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Society Exchange Characteristics, Service Quality, and Relationship Quality between Hospital and Its Suppliers

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Abstract- **Successful supply chain management provides an enterprise with a new competitive advantage. However, successful supply chain performance is based on a high level of trust and strong commitment among supply chain partners. In the current study, we attempted to integrate two types of theories of social exchange and service quality by proposing an integrated model that influences the factor to trust and commitment. We then applied structural equation modeling to test the model. The study included respondents comprising medical device procurement staff working in hospitals within Taiwan. A total of 500 questionnaires were distributed; 316 completed questionnaires were received. The study results indicated that a hospital's trust in its supply chain partner is highly associated with commitment. The results revealed that communication, partner's reputation, and perceived benefits had a positive effect on trust. Service quality was also determined to have a positive effect on trust and commitment. This result should provide reference for a hospital and its relationship with suppliers, which helps monitor decision variables in the supply chain management of medical devices.**

Keywords— Social Exchange Theory, Trust, Commitment, Supply Chain Management, Structural Equation Modeling

1. Introduction

In the current era of global competition, enterprises continually improve to follow the trend and address challenges. Competing and cooperating through global competition can develop long-term competitive advantage, a common phenomenon that can enhance collaborative relationships [1]. Suppliers and buyers seek to build closer relationships with each other to improve the effectiveness and efficiency of their transactions. For example, combined information technologies that link the ordering, manufacturing, and inventory control systems of a supplier and a buyer can reduce waste and provide long-term sales gains, which in turn can avoid stock-outs. The medical device industry is a special industry. Because of the large number of devices produced and increasing supplying needs, a complete supply chain management (i.e., end-to-end management) is important. In addition, excellent relationship quality (trust and commitment) is the key factor for better partnership, rendering the cooperation steady and sustainable [2-3]. Consequently, both sides (supplier and buyer) can stand the test of time.

In the past, few studies have investigated the cooperation between organizations from the perspective of social exchange theory (SET). SET posits that instead of signing a contract, two organizations support each other by exchanging benefits. In other words, social exchange is a social interaction. During the interaction, two organizations will share the profits, valuable resources, and various activities, which benefit both sides. If the advantages are sufficiently appealing, then the exchange will turn into a long-term partnership [4]. Blau [5] indicated that the process of exchange is based on the reciprocity for both sides, and in the long run, trust will be built between the parties concerned. Furthermore, shared information, commitment, and trust between or among partners have become essential elements for supply chain integration [6-7] and performance [8] and successful supply chain implementation [9]. On the basis of the perspectives of SET and service quality, we conduct this study with the objective of investigating the factors that influence trust and commitment in a supply chain relationship. In addition, we examine the structural relationship between trust and commitment.

The remainder of this paper is organized as follows. A brief overview and the related literature on SET, service quality, and relationship quality are presented in the "Literature Review" section. Based on the critical literature review, we propose a theoretical framework and research hypothesis development for the medical device procurement staff. We explain in detail the source, sample, data, and data processing in the "Methods" section. Data analysis and results of structural equation modeling (SEM) are presented in the "Results" section. A discussion of our research

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work is presented in the "Discussion" section. Finally, a summary of our findings and directions for future research are presented.

2. Literature Review

2.1 Social Exchange Theory

Similar to the exchange relationships in economics, SET examines interpersonal interactions from the cost–benefit perspective. Although SET does not provide any specific advantage, it focuses on the invisible social costs and beneficial exchange, which are not regulated by any rules or treaty. Both exchange relationships and SET hypothesize that partial exchange occurs only when personal benefits are larger than the costs. The most significant difference between these two theories is that exchange relationships emphasize external benefits, whereas SET emphasizes intrinsic rewards [5, 10-12].

The concept of SET originated in the 1950s and was founded by Homans [4]. Since then, it has been expanded and defined by several sociologists and economists, with Thibaut and Kelly [12], Blau [5], and Emerson [13-15] being considered the other major developers. The views of each of these developers are as follows:

(a) Homans [4]: Homans' exchange behaviorism emphasizes that interpersonal interaction is a process. Both sides are involved in the process and they exchange valuable resources to meet each other's needs [16]. In an exchange relationship, people continue the interaction only when it is attractive; in particular, communication plays a vital role in the interaction.

(b) Thibaut and Kelly [12]: Thibaut and Kelly's exchange outcome matrix analyzes the exchange relationship between partners and quantifies interpersonal interaction. The exchange relationship is based on interactions and impacts resulting from both sides.

(c) Blau [5]: According to Blau's exchange structualism, trust is the most critical dimension. Because mutual benefit is sometimes not guaranteed in an exchange process, an individual needs to develop friendly relations with others to build trust. Other dimensions, such as conflict and commitment, also play an important role in maintaining an exchange structure.

(d) Emerson [13-15]: Emerson's exchange network stresses the role power plays in social exchange. In a partnership, relative dependence determines relative power. Relative power means that the parties involved in exchange can influence each other; when both sides have certain power, then they are able to influence others.

Thus, these four researchers [4-5, 12-15] have contributed to the development of SET. Social exchange is regulated by morality and obligation [17-18] and is on the basis of a long-term relationship. The rewards that an organization gain from social exchange depend on partner's trust, respect, attitude, and mutual benefit [17, 19]. Thus, studying cooperation between organizations based on social factors could be valuable. This paper presents trust-impacted SET to better understand the critical factors that affect a medical supplier's relationship. Although SET can be discussed from several perspectives, in this paper, we cover only the following social exchange characteristics: communication, partner's reputation, perceived benefits, fairness, and relationship tenure.

2.2 Service Quality

Zeithaml et al. [20] defined service quality as "the consequence of discrepancy between the customers' expectations and perceptions." Service has several features: inseparability, heterogeneity, intangibility, and perishability [21-22]. Service is invisible and is difficult to define and measure. Moreover, because customers are involved in a service process, service quality is affected by their opinion about the service level provided. Thus, compared with other economic activities, service quality is difficult to define and measure.

Parasuraman et al. [21] reviewed several studies on service quality and proposed a service quality model, namely the PZB model). The PZB model is considered the most comprehensive among service-quality-related models. According to this model, customers' perceived service (PS) could be measured by comparing PS quality and expected service (ES). When $ES \geqq PS$, perceived quality is satisfying or is the finest service. By contrast, when $ES > PS$, customers' satisfaction is low; that is, customers' expectation has not been met, and they are thus not satisfied with the service quality. The PZB model includes 10 dimensions: (1) reliability, (2) responsiveness, (3) competence, (4) access, (5) courtesy, (6) communication, (7) credibility, (8) security, (9) understanding/knowing, and (10) tangible. Parasuraman et al.[22] simplified these 10 dimensions [21] into 5—(1) tangibles, (2) reliability, (3) responsiveness, (4) assurance, and (5) empathy—and developed a 22-item scale called SERVQAL [23], designed to capture customers' expectation and their perception of service along these five dimensions.

2.3 Relationship Quality

Relationship quality refers to the faith customers have in sellers' honesty and ability on the basis of their previous service quality [24]. Smith [25-26] measured the relationship quality model by trust, commitment,

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and satisfaction. Relationship quality has been studied by several researchers using different dimensions: perceived quality of products and services, trust, and commitment [2-3]; satisfaction, commitment, and trust [25-29]. From these studies, it is obvious that although relationship quality dimensions are inconsistent, most researchers believed trust and commitment as two main dimensions [25-26]. Henning [30] indicated that satisfaction cannot be a relationship quality dimension. He believed that after the test of time, customers' satisfaction will gradually improve and eventually form a stable relationship. Although most business studies have focused on only trust and commitment [31], we investigated these factors from suppliers' perspective. Our definitions of trust and commitment are presented as follows:

2.3.1 Trust

Trust is the key to the success of a strategic alliance [32-33]. Trust is essential to building strong customer relations and improving market share [34]. Trust must be built before gaining customer loyalty [35]. Johnson and Grayson [36] classified trust as knowledge-oriented trust and emotion-oriented trust. Ybarra and Turk [37] reported trust between alliances as one of the critical success factors. Trust refers to the subjective belief that trading partners will fulfill obligations and engagements that positively affect each other [38]. To trust partners' honesty means that organizations believe that their partners are trustworthy and will faithfully meet obligations on contracts [38-39]. Moreover, to trust partners' goodwill signifies that the parties believe that their partners will not give up long-term benefits for private profit [24], and will not execute anything that has a negative effect on the relationship/business. In addition, Wong and Sohal [40] indicated that the cognition of trust toward trading partners is an important indicator in marketing relationships.

2.3.2 Commitment

Long-term commitment between both parties is important for maintaining a relationship [41]. Commitment to ongoing relationships among supply chain partners helps to increase effectiveness and efficiency [42-43]. Wong and Sohal [40] believed that trust and commitment are the most critical variables in the examination of relationship strength. In addition, trust and commitment are the most practical dimensions for measuring customer loyalty and future purchase intention. Commitment is a continuous implication or explicit promise of maintaining the relationship between trading partners [39].

2.4 Conceptual model and hypothesis development

This study was based on the conceptual model linking social exchange characteristics and service quality to trust and commitment in a supply chain relationship. In the following sections, the relationships of all variables in the model are discussed, followed by the development of hypotheses.

2.4.1 Social exchange characteristics and trust

Considering SET and other related literature, Homans [4] indicated that communication helps to build a smooth relationship. Effective communication between trading partners is the key to achieving common goals. If partners do not have adequate time for coordination, constructing a strong relationship is impossible [39, 44]. Etgar [45] found that "instant communication" increases trust among partners. Other researchers [37-38, 46] have also opined that building trust depends on proper communication. Kwon [47] noted that SET views communication as being influential in the trust between partners. Kwon and Suh [48] indicated that partner reputations have a significant and positive effect on the level of trust. Kwon and Suh argued that successful supply chain performance is based on a high level of trust and a strong commitment among the supply chain partners. Chang et al. [49] reported that the perceived benefits associated with SET have a positive influence on strategizing and trust [50]. Lin and Huang [51] researched individuals' behavior in groups and found that the fairness among individuals has a positive effect on trust. In addition, several studies [3, 39] have noted that shared values between partners could increase mutual trust in contractual relationships. Chao and Cheng [3] found that maintaining perceived benefits and communication of relationships between hospital and medical supplier results in both increased positive effects and trust [2], as well as higher commitment [3], and that communication has a positive effect on trust [2-3]. Therefore, in terms of hospital–supplier partnerships, mutual trust is likely to be incrementally constructed in accordance with social exchange characteristics (e.g., communication, partner's reputation, perceived benefits, fairness, and relationship tenure). Based on these discussions, we proposed the following five hypotheses:

H 1: *Communication has a positive effect on trust.*
H 2: *Partner's reputation has a positive effect on trust.*
H 3: *Perceived benefits has a positive effect on trust.*
H 4: *Fairness has a positive effect on trust.*
H5: *Relationship tenure has a positive effect on Trust.*

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2.4.2 Service quality and relationship quality

Crosby et al. [24] revealed that service quality is the key to achieving excellent relationship quality. Wong and Shohal [40] indicated that service quality has a positive effect on relationship quality. Therefore, we proposed the following hypotheses:

***H6:*** *Service quality has a positive effect on trust.*
H7: *Service quality has a positive effect on commitment.*

2.4.3 Trust and commitment

Because a well-trusted relationship has higher value, it would attract more customers to commit in the partnership. Commitment can be broken easily; therefore, organizations would only collaborate with partners they trust [3]. Thus, trust has become the key to commitment. Several studies have found a positive relationship between trust and commitment [9, 48, 52]. Trust is a major determinant of relationship commitment. No commitment is consummated unless the partners feel trusted [9]. Chao et al. [2] and Chao and Cheng [3] indicated that the level of commitment is strongly related to the level of trust. Therefore, we proposed the following hypothesis:

H 8*: Trust has a positive effect on commitment.*

This study combined research related to social exchange characteristics and service quality to investigate the effect of social exchange characteristics on trust and commitment. This study was conducted within hospitals in Taiwan, and it presents the trust and commitment pattern of hospitals and suppliers. Our operational framework is illustrated in Figure 1.
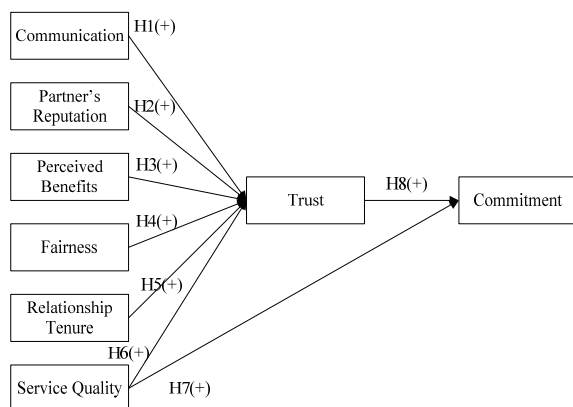
Figure 1. Operational framework

3. Methods

This study tested a conceptual model depicting the relationship among social exchange characteristics (i.e., communication, partner's reputation, perceived benefits, fairness, and relationship tenure), service quality, trust, and commitment in a medical device supply chain relationship. The model describes that social exchange characteristics influence trust in the medical device supply chain relationship, which in turn influences commitment. Service quality influences trust and commitment.

3.1 Instruments

This study had two main goals: first, to construct a theoretical model to predict and explain the trust and commitment between hospitals and suppliers; and second, to test the empirical model. The purpose of this study was to investigate the interrelation of the social exchange characteristics, service quality, trust, and commitment between hospitals and suppliers.

The questionnaires included social exchange characteristics (i.e., communication, partner's reputation, perceived benefits, fairness, and relationship tenure), service quality, trust, commitment, and general characteristics (i.e., gender, education, position, year of working, and level of hospital). The questionnaire measured social exchange characteristics. Scales for communication, partner's reputation, perceived benefits, fairness, and relationship tenure were adopted from previous study [2, 3, 9, 47, 48, 50]. Service quality scales in this study were adopted from Parasuraman et al. [21-23]. Trust and commitment scales in this study were adopted from previous study [2, 3, 24, 38, 39]. Respondents were asked to indicate their responses on a 5-point Likert scale ranging from 5 (strongly agree) to 1 (strongly disagree). We randomly ordered the items to reduce potential ceiling (or floor) effects that induce monotonous responses to items designed to measure the same construct. To ensure that the questionnaire was concise and understandable, we conducted an in-depth interview and a pilot study. The initial questionnaires were administered to five researchers who specialized in or were interested in the medical supply management field.

The initial questionnaire was then administered to 50 individuals who were medical device procurement staff (including managers) working in medical institutions. The value of construct reliability exceeded the acceptable value of 0.7 (communication, 0.928; partner's reputation, 0.917; perceived benefits, 0.878; fairness, 0.850; relationship tenure, 0.722; service quality, 0.915; trust, 0.878; and commitment, 0.825) through Cronbach's alpha. This implies that the scales used in this study were satisfactory in terms of measuring the constructs of interest. Based on the pilot study results, the questionnaire was revised two times. The final questionnaire included 48 items, with social exchange characteristics consisting of 12 items, service quality 22 items, trust 7 items, commitment 2 items, and general characteristics 5 items, as well as a series of demographic and self-reported usage items.

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3.2 Sample

To fulfill our objectives regarding the determination of specific factors that influence trust and commitment between hospitals and suppliers, we adopted mail and interview surveys. The study participants were medical device procurement staff (including executives) from hospitals in Taiwan. As a preliminary step, we contacted each of the managers in hospitals to secure their willingness to participate. We chose to use a census sample. For hospitals willing to distribute the surveys, the medical device departments would participate through interviews. When hospitals were unable or unwilling to distribute

the surveys, we adopted mail surveys. All participants were volunteers.

A total of 500 questionnaires were distributed and 330 were collected, with a gross response rate of 66.0%, among which only 316 (63.2%) responses (141 from local community hospitals, 108 from regional hospitals, and 67 from major medical centers) were deemed valid after removing the missing values. The demographic profile of the respondents is presented in Table 1; 197 (62.3%) of the respondents were women, 251 (79.4%) had graduated from college, 233 (73.7%) were nonexecutives, and 111 (35.1%) had more than 10 years of working experience.

Table 1. Demographic profile of sample (N=316)

Factor	Level	N	%	Factor	Level	N	%
Gender	Female	197	62.3		Less than 1 year	12	3.8
	Male	119	37.7	Year of Working	1-3 years	44	13.9
Education	High school	28	8.9		3-5 years	64	20.3
	College	251	79.4		5-10years	85	26.9
	Master's	37	11.7		10 years or more	111	35.1
Position	Executive	83	26.3	Level of Hospital	Local Community Hospital	141	44.6
	Non-Executive	233	73.7		Regional Hospital	108	34.2
					Major Medical Center	67	21.2

4. Results

The proposed model was determined to comprise six exogenous variables (i.e., communication, partner's reputation, perceived benefits fairness, relationship tenure, and service quality) and two endogenous variables (i.e., trust and commitment). The SEM analysis can be divided into two parts: the measurement model and the structural model. SEM was estimated using the maximum likelihood method and was applied to the sample data through the linear structural relational model (LISREL 8.72). The psychometric properties of the variable measurement scales were also analyzed. Following confirmatory factor analyses (CFAs), the structural models were tested. In addition, missing data were handled by listwise deletion.

The relationships between the observed variables (manifest variables, or indicators) and the latent variables (constructs being measured) were specified by the measurement model. Reliability was examined through CFA and Cronbach's alpha coefficient (>0.7). The construct validity levels of the latent constructs were then evaluated by both discriminant validity and convergent validity. Bagozzi and Yi [53] suggested that the measurement model assessment includes three indices: reliability coefficients (Cronbach's alpha), composite reliability coefficients, and average variance extracted (AVE).

4.1 Measurement Model Evaluation

Internal consistency was assessed using Cronbach's alpha coefficients and composite reliabilities. The Cronbach's alpha coefficients ranged from 0.702 to 0.933. This high internal consistency of the instrument is shown in the results presented in Table 2. In addition, the value of construct reliability exceeded the acceptable value of 0.7. Thus, the reliability for each scale was also in the commonly accepted range [54].

Composite reliability is a set of latent construct indicators consistent in terms of their measurement. More specifically, the reliability represents the degree of a set of two or more indicators within a construct measurement [54]. The composite reliability coefficients ranged from 0.792 to 0.937 (Table 2). Moreover, all constructs exhibited a higher composite reliability level than the 0.60 benchmark recommended by Fornell and Larcker [55]. The test of construct validity is central to stabilizing the measure dimensionality while conducting measurement development [56]. Convergent validity and discriminant validity were evaluated by calculating the AVE for each factor within each model. An AVE over 0.5 also indicates the acceptability of the convergent validity of the construct [55]. All constructs demonstrated AVE values between 0.621 and 0.858 (Table 2), and thereby demonstrated adequate convergent validity.

Discriminant validity refers to the degree of distinctive concept measurements. It implies that

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within the same scale, correlations among constructs should be larger than those of constructs across different constructs. Discriminant validity is evident when the AVE for each construct is greater than the squared correlation between that construct and any other construct in the model [55]. As presented in

Table 3, the square roots of all AVE values were substantially greater than all other cross-correlations. Overall, the constructs demonstrated satisfactory convergent validity and discriminant validity.

Table 2. Construct reliability results

Construct	Cronbach's alpha	Composite reliability	Average variance extracted
Communication (COM)	0.933	0.937	0.788
Partner's Reputation (PARR)	0.929	0.923	0.858
Perceived Benefits (PERR)	0.894	0.890	0.802
Fairness (FAI)	0.849	0.860	0.756
Relationship Tenure (RELT)	0.702	0.792	0.659
Service Quality (SERQ)	0.933	0.881	0.649
Trust (TRU)	0.891	0.868	0.621
Commitment (COMM)	0.820	0.841	0.730

Table 3. Discriminant validity using AVE

	Mean	Std	COM	PARR	PERR	FAI	RELT	SERQ	TRU	COMM
COM	3.45	0.81	**0.788**							
PARR	2.44	0.69	0.710	**0.858**						
PERR	3.43	0.76	0.714	0.683	**0.802**					
FAI	3.48	0.66	0.442	0.347	0.330	**0.756**				
RELT	3.57	0.61	0.334	0.363	0.278	0.598	**0.659**			
SERQ	3.22	0.53	0.759	0.774	0.641	0.371	0.298	**0.649**		
TRU	3.08	0.69	0.641	0.561	0.647	0.283	0.210	0.568	**0.621**	
COMM	3.35	0.79	0.654	0.585	0.557	0.365	0.348	0.611	0.681	**0.730**
(correlation)^2			0.576	0.599	0.419	0.358	0.358	0.599	0.464	0.464
Discriminant validity			1.368	1.432	1.916	2.114	1.843	1.083	1.339	1.574

Note: Diagonal elements (in bold) are the square root of the average variance extracted (AVE). Convergent validity=AVE$\geq$0.5. Discriminant validity coefficient =AVE/(Correlation)2 ; where (Correlation)2=highest (Correlation)^2 between factor of interest and remaining factors.

4.2   Structural Model Estimation

The measurement model fitness assessment should include the chi-square, chi-square/degrees of freedom (df), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), root mean square error of approximation (RMSEA), normed fit index (NFI), non-normed fit index (NNFI), and comparative fit index (CFI) [53, 57]. The fitness measurement indices of the structural model are provided in Table 4.

In this study, the constructs and their hypothesized relations were tested simultaneously. SEM results obtained from the theoretical model revealed a chi-square of 464.25 with 166 df (p < .001), and chi-square/df of 2.80. The GFI was 0.877, AGFI 0.829, RMSEA 0.076, NFI 0.966, NNFI 0.971, and CFI 0.977.

The chi-square p value (0.000) did not meet its

recommended value, which can be explained by the relatively large sample size in this study (316 respondents). Carmines and McIver [58] reported that a ratio of chi-square to df lower than 5:1 is considered acceptable; moreover, the chi-square value should be as low as possible. Although GFI and AGFI values exceeding 0.90 are preferable, the more liberal cutoff of 0.80 has been used to indicate good model fit [54]. The RMSEA was lower than 0.08, with the fit index revealing that the hypothesized model fit the data very well. The results indicate a reasonably high level of goodness of fit in relation to this study's structural model.

Table 4. Measures of model fit and reported values for structural model

Fit index	Recommended values	Model values	Model fit
Chi-square	$P \geqq 0.05$	464.25 (p=0.000)	Poor fit
Chi-square/ d.f.	$\leqq 3$	2.80(d.f.=166)	Good fit
GFI	$\geqq 0.9$	0.877	Moderate fit
AGFI	$\geqq 0.9$	0.829	Moderate fit
RMSEA	$\leqq 0.08$	0.076	Good fit
NFI	$\geqq 0.9$	0.966	Good fit
NNFI	$\geqq 0.9$	0.971	Good fit
CFI	$\geqq 0.9$	0.977	Good fit

4.3 Interpretation of structural model results

Standardized beta-coefficients from the estimated structural model are reported in Table 5 along with the associated t-values for each construct. Six of the eight proposed hypotheses were supported. We proposed that communication would be positively related to trust (H1). Based on the analyses results, standardized beta-coefficient of 0.35, and t-value of 2.42 ($p < 0.05$), this proposition was confirmed. From H2, we expected that partner's reputation would positively affect trust. This expectation was supported, because we obtained a positive relation of constructs (standardized beta-coefficient of 0.27 and t-value of 2.02, $p < 0.05$). H3 was confirmed in the study, because perceived benefits had a positive effect on trust (standardized beta-coefficient of 0.31 and t-value of 3.14, $p < 0.05$). However, H4 and H5 were not supported, because fairness and relationship tenure did not have an effect on trust (standardized beta-coefficients of –0.06 and 0.01, $p > 0.05$). In terms of the SEM analyses, H4 and H5 were not supported, but the other hypotheses (H1–H3) pertaining to trust and commitment were supported.

From H6 and H7, we expected that service quality would be positively related to trust and commitment. This expectation was supported in that we obtained a positive relation of constructs (standardized beta-coefficients of 0.40 and 0.49, $p < 0.05$). Furthermore, H8 predicted that trust between hospitals and suppliers has a positive effect on commitment. According to the results, trust indeed had a positive effect on commitment (standardized beta-coefficient of 0.43 and t-value of 6.20, $p < 0.05$). Therefore, H6, H7, and H8 were supported. The model path coefficients for each value are shown in Figure 2, which also explained a substantial portion of the variance for all the endogenous variables: 66.8% for trust and 78.1% for commitment.
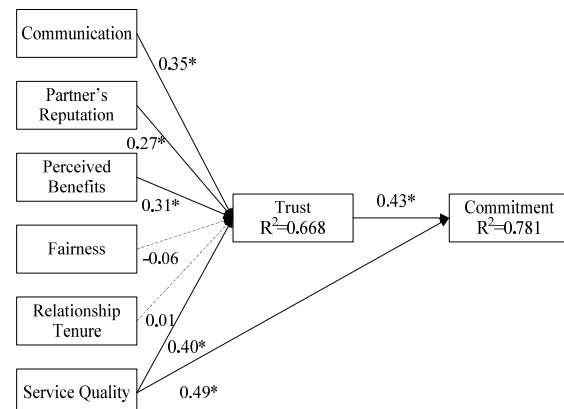

Figure 2:   Structural model.
*$p < 0.05$

Table 5. Estimation results for hypotheses 1-8

Path from/to	Standardized coefficient	*t*-value	Test results
Communication → trust (H1)	0.35*	2.42*	Accepted
Partner's Reputation → trust (H2)	0.27*	2.02*	Accepted
Perceived benefits→ trust (H3)	0.31*	3.14*	Accepted
Fairness → trust (H4)	-0.06	-0.57	Rejected
Relationship tenure→ trust (H5)	0.01	0.10	Rejected
Service quality → trust (H6)	0.40*	2.26*	Accepted
Service quality → commitment (H7)	0.49*	7.20*	Accepted
Trust → commitment (H8)	0.43*	6.20*	Accepted

* p< 0.05

5. Discussion

The main goal of supply chain management is to improve the supply chain performance. Concerning operation and management, the emphasis is often on integrating software and hardware. The importance of

partnership management is usually neglected. A recent study of companies in the United Kingdom found that within 3 years, 55% of all strategic partnerships fail [59]. From a management perspective, a failed supply chain partnership has two implications: (1) the partnership requires a reconstruction or adjustment and (2) the expected transaction costs with suppliers would increase.

We argue that the factors of SET and service quality have a strong effect on trust. Furthermore, trust could influence the commitment between supply chain partners. We gathered and analyzed the related literature and developed our operational framework, which was tested using a questionnaire as well as by data collection and SEM data verification. Our results support the hypothesis that SET and service quality are the factors influencing trust and commitment, providing a systematic and complete empirical model for assessing supply chain management.

In terms of social exchange characteristic dimensions, partners' reputation has a positive effect on trust; this result is consistent with those of previous studies [3, 37, 38, 46, 47]. In other words, higher reputation of partners would raise the level of trust. Trust has a direct effect on supply chain partners' commitment. Trustworthy suppliers are attractive because reputation could strongly affect opportunistic behavior, and avoiding opportunistic behavior results in increased overall costs. Therefore, a supply chain partner with great reputation in the market could be trusted [48]. Trusted suppliers not only raise the level of trust between partners, but are also a positive factor. In health care management, good reputation is helpful for strengthening the supply chain partnership between hospitals and suppliers.

Regarding perceived benefits, we found that increasing perceived benefits would increase the level of trust. When a hospital collaborates with a supplier, higher expected profit helps to secure common goals and raise the trust level; consequently, the hospital will continuously work with the suppliers, who in turn will be willing to contribute to develop the hospital. In addition, fairness and relationship tenure have nonsignificant effects. These results are different from those of previous research [51]. A shorter relationship length would reduce trust, commitment, and satisfaction toward a supplier; additionally, supplier's service quality would drop. These problems would negatively affect the partnership if not resolved at the earliest [60-61]. To avoid the aforementioned problems, hospitals would purchase products by inviting bids. Bidding causes suppliers to lose profit and hinders them from meeting hospitals' strategic needs, which makes trust nonsignificant.

Unlike products, service is invisible. In the modern society, people value service quality. Good service quality not only satisfies customers but also increases the trust level and commitment. This study showed that service quality had a positive impact on trust and commitment; these results are in line with those of previous research [24, 40]. Good service quality raises the trust level; suppliers' quality service raises hospitals' trust and builds a smooth long-term relationship. For suppliers, improving service quality is a crucial marketing approach to build trust and commitment with hospitals; therefore, suppliers should devote time to employee management and training for better service quality. Mayer et al. [62] believed that in a cooperation process, a higher trust level could promise a stable committed relationship. Our findings indicate that supply chain partners' trust has a positive and significant influence. Commitment accelerates the efficiency and effectiveness among partners [2, 3]. Commitment is the key to achieving a successful supply chain. Commitment also ensures that trust is crucial for supply chain integration and fostering the performance among supply chain partners. This study revealed the factors that influence trust and commitment. In relationship management, raising the trust level among partners has a positive effect to secure commitment. The result is consistent with those of previous research [2, 3, 47, 48, 52]. To conclude, from a management perspective, based on the factors that affect trust, we believe that the easiest means of increasing trust and harmonizing cooperation is to improve communication.

6. Conclusions

Successful supply chain management can provide hospitals with new competitive advantages. Trust and commitment are important factors of a successful long-term supply chain relationship. In the past, few studies have investigated the cooperation between hospital and medical suppliers from the perspective of social exchange theory (SET). The medical device industry is a special industry. Because of the large number of devices produced and increasing supplying needs, a complete supply chain management (i.e., end-to-end management) is important. The primary task of the study was to investigate the relationship between hospital and medical suppliers in Taiwan. And constructs a theoretical model to test the connection between the theoretical argument and the empirical realities. The final contribution of this study is its managerial implications. In addition, this study focuses on incorporating SET and service quality into the integration model, which influences trust and commitment factors. A structural equation model (SEM) was used to achieve the objectives. The results of the study found that communication, partner's reputation, and perceived benefits influence the trust; therefore, all direct hypotheses H1, H2 and H3 were accepted. However, fairness and relationship tenure were not effect on trust; therefore, H4 and H5 were

not supported. On the other hand, service quality had a significantly positive effect on trust and commitment; therefore, H6 and H7 were accepted. Finally, trust had a significantly positive effect on commitment; therefore, H8 was accepted. These results can act as a reference for hospitals sustaining relationships with their supplier partners and making managerial decisions regarding medical device supply chain management. Furthermore, the findings are valuable for successful medical device supply chain management.

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