

The (un)sustainable mix: supply chain finance, sustainability ratings and liquidity

The (un)
sustainable
mix

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Received 28 August 2023
Revised 17 November 2023
27 January 2024
Accepted 6 February 2024

Abstract

Purpose – This study aims to investigate the interaction effect between offering supply chain finance (SCF) programmes and sustainability ratings on the liquidity performance of buyers and suppliers.

Design/methodology/approach – The study uses a unique sample of buyers that each have an SCF programme. The sample is complemented with financial information and sustainability scores. The data is analysed through a random effects model.

Findings – Aligning with recent advances in SCF literature, the results confirm a tendency for SCF programmes to favour buyers over suppliers. However, the relationship between SCF programme adoption and liquidity performance for buyers and suppliers is positively moderated by the strong sustainability performance of both parties.

Practical implications – Buyers and suppliers are advised to implement and adopt effective SCF programmes that are beneficial for both parties. For buyers, the authors suggest leveraging on SCF programmes as incentives to foster sustainable behaviour among suppliers. For suppliers, the authors recommend caution before joining programmes offered by buyers that do not perform well on sustainability.

Social implications – Enhancing sustainability within global supply chains and fostering favourable payment practices towards suppliers are crucial for policy development and regulation. The findings clarify the connection between both components, offering valuable insights for policymakers in this domain.

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Originality/value – The study is built on a manually picked, unique database of buyers offering SCF programmes to their suppliers. This allows, across a large sample, an evaluation of the differences between buyers that offer SCF programmes and those that do not.

Keywords Supply chain finance, Environmental, Social and governance, Liquidity performance, Sustainability ratings

Paper type Research paper

1. Introduction

The sustainable aspect of supply chain finance (SCF) has recently gained considerable attention in both academia and practice. Multinational corporations such as PUMA, Levi's, Henkel, Nestlé and many others are explicitly and formally adjusting their trade credit and SCF strategies based on the sustainability performance of suppliers. These buyers establish SCF programmes wherein they instruct a financial institution to settle suppliers' invoices before their natural maturity. As a result, suppliers are offered more favourable financing rates than they could otherwise secure. The fee charged to suppliers is contingent on their sustainability ratings, as assessed by the buyer or an external party. This concept has been conceptually formalized, for example, by [Jia et al. \(2020\)](#), who highlight how SCF has evolved from focusing on working capital to encompassing a multi-objective function that includes social and environmental performance and explain how this evolution impacts the effectiveness of the SCF approach overall.

However, the shift towards sustainability in SCF reveals unexplored tensions. While a stronger emphasis on sustainability in SCF intensifies the need for collaborative, mutually beneficial programmes, the literature contains growing evidence of buyers behaving opportunistically within SCF programmes, to the detriment of their suppliers. Buyers are shown to prioritise their own benefits in SCF (such as extended payment terms), often acting assertively and restricting suppliers' opportunities to capitalize on programmes through early payments (e.g. [De Goeij et al., 2021](#); [Kouvelis and Xu, 2021](#)). As this tension contributes to relational issues between buyers and their suppliers, it remains unclear whether an emphasis on sustainability of SCF programmes serves as a remedy for ineffective programmes or merely as a greenwashing measure.

The purpose of this paper is to shed light on the extent to which sustainability contributes to more equitable SCF programmes (i.e. those that benefit both buyers and suppliers). More specifically, we aim to investigate whether SCF programmes are mutually beneficial for buyers and suppliers and whether the sustainability dimension influences the capacity of the programmes to do so. The current investigation is summarised in our research question: "To what extent does the sustainability performance of buyers and suppliers moderate the relationship between SCF and liquidity performance?" We address the question by using a unique, manually constructed database of SCF programmes, complemented with financial and sustainability information from Compustat and Thomson Reuters. Our results show that SCF programmes consistently benefit buyers, while suppliers benefit only when both buyers and suppliers exhibit strong sustainable performance. These findings contribute to a better understanding of how SCF programmes create value and, more broadly, how financing interacts with sustainable performance in buyer–supplier relationships.

2. Theoretical background and hypotheses development

2.1 *Supply chain finance and buyer–supplier liquidity performance*

SCF is an approach for facilitating the collaborative management of physical flows between buyers and their suppliers ([Caniato et al., 2016](#)). The most common practical application of

SCF is a buyer-driven programme whereby a large buyer collaborates with a financial institution to settle suppliers' invoices before their natural maturity, allowing suppliers to acquire more favourable financing rates than what they could otherwise secure (Wynne, 2020). A buyer typically repays the financial institution after it would have paid the supplier, effectively improving the liquidity performance of the buyer by increasing its accounts payable (AP) and enhancing the liquidity of the supplier by reducing its accounts receivable (AR) (e.g. dello Iacono *et al.*, 2015; Gelsomino *et al.*, 2019).

Nevertheless, the impact of SCF implementation remains ambiguous. The extant literature predominantly examines the opportunities of SCF, while the associated risks are often overlooked (Beka Be Nguema *et al.*, 2022), and most studies adopt an optimistic view on SCF implementation. However, within an SCF programme, buyers may be criticised for imposing cash discounts or unilateral payment term extensions on suppliers (Hofmann *et al.*, 2021). Recent literature acknowledges that buyers may exert excessive pressure, to the extent of making SCF unappealing to suppliers (Kouvelis and Xu, 2021). Suppliers might be coerced to participate in SCF (van der Vliet *et al.*, 2015), and with disproportionate bargaining power, buyers can achieve greater benefits from SCF, potentially to the suppliers' financial detriment (De Goeij *et al.*, 2021). Notably, buyers can optimise their AP, while the anticipated AR benefits for suppliers fail to materialise (Wetzel and Hofmann, 2019). This occurs despite suppliers' need for financial support from buyers (Caniato *et al.*, 2020) and the recognition that a strong buyer is essential for effective SCF (Martin and Hofmann, 2019). Ideally, proper SCF implementation should decrease AR for suppliers and increase AP for buyers (Wuttke *et al.*, 2019). Moreover, from a buyer's perspective, the overall health of a business should be bolstered by offering favourable financial terms to suppliers (Hofmann *et al.*, 2021). Therefore, within the norms of socioeconomic transactions, it is reasonable to expect that SCF adoption is associated with improved liquidity performance for both the buyers and the suppliers involved. Formally:

- H1.1* The adoption of an SCF programme enhances the liquidity performance of the buyer.
- H1.2* Joining the SCF programme offered by a buyer enhances the liquidity performance of suppliers.

2.2 Supply chain finance and sustainable performance

Currently, sustainability is a core concern on the agendas of corporations (Akyildirim, 2023). Companies acknowledge the importance of sustainability and invest in sustainability initiatives, shifting towards more responsible behaviour, often summarised through the set of performance indicators known as environmental, social and governance (ESG; e.g. Saini *et al.*, 2022). However, the issue with sustainability is limited access to financial resources (Bancilhon *et al.*, 2018), and small and medium-sized enterprises in particular face financial barriers that prevent them from becoming more sustainable (Jia *et al.*, 2020). SCF is recognised as an efficient way to promote supply chain sustainability while coping with financial issues (*ibid.*).

To combine SCF with sustainability in a successful manner, the parties involved should balance the ESG goals with financial goals (Jia *et al.*, 2020). This implies improving the liquidity performance for both buyers and suppliers while at the same time considering the sustainability aspect (Tseng *et al.*, 2018). To a limited extent, the existing academic literature captures the relationship between SCF and sustainability (Jia *et al.*, 2020). Nonetheless, pursuing a framework that combines SCF and sustainability will create more transparency,

which, in turn, reduces risks associated with financing (Liang *et al.*, 2018). More specifically, current literature suggests that a potential interaction effect might exist between the impact of SCF on the liquidity performance and high sustainability performance on both the buyer and supplier sides. We summarise the argument in four points.

Firstly, benefits of SCF for suppliers are driven by good governance on the buyer side, exemplified when buyers efficiently approve invoices in a prompt manner (De Goeij *et al.*, 2021; Gelsomino *et al.*, 2019). Prompt approval of invoices implies, all else being equal, a reduction in account receivables for suppliers, thus impacting their liquidity performance. Consequently, we should observe an enhanced liquidity impact on the supplier side in concomitance with buyers that score well in governance.

Secondly, buyers with a high sustainability performance are now often subject to stringent environmental reporting standards involving suppliers (e.g. scope three emission reporting). As a result, buyers are usually required to provide suppliers with strong incentives for information sharing, such as linking them to an effective SCF programme (Zhan *et al.*, 2018; Tate *et al.*, 2011). Thus, buyers that score well in environmental measures and have an SCF programme should be motivated to provide a strong incentive to suppliers (i.e. an attractive SCF programme as opposed to one that does not benefit suppliers), especially to those that also have high sustainability ratings.

Thirdly, buyers with an SCF programme are now subject to intense scrutiny and requests for transparency (Murphy, 2022; De Paoli *et al.*, 2022). This implies that buyers aiming for high sustainability performance will be incentivised to ensure that suppliers benefit from SCF, which can avoid general “greenwashing” accusations as well as the negative publicity that has characterised programmes that were previously detrimental for suppliers (Coppola, 2018; Moody, 2015).

Fourthly, in SCF, benefits for buyers are predominantly driven by the number of suppliers that agree to participate in the programme, relative to the size of the supply base and spend (dello Iacono *et al.*, 2015; Wuttke *et al.*, 2016; Gelsomino *et al.*, 2019). Therefore, incentivising suppliers to join the programme (for the three reasons mentioned above) also has an interaction effect on the liquidity performance of the buyer. Consequently, it is reasonable to posit that high sustainability performance on the buyer side also positively moderates the benefits that buyers can obtain from SCF. Formally:

- H2.1* A high ESG score on the buyer side positively moderates the impact of an SCF programme on the liquidity performance of the buyer.
- H2.2* A high ESG score on the buyer side positively moderates the impact of an SCF programme on the liquidity performance of suppliers.
- H2.3* A high ESG score on the supplier side positively moderates the impact of an SCF programme on the liquidity performance of suppliers.

Figure 1 below summarises the conceptual framework of this research.

3. Methodology

3.1 Data collection and sample

The study sample consists of a selected group of corporations that engage in SCF and others that do not. The total sample is composed of two groups: one group of buyers and one group of suppliers. This study uses data from the timeframe of 2017–2021, retrieved from three databases:

- (1) An SCF database;

- (2) S&P CapitalIQ; and
- (3) Thomson Reuters Eikon.

The SCF database contains buyers that engage in SCF and others that do not. The database was constructed in 2016 and was based on the first 1,000 largest companies worldwide at the time, according to Forbes. All companies within the database were analysed to establish whether they offer an SCF programme. This was accomplished by using knowledge and private databases of buyers offering SCF programmes owned by the research team and by manually searching for each buyer on the internet and examining search results to determine if it offers an SCF programme (e.g. a reference to the programme on a page from the buyer’s website, a record of the buyer winning an award for its programme, a job posting related to the management of the programme, etc.).

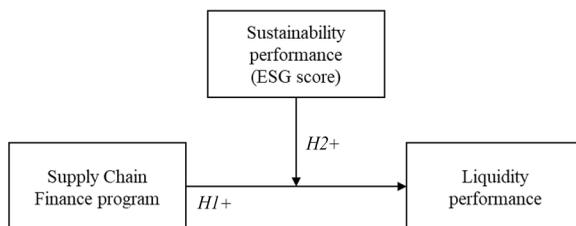
Suppliers associated with each buyer were selected through CapitalIQ. This posed the challenge of determining whether or not suppliers belonged to their buyer’s programme. We adopted a two-pronged approach to filter suppliers. Firstly, suppliers with better credit ratings than their buyers were excluded; SCF is deemed more efficient when buyers have a superior credit rating, as capital can be sourced at a more competitive rate (Wuttke *et al.*, 2019). Secondly, suppliers larger than their respective buyers were excluded, since smaller suppliers typically have less access to financial resources and, therefore, are more likely to engage in SCF (Martin and Hofmann, 2019). Our approach to filtering suppliers was tested on an alternative and much smaller sample of buyers and suppliers, for which we know whether or not suppliers are in the programme. The test returned a type I error rate (suppliers marked as being in the programme even though they are not) of less than 5% and no type II errors (suppliers marked as not being in the programme even though they are).

Moreover, all other financial data necessary for the analysis was collected from CapitalIQ. Finally, we gathered ESG data from Thomson Reuters EIKON. From the initial sample, all private buyers and suppliers were excluded due to lack of financial and/or ESG data availability. The sample selection is summarised in Table 1.

3.2 Measures

The dependent variable of this study is liquidity performance, which we measured as AP for buyers and as AR for suppliers. As discussed in Section 2, for buyers, liquidity performance is improved by extending payment terms with suppliers that are part of the SCF programme (i.e. increasing AP). For suppliers, liquidity performance is enhanced by accessing early payments through SCF (i.e. reducing AR).

The independent variable of this study is the SCF programme. SCF is presented as a dummy variable, with a value of “1” if the buyer or supplier engages in SCF and a value of “0” otherwise.



Source: Figure by authors

Figure 1. Conceptual framework

EBR

SCF	Firms	Non-SCF	Firms
<i>Panel A: Sample selection buyers</i>			
Starting sample of buyers	266	Starting sample of buyers	734
Not available			(6)
Private firms	(29)	Private firms	(58)
No ESG rating available	(8)		(39)
Total SCF buyers included	229	Total non SCF buyers included	631
<i>Panel B: Sample selection suppliers</i>			
Suppliers	8,251	Suppliers	6,142
Private suppliers	(4,022)	Private suppliers	(4,322)
Excluded credit rating/size	(967)	Excluded credit rating/size	–
Suppliers without ESG rating	(2,161)	Suppliers without ESG rating	(1,137)
Total SCF suppliers	1,101	Total non SCF suppliers	683

Table 1.

Sample selection

Source: Table by authors

The moderating variables in this study are the environmental (ENV), social (SOC) and governance (GOV) pillars of the ESG scores. The environmental pillar considers the corporation's impact on living and non-living (natural) systems and reflects the corporation's capability to avoid actions that jeopardise the environment. It includes resource use, emissions and innovation. The social pillar focuses on the best management practices to create trust and loyalty from the workforce, customers and society, examining key factors to optimise future shareholder value. It includes workforce, human rights, community and product responsibility. The governance pillar reflects the management activities to direct and control rights and responsibilities. It includes the corporation's systems and processes. For the ESG scores, the score of the buyers is considered for both suppliers and buyers since buyers initiate SCF. Additionally, large buyers are less influenced by the sustainability of suppliers, whereas suppliers may strongly rely on the sustainability strategies of the buyer (Sardanelli *et al.*, 2022).

We included in our model five different control variables:

- (1) *Company size*. Larger firms can create synergy due to the realisation of scale within the business and, therefore, can benefit more from engaging in an SCF programme (Martin and Hofmann, 2019). Moreover, company size can be linked to ESG score since larger corporations have more opportunities/capabilities to engage in corporate social responsibility. Finally, all else being equal, higher revenues will tend to correlate with higher liquidity performance. We use market capitalisation (Fama and French, 2015), revenues and total assets (Waddock and Graves, 1997) as proxies for size.
- (2) *Financial risk*. The strategies of corporations depend on risk tolerance and can influence their decision-making (Waddock and Graves, 1997). The strategy of a corporation, in turn, will affect its financial performance (Soppe, 2009). Similar to Waddock and Graves (1997) and Ullmann (1985), we measure the financial risk through long-term debt.
- (3) *Industry*. Although all industries have raised sustainability concerns (Zhou *et al.*, 2018), one industry might be more open than another to SCF (Wuttke *et al.*, 2019). We created 11 dummy variables to control for industry by using the four digits of the Global Industry Classification Standard.

- (4) *Geographic area.* The awareness of SCF varies by geographic area (Lamoureux and Evans, 2011). Additionally, different geographic areas face different financial and sustainability-related regulations (Wuttke *et al.*, 2019). We controlled for Europe, North America, Central America, South America, Asia, Oceania and Africa (dummy variables).
- (5) *AR and payable.* It is well known that companies with longer collection periods will naturally tend to compensate with longer payment terms to suppliers and vice versa (Hofmann and Kotzab, 2011). We include AP and receivable as control variables for buyer and supplier regressions, respectively.

Table 2 presents the descriptive statistics. On average, buyers that engage in SCF have a higher average AP, a larger market capitalisation, a similar financial risk and a higher ESG score than buyers that do not engage in SCF. Furthermore, suppliers who engage in SCF have a lower AR, a smaller market capitalisation and a higher financial risk.

3.3 Model specification

We tested our hypotheses by analysing panel data with a random effects model, incorporating a one-year lag between the dependent variable and the independent, control and moderating variables. This approach is reported in equations (1) and (2), where, for the sake of conciseness, control variables are omitted:

$$AP_{t+1} = \alpha_i + \beta_1 SCF_{it} + \beta_2 ENV_{it} + \beta_3 SOC_{it} + \beta_4 GOV_{it} + \beta_5 SCF_{it} \cdot ENV_{it} + \beta_6 SCF_{it} \cdot SOC_{it} + \beta_7 SCF_{it} \cdot GOV_{it} + \varepsilon_{it} \quad (1)$$

SCF	Mean	SD	Min	Max	Non-SCF	Mean	SD	Min	Max
<i>Panel A: buyer</i>									
AP + 1	6,334.19	9,317.56	0.00	85,001.20	AP + 1	2,694.41	5,437.21	0.11	70,983.45
MarketCap	63,916.82	148,798.50	0.12	2,561,651.00	MarketCap	24,289.18	55,713.92	1.22	1,486,899.00
Risk	0.24	0.14	0.00	0.96	Risk	0.21	0.18	0.00	2.28
ESG	72.50	13.97	5.10	95.64	ESG	61.46	17.79	5.75	94.97
Env	71.81	17.90	3.24	99.09	Env	61.47	22.07	0.22	99.04
Soc	75.74	16.97	1.31	97.91	Soc	62.27	21.92	0.75	97.75
Gov	68.04	18.92	9.57	98.59	Gov	59.74	21.27	0.41	99.49
<i>Panel B: supplier</i>									
AR + 1	520.09	2,618.704	0.00	168,696.30	AR + 1	1,788.59	28,970.62	0.00	1,549,245.00
MarketCap	4,125.99	15,552.36	0.00	348,075.40	MarketCap	17,659.08	96,169.26	0.00	2,561,651.00
Risk	0.45	0.35	0.00	4.67	Risk	0.22	0.49	0.00	8.56
bESG	78.13	10.82	5.10	95.64	bESG	66.66	16.60	5.92	94.97
bEnv	77.16	14.04	3.24	99.09	bEnv	66.09	21.82	0.23	99.04
bSoc	81.36	12.99	1.31	97.91	bSoc	68.50	19.55	0.75	97.75
bGov	73.58	16.41	10.00	98.59	bGov	63.62	21.26	8.23	99.49

Source: Table by authors

Table 2.
Descriptive statistics

$$\begin{aligned}
AR_{t+1} = & \alpha_i + \beta_1 SCF_{it} + \beta_2 ENV_{it} + \beta_3 SOC_{it} + \beta_4 GOV_{it} + \beta_5 bENV_{it} + \beta_6 bSOC_{it} \\
& + \beta_7 bGOV_{it} + \beta_8 SCF_{it} \cdot ENV_{it} + \beta_9 SCF_{it} \cdot SOC_{it} + \beta_{10} SCF_{it} \cdot GOV_{it} \\
& + \beta_{13} SCF_{it} \cdot bENV_{it} + \beta_{14} SCF_{it} \cdot bSOC_{it} + \beta_{10} SCF_{it} \cdot bGOV_{it} + \varepsilon_{it} \quad (2)
\end{aligned}$$

where:

- AP_{t+1} is the liquidity performance of the buyer (AP);
- AR_{t+1} is the liquidity performance of the supplier (AR);
- SCF_{it} is a binary variable expressing whether a buyer (suppliers) is (supplying at least one buyer that is) offering SCF;
- ENV_{it} , SOC_{it} and GOV_{it} are the ESG pillars for the dependent variable firm [buyer in equation (1); supplier in equation (2)];
- $bENV_{it}$, $bSOC_{it}$ and $bGOV_{it}$ are the ESG pillars for the corresponding buyer [only in equation (2)];
- α_i , β_n are the regression coefficients; and
- ε_{it} is the error term.

4. Empirical results

Tables 3 and 4 summarise our empirical results. As expected, SCF is associated with longer payables on the buyer side. However, the direct impact of SCF on the AR of suppliers is not significant. Based on these findings, *H1.1* is supported, while *H1.2* is not. Engaging in SCF directly benefits the liquidity performance of buyers but not suppliers.

Considering the effects of the interaction terms between SCF and the ESG pillars, the results indicate that buyers with high performance in the social dimension tend to extend payment terms to a lesser extent. Other moderating effects at the supplier level are less significant. Such evidence provides partial support for *H2.1*. Notably, only the governance pillar shows a positive direct effect on the liquidity performance of buyers.

On the supplier side, the results reveal a moderating effect of the social pillars on the relationship between SCF and liquidity performance. The sustainability performance of the buyer shows significant direct and moderating effects for both social and environmental performance, although the moderating effect for social performance is opposite in sign from expectations, as is the direct effect for environmental performance. This evidence offers partial support for *H2.2* and *H2.3*.

4.1 Sensitivity analysis

We conducted sensitivity analyses to check the robustness of our results, which are not reported in detail for the sake of conciseness. Specifically, we performed two analyses. Firstly, we ran the regression model on the supplier side without suppliers' ESG ratings. This increased the supplier sample by 2,161 firms for SCF suppliers and 1,137 firms for non-SCF suppliers. SCF remains insignificant for suppliers, while the $bENV$ interaction term remains significant, albeit at a lower level (10%). We interpret this consistency as an indication that our model is robust even when not controlling for supplier ratings.

Secondly, we applied a two-year lag (lag-2) between the dependent variable and the independent, control and moderating variables for both buyers and suppliers. For buyers, the SCF term remains significant, and SOC and GOV gain significance at 1%. Moreover, the

Variable	Buyers DV: AP
<i>Main effect (H1)</i>	<i>H1.1</i>
SCF	1,461.38** (594.82)
<i>Moderators</i>	
ENV	-3.88 (4.24)
SOC	0.90 (4.42)
GOV	8.11** (3.29)
<i>Interaction terms (H2)</i>	<i>H2.1</i>
SCF x ENV	0.61 (7.41)
SCF x SOC	-16.91** (7.98)
SCF x GOV	-1.48 (5.59)
<i>Controls</i>	
Marketcap	0.00** (0.00)
Debt	0.00* (0.00)
Assets	-0.00*** (0.00)
Rev	0.08*** (0.00)
AR1	0.47*** (0.01)
INDUSTRY dummies	<i>Included</i>
GEO dummies	<i>Included</i>
Constant	-1,089.08* (578.49)
Observations	3,611
R^2	0.78

Table 3.
Results – random
effects model –
buyers

Notes: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Table by authors

interactions between SCF and ENV and SCF and GOV gain significance at 1%. For suppliers, SCF remains insignificant, SOC remains positive and significant and GOV becomes significant. The only significant interaction on the supplier side is with bENV, where both bENV and its interaction with SCF are significant (at 10% and 5%, respectively). We also interpret this as a sign that our findings are robust.

5. Discussion

The study shows how SCF, as expected, has a direct positive impact on the buyer's liquidity performance by extending payment terms and, consequently, increasing AP. This aligns with the consistent research predictions over time regarding the impact of SCF. However, from a supplier perspective, our findings do not support the hypothesis that SCF positively affects supplier liquidity performance. This lends further support to the increasingly common view in recent literature that SCF does not necessarily have a positive impact on suppliers (e.g. [De Goeij et al., 2021](#); [Kouvelis and Xu, 2021](#)). For instance, buyers might offer suppliers inadequate proposals or poorly managed programmes that fail to lower suppliers' AR substantially (e.g. due to long invoice approval periods). Additionally, suppliers might not have access to SCF for a significant portion of their AR; hence, the overall direct impact could be limited.

Regarding the interaction between SCF and sustainability, our results are both clear and ambiguous. On the clear side, there is a strongly significant interaction effect on supplier AR when the buyer's environmental performance is high. This heavily supports the notion that buyers use SCF to enhance their environmental performance, notably by providing

Variable	Suppliers DV: AP
<i>Main effect (H1)</i>	<i>H1.2</i>
SCF	415.66 (491.45)
<i>Moderators</i>	
ENV	-4.14 (3.53)
SOC	11.32*** (3.83)
GOV	4.23 (2.67)
bENV	8.20** (3.76)
bSOC	-8.95** (4.29)
bGOV	-0.17 (2.89)
<i>Interaction terms</i>	<i>H2.2</i>
SCF x ENV	5.10 (4.23)
SCF x SOC	-10.82** (4.71)
SCF x GOV	-1.46 (3.27)
	<i>H2.3</i>
SCF x bENV	-14.61*** (5.63)
SCF x bSOC	14.59** (6.01)
SCF x bGOV	-1.28 (3.78)
<i>Controls</i>	
Marketcap	-0.00*** (0.00)
Assets	0.00*** (0.00)
Rev	0.03*** (0.00)
Debt	-0.00 (0.00)
API	0.61*** (0.01)
INDUSTRY dummies	Included
GEO dummies	Included
Constant	-151.55 (402.18)
Observations	6,283
R ²	0.73

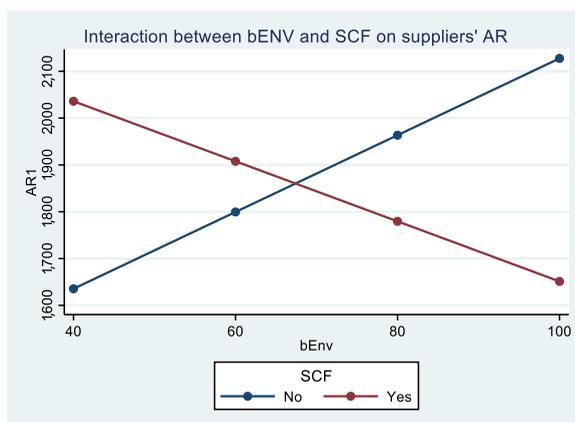
Table 4.
Results – random
effects model –
suppliers

Notes: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source: Table by authors

suppliers with incentives for environmental-related disclosures. These findings align with previous discussions (e.g. [Tate et al., 2011](#)) on the role of suppliers in mapping and reducing scope 3 emissions. As demonstrated in [Figure 2](#), for the average buyer in our sample (with bENV around 70), SCF does not significantly impact supplier AR. However, buyers with strong environmental performance can offer substantial incentives to suppliers, as evidenced by a substantial reduction in their AR.

Another clear finding is the lack of support for the governance pillar, despite good governance being associated with longer AP on the buyer's side. This may stem from measurement issues, specifically a mismatch between our theoretical rationale for the governance pillar's moderating effect on the impact of SCF on liquidity performance and the actual method of measuring the pillar. The [Refinitiv \(2022\)](#) methodology for the governance pillar encompasses six factors, none of which individually constitute a direct measure of procurement governance, though some are indirect indicators. Consequently, the speed of invoice approval might be too detailed to be effectively captured by ratings such as those established by Refinitiv.

The results pertaining to the social pillar are more ambiguous. On the buyer side, it appears that socially conscious buyers avoid excessively extending payment terms, aligning



Source: Figure by authors

Figure 2.
Interaction effect
between bENV and
SCF on the liquidity
performance of
suppliers

with our expectations. However, the implications are less clear for suppliers. Suppliers with strong social performance do benefit from AR reduction when participating in SCF, but they also tend to have longer AR initially. The results seem to neutralise each other, leading to no pronounced overall effect. A similar pattern is noted for the bSOC variable in the supplier regression. This could be attributed to the possibility that high social performance involves longer AR. Enhanced social performance might entail offering longer payment terms to customers or at least to certain categories of customers – which is a practice that is increasingly observed, for example, in the USA – thereby naturally increasing AR.

6. Conclusion

The focus of this study is on the topic of sustainability and SCF programmes. From the buyer's perspective, the fundamental tenets of SCF are confirmed. Therefore, the study highlights that the extension of payment terms is a critical component for the adoption of SCF. Interestingly, there is no evidence to suggest that SCF, in isolation, significantly impacts the liquidity performance of suppliers. Such an impact is instead contingent upon the sustainability performance at both the buyer and supplier levels. Specifically, we observe strong support for buyers facilitating significant reductions in the AR of suppliers – potentially achieved through investments in short and effective invoice approval processes – but only when the buyer also demonstrates high environmental performance, which indicates a propensity to incentivise suppliers. Similarly, we find that suppliers benefit from SCF when they exhibit high social performance, particularly when coupled with buyers who also excel socially. However, we posit that this may entail suppliers offering more lenient payment terms, thereby neutralising the potential benefits of SCF.

6.1 Theoretical contributions

The study offers three theoretical contributions, which are presented here in the order of specific to general. The first contribution pertains to sustainable SCF programmes. There has been debate in the literature, arguably since the contribution of [Jia et al. \(2020\)](#), on the effectiveness of sustainable SCF programmes on the supplier side. Our findings suggest that such support is predominantly, if not exclusively, confined to scenarios where buyers exhibit strong, sustainable performance. This suggests that buyers with a strong

sustainable performance might provide effective incentives to their suppliers through SCF programmes, while buyers without a strong sustainable performance may fail to do so.

The second contribution relates to the field of SCF in a broader sense. We find evidence that the impact of standard SCF programmes on suppliers is not significant. Although our results must be considered within the context of potential limitations (discussed below), they add to the growing body of knowledge that conveys scepticism towards the notion of SCF as a default “win-win” solution for both buyers and suppliers (e.g. De Goeij *et al.*, 2021). We confirm the “win” for buyers but question the “win” for suppliers.

The third contribution addresses sustainability and global supply chains from an even wider perspective. As the imperative for sustainable initiatives within supply chains intensifies, comprehending the intricate system of incentives and motivations driving high (or low) sustainable performance among buyers and their suppliers becomes increasingly vital. Our study contributes to this understanding by highlighting how financial incentives, in the form of SCF schemes, reward suppliers that excel in specific sustainability dimensions. The role of financial incentives, and SCF schemes in particular, in fostering sustainable performance across global chains has not been widely discussed, yet they exert a significant influence. This consideration should inform future research.

6.2 Managerial implications

Our study has implications for both buyers and suppliers. We recommend that buyers consider the benefits to suppliers when implementing SCF programmes, especially if the goal is to incentivise suppliers towards better sustainable performance. For suppliers, we advise caution when joining buyers’ SCF programmes, as the benefit may be limited. It is evident that, on average, the impact of SCF programmes on supplier liquidity performance is not statistically significant. Therefore, suppliers should exercise due diligence in their decisions and ensure that an appropriate incentive system is in place for the buyer to guarantee mutual benefit. Buyers with strong sustainable performance are more likely to offer effective SCF programmes.

6.3 Limitations and future research

Three main limitations of the study are particularly relevant. The first is that our sample comprises only publicly listed companies. While this limitation is unlikely to pose any challenges on the buyer side as SCF is predominantly adopted by large public companies, we are nevertheless excluding a significant number of suppliers. This convenience sampling is somewhat mitigated by the fact that most suppliers involved in SCF programmes are large and, therefore, more likely to be publicly listed; however, it is conceivable that this approach could introduce biases into our results. The second issue concerns the fact that, on the supplier side, we cannot be certain that our sampled companies are actually participating in their buyers’ SCF programmes. To address this, we applied insights from SCF literature and introduced appropriate filters, such as including only those suppliers that are smaller than their buyers. However, there remains the possibility that some suppliers in our sample are not actually engaged in their buyers’ SCF programmes, which could diminish the reliability of our findings. Enhancing these two aspects is challenging, as it necessitates *ad hoc* data collection from existing SCF programmes. Finally, the ESG ratings used in the analysis come from a single provider (Thomson Reuters’ Eikon database). We acknowledge this as a further source of bias, as different providers might have strong variations in the ESG ratings assigned to the same companies in our sample.

We identify these issues as primary avenues for future research. Another intriguing area to explore is whether the current trend towards standardising sustainable SCF programmes

via external rating agencies (e.g. Ecovadis) offers new theoretical insights into sustainable SCF. Also, it may be worth examining the incorporation of sustainability dimensions into a broader range of trade credit arrangements beyond traditional SCF.

In conclusion, SCF appears to be an influential tool for buyers to enhance the sustainability performance of their supply chain. Nevertheless, there is a risk that SCF may predominantly reward suppliers that are already performing well in sustainability or have the resources to do so. This could result in a negligible overall impact and, ultimately, prove unsustainable in the long term.

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Further reading

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