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THE FACTORS EFFECTING THE SUPPLY CHAIN SUCCESS: AN EMPIRICAL EVIDENCE FROM AUTOMOBILE INDUSTRY IN CHINA

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Abstract---*This study aims to develop an experiential model to test the factors which can influence the supply chain partnerships in the automobile industry in China. The research is based on both primary data and secondary data. The primary data was collected from both automobile manufacturers and suppliers using a specially developed questionnaire – the total numbers of respondents were 128 managers from the companies sampled. The survey was analyzed using two statistical tools, which are Regression and T – tests. The results of survey proved that the level of supply chain technologies usage is still very low and it indicated that there are eight factors influence the supply chain partnerships in auto industry in China, which include "trust", "commitment", "culture", "human involvement", "training and education", as well as "stability of demand", "problem specific capability" and "adequate measurement of IT infrastructure". The further improvement of IT infrastructure of supply chain and interaction partnerships should be considered in order to keep the long – term relationship among partners.*

Keywords---*Automobile Industry, Supply Chain Partnerships, Trust, Commitment*

I. Introduction

Even though there are over 15,000 components in an "average" automobile, only a few are actually manufactured by the final assemblers, the majority being supplied by a network of specialist component manufacturers. Therefore, the price and quality of a typical car depends heavily on the prices and quality of its components, which in turn are influenced by the type of buyer – supplier relationships. These relationships have experienced a radical change since the mid-1980s, due to the global restructuring of the automotive industry and the diffusion of some lean production techniques among the final assemblers and their first-tier suppliers.

With rapidly changing technologies and global competition, there are more and more advanced techniques to implement to supply chain process, such as Enterprise Resource Planning (ERP) and Radio Frequency Identification (RFID). However, these new technologies cannot independently make supply chain successful without the integration of information system and collaboration among partners. Moreover, the human factor and the relationship among people are more important. Therefore, this study seeks to build an experiential model to test the factors which can influence the supply chain partnerships in the automobile industry in China.

In the automobile industry, it takes approximately 60 days to build and deliver an automobile to a customer, although only one to two of those days are spent assembling the car. Approximately 58 days are spent scheduling production, ordering

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materials, and purchasing supplies. The top five automotive manufacturers, on average, currently process approximately 250 billion dollars' worth of raw materials and 59 billion dollars' worth of work in process inventory each year. These automakers are also experiencing declining levels of efficiencies. Currently, 30 percent of the cost of an automobile is derived solely from the inventory stage where they are placed in a warehouse waiting for the next appropriate queue in process (Kumar & Rahman, 2016; De Silva et al., 2018a; De Silva et al., 2018b; Nikhashemi et al., 2013). In essence, the vast majority of the cost for an automobile is non-value added inefficiencies (such as slow inventory turns, delays, queue times, and many others) in the manufacturing process.

Conversely, collaboration is a complex process that does not always lead to success. A collaborative approach is appropriate only in situations where such efforts are justified. Even then, there is no guarantee of success. Collaboration is most beneficial when the problem or opportunity addressed is highly complex and interdependent. Highly complex problems are those that are difficult to solve, have no easy solutions, and require a lot of effort. Interdependent problems or opportunities are those that are dependent on other companies for effective resolution, where there is a need for knowledge or skills other firms possess.

The rapid growth of SCM as a new medium poses intriguing questions for academic research. To date, most researchers have focused on the roles of the supply chain partnerships, and many have examined the adoption and practice of supply chain. However, much of the latter area is primarily conceptual in nature. There appears to be very little empirical work coming from China, on the issues relating to the factors that may influence and hinder the success supply chain partnerships which can help in the implementation of the practical model to improve the performance of suppliers and buyers in reality (Khan & Qianli, 2017; Dewi et al., 2019; Pambreni et al., 2019; Tarofder et al., 2017).

II. Literature Review

Global competition is forcing corporations to periodically look at their supply chain map to reduce costs and time involved in the process. Innovations in this area help corporations in gaining significant advantages over their global competitors. According to Han, Huang, and Macbeth (2018), many companies have already begun to see the development of a competitive supply chain as a necessity, a matter of survival rather than choice. They also concludes that supply chain management is not a quick fix, nor is it the competitive form for every situation (Liu, Blome, Sanderson, & Paulraj, 2018; Doa et al., 2019; Maghfuriyah et al., 2019; Nguyen et al., 2019).

According to the statistics of China Association of Automobile Manufacturers, currently, there are 355 automobiles brand in China, which including 69 percent local brand and 30 percent international brand. In 2004, the production of Automobiles is 5,070,000 and increase 14.11 percent compare with 2003. The Association also forecast that the production of Auto will get 5.6 million and increase 12 percent in 2005. Shanghai Volkswagen ranked the number one of Auto sale and behind it are Faw – Volkswagen, Shanghai General Motors, Guangzhou Handa and Beijing Hyundai. In 2001 China identified auto manufacturing as one of seven "pillar industries" of the Chinese economy and announced a five-year plan to implement a primarily domestic industry that could offer a Chinese family car at a price that would encourage widespread ownership. Between 2000 and 2004, production of passenger cars in China jumped from 605,000 to 2.33 million. On 5 February 2005, the China Federation of Machinery Industry, an industry association, forecast 20% growth for 2005 to a level that would move China past Germany into third place globally for motor vehicle production. Most industry analysts believe that the industry will continue to expand in the 15% range annually for years to come (Liu et al., 2018).

The main reasons which explain such boom are the following:

1) Strong development of Chinese economy and enrichment of Chinese population.

2) Significant price decrease in nearly every segment
3) Pent-up demand (related to entry into World Trade Organization, since December 2001)
4) Strong introduction of new products.
5) Better access to vehicle financing.
6) Relative improvements in infrastructure and traffic management
7) Change in the commuting movements among large cities.

The growing importance of suppliers in the automotive industry is affecting their structure. Studies within the international Motor Vehicle Program (IMVP) and other outside analysis suggest a new configuration that will probably involve a division along the following lines. This configuration divided suppliers into four levels, which are raw material supplier, standardizer, component specialist and integrator. (See Table 1)

Table 1: Configuration of Auto Suppliers

	Raw Material Supplier	Standardizer	Component Specialist	Integrator
Focus	A company that suppliers raw materials to the OEM or their suppliers	A company that sets the standard on a global basis for a specific component or system	A company that designs and manufacturers a components tailored to a platform or vehicle	A company that designs and assembles a whole module or system for a car
Market Presence	● Local ● Regional ● Global	● Global	● Global for 1st tier ● Regional or local for 2nd , 3rd tier	● Global
Critical Capabilities	● Material Science ● Process engineering	● Research, Design and Engineering ● Assembly and supply chain management capabilities	● Research, Design and Process Engineering ● Manufacturing capabilities in varied technologies ● Brand image	● Product design and engineering ● Assembly and supply chain management capabilities
Types of Components or Systems	● Steel Blanks ● Aluminum ingots ● Polymer Pellets	● Tires ● ABS ● Elect. Control Unit	● Stampings ● Injection molding ● Engine components	● Interiors ● Doors ● Chassis

➢ System Integrator. Suppliers capable of designing and integrating components, subassemblies and systems into modules that are shipped or placed directly by the suppliers in the automakers' assembly plants.

- Global standardizer (System Manufacturer). Company that stress the standard on a global basis for a component or system. These firms are capable of design, development and manufacturing of complex systems manufacturers directly or indirectly through systems integrators.
- Component Specialist: A company that designs and manufactures a specific component or subsystem for a given car or platform. These can include "process" specialists, such as a metal stamper, die caster, injections molder, or forging shop that builds parts to print. They might also have additional capabilities such as machining and assembly, supplying components such as a steering column or the pedal system. These firms will increasingly work as suppliers to system integrators and standardizers.
- Raw Material supplier. A company that supplies raw materials to the OEMs or their suppliers, this includes products ranging from steel coils or blanks, to aluminum ingots or polymer pellets, the presence and competitive structure of the specific marker varies, with steel and polymers mostly a regional business, and aluminum or magnesium a global market. Some of the raw material suppliers are also moving into component specialist to add value to their products.

Luthra, Garg, and Haleem (2016), sates that "successful partnerships are about radically redesigning a business relationship and partnership creates new value that could not be achieved within the existing vendor/customer roles." Both suppliers and manufacturers can gain from partnerships and the automotive industry has spearheaded the development. It is often claimed that car manufacturers now work almost exclusively in partnership with their suppliers (Gopal & Thakkar, 2016; Pathiratne et al., 2018; Rachmawati et al., 2019; Seneviratne et al., 2019; Sudari et al., 2019; Tarofder et al., 2019). They also states that partnerships are the foundation on which an effective supply chain be built. In order to arrive to a fuller understanding of supplier – manufacturer partnerships, the link between the two parties needs to be studied. Hence, the dyadic perspective is a sound viewpoint to adopt. All business relationships have elements of formal and informal commitment. It is possible to collaborate in one direction impelled by a powerful customer for example but the partnering relationship requires a two way and more open process. Definition of partnership in the literature often exhibits the following characteristics:

i. They are vague and rarely include measures (of the degree of partnerships, which could help in operationalizing the concept.
ii. Where measures are included in definitions, these are based on the authors' perceptions, and are not empirically tested.
iii. Different definitions from different research show inconsistency, which suggests that different attributes are measured.
iv. Where definitions identify partnership attributes, these are usually based on very limited empirical evidence.

On the whole, partnerships can be characterized by a high level of commitment, mutual dependency, trust, and a long – term orientation where the sharing of information as well as risks and rewards are typical. However, a consistent definition of partnership based on empirical evidence cannot be found in the literature and no commonly accepted theoretically derived definition yet exists.

Yu, Chavez, and Feng (2017) identified the concept of re – linking. The supply chain is round in form, unlike structures of the past, it is extremely dynamic. Corporations connected via information technology linkages form chains that relate and re - link as needed to bring the available resources in contact with requests from stakeholders. The inner ring, representing the focal organization, will rotate and spin to find the appropriate resource needed to answer the needs of the outer circle (see figure 1). The outer circle represents external relationships, suppliers, customers, environmentalists, etc. When the resource is found that matches the demands of external stakeholders a connection is made for as long as the need is met. When costs increase beyond a certain threshold, or sales expectations are not met, and uncoupling can be done so that a connection can be made with a more beneficial partner; this is the re – linking concept.

Figure 1: The outer circle of partnerships

Partnering has received much attention by academics and practitioners, with the automotive industry as a basis for the development of most studies. The automotive and component industries provide an interesting focus for studying partnering and collaboration. Their argument is partly based on the difficulty faced by these industries in the West in adopting collaborative relationships due to high levels of complexity, and the deeply ingrained adversarial supplier relationships of the past. They considered the automotive industry as a good illustration of both the adversarial and the relational models of BSR. The attractive context offered by automotive and component industries for further research on partnering and collaboration, is reinforced by the trends verified over the last decade that emphasize the importance of partnering between carmakers and suppliers (Han et al., 2018).

Supply chain partnerships goes beyond mere exchanging and integrating information between suppliers and their customers, and involves tactical joint decision making among the partners in the areas of collaborative planning, forecasting, distribution and the product design. Partnerships also involve strategic joint decision making about partnerships and the network design. The result of Supply chain partnerships is not only the reduction of waste in the supply chain, but increased responsiveness, customer satisfaction, and the competitiveness among all members of the partnership. Thus, Supply chain partnerships systems allow organizations to progress beyond operational – level information exchange and the optimization and can transform a business and its partners into more competitive organizations (Hussain, Mosa, & Omran, 2017; Nikhashemi et al., 2017; Tarofder et al., 2019; Ulfah et al., 2019; Tarofder et al., 2016; Udriyah et al., 2019).

They highlights that if all the enablers can be put in place, and the impediments removed, the greatest benefit that can be expected is financial:

- Reduced inventory
- Improved customer service
- More efficient use of human resources; and
- Better delivery through reduced cycle times

In addition to these considerable financial benefits, certain non – financial benefit to flow from collaboration include the following:

- Faster speed to market of new products

- Stronger focus on core competencies
- Enhanced public image
- Greater trust and interdependence
- Increased sharing of information, ideas and technology
- Stronger emphasis on the supply chains.

All of these benefits eventually affect the bottom line, whether directly or indirectly. Once companies understand this, they are ready to make the commitment to begin collaborating with key supply chain members on key process. Trust refers to the extent to which one partner may depend on another to look after its business interests. Many studies have shown that trust is a vital element of a business relationship (Hussain, Mosa, & Omran, 2018). A slow and sustained process, trust building is an important factor affecting the extent and character of interactions in the supply chain relationship (Nawaz, Afzal, & Shehzadi, 2013). The degree of trust will determine the extent to which automobile suppliers are willing and able to interact (Hussain, Musa, & Omran, 2018). Trust within supply chains concerns the reputations of organizations while "trustworthiness" is an individual characteristic that facilitates interaction at the community level (Hussain, Musa, & Omran, 2019).

It is clear that no real collaboration can exist in supply chain relationships without meaningful trust. In automobile industry, while a powerful firm may be able to influence the behavior of a less powerful organization, the change in behavior may be temporary and certainly entered into unwillingly. Research has also shown that consistent use of coercion by one organization ultimately leads the vulnerable firm to seek alternative supply chain relationships. Further, the fundamental premise of collaborative relationships is that supply chain management requires firms to work tighter to find ways to increase that value delivered to end customers (Nawaz, Azam, & Bhatti, 2019). Successful supply chain performance is based on a high level of trust and a strong commitment among supply chain partners. Effective supply chain planning based on shared information and trust among partners is an essential requirement for successful supply chain management. One study reported that one-third of supply chain partnerships failed due to a lack of trust among trading partners (Nawaz et al., 2019).

Information sharing sometimes requires a release of guarded financial, strategic and other operating information to partners who might have been and/or will be competitors, since "effective information sharing is heavily dependent on trust beginning within the firm and ultimately extending to supply chain partners" (Nawaz & Hassan, 2016). It has been argued that "issues of trust and risk can be significantly more important in supply chain relationships, because supply chain relationships often involve a higher degree of interdependency between competitors". If information is available but cannot be shared by the partners, its value degrades exponentially. Yu et al. (2017), argued that "when both commitment and trust - not just one or the other - are present, they produce outcomes that promote efficiency, productivity and effectiveness." It is reported that the biggest stumbling block to success of strategic alliance formation is the lack of trust and subsequently trust is perceived as a cornerstone of the strategic partnership (Gunasekaran, Subramanian, & Rahman, 2017). Several studies assert that if supply chain partners share information openly and come to have a long-term perspective on the relationship, they may even attempt to reduce opportunistic behaviors (Shi, Zhang, Arthanari, Liu, & Cheng, 2016). A lack of trust among trading partners often creates a condition where every transaction has to be scrutinized and verified, thereby increasing the transaction costs to an unacceptably high level. Productivity is lost and efficiency and effectiveness, cornerstones of supply chain goals, will be compromised. Creating value-added activities with such partners becomes almost impossible and the supply chain tools used to improve efficiency, effectiveness and productivity (such as vendor managed inventory (VMI), cross-docking (CD), and collaborative forecasting, planning and replenishment (CFPR)) eventually become ineffective.

Under the less than open-trust conditions, decision makers often spend their time mostly on analyzing their trading partner's credibility, reliability and trustworthiness, rather than optimizing their operations.

Expectation is the belief about (or mental picture of) the future. The same expectation is a critical factor for supply chain partnerships. Suppliers and customers need to understand what is expected of them and the others in the relationship. The same expectation should accept by all members of supply chain so that they can pursuer the same direction and motivate thinking and action. Suppliers can achieve coordination by acting on their concordant expectations about each other's actions. Expectation hence constrains supplier's interactions. According to Lewis (2004), mutual expectation is a combination of common knowledge and mutual belief between suppliers and buyers. Suppliers can base on the expectation to desired behaviors that they observed.

Another factor that suppliers have to consider carefully for supply chain partnerships in Chinese market is *guanxi* (relationship marketing). China has attracted automobile investment from major multi-national corporations and much attention. However, westerners have often been frustrated and disappointed by the distinctive practices which they meet in China. Westerners find it difficult to identify appropriate approaches to exploiting the China market and adapting to marketing environment. In particular, the traditional practice of relationship marketing in the Chinese business community which is known as *guanxi* is a barrier for the development of western automobile firms. Don-Lin Lee et al. (2001) discussed the managerial and theoretical implication of *guanxi*. When international automobile suppliers tend to develop market in China, they have to pay keen attention to *guanxi* with Chinese partner. Firstly, understanding the expectations of Chinese partners is necessary, because those expectations often go beyond traditional role expectations, especially under high uncertainty. Secondly, attitude and affective commitment are important for western marketers to enhance the relationship. It benefits to establish and develops *guanxi*. Thirdly, western companies should avoid their opportunistic behaviors because it will violate of the social norms in *guanxi* and damage the reputation and have the negative effect for long-term business. Finally, good relationship is required international suppliers share more similarities with Chinese partners, such as common interests and mutual understanding. The finding of this study emphasizes the importance of developing interpersonal relationships and mutual understanding for business success. Once *guanxi* is established, it has the positive effect on business performance and help international marketers to build and develop the effective market strategy in China.

Zaid, Jaaron, and Bon (2018) identified the similar concept of *guanxi*, so call: Network connections. According to this study, network connections include the buyer and seller firms' formal and informal networks outside the dyad. Formal relationships include relationships with the government, universities, and consultants and other contacts with more distant links in the supply chain. Informal networks are professional bonds that specialists have across several firms in communities of practice (COPs). In the marketing literature, network theory maintains that network connections are important for innovation in supply chain contexts (Hong, Zhang, & Ding, 2018). Networks are efficient vehicles of organizational learning and flexible adaptability in turbulent environments (Zhang, Ma, & Qu, 2018). This effect is made possible by "loose coupling" which allows partners to interact and check out different understandings of the usage phenomena of the supplied product, often by going beyond the specific dyadic relationships. This loose coupling enables a better fit between those who can understand and create knowledge of a specific kind and those who can provide specific input knowledge at the work locale (Kim & Chai, 2017). Empirical studies in the automotive industry confirm that competence and knowledge creation occur in networks spanning buyers and sellers (Savic, Djordjevic, Milosevic, Mihajlovic, & Zivkovic, 2017).

Hypothesis I:

H_0 : Long – term relationship is not one of the key factors to influence business performance of supply chain.

H_1: Long - term relationship is one of the key factors to influence business performance of supply chain.

Hypothesis II:

H_0 : A successful supply chain is not dependent on whether suppliers can meet clients' needs.

H_1: A successful supply chain is dependent on whether suppliers can meet clients' needs.

Hypothesis III:

H_0 : Implementation of advance technology and software of supply chain is not a competitive advantage for the automobile companies.

H_1: Implementation of advance technology and software of supply chain is a competitive advantage for the automobile companies.

Hypothesis IV:

H_0 : Automobile suppliers are not helping manufacturers and are not involved in new accessories design.

H_1: Automobile suppliers are helping manufacturers and are involved in new accessories design.

Hypothesis V:

H_0 : A successful supply chain company cannot always meet its performance target.

H_1: A successful supply chain company can always meet its performance target.

III. Research Methods

This study is based on both primary data and secondary data. Primary data refer to information obtained firsthand on the variables of interest for the purpose of the study. For this study, the primary data is collected from four kind of automobile companies, which are Automobile Manufacture, Original Equipment Supplier, Automobile Dealer and Automobile Accessory Wholesaler. The secondary data is used to support the study and to give background information of the study. A total of 27 questions were included in the two section questionnaire. Section A is the background information. The main purpose of this section is to get some general demographic characteristic information of the survey companies being surveyed, which include the category and history of the companies. The answer to the first question can be used to classify automobile manufacturers, suppliers, dealers and wholesaler of the companies surveyed. The third question can be used to identify the level of technology used by of these companies and what kinds of supply chain techniques they have adopted before.

IV. Findings

Based on the hypothesis design in Chapter 3, there are 5 hypotheses for this study. Firstly, the relationship among of 17 factors of the independent variables and the first factor of business performance, namely, long – term relationship will be determined.

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.958	.918	.905	.23007

Based on Table 2, the coefficient of determination, namely R square is 91.8 percent. Therefore, 91.8% of the long – term relationship can be explained by the 17 independent variables. This R square indicates a strong positive relationship between the independent and dependent variables and only 8 percent of the variability in long – term relationship can be explained by other factors.

Table 3. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65.052	17	3.827	72.289	.000
	Residual	5.823	110	.053		
	Total	70.875	127			

As Table 3 shows, the regression row displays information about the variation accounted for by the research model. The residual row displays information about the variation that is not accounted for by the model. The regression sums of squares are 65.1 and residual is only 5.8, which indicates that about 93 percent of the variation in long – term relationship is explained by the model. If a level of significance of 0.05 is chosen, the critical value of the F distribution is 1.72. Since F statistic is 72.28, which is greater than 1.72, it can be concluded that the independent variables are significantly related to long – term relationship. The significance value of the F statistic is less than 0.05, which means that the variation explained by the model is not due to chance.

Table 4. Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.406	.020		216.673	.000
Trust	.497	.091	.665	5.461	.000
Effective communication	-.198	.103	-.264	-1.914	.058
Same expectation	-.185	.087	-.248	-2.123	.036
Commitment	.460	.097	.616	4.736	.000
Guan Xi	-2.490E-02	.060	-.033	-.417	.677
Product design	-.418	.109	-.560	-3.827	.000
Culture	.151	.088	.202	1.724	.088
Reward and motivation system	2.322E-02	.093	.031	.250	.803
Human involvement	.262	.070	.351	3.737	.000

Training and education	-2.557E-02	.098	-.034	-.262	.794
Stability of demand	.175	.065	.234	2.669	.009
Problem specific capability	.178	.091	.238	1.957	.053
Information system integration	-4.737E-03	.087	-.006	-.054	.957
Adopt software	5.928E-02	.082	.079	.720	.473
IT infrastructure	.129	.091	.173	1.421	.158
IT investment and sourcing decision	-.275	.126	-.368	-2.189	.031
Measurement	-8.168E-02	.114	-.109	-.714	.477

From Table 4 analysis, it shows the coefficients of the regression line, which can determine which independent variables have a linear relationship with long – term relationship. Referring to the Coefficients column, the multiple regression equation is

$$y = 4.406 + 0.497x_1 - 0.198x_2 - 0.185x_3 - 0.460x_4 - 0.002x_5 - 0.418x_6 + 0.151x_7 + 0.002x_8$$
$$+ 0.269x_9 - 0.003x_{10} + 0.175x_{11} + 0.178x_{12} - 0.0005x_{13} + 0.006x_{14} + 0.129x_{15} - 0.275x_{16} - 0.008x_{17}$$

Using the 0.05 level of significance, the critical value of the T distribution is 1.979. According to T – test column, the result of trust achieved: 5.461. As 5.461 is greater than 1.979, H_0 is rejected. This supports the finding of Gardner and Cooper (1988) that if supply chain partners share information openly and come to have a long-term perspective on the relationship, they may even attempt to reduce opportunistic behaviors. Next, the analysis determined that T value of commitment is: 4.736 > 1.979, therefore, H_0 is rejected. This means commitment and long – term relationship have a linear relationship. As most respondents agreed, the greater the stability of the suppliers' contractual duration, the more they are to reduce cost and to increase the delivery frequency. The T value of human involvement is 3.737, which is also greater than 1.979. Therefore H_0 is rejected. It implies that employees have to sufficiently know about the process, method or techniques of supply chain. As the factor of stability of demand, the T value is 2.669 > 1.979. Therefore H_0 is rejected as well.

As the literature review indicated, it can be proven that if the demand is stable and the product is routine, suppliers and automakers will have the opportunity to reduce cost. The significance values of these four factors (trust, commitment, human involvement, and stability of demand) are less than 0.05, which mean that these four factors have linear relationship with long – term relationship. Compared with the T value of other factors, they are less than the critical value which is 1.979. Therefore, H_0 is accepted. It indicates that these factors do not have significance relationship with dependent variable. To conclude, trust, commitment, human involvement, and stability of demand, these fours factors will affect the long – term relationship of suppliers and buyers. In order to build long – term relationship, auto suppliers and manufacturers should consider these four factors so as to achieve the target business performance.

Table 5. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.968	.937	.927	.26006

Table 5 indicates that 96.8% of the variability of the dependent variable can be explained by the 17 independent variables, because it is shown that R square is 96.8 percent. This R square indicates a strong positive linear relationship between the factor of meeting clients' needs and independent variables and only less than 4 percent of the variability in the dependent variable can be explained by other factors.

Table 6. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	110.060	17	6.474	95.725	.000
	Residual	7.440	110	.068		
	Total	117.500	127			

The analysis depicted in Table 6 shows that the regression sums of squares are 110.06 and residual is only 7.44. It indicates that the variation of the dependent variable can be explained by the model. The deviation of this model is only 7.44 or 6.3 percent. Using the significance of 0.05, it is found that the critical value of the F distribution is 1.72. As F statistic is 95.73, which is greater than 1.72, it can be concluded that the independent variables are significantly related to meeting clients' needs. The significance value of the F statistic is less than 0.05, which means that the variation explained by the model is not due to chance.

Table 7. Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.187	.023		182.172	.000
Trust	.693	.103	.721	6.746	.000
Effective communication	5.317E-02	.117	.055	.456	.650
Same expectation	-2.132E-02	.099	-.022	-.216	.829
Commitment	.179	.110	.186	1.632	.106
Guan Xi	-.175	.067	-.182	-2.589	.011
Product design	-.240	.123	-.250	-1.944	.054
Culture	2.544E-02	.099	.026	.257	.798

Reward and motivation system	5.742E-02	.105	.060	.546	.586
Human involvement	3.202E-02	.079	.033	.404	.687
Training and education	-.115	.110	-.120	-1.043	.299
Stability of demand	.107	.074	.111	1.443	.152
Problem specific capability	.291	.103	.303	2.834	.005
Information system integration	.101	.098	.105	1.023	.309
Adopt software	.153	.093	.159	1.646	.103
IT infrastructure	-.186	.103	-.193	-1.810	.073
IT investment and sourcing decision	3.880E-02	.142	.040	.273	.785
Measurement	-5.119E-02	.129	-.053	-.396	.693

It can be seen from Table 5.13 that the multiple regression equation is

$$y = 4.187 + 0.693x_1 + 0.005x_2 - 0.002x_3 + 0.179x_4 - 0.175x_5 - 0.240x_6 + 0.003x_7 - 0.006x_8$$
$$+ 0.003x_9 - 0.115x_{10} + 0.107x_{11} + 0.291x_{12} + 0.101x_{13} + 0.153x_{14} - 0.186x_{15} - 0.004x_{16} - 0.005x_{17}$$

The analysis from the T – test column shows that the T value of trust achieved 6.746, which is well above the 0.05 level of significance which is 1.979 Since 5.461 is greater than 1.979, therefore, H_0 is rejected. It indicates that there is a significant relationship between trust and meeting clients' needs. This supports the notion that trust building is an important factor affecting supply chain partnerships. The analysis determined that T value of problem specific capability is 2.834, which is greater than critical value of 1.979. Therefore, H_0 is rejected. This means problem specific capability and meeting clients' needs have a linear relationship. This supports the finding of Nancy Nix (2004) which showed that companies with high levels of problem specific capability and highly intense collaboration has a high improvement in task performance. The significance values of these two factors (trust, and problem specific capability) are less than 0.05, which mean that these two factors have significant relationship with meeting clients' needs. However, the T values of the other 15 factors are less than the critical value which is 1.979. Therefore, H_0 is accepted. It indicates that these factors do not have a significant relationship with the dependent variable. In short, there are only two factors have a linear relationship with meeting clients' needs. If suppliers want to meet clients' needs, they should have good reputation in terms of trust and the capabilities to deal with problems.

V. Discussions

Indeed, China's automotive industry is surging as the newest player in the global landscape, following the trail blazed by the U.S., Europe, Japan and South Korea. The explosive growth peaked in 2003, when passenger car sales increased by 65 percent over 2002, additionally fueled by increasing private consumption. The market had grown to include all of the toughest global competitors, in particular today's "blue chip" global OEMs like Toyota, Nissan, Honda and Hyundai as well

as the big players like GM, Ford and VW. When you add to this mix low-cost, independent Chinese OEMs, the industry became a battlefield.

The automobile business in China has an emerging supply side. In 2003 China exported only 0.1 percent of the cars built on its shores. Now the industry is undergoing a transition phase towards making the car industry an export platform. The government has set a long-term goal of exporting 40 percent of China's production. Setting the stage for exports, suppliers are consolidating in an effort to lower costs and improve the global competitiveness. The government is imposing regulations for OEMs that allow a majority stake for foreign companies in Chinese joint ventures for export-only purposes and thus stimulates local production and local sourcing. Quality and emission standards are improving with regard to Western standards, and Chinese joint ventures and independent Chinese OEMs are extending to a global scope.

VI. Conclusion

The first Objective of this study is to ascertain the level of supply chain practice in the automobile industry of China and to analysis the main problems that affect the supply chain partnerships. Supply chains in China are still in the age of infancy. Most automobile suppliers have only 1 – 5 years history. The usage of new information technology based - services of auto companies in China are still at a low level. Only a few companies have started to apply the new techniques such as EDI and RFID. Fortunately, most of respondents of this study considered that the investment of new information technology is underutilized.

Objective 2 is to examine main factors that will influence a success of supply chain partnerships in Automobile industry in China. The result from the testing of hypotheses showed that the factors of trust, commitment, human involvement, stability of demand and problem specific capability will affect the long term relationship of partners. According to hypothesis II, trust and problem specific capability are critical factors to meet client's need. For the third criterion of business performance, namely, advance technology and software, the factors of culture, human involvement, training and education, and problem specific capability will influent it. There are three factors affect the criterion of accessories design, which is trust, stability of demand and problem specific capability. Finally, the factors of effective communication and stability of demand is considered important to meet the performance targets. Thus, there are 8 factors have been identified as having relationship with the successful supply chain partnerships.

VII. Limitations and Future Directions

The relevant future research direction would be to arrive at the relative impact of the various factors considered in this study. It is possible that the relative role of the factors will depend on the different kinds of suppliers' characteristics within the auto industry. For example, manufacturers and wholesalers have different measurements of IT infrastructure and the expectation between upstream suppliers and downstream suppliers are in different direction. The future research may focus on the various factors which are implemented in different kinds of suppliers.

A second future research direction is to develop a normative model for organizational decision making to facilitate supply chain partnerships. This will allow certain questions to be answered, such as, "What levels of various factors are needed to achieve optimal performance in supply chin relationships?" and "What is the quantitative impact of changing an organizational decision variable on supply chain?" These and other important questions must await further conceptual development and empirical research.

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