

lenders' overall risk [103]. This information advantage could contribute to the identification of low-risk customers and provide them with better loan terms [104]. Therefore, firms without the support from traditional banking credit due to information asymmetry could obtain more financing support from digital finance. In contrast, lenders could identify firm with growing bankruptcy risk promptly, thereby decreasing the credit supply to them. Second, compared to traditional credit rating methods, digital finance has the data advantage and model advantage. With regard to data advantage, digital finance can analyse borrowers' behaviours and characteristics that are difficult to evaluate with traditional credit scores system, providing better risk control for lenders. In addition, it offers up-to-date transaction information for borrowers, which accurately reflects current business conditions. With respect to model advantage, the BigTech credit risk assessment model provides more precise predictions for credit card delinquency, corporate loan default, and mortgage default problems than traditional models [20, 105]. These advantages would reduce the dependency on collateral for credit, allowing more businesses that lack collateral to secure loans. As a result, digital finance could ease credit discrimination and allocate credit efficiently.

4.3. Digital Finance, Financial Constraints and Capital Structure

Financial constraints refer to a firm's limitations in financing its operations and investments. Farre-Mensa and Ljungqvist [106] summarise two formal definitions of financial constraints that are prevalent in the studies. Based on the study of Stiglitz and Weiss [107] and Whited and Wu [108], The first definition explains constraints from the perspective of the elasticity of the capital supply curve. The additional unit of capital cost is higher when capital supply curve become more inelastic. The second definition is broader and focuses on the level of capital supply curve, particularly the gap between capital supply curve and the firm's opportunity cost of internal capital. According to the above definitions, the former and latter focus on the elasticity and level of capital supply curve, respectively, which means financial constraints stem from the friction in the capital supply. Financial constraints have significant implications for a firm's decision, such as its investment decisions [109, 110], merger and acquisition [111, 112] and capital allocation [113, 114]. According to Stiglitz and Weiss [107], firms could seek funds from either an internal or external source. However, due to the gap in information and agency problem, the cost of external financing is higher than internal financing. This discrepancy gives rise to a phenomenon known as financing constraints.

As Gomber, et al. [13] demonstrate, digital finance provides broader access to financial services at a lower costs, which is conducive to easing financial constraints. By using digital technology, digital finance provides alternative channels for obtaining capital beyond traditional financial institutions and rectify financial mismatch for enterprises [84, 88, 115]. More diverse funding sources helps decrease firms' dependence on traditional financial institutions, mitigating the impact of financing constraints. For example, due to the lack of credit history or collateral, individuals and small businesses may be excluded by traditional lenders. However, they could resort to peer-to-peer (P2P) lending platforms to obtain funds. The easing of financial constraints allows enterprises to satisfy firms' capital needs for business activities timely, which may increase the profit of enterprises. A better financial performance means firms would have more cash and retained earnings to repay debt, hence, firms' leverage would decline [116, 117].

5. Conclusion

Digital finance has influenced financial institutions and capital market in numerous aspects, in particular, capital supply which is closely associated with firms' financing decision. Given the significant impact of digital finance, it is necessary to examine its impact on capital structure. Based on the extant literature, this paper develops a conceptual framework to investigate the relationship between digital finance and capital structure. Information asymmetry and financial constraints are identified as the channels through which digital finance affects capital structure. This may offer an insight for future research and practical application, such as the role of digital finance in deleveraging campaign.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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