

Uncertain Supply Chain Management

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How do financial leverage and supply chain finance influence firm performance? Evidence from construction sector

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ABSTRACT

This paper investigates the impact of financial leverage and supply chain finance on firm performance of Vietnamese construction sector. Although there is a big gap in the literature needed to be filled, little empirical evidence can be found on this interesting topic. Therefore, the results are essential for Vietnamese firms, particularly those in construction industry. By adopting the generalized method of moment (GMM), the results reveal the significant influence of financial leverage and supply chain finance on the performance of construction firms. In particular, firm performance (FP) is more influenced by financial leverage (FL) than supply chain finance (SCF). The findings also show that supply chain finance plays a key role in enhancing firm performance. Meanwhile, more debts and their inefficient use exert a negative impact on firm performance, which is an unprecedented finding of this study.

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1. Introduction

In the context of the international integration, Vietnamese construction sector is facing a number of big challenges. Particularly, capital access is one of the matters which attracts much attention from construction firms. Especially, Vietnam economy has just overcome a recession caused by the global financial crisis, so it becomes more difficult for construction companies in accessing to capital. This source helps these firms not only maintain their operations but also raise their competitive ability against other multinational firms with high financial capacity expanding to Vietnam's market. Together with using financial leverage through traditional channels, specifically credit organizations, construction firms show more concern on short-term credit through supply chain finance. It is because short-term credit allows enterprises optimise their working capital at a low cost (Wuttke et al., 2013), thereby enhancing firm performance (Lekkakos & Serrano, 2016). Although the role of financial leverage and supply chain finance in improving firm performance cannot be denied, their concurrent impact on corporate performance has not been empirically examined in many studies. Hence, this paper aims to give first empirical evidence on this influence. Especially, the data are obtained from Vietnamese companies in construction industry which is growing impressively but still facing many difficulties in the capital access. Therefore, this paper is expected to reveal more interesting findings.

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2. Literature review

2.1. Financial leverage and firm performance

Financial leverage refers to how firms use their debt. In their use, firms experience benefits of tax shields which lower the overall amount of income tax which they need to pay for the state by a reduction in taxable income, thereby enhancing their performance. In other words, the use of financial leverage possibly exerts positive influence on the corporate performance. This is consistent with what have been reported by Burja (2011), Seelanatha (2011), Nirajini and Priya (2013), Sivathaasan et al. (2013), Ghayas and Akhter (2018). However, the use of financial leverage can also bring firms more financial risks. Indeed, more debts and their inefficient use put firms in bankruptcy risk, which may negatively affect the corporate performance. The negative influence of financial leverage on firm performance has been also found by Azhagaiah and Gavoury (2011), Malik (2011), Akinlo and Asaolu (2012), González (2013), Hamid et al. (2015), Vithessonthi and Tongurai (2015), Daud et al. (2016), Ameen and Shahzadi (2017).

2.2. Supply chain finance and firm performance

Supply chain finance is frequently measured through cash conversion cycle (Zhang et al., 2019). Accordingly, cash conversion cycle is defined as the period starting from the cash outlay to cash recovery (Bui, 2020). Reducing cash conversion cycle makes the financial link among participants stronger (Wuttke et al., 2013), which means supply chain finance performs better. More than that, this allows its participants take use of short-term credit at a low cost, thereby boosting firm performance (Bui, 2020). Therefore, supply chain finance greatly contributes in optimizing corporate financial flows (Pfohl & Gomm, 2009), stabilising the holistic supply chain (Klapper, 2006), and most notably, enhancing firm performance (Lekkakos & Serrano, 2016). In other words, supply chain finance is positively correlated with firm performance meanwhile cash conversion cycle has a negative impact on how firms perform. This negative influence has been revealed in studies of Zhang et al. (2019) and Bui (2020).

3. Data and Methodology

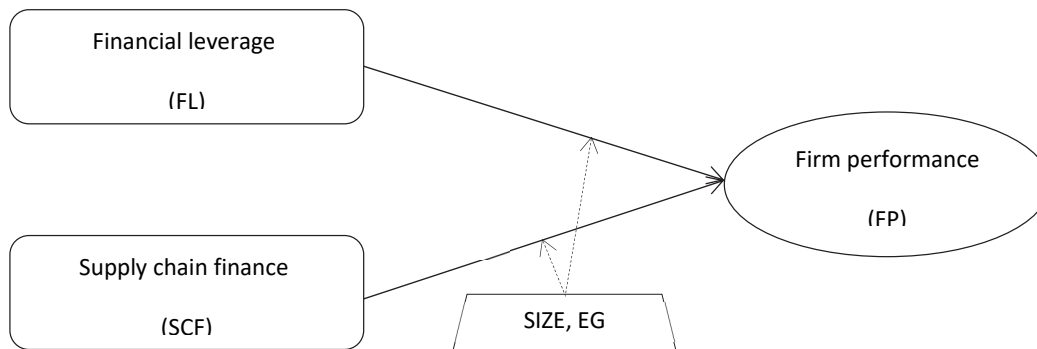
3.1. Data Collection

Data are collected from financial reports of 30 construction companies listed on Vietnam stock market. The data are obtained in the period from 2015 to 2018. Further, data on economic growth are collected from World Bank source.

3.2. Methodology

The study analyses the impact of financial leverage and supply chain finance on performance of construction firms in Vietnam. Therefore, the model is estimated by adopting the Pooled Regression model (Pooled OLS), Fixed effects model (FEM) and Random effects model (REM). Next, the Generalized Method of Moment (GMM) which allows to control potential endogeneity and detect violations of null hypotheses is employed in the estimation to assure the reliability of the results (Doytch & Uctum, 2011). Following earlier researchers, the author measures firm performance (FP) by return on assets ratio (ROA). Financial leverage (FL) is measured by total debt to total equity while supply chain finance (SCF) is performed by cash conversion cycle (CCC). In addition, firm size (logarithm of total assets) and economic growth are included as control variables in the model. The former representing for firm characteristics has been adopted in the analyses of Malik (2011), Akinlo and Asaolu (2012), Sivathaasan et al. (2013), Hamid et al. (2015), Vithessonthi and Tongurai (2015), Daud et al. (2016) while the latter as an indicator of the macroeconomy was also been found in the research of Vithessonthi and Tongurai (2015). Therefore, the research model is estimated in the following equation:

$$FP_{it} = \beta_0 + \beta_1 FL_{it} + \beta_2 SCF_{it} + \beta_3 SIZE_{it} + \beta_4 EG_{it} + \varepsilon_{it} \quad (1)$$



Source: Research model proposed by the author.

Fig. 1. The impact of financial leverage and supply chain finance on firm performance

where:

Dependent variable: Firm performance (FP).

Independent variables: Financial leverage (FL), supply chain finance (SCF).

Control variables: Firm size (SIZE), economic growth (EG).

The term ε is the model regression error term.

Table 1

Summary of variables

Variable name	Code	Measurement
Dependent variable		
Firm performance	FP	Net income / Total assets
Independent variables		
Financial leverage	FL	Total debt / Total equity
Supply chain finance	SCF	Logarithm of cash conversion cycle Cash conversion cycle (CCC) = Days receivable + Days inventories - Days payable = (trade receivable / sales) * 365 + (total inventories / cost of goods sold) * 365 - (trades payable / cost of goods sold) * 365
Control variables		
Firm size	SIZE	Logarithm of total assets
Economic growth	EG	Annual growth of gross domestic product

Source: Research model proposed by the author.

4. Empirical Results

The correlation among variables are shown in Table 2 as follows,

Table 2

Variable correlations

	FP	FL	SCF	SIZE	EG
FP	1.0000				
FL	-0.2265	1.0000			
SCF	-0.2265	-0.0761	1.0000		
SIZE	0.1754	0.0571	-0.1794	1.0000	
EG	0.3858	0.0155	-0.1709	0.1225	1.0000

Source: Author's computed.

Table 2 shows that the independent variables, particularly financial leverage (FL) and supply chain finance (SCF) are negatively associated with firm performance (FP). Meanwhile, control variables, specifically firm size (SIZE) and economic growth (EG) are positively correlated to firm performance (FP). Next, the Pooled Regression model (Pooled OLS), Fixed effects model (FEM) and Random effects model (REM) are adopted to estimate the model.

Table 3

Regression results

	FP	Pooled OLS	FEM	REM
Constant		-29.2821***	-58.4203***	-34.7289***
FL		-0.0613***	-0.0449	-0.0577**
SCF		-0.0003**	-0.0001	-0.0003
SIZE		0.5164	1.5909	0.7102
EG		3.8750***	3.8004	3.8812***
R ²		22.94%	29.03%	28.21%
Significance level		F(4, 145) = 10.79 Prob > F = 0.0000***	F(4, 116) = 11.86 Prob > F = 0.0000***	Wald chi2(4) = 50.46 Prob > chi2 = 0.0000***
F test			F(29, 116) = 2.84 Prob > F = 0.0000***	
Hausman test			chi2(4) = 1.94 Prob>chi2 = 0.7459	

Note: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Source: Author's computed.

It can be seen from Table 3 that F-test is significant at the 1% level (Prob > F = 0.0000). Meanwhile, Hausman test shows no statistical significance (Prob>chi2 = 0.7459). It can thus be concluded that the Random effects model (REM) is superior to the other, so it is chosen for testing the model.

Table 4

Results of testing multicollinearity

Variable	FL	SCF	SIZE	EG	Mean VIF
VIF	1.01	1.06	1.04	1.04	1.04

Source: Author's computed.

Table 4 reveals that there are no serious issues of multicollinearity (Mean VIF < 10).

Table 5

Results of testing heteroscedasticity and autocorrelation

Heteroscedasticity test	Autocorrelation test
chibar2(01) = 19.60 Prob > chi2 = 0.0000***	F(1, 29) = 4.530 Prob > F = 0.0419**

Note: ** and *** indicate significance at the 5% and 1% level, respectively.

Source: Author's computed.

Table 5 shows that heteroscedasticity and autocorrelation really exist at the 1% (Prob > chi2 = 0.0000) and 5% (Prob > F = 0.0419) level of significance, respectively. Thus, the author chooses the generalized method of moment (GMM) for the analysis in order to avoid heteroscedasticity and autocorrelation issues. Also, GMM can address potential endogeneity.

Table 6

GMM estimation results

	FP	Coef.	P> z
Constant		-9.3697	0.174
FL		-0.0791	0.000***
SCF		-0.0002	0.045**
SIZE		0.3309	0.160
EG		1.2432	0.041**
Significance level		Wald chi2(3) = 33.89	Prob > chi2 = 0.000***
Arellano-Bond test for AR(2) in first differences		z = 0.34	Pr > z = 0.732
Sargan test		Chi-Square (5) = 4.30	Prob > chi2 = 0.506

Note: ** and *** indicate significance at the 5% and 1% level, respectively.

Source: Author's computed.

Table 6 shows that results of GMM estimator is appropriate and valid at the 1% level of significance (Prob > chi2 = 0.000). Also, Sargan test shows that instruments adopted are suitable. Accordingly,

financial leverage (FL) exerts a negative (-0.0791) impact on firm performance (FP) at the 1% level of significance while supply chain finance (SCF) negatively (-0.0002) affects firm performance (FP) at the 5% significance level. Therefore, firm performance (FP) is more influenced by financial leverage (FL) than supply chain finance (SCF). Furthermore, the result reveals the positive causality between economic growth (EG) and firm performance (FP) at the 5% level of significance.

Hence, the results of the model take the following equation:

$$FP_{it} = -0.0791 FL_{it} - 0.0002 SCF_{it} + 1.2432 EG_t + \varepsilon_{it} \quad (2)$$

The impact of financial leverage on firm performance: The findings show that the influence of financial leverage (FL) on firm performance (FP) is negative (-0.0791) and significant at the 1% level. Accordingly, the inefficient use of debt causes a considerable decrease in firm performance. This is suitable for the reality in Vietnam. Recently, Vietnam real estate industry has experienced many difficulties due to the negative impact of the international and national economy, causing lots of obstacles to construction sector, particularly making the capital use of construction firms inefficient. Also, these firms have to face more financial risks, which significantly affects their performance. This is in line with the findings of Azhagaiah and Gavoury (2011), Malik (2011), Akinlo and Asaolu (2012), González (2013), Hamid et al. (2015), Vithessonthi and Tongurai (2015), Daud et al. (2016), Ameen and Shahzadi (2017). Nevertheless, this is the first empirical evidence on the correlation between financial leverage and firm performance in construction sector, which is an interesting novelty of this study.

The impact of supply chain finance on firm performance: Supply chain finance (SCF) is negatively (- 0.0002) correlated to firm performance at the 5% significance level. This finding corroborates what has been found by Zhang et al. (2019) and Bui (2020). Specifically, when cash conversion cycle is shortened (supply chain finance performs well), working capital and funds of its participants will increase. They are considerable capital sources with low cost supplying for the following operation cycle, so firm performance will be improved. In fact, Vietnam is a developing country whose ability and link among construction companies in the supply chain are limited. That is why the study along with its findings on the statistically significant causality between supply chain finance and firm performance is essential for Vietnam as well as other developing countries.

5. Conclusions

The results show that financial leverage and supply chain finance significantly influence how Vietnamese construction firms perform. Particularly, firm performance (FP) is far more influenced by financial leverage (FL) than supply chain finance (SCF). More than that, supply chain finance plays a major role in enhancing firm performance. However, more debts and their ineffective use are negatively linked to firm performance. The findings are first empirical evidence on the influence of financial leverage and supply chain finance on firm performance in construction sector. Therefore, they are essential for the management in construction industry to better supply chain finance and utilise financial leverage efficiently for the performance improvement. In specific: (1) It is vital for the firms to make plans to use debt efficiently, combined with the prediction of customers' demands in order to set suitable loan plans; (2) It is necessary for the firms to participate in and improve supply chain finance to make use of its benefits. The paper succeeds in giving first empirical evidence on the influence of financial leverage and supply chain finance on the performance of Vietnamese construction firms. However, as a limitation of this study, the authors does not consider some control variables which may influence firm performance such as inflation, liquidity and firm management ability. This may be an interesting proposal for future research.

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