Predicting supply chain effectiveness through supply chain finance

Evidence from small and medium enterprises

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Abstract

Purpose – Due to globalization, textile small and medium enterprises (SMEs) operations have become complex which raised the needs of risk-free financing solutions to support the SMEs' daily processes. The purpose of this paper is to investigate the effect of supply chain (SC) finance, a risk-free financing solution, on SC effectiveness (SCE) in the context of textile SMEs by employing transaction cost (TC) approach.

Design/methodology/approach – The participants of the study were recruited from textile SMEs through a structured questionnaire. The proposed model and structural relationships were assessed by employing AMOS 24.0.

Findings – The results of this paper indicate that supply chain finance (SCF) has a significant effect on SCE. Furthermore, all proposed factors of SCF adoption have a positive and significant effect on SCF.

Practical implications – This study helps the SMEs executives or owners to adopt SCF as a secure financing scheme to reduce the credit TCs, optimize the firm working capital, reduce the risk of default, and improve SC effectiveness. SMEs and suppliers can build strong relationships while adopting the findings of this study. SMEs can engage the suppliers to work under strategic alliance through negotiation, collaboration, and work digitization, and extend their payment terms while providing an opportunity to the suppliers to get their payment back before a fixed time through discounting from financial institutions as needed.

Originality/value – The present study covered the gap related to SCF and SCE by identifying unique factors of SCF adoption which was ignored in the previous literature by employing TC approach.

Keywords Survey, Small to medium-sized enterprises, Asia, Supply chain finance, Performance measurements

Paper type Research paper

1. Introduction

Supply chain (SC) management has become more complicated due to systematic changes in the SC operations by the firms. Small and medium enterprises (SMEs) are searching for different financing solutions which can help them to settle their credit issues and improve financial performance. SC management emphasizes that organizations should have the capacity to set up a long-run association with their partner organizations (Fei and Yi-na, 2006). The recent economic decline brought a critical decrease in the sanctioning of new loans (advances) with a substantial rise in capital cost (Ivashina and Scharfstein, 2010). Furthermore, the lack of collateral-based financing makes the firms challenging to obtain loans (Cornett *et al.*, 2011). In such troublesome conditions, SMEs (expressly the firm with solid negotiating ability) are extending business loans from suppliers to add-on different sorts of loans to tackle upstream SCs issues (Garcia-Appendini and Montoriol-Garriga, 2013).

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Such events profoundly contributed to the need for programs and solutions which can support the working capital of a firm.

Ministry of Textile Industry (2015) stated that textile is the primary manufacturing sector in Pakistan and is equipped with well-managed production lines which use more than 40 percent of the banking credit and bear the high cost of financing. Currently, there are many supply chain finance (SCF) solutions in the market, offered by financial institutions and financial service providers to SMEs. For example, inventory financing, working capital optimization, fixed assets financing, reverse factoring, order cycle financing, and logistics financing (More and Basu, 2013; Gomm, 2010). In Pakistan, the primary sources of supply chain financing are the commercial banks which are actively providing SC loans to SMEs. Mainly, most of the SMEs are obtaining SCF in terms of working capital optimization, inventory financing, and fixed assets financing to fulfill their financing needs for the smooth functioning of their operations. To minimize cost and risk, SCF has now become a core area of the commercial banks business. Traditional credit financing schemes are backed by collaterals which increase the firm's risk (Zhao *et al.*, 2015). SCF can bring the firms in a position to deal with their suppliers by negotiating about terms for payment and make long-term relations that lead toward strong collaboration among them. Currently, for SC development, financial institutions are strengthening buyers and suppliers' relationships by providing SCF to optimize their working capital. Firms are adopting the innovative financing solutions (SCF) to avoid unacceptable risks and improving their SC performance without losing their essential suppliers in the SC (Phillip, 2010). Therefore, in Pakistan, SCF is providing an opportunity to SMEs for solving their credit issues by incorporating long-term relations with financial institutions, making collaborations with the suppliers by negotiating on raw material and services and improving the visibility of SC orders through trade digitization process for all key players of the SC.

Previous literature identified two perspectives related to SCF. The first view focuses on only financial activities and represents that SCF is all about monetary benefits (More and Basu, 2013). The second view focuses on SC perspectives and represents that SCF is not only a financial activity, but it also creates the relationship among SC players (Gelsomino *et al.*, 2016). Gelsomino *et al.* (2016) proposed a SCF framework for building trust, commitment for timely delivery of goods, negotiation about terms of payment, collaboration for information sharing about customer needs and supply-related matters. It also provides visibility to buyers and suppliers about the digital process of transactions and offers an opportunity to the suppliers to get their money back before a fixed time from financial institutions (Caniato *et al.*, 2016). Recent studies showed that SCF is considered as a financial technique only to get cash for optimizing the firm's working capital (More and Basu, 2013) but ignored the long-run factors related to SCF which is essential for the survival of the firms. Therefore, more studies are needed to identify the relevant factors which encourage the adoption of SCF in the textile sector. In the current study, we proposed a model while focusing on transaction cost (TC) approach which states that SCF works to mitigate the TC and offers a risk-free financial solution to SMEs for optimizing their liquidity and improve their SC effectiveness (SCE). Thus, we focus on adoption factors of SCF, which are equally critical to financial matters. The literature, however, did not deliver any quantitative study that can encourage the firm's to adopt SCF for fulfilling their financing needs. Notably, it did not identify the crucial factors in the decision making that can motivate the firm's to adopt SCF. To fill this void gap, the present research empirically examines different factors of SCF adoption (negotiation, collaboration, trade digitization and role of financial institution) and their effect on SCE. The objective of this paper is to explore different factors which constitute SCF and their contribution in the advancement of more specific framework which facilitates managerial decisions making concerning SCF and SCE.

The primary contribution of the current paper is to identify the SCF adoption factors and how SMEs can adopt SCF to enhance their liquidity for improving SCE. SCF mitigates the transactions cost as compared to traditional financing. Another significant contribution of this study is to empirically develop the relationship between SC finance and SCE in the context of textile SMEs by employing TC approach. Moreover, the present study expands the TC approach that SC finance significantly reduces the cost of the financial transactions due to its vibrant nature of financing to SMEs and offers risk-free (without collateral) credits to SMEs for enhancing their SCE. The present study extends the research work of Caniato *et al.* (2016), they proposed the prepositions related to SCF and performance. Our study responds to the earlier call for future research made by Gelsomino *et al.* (2016). They performed a systematic literature review of SC finance potentials, challenges, and relationship with SC members.

This paper summarizes as follows: after introduction, a literature review on SC finance and SCE is provided. After that, the research methodology was presented to assess the proposed model and relationship. Results are illustrated, and discussion follows. Finally, limitations and future research directions are recorded.

2. Literature review, theoretical background, and hypothesis

2.1 SCF and adoption factors

SCF is an essential tool for SMEs to keep their business operations smooth. It is the primary challenge for SMEs to bring in line the physical and financial flow of the SC (Pfohl and Gomm, 2009). SCF eco-system is made up of third-party providers who collaborate with firms to fulfill the requirements of capital for the whole SC. SCF makes a money-related win–win situation for the buyers, suppliers, and financial institutions. The goal of SCF is to boost the working capital at the inter-organizational level (Hofmann, 2005) by utilizing the solutions provided by financial institutions and technology providers (Lamoureux and Evans, 2011). However, SCF is at its critical stage of development and facing many challenging issues. It is essential to analyze, understand, and measure how different adoption factors of SCF interact and gain an understanding of their complex changing aspects. Many SMEs has skipped the analysis of SCF factors in their overall approach while formulating the business continuity planning. SC theory emphasizes the relationship between upstream and downstream firms in a specific industry. According to Keebler (2002), closer relationships among SC players and an integrated SC have been recognized as an effective way to minimize cost and escalate business agility. The values of SCF rely on relationship among SC players which typically results in high visibility upon transactions processing, lower debt costs, high collaboration and new opportunities for getting the loan within the SC. Additionally, SCF often enhances the level of commitment, trust, and profitability for SC partners (Randall and Farris, 2009). Lekkakos and Serrano (2016) studied a financing solution reverse factoring in SMEs to predict the operational decisions and performance and found that reverse factoring substantially enhances the suppliers' operational performance while optimizing their working capital. Zhu *et al.* (2017) predicted the SMEs' credit risk in SCF by adopting six approaches and found that RS-boosting is the best approach to measure SMEs' credit risk among six approaches for corporate lending. Recently, Gornall and Strebulaev (2018) established a joint capital structure of borrowers and banks decisions in the context of the SC. They found that capital regulations reduce the banks control and enhance their risks due to compensating the increase in borrower control.

2.2 Theoretical background and development of hypotheses

TC always remains a critical concern for obtaining loans from financial institutions or financial service providers by SMEs to achieve the best firm performance (Song *et al.*, 2016).

Literature revealed that TC and limited transaction history restrain the SMEs to obtain credits from financial institutions (Song and Wang, 2013; Herath, 1994). TC defined by Coase (1937) with the focus on pricing mechanism "the cost of providing for good and service through the market rather than having it provided from within the firm." TC involves search and information costs, bargaining and decision costs, and policing and reinforcement costs. Search and information costs include buyers and suppliers business planning, trading behaviors, and transaction history. Bargaining and decision costs include negotiating capability and customers' needs. Policing and reinforcement costs include monitoring of business credit and technology adoption. All these factors immensely contribute to the TC of an SME.

In traditional SMEs financing schemes, the TC exceeds the amount of credit which discourages the financial institutions to grant loans to SMEs (Song *et al.*, 2016). Recently, to strengthen the SMEs financial position, a new stream of financing "SCF" is introduced by financial service providers for SMEs which minimizes the TCs and mitigates the risk of firm default. For granting SCF and evaluating the creditworthiness of SMEs, lenders continuously access buyers and suppliers' information about transactions, orders, business planning, human resources, customers' needs, production status, products flow, information flow, technology adoption, negotiation, financial history, and collaboration activities. In this study, we draw that SCF reduces the transactions cost and offers a risk-free financial solution to SME for optimizing its working capital to improve the SCE. Moreover, we propose critical four factors which motivate the SMEs to adopt SC finance and subsequently improve the SCE.

The balance of power between firms is critical for the adoption of SCF. Therefore, negotiation between the buyers and the suppliers plays a vital role in the development and adoption of SCF (Liebl *et al.*, 2016). Carnevale and Isen (1986) defined negotiation as "a procedure in which at least two individuals make a shared decision with respect to a problem about which there are initial differences in preference." Typically, in the SC, the buyers (negotiators) meet face-to-face with the suppliers for settlement of their issues or disagreements. The literature showed two types of negotiation approaches that buyers and suppliers can utilize when they enter into the negotiation process. That is a distributive negotiation and integrative negotiation strategy (Lewicki *et al.*, 2004). Buyers use distributive strategy when they think another party (suppliers) has opposed interests to them that lead to win–lose situation, in which one should try to argue intensively and aggressively for convincing the other party to reduce delivery time and lower price (Walton and Mckersie, 1965). As compared to distributive strategy, the integrative strategy seeks to join all members' divergent interests and offer all parties with joint interests as a result of the particular negotiation (Pruitt, 1981). This strategy focus on the need for collaboration, trust, openness, and feelings for others, besides it also creates a win–win situation (Adair, 2003). Therefore, we hypothesized that:

H1. Negotiation between SMEs and suppliers has a positive and significant effect on SCF.

For a more cohesive relationship between the buyers and the suppliers, collaboration is an essential component for the successful adoption of SCF. In the adoption of SCF context, collaboration means developing trust, commitment, knowledge, respect, and business agility among SC players (Barratt, 2004) and acts as a homogeneous unit. It is broadly acknowledged that SC collaboration supports superior performance in SMEs due to processes, competences, capitalization on resources, and procedures existing in the firms (Fawcett *et al.*, 2012; Gammelgaard and Mathiasen, 2007; Zacharia *et al.*, 2009). Kanwal and Rajput (2016) studied the TC framework in SC from the social capital perspective and stated that the collaboration between buyer–supplier relationships enhances the SC performance. Similarly, Piboonrungroj and Disney (2015) theoretically studied the collaboration from TC

theory approach and found that TC is similar to search cost and cost of quality checking, and inter-firm collaboration helps to minimize them. Furthermore, Cao and Zhang (2011) stated that collaboration reduces the transactions cost because particular assets enhance with contract frequency and higher interdependence level. Vieira *et al.* (2015) highlighted that interpersonal collaboration decreases the transactions cost of uncertainty which in turn enhances the logistic performance of the firm. Therefore, we predict that:

H2. Collaboration between SMEs and suppliers has a positive and significant effect on SCF.

Due to the rapid advancement of technology and globalization, SMEs are placing their orders over a well-managed and transparent online digital trading system which help all the key players of the SC to check the status of their orders, e.g., delivery time, inventory control, and payment time (Fairchild, 2005). Digitization improves operating efficiency and effective decision making of SMEs. Therefore, trade digitization process provides a significant reduction in cost as compared to the paper-based business procedure (Perego and Salgaro, 2010) and it permits the value-added services (visibility of invoices). Trade digitization also provides the suppliers flexibility of accounts receivable or payable, this virtual flexibility costs nothing being acquired from digitalization trade process. Digitization is essential for SMEs to expand their permeability, management, and control over the trade activities. Thus, by using an electronic platform, SMEs can efficiently ensure compliance, transparency, and minimize the risk of default which leads to the adoption of SC finance and enhances SCE (Maiti and Kayal, 2017). Firms that keep a higher level of trade digitization tends to implement more advanced financing solutions (Caniato *et al.*, 2016). Therefore, we hypothesized that:

H3. Trade digitization makes visibility of trading system for SMEs and the suppliers, which leads toward positive and significant effect on SCF.

The primary source of financing for SMEs is the financial institutions or service providers. Hence, the behavior of top management in financial institutions affects the SCF business structure. Zhang (2015) stated that the Shenzhen Development Bank of China is engaged in SC financing and making a substantial investment in granting SC loan as compared to other banks. The trade relationship between the buyers and the suppliers is significant to measure for granting financing to SMEs by the financial institutions. Financial institutions enabled their systems according to the needs and requirements of the firms. The SCF approach may expand the accessibility and information accuracy, consequently supporting financial institutions in the evaluation of a default possibility, fitted to the particular SMEs (Hofmann, 2005). Financial institutions generally carry the load of collecting payments for SC players in return for a rise in revenue (Tanrisever *et al.*, 2012). Additionally, financial institutions can advance their process of risk-assessment, particularly concerning SMEs. Therefore, we predict that:

H4. Role of financial institutions has a positive effect on SCF.

SCE denotes direct or indirect impacts of SC finance factors. Connecting these factors with SCE is an imperative measure associated with SC firm performance. Lee *et al.* (1997) stated that competency requirements, to enhance functional performance, are attained from the establishment of productive internal and external relationships. Measurement of effectiveness is needed to reflect the findings of factors related to the SCF adoption. Gunasekaran *et al.* (2004) highlighted that SCE shows how well the firms in SC succeed in their financial and operational objectives.

Operational and financial objectives are acquired, when operations of the SC are capable enough to maintain the balance between effectiveness and cost. Operational strategy of the

SC is critical to stimulate the firm performance development and strategically increase the SCE (Humphreys *et al.*, 2004). Measurement of SC operations and effectiveness is based on product cost, inventory and warehousing costs, transportation management, and logistics administration cost (Fugate *et al.*, 2009). SCE comprises minimization of cost in shipping and handling and reduction in the cost of distributions which lead to an apparent deterioration in the price of product and cost of logistics.

Better environmental planning is essential to know the threats for business existence, which exist outside the organization. So, in SC development, it is favorable to plan behavioral factors of SCF elastically. Tang (2006) explained that behavioral factors can put a firm in a position to cope with operational tasks efficiently, sustain operations of SC and rescue from troubles which lead SC operations more responsive toward customer needs while having less cost of inventory (Faisal *et al.*, 2006). Jing and Seidmann (2014) compared the bank and trade credit in the SC and found that trade financing is more effective than bank financing in minimizing double marginalization in case of low production cost. Wuttke *et al.* (2016) highlighted that SCF enhances the SC performance by providing longer payment terms for buyers and giving better access to optimizing the working capital for suppliers. Therefore, different factors of SCF can develop SC responsiveness which leads to improving the effectiveness of SC. Thus, we predict that:

H5. SCF is positively related to SCE.

Figure 1 depicts the proposed conceptual framework of the current study that is providing an overview of the relationship between predictors of research and criterion variables. This proposed model is explaining that how success factors of SCF constitute the adoption of SCF in SMEs for enhancing the SCE.

3. Research methodology

3.1 Sample and procedure
SCF in SMEs is growing day by day. Therefore, participants of the study drawn from textile SMEs, located in the hub city of Faisalabad, Pakistan. The respondents of the study were SMEs owners, SC executives, and SC managers. Faisalabad is famous for textile products and services all over the world and also known as the Manchester of Pakistan. Most of the textile units in Pakistan are operating in this district as compared to others cities and regions. Pakistan is one of the major exporters of textile products to the other countries of the world. The logic behind to conduct this study in SMEs is that SMEs are considered risky as compared to other types of firms, and SCF is an innovative solution which fulfills the
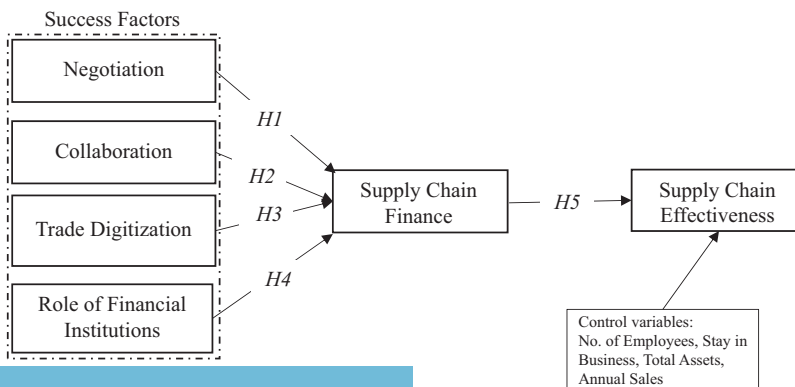

Figure 1.
Proposed conceptual
model

financial requirements of SMEs without any collateral (Song *et al.*, 2018). In Pakistan, textile SMEs are playing a crucial role in the economic development and contributing more than forty percent in the GDP of the country (Jamshed and Ghani, 2004). State Bank of Pakistan (2011) defined the SMEs as any firm that fulfills any of the following criteria, will be considered as a SME. A firm has up to 250 workers, earned up to 800m rupees as annual sales, and up to 200m rupees in total assets.

According to the State Bank of Pakistan (2011), about 1,900 SMEs are involved in the textile business. Initially, participants were contacted by telephone, and they were requested to participate in this study by filling questionnaires. To fulfill this task, the first author briefed the respondents about the purpose of the study and ensured them that they would get the results of this study later on. From the view of "double translation protocol" (Brislin, 1980), the present study utilized the conventional "translate-back-translate" approach to convert the English language questionnaire into Urdu language questionnaire, and this approach was conducted to underpin the reliability and validity of the scales (Douglas and Craig, 2007). We approached two bilingual Urdu professors to do "translate-back-translate" process independently, and then, a pilot study was carried out, consisted of forty respondents (excluded from the primary study), to check the understandability and content correctness of questions, and nobody reported any confusion responding the survey questions. Furthermore, questionnaire was checked by two textile experts, a university professor and colleagues and their suggestions were incorporated for more clarity of questionnaire items. After that, we sent 1,000 questionnaires to the respondents by using convenience sampling technique, and this process continued about two months from May to June 2017. The usable questionnaires were 330 after discarding the incomplete questionnaires with a response rate of 33 percent. As shown in Table I, most of the SMEs had 200 workers and involved in the textile business for about ten years. Moreover, most of the SMEs annual sales is about 400m rupees and have assets of about 150m rupees.

3.2 Measures

The measures of the study were taken from the previous relevant studies published in top journals to ensure the content and face validity of the instrument (see the Appendix). Negotiation scale was adopted from the research study of Janda and Seshadri (2001). They measured negotiation with three items. The α value of scale was 0.867. Confirmatory factor analysis indicated a satisfactory fit ($\chi^2 = 1.169$, df $= 2$, GFI $= 0.996$, AGFI $= 0.982$, RMSEA $= 0.023$, CFI $= 0.999$, IFI $= 0.999$, NFI $= 0.996$, TLI $= 0.998$). Trade digitization scale was adapted from the study of Choi (2013). He measured trade digitization with three items. The α value of scale was 0.812. Confirmatory factor analysis presented a satisfactory

Category	%	Cum.	Category	%	Cum.
No. of employees			*Stay in business*		
0–100	22	20	0–2	6	6
101–200	53	75	3–5	19	25
Above 200	25	100	6–10	44	69
Annual sales[a]			Above 10	31	100
0–200	29	29	*Total assets*[a]		
201–400	33	62	1–75	29	29
401–600	26	88	76–150	46	65
Above 600	12		Above 150	25	100
	100				

Note: [a]Million rupees

Table I.
Sample statistics

fit ($\chi^2 = 0.114$, df $= 1$, GFI $= 1.00$, AGFI $= 0.998$, RMSEA $= 0.000$, CFI $= 1.000$, IFI $= 1.000$, NFI $= 1.000$, TLI $= 1.000$). The collaboration scale was adopted from the study of Simatupang and Sridharan (2005). They measured collaboration with four items. The α value of scale was 0.887. CFA showed a satisfactory fit ($\chi^2 = 0.084$, df $= 2$, GFI $= 1.000$, AGFI $= 0.998$, RMSEA $= 0.000$, CFI $= 1.00$, IFI $= 1.00$, NFI $= 1.00$, TLI $= 1.00$). The role of financial institutions scale was adapted from the study of Zhang (2015). He measured this scale with three items. The α value of scale was 0.861. CFA showed a satisfactory fit ($\chi^2 = 2.091$, df $= 1$, GFI $= 0.997$, AGFI $= 0.968$, RMSEA $= 0.058$, CFI $= 0.998$, IFI $= 0.998$, NFI $= 0.997$, TLI $= 0.989$). SCE scale was measured on six items, adapted from the research work of Fugate *et al.* (2009). The α value of scale was 0.861. Confirmatory factor analysis showed a satisfactory fit ($\chi^2 = 2.516$, df $= 8$, GFI $= 0.980$, AGFI $= 0.947$, RMSEA $= 0.068$, CFI $= 0.986$, IFI $= 0.986$, NFI $= 0.978$, TLI $= 0.974$). SC finance was measured with five items, adapted from the research study of Zhang (2015). The α value of scale was 0.861. CFA indicated a satisfactory fit ($\chi^2 = 1.794$, df $= 3$, GFI $= 0.993$, AGFI $= 0.967$, RMSEA $= 0.049$, CFI $= 0.997$, IFI $= 0.997$, NFI $= 0.994$, TLI $= 0.991$). In lines with the study of Song *et al.* (2018), we incorporated the sample characteristics (stay in Business, no. of employees, annual revenue, and total assists) as control variables to test their effect on SCE.

4. Data analysis and results

Data analysis was done in SPSS 23.0 and AMOS 24.0 using structural equation modeling to validate the proposed model and relationships. Before running the analysis, we checked data set for any issue of multicolinearity, outliers, and missing values, and results did not find such issues in the data set.

Data were checked for the issue of non-response bias while comparing the early ($n = 30$) and late ($n = 30$) response of participants (Rogelberg and Stanton, 2007). A *t*-test reveals the insignificant results between early and late ($p = 0.12$) participants groups. Hence, our sample did not influence by non-response bias. In addition to non-response bias, we checked the issue of common method bias (CMB) by employing Harman single-factor method (Podsakoff *et al.*, 2003). The issue of CMB exists in this study if a single factor constitutes more than 50 percent variance (Harman, 1976). The outcome indicates that single factor explains just 18.19 percent variance which is less than the criteria of 50 percent. Another proof of CMB is a high correlation ($r > 0.9$) among the constructs (Pavlou and El Sawy, 2006). Table IV indicates the inter-correlations among constructs which represented that sample do not exist in high correlation. Thus, CMB is not an issue in this study.

4.1 Reliability and validity

We run exploratory factor analysis (EFA) in SPSS 23.0 by employing a principal component method for extraction and varimax for rotation to assess the data set suitability for further analysis (Hair *et al.*, 2010). The findings indicate that EFA value of Kaiser–Meyer–Olkin (0.877) and Bartlett's test of sphericity ($\chi^2 (351) = 7{,}439.24$, $p = 0.000$) successfully achieved the threshold criteria of suitability of data set for further analysis. Moreover, factor loadings of all variables are higher than 0.60 (Hair *et al.*, 2010) and no issue of cross-loadings was found in EFA analysis among variables items (see Table II).

Reliability of constructs was measured through the value of α, composite reliability, and average variance extracted (Hair *et al.*, 2010; Fornell and Larcker, 1981). If the value of α and composite reliability is higher than 0.7 and 0.6 respectively then it is reasonably a fit measure (Hair *et al.*, 2010). The outcome showed that both α and composite reliability values are achieving the threshold values and values of all constructs are in between 0.85 to 0.89 and 0.81 to 0.88, respectively. The value of the average variance extracted (AVE) should be 0.5 or higher (Fornell and Larcker, 1981). Table III showed that all constructs values for

Table II.
The outcome of
exploratory factor
analysis

Constructs	Loadings and cross-loadings					
	Nego	TD	SCC	FI	FIN	SCE
Nego1	*0.81*	0.046	0.157	0.027	0.216	0.114
Nego2	*0.94*	0.011	0.080	0.153	0.230	0.321
Nego3	*0.74*	0.066	0.092	0.131	0.191	0.163
TD1	0.066	*0.63*	0.146	0.114	0.065	0.155
TD2	0.229	*0.90*	0.069	0.121	0.032	0.022
TD3	0.164	*0.78*	0.069	0.195	0.145	0.123
SCC1	0.235	0.042	*0.89*	0.255	0.231	0.212
SCC2	0.213	0.055	*0.96*	0.249	0.208	0.102
SCC3	0.214	0.224	*0.71*	0.179	0.113	0.212
SCC4	0.213	0.331	*0.61*	0.148	0.220	0.111
FI1	0.174	0.288	0.323	*0.96*	0.115	0.232
FI2	0.180	0.202	0.212	*0.89*	0.094	0.109
FI3	0.090	0.575	0.112	*0.63*	0.125	0.010
FIN1	0.148	−0.003	0.155	0.194	*0.66*	0.123
FIN2	0.188	0.105	0.094	0.220	*0.78*	0.131
FIN3	0.197	0.364	−0.020	0.167	*0.84*	0.272
FIN4	0.192	0.277	0.048	0.204	*0.88*	0.042
FIN5	0.070	0.291	−0.074	0.152	*0.62*	0.022
SCE1	0.187	0.132	0.183	0.368	0.084	*0.66*
SCE2	0.230	0.145	0.110	0.250	0.018	*0.70*
SCE3	0.105	0.167	0.422	0.274	0.103	*0.80*
SCE4	−0.025	0.013	0.326	−0.048	0.133	*0.75*
SCE5	0.041	0.231	0.365	0.017	0.284	*0.74*
SCE6	0.149	0.132	0.232	−0.106	0.160	*0.60*

Notes: Items in italics show the loading of measurement items on the constructs to which they are assigned. Nego, negotiation; TD, trade digitization; SCC, supply chain collaboration; FI, role of financial institutions; FIN, supply chain finance; SCE, supply chain effectiveness

AVE are higher than 0.5, and in between 0.51 to 0.70. Thus, all construct values are under recommended criteria which indicate the valid measures (see Table III).

Convergent validity was evaluated by analyzing the value of factor loadings. As per Hair *et al.* (2010), factor loadings of all constructs items should be higher than 0.60. Results of confirmatory factor analysis (see Table III) indicated that all items of factor loadings are higher than 0.60 and values are in between 0.60 to 0.96. Thus, the current study successfully achieved good convergent validity for the measures. Additionally, discriminant validity was evaluated through the proposed method of Fornell and Larcker (1981) by comparing the inter-correlations of each construct with the square root of average variance extracted for each construct. As shown in Table IV, the values of the square root of the average variance extracted are larger than the values of inter-correlation for all constructs. Another proof of the discriminant validity of the measures is that the loadings of items are significantly higher than cross-loadings of items for all constructs (see Table II). Thus the discriminant validity was not an issue for the study.

Table IV depicts the values of mean, standard deviation and correlation matrix. All constructs positively and significantly correlated with each other. These results provide preliminary support for the proposed five hypotheses. Table II also shows that among these SCF adoption factors, collaboration among SC players is highly adopted by SME's (means = 3.94).

4.2 Structural equation modeling
To verify the proposed research model and hypotheses, we run the structural equation modeling by using the maximum likelihood method with collected data for the validated measures. As per Hair *et al.* (2010), AMOS is a powerful software which constitutes factor analysis and

Constructs	Loadings	α	CR	AVE
Negotiation				
Nego 1	0.81	0.867	0.87	0.70
Nego 2	0.94			
Nego 3	0.74			
Collaboration				
SCC 1	0.89	0.887	0.88	0.65
SCC 2	0.96			
SCC 3	0.71			
SCC 4	0.61			
Trade Digitization				
TD 1	0.63	0.812	0.81	0.61
TD 2	0.90			
TD 3	0.78			
Financial institutions				
FI 1	0.96	0.861	0.87	0.70
FI 2	0.89			
FI 3	0.63			
Supply chain finance				
SC Fin 1	0.66	0.862	0.87	0.58
SC Fin 2	0.78			
SC Fin 3	0.84			
SC Fin 4	0.88			
SC Fin 5	0.62			
Supply chain effectiveness				
SCE 1	0.66	0.855	0.86	0.51
SCE 2	0.70			
SCE 3	0.80			
SCE 4	0.75			
SCE 5	0.74			
SCE 6	0.60			

Table III.
Results of
confirmatory factor
analysis

S. No.	Constructs	Mean	SD	1	2	3	4	5	6
1	Negotiations	3.62	0.757	*0.84*					
2	Collaboration	3.94	0.561	0.473**	*0.81*				
3	Trade digitization	3.69	0.621	0.654**	0.595**	*0.78*			
4	Financial institution	3.45	0.727	0.317**	0.526**	0.427**	*0.84*		
5	Supply chain finance	4.11	0.541	0.363**	0.623**	0.477**	0.373**	*0.76*	
6	Supply chain effectiveness	3.72	0.549	0.295**	0.620**	0.415**	0.570**	0.482**	*0.71*

Notes: A diagonal line placed in italics shows the square root of the AVE of each construct. **Correlation is significant at the 0.01 level (two-tailed)

Table IV.
Descriptive statistics,
correlation matrix
and the square
root of AVE

multiple regression to estimate the measurement and structural model simultaneously. Confirmatory analysis was done to assess the measurement model of SCF adoption factors. The findings of the proposed measurement model showed that model is a good fit and acceptable because model indices have achieved the threshold values suggested by Hair *et al.* (2010), and Hu and Bentler (1999). The model of measurement backed by excellent fit to the data: χ^2 (CMIN/df) (504.69/185) = 2.728, $p = 0.000$, CFI = 0.949, NFI = 0.922, NNFI = 0.916, IFI = 0.949, and RMSEA = 0.072.

Considering the acceptable results of measurement model fit, we proceeded to calculate the structural model fitness and path coefficients of the model. Findings showed that structural model is a good fit to the data: χ^2 (CMIN/df) $(747.76/312) = 2.397$, $p = 0.000$, CFI $= 0.932$, NFI $= 0.900$, NNFI $= 0.911$, IFI $= 0.933$, and RMSEA $= 0.065$. As expected, all structural path coefficients are positive and significant (see Figure 2). The results indicate a direct effect of negotiation on SCF is $\beta = 0.212$ with $p < 0.05$. Thus, negotiations among SMEs, suppliers, and financers in SCF process has a positive and significant effect on SCF (*H1* is accepted). The effect of collaboration on SCF is $\beta = 0.481$ with $p = 0.000$. Thus, collaboration among SC members, in SCF process, has a positive and significant effect on SCF (*H2* is accepted). Path coefficient of trade digitization is $\beta = 0.356$ with $p = 0.001$, which indicates that trade digitization makes the trading system easy for SMEs, suppliers, and financers that results in a positive and significant effect on SCF (*H3* is accepted). Path coefficient of the role of a financial institution is $\beta = 0.143$ with $p < 0.05$, which demonstrating that financial institutions play an important role in the relationship between buyers and suppliers, and has a positive effect on SCF (*H4* is accepted). Moreover, the findings of the study also show that the direct effect of SCF on SCE is $\beta = 0.652$ with $p < 0.05$. Thus, SCF is positively related to SCE (*H5* is accepted). Finally, our study indicates that all factors have a significant effect on SCF adoption. However, SC collaboration ($\beta = 0.481$) and trade digitization ($\beta = 0.356$) are the main factors which largely contribute and push the SMEs officials to adopt SCF. Thus, our hypothesized research model is acceptable. Furthermore, the accepted model demonstrates that 38 percent variance accounted by internal and external factors in SCF and 34 percent variance accounted by all predictors in the criterion variable (i.e. SCE). In this model, none of the control variables has a significant effect on SCE. Thus, our proposed research model is satisfactory and acceptable (see Figure 3).

5. Discussion
The basic purpose of this research was to explore the determinants of SCF and how SC finance improves SMEs SCE which was previously ignored in the literature of strategic
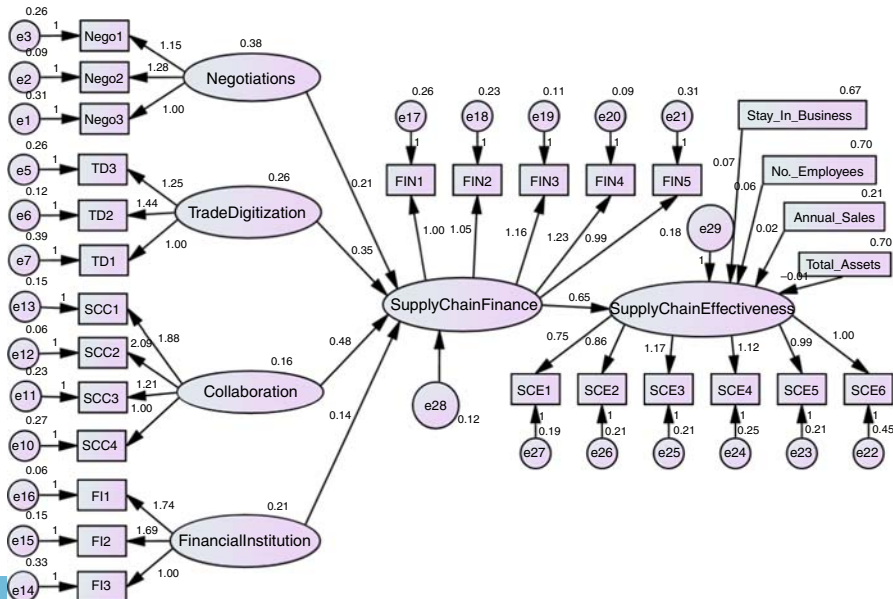

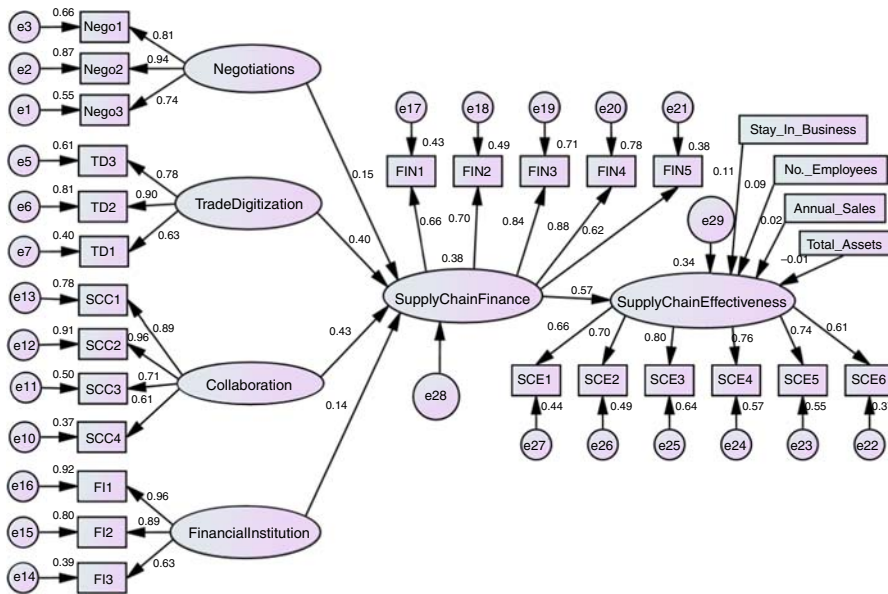**Figure 2.**
Path analysis:
un-standardized
coefficients

Figure 3.
Path analysis:
standardized
coefficients

SC management. As the results shown, the four key elements of SCF, namely negotiation, trade digitization, collaboration, and role of financial institutions have positively and significantly constituted the SCF as a strategic enabler of SMEs' success. As expected, the findings indicate that SCF ($\beta = 0.652$, $p < 0.05$) is a critical construct which significantly contributed to the effectiveness of the SC. Negotiation is positively related to SCF which explains that negotiation between buyers and suppliers helps to formulate their business terms positively including financing (Liebl *et al.*, 2016). Trade digitization is significantly related to SCF and effectiveness that explains digitization is a significant way to reduce cost as compared to the paper-based trading which increases quality and visibility over SC cycle for increasing the firm performance (Maiti and Kayal, 2017; Bartlett *et al.*, 2007; Perego and Salgaro, 2010). Collaboration is significantly related to SCF; indicating that a strong collaboration between buyers and suppliers in the business process helps them to work for the improvement of ways for doing business as to form strategic alliance and acts as an identical unit (Fawcett *et al.*, 2012). Role of the financial institution is positively and significantly related to SCF which means that financial institutions are playing a crucial role for the development of buyers and suppliers relationships by providing them financing opportunity through SCF schemes. As per Zhang (2015), Shenzhen Development Bank of China is providing SCF facility (giving more advances) to SMEs and the suppliers to strengthen their working capital for the smooth working of their business. Most of the previous studies have discussed financial perspective (Deloitte, 2009; Hurtrez and Salvadori, 2010; More and Basu, 2013) and SC perspective (trust and commitment relationship among SC players) (Gelsomino *et al.*, 2016). This study extended the SC perspective by integrating the TC approach to enhance SCE through the adoption of SCF. Moreover, this study investigates different adoption factors of SCF (negotiation, trade digitization, collaboration, and the role of financial institutions) which enable the SMEs to adopt SCF. Previously, these factors were not taken into consideration while formulating financial policy by the SC department. Findings also indicated that the implementation of SC finance provides a good financial solution to the buyers and the suppliers for the smooth working of their routine

operations which improves the effectiveness of the SC cycle and creates a win–win situation for both key players (Deloitte, 2009; Hurtrez and Salvadori, 2010). Overall, this study investigated five hypotheses and outcome supported that all relationships are significant. Findings also confirm that most of the SC executives are interested in adopting SCF as a financing solution for their business. Finally, the conclusion of the study is consistent with the study of Caniato *et al.* (2016). Moreover, our findings also empirically test the finding of Caniato *et al.* (2016), they used case methodology at Italian firms and determined that recognition of diverse objectives lead to the implementation of SCF.

5.1 Managerial implications

First, the accepted research model provides a guideline to SMEs executives, how to start, develop, and settle the SCF process by incorporating negotiation, collaboration, trade digitization, and role of financial institutions as a strategic tool to optimize the firm's working capital and build longer relations with SC players. Second, SMEs owners or managers obtain credits in line with the findings of the current study to meet their daily financial requirements and mitigate the risk of default. Furthermore, the present study provides important contributions by allowing SC officials to advance an improved understanding of current investigated phenomena, their prospects, requirements, and shortcomings, thus allowing an improved knowledge and support decision making. Third, the perfect identification of factors leading to the adoption of SC finance and enhancing SCE are of incredible enticement for SC officials eager to discover the potential usage of SCF. In addition, the proposed measured model will be used as a diagnostic tool for SC managers to identify the gray areas where definite improvement is desired. Fourth, the SC managers may examine the level of relationship amongst SCF and its factors and their impact on SCE, and afterward, in the light of the level of relationship, managers may decide to create a specific process, resources, and the way of competency with needs.

5.2 Theoretical implications

First, this paper adds to the propel learning in the field of SCF while providing empirical evidence on SC finance and SCE by using TC approach, which is an important advancement in this field of SC management (Hofmann, 2005; Pfohl and Gomm, 2009). The current study also accompaniments the previous studies on SC finance (Wuttke *et al.*, 2013; Song *et al.*, 2018). Second, the current research on SCF is expanded by identifying the critical role of negotiation, trade digitization, collaboration, and role of financial institutions as the adoption factors of SCF strategy and its impact on SC effectiveness. The present study is the first quantitative study that explored the underlying adoption factors of SCF to improve the SCE of textile SMEs using TC approach as a theoretical base. Third, instead of focusing on the pure financial perspective of the SC, our study extends the SC perspective by employing the TC approach while incorporating the internal and external factors of SCF which was previously ignored (Randall and Farris, 2009). Fourth, the present study contributes to the better understanding of SCF adoption and factors among SMEs SC managers. Furthermore, SCF works as an adaptation response strategy to mitigate the risk of bankruptcy by SMEs officials (Caniato *et al.*, 2016; Gomm, 2010). Fifth, from the theoretical view, the modeling method and results give positive and significant proof for the adoption of SCF characterized by success factors of SCF as a mean of attaining grander SC performance for SMEs. Finally, the present study extends the research work of Caniato *et al.* (2016), they proposed the prepositions related to SCF and performance. Our study also responds to the earlier call for future research made by Gelsomino *et al.* (2016). They performed a systematic literature review of SCF potentials, challenges, and relationship with SC members.

5.3 Limitations and future research directions
Although, desired goals are achieved by the authors yet this study has certain limitations which are necessary to highlight. First, the current study was conducted in textile SMEs by targeting a large district of Pakistan, and that may produce the issue of generalizability in other settings. Future studies may be done in other settings to improve the generalizability of the results. Second, the present study applied cross-sectional and self-reported data collection design which may be not appropriate for casual studies because it produces CMB, but the current study has no issue of CMB. However, future studies can be done by longitudinal data collection design to verify the results over time. Third, future study can apply the research model on large-scale organizations. A comparative study can be done to test the efficiency and effectiveness of research model between SMEs and large-scale firms. The outcome of the study may be considered as a reference point by different researchers for further research on a similar field.

In addition to the limitations, future studies can also examine the effects of other related factors of SCF like SC integration, SC information, and SC agility on SC performance. The most desirable for future research is to investigate the moderating role of information sharing in the relationship between SCF and SMEs performance. Future studies can incorporate the moderating and mediating variables for the in-depth exploration of adoption of SCF and enhance the overall SC performance. Moreover, future research can be done to identify the antecedents (trust and commitment) of collaboration which may help the SMEs to adopt SCF.

6. Conclusion
The successful application of SCF is not just based on financial indicators but also requires SC relationships (negotiation, trade digitization, collaboration and role of financial institutions) among buyers, suppliers, and the financial institutions which promote behavioral cohesion to progress small and medium-sized business (SMEs). Furthermore, SCF is the significant predictor of SCE in the context of textile SMEs.

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Appendix

Questionnaire: items for survey scales
Supply chain finance (*Zhang, 2015*) (1 = "strongly disagree" to 5 = "strongly agree")*:*
SCF1: You see supply chain finance as a risk prevention system (strategy).
SCF2: Supply chain finance increases the capital flow coordination in the supply chain.
SCF3: Supply chain finance brings the high level of overall supply chain efficiency.
SCF4: Supply chain finance considers as high-risk prevention capability of core enterprise.
SCF5: Supply chain finance requires a high degree of technology for its application.

Supply chain effectiveness (adapted from Fugate et al., 2009) (1 = "strongly disagree" to 5 = "strongly agree"):
SCE1: Transportation cost.
SCE2: Warehousing cost.
SCE3: Inventory cost.
SCE4: Logistic administration cost.
SCE5: Product cost.
SCE6: Order delivered in the right quantity, specification and without damage.
Negotiation (adapted from Janda and Seshadri, 2001) (1 = "strongly disagree" to 5 = "strongly agree"):
We as SME believe to:
Neg1: Seek for a win–win outcome.
Neg2: Spend a longer time on the negotiation process.
Neg3: Reach mutual agreement on the discussed issue.
Trade digitization (adapted from Choi, 2013) (1 = "strongly disagree" to 5 = "strongly agree"):
TD1: Interactive technologies offer valuable new ways of engaging buyer and suppliers.
TD2: Training of digital technologies are needed to upgrade buyer and supplier trading
TD3: The future of digital trading lies in the relationship between buyers and suppliers.
Supply chain collaboration (adapted from Simatupang and Sridharan, 2005) (1 = "strongly disagree" to 5 = "strongly agree"):
Our business unit consistently shares the following information with our suppliers:
SCC1: Demand forecast.
SCC2: Inventory policy.
SCC3: Price changes.
SCC4: Supply disruption.
Financial institutions (Zhang, 2015) (1 = "strongly disagree" to 5 = "strongly agree"):
FI1: Financial institutions hold a supportive attitude when applying supply chain finance.
FI2: Commercial banks system for granting supply chain finance is easy for all SC players.
FI3: Risk prevention system is perfect when applying supply chain finance.

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