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THE IMPACT OF TECHNOLOGY ORIENTATION AND CUSTOMER ORIENTATION ON FIRM PERFORMANCE: EVIDENCE FORM CHINESE FIRMS

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ABSTRACT

This study examines how Technology Orientation (TO) and Customer Orientation (CO) with organizational characteristics e.g. firm size and culture collectively impact firm performance. A sample of 158 Chinese firms were clustered of the basis of their mix of Technology Orientation (TO) and Customer Orientation (CO). The paper provides evidence that firms combining several strategic orientations such as (TO) and (CO) perform better. The second key finding is that organizational characteristics e.g. firm size and collectivism have a positive influence on firm performance while power distance and risk taking have a negative influence on firm performance. Implications of the findings are discussed.

JEL: M3

KEY WORDS: Technology Orientation (TO), Customer Orientation (CO) and Firm Performance

INTRODUCTION

Strategic orientations are fundamental rules that influence the activities of firms and create behaviors that are crucial for firm performance (Gatignon and Xuereb, 1997). Firms that operate in developing and industrialized countries face many challenges when endeavoring into the modern global business environment. To cope, they should have capacity to adjust and respond to this changing realm efficiently and effectively. Over that past few decades, marketing discipline has made considerable progress in addressing scientific and managerial problems. Much work in this regard has been done in high income industrialized economies. The literature has defined different orientation constructs including marketing orientations (MO), entrepreneurial orientation (EO), technology orientation (TO) and customer orientations (CO) and test these propositions independently. A few studies that have examined the combination of these orientations. Currently (MO) gets lot of attention from scholars because of its pivotal role in market discipline (Kirca, Jayachandran, & Bearden, 2005). Various studies show that (MO) has a positive impact on firm performance as (Kohli & Jaworski, 1990); (Matsuno, Mentzer, & Özsomer, 2002); (Narver & Slater, 1990); (Slater & Narver, 1994).

However, market orientation is not only executable option available for firms. There are many companies following (TO) (Gatignon & Xuereb, 1997) or selling orientation (Noble, Sinha, & Kumar, 2002) with considerable success. For instance a strand of literature asserts that (CO) plays a vital role for reflecting the organization's culture. This literature argues (CO) creates behavior which enhances firm performance (Deshpandé, Farley, & Webster Jr, 1993) and (Kohli & Jaworski, 1990). Noble et al., (2002) argued that (CO) is not the only viable strategic orientation. The importance of (TO) is highlighted by (Prahalad & Hamel, 1994) and (Grinstein, 2008) through their findings that the long term success is best achieved through new technological solutions, products and service.

Some studies investigate the separate effects of these orientations (Li, 2005) and (Zhou, Yim, & Tse, 2005) rather than the combined effect. Meanwhile, some studies investigate the combined influence of customer orientation and entrepreneurial orientation (Bhuian, Menguc, & Bell, 2005). But these studies appear to consider orientations as alternatives rather than a complementary set of measures. To fill this research space, we examine the impact that different strategic orientations have on business performance in transitional economy in China. In particular, we examine two types of strategic orientations: (TO) and (CO) with organizational characteristics such as firm size; culture (Collectivism, Power distance, Risk taking) and impact on firm performance.

There are two particular reasons that we focus the examination on China. First, because it is the largest and fastest growing transitional economy. The market economy continuously changes in China. Stout and rapid changes provide great opportunities and raise serious strategic problems that are big challenge for business operation in China as stated by (Hoskisson, Eden, Lau, & Wright, 2000); (Quer, Claver, & Rienda, 2007) and (Zhou, David, & Li, 2006). Second, China has been member of World Trade Organization (WTO) since 11 Dec 2001. Continuous change allows for the betterment of state-owned enterprises and increased contribution to the world economy. It has become one of the largest target countries for foreign direct investments (FDI) and the second largest economy in the world after the United State. Zhou et al., (2005) presents business philosophies and strategic orientations as playing a terminate role in business success. Hence, these rampant environment changes in China provide a rich opportunity for research. The remainder of the article is organized as follows. In the next section, we provide a discussion of the extant literature. Next we describe the data used in the analysis. The following section includes the results of statistical test. The paper closes with some concluding comments.

REVIEW OF LITERATURE

A large amount of resources has been and continue to be invested in (TO). Much of this investment is made on the basis of faith that good returns will come. (TO) holds that consumers prefer products and services with technological superiority (Gatignon & Xuereb, 1997). According to this philosophy, firms devotes their resources to R&D, actively acquire new technologies and use sophisticated production technologies (Voss & Voss, 2000). Accordingly, a technology oriented firm is one "with the ability and will to acquire a substantial technological background and use it in the development of new products" (Gatignon & Xuereb, 1997). Because of their strong commitment to R&D and application of latest technologies, technology-oriented firms can build new technical solutions and offers new and advanced products to meet customer needs. Thus, technology-oriented firms have a competitive advantage in terms of technology leadership and offering differentiated products, which can lead to superior performance (Prahalad & Hamel, 1994). The literature also suggests that a (TO) has a positive relationship with new products (Gatignon & Xuereb, 1997) and firm's performance (Voss & Voss, 2000). When the market environment is marked by rapid technological advances, the value and impact of prior technology deteriorates very quickly (Srinivasan, Lilien, & Rangaswamy, 2002). Firms must allocate more resources to technology development, experiment with new technologies and manage uncertainty through innovations. Otherwise, they will be driven out of the market due to increasingly obsolete technology.

The emphasis on technological orientation means competition that should reduce the importance of market orientation (Grewal & Tansuhaj, 2001). Firms characterized by high technological uncertainty compete more on the basis of technology than on the basis of market orientation in contrast to firms characterized by low technological uncertainty (Hayes & Wheelwright, 1984). Computer supported designing models increase the performance of machines and products with the help of advanced simulation techniques. A firm's high performance depends on technological proficiency. Unless a firm predicts and follows technological developments and uses these developments for improvement of its own product and process, high firm performance may not occur (Freeman & Soete, 1997) and (Meeus & Oerlemans, 2000).

China is an emerging economy and technology is changing dramatically for different industries. While some industries experience incremental technological development, others have absorbed cutting-edge technology from foreign firms through licensing or forming joint ventures (Zhou et al., 2005). In recent years, an increasing number of multinational firms have set up R&D centers in China and some Chinese firms established offices abroad to acquire advanced technology. This provides a dynamic environment that may moderate the effect of (TO). Technology is being presented as something new as it drives change at an ever increasing rate (Chaharbaghi & Willis, 2000) and the correct manufacturing technologies can provide the organization with considerable operational and competitive benefits (Sohal & Terziovski, 2000). Both the pace and degree of innovation and change in technology induce technological uncertainty as documented by (Grewal & Tansuhaj, 2001). Market orientation matters a lot for stable technological industries in comparison with non-stable technological industries (Kohli & Jaworski, 1990). Consequently, organizations often use (TO) as an alternative to market orientation in building sustainable competitive advantages.

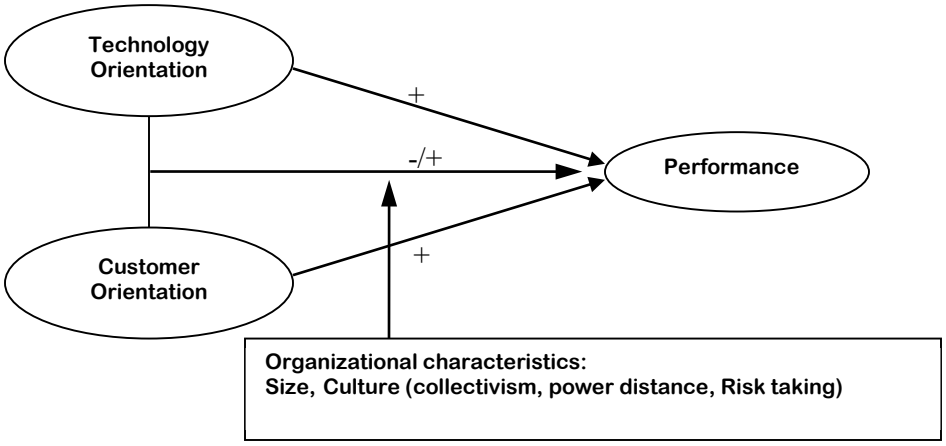
(CO) is define as "the set of beliefs that puts the customer's interest first, while not excluding those of all other stakeholder; in order to develop a long-term profitable viable enterprise" (Deshpandé et al., 1993). (CO) is all about the set of beliefs and vary from culture to culture. The cultural transformation process is difficult to investigate. Researchers agree that understanding of implementing a customer-focused culture is inadequate (Day, 1994 and Narver, Slater, & Tietje, 1998). The management literature states that cultural transformation requires an active role of top management in setting organizational vision. It also creates a link between management and marketing (Argyris, 1966); (Bass & Stogdill, 1990); (Bate, 2010); (House & Podsakoff, 1994); (Pfeffer, 1977) and (Senge, 2014). Marketing scholars document that without senior management support (CO) is not possible (Day, 1994); (Kohli & Jaworski, 1990); (Levitt, 1960); (McKitterick, 1957) and (Narver & Slater, 1990). Deshpandé et al., (1993) explains, "Everyone's job is defined in terms of how it helps to create and delivers value for the customer and internal processes are designed and managed to ensure responsiveness to customer needs and maximize efficiency in value of delivery". (CO) is all about understanding target customers and delivering them superior values. Thus, customer-oriented firms show a continuous and proactive disposition toward identifying and meeting customer needs (Han, Kim, & Srivastava, 1998). For positive financial outcomes, firms satisfy customer needs (Zhou & Li, 2010). Closer relationships with customers leads to a better understanding of customer needs, closer tailoring of products and services, higher customer satisfaction and easier forecasting of demand. On the other hand, loose connections result in broader threats that could hurt the firm badly (Danneels, 2003). It is equally important for firms to serve existing customers. Creating new customers could be accomplished by new products and services and innovation (Henard & Szymanski, (2001) and Langerak, Hultink, & Robben, (2004).

DATA AND METHODOLOGY

This study examines the impact of (TO) and (CO) with organizational characteristics firm's size & culture (collectivism, power distance, risk taking) on Chinese firm performance. To achieve the objective, we used a quantitative research approach to examine the applicability of the conceptual framework of strategic orientations. The quantitative approach involved the collection of primary data from 158 firms in China. A structured questionnaire, translated into Chinese, was distributed to collect the data.

Figure 1 shows the expected impact of technology orientation and customer orientation with the organizational characteristics size of firm and culture (collectivism, power distance, risk taking) on firm performance. Through the framework proposed in Figure 1, we developed the following research questions How does (TO) influence firm performance? Does (CO) matter for firm performance? Does the ambidexterity (TO & CO) correlate with firm performance? And Do the organizational characteristics such as firm size and culture's (collectivism, power distance, risk taking) have any relationship with Firms Performance?

Figure 1: Conceptual Model of the Study



This figure displays the expected impact of technology orientation and customer orientation with the organizational characteristics size of firm and culture on firm performance

To measure and achieve the study object, we used valid, well tested and reliable instruments that have been extensively used in the literature. We followed the Gatignon & Xuereb (1997) method to measure (TO). This four-item measurement represents a firm's ability and willingness to develop new technologies and use sophisticated technologies in new product development. We measured (CO) from Narver & Slater (1990) scales, that are measured by six items to assesses a firm's understanding of its customer's need and its ability to create superior customer values continuously. SPSS software is used for data analysis.

RESULTS AND DISCUSSION

Table 1 shows descriptive statistics of the study variables. These variables are mixed in nature. Some variables are quantitative in nature and some are qualitative. The qualitative variables are further converted into quantitative variables with the help of a Likert scale to conduct the analysis.

Table 1: Descriptive Statistics

Variable	Mean	Min	Max	Std. Dev.
Age in years	15.60	2.00	35.00	18.76
Size*	2.79	-115.00	978.00	21.15
SOE	0.71	0.00	1.00	0.23
POE	0.66	0.00	1.00	0.21
Hybrid	0.37	0.00	1.00	0.15
Listed	0.43	0.00	1.00	0.17
Technology oriented	3.45	1.00	5.00	1.53
Customer Oriented	2.79	1.00	5.00	1.83
Return on Equity in %	0.12	-156.36	615.20	6.89
Return on Asset in %	0.03	-41.45	21.54	0.45
Return on Invested Capital in %	0.12	-321.77	211.56	4.12
Market Value*	92.10	-4.34	12,300.00	245.00

*This table displays descriptive statistics analysis of the sample. Note: * in RMB in 100 Millions*

The age of a firm is given in years. The mean age of the sampled firms are 15.60 years with an 18.70 standard deviations. The return on equity, return on asset, return on invested capital and market value of firm are proxies as performance variables. The results show the mean values for ROE, ROA, ROIC and

market values are 12%, 3%, 12% and 92.40 billion RMB respectively. The high standard deviations of these variables shows that the firm performance indicators are highly volatile. Total assets is used as a proxy for size of the firm and its mean value is 2.79 billion RMB. Apart from quantitative variables, there are some quantitative and dummy variables also included in this analysis. SOE, POE, Hybrid and Listed are dummy variables. In case of SOE, 0 shows that a firm is non-SOE whereas 1 shows a firm is SOE. The same coding system is used for POE, Hybrid and Listed variables. The mean value of SOE is 0.71 which shows that a majority of firms are SOE. The same is the case of POE, where the mean value is 0.66. In the case of Hybrid and Listed the mean value is 0.37 and 0.43 respectively. This shows that on average sampled firms are non-listed and non-hybrid. The Technology orientated and Customer orientations are measured with a structured instruments developed by the researchers. The mean value of (TO) is 3.45 which shows on average firms are technology oriented. The mean value of (CO) is 2.79 which show that firms on average are close to neutral with regard to customer oriented approach. The equation that was estimated is specified by Equation 1 as follows:

$$FirmPerformance = \alpha_1 + \beta_1(Age) + \beta_2(Size) + \beta_3(SOE) + \beta_4(POE) + \beta_5(Hybrid) + \beta_6(Listed) + \beta_7(TO) + \beta_8(CO) + \varepsilon_1 \quad (1)$$

Where:

Age = Life of the Enterprise
Size = Total Assets of the Enterprise
SOE = State Owned Enterprise
POE = Private Owned Enterprise
Hybrid = Mixed Characteristics of State and Private Enterprise
Listed = Listed on the Securities Exchange Commission
TO = Technology Orientation
CO = Customer Orientation

Table 2 demonstrates the results of how the suggested variables influence the performance of the firm. All variables show a positive influence on firm performance. The results show that nature of the business matters significantly as hybrid firms contributes noticeably to performance of the firms as evident by (0.216, 0.084*).

Table 2: Regression Analysis Results of Suggested Variables

F	R-Square	Adjusted R-Square
4.284	0.301	0.231
Age	0.021	
	(0.063)	
Size	0.083	
	(0.063)	
SOE	0.051	
	(0.073)	
POE	0.062	
	(0.083)	
Hybrid	0.216	
	(0.084*)	
Listed	0.09	
	(0.063)	
Technology Orientation (TO)	0.276	
	(0.073*)	
Customer Orientation (CO)	0.312	
	(0.062*)	

*This table displays the results of the suggested variables and their impact on firm performance. *p<0.1, **p<0.05& 0.1 and ***p<0.00, 0.05 &0.1*

$$FirmPerformance = \alpha_2 + \beta_1(Age) + \beta_2(Size) + \beta_3(SOE) + \beta_4(POE) + \beta_5(Hybrid) + \beta_6(Listed) + \beta_7(TO) + \beta_8(CO) + \beta 9(TO \times CO) + \varepsilon_2 \quad (2)$$

Table 3 shows the results of the combination of (TO) and (CO) with the principle model. By applying the regression analysis we observe that (TO) is significant at the 5% and 10% alpha. (CO) significantly contributes in the performance of the firms as follows (0.308, 0.006***). We found that enterprises with the combination of (TO) and (CO) enjoy sound performance evidence by (0.122, 0.008***). This was expected from the literature as reported by (Gatignon & Xuereb, 1997).

Table 3: Regression Analysis Results Of TO & CO Combine Impact on Firm Performance

F	R-Square	Adjusted R-Square
3.722	0.306	0.224
Age	0.041	
	(0.064)	
Size	0.076	
	(0.064)	
SOE	0.031	
	(0.073)	
POE	0.061	
	(0.083)	
Hybrid	0.202	
	(0.085*)	
Listed	0.104	
	(0.064)	
Technology Orientation (TO)	0.271	
	(0.034**)	
Customer Orientation (CO)	0.308	
	(0.006***)	
TO×CO	0.122	
	(0.008***)	

*This table displays the results that the combination impact of technology orientation and customer orientation on firm's performance. *p<0.1, **p<0.05 & 0.1 and ***p<0.00, 0.05 &0.1*

To continue the analysis we estimate Equation 3, which include interaction terms.

$$FirmPerformance = \alpha_3 + \beta_1(Age) + \beta_2(Size) + \beta_3(SOE) + \beta_4(POE) + \beta_5(Hybrid) + \beta_6(Listed) + \beta_7(TO) + \beta_8(CO) + \beta 9(TO \times CO) + \beta 10(TO \times CO \times Size) + \varepsilon_3 \quad (3)$$

The results are presented in Table 4. The results include the combined influence of (TO), (CO) and size of firms all together by keeping the other variables constant. Only size of the enterprise contributes to the performance of the enterprise but is significant at the 10% level. Combining the size with the (TO) and (CO) it becomes significant at the 5% and 10% (0.186, 0.049**) levels. This implies that an enterprise with strong (TO) and (CO) also gains the benefit of size. Furthermore, size as an individual factor, does not contributing as well as with (TO) and (CO).

Table 4: Results of to & CO with Size of Firm Impact on Firm Performance

F	R-Square	Adjusted R-Square
3.957	0.33	0.246
Age	0.016	
	(0.063)	
Size	0.093	
	(0.063)	
SOE	0.031	
	(0.072)	
POE	0.049	
	(0.082)	
Hybrid	0.199	
	(0.083)	
Listed	0.130	
	(0.064)	
Technology	0.265	
Orientation (TO)	(0.023**)	
Customer	0.289	
Orientation (CO)	(0.009***)	
TO×CO	0.194	
	(0.006***)	
TO×CO×Size	0.186	
	(0.049**)	

*This table displays the results of both technology orientation and customer orientation includes size of the firm to influence the firm's performance. *p<0.1, **p<0.05 & 0.1 and ***p<0.00, 0.05 &0.1*

Finally, we estimate Equation 5 as follows:

$$FirmPerformance = \alpha_4 + \beta_1(Age) + \beta_2(Size) + \beta_3(SOE) + \beta_4(POE) + \beta_5(Hybrid) + \beta_6(Listed) + \beta_7(TO) + \beta_8(CO) + \beta 9(TO \times CO) + \beta 10(TO \times CO \times Size) + \beta 11(TO \times CO \times Collectivism) + \beta 12(TO \times CO \times PowerDis\tan ce) + \beta 13(TO \times CO \times RiskTaking) + \varepsilon_4 \quad (5)$$

Where:

Collectivism = Working Environment Collectivism
Power Distance = either high or low
Risk Taking= either risk lover or risk averse

Table 5 shows the results related to the impact of collectivism, power distance and risk taking with (TO) and (CO). Firms believe in the collectivism performing well and it contributes positively (0.317, 0.008***) to the performance of firms. We found that firms with high power distance loose the benefits of (TO) and (CO) and are negatively related (-0.155, 0.043**) to firm performance. Although risk taking is good in some circumstances our sample firms show that risk taking is adversely affected by the performance of firms (-0.239, 0.036**). In a nutshell, firms with high (TO) and (CO) realize good performance.

CONCLUDING COMMENTS

This is study is unique because it evaluates the influence of (TO) and (CO) along with organizational characteristics such as firm size, culture (collectivism, power distance and risk taking) among Chinese firms. We found fruitful and interesting facts for firms which are in the implementing phase of technology orientation and customer orientation. Usually, TO and CO significantly enhance firm performance. Gatignon & Xuereb, (1997) observed the same relationship. This study highlights and supports that the Hybrid form of firms enjoy more profits as shown in Table 2, (0.216, 0.084*). The findings also show that larger firms gain more advantages from TO and CO. We also find that collectivism plays a significant role

in firm performance. Being in an Asian country, it is not unusual that higher power distance hurts firm performance (-0.155, 0.043**) as shown in Table 5.

Table 5: Regression Results of Collectivism, Power Distance and Risk Taking with TO & CO on Firm Performance

F	R-Square	Adjusted R-Square
4.402	0.396	0.298
Age	0.001	
	(0.062)	
Size	0.102	
	(0.062)	
SOE	0.035	
	(0.074)	
POE	0.004	
	(0.086)	
Hybrid	0.128	
	(0.082)	
Listed	0.144	
	(0.062)	
Technology Orientation (TO)	0.262 (0.050**)	
Customer Orientation (CO)	0.321 (0.009***)	
TO×CO	0.312 (0.006***)	
TO×CO×Size	0.120 (0.038**)	
TO×CO×Collectivism	0.317 (0.008***)	
TO×CO×Power Distance	-0.155 (0.043**)	
TO×CO×Risk-taking	-0.239 (0.036**)	

*This table shows the impact of collectivism, power distance and risk taking with technology orientation and customer orientation on firm performance. *p<0.1, **p<0.05 & 0.1 and ***p<0.00, 0.05 &0.1*

Our results are consistent with prior studies that documented (TO) and (CO) contribute positively to firm performance (Henard & Szymanski, (2001) and Langerak et al., 2004). However, this study provides a better understanding of the combined effect of (TO) and (CO) and organizational characteristics. Overall, (TO) and (CO) are particularly effective at improving firm performance. Our study explicitly considered the role of organizational characteristics size, culture (collectivism, power distance and risk taking). Firm size contributes positively to firm performance. We conclude that higher power distance not only hurt (TO) and (CO) benefits but also overall firm performance. This is consistent with existing studies such as as (Day, 1994); (Kohli & Jaworski, 1990); (Levitt, 1960); (McKitterick, 1957) and (Slater & Narver, 1994) who that argued that effective (CO) could not be achieved without the role of the top management.

Identification of a successful mix of strategic orientations such as (TO) and (CO) with organizational characteristics size, culture (collectivism, power distance and risk taking) is a most complex challenge for management. We urge firm managers to develop a culture that nurtures organizational learning. The study suggests that managers should not ignore organizational factors and must develop the mix of orientations that enables adaptation to a dynamic business environment. This paper is subject to the usual limitations. We examine a single country and examine a sample with limited sample size. Further research in other countries is needed to confirm and extend the results. Our statistical tests show satisfactory influence of (TO) and (CO) on firm performance but the underlying phenomena is difficult to measure in practice.

Therefore, development of more differentiated measurements for (TO) and (CO) would be a valuable avenue for future research.

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BIOGRAPHY

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