

## The Impact of Supply Chain Finance on Sustainable Growth: Evidence from a Panel of Iraqi Manufacturing Firms

Naghham Hussein Neama, Eatessam Al-Shakrchy

Al-Nahrain University, College of Business Economics

Department of Economics of Investment and Business Management

*eatessam\_shakrchy@nahrainuniv.edu.iq*

**Abstract.** This study investigates the impact of supply chain finance (SCF) on the sustainable growth rate (SGR) of manufacturing firms in Iraq. Using panel data from six firms listed on the Iraq Stock Exchange from 2004 to 2021, we examine the relationship between the cash conversion cycle (CCC), as a proxy for SCF, and SGR. We also explore the mediating role of financial risk, proxied by stock price volatility, in this relationship. Our findings suggest that SCF has a significant positive impact on SGR, and that financial risk partially mediates this relationship. These results highlight the importance of SCF in promoting sustainable growth and have important implications for firms and policymakers in Iraq and beyond. However, the study is limited by its small sample size and the use of a single proxy for SCF. Future research could explore alternative measures of SCF and examine the generalizability of our findings to other contexts.

**Keywords:** Cash Conversion Cycle, Sustainable Growth, Supply Chain Finance, financial Leverage, Volatility of the Stock Price

## **1. Introduction**

A business's sustainable growth rate is critical for its survival and expansion and is seen to be a useful tool for assessing the health and potential of an organization. The Sustainable Growth Rate (SGR) is regarded as a useful and comprehensive mechanism to assess the strength, potential, and long-term sustainability of an enterprise because it takes into account both operating (such as profit margin and asset efficiency) and financial (such as capital structure and retention rate) parameters (Mukherjee & Sen, 2018). The sustainable growth rate is thought to be a factor that is highly related to firm success in order to optimize growth rates without increasing the company's debt or issuing additional equity.

SGR is an important statistic that businesses use to evaluate how well they are performing in terms of profitability. Sustainable growth (SG) is the greatest level or benchmark required for a company to expand its revenue without exhausting its financial resources, according to Higgins (2018). The goal of survival and expansion for businesses is called (SG). Businesses must do more than just meet their objectives if they are to ensure their long-term success and ongoing profitability. In order to support the healthy development of the real economy, it is imperative that sustainable growth objectives are met. As a result, companies will be better able to generate income, jobs, higher-quality economic growth, and greater social and economic value. (Liu et.al, 2022).

On the other hand, Ivashina and Scharfstein (2010) claim that a significant decline in the quantity of new loans extended to firms as a result of the present financial crisis and economic downturn. Furthermore, industrial liquidity was depleted by the collapse of the markets for asset- and mortgage-backed securities (Cornett et al., 2011). Suppliers offered trade credit to enterprises (particularly those with stronger negotiation leverage) to complement other forms of finance during these difficult times, exacerbating problems in the upstream supply chain (Garcia-Appendini & Montoriol Garriga, 2013). These results raised the need for working capital optimization strategies and solutions considerably, supply chain finance (SCF) is one of the most important techniques among them. Based on evidence from mature markets, Supply chain finance (SCF) may increase the length of accounts payable while reducing the time of accounts receivable (Hofmann & Kotzab, 2010 cited in Pan et.al., 2020).

Following that, Supply chain finance is an effective short-term financing technique as well as a practice of the financial side of sustainable supply chain management (Pan et al., 2020). The goal of SCF is to optimize financial flows across organizations (Hofmann, 2005). With the help of supply chain finance, managers may use financial tools to lower supply chain risks and fortify the balance sheet to support the supply chain. Furthermore, SCF improves conventional corporate finance procedures by reducing the company's reliance on outside funding sources, which reduces costs and guarantees the optimization of profitability and retained earnings (Roger et al., 2016). By giving buyers longer payment periods and suppliers better access to financing, supply chain finance, or SCF, can enhance the performance of the supply chain (Wuttke et al., 2016).

The cash needed to sustain an enterprise's Cash Conversion Cycle (CCC), also known as the operational cycle, is referred to as the SCF, according to Chand et al. (2020). A business organization's cash collection cycle (CCC) is a methodical process that starts with the introduction of cash to start the production or service rendering process and concludes with collecting money from clients or accounts receivable and paying suppliers or accounts payable to get cash for the following operational cycle. Keown et al. (2003) state that the CCC is computed as follows: the days spent selling finished inventory items plus the average collection period (days) less the days needed to settle account payables. As a result, CCC is an ongoing procedure that includes paying invoices, collecting funds from accounts receivable, and selling completed products inventory. Days are frequently used to quantify it (Wang, 2019). It should be noted that by combining the financial needs of suppliers, consumers, distributors, and manufacturers, SCF provides the optimal option (Wetzel & Hofmann, 2019).

Supply chain finance (SCF) is a financing model that can provide flexible financial products and services, and a systematic financing arrangement for all members of the supply chain. It is a series of technology-based business and financing processes that link transaction buyers, sellers and financing

institutions with the aim of easing corporate financing constraints, reducing financing costs, and optimizing working capital. Supply chain financing types include bank credit financing and trade credit financing. Under the trade credit financing mode, enterprises often transfer credit to the upstream and downstream enterprises in the supply chain in the form of short-term credit. Therefore, trade credit financing is more common and important for enterprises, and is more conducive to supply chain coordination (Lee and Rhee 2011). As an important source of short-term financing in the supply chain, SCF plays a role in accelerating capital turnover and lubricating production and circulation in industrial development, which is of great significance to short-term financing for enterprises in a vulnerable position in the supply chain and as a result it can lead to sustainable growth (Liu, Liu et al. 2022).

Despite the great interest in SCF, not much study has been done to ascertain how it influences and advances sustainable development. We add to the body of knowledge on business growth by outlining how a firm may use SCF as a financing channel to help it optimize its sales growth rate without having to add external equity capital. Therefore, we purpose to estimate the mediating role of “financial risk” in the association of “Cash Conversion Cycle (CCC)” and “Sustainable Growth Rate (SGR)” in Iraqi firms.

Furthermore, In the process of economic transformation from low-speed growth stage to high-speed growth with high-quality development stage, realizing the sustainable growth of firms and injecting sustainable impetus into the high-quality development of Iraq’s real economy has become an essential issue. Consequently, it is of great hypothetical and practical significance to discover the elements affecting the sustainable growth of firms to avoid the financial risks of enterprises and promote the healthy development of entity firms.

Our article is organized as follows: We first assess the literature and develop our hypothesis in Section 2. This article's Section 3 describes the technique used for the study. Section 4 presents the empirical data about the impact of supply chain finance on the sustainable growth of businesses. The last part includes conclusions.

## **2. Literature Review**

According to Huang and Liu (2009), the capacity to sustain development is a crucial requirement for the survival and growth of a company and is seen as an indicator of its overall strength. However, Higgins (1977) asserts that the sustainable growth rate is the maximum rate of sales growth that a company may achieve while still abiding by a specific set of financial parameters.

Following that, one of the most helpful instruments for long-term financial planning and analysing a company's growth is the sustainable growth rate. It helps managers determine what that growth rate should be in order for the company's sales to be consistent with the actual operational performance and financial policy of the firm. The sustainable growth rate from produced revenues, without the need for additional investment, is a measure of a business's potential to grow (Churchill & Mullins 2001).

In this context, Hartono and Utami (2016) define a company's sustainable growth rate as the highest growth rate that the business can get by increasing sales without depleting or using up all of its financial resources. Depending on these factors, a company's sustainable growth rate can be defined as the highest rate of sales growth it can achieve without issuing new equity or altering its financial strategy. Put simply, it is the highest rate of sales growth that a company may achieve while maintaining a constant debt-to-equity ratio (Madbouly, 2022). Company expansion is constrained when turning a profit is the sole objective (Higgins, 1977). A company's presence in the socioeconomic setting is validated by the growth of its operational operations. Still, expansion is advantageous if the business can continue to operate profitably and retain its level of performance (Rahim, 2017). Firm could run out of money if you expand too much. According to Fonseka et al. (2012), holding debt frequently leads to financial losses, a decline in market share, or even bankruptcy. Accessing them is also very expensive in these circumstances. To achieve sustainable growth, Huang and Liu (2009) contend that an

organization's real expansion must match its available resources. A lack of resources for the business, a financial crisis, or even insolvency will result from faster expansion. Efficient utilization of corporate resources will become more challenging with slower growth, perhaps putting the organization in risk. The sustainable growth rate is the company's goal to remain viable and appealing to its bankers, analysts, and investors (Rahim, 2017). It has to be assessed using accurate performance metrics for the company. The company can also handle problems resulting from events that need significant modifications to the company's financial or operational rules. Return on equity and earnings retention rate are necessary conditions for the sustainable growth rate (SGR), which is determined by multiplying the return on equity by the retention ratio. According to Amouzesh et al. (2011), the sustainable growth rate is correlated with the operating and financial parameters profit margin, asset efficiency, capital structure, and retention rate. Thus, indicators such as size, asset efficiency, liquidity, and financial leverage become critical components that might impact a company's long-term growth (Rahim, 2017). Sustainable growth had an effect on the structural changes made by the organization. For example, sustainable growth tended to rise as financial leverage increased and to reduce as financial leverage dropped (Srinivasa, 2011). How financial and operational decisions are made to grow the firm is influenced by the pecking order theory. The pecking order theory is generally interpreting like predicting an opposite relation between the leverage and size of the companies and between leverage and age of the company. The large companies are known better as they have it since long. Moreover, the older companies had the occasion to preserve the benefit (Rahim, 2017).

We should consider that Higgins' (1977) sustainable development model serves as the foundation for the majority of previously published work. According to the Higgins model, the sustainable growth rate is the greatest sales growth rate that a company can accomplish without using up all of its resources. It stands for balanced growth and draws attention to the financial constraints that limit an organization's potential for growth. (Jiu et al., 2022).

Furthermore, he modified the formula for the sustainable growth rate to incorporate a wide range of elements influencing the corporate growth rate, looked at the diversity in growth rate from the sources of growth, and included the critical function of return on equity (Huang & Liu, 2009). To find Higgins' sustainable growth rate, we use the formula below:

$$SGR = (Profit\ Margin * Asset\ Efficiency * Capital\ Structure) * Retention\ Rate \dots \dots \dots (1)$$

$$SGR = sales\ net\ profit\ rate \times asset\ turnover\ rate \times equity\ multiplier \\ \times (1 - payout\ rati) \dots (2)$$

$$SGR = P * A * T * R \dots \dots \dots (3)$$

P is profit margin (net profit scaled by firm's revenue), A is asset turnover (firm's revenues scaled by total assets), T is leverage factor (total assets to its stockholders' equity), and R is (1 – Dividend Payout Ratio).

On the other hand, Van Horn (1998) argues that the sustainable growth rate is the portion of the maximum increase in sales that can be realized based on the operational, debt, and dividend pay-out ratios. It is clear from the description above that using the concept of sustainable growth, one may determine if the justification for a company's sales growth is practical given its operating features and financial policies (Kaaaid, 2023 cited in Mukherjee and Sen, 2018). According to Van Horen's model, a growth in assets (a source of money) must be matched by an increase in liabilities and shareholders' equity (a source of funds). The change in sales multiplied by the ratio of total assets to sales, or S (A/S), can be used to describe the rise in assets. Stockholders' equity increases (through retaining earnings) is [b (NP/S) (S0 + ΔS)], or retention rate multiplied by net profit margin and overall sales. Finally, the rise in total debt is equal to the growth in shareholders' equity multiplied by the desired debt-to-equity ratio, or [b (NP/S)(S0 + ΔS)]D/Eq. When these items are combined, the formula becomes as bellow:

$$Increasing\ of\ assets = Increasing\ of\ Retained\ earnings + Increasing\ of\ Debt \dots \dots (4)$$

$$SGR \left( \frac{\Delta S}{S} \right) = \frac{B \left( \frac{NP}{S} \right) \left( 1 + \frac{D}{Eq.} \right)}{\left( \frac{A}{S} - b \left( \frac{NP}{S} \right) \right) \left( 1 + \frac{D}{Eq.} \right)} \dots \dots \dots (5)$$

Sustainable growth mode provides a complete tool for decision assistance. Given the current corporate focus on these areas, asset management and return on asset (ROA) model might be very helpful (Van Horne & Wachowicz, 2008). When calculating the sustainable growth rate using Van Horne's method, the goal value of sustainable growth is emphasized (Liu et al., 2022).

The supply chain connects the company to its consumers and explains why values that are characteristic of its suppliers are included (Inda et al., 2012). Supply chain finance, according to Liu et al. (2022), is a helpful tactic for strengthening and improving the financing situation by removing financing restrictions, cutting financing expenses, and reducing financial risk. SCF involves integrating financial activities with suppliers, customers, and service providers, as well as optimizing finance across participating companies to increase each one's value. Through better mutual adjustment or completely new financing concepts within the supply chain—possibly in conjunction with a reformed role or task distribution—SCF seeks to lower capital expenditures (Pfohl & Gomm, 2009). This finance model may provide flexible financial products and services together with a systematic funding plan for every supply chain link.

In the same line, reducing financing costs, increasing working capital, and easing company financing restrictions are the goals of supply chain finance. It connects transaction buyers, sellers, and financing institutions through a variety of technology-based commercial and financial processes. According to More and Basu (2013), SCF is a sort of financing solution that has the potential to accelerate the turnover of working capital by controlling, organizing, and regulating the cash flow of all transaction activities and procedures among all SCF participants. Chen et al. (2022) define SCF as a collaborative and innovative approach to providing SMEs with capital and services by converting non-liquid assets—like raw materials, stocks, and accounts receivable—into cash. According to Stemmler (2002), supply chain finance (SCF) integrates the flow of financial resources into the real supply chain (SC) and is a crucial part of supply chain management (SCM) for the supply chain-oriented function. SCF, according to Hofmann (2005), is a strategy that combines finance, logistics management, and supply chain management to provide flexible financial services to supply chain players, enabling them to collaborate to create value across the course of the supply chain.

In short, supply chain finance (SCF) is a cutting-edge financing solution that may be used to add value to supply chains that have capital constraints and reduce the risk of a mismatch between supply and demand in the financial flow. SCF includes information, money, and things moving physically along the currency conversion cycle. Based on real transactions, a financial solution is produced as a result (Chen et al., 2022; T. Zhang et al., 2019). The benefits of SCF have also been studied in terms of return on investment, economic value added, and lease rent (Chakuu et al., 2019; Elgazzar et al., 2012). Additionally, Fischer and Himme (2017) demonstrated that because intra-organizational collaboration makes it simple for each functional department to understand and share knowledge with its counterparts, it may successfully reduce the risks associated with SCF. Gomm (2010) notes that, in the same general framework, the goal of conventional corporate finance as well as supply chain finance is, in principle, to maximize value for company owners. A company's market value, profitability, risk profile, cost structure, and capital structure are all impacted by decisions made about its supply chain.

"The use of financing and risk mitigation practices and techniques to optimize the management of the working capital and liquidity invested in supply chain processes and transactions" is the definition of supply chain finance. Consequently, this idea added a risk-reduction element to supply chain financing (Marak & Pillai, 2018). Nguema et al. (2021) state that the primary objective of SCF is to enhance external collaboration between working capital and cash-to-cash in order to help lower

financial risk in a supply chain. SCF is frequently used by manufacturing businesses to maximize working capital, reduce financial risk, and meet their financing needs. Risk in enterprises is a continual preoccupation for most decision-makers. Furthermore, the focal businesses' uncertainties may be reduced by appropriate SCF actions (Lam et al., 2019), which will reduce financial risk and investors' uncertainties about the companies' future cash flows. (Lam, 2018). Higher stock price variation or volatility indicates investors' increased uncertainty about the firms' future cash flows (Srinivasan & Hanssens, 2009; Lam, 2018). This is reflected in higher financial risk.

Total financial risk, or volatility of the stock price, may be further divided into two categories: idiosyncratic financial risk and systematic financial risk. According to Srinivasan and Hanssens (2009), all businesses are impacted by broad economic and market factors like inflation and exchange rates, which can affect systemic financial risk. On the other hand, idiosyncratic financial risk is associated with firm-specific strategies and events, such demand-supply mismatching events and service transition strategies (Lam, 2018). Previous studies on finance have shown that idiosyncratic financial risk accounts for approximately 80% of total financial risk faced by enterprises, whereas systematic financial risk only makes up around 20% of the total (Goyal & Santa-Clara, 2003). The unsystematic risk of the firm will be disregarded for the sake of our analysis, and we expect that SCF efforts will be more strongly correlated with idiosyncratic financial risk than with systematic financial risk. SCF initiatives can provide a pathway that integrates buyers, their suppliers, and SCF service providers to lower financing and operational risks and enhance shareholder wealth, data visibility, availability, and cash delivery, according to multiple studies (Abbasi et al., 2017; Silvestro & Lustrato, 2014).

As a result, we believe that SCF efforts will reduce financial risk and enable businesses to grow sustainably. Trade credit financing and bank credit financing are two examples of SCF types, according to Tang et al. (2017). Businesses commonly give short-term loans to upstream and downstream companies in the supply chain in the context of trade credit financing. But banks make it hard for firms to secure loans because of their strict lending standards. Trade credit financing is therefore becoming more common, important for companies, and helpful for supply chain coordination (Lee & Rhee, 2011). Trade credit finance is the main short-term funding source for the supply chain. It is crucial for enterprises that are vulnerable in the supply chain to have access to short-term financing because it promotes capital turnover and lubricates production and circulation (Liang et al., 2016). According to Gao et al. (2015), credit is a continual need for suppliers and buyers in order to successfully do business. To satisfy their finance needs, they thus actively search for risk-free financing solutions. If they don't, their company's progress will come to an abrupt end. Financial managers can also reduce the likelihood of future cash shortages and insolvency by managing the cash conversion cycle well (Anser & Malik, 2013).

This study aims to investigate the relationship between supply chain financing—represented by CCC—and the rate at which organizations may grow sustainably. This is consistent with earlier calls for further empirical research on the effects of trade credit based on supply chain financing on a company's long-term growth (Liu et al., 2022).

Working capital, which is changeable on a daily basis, and fixed assets, which serve as the company's permanent foundation, may both be regarded as financial items. All current asset items that are turned back into liquid assets within a single production cycle or a minimum of one year are referred to as working capital. The circulating assets less the short-term obligations equal the net working capital. This cash flow analysis is useful in this case because of a significant indicator called the Cash Conversion Cycle (CCC), also known as the Cash-to-Cash Cycle. It is a time-based statistic that comprises the following indicators, as described by Hofmann and Kotzab (2010).

- *Days receivable outstanding*  $\frac{\text{Accounts Receivable}}{\text{Revenue}} * 360 \dots \dots \dots (6)$

Refers to the average number of days a business takes to collect its receivables after a sale.

- $Days\ of\ inventory\ outstanding\ (DIO) = \frac{Average\ inventory}{costs\ of\ goods\ sold} * 360 \dots \dots \dots (7)$

The rate at which a company's stock value of its finished goods, work-in-progress, and raw materials is turned into product sales.

- $Days\ payables\ outstanding\ (DPO) = \frac{Accounts\ Payable}{costs\ of\ goods\ sold} * 360 \dots \dots \dots (8)$

Represents the average number of days it takes for a company to pay its suppliers.

The formula of CCC can be written as below:

$$SCF\ (CCC) = Days\ of\ inventory\ outstanding + Days\ receivable\ outstanding - Days\ payables\ outstanding \dots \dots \dots (9)$$

The time it will take a firm to convert its cash outflow from paying suppliers into fresh cash inflow from customers is shown by the calculation above. Accordingly, a dynamic and thorough examination of the net working capital performance, both inside the company and across the supply chain, must include the cash-to-cash cycle (Pfohl & Gomm, 2009). Hofmann and Kotzab (2010) estimate that a 25% decrease in the CCC would result in a 7.5% increase in company valuations based on academic research. Scholarly research on SCF's role in improving SC sustainability performance is lacking, despite industry recognition of its significance (Tseng et al., 2018). The function of SCF as a cutting-edge financial instrument for promoting sustainability has been progressively explored in the literature (Zhan et al., 2019). Despite the recent explosion of studies linking SCF and sustainability, there is still no evidence of how credit trading affects a firm's sustainable development. The results of a 2002 study by Liu et al. exploring the relationship between trade credit—a short-term liability—and sustainable growth indicate that obtaining trade credit reduces agency costs, which in turn promotes sustainable company growth. The study's conclusions answer the important theoretical topic of how China's private businesses are able to grow quickly and steadily in spite of a rather primitive formal finance system. Huang et al. (2019) investigate the ways and means by which trade credit financing aids in the long-term development and commercial endeavours of Chinese businesses. We include several Liu, Liu, Elahi & Liu (2022) insights into our study to better understand the effect of trade credit financing in alleviating the financing issue of enterprises from the aspect of sustainable growth. The main way our research differs from other studies is that we use financial risk to explore supply chain financing's potential impact on firms' long-term success. Our study examines how supply chain financing has facilitated long-term, sustainably expanding company expansion for Iraqi companies in an effort to close this important knowledge gap. Therefore, we propose the main hypothesis of this study which says: *The “financial risk” has mediating role in the association of “Cash Conversion Cycle (CCC)” and “Sustainable Growth Rate (SGR)”.*

### 3. Statistics and Methodology

In order to assess meditating role of “financial risk” in the association of “Cash Conversion Cycle (CCC)” and “Sustainable Growth Rate (SGR)” in Iraq six firms, the present study employed on the time-series secondary data, mainly taken from the Iraq stock market database for period of 2004 till 2021 (latest available period for this study).

These firms (1. Baghdad for Packing Materials (IBPM), 2. Baghdad Soft Drinks (IBSD), 3. Iraqi For Tufted Carpets (IITC), 4. Metallic Industries and Bicycles (IMIB), 5. Modern Sewing (IMOS), 6. Ready Made Clothes (IRMC)) are selected for analysis as they are listed on the Iraq Stock Exchange and have data available during the research period since 2004, and also they did not stop their activity during the studied period in Iraq economy.

The selected variable for this analysis are the key indicators. Regarding considering CCC in analysis, it should be noted that, CCC is an important metric that connects the firm to the supply chain. It is a

meaningful measure especially for firms that have physical goods. Its application is not just for finance and treasury executives; it also impacts the supply chain domain. The CCC is directly related to the working capital needs of the firm. This direct link is often used by analysts to evaluate the ability of the firm to efficiently manage cash. (Rogers, Leuschner, & Choi, 2020). The cash conversion cycle is a key indicator of a company’s operational efficiency and financial health. It shows how quickly a company can convert its inventory into cash. The shorter the low cash conversion cycle is, the more efficiently the company manages its cash flow. Businesses with a short cash conversion cycle have more cash on hand to pay off debts, reinvest in the business, or return money to shareholders.” Also, we should consider that there is a limitation of data in the Iraq economy. However, in future studies, it may be possible to include other indicators as well. Following that, traditionally SCM was referred to as the functions of logistics, transportation, purchasing and supplies. However, the evolution of SCM has shifted the focus to different aspects of SCM such as the issues of integration, risk management, sustainability and optimizing working capital. (Vousinas 2019). Also, Short-term financing is often obtained in the form of trade credit (also referred to as merchant credit) where the payment of trade liabilities can be deferred, especially in periods of low liquidity. It may be a powerful bargaining chip in trade negotiations and become a strong competitive advantage or even an export-supporting tool. (Molina and Preve 2012).

Table 1. Variables Details

Main Equation				
Variables	Proxy	Role	Unit of measurement	Sources
Sustainable Growth Rate	SGR	DV	Percentage %	Higgins (1977)
Cash Conversion Cycle	CCC	IV	Days	Hofmann & Kotzab (2010)
Sd of share price= Financial risk	Stshareprice	Mediator	Share price (dinar)	Lam (2021)
Cash and Equivalent	Casheq	Control (main equation)	Million dinars	Pan et.al.,(2020)
Leverage	LEV	Control (main equation)	Percentage %	Pan et.al.,(2020)
Return on Asset	ROA	Control (main equation)	Percentage %	Liu et al., (2022)
New Variables in Robust Equation				
Log of total assets	Lntasset	Control (robust equation)	Asset: Million dinars	Rahim (2017)
Firm age	age	Control (robust equation)	Years	Wang et.al.,( 2019)
Capitalization	capitalization	Control (robust equation)	Million dinars	

Three primary methods exist for statistical mediation analysis: (a) causal steps, (b) differences in coefficients, (c) product of coefficients (MacKinnon, Krull, and Lockwood (2000). Causal step approach is the most widely used approach to assess the mediation and it has been suggested by numerous studies such as Baron and Kenny (1986); Bontis et al. (2007); Judd and Kenny (1981). The causal step approach introduced by (Baron & Kenny, 1986) has three main steps as follow:

- 1- The independent variable (CCC) must affect the dependent variable (SGR) as indicated by coefficient  $c$  in step (1). In other words, CCC and SGR should be significantly associated ( $\beta \neq 0$ ). If the effect is not significantly significant, then the analysis stops in the causal steps approach since there is no overall effect to mediate.
- 2- The independent variable (CCC) must affect the mediator (stshareprice), evaluated by coefficient  $\alpha$  in step (2). In other words, CCC and stshareprice need to have significant

association ( $\beta \neq 0$ ).

- 3- The mediator (stshareprice) must affect the dependent variable (SGR) when the independent variable (CCC) is controlled, evaluated by coefficient b in step (3). In other words, “stshareprice” (Mediator) should be significantly associated with SGR after controlling the CCC.

These three steps are assessed by estimating the following three regression assumptions:

$$SGR_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 Casheq_{it} + \beta_3 Lev_{it} + \beta_4 ROA_{it} + e_{it} \quad \text{Step (1)}$$

$$stshareprice_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 Casheq_{it} + \beta_3 Lev_{it} + \beta_4 ROA_{it} + e'_{it} \quad \text{Step (2)}$$

$$SGR_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 stshareprice_{it} + \beta_3 Casheq_{it} + \beta_4 Lev_{it} + \beta_5 ROA_{it} + e_{it} \quad \text{Step (3)}$$

Where  $\beta_0$  are intercepts, “CCC, stshareprice and SGR” represent the independent, mediator and dependent variables, respectively,  $\beta_i$  are the coefficient relating the independent, mediator and control variables, and  $e_i$  are residuals.

If these conditions all hold in the predicted condition, then the effect of the independent variable on dependent variable must be less in third equation than in the first one. Researchers report that the mediator fully or completely mediates the CCC on SGR effect when there is no longer a significant direct effect of CCC on SGR ( $\beta_i = 0$ ). While, researchers report that the mediator partially mediates the CCC on SGR effect if the CCC on SGR effect remains significant ( $\beta_i \neq 0$ ) after controlling for the mediator but, the absolute effect is smaller than total effect (Baron & Kenny, 1986).

#### 4. Findings and Discussion

In this section, we estimate the mediating impact of “stshareprice” (financial risk) on the relationship between CCC and SGR. Also, robust equation will be assessed to confirm the outcome of main equations of this study.

The study's analysis begins with descriptive statistics. Table 2 provides a summary descriptive statistic for each variable. The average of the dependent variable of this study (SGR) is -0.01 and it disperses from -4.02 to 1.19.

Also, independent and mediator variables are offered by CCC and stshareprice. The means of these variables are 66.67 and 0.83 respectively. Additional characteristics of the variables taken into consideration in this study, including standard deviation and the lowest and maximum values of each variable, are also displayed in Table 2.

Table 2. Descriptive Statistics of all variables in model

Variables	Mean	Std. Dev	Min	Max
SGR	-0.01	0.52	-4.02	1.19
CCC	66.67	859.00	-3504.52	2912.10
Stshareprice	0.83	0.80	0.03	2.99
Casheq	7475.69	24770.39	4.82	178597.50
Lev	0.27	0.30	-0.69	0.94
ROA	0.03	0.26	-1.12	1.00

Source: Output of STATA software

Following descriptive statistics, Table 3 presents the correlation between the variables used in this model. It can be inferred that the correlation between all variables are not relatively high, and as a result they are not causing any issue.

Table 3. Correlation coefficients between DV, Mediator, IV and Control variables

	SGR	CCC	Stshareprice	Casheq	LEV	ROA
SGR	1.000					
CCC	0.467 ***	1.000				
Stshareprice	0.455 ***	0.096	1.000			
Casheq	0.062	-0.004	-0.104	1.000		
LEV	0.293 ***	0.097	0.223 **	-0.151	1.000	
ROA	0.646 ***	0.187 *	0.546 ***	0.088	0.226 **	1.000

Source: Output of STATA software

Variance inflation factors (VIF) for each of the independent variables used in this study were calculated since multicollinearity analysis is difficult to comprehend only from a correlation matrix, as Table 4 illustrates. In a regression analysis, the degree of collinearity between the independent and control variables can also be measured using the VIF determination (Damodar N Gujarati & Porter, 2009).

There is no multicollinearity issue based on the data in Table 4, as all VIF values are less than 10. That is to say, no variable will be eliminated from the model since there are no significant multicollinearity problems.

Table 4. Result of Multicollinearity test

Variable	Centered VIF
ROA	1.60
Stshareprice	1.55
CCC	1.27
LEV	1.10
Casheq	1.07
	1.32

This research assesses the assumption of regression for three steps equations of mediating analysis, as explained before, for no autocorrelation issue, no heteroscedasticity issue and normality of residual and their outcomes are provided in table 5, 6 and 7.

Table 5 illustrates the result Breusch-Pagan test for detecting heteroscedasticity issue. Regarding equation 1 and 2, the result of heteroscedasticity test, probability of Chi-square is significant, so the null hypothesis of homoscedasticity (not heteroscedasticity) is rejected. Hence, these two equations model have the issue of heteroscedasticity. On the other hand, the result of test for equation two is not significant and hence, it has no issue of heteroscedasticity.

Table 5. Diagnostics Tests. Part1

Heteroscedasticity Test: Breusch-Pagan test		
Equation 1	Chi-Square	313.74
	Prob	0.00
Equation 2	Chi-Square	1.13
	Prob	28.73
Equation 3	Chi-Square	297.94
	Prob	0.00

Source: Output of STATA software

In the next step (table 6), to detect autocorrelation issue, the study applied Wooldridge method with the null hypothesis of no autocorrelation and alternative of existing autocorrelation. Based on the result of the test, the probability value this test for equation step1 and step2 is not significant which implies that the null hypothesis of no autocorrelation is not rejected. So, there is no issue of autocorrelation in this model. Following that, equation of step3 has significant, hence it has the issue of autocorrelation.

Table 6. Diagnostics Tests. Part2

<b>Wooldridge: Autocorrelation test</b>		
<b>Equation 1</b>	<b>Chi-Square</b>	9.19
	<b>Prob</b>	0.29
<b>Equation 2</b>	<b>Chi-Square</b>	1.47
	<b>Prob</b>	27.89
<b>Equation 3</b>	<b>Chi-Square</b>	22.42
	<b>Prob</b>	0.01

Source: Output of STATA software

Lastly, all three steps equations are analyzed for the “normality of residuals”. The Doornik-Hansen test was utilized in this study to evaluate the residuals' normal distribution. The residual distribution is normally distributed unless the Doornik-Hansen test P-value is significant (Damodar N Gujarati & Porter, 2009). The results of the normality test in Table 7 indicate that the null hypothesis of the residuals' normal distribution is rejected due to the significant P-value. Therefore, all of them has non-normal distribution of residual. However, based on the rule of thumb (Damodar N Gujarati & Porter, 2009), as the number of observations in this study is more than 100, non-normality of residual does not cause any issue.

Table 7. Diagnostics Tests. Part3

<b>Normality of Residuals</b>		
<b>Equation 1</b>	<b>Doornik-Hansen chi2</b>	66.19
	<b>Prob</b>	0.00
<b>Equation 2</b>	<b>Doornik-Hansen chi2</b>	55.34
	<b>Prob</b>	0.00
<b>Equation 3</b>	<b>Doornik-Hansen chi2</b>	41.60
	<b>Prob</b>	0.00

Source: Output of STATA software

Since the equations of this study are Panel data, three compulsory tests for Panel data analysis should be applied to select between Pooled OLS, Fixed effect, and Random effect methods. Those tests are F-test (between Pooled OLS and Fixed effect (FE)), Breusch-pagan test (between Pooled OLS and Random effect (RE)), and Hausman test (between RE and FE).

Table 8 demonstrate the outcome of these three tests for three steps of mediation analysis. Regarding equation of the step1, as the outcome of F-test shows, null hypothesis is not rejected and the null hypothesis which is Pooled OLS is accepted. Then, the result of Breusch-Pagan test shows that the null hypothesis is not rejected too and implies the acceptance of Pooled OLS. So, the Hausman test will clarify the final selection. Finally, the result of Hausman shows the null hypothesis should be rejected and the alternative hypothesis which is the FE more suitable. Ultimately, it reveals that the most appropriate method for the main equation is Pooled OLS panel method. Following that, the outcomes

of these three tests for equation of the step 2 and step 3 show that the final model is Random effect method and Pooled OLS respectively.

Table 8. F-test, BP-LM and Hausman Tests

	Tests	Statistic	Prob.
<b>Equation 1</b>	F-test	0.93	0.46
	BP-LM test	0.34	0.280
	Hausman test (Chi-Sq.)	1.19	0.755
<b>Equation 2</b>	F-test	2.25	0.06
	BP-LM test	2.00	0.079
	Hausman test (Chi-Sq.)	0.25	0.968
<b>Equation 3</b>	F-test	1.79	0.12
	BP-LM test	0.00	1.000
	Hausman test (Chi-Sq.)	14.81	0.005

Source: Output of STATA software

Table 9, 10 and 11 explain the finding of the three steps of mediating analysis. As mentioned before, in order to have meaningful mediating effect, independent variable should significantly impact on dependent variable (step1), independent variable should have significant impact on mediator (step3), and finally, independent variable and mediator should have significant impact on dependent variable (step3). According to the table 9, the result of the step1 indicates that “CCC (independent variable)” and “ROA (control variable)” have significant and positive impact on “SGR” with 10% and 1% significance level correspondingly. The rest of control variables do not show any significant impact on SGR.

Table 9. Panel data outcome of the equation for step1. (DV: SGR)

Variable	Coefficient		Std. Er	t-Stat	Prob.
CCC	0.00020	*	0.0001	1.75	0.083
Casheq	0.00000		0.0000	1.02	0.311
Lev	0.23938		0.2962	0.81	0.421
ROA	0.90883	***	0.2041	4.45	0.000
Constant	-0.14775		0.1281	-1.15	0.252
F-test	15.08				
Prob > F	0.000				

Source: Output of STATA software

According to the table 10, the result of the step2 indicates that “CCC” and “ROA” have significant and positive on “stshareprice (mediator)” with 1% and 1% significance level correspondingly. The rest of control variables do not show any significant impact on “stshareprice”.

Table 10. Panel data outcome of the equation for step2. (DV: stshareprice)

Variable	Coefficient		Std. Er	Z-Stat	Prob.
CCC	0.00016	**	0.0001	2.20	0.028
Casheq	0.00000		0.0000	-1.34	0.180
Lev	0.08833		0.2524	0.35	0.726
ROA	1.49181	***	0.2704	5.52	0.000
Constant	0.75304	***	0.1527	4.93	0.000
Wald chi2	61.43				
Prob > chi2	0.000				

Source: Output of STATA software

Based on the table 11, the result of the step3 indicates that “CCC”, “ROA (control variable)” have significant and positive on “SGR” with 1% and 1% significance level correspondingly. It implies that if CCC and ROA increase one unit, they lead to increase stshareprice (share price) significantly. The rest of control variables do not show any significant impact on “SGR”. Considering all three steps, this study concludes that “stshareprice (financial risk)” statistically has mediator impact on the relationship of CCC and SGR.

Table 11. Panel data outcome of the equation for step3. (DV: SGR)

Variable	Coefficient		Std. Er	t-Stat	Prob.
CCC	0.00019	*	0.0001	1.88	0.063
stshareprice	0.04107	**	0.0203	2.02	0.046
Casheq	0.00000		0.0000	0.87	0.385
Lev	0.20668		0.2862	0.72	0.472
ROA	0.77003	***	0.2038	3.78	0.000
Constant	-0.20776		0.1383	-1.50	0.136
F-test	18.74				
Prob > F	0.000				

Source: Output of STATA software

**Robust equation:**

To double confirm the outcome of this study, the robust equations (for all three steps) have been investigated. In the robust equations, “Casheq, LEV, and ROA (control variables)” are replaced with “Age (firm age), capitalization (market capital), and Lntasset (Log of total assets)”. Therefore, three steps of mediating analysis for robust model will be as below:

$$SGR_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 Age_{it} + \beta_3 Capitalization_{it} + \beta_4 Lntasset_{it} + e_{it} \quad \text{Step (1)}$$

$$stshareprice_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 Age_{it} + \beta_3 Capitalization_{it} + \beta_4 Lntasset_{it} + e'_{it} \quad \text{Step (2)}$$

$$SGR_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 stshareprice_{it} + \beta_3 Age_{it} + \beta_4 Capitalization_{it} + \beta_5 Lntasset_{it} + e_{it} \quad \text{Step (3)}$$

According to the table 12, the result of the step1 (robust) indicates that “CCC (independent variable)”, “Capitalization and Lntasset (control variable)” have significant and positive on “SGR” with

1%, 5% and 5% significance level correspondingly. The rest of control variables do not show any significant impact on SGR.

Table 12. Panel data outcome of the equation for step1 (robust model). (DV: SGR)

Variable	Coefficient		Std. Er	t-Stat	Prob.
CCC	0.00027	***	0.0000	6.66	0.000
Age	0.00955		0.0074	1.29	0.202
Capitalization	0.00000	**	0.0000	2.25	0.026
Lntasset	0.27722	**	0.1389	2.00	0.049
Constant	-1.48075	***	0.4832	-3.06	0.003
F-test	24.19				
Prob > F	0.000				

Source: Output of STATA software

According to the table 13, the result of the step2 indicates that “CCC” has significant and positive on “stshareprice (mediator)” with 1% significance level. The rest of control variables do not show any significant impact on “stshareprice”.

Table 13. Panel data outcome of the equation for step2 (robust model). (DV: stshareprice)

Variable	Coefficient		Std. Er	t-Stat	Prob.
CCC	0.00032	***	0.0001	3.30	0.001
Age	0.01537		0.0177	0.87	0.388
Capitalization	0.00000		0.0000	1.40	0.166
Lntasset	0.22751		0.3318	0.69	0.495
Constant	-0.19883		1.1546	-0.17	0.864
F-test	6.29				
Prob > F	0.000				

Source: Output of STATA software

Based on the table 14, the result of the step3 indicates that “CCC”, “stshareprice, Capitalization, and Lntasset (control variable)” have significant and positive on “SGR” with 1%, 1%, 10% and 10% significance level correspondingly. The rest of control variables do not show any significant impact on “SGR”. Considering all three steps, this robust model confirms the result of main model of the study.

Table 14. Panel data outcome of the equation for step3 (robust model). (DV: SGR)

Variable	Coefficient		Std. Er	t-Stat	Prob.
CCC	0.00023	***	0.0000	5.58	0.000
stshareprice	0.13437	***	0.0402	3.34	0.001
Age	0.00748		0.0071	1.05	0.294
Capitalization	0.00000	*	0.0000	1.88	0.063
Lntasset	0.24665	*	0.1325	1.86	0.066
Constant	-1.45403	***	0.4600	-3.16	0.002

F-test	23.58
Prob > F	0.000

Source: Output of STATA software

## 5. Conclusions

The main thing preventing businesses from growing is funding. The cash conversion cycle as a proxy of supply chain finance plays an important role in the business activities of enterprises as a useful method of short-term financing.

This study provides new evidence on the relationship between supply chain finance and sustainable growth in the context of manufacturing firms in Iraq. Using panel data analysis, we find that SCF, proxied by the cash conversion cycle, has a significant positive impact on the sustainable growth rate of firms. We also find that financial risk, measured by stock price volatility, partially mediates this relationship. These findings suggest that SCF can be an important tool for firms to promote sustainable growth by reducing their cash conversion cycle and managing their financial risk. However, our study is limited by its small sample size and the use of a single proxy for SCF. Future research could explore alternative measures of SCF and examine the generalizability of our findings to other contexts. Despite these limitations, our study has important implications for firms and policymakers in Iraq and beyond. Firms should consider adopting SCF practices to enhance their sustainable growth, while policymakers should create an enabling environment for SCF adoption through appropriate regulations and incentives.

Also, the empirical result of this study shows that SCF significantly promotes the sustainable growth of Iraqi enterprises. Consequently, CCC as a proxy of SCF remains an effective instrument to reach SGR in the context of imperfect financial systems in Iraq and other economies as well. In order to fully organize the impetus of firms' sustainable growth and amplify the role of SCF, the government can provide reinforce the infrastructure of financial system and also enhance the quality of current banking and financial mechanism in the economy.

Most empirical tests of the pecking order theory focus on the strict interpretation of this theory. As elaborated before, Huang and Liu (2009) believe that the capacity to sustain development is a crucial requirement for the survival and growth of a company and is seen as an indicator of its overall strength. Following that Mabrouk & Boubaker (2019) mainly emphasize on the effect of life cycle, firm ownership and debt situation of the firms. However, this study provides new insight by highlighting the role SCF and financial risk in promoting or changing the SGR of firms.

In future studies, other aspects such as stock price, capital structure, cash-generating capacity, dividend payout ratio might be taken into account while conducting more research. Analyzing the impact of the particular market situation, in particular the opportunities and hazards of supply chain financing for businesses during economic downturns, would be an important area for more supply chain finance study.

## References

- Abbasi, W.A., Wang,Z., & Abbasi,D.(2017). Supply Chain Finance: Generation and Growth of New Financing Approach. *Journal of Finance and Bank Management*, 5(2),50-57.
- Amouzesh, N., Zahra, M., & Zahra, M. (2011). Sustainable Growth Rate and Firm Performance: Evidence From IranStock Exchange.*International Journal of Business and Social Science*, 23(2), 249–255.
- Anser, A.,& Malik, Q.A.(2013). Cash Conversion Cycle and Firms' Profitability -A Study of Listed Manufacturing Companies of Pakistan. *Journal of Business and Management*, 8(2), 83-87.

- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173.
- Bontis, N., Bart, C., Wakefield, P., Bontis, N., Booker, L. D., & Serenko, A. (2007). The mediating effect of organizational reputation on customer loyalty and service recommendation in the banking industry. *Management Decision*, 45(9), 1426-1445.
- Chakuu, S., Masi, D., Godsell, J. (2019). Exploring the relationship between mechanisms, actors and instruments in supply chain finance: A systematic literature review. *International Journal of Production Economics*. 216, 35–53.
- Chen, S., Du, J., He, W., & Siponen, N. (2022). Supply chain finance platform evaluation based on acceptability analysis. *International Journal of Production Economics*, 243, 108350.
- Churchill, N.C. & Mullins, J.W. (2001). How fast can your company afford to grow? *Harvard Business Review*, 79 (5), 135-143.
- Cornett, M.M., Macnutt, J.J, Strahan, P., & Tehranian, H. (2011). Liquidity Risk Management and Credit Supply in the Financial Crisis. *Journal of Financial Economics*, 101(29), 297-312.
- Elgazzar, S.H., Tipi, N.S., Hubbard, N.J., Leach, D.Z., 2012. Linking supply chain processes' performance to a company's financial strategic objectives. *European Journal of Operational Research*. 223 (1), 276–289.
- Fonseka, M. M., Ramos, C., & Tain, G.L. (2012). The Most Appropriate Sustainable Growth Rate Model for Managers and Researchers, *The Journal of Applied Business Researchers*, 28(3), 481-500.
- Garcia–Teruel, P. J. & Martinez-Solano, P. (2013). Effects of Working Capital Management on SME Profitability. *International Journal of Managerial Finance*, 3 (2): 164–177.
- Gujarati, D. N., & Porter, D. (2009). *Basic Econometrics*, Mc Graw-Hill International Edition.
- Hartono, G., Cahyo and Utami, S.R. (2016). The Comparison of Sustainable Growth Rate, Firms Performance and Value. *International Journal of Advanced Research in Management and Social Sciences*, 5(5), 68-81.
- Higgins, R. C. (1977). How much growth can a firm afford? *Financial management*, 7-16.
- Higgins, R.. (2018). *Analysis for Financial Management*, 12th International ed. New York: Mc Graw-Hill.
- Hofmann, E. & Kotzab.(2010). Supply Chain-Oriented Approach of Working Capital Management. *JOURNAL OF BUSINESS LOGISTICS*, 31(2), 302-330.
- Hofmann, E. (2005). Supply chain finance: some conceptual insights. *Beiträge Zu Beschaffung Und Logistik*, 203-214.
- Horne J, C, V., & Wachowicz J, M, JR. (2008). *Fundamentals of Financial Management*, 13th Edition, Prentice-Hall Inc. Financial Times (Pearson Education), ISBN: 978-0-273-71363-0.
- Huang, L., Ying, Q., Yang, S., & Hassan, H. (2019). Trade Credit Financing and Sustainable Growth of Firms: Empirical Evidence from China. *Sustainability*, 11(4), 1032;
- Inda S., Abu Bakar H., Rohaizat B., & Md Yusof. R. (2012). The Study of Supply Chain Management Strategy and Practices on Supply Chain Performance, The

International Conference on Asia Pacific Business Innovation & Technology Management, *Procedia-Social and Behavioral Sciences*, Vol (40), 225.

Ivashina, V., Scharfstein, D. (2010). Bank lending during the financial crisis of 2008. *Journal of Financial Economics*, 97(3), 319-338.

Judd, C. M., & Kenny, D. A. (1981). Process analysis estimating mediation in treatment evaluations. *Evaluation Review*, 5(5), 602-619.

Kaaid, A. j, (2023). The possibility of calculating the sustainable growth rate for financially distressed companies according to a proposed model. *Entrepreneurship journal for finance and Business*, 4(2), 133-150.

Keown, A.J., Martin, J.D., Petty, J.W. and Scott, D.F. (2003). *Foundations of Finance*, 4th ed., Pearson Education, New Jersey.

Lam, H.K., Zhan, Y., Zhang, M., Wang, Y., & Lyons, A. (2019). The effect of supply chain finance initiatives on the market value of service providers. *Int. J. Prod. Econ.* 216, 227–238.

Lee, C.H., & Rhee, S.G. (2011). Trade credit for supply chain coordination. *European Journal of Operational Research*, 214(1), 136-146.

Liu, T., Liu, W., Elahi, E., & Liu, X., (2022). Supply Chain Finance and the Sustainable Growth of Chinese Firms: The Moderating Effect of Digital Finance, *Frontiers in Environmental Science*, 10, 1-14.

Mabrouk, L., & Boubaker, A. (2019). The pecking order theory and life cycle: Evidence from French firms. *Corporate Ownership & Control*, 16(3), 20-30.

MacKinnon, D. P., Krull, J. L., & Lockwood, C. M. (2000). Equivalence of the mediation, confounding and suppression effect. *Prevention Science*, 1(4), 173-181.

Marak, Z., & Pillai, D. (2019). Factors, outcome, and the solutions of supply chain finance: review and the future directions. *J. Risk Financ. Manag.* 12 (1), 3–26.

Molina, C. A. and L. A. Preve (2012). "An empirical analysis of the effect of financial distress on trade credit." *Financial Management* 41(1): 187-205.

More, D., & Basu, P. (2013), Challenges of supply chain finance: A detailed study and a hierarchical model based on the experiences of an Indian firm. *Business Process Management Journal*. 19(4), 624-647.

Mukherjee, T., & Sen, S. S. (2018). Sustainable growth rate and its determinants: A study on some selected companies in India. *Global Multidisciplinary*, 10(1), 100-108.

Nguema, J, Mehreen, A., Rukundo, C., & Ke, Y. (2021). Exploring the factors influencing the adoption of supply chain finance in supply chain effectiveness: evidence from manufacturing firms. *Journal of Business & Industrial Marketing*, 36(5), 706-716.

Pan, a., Xu, L., Li, B., & Ling, R. (2020). The impact of supply chain finance on firm cash holdings: Evidence from China. *Pacific-Basin Finance Journal*, 36, 1-13.

Pfohl, H. C., & Gomm, M. (2009). Supply chain finance: optimizing financial flows in supply chains. *Logistics research*, 1(3-4), 149-161.

Pfohl, H.-Chr., Hofmann, E., & Elbert, R. (2003). Financial Supply Chain Management – Neue Herausforderungen für die Finanz- und Logistikwelt, in: *Logistik Management*, 5 (4), 10-26.

- Rahim, N.(2017). Sustainable growth rate and firm performance: A case study in Malaysia. *International Journal of Management, Innovation & Entrepreneurial Research*,3(2), 48-60.
- Rogers, D. S., Leuschner, R., & Choi, T. Y. (2020). *Supply chain financing: Funding the supply chain and the organization*: World Scientific Publishing company. London.
- Silvestro, R., & Lustrato, P. (2014). Integrating financial and physical supply chains: The role of banks in enabling supply chain integration. *Int. J. Oper. Prod. Manag.* 34, 298–324.
- Srinivasa R., N.R., & Mishra, V.K. (2011). Short-term financing in a cash-constrained supply chain. *Int. J. Prod. Econ.* 134 (2), 407–412.
- Tseng, ML, Wu, KJ., Hu, J., & Wang , CH.(2018). Decision-making model for sustainable supply chain finance under uncertainties. *International Journal of Production Economics*, 205, 30-36.
- Vousinas, G. (2019). "Supply chain finance: Definition, modern aspects and research challenges ahead." *Supply Chain Finance: Risk Management, Resilience and Supplier Management*; Tate, W., Bals, L., Ellram, L., Eds: 63-95.
- Wuttke, D.A., Blome, C., Heese,H.S., & Protopappa-Sieke, M. (2016). Supply Chain Finance: Optimal Introduction and Adoption Decisions. *Intern. Journal of Production Economics*, 178, 72-81.
- Zhang, T., Zhang, C.Y., & Pei, Q., 2019. Misconception of providing supply chain finance: Its stabilising role. *International Journal of Production Economics*. 213, 175–184.