IMPACT OF FINANCIAL SUPPLY CHAIN MANAGEMENT (FSCM) ON FINANCIAL PERFORMANCE OF TEXTILE SECTOR IN PAKISTAN: EMPIRICAL EVIDENCE FROM GENERALIZED METHOD OF MOMENTS

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ABSTRACT: *The flow of financial resources in supply chain management is progressively more drawing the center of attraction in recent years. This study examines the effects of financial supply chain management variables such as Inventory Turnover (hereafter referred as IT), Cash Conversion Cycle (hereafter referred as CCC), Cost of Revenue (hereafter referred as CR), Selling, General & Administrative Expenses on Revenue (hereafter referred as SR) and Gross Margin (hereafter referred as GM) on key profitability indicators such as Return on Assets (hereafter referred as ROA), Return on Equity (hereafter referred as ROE), Return on Sales (hereafter referred as ROS) and Basic Earning Power (hereafter referred as BEP). This study used Generalized Movements Method (hereafter referred as GMM), Random Effect (hereafter referred as RE) and Fixed Effect with Driscoll-Kraay standard errors (FE) estimation techniques to test the effects of several financial supply chain related variables on key profitability indicators.*

Key Words: Financial supply chain management, ROA, ROE, ROS, KPIs, Karachi stock exchange, GMM, FE, RE.

1. INTRODUCTION

The supply chain management consists of a customer base approach. It implies that the concentration on well-timed and effective interactions between all elements of supply chain for understanding the customer's needs and fulfilling their needs promptly with low cost. Due to this, supply chain management is considered as one of the issue which could upset the financial performance of the firm as well as influence the investors' view about the firm. Textile industry is the biggest manufacturing industry in Pakistan. After the agriculture sector it is the only industry that generates substantial employment opportunities for both skilled and unskilled labor. The textile industry of Pakistan has remarkable impact on the economy and also contributes up to 57% to country's exports. Now a day's keeping in view of infinitely competitive international environment, textile firms which promote its supply chain efficiency, increase its productivity, and maximize value-addition, will only be able to survive.

In today's worldwide industry atmosphere, textile firms are trying to get competitive benefit by paying more concentration to efficient management of their supply chain. As a result, they could reduce cost, increase profits and enhance consumer satisfaction. Various concepts have been used to capture the chain of relationships between suppliers and buyers. Since arise of the supply chain concept in 1980s, after broadening the view, new clarity of supply chain was brought through [14]. It includes all necessary activities for a product or service from its beginning till it reaches the final consumers. Numerous firms have progressed through recognizing the supply chain management concept to construct sustainable aggressive edge for products and services in national and international markets with busy consumers. From financial point of view supply chain impact on cash flows gauges has been presented in literature. Various firms have already identified various theories and then implemented the same regarding Supply Chain Management (hereafter referred as SCM) through short term and long term goals for attaining competitiveness and enhanced profits [15,11,16].

After financial crisis of 2008, firms create value by civilizing their liquidity, inventory management, delaying payments, quicken their receivables, decreasing cost of goods sold and increasing profitability, as confirmed through economic value added model. Additionally, positive effects of supply chain management on financial performance of firms during economic crises can enhance monetary power of firms in the marketplace and defend their competitiveness.

1.1 Research Questions

This paper tries to find the answer of two major research questions that are given below:

1. Is there a significant relationship between Financial Supply Chain Management (FSCM), Key Performance Indicators (KPI) and Financial Performance (key profitability indicators) of textile firms listed in Karachi Stock Exchange?
2. Which element of Financial Supply Chain Management (FSCM) performance indictor is the most influential variable affecting the key profitability indicator of textile firms listed in Karachi Stock Exchange?

2. LITERATURE REVIEW

Some researches, theories and studies have already been conducted about SCM. The financial disaster brings fresh issues but it is developing new opportunities of supply chain. The relationship of financial flows with supply chain is measured as a predictable strategic key while increasing corporate performance.

Others [2] studied the financial flow idealization. According to researcher the operational process will assure investors and also enhance firms supply chain efficiency. In supply chain process at all stages the cash flows are engaged and financial flows are also required. He described the significance of financial flows in process of supply chain and it is necessary to implement the FSCM strategic plan. The FSCM is an exact set of clarifications that accelerate financial flows and information among trading collaborators [10]. In [12] authors identified decisions about supply chain that shows impact on the financial performance. This theory suggests that low financial performance is based on short of cross inefficient

coordination. Because the cross efficient coordination can facilitate businesses to improve financial efficiency.

The integration of actual supply chain flow along with financial management by means of backward information circulation should be carried out being a one offer method throughout corporate. This synchronization is supposed to attain from the harmonization between systemized organization's procedures along with financial decision making [9]. Financial performance in relation with supply chain actions are forever observed as price reduction, market development and turnover boost [5]. Here are affirmative relationships involved financial issues and modern supply chain put into practice: better supply chain production procedures can promote firms through improved financial performance. As a result, profits of corporations enhance and market situation adjuncts to increase overall business performance.

After financial crises of 2008, firms forfeited extra attention on strategies that related to supply chain to decrease cost and improve profit margin. Development from SCF toward FSCM facilitates the firms to strengthen competitiveness through genuine profits in market which is produced on cash fund [13]. In [8,13] authors have applied performance indicators and key profitability indicators that relate to supply chain management for evaluating firm's performance which is based on EVA model. This research encourages supply chain growth, value formation and risk adjustment through enhanced operational performances and restructured financial resources.

Some others conducted an experimental study on effect of SCF on short-lived corporate performance [17]. Key Performance Indicators (KPIs) are present the supply chain flows and financial flows. This study suggests that execution of supply chain finance is helpful in resolving short term level cash flow problems and also decrease operating costs. In [16], researchers concluded that implementation of financial flow in supply chain is provide benefit to firms increase supply chain efficiency, reduce operational cost as well as increase profitability of the firms.

3. DATA AND METHODOLOGICAL ISSUES

3.1 Data

The purpose of this study is to scrutinize the impact of FSCM on financial performance in approximately 30 large textile firms listed in the Karachi Stock Exchange (KSE) from 2010 up to 2014.[1] The studied variables and its relationship will be helpful to increase efficiency of supply chain and profitability of textile firms in Pakistan. To explain effects of FSCM on financial performance of Textile sector in Pakistan, study proposed the following below mention four equations models:

Model 1: $ROA_{it} = \alpha_0 + \alpha_1 (CCC_{it}) + \alpha_2 (IT_{it}) + \alpha_3 (CR_{it}) + \alpha_4 (SR_{it}) + \alpha_5 (GM_{it}) + \mu_{it}$

Model 2: $ROE_{it} = \alpha_0 + \alpha_1 (CCC_{it}) + \alpha_2 (IT_{it}) + \alpha_3 (CR_{it}) + \alpha_4 (SR_{it}) + \alpha_5 (GM_{it}) + \mu_{it}$

Model 3: $ROS_{it} = \alpha_0 + \alpha_1 (CCC_{it}) + \alpha_2 (IT_{it}) + \alpha_3 (CR_{it}) + \alpha_4 (SR_{it}) + \alpha_5 (GM_{it}) + \mu_{it}$

Model 4: $BEP_{it} = \alpha_0 + \alpha_1 (CCC_{it}) + \alpha_2 (IT_{it}) + \alpha_3 (CR_{it}) + \alpha_4 (SR_{it}) + \alpha_5 (GM_{it}) + \mu_{it}$

Formula for calculation of selected variables are as follows:

ROA= (Net Income / Total Assets) × 100

ROE = (Net Income / Total Equity) × 100

Return on Sales (ROS) = (Net Income / Net Sales) × 100

Basic Earning Power (BEP) = (Operating Income / Total Assets) × 100

As per research model that are using in this study, there are five independent variables that symbolize mechanisms of FSCM.

Cash Conversion Cycle (CCC) = DSO+DIO-DPO

The CCC explains value produced by both equally supply chain as well as financial flows. This variable offers three components:

DSO = (Avg. Accounts Receivables / Net Sales) × 365

DIO = (Avg. Inventory / CGS) × 365

DPO = (Avg. Accounts Payables / CGS) × 365

Inventory Turnover (IT) = CGS / Average inventory

Cost of Revenue (CR) = (CGS / Net Sales) × 100

Selling, general & admin expenses on Revenue = (Expenses / Net Sales) × 100

Gross Margin (GM) = Gross Profit / Net Sales × 100

3.1.1 Main Hypothesis

Is there a significant relationship between the Financial Supply Chain Management (FSCM) key performance indicators and Financial Performance (key profitability indicators) of textile firms listed in Karachi Stock Exchange?

3.1.2 Sub Hypotheses

Model 1: Is there a significant relationship among the FSCM performance indicators and ROA?

Model 2: Is there a significant relationship among the FSCM performance indicators and ROE?

Model 3: Is there a significant relationship among the FSCM performance indicators and ROS?

Model 4: Is there a significant relationship among the FSCM performance indicators and BEP?

4. RESULTS AND INTERPRETATION

Model 1: Panel data technique by means of small time sequence produced biased results by using OLS, FE as well as RE in presence of endogeneity. So, coup up with the endogeneity problem we run the following test:

Table 1: Durbin-Wu-Hausman Tests for Endogeneity

Null Hypothesis (Ho): Regressor is Exogenous			
Test	**Statistics**	**Notation**	**p-value**
Wu-Hausman (F-stat)	19.8062	F(1,145)	0.000
Durbin-Wu-Hausman χ^2	18.0268	chi-sq(1)	0.000
Source: Authors' estimates			

[1] This study used the following below mention criteria to choose eligible textile firms between years 2010 to 2014:

1. The firm ought to be registered in Karachi Stock Exchange (KSE) earlier than ending of 2014.
2. The annual financial reporting time must start on 01st July and be end on the 30th June.
3. The firm would not alter financial year throughout the time of research.
4. The textile firm is earning profit through the time of study.
5. The Equity Position would not negative through the time of study.
6. The financial data is accessible through the time of study.
7. The Threshold technique should be used for selection of textile firms. There is spot at that stimulus is of enough concentration to start to generate an effect.

According to above mention criteria, the total of thirty (30) eligible textile firms are recognized and integrated in study.

In the existence of endogeneity, 2SLS/IV techniques create extra reliable outcomes as matched above mentioned results. However, 2SLS/IV also demonstrates biased results in presence of heteroskedasticity. So, second test before the final estimated result is the heteroskedasticity test.

Table 2: Breusch-Pagan/Cook-Weisberg Test			
Null Hypothesis (Ho): Constant variance			
Test	**Statistics**	**Notation**	**p-value**
Breusch-Pagan / Cook-Weisberg	18.3500	chi-sq (1)	0.000
Source: Authors' estimates **Note:** Test is for checking the presence of heteroskedasticity			

The above mention test of heteroskedasticity is rejecting null hypothesis that is clear cut and identify about panel data have problems in the form of endogeneity as well as heteroskedasticity. So due to this we used the one-step system GMM in this study. The Table 3 illustrates results of the variables.

Table 3: Model 1 –GMM Results				
ROA_{it}	**Slope**	**Robust S.E.**	**z-val.**	**p-val.**
$ROA_{i,t-1}$	-0.0043	0.1235	-0.04	0.972
CCC_{it}	-0.0457	0.0140	-3.26	0.001
IT_{it}	-0.1797	0.1079	-1.67	0.096
CR_{it}	-	-	-	-
SR_{it}	-1.1888	0.2894	-4.11	0.000
GM_{it}	1.3617	0.1041	13.08	0.000
CONS	1.9740	2.9030	0.68	0.497
Source: Authors' estimates				

The coefficient of lagged dependent variable ($ROA_{i,t-1}$) is -0.0043 and CCC is also negative. It means relationship of ROA and CCC is cause effect and these are significant as per previous theories. This relationship indicates that profitability of textile firms decreased due to lengthy cash conversion cycle. Basically reduction in CCC attained simply by function of FSCM can probably enhance profitability in form of ROA. The SR usually is replicated in business costs, and they are negatively in connection with profitability. The IT is predictable to acquire positive impacts on the profitability, but in above mention table IT is negative. This position shows that textile firms are minimal turnover, which indicates very poor sales, thus, surplus inventory. That percentage ought to be as compared alongside industry averages. A higher percentage indicates sometimes strong income or perhaps unproductive obtaining. CR is skipped due to the presence of multicollinearity. The coefficient of GM is also positive and it shows positive results for the financial effectiveness. Table 3 upshots confirm generally satisfactory situation from empirical point of view, however aforesaid results focuses on some trials. These tests that are going to performed is Arellano Bond test for AR(1) in first differences, Arellano-Bond test for AR(2) in first differences, Sargan test of override restrictions and Hansen test of override restrictions.

Table 4: Arellano-Bond test for Serial Correlation		
Arellano-Bond test for:	**z-val.**	**p-val.**
AR(1) in first differences	-1.620	0.105
AR(2) in first differences:	0.000	1.000
Source: Authors' estimates		

Table 5: Over Identification Restrictions Tests		
Test	**χ^2**	**p-value**
Sargan(over identification restrictions)	3.43	0.329
Hansen (over identification restrictions)	4.45	0.217
Source: Authors' estimates		

Table 4 and Table 5 explain robustness check on the whole results. These results prove with the intention of instruments validity and overall outcomes are robust.

Model 2: Second equation of ROE shows insignificant results of endogeneity and heteroscedasticity therefore, we applied Hausman test for the purpose of selecting the FE and RE.

Table 6: Diagnostic Tests					
Test for:					
Multi-collinearity		**Selection of Technique**			
Variable	**VIF**	**Breusch-Pagan / Cook-Weisberg Test**		**Hausman Test**	
CCC_{it}	1.76				
IT_{it}	1.73				
CR_{it}	1.52				
SR_{it}	1.51	$chibar^2(01)$	2.28	Value	Decision
Mean VIF	1.63	p-val> F	0.1307	0.1317	RE(FGLS) is preferred
Source: Authors' estimates					

Firstly, we are checking the presence of multi-collinearity between independent variables of study. As per general law, when variance inflation factor (VIF) of the variables goes beyond 10, which generally occur while R^2 go beyond 0.90, this situation shows presence of multi-collinearity. VIF of clarifying variables reporting in Table 6 that is indicates multicollinearity in the estimation. When heterogeneity is showing between the variables than OLS will be imperfect specification and the fixed or random effects technique should be projected. For this purpose, two tests are used such as Breusch-Pagan / Cook-Weisberg test and Hausman test. The above mention test points out the existence of fixed as well as random effects. After this we used Hausman test to choose between fixed as well as random effect estimation. When p-value is greater than 5% than random effect model is best suitable. So we used random effect model that is describe below:

Table 7: Model 2 – FGLS Results				
ROE	**Slope**	**S.E.**	**z-val.**	**p-val.**
CCC_{it}	-0.0695	0.0402	-1.73	0.084
IT_{it}	-0.0269	0.2797	-0.10	0.923
CR_{it}	-	-	-	-
SR_{it}	-5.6292	1.0944	-5.14	0.000
GM_{it}	3.3112	0.2998	11.04	0.000
C	10.0405	7.5488	1.33	0.183
Source: Authors' estimates				

Table 7 shows that independent variables coefficient in which CCC and SR is negative, which is significant as per theoretical as well as empirical point of view. It means both variables show impact on ROE; reduction in CCC and SR will increase the financial performance of textile firms in Pakistan. The coefficient of IT is also negative and insignificant. It indicates that textile firms are not properly managing the inventory turnover. The result of GM is positive and show direct relationship with ROE. All the independent variables are showing impact on dependent variable (ROE). The CR is also skipped in this equation due to multicollinearity.

Model 3: After applying diagnostic tests, it is found that the data have heteroscedasticity problem but does not have the endogeneity problem therefore, we used the remedial measure technique keeping in view of the heteroscedasticity problem.

Table 8: Diagnostic Tests

Test for:					
Multi-collinearity		**Selection of Technique**			
Variable	**VIF**	**Breusch-Pagan / Cook-Weisberg Test**		**Hausman Test**	
CCC_{it}	1.76				
IT_{it}	1.73				
CR_{it}	1.52				
SR_{it}	1.51	$chibar^2(01)$	14.84	Value	Decision
Mean VIF	1.63	p-val> F	0.000	0.000	FE is preferred with Drisc/Kraaystandard errors

Source: Authors' estimates

Initially we scrutinized existence of multi-collinearity among independent variables. The VIF test is used and found multi-collinearity in data. After this we found heterogeneity between variables and fixed or random effects technique must be projected. The selection of random as well as fixed effect technique the Breusch-Pagan / Cook-Weisberg test and Hausman test are used. The above point out trial is defined that fixed effect technique is more suitable with Drisc/Kraay standard errors to check the impact of independent variables on ROS on textile firms. Consequently, we used fixed effect model. Table 9 shows the element(s) of financial performance which is not applicable for Pakistani textile sectors firms.

Table 9:Model 3 –FE with Driscoll-KraayStandard Errors

ROS	Coefficient	Drisc/Kraay Standard Error	T	p-value
CCC_{it}	-0.0023	0.0031	-0.74	0.502
IT_{it}	-0.0189	0.0325	-0.58	0.591
CR_{it}	-	-	-	-
SR_{it}	-0.3390	0.1873	-1.81	0.145
GM_{it}	0.7236	0.0692	10.46	0.000
C	-2.2758	1.2664	-1.80	0.147

Source: Authors' estimates

Earlier researchers like [13,16] and [8] proposed result of ROS that are significant. These results are valid for international market/industry. But in case of Pakistan, ROS is not showing empirical impact on textile sector financial performance. But it is well established that theoretical point of view this key profitability indicator is significant for firm financial performance.

Model 4: For scrutinizing influence regarding independent variables for instance CCC, IT, CR, SR and also GM on textile firms dependent variable BEP, GMM technique is applied due to existence of endogeneity and also heteroskedasticity in the data. The statistical significance of Durbin-Wu-Hausman test points out the existence of endogeneity. The following below mention test is used for checking the endogeneity in the data.

Table 10: Durbin-Wu-Hausman Tests for Endogeneity

Null Hypothesis (Ho): Regressor is Exogenous

Test	Statistics	Notation	p-value
Wu-Hausman (F-stat)	30.2556	F(1,145)	0.000
Durbin-Wu-Hausmanχ^2	25.8956	Chi-sq(1)	0.000

Source: Authors' estimates

In case of endogeneity, the 2SLS/IV regression generates additional reliable conclusions as comparison with above stated results. Though, 2SLS/IV also reveals biased outcomes/results in situation heteroskedasticity showing in the variables. So, due to this research the heteroskedasticity test is performed.

Table 11: Breusch-Pagan/Cook-Weisberg Test

Null Hypothesis (Ho): Constant variance

Test	Statistics	Notation	p-value
Breusch-Pagan / Cook-Weisberg	10.59	chi-sq (1)	0.001

Source: Authors' estimates
Note: Test is for checking the presence of heteroskedasticity

The heteroskedasticity test is discarding null hypothesis which is certainly show that problems in panel data in shape of endogeneity and heteroskedasticity. So just for this we utilized GMM technique for the equation model. The below mention table identify relation linking the specific variables.

Table 12: Model 4 – GMM Results

BEP_{it}	Slope	Robust S.E.	z-val.	p-val.
$BEP_{i,t-1}$	0.1740	0.2110	0.82	0.410
CCC_{it}	-0.0301	0.0116	-2.59	0.009
IT_{it}	0.0796	0.0849	0.94	0.349
CR_{it}	-	-	-	-
SR_{it}	-2.3798	0.4102	-5.80	0.000
GM_{it}	1.5219	0.1260	12.08	0.000
CONS	4.3736	5.1371	0.85	0.395

Source: Authors' estimates

All of above mention variables in Table 12 tests connection between FSCM key performance indicators variables and BEP for textile firms listed in Karachi Stock Exchange. The GMM results are shown in Table 12, identify that all independent variables coefficient such as CCC and SR have inverse relationship with BEP profitability indicator. On the other side coefficient of IT and GM is direct relationship with BEP. The relationship of all independent variables with BEP profitability indicator is significant, as per theoretical as well as empirical point of view. The results are also comparable to results of earlier researchers by [13,16,17] who exposed a significant connection between FSCM & BEP. Table 12 confirm frequently satisfactory situation however, aforesaid results focuses on some trials that are discussed below in Table 13 and Table 14.

Table 13: Arellano-Bond test for Serial Correlation

Arellano-Bond test for:	z-val.	p-val.
AR(1) in first differences	-1.620	0.105
AR(2) in first differences:	0.000	1.000

Source: Authors' estimates

The above mention Table 13 shows results of robustness check.

Table 14: Over Identification Restrictions Tests		
Test	χ^2	**p-value**
Sargan(over identification restrictions)	3.43	0.329
Hansen (over identification restrictions)	4.45	0.217
Source: Authors' estimates		

The Table 14 also shows results of robustness check. It is clearly identifying that all results are valid and overall outcomes are robust.

Over the past few years China is using "Bamboo Cotton" because as the world opt for green revolution, "Bamboo" has gain more popularity than Cotton. One of the unique features of bamboo is that it grows so quickly than cotton and also it requires only one third portion of water to grow as compared to cotton. Another thing which makes it more attractive to producer is its low cost and ever green availability.

The Fabric which is made by the Bamboo fiber is very soft, sometime people describe it like cashmere. The reason behind the cashmere is that bamboo fiber is naturally smooth and bamboo is grown naturally without any chemicals and oxidation unlike cotton. This makes bamboo fiber to be wears directly on skin without any allergy. Bamboo fiber is also antibacterial. This antibacterial unique and classic quality comes from the "Bamboo Kun" which is already found in bamboo fiber.

The aforementioned Bamboo Kun also helps to reduce bacterial effects on cloths which lead to fewer allergies and other diseases.

Due to the above mentioned features of the Bamboo Cotton worldwide, Regular Cotton is becoming more and more expensive as compared to Bamboo Cotton. Due to this reason in Pakistan Cotton bales are expensive as compared to Processed Yarn. Therefore, from last few years Pakistan textile has suffer more as compared to other countries. Due to this reason there is negative inventory shows in empirical analysis section of ROA, ROE and ROS. As per Economic Survey and Growth trends of Pakistan production of our textile sector is also very low as compare to China textile sector that is world largest textile sector. Due to low production percentage ROS is also not screening empirical impact on textile sector financial performance.

5. CLOSING REMARKS

This paper examined the impact of FSCM key performance indicators on four key profitability indicators for 30 textile sector firms listed in Karachi Stock Exchange since 2010 to 2014. The CCC and SR coefficients to encompass inverse relations with all four key profitability indicators and Inventory turnover coefficient is also negative that thing indicating textile firms are not proper managing IT during the financial years. However, Gross Margin is expected to showing direct relationship with key profitability indicators that is good sign for textile firms. In all independent variables CCC is most influential variable of FSCM that affecting the key profitability indicators of textile firms. The FSCM impact on firm's performance can enhance efficiency of supply chain in provisions of operational cost saving as well as profit maximizing. As a result, the financial performance of firms is increased. The financial resolution with FSCM can end result an improved operating cycle of supply chains; enhanced supply chain performance can advantage the firms through healthier financial performance; enlarged business economic power in market.

This study can be expanded in a number of ways together with the following linked areas:

1. Investigating the relationship among financial supply chain management (FSCM) and the capital/funds structure of firm.
2. Scrutinizing the relationship connecting financial supply chain management (FSCM) and approach of management on risk aversion.
3. Examining role of technology in reducing the cost of supply chain management.
4. A similar study can be conducted on other sectors of Pakistan.

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