

Exploring the Relationship between Justice and Supply

Chain Process Integration through Linkage of Trust-An

Empirical Study of Pakistan

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Abstract:

The purpose of this study is to investigate the relationship among supply chain justices (procedural, distributive and interactional), trust and inter-firms supply chain process integration in mainland Pakistan. The study variables have considerable importance in the literature of supply chain management (SCM). The conceptual model comprises four hypotheses. Then hypotheses are tested via an empirical study in which data are collected from 170 manufacturers, distributors, suppliers and retailers of mainstream spectrum industries in Pakistan. We used exploratory factor analysis (EFA), confirmatory factor analysis (CFA) to test the validity and reliability of the measurement model, and structural equation modeling (SEM) to test the hypotheses. The findings delineate that supply chain justices can encourage process integration through developing trust among partners. Moreover, this study reveals interesting implications of supply chain justices, trust and processes integration that is useful to both academicians and practitioners.

Keywords: supply chain integration, process integration, supply chain justices, trust, Pakistan

1. Introduction

Supply chain processes integration refers to the degree to which firm can structure its operational processes, sharing of resources, rewards and risk across the organizations into a mutual consent in order to achieve competitiveness. Processes integration practice can helps supplier to understand the market environment and respond to changes rapidly (Yeung et al., 2009). Moreover, it integrates the processes of different functions within a company or different firms within a supply chain (Kanda & Deshmukh, 2008). With fact processes integration positively associated with the profitability of partnerships. While the extensive supply chain integration practices improve profitability of partnerships (Schloetzer, 2012).

Therefore, partners should standardize and coordinate the inter-firm processes in the supply chain (Zhou & Benton, 2007). In order to highlight the importance of supply chain integration researchers suggested that partner should invest in certain assets that facilitate the integration processes such as marketing, sales and inventory replenishment processes (Zhao et al., 2008; Heide and John, 1990). It has been observed that there are some barriers that occurred in the process integration of the supply chain that mainly effect on the performance. There are factors that create impede in the process integration such as lack of trust, lack of supply chain visibility, silo mentality and lack of knowledge (Chopra & Meindl, 2007). Lack of trust is the central issue in the supply chain process integration. This issue can be addressed through assurance of supply chain justice (fairness) among the partners of the chain. Literature has examined justice via three dimensions; procedural justice (PJ), distributive justice (DJ) and interactional justice (e.g. Luo, 2007; Cropanzano et al., 2007). Procedural justice refers to the fairness of the decision process; distributive justice refers to the equity of rewards commensurate with the effort expended; and interactional justice deals the aspects of the communication process that refer to the degree to which the partners perceive the exchange of information within the relationship as fair (Narasimhan et al., 2013). While trust is a willingness to rely on the exchange partner (Moorman et al., 1993).

The purpose of this study is to propose and demonstrate a model of the supply chain process integration, by incorporating supply chain justices i.e. procedural, distributive, and interactional and trust. This study intends to focus on Pakistan firms' attitude and behaviors towards justices and trust. How supply chain justices can develop trust among all stakeholders in the supply chain which in turn leads to establish and improve process integration? This study begins with an introduction. Sections 2, describe literature review,



conceptual framework and the research hypotheses. Section 3, research methodology, data analysis and discussion of results are presented in Section 4. Section 5, highlighted managerial implications, conclusions, limitations and direction for future research.

2. Literature reviews and research hypotheses.

This research is based on some previous theories to establish hypotheses with regard to the effect of supply chain justices on trust and processes integration. We introduce a conceptual framework in Figure 1, which illustrates the hypothesized relationships discussed in the consequent sections.



Figure 1. Conceptual Framework of Relationship between SC Justice and Processes Integration

2.1 The relationship between supply chain procedural justice and trust.

Procedural justice (PJ) means fairness about the policies and procedure to be used to handling the vulnerabilities between the partners. It refers that fairness regarding means which have been used to determine the outcomes in the relationship. Procedural justice has the stronger effects on the relationship as compared to the distributive justice, weaker partner has examined and evaluate the strong partner system of PJ which stimulate and strengthen the relationship intensity (Kumar, 1996).

PJ has a positive influence on the manager's belief to encourage the employees' initiatives and to share information with them (Wang & Nayir, 2009). Fair procedures and processes have been found that moderate the impact of negative reactions such as mistrust. The various dynamics of procedural justice have linked to a number of positive attitudinal and behavioral reactions as improved trust in management (Tyler & Lind, 1992). Particularly, recognizing the importance of Integrity ensures the fair and consistent application of moral and ethical procedure to generate equity and trust (Bews & Uys, 2002). However, the lack of procedural justice has likely to generate lower levels of trust. These kinds of perceptions have more impact as compared to distributive justice because the outcomes have been viewed to happening only once while procedures are consistent and considered to have a more enduring quality (Pillai et al., 2001). Therefore, we propose the following hypothesis.

H1: There is a positive relationship between supply chain procedural justice and trust in the context of process integration of firms in Pakistan.



2.2 The relationship between supply chain distributive justice and trust.

Adams (1965) defines distributive justice as equity; likewise ratios of outcomes to inputs are equal to the ratio of outcomes to inputs of others. In a broad approach contribution of inputs could be included education, skills, efforts, experience, intelligence and time, while outcome as a reward have to be considered as prestige, acceptance, recognition and pay. It refers as the equity of reward commensurate as efforts expanded in the relationship. In fact, appropriate rewards are an essential key to continuation of unconstrained, future efforts.

In the context of supply chain integration, It has been examined that distributive justice exists as the strong partners realizes that they have some responsibility to take care of their partner's profit and this has been recognized and measured that how the benefits and losses have been shared between the partners (Kumar, 1996). It argues that higher level of organizational outcome distribution will likely ensure the highest level of trust (Pillai et al., 2001), the manifestation of trust is based on the fulfillment of the obligations (Herriot et al.,1998) and fulfillment of obligations is positively related with generation of trust (Saunders & Thornhill, 2003). Therefore, we propose the following hypothesis.

H2: There is a positive relationship between supply chain distributive justice and trust in the context of process integration of firms in Pakistan.

2.3 The relationship between supply chain interactional justice and trust.

Interactional justice deals the aspects of the communication processes and degree to which partners perceives the exchange of information as fair in the relationship. It is the way to acquire the appropriate insights about the individual who are conducting the business and the organizations themselves (Narasimhan et al., 2013). It is the only justice dimension that is the best predictor of organizational performance (Wang et al., 2010). Moreover, interactional justice comprising two forms, namely interpersonal and informational justice. Interpersonal justice refers as individual reactions about the decision outcome while information justice refers as individual reactions about the procedures (Greenberg, 1990; Greenberg & Greenberg, 1993).

Interactional justice in which people have been treated has likely to generate the significant impact on the perceptions not only about the process, but also the moral obligations to treat everyone fairly, that reinforces the process and their levels of trust (Saunders & Thornhill, 2003). Therefore, we propose the following hypothesis.

H3: There is a positive relationship between supply chain interactional justice and trust in the context of process integration of firms in Pakistan.

2.4 The relationship between supply chain trust and processes integration.

Trust has gained significant importance and to become one of the top priorities of upholding the relationship among the supply chain partners (Yeung et al., 2009). Trust is a willingness to rely on the exchange partner (Moorman et al., 1993).

Trust encourages the supplier investment in the specific equipment and adoption of business process in the supply chain relationship (Sahay, 2003). There are several studies have been investigated that trust is the critical factor for the supply chain integration (Fynes et al., 2005; Sheu et al., 2006). Lack of trust is the main and single most important obstacle in the supply chain process integration (Forslund and Jonsson, 2009). It is described that trust has been positively affected the process integration (Forslund & Jonsson, 2007). Therefore, we propose the following hypothesis.



H4: There is a positive relationship between supply chain trust and processes integration of *Pakistan firms.*

3. Research design and methodology

3.1 Instrument design

The questionnaire included questions about the demographic profile of the companies, and questions related to the supply chain justices, trust and processes integration. Therefore, we surveyed the literature to identify valid measures for related constructs and adapted existing scales to measure supply chain justices i.e procedural and distributive (Narasimhan et al., 2013; Griffith et al., 2006), interactional (Narasimhan et al., 2013; Luo, 2007), trust (Kumar et al., 1995; Chen et al., 2011) and supply chain process integration (Wu et al., 2004; Lambert et al., 1998). Since the drawn scales from the literature were in English. So we used the English version questionnaire with minor modifications in mainland Pakistan, because the official language is English in Pakistan. All the items were measured on a seven-point-Likert scale ranging from strongly disagree to strongly agree (1=strongly disagree; 7=strongly agree).

3.2 Sampling and data collection

The data utilized to prove the hypotheses are described from the diverse spectrum of industries in Pakistan. The study sample units were consisted of a wide range of industries including electronics and communication, mechanical manufacturing (tractors), cement, foods, textile, agriculture (fertilizers and pesticide), petroleum, furniture, retail and tobacco. The companies taking part in the survey have regional, national and international operational domains. The survey was conducted from June to August 2014. The study respondents belong to the medium and large sized companies which are residing in major urban centers (i.e. Karachi, Sukkur, Dera Ghazi Khan, Multan, Sahiwal and Lahore) of Pakistan.

The survey provides the respondents an incentive for completing and returning the questionnaires. Therefore, two hundred fifty questionnaires were distributed initially, a total of 197 questionnaires was returned. Out of the 197 collected, 27 questionnaires were either incomplete or answers were found to be unreliable. Subsequent data analyses were conducted on the 170 usable questionnaires. The response rate was 78.80%. The profile of the useable respondents and their characteristics are listed in Table 1.

3.3 Construct development

Kaiser-Meyer-Olkin (KMO) applied to measure sampling adequacy and the Bartlett test of sphericity. The output shows KMO value of 0.905 with the significance of Bartlett's test at 0.000 level, and also indicates the data for exploratory factor analysis (EFA) fitting. We used maximum likelihood analysis for data reduction and Promax rotation with Kaiser Normalizations for clarifying the factors. Hence EFA was conducted by specifying five numbers of factors. The cumulative variance explanation reaches 75.017%. All the items have strong loadings >0.30 on the construct in the pattern matrix. Hair et al. (1998) supported this value. The results of EFA are shown in Table 2.



Table 1. Respondent profile (n=170)

Job Title General Manager Production Manager 8 4.7% (7) Job Title General Manager Production Manager 17 10.0% (3) Sales/Marketing Manager 33 19.4% (3) Financial Manager 36 21.2% (3) Sales Executive 28 16.5% (3) Experience 1-3 Year 45 26.5% (4) Hore than 12 Years 42 24.7% (3) More than 12 Years 42 24.7% (3) Nature of Ownership Sate Owned 18 10.6% (3) Private 151 88.8% (3) 25 Joint Venture 1 0.6% 14.7% (2) Industry Electronic & 25 14.7% (2) 11 General 11 6.5% (2) 14.7% (2) Venture 1 10.0% (2) 11 Foods 11 6.5% (2) 14.7% (2) Communication 17 10.0% (2) 10.0% (2) Venture 1 6.5% (2) 14.7% (2) Venturitre & Fixture <t< th=""><th>Demographics Variable</th><th>e Category</th><th>Sample</th><th></th></t<>	Demographics Variable	e Category	Sample	
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		Sales Executive	28	16.5%
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $		300-1000	10	5.9%
$\begin{array}{ c c c c c c c } \hline >3000 & 77 & 45.3\% \\ \hline \text{Nature of firms} & \text{Manufacturer} & 84 & 49.4\% \\ \hline \text{Wholesaler/Distributor} & 49 & 28.8\% \\ \hline \text{Retailer} & 17 & 10.0\% \\ \hline Supplier & 20 & 11.8\% \\ \hline \text{Operational Area} & \text{Regional} & 73 & 42.9\% \\ \hline \text{National} & 66 & 38.8\% \\ \hline \text{International} & 31 & 18.2\% \\ \hline \end{array}$		1000-3000	8	4.7%
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National6638.8%International3118.2%	Operational Area	Regional	73	42.9%
International 31 18.2%		National	66	38.8%
		International	31	18.2%



Table 2. Results of exploratory factor analysis	(СГА)
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Construct	Process	Supply	Procedural	Distributive	Interactional
items	integration	chain trust	justice	justice	justice
PI5	0.999				
PI4	0.935				
PI6	0.881				
PI3	0.832				
PI2	0.560				
PI1	0.550				
TST1		0.941			
TST2		0.883			
TST3		0.827			
TST4		0.785			
TST5		0.729			
TST6		0.538			
PJ3			0.682		
PJ2			0.607		
PJ1			0.562		
DJ4				0.851	
DJ3				0.842	
DJ2				0.662	
DJ1				0.618	
IJ2					0.661
IJ4					0.633
IJ3					0.602
IJ1					0.502

Extraction Method: Maximum Likelihood. Rotation Method: Promax with Kaiser Normalization. a. Rotation converged in 14 iterations. * PJ: procedural justice, DJ: distributive justice, IJ: interactional justice PI: processes integration, TST: trust.

3.3.1 Reliability analysis

Cronbach's alpha is used to evaluate the construct reliability (Flynn et al., 1990), with threshold value of 0.70 recommended by Hair et al. (2006). In our study all the constructs are higher than the minimum recommended critical value. As shown in Table 3, Cronbach's alpha values of the measures are above the minimum recommended critical value and ranged from 0.90 to 0.95. Therefore, the results demonstrate the highly reliable theoretical constructs of the study.

3.3.2 Unidimensionality

Confirmatory factor analysis (CFA) is used to establish unidimensionality. The CFA results of all measurement models have acceptable fit indices that prove unidimensionality of the constructs which can be seen from Table 4. Furthermore, the convergent and discriminant validities established in the subsequent section to solidify the extent of unidimensionality of the constructs.

3.3.3 Convergent and discriminant validity

Standardized factor loadings of all items in each construct a range from i.e. Supply chain



procedural justice (0.893-0.683), distributive justice (0.935-0.896), interactional justice (0.908-0.854), trust (0.932-0.669) and process integration (0.955-0.675), that exceed the minimum recommended level of 0.60 (Hair et al.,1998). The composite reliabilities (CR) range from 0.95 (distributive justice) to 0.82 (procedural justice) which also exceed the minimum required recommended level of 0.70. The average variance extracted (AVE) measure ranges from 0.83 (distributive justice) to 0.60 (procedural justice) which is better than the threshold value of 0.50 (Hair et al., 1998).

The average variance extracted (AVE) of each construct is greater than the variance shared with other constructs that can be seen in Table 3. That exhibited the discriminant validity of all scales is adequate. Moreover, all AVE exceeded 0.50, which indicates strong construct validity. In overall the measurement results are satisfactory and recommended that it is appropriate to proceed with the investigation and evaluation of the theoretical constructs.

Moreover, the higher value of AVE, CR and factor loading results show the adequate convergent validity of the measurement items. The results of the convergent validity test are also presented in Table 3.

Construct Items		Cronbach α	Item Total	Standardized	Composite	Variance
			Correlation	Factor	Reliability	Extracted
				Loadings	-	
	PI5	0.92	0.908	0.933	0.93	0.70
s	PI4		0.883	0.955		
ces ati	PI6		0.756	0.773		
roc	PI3		0.872	0.903		
int	PI2		0.765	0.757		
	PI1		0.502	0.675		
	TST1	0.91	0.559	0.932	0.92	0.66
	TST2		0.761	0.827		
H	TST3		0.832	0.893		
L	TST4		0.871	0.724		
	TST5		0.825	0.792		
	TST6		0.729	0.669		
	PJ3	0.90	0.801	0.893	0.82	0.60
РJ	PJ2		0.834	0.733		
	PJ1		0.766	0.683		
	DJ4	0.95	0.877	0.896	0.95	0.83
ſ	DJ3		0.904	0.896		
D	DJ2		0.886	0.935		
	DJ1		0.879	0.918		
	IJ2	0.95	0.823	0.908	0.93	0.77
ſ	IJ4		0.910	0.854		
Ī	IJ3		0.934	0.885		
	IJ1		0.879	0.875		

Table 3. Results of internal reliability and convergent validity tests

4. Data analysis and discussion of results

We used AMOS to analyze the data and demonstrate structural equation modeling (SEM),



which is a powerful multivariate analysis technique used to measure latent variables and investigate the causal relationship among variables. Particularly, SEM allows conducting confirmatory factor analysis (CFA) for theory development and testing. It is helpful and deemed a suitable tool to test the hypotheses in this study. The overall model fit indices are x2 =389. 94, df=207 (p-values=0. 00), GFI=0. 84, AGFI=0. 84, NFI=0. 92, CFI=0. 96, RMSEA=0. 042 indicating that model is acceptable with no substantive differences. The fit indices of structural model are presented in Table 4. Moreover the description of the model factor correlation matrix is given in Table 5.

Fit Index	Scores	Recommended cutoff values
Absolute fit Measures		
Minimum fit function chi-square (x2)	389.94 (p=0.00)	The lower, the better
Degree of freedom (d.f)	207	
(x2)/d.f	1.88	<5
Goodness-of-fit index (GFI)	0.84	>0.80
Root mean square residual (RMSR)	0.042	<0.05
Incremental fit measures		
Adjusted goodness-of-fit index (AGFI)	0.84	>0.80
Tucker-Lewis index (TLI)	0.95	>0.90
Normal fit index (NFI)	0.92	>0.90
Comparative fit index (CFI)	0.96	>0.90
Parsimonious fit measures		
Parsimonious normed fit index (PNFI)	0.752	The higher, the better
Parsimonious goodness-of-fit index (PGFI)	0.628	The higher, the better

Table 4. Fit indices for structural model

Table 5. Factor correlation matrix

Factor	DJ	PI	TST	PJ	IJ
DJ	1.000				
PI	0.550	1.000			
TST	0.621	0.498	1.000		
PJ	0.656	0.595	0.527	1.000	
IJ	0.630	0.555	0.493	0.602	1.000

Based on the given satisfactory fit indices of the models, hypotheses were tested by examining the estimated structural coefficient. All the proposed hypotheses are fully



supported by the results as shown in Table 6. The path between supply chain procedural justice and trust (β =0. 62), distributive justice and trust (β =0. 68), interactional justice and trust (β =0. 69), trust and processes integration (β =0. 58) are found significant and support H1, H2, H3 and H4 respectively.

Path	Hypotheses	Standardized	Standard	R2	t-value	p-value
		Co-efficient	Error			
Procedural justice => Trust	H1	0.62	0.70	0.38	10.27	p<0.00
Distributive justice =>	H2	0.68	0.65	0.46	12.07	p<0.00
Trust						-
Interactional justice=>	Н3	0.69	0.64	0.48	12.57	p<0.00
Trust						-
Trust => Processes	H4	0.58	0.95	0.34	9.23	p<0.00
integration						

Table. 6 Standardized parameter estimates of hypothesized paths

5. Managerial implications

The purpose of this study is to examine how supply chain justices i.e. Procedural, distributive and interactional improves process integration through developing trust among the supply chain partners. Data collected from 170 manufacturers, distributors, suppliers and retailers of Pakistan. We find that a higher level of justice mutually perceived by all parties is positively associated with a higher level of trust, which is devoted to supply chain activities by all parties. In turn, the higher level of trust contributes to improve process integration. The findings of this study provide new insight for the justice and supply chain management literature, and also have some practical implications for managers. First, supply chain justices mutually shared by all supply chain partners can contribute in the development of trust which energies the process integration. Second, it is important for supply chain manager to create justice atmosphere by incorporating the three dimensions of justice. Third, the results of this study indicate that each of the three justice types contributes to a fair and just atmosphere in the supply chain integration; in such an atmosphere firms will be more likely to develop trust which stimulates firms to involved in process integration, as well as it encourages higher level the process integration.

6. Conclusions, limitations and future research

We examined the supply chain justices' role in the development of trust and processes integration based on the sample of Pakistan supply chain firms. We verified that supply chain justices have directly contributed in the development of supply chain partners' trust, which in turn to improve the process integration.

This study encompasses several limitations which create a new paradigm for further research. First, the study sample units consist of various industries. Therefore, it is difficult to generalize results to the specific industries. Second, there is not a differentiation concerning the size of the firms involved in this study. Thus, results may differ for SMEs and large size firms. Third, results reported in this paper from a Pakistan. Therefore, results may differ for firms located in different areas which are operating in different cultural, environmental and political conditions. Therefore, future research might be conducted to examine the justices' impact on trust in the specific industries.



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