World Review of Business Research
Vol. 7. No. 2. September 2017 Issue. Pp. 119 – 135

Supply Chain Management Performance: The Case of the Real Estate Industry of Bangladesh

Surajit Sarbabidya*

The upward trend of population growth and migration from the rural to urban areas necessitated the development of the real estate industry (REI) in Bangladesh as a prospective solution to this context. However, the quality and standard of many real estate companies raise question of reliability of this industry. With this end in view, the current study is an endeavor to assess the management performance of supply chain in the customer satisfaction and thereby growth of the REI industry with special reference to readymade apartments marketing companies. Since the REI of Bangladesh is also not an exception to this the present study was undertaken during August to October 2016 in Bangladesh with the sample size of 100 employees of five real estate companies in Bangladesh using random sampling method through a structured and self-administered questionnaire based extensive survey comprising of open-ended and non-forced, balanced and odd numbered non-comparative itemized questions using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Since there is paucity of research findings on the SCM performance of the REI in Bangladesh, the current study will mitigate the research gap by suggesting the significant factors to consider for the effective management of supply chain to ensure stable growth of the REI of Bangladesh.

Field of Research: Management and Marketing

Keywords: SCM, REI, Housing Facilities, JIT, etc.

1. Introduction

The real estate is one of the emerging industries of Bangladesh in order to mitigate the rising challenges of fixed but limited land areas together with increased rate of population growth. Migration of the rural population to urban areas is also a greatly responsible factor behind this. It is exhibited from the shift of 7.6% urban population in the year 1976 to 27.1% in the year 2010 which is projected to reach 39.3% in the year 2030 (World Population Prospects, 2008). This indicates that the present scenario of the REI in Bangladesh is going through rising demand in one hand and necessity of quality supply on the other hand. For example, the requirements of the clientele regarding building materials and fittings, environmental vulnerability, land and apartment registration, power for lighting and gas supply for cooking, housing loan or finance, etc., have also increased to a great extent, which, have become compelling for each of the real estate companies to prioritize to make necessary provisions for backward, horizontal and forward linkage from land, power, gas, financial supply to apartment handover, registration, etc., so that customers of various segments can afford quality apartments within their budget and expectation level. So, it is evident that the demand is still higher than supply in this industry. To mitigate this gap an effective supply chain is required.

*Dr. Surajit Sarbabidya, Professor, Department of Business Administration, School of Business, Britannia University, Comilla, Bangladesh, **Email:** surajitsarbabidya@gmail.com

But the prior research findings from different industries have been always been found directly related to the REI of Bangladesh. However, they are almost same in case of SCM performance of any industry. Keeping this research gap into consideration the present study motivates to investigate and know which aspects of supply chain management can effectively contribute in the development of emerging REI of Bangladesh so that the concerned can be recommended to take appropriate policy measures and actions. In this connection, effective management of SCM may be an approach for the growth of the Real Estate Industry of Bangladesh.

Some of the previous papers adopted various qualitative frameworks or models while others focused on individual variables as factors of SCM. From that perspective, the current paper is unique because by using the Principal Component Analysis (PCA) on the individual variables this study found five important components of SCM which have direct influence of the REI of Bangladesh. The significance of the identified components on the SCM of the REI was verified and proved through multiple regression analysis.

But the current study is not free from limitations. From the intensive effort during the collection of secondary data, it has been seen that there is acute scarcity of research works on the SCM of the REI from Bangladesh perspectives. Some of the past studies have not come into a conclusion with the concrete and exhaustive list of necessary factors which could may positively affect and ensure effectiveness and efficiency of the supply chain of the REI of Bangladesh. However, by citing the findings of the research papers similar to the subject matter an empirical study has been endeavored later on to draw Bangladesh scenario. So, there is a research gap which can be mitigated by undertaking an extensive primary survey. To fill out such knowledge gap left out by the previous papers, the present study investigates the research question: “Is the growth of the Real Estate Industry of Bangladesh dependent on effective and efficient Supply Chain Management Performance or not?” However, from the context of the current research question the following hypothesis has been developed to exhibit the appropriate answer:

$H_{0:}$ Growth on the Real Estate Industry of Bangladesh is not dependent on effective and efficient Supply Chain Management Performance.

H_a: Growth on the Real Estate Industry of Bangladesh is dependent on effective and efficient Supply Chain Management Performance.

From the light of the above hypothesis, the principal objective of this study is to investigate the relationship between the factors of SCM performance and the growth of the REI of Bangladesh with special reference to readymade apartments marketing companies.
This paper is organized with the various sections. Section 1 deals with introduction, Section 2 focuses on the background of REI in Bangladesh, Section 3 contains the theoretical framework of Supply chain management & performance, business growth; Section 4 portrays the literature review, Section 5 defines the research problem, Section 6 goes with the methodology of the study, Section 7 exhibits the findings and analysis, and Section 8 draws a constructive conclusion.

2. Background of REI in Bangladesh

The construction of building in Bangladesh for selling flats or apartments on commercial basis in compliance with the necessary rules and regulations has started with the formation of the formal body of the Real Estate & Housing Association of Bangladesh (REHAB) in the year 1991. Since then such endeavors gradually started to grow as an industry popularly known as REI. The statistical figures indicate the growth of this industry with the 11 REHAB members in 1991 and 1151 in 2016 (REHAB website). In addition to the REHAB members, there are many such companies which are engaged in constructing building for the purpose of selling apartments though they are not within the supervising authority of the REHAB to control and ensure their quality, reliability, service, trustworthiness, etc. As a result, the stable growth of this industry is sometimes at question because the buyers of apartment selling real estate companies without REHAB membership may be affected due to unprofessional practice like poor quality, lack of commitment, legal issues, etc. Even though the said limitations, this industry is growing further because of the emergence of the important supply chain stakeholders like developers of land, apartment, roads, buildings, service providers, architectural firm, interior designers, security companies, banks, house building finance companies, logistic support providers, power and gas suppliers, home appliances, etc.

3. Theoretical Framework

3.1 SCM

Supply chain management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements (Simchi-Levi et al., 2008). It is a dynamic process to ensure the constant flow of information, materials, and funds across multiple functional areas both within and between chain members (Jain, Wadhwa and Deshmukh, 2009).

3.2 SCM Performance

A good number of studies (Droge et al., 2004; Cousins and Menguc, 2006; Das et al., 2006; Subramani, 2004) found significant relationship between effective and efficient performance of supply chain with those of mutual understanding, trust or commitment, long-term relationships, shared visions and goals, information sharing, profit and risk sharing, flexibility, lead time, innovation, etc. Whitten et al. (2012) defined supply chain performance as the ability of the supply chain to provide products and services of appropriate quality in specific quantities and at the appointed time, and minimize the total cost of products and services to the final customer in the supply chain. Barrow (2013) advocated for an efficient supply chain to achieve both cost leadership and service leadership. Tseng and Chiu (2013) adopted the performance prism framework to have a much more comprehensive view of different stakeholders (investors, customers, employees, regulators and suppliers) than other frameworks. Supply chain performance is the ability of the supply chain to deliver the right product to the correct location at the appropriate time at the lowest cost of logistics (Zhang and Okoroafo, 2015).

3.3 Business Growth

Industrial growth appears to be driven by the growth in the number of new firms (Rajan and Zingales, 1999). Kruger (2004) defined business growth in terms of revenue generation, value addition, and expansion in terms of volume of the business. Gilbert et al. (2006) highlighted business growth as a function of the decisions that an entrepreneur makes, like how to grow internally or externally and where to grow in domestic market or international market. Some countries use turnover of the business to determine the size of an enterprise, whereas some use fixed investment or the number of employees (Lokhande, 2011), sales volume, and worth of assets (Rahman, 2001).

4. Literature Review

Relationship between the efficient performance of a supply chain and the development of an industry like real estate has been evident in the years of research literature.

From the secondary research literature it is exhibited that the supply chain members may coordinate by joint consideration of the system wide costs (Haq and Kannan, 2006; Wu and Ouyang, 2003; Gurnani 2001), sharing cost and price information (Boyaci and Gallego, 2002; Piplani and Fu, 2005). Harrison and Hoek (2005) and Childerhouse, Lewis, Naim and Towill (2003) found that management of a smooth material flow is a key factor in achieving superior supply chain performance. Again Mello and Stank (2005) found that organizational capability and top management supports are essential for an effective SCM. Their findings indicated that four types of managerial support are needed to achieve best SC success which are top management support, broad-based functional support, channels support and infrastructural/governance support. Few more research works (Robinson and Malhotra, 2005; Wouters, 2009) clearly support the need for a performance measurement system taking the holistic picture, including the human side and organizational issues.

According to Kurata and Num (2010), manufacturers and retailers in a supply chain are always looking for practical after-sales policies that will permit them to enhance customer satisfaction levels. Ou, Liu, Hung and Yen (2010) showed that customer-firm-supplier relationship management improves operational performance and customer satisfaction. Quayle (2006) states that customer service from the suppliers subject to demand forecasting, service levels, order processing, parts/service support and aftermarket operations act as one of the most influencing factors of effective and efficient supply chain performance.

According to Othman and Ghani (2008), just in time (JIT) in supply chain practices can improve schedule for delivery, can eliminate the waste, and make close collaboration, rationalization and progress of effective suppliers. Duclos et al. (2003) identified six components of supply chain flexibility which have greater impact on SCM performance. These are namely operations system flexibility, market flexibility, logistics flexibility, supply flexibility, organizational flexibility and information systems flexibility. Tachizawa and Thomsen (2007) conclude that there are two main strategies that could be employed at supply chain level in order to increase the flexibility of a supply chain: improved supplier responsiveness and flexible sourcing. Chan and Chan (2010) and Corinna (2012)

demonstrated with the help of their industrial case studies, that a quick and speedy adaptability to the environmental uncertainties makes a supply chain more flexible.

Importing raw materials, components or products increases the dependence on suppliers (Lockamy and McCormack, 2010), and some risks are identified such as culture, language, foreign exchange rate, regulations, quality, political and economic stability, and transportation delays (Canbolat et al., 2008). An important point according to Canbolat, Gupta, Matera and Chelst (2008) is outsourcing, which is significant in the supply chain management for the opportunities and risks that it offers. Steward, Wu, and Hartley (2010) found that supplier performance is higher when the supply manager perceives trust and satisfaction on the part of the supplier's account executive. A successful logistics network can reduce entire supply chain costs, including manufacturing and procurement costs, inventory handling costs, facility costs (fixed costs), labour cost and transportation costs (Simchi-Levi, Kaminisky and Simchi-Levi, 2000). Meier, Williams and Singley (2004) found that a logistic capability is important for SCM performance. The capabilities include ships materials according to target date, provide reliable delivery, possess broad geographic delivery capabilities, achieves accuracy in shipments and knowledgeable in logistics.

Budiman (2004) found that supply fluctuation was due to capacity adjustment lead time, production lead time, order processing delay and order wait time. Building from Simatupang and Sridharan (2005) suggest that supply chain performance criteria should include fulfillment, inventory measures and responsiveness measures. Zhou and Benton (2007) emphasized on the delivery performance defining by on-time delivery, perfect order fulfillment rate and delivery reliability/dependability for effective supply chain management performance. Delivery reliability is especially important to companies that are linked together in a supply chain (Mohanty and Deshmukh, 2006).

The recent trends in intelligent wireless web services have proved enhancement in the mobile real time supply chain coordination (Saroor et al., 2009). Study by Hazen and Byrd (2012), support this by concluding, use of IT will help logistics service provider to improve their productivity. In order to make the supply chain competitive, a necessary first step is to acquire a clear understanding of supply chain concepts and be willing to openly share information with supply chain partners (Thatte, 2007).

Mehrjerdi (2009) found trust as an important factor in building relationship and improved decision making among supply chain members. Supply chain member's commitment is very vital for increasing the performance of supply chain in the countries that are developing (Bianchi and Saleh, 2010). Coordination in decision making in supply chain management is cause of reducing inventory cost, reducing information asymmetry improves customer service and also cause to improve the efficiency of replenishment system (Petersen et al, 2005).

Yee et al., (2004) said that it is significant not only to focus on inter-firm collaboration and relationships between two independent business units but also to take into consideration other members in the supply network. Successful collaborative partnership in supply chain offers many positive outcome such as minimizing costs, improve service efficiency and effectiveness, improve revenue and allow greater operational flexibility (Gimenez and Ventura, 2005; Richey et al. 2010).

Relationship with suppliers is based on production, personal, and or symbolic networking that will turn on strategic alliances (Hines, 2004), allowing the information sharing, risk sharing, obtaining mutual benefits and coordinating plans, permitting the improvement of the supply chain. According to Yushan and Cavusgil (2006), changes in the market create sensible companies regarding firm-supplier relationship. While Klein (2007) examined the supply chain management relationships between service providers and clients, and focuses on the impacts of the provider's information exchange behaviour and both parties' level of trust.

The above findings of the numerous research studies exhibit a good number of factors influencing the SCM performance of many businesses. However, only a very few of these studies became successful in answering to such research question to enquire whether growth on the REI of Bangladesh is dependent on effective and efficient SCM Performance or not. An affirmative answer to the raised question may be considered as a hypothesis which later on may be statistically proved on the basis of the primary data.

5. Methodology of the Study

This research paper has been prepared through the collection of both primary and secondary data and their analyses. The primary data of the study have been collected during August to October 2016 in Bangladesh with the sample size of 100 employees of five real estate companies in Bangladesh using random sampling method through a structured and self-administered questionnaire based extensive survey comprising of open-ended and non-forced, balanced and odd numbered non-comparative itemized questions using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) while the secondary data have been collected from the updated research papers and articles published in the referred journals relevant to the subject matter of the study. From the literature review 20 factors of effective supply chain management have been identified as variables which are exhibited in the **Table 1** from v1 to v20.

Table 1: Identification of Variables

Code	Items	Sources
v1	Cost	Boyaci and Gallego 2002; Gurnani 2001; Huq et al. 2006; Piplani and Fu 2005; Wu and Ouyang 2003
v2	Material flows management	Childerhouse, Lewis, Naim and Towill, 2003; Harrison and Hoek, 2005
v3	Management support	Mello and Stank, 2005; Robinson and Malhotra, 2005; Wouters, 2009
v4	Customer satisfaction	Kurata and Num, 2010; Ou, Liu, Hung and Yen, 2010; Simchi-Levi et al., 2003
v5	Customer service	Quayle, 2006
v6	Customer responsiveness	Othman and Ghani, 2008
v7	Flexibility	Chan and Chan, 2010; Corinna, 2012; Duclos et al., 2003; Tachizawa and Thomsen, 2007
v8	Material sourcing	Canbolat et al., 2008; Lockamy and McCormack, 2010
v9	Supplier performance	Steward, Wu, and Hartley, 2010
v10	Logistics Management	Cousins, P. D. and Menguc, B. 2006; Das, A., Narasimhan, R. and Talluri, S. 2006; Droge, C., Jayaram, J., Vickery, S.K., 2004; Meier, Williams and Singley, 2004; Simchi-Levi, Kaminisky and Simchi-Levi, 2000; Subramani, M., 2004
v11	Inventory Management	Budiman, 2004; Simatupang and Sridharan, 2005
v12	Delivery performance	Mohanty and Deshmukh, 2006; Zhou and Benton, 2007
v13	Information Technology	Hazen and Byrd, 2012; Saroor et al., 2009
v14	Information Sharing	Thatte, 2007
v15	Trust	Mehrjerdi, 2009
v16	Commitment	Bianchi and Saleh, 2010
v17	Coordination	Petersen et al, 2005
v18	Collaborative Relationship	Gimenez and Ventura, 2005; Richey et al., 2010; Yee et al., 2004
v19	Relationships with	Hines, 2004; Yushan and Cavusgil, 2006
v20	Relationships with Customers	Klein, 2007

Source: Literature Survey

From the results of the reliability, validity and factor analysis based on the field survey, the following results have been found:

5.1 Reliability Analysis

Table 2: Reliability Analysis

Number of variables	Cronbach's Alpha	Acceptable Value	Reliability Status
21	.870	>..7	High

From the above Table 2 the reliability of the study has been found high since the test result of the Cronbach's Alpha using 21 variables including 20 independent variables and 1 dependent variable shows the value as .870. Since the value is greater than 0.7, the study is highly reliable.

5.2 Validity Analysis

Table 3: KMO and Bartlett's Test

Name of Test		Test Score/Result	Acceptable Value	Validity Status
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.757	Good	Significant
Bartlett's Test of Sphericity	Approx. Chi-Square	879.944	Greater than the table value	Significant
	Df	190		
	Sig.	.000		

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy validates that the identified variables affect supply chain management performance. The above **Table** exhibits that the value of KMO is .757 which is 'good' or, 'middling' (Kaiser, 1974) suggesting the adequacy of the sample size for the factor analysis.

From the results of the **Bartlett's Test of Sphericity** in the above **Table 3**, it is seen that with 190 degrees of freedom the approximate chi-square statistics is 879.944 which is greater than the table value. This shows that the result of Bartlett's test of sphericity is significant suggesting that the population was not an identity matrix. Therefore, the Bartlett's Test of Sphericity is significant.

6. Findings and Analysis

6.1 Factor Analysis

The **Table 4** exhibits five components of supply chain management performance for REI with the eigen values greater than 1.0 using the factor loading of 0.50 as the cut-off point and cumulative proportion of **63.990**% variance.

From the findings of this study through **Table 4**, it is evident that supply chain management performance of the growth of the REI of Bangladesh can be ensured because of the five reasons of SCM performance:

The Component 1 contains 5 (five) variables from v8 to v12 which exhibits the significant impact of the SCM performance on the REI of Bangladesh. Since, all these variables are related to the continuity of the material supply from the sourcing to delivery through suppliers, logistic and inventory system, the component can be labeled as 'Supply continuity'.

Table 4: Component Loadings

Name of Components	Variables	Component Loading*	Eigen value**	Component Interpretation (% of Variance Explained)**
Component 1: Supply continuity	v8: Material sourcing	.581	5.630	28.150
	v9: Supplier performance	.672		
	v10: Logistics Management	.859		
	v11: Inventory Management	.890		
	v12: Delivery performance	.786		
Component 2: Trustworthy and committed relationship	v15: Trust	.535	2.436	12.182
	v16: Commitment	.743		
	v17: Coordination	.657		
	v18: Collaborative relationship	.624		
	v19: Relationships with suppliers	.687		
	v20: Relationships with customers	.729		
Component 3: Cost, Material and Management Support	v1: Cost	.814	2.137	10.686
	v2: Material flows management	.863		
	v3: Management support	.749		
Component 4: Customer Orientation	v4: Customer satisfaction	.654	1.383	6.916
	v5: Customer service	.771		
	v6: Customer responsiveness	.620		
	v7: Flexibility	.537		
Component 5: Sharing updated information	v13: Information Technology	.646	1.211	6.057
	v14: Information sharing	.783		
			Total Variance	**63.990**
Extraction Method: Principal Component Analysis. **Rotation Method:** Varimax with Kaiser Normalization. a. Rotation converged in 6 iterations				

Source: Field Survey

The Component 2 contains 6 (six) variables from v15 to v20 which exhibits the significant impact of the SCM performance on the REI of Bangladesh. Since, all these variables are related to the relationship management of the supply chain covering the relationship variables like trust, commitment, coordination, collaborative relationship, relationships with suppliers and customers, etc., the component can be labeled as 'Trustworthy and committed relationship'.

The Component 3 contains 3 (three) variables from v1 to v3 which exhibits the significant impact of the SCM performance on the REI of Bangladesh. Since, all these variables are related to the Cost, Material and Management Support of the supply chain covering the management aspects of the cost, material flow and management support, the component can be labeled as 'Cost, Material and Management Support'.

The Component 4 contains 4 (four) variables from v4 to v7 which exhibits the significant impact of the SCM performance on the REI of Bangladesh. Since, all these variables are related to the Customer Orientation of the supply chain covering the satisfaction, service,

responsiveness and flexibility of customers, the component can be labeled as 'Customer Orientation'.

The Component 5 contains 2 (two) variables from v13 and v14 which exhibits the significant impact of the SCM performance on the REI of Bangladesh. Since, all these variables are related to the Information Management in the supply chain covering the management issues of the information technology and information sharing, the component can be labeled as 'Sharing updated information'.

6.2 Multiple Regression Analysis

Multiple regression analysis has been used to examine whether effective and efficient performance of supply chain management can ensure the growth of the Real Estate Industry of Bangladesh or not.

The dependent variable (effective and efficient performance of supply chain management) has been regressed against each of the 20 identified independent variables in the Table 1.

The following **Table 5** exhibits the results of the regression analysis. To predict the goodness-of-fit of the regression model, the Multiple Correlation Coefficient (R), Coefficient of Determination or, Square Multiple Correlation Coefficients (R^2), Adjusted R^2, F ratio and t-values with significance have been examined.

Table 5a: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.852[a]	.725	.711	.42229

a. Predictors: (Constant), REGR Component 1: Supply continuity, REGR Component 2: Trustworthy and committed relationship, REGR Component 3: Cost, Material and Management Support, REGR Component 4: Customer Orientation, REGR Component 5: Sharing updated information

In the Table 5a: Firstly, the multiple correlation coefficients (R) of 20 independent variables (X_1 to X_{20}) on the dependent variable (effective and efficient management of supply chain i.e., SCM) of the REI of Bangladesh, or Y_{REI}) is 0.852, which showed that the growth of the REI of Bangladesh (REI) has positive input from the 20 independent variables of effective and efficient management of supply chain (SCM). In other words, the R value 0.852 shows 85.2% multiple correlation coefficients which means that there is 85.2% correlation between the predictors or 20 independent variables of SCM and the dependent variable (REI).

Secondly, the Square multiple correlation coefficients (R^2) is 0.725, suggesting that more than 72.5% of the variation or variance in the dependent variable (REI) has been explained by the 20 predictors or independent variables of the SCM. This meets the assumption of non-zero variance based on the fact that the R^2 value the variance in the predictor values, which in this case is not equal to zero.

Thirdly, the adjusted R^2 value 0.711 is ideal to generalize the model well because this value is close to R^2 value with a small difference of 0.014 (0.725 – 0.711). This means that if the model were applied to the population, it would account for 1.4% less variance in outcome.

In Table 5b: ANOVA[a]

Firstly, the F ratio is 49.602, which is highly significant ($p<0.001$) and this means that the model significantly improves the ability to predict the outcome variable. In this table, the p value is shown as 0.000 which is less than 0.05 indicating the model has a significant fit to the overall data.

Table 5b: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	44.227	5	8.845	49.602	.000[b]
	Residual	16.763	94	.178		
	Total	60.990	99			

a. Dependent Variable: SCMP

b. Predictors: (Constant), REGR Component 1: Supply continuity, REGR Component 2: Trustworthy and committed relationship, REGR Component 3: Cost, Material and Management Support, REGR Component 4: Customer Orientation, REGR Component 5: Sharing updated information

So, the regression model achieved a satisfactory level of goodness-of-fit in predicting the variance of REI in relation to the 20 predictors or independent variables of the SCM, as measured by the above mentioned R, R^2, Adjusted R^2 and F ratio. In other words, at least one of the 20 predictors or independent variables of the SCM is important in contributing to the growth of the REI of Bangladesh.

In **Table 5c:**

The application of the b-values in the multiple regression model equation ($Y_{REI} = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5$ Or, = 2.990 + .404 + .389 + 0.029 + 0.167 + 0.322**)** interprets this model to mean that for every increase of one unit in Component 1, assuming the effects of Component 2, Component 3, Component 4, and Component 5 be held constant, growth of the REI of Bangladesh would increase by 0.404. Likewise, should the effects of other components be held constant, a single unit increase in Component 2 would result in a 0.389 increase in growth of the REI of Bangladesh. Similarly, being other components held constant a single unit increase in Component 3, Component 4, and Component 5 would lead to a 0.029, 0.167 and 0.322 increase respectively in growth of the REI of Bangladesh.

Table 5c: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.990	.042		70.805	.000
Component 1: Supply continuity	.404	.042	.514	9.512	.000
Component 2: Trustworthy and committed relationship	.389	.042	.495	9.162	.000
Component 3: Cost, Material and Management Support	.029	.042	.037	.688	.493
Component 4: Customer Orientation	.167	.042	.213	3.936	.000
Component 5: Sharing updated information	.322	.042	.411	7.592	.000

Since the beta values are the standardized versions of the b-values and are directly comparable, these values may be used to infer regarding the relative importance of each predictor or independent variables to the model. In other words, the beta coefficients could be used to explain the relative importance of the 20 dimensions (independent variables) in contributing to the variance in the growth of the REI of Bangladesh (REI i.e., dependent variable). As far as the relative importance of the 20 SCM dimensions is concerned, Component 1: (Beta=0.514) followed by Component 2: (Beta=0.495), Component 5: (Beta=0.411), Component 4: (Beta=0.213) and Component 3: (Beta=0.037) are all important in the growth of the REI of Bangladesh.

Again, since there are more than one predictors (independent variables), the magnitude of the t-value in conjunction with the significance has been considered to assess the overall contribution to the model. Based on the decision rule “the smaller the significance value and the greater the t-value, the greater the contribution of the predictor”, it is seen that Component 1: (t=9.512) followed by Component 2: (t=9.162), Component 5: (t=7.592), Component 4: (t=3.936) and Component 3: (t=.688) are all significant predictors or independent variables of SCM performance on the growth of the REI of Bangladesh. In this regard, from the t-values it can be also concluded that Component 1 has a greater impact on the outcome (i.e. REI) than Component 2, Component 5, Component 4 and Component 3.

In summary, it can be stated that the 5 components of SCM can bring 63.990% variance in the growth of REI of Bangladesh. Again the higher values of multiple correlations coefficient *r* is 85.2%, F is 49.602, Beta and t test values all exhibit positive and significant result which all underlying dimensions are positive and therefore are significant. Thus, the result of multiple regression analysis rejects the null hypothesis (H_0) that “Growth on the REI of Bangladesh is not dependent on effective and efficient SCM Performance” and proves or accepts the alternative hypothesis (H_a) that “Growth on the REI of Bangladesh is dependent on effective and efficient SCM Performance”. So, there is a relationship as expected.

7. Conclusion

The present study revealed that there is necessity to improve the performance of the SCM so that continuity of quality and sufficient supply of construction, decoration and other raw materials in the most cost effective manner can be ensured by fulfilling the rising demand of the readymade apartments.

Sarbabidya

The findings of the reviewed literature represent the influence of SCM performance factors in the growth and development of varied industries. However, each study focuses on their unique findings which are not always directly related to the SCM performance of the REI of Bangladesh. Moreover, these studies focused either one or some aspects other than the complete subject matter of the current study. For example, the findings of the previous studies on the variables like v5, v6, v9, v15, v16, v17, v20, etc., were inadequate to properly exhibit the performance of SCM on the REI of Bangladesh. So, the previous papers did not exhibit the factors of SCM in such constructive and compact manner. Though some of the past papers adopted factor analysis, the result of such analysis were not verified in each case with inferential statistics like multiple regression analysis. From this perspective, the present paper is unique for its compliance with the reliability and validity test criterion.

The new findings of this paper are that 5 (five) factors namely i) Supply continuity including material sourcing, supplier performance, logistics management, inventory management, delivery performance; ii) trustworthy and committed relationship emphasizing trust, commitment, coordination, collaborative relationship, relationships with suppliers, relationships with customers iii) Cost, assured material flow in time and management support; iv) customer orientation by ensuring customer satisfaction, customer service, customer responsiveness and flexibility; and v) sharing updated information with information technology can strongly enhance the growth of the REI of Bangladesh through SCM performance. The current paper will add further value into the area of research by emphasizing on the continuity of the material supply or delivery by adopting the appropriate logistics and inventory management approaches. At the same time, this paper suggests to develop trustworthy, committed, collaborative, and well-coordinated relationship with the suppliers and customers backed by cost effective management support. The paper advocates to utilize the benefits of the state-of-the-art technologies for shared and updated information so that satisfaction of the respective customers can be maximized through flexible and customized schedule and quantity of supply, prompt responsiveness and excellent service quality. Such initiatives may take the REI of Bangladesh to a long way with stable growth. It is also expected that the current paper may contribute in the research and academic development of supply chain management performance in the REI of Bangladesh through a systematic process of extensive literature review followed by the primary survey findings and analysis together with conclusive implications. Thus, the paper will enable the industry with necessary course of actions and new business models which will enable the academia in developing its theory based on proven practice.

The present study has been found very much significant from the results of higher reliability and validity scores. In practice if supply chain can ensure supply of quality raw material in sufficient quantity as per scheduled requisition from the real estate developers at reasonable cost with the top management support and updated information then REI players can ensure customer oriented sound, trustworthy and committed relationship with the target groups. Thus, the growth of the industry will be accelerated in one hand and employment with economic development at both micro and macro level will be fostered on the other hand by resolving land crisis and dwelling places for the rising population.

References

Thatte, AA 2007, 'Competitive advantage of a Firm through Supply Chain Responsiveness and Supply Chain Management Practices', Published PhD Dissertation. University of Toledo

Barrow, C. 2013, *The 30 Day MBA*, 3rd edn, London: Kogan Page

Bianchi, C. and Saleh, A. 2010, 'On Importer Trust and Commitment: A Comparative Study of two Developing Countries', *International Marketing Review*, Volume 27, Number 1, pp. 55-86

Boyaci, T. and Gallego, G 2002, 'Coordinating pricing and inventory replenishment policies for one wholesaler and one or more geographically dispersed retailers', *International Journal of Production Economics*, Volume 77, Number 2, pp. 95–111

Budiman, B. 2004, 'Optimal capacity adjusted for supply chain control', Unpublished doctoral dissertation, Massachusetts Institute of Technology, MIT

Canbolat, Y, Gupta, G, Matera, S and Chelst, K. 2008, 'Analysing risk in sourcing design and manufacture of components and sub-systems to emerging markets' *International Journal of Production Research*, Volume 46, p. 5145

Chan, HK and Chan, FTS 2010, "Comparative study of adaptability and flexibility in distributed manufacturing supply chains", *Decision Support Systems*, Volume 48, Number 2, pp 331–341

Childerhouse, P, Lewis, J, Naim, M and Towill, DR 2003, 'Re-engineering a construction supply chain: A material flow control approach', *Supply Chain Management: An International Journal*, Volume 8, Number 4, pp. 395-406

Corinna, EN 2012, 'Improving value chain flexibility and adaptability in build-to-order environments', *International Journal of Physical Distribution & Logistics Management*, Volume 42, Number 4, pp. 318 – 337.

Cousins, PD and Menguc, B 2006, 'The implications of socialization and integration in supply chain management', *Journal of Operations Management*, Volume 24, Number 5, pp. 604-620

Das, A, Narasimhan, R and Talluri, S 2006, 'Supplier integration – finding an optimal configuration', *Journal of Operations Management*, Volume 24, pp. 563-82.

Droge, C, Jayaram, J, Vickery, SK 2004, 'The effects of internal versus external integration practices on time-based performance and overall firm performance', *Journal of Operations Management*, Volume 22, Number 6, pp. 557–573

Duclos, LK, Vokurka, RJ and Lummus, RR 2003, 'A conceptual model of supply chain flexibility', *Industrial Management & Data Systems*, Volume 103, Number 6, pp. 446-456.

Gilbert, BA, McDougall, PP and Audretsch, DB 2006, 'New venture growth: A review and extension", *Journal of Management*, pp. 32, 926

Giménez, C and Ventura, E 2005, 'Logistics-production, logistics-marketing and external integration: Their impact on performance', *International Journal of Operations and Production Management*, Volume 25, Number 1, pp. 20-38

Gurnani, H 2001, 'A study of quantity discount pricing models with different ordering structures: order coordination, order consolidation, and multi-tier ordering hierarchy', *International Journal of Production Economics*, Volume 72, Number 3, pp. 203–225

Haq, N and Kannan, G 2006, 'Design of an integrated supplier selection and multi echelon distribution inventory model in a built-to-order supply chain environment', *International Journal of Production Research*, Volume 44, Number 10, pp. 1963–1985

Harrison, A and Hoek, RV 2005, *Logistics management and strategy*, 2nd edn, UK: Prentice Hall

Hazen, BT and Byrd, TA 2012, 'Toward creating competitive advantage with logistics information technology', *International Journal of Physical Distribution & Logistics Management*, Volume 42, Number 1, pp. 8-35

Hines, T 2004, *Supply chain strategies: Customer driven and customer focused*, Oxford: Elsevier

Jain, V, Wadhwa, K and Deshmukh, SG 2009, 'Select supplier-related issues in modelling a dynamic supply chain: Potential, challenges and direction for future research', *International Journal of Production Research*, Volume 47, Number 11, pp 3013 –3039

Klein, R 2007, "Customization and Real Time Information Access in Integrated E-Business Supply Chain Relationships", *Journal of Operations Management*, Volume 25, pp. 1366-1381

Kruger, ME 2004, *Entrepreneurial theory and creativity*, University of Pretoria. Viewed June 19, 2013 <http://upetd.up.ac.za/thesis/available/etd-08242004145802/unrestricted/02chapter2.pdf.>

Kumar, K, Rajan, R and Zingales, L 1999, 'What determines firm size?', *NBER Working Paper 7208*, Cambridge MA: National Bureau of Economic Research

Kurata, H and Nam, SH 2010, 'After-sales service competition in a supply chain: Optimization of customer satisfaction level or profit or both?', *International Journal of Production Economics*, Volume 127, pp. 136-146.

Lockamy, A and McCormack, K 2010, "Analysing Risks in Supply Networks to Facilitate Outsourcing Decisions', *International Journal of Production Research*, Volume 48, pp. 593–611

Lokhande, M 2011, "Financial inclusion: options for micro, small and medium enterprises", *Synergy*, Volume 9, Number 2, pp. 39–50

Mehrjerdi, YZ 2009, 'Excellent supply chain management', *Assembly Automation Journal*, Volume 29, Number 1, pp. 52-60

Meier, RL, Williams, MR and Singley, RB 2004, 'Supply chain management: Strategic factors from the buyers' perspective', *Journal of Industrial Technology*, Volume 20, Number 2

Mello, JE and Stank, PT 2005, 'Linking firm culture and orientation to supply chain success', *International Journal of Physical Distribution & Logistics Management*, Volume 35, Number 8, pp. 542-554

Mohanty, R and Deshmukh, SG 2006, *Essentials of Supply Chain management*, 2nd edn, Jaico Publishers Mumbai India

Othman, R and Ghani, RA 2008, 'Supply Chain Management and Suppliers' HRM Practice', *Supply Chain Management: An International Journal*, Volume 13, Number 4, pp. 259-262.

Ou, CS, Liu, FC, Hung, YC and Yen, DC 2010, 'A structural model of supply chain management on firm performance', *International Journal of Operations & Production Management*, Volume 30, Number 5, pp. 526-545.

Petersen, KJ, Handfield, RB and Ragatz, GL 2005, 'Supplier integration into new product development: coordinating product, process and supply chain design', *Journal of Operations Management*, Volume 23, Number 3/4, pp. 371-88

Piplani, R and Fu, Y 2005, 'A coordination framework for supply chain inventory alignment', *Journal of Manufacturing Technology Management*, Volume 16, Number 6, pp. 598–614

Rahman, S 2001, 'A comparative study of TQM practice and organizational performance of SMEs with and without ISO 9000 certification', *International Journal of Quality & Reliability Management*, Volume 18, Number 1, pp. 35–49

REHAB Website Viewed on July 20, 2017 <http://www.rehab-bd.org/index.php?page=rehab_at_a_glance >

Richey, RG, Roath, AS, Whipple, JM and Fawcett, SE 2010, 'Exploring a Governance Theory of Supply Chain Management: Barriers and Facilitators to Integration', *Journal of Business Logistics*, Volume 31, Number 1, pp. 237-256

Robinson, CJ and Malhotra, MK 2005, 'Defining the concept of supply chain quality management and its relevance to academic and industrial practice', *International Journal of Production Economics*, Volume 96, Number 3, pp. 315–337

Saroor, J, Tarokh, MJ and Shemshadi, A 2009, 'Initiating a state of the art system for real-time supply chain coordination', *European Journal of Operations Research*, Volume 196, Number 2, pp. 635–650

Simatupang, TM and Sridharan, R 2005, 'An integrative framework for supply chain collaboration', *International Journal of Logistics Management*, Volume 16, Number 2, pp. 257-274.

Simchi-Levi, D, Kaminsky, P and Simchi-Levi, E 2008, *Designing and managing the supply chain: concepts, strategies, and case studies*, Boston, Mass, McGraw-Hill/Irwin

Simchi-Levi, D, Kaminsky, P and Simchi-Levi, E 2000, *Designing and managing the supply chain: Concepts, strategies, and case studies*, New York: Irwin-McGraw-Hill

Steward, D, Wu, Z and Hartley, J 2010, 'Exploring Supply Managers' Intrapreneurial Ability and Relationship Quality', *Journal of Business to Business Marketing*, Volume 17, p. 127

Subramani, M 2004, 'How do suppliers benefit from information technology use in supply chain relationships?' *MIS Quarterly*, Volume 28, Number 2, pp. 45-73

Tachizawa, EM and Thomsen, CG 2007, 'Drivers and sources of supply flexibility: an exploratory study', *International Journal Operations and Production Management*, Volume 27, Number 10, pp.1115–1136

Tseng, ML and Chiu, ASF 2013, 'Evaluating firm's green supply chain management in linguistic preferences', *Journal of Cleaner Production*, Volume 40, pp. 22-31.

Whitten, GD, Green, KW and Zelbst, PJ 2012, 'Triple-A supply chain performance', *International Journal of Operations & Production Management,* Volume 32, Number 1, pp. 28–48

Wouters, M 2009, 'A developmental approach to performance measures – results from a longitudinal case study', *European Management Journal*, Volume 27, Number 1, pp. 64–78

Wu, K and Ouyang, L 2003, 'An integrated single-vendor single-buyer inventory system with shortage derived algebraically', *Production Planning Control,* Volume 14, Number 6, pp. 555–561

Yee, CL and Tan, KH 2004, "A process and tool for supply network analysis", *Industrial Management & Data Systems*, Volume 104, Number 4, pp.355-363

Yushan, Z and Cavusgil, ST 2006, 'The effect of a supplier's market orientation on manufacturer's trust', *Industrial Marketing Management*, Volume 35, p. 405.

Zhang, H and Okoroafo, SC 2015, 'Third-party logistics (3PL) and supply chain performance in the Chinese market: a conceptual framework', *Engineering Management Research*, Volume 4, Number 1, pp. 38–48

Zhou, H and Benton, WC 2007, 'Supply chain practice and information sharing', *Journal of Operations Management*, Volume 25, Number 6, pp.1348–1365

World Population Prospects: The 2008 Revision, UN Population Division Viewed on October 17, 2017 <http://www.un.org/esa/population/publications/wpp2008/wpp2008_highlights.pdf>

World Population Prospects: The 2008 Revision, UN Population Division Viewed on October 17, 2017 <http://www.un.org/esa/population/publications/wpp2008/wpp2008_text_tables.pdf>