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Employee Satisfaction and Customer Satisfaction: Testing the Service-Profit Chain in a Chinese Securities firm

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Abstract

With the rising share of the service sector in the global economy, best practices in production, human resource management (HRM) and marketing are copied from manufacturing and applied to service industries. As the production and marketing of services involve human interaction between producer and consumer, the question is relevant to what extent the marketing function intersects with production and HRM functions. A particular strand of research deals with the relationship between employee versus customer satisfaction. If the two are found to be mutually reinforcing, then company policies should take that fact into consideration. Motivation of staff hinges on a joint effort of production, HRM and marketing managers. And in reverse, staff motivation is a key element in successful marketing. The empirical study of a leading Chinese securities firm on which this article is based, tests the relationship between employee satisfaction, customer satisfaction, and their joint impact on profitability. The findings indicate that employee satisfaction and customer satisfaction are positive correlated, and both of them have a positive impact on profitability. Satisfied employees deliver the service customers desire for the company and remain loyal to the company, which results in a higher return on employee investment. Customer satisfaction and increased profitability can be achieved by managing the quality of employees and by improving employee satisfaction. Since customer satisfaction feeds back into employee satisfaction, a lasting competitive advantage has been created.

Key words: Service-profit chain, employee satisfaction, customer satisfaction, profitability.

1. Introduction

The industrial revolution and its aftermath can be characterized by a separation of production and consumption. To gear the activities of the employees to the needs of the market, specialist marketers are leading the way, but in many organizations the workers are more or less detached from the markets that they are serving. This detachment is aggravated by the fact that specialization of tasks performed has even led to a certain detachment from the workers with the end products of the organization. As a consequence, human resource management has resulted as a specialization dealing with the well-being and motivation of the workforce. It is only in the last decades that trends in technology and marketing have given rise to new concepts of one-on-one marketing and direct marketing, involving a closer and more often personal interaction between (employees of) the organization and individual customers. Apart from the growing importance of the service industry in economies all over the world, this trend is inspired by the realization that many goods do contain an element of service, which ultimately calls for a level of human interaction in any manufacturing or service industry. Still, the separation of HRM and marketing as specialist functions seems to persist.

Concentrating on the service industry, the theater metaphor is helpful for describing and analyzing service performance (Grove & Fisk, 2001). Actors can be thought of as the employees serving the customers, and the audience as the customers that experience the performance. The on-stage actors communicate their roles with the audience through their personal appearance, their behavioral manner and the setting of the performance. Employees and customers in most service industries are part of a *service factory* that can be compared to a performance in a theater (Love-lock & Wirtz, 2004). In the customers' point of view, indeed employees *are* the service (Zeithaml & Bitner, 2003). The service *actors'* commitment to their roles, like employee job satisfaction and loyalty, do have a strong impact on the *audiences'* perception of the performance, leading to a

situation of customer satisfaction in which actual performance and expectations are aligned. Simultaneously, the *audiences'* reactions to the performance are also of influence to the role acting of the *actors*. Actors and audience are communicating with each other through the transparent wall that separates them only symbolically. In fact, service employees and customers are influencing each other by their continuous interactions within the service factory.

In this article, the links that exist within the service factory are reviewed from a theoretical perspective. The most promising model, the service profit chain (Heskett et al., 1994, 1997), is used for empirically testing these links. The empirical tests are based on an in-depth study of the both the separate blocks of the service-profit chain (employee and customer satisfaction) and the relationship between these blocks, within the setting of a leading Chinese securities firm (Xu, 2004). The ultimate aim of the study is to find support for the positive relationship between employee satisfaction and customer satisfaction, and to see whether indeed the combined effect on profitability is positive, as an indication of a competitive advantage and enhanced financial organizational performance. The results of the study are directly helpful for the managers of financial service companies in China, where the study was done, in understanding that combined HRM and marketing are needed in order to increase profitability. As an empirical test of a general framework on the functioning of the service industry, the results of the study provide support for any service industry all over the world.

The rest of the paper is organized as follows. Section 2 briefly discusses previous studies on the link of employee and customer satisfaction, as an introduction to the empirical results obtained from testing the integrative framework of the service-profit chain using data for a Chinese securities firm. While the results in section 2 refer to testing two interdependent blocks of the service-profit chain, the customer-profit and the employee-profit blocks, section 3 will extend the analysis to a synthesized employee-customer-profit model. Section 3 discusses the model, introduces the hypotheses, and comments on the key aspects of the methodology used, before presenting the results of the analysis. Finally, section 4 discusses the findings, along with practical implications and need for future research.

2. Previous Studies of Employee-Customer Satisfaction Links

2.1. Studies on employee and customer satisfaction

With the rising share of the service sector in the global economy, academics and managers have tried to adapt the best practices in the functional areas of production, human resource management and marketing from the manufacturing industry to the service industry. Thereby, services have become topics of specialization, most notably in the field of marketing. The characteristics of services are so idiosyncratic that marketing of services has matured as a topic separate from general marketing. As the production and marketing of services involve human interaction between the producer and the consumer, leading to the 'people is product' notion, the question is relevant to what extent the marketing function intersects with the production and HRM functions. In this respect, a particular relevant strand of research deals with the relationship between employee satisfaction and customer satisfaction. If the two are mutually reinforcing, then company policies in both areas should start from that position.

Understanding the impact of employees' performance is critical in the service sector, because the intangibility of services leads customers to rely on employees' behavior in forming opinions about the service offering (Clark, 1997). Research has focused on the nature and the strength of links between employee satisfaction and customer satisfaction. There is growing evidence that supports a positive relationship between the two (Schneider, 1973; Hostage, 1975; Schneider et al., 1980; Carlzon, 1987; Schneider & Bowen, 1985; Schlesinger & Zornitsky, 1991; Schlesinger & Heskett, 1991a; Wiley, 1991; Rosenbluth & Peters, 1992; Dahlgaard et al., 1998: 355). Heskett et al. (1997) describe the relationship between employee and customer satisfaction with their analogy of the *satisfaction mirror*, which conveys the idea that business success results from employee satisfaction being reflected in terms of customer satisfaction. Schlesinger and Heskett (1991b) claim that staff frustrations lead to high turnover, merely reinforcing the organizational approach of minimal training, poor rewards and poor customer service in a *cycle of failure* (Schlesinger &

Heskett, 1991a). The mirror effect is also central to Normann and Ramirez' (1993) work on the value for designing interactive strategy and also to Liedtka et al.'s (1997) generative cycle of mutually reinforcing, self-sustaining employee and client development in professional services. In particular, the strength and richness of Heskett et al.'s contribution lies in the fact that the model interlinks and integrates many drivers of performance, drawing together many disparate claims about these interdependencies (Silvestro & Cross, 2000).

Several studies involving empirical analysis of some of the links in the service-profit chain have been undertaken. For example, Schneider and Bowen (1985, 1993) provide documented evidence of the relationship between employee and customer satisfaction. Several empirical studies have shown that it is impossible to maintain a satisfied and loyal customer base without satisfied and loyal employees. Those studies suggest a significant impact on customer satisfaction following an improvement in employee attitudes. Brooks (2000) overviews the research on the relationships between financial performance and customer and employee variables. According to his research, between 40 and 80 percent of customer satisfaction and loyalty is determined by the customer-employee relationship, depending on the industry and market segment that is being considered. For example, at Sears (Rucci et al., 1998), employee satisfaction accounts for 60 to 80 percent of customer satisfaction. At The Royal Bank of Canada (Brooks, 2000), 40 percent of the difference in how customers view its services can be directly linked to their relationships with bank staff.

Studies of factors common to successful companies (Porras & Collins, 1994) indicate that those companies whose goals reflect the interests of both employees and customers produce better results. High levels of customer satisfaction are predicted when employees are satisfied and loyal to the organization. Direct and quantifiable links exist between customer variables and employee variables, and financial performance.

2.2. The service-profit chain as an integrative framework for studying employee and customer satisfaction

The service-profit chain (Heskett et al., 1994) is a research framework that comprises the linkages of employee variables, customer variables and organizational performance (Figure 1).

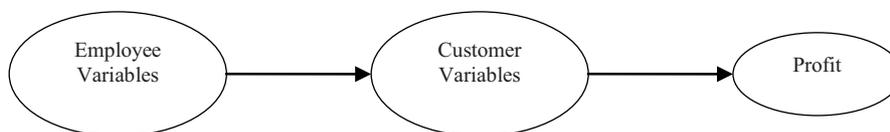


Fig. 1. The Service-Profit Chain Framework

Employee variables consist of employee perception of internal service quality which organization provides to its employees, employee satisfaction and employee loyalty. Customer variables comprise the customer's perception of the quality of the service delivered by employees, customer satisfaction, and customer loyalty. Causal relationships run from employee variables to customer variables and corporate profitability. The model provides an integrative framework for understanding how employee variables are related to customer variables regarding the perception of the service and intended behavior, and how these ultimately translate into profit. The argument of the service-profit chain (Heskett et al., 1994: 164-165) proceeds as follows:

"Profit and growth are stimulated primarily by customer loyalty.

Loyalty is a direct result of customer satisfaction. Satisfaction is largely influenced by the value of the services provided to customers. Value is created by satisfied, loyal and productive employees. Employee satisfaction results primarily from high-quality support service and policies that enable employees to deliver results to customers."

Heskett et al. (1997) collected empirical evidence from 20 large service organizations supporting many of the linkages in the chain. However, they appeared not to have subjected any single organization to a simultaneous analysis of all the linkages in the chain. Based on the service-profit chain framework, an empirical study in a leading Chinese securities firm has been conducted to fill in this gap. The study assesses the service-profit chain by two interdependent models. The first model describes customer-profit relations, while the second model deals with employee-profit model (Xu, 2004). A third model synthesizes the interdependent models in an overall service-profit chain model. The first two models and their empirical tests are discussed in the next two subsections. The synthesized model is the treated in the section 3 and following.

2.2.1. The empirically tested customer-profit model

The customer-profit model, as the marketing module of the service-profit chain model, is presented in Figure 2. Even though the terminology of the main constructs (quality perception; customer satisfaction; loyalty) is about perceptions and behavior of consumers, it should be realized that these constructs are explicitly linked to what has been labeled the employee variables in the above. The perception of the relationship value, as a direct determinant of customer satisfaction and an indirect determinant of profitability, hinges on the trust that exists between the customer and the service provider as represented by the employees with whom the customer is in more or less frequent contact. Likewise, the perception of service quality is co-determined by the customer's perception of the employee. Although employees can be trained in politeness and helpfulness, it is probable that the general state of mind of employees is mirrored by the perceptions that consumers are holding. The general assumption therefore is that, although it is not explicitly specified in the model at this stage, employee satisfaction feeds into the model via the employee-related variables that determine the main customer constructs.

Focusing on this part of the service profit chain, the empirical tests of the customer-profit model indicate positive causal relationships running from customer perception of service quality and relationship value to customer satisfaction and to customer loyalty and positive word of mouth, and ultimately profitability. Customer perception of service quality has a positive influence on customer satisfaction, and employee service attitude is more important than the provision of IT in the customer perception of service quality. The customer perception of relationship value has a positive influence on customer satisfaction. Among the three components (social benefits, special benefits and trust) of relationship value perceived by customers, trust is considered to be most important by customers, followed by social benefits and special benefits, suggesting that trust plays a key role in managing customer relationships.

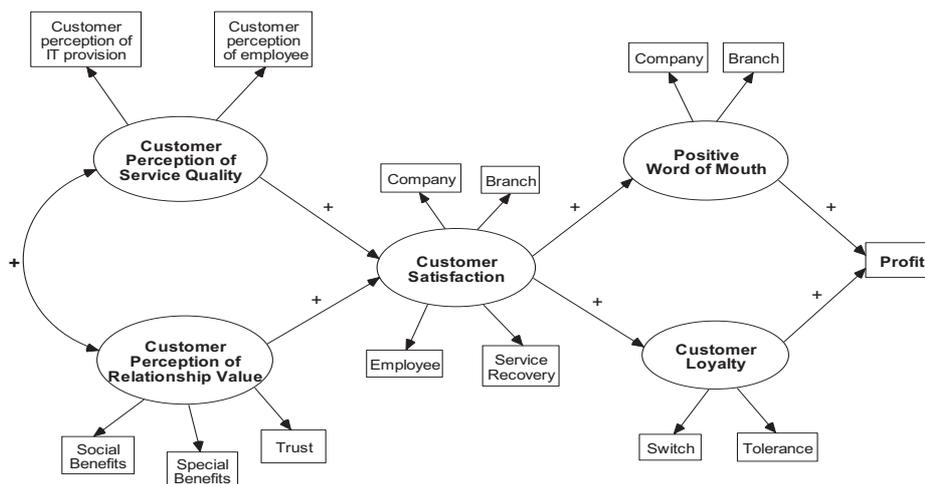


Fig. 2. The Empirically Tested Customer-Profit Model

Customer satisfaction is an important determinant of repeat purchasing behavior, and therefore it is the essential component of sustainable competitive advantage (Van Montfort et al., 2000). Customer satisfaction is assumed to be one of the most important criteria for customer loyalty (Heskett et al., 1994). The empirical study of the customer-profit model has pointed out that customer satisfaction has a positive impact on customer loyalty and on the company's financial performance (profitability). Customer satisfaction, measured by customer rating of the company, branch, employee and service recovery, can be predicted by customer perception of the service quality and service relationship value. Customer satisfaction has a positive influence on customer loyalty, in terms of both intentions to switch and tolerance to price changes. Profitability is positively influenced by customer loyalty. For a detailed overview of the model specifications, the operationalization of the variables and the findings, we refer to Xu (2004).

In summary, as the attitude of employees and trust are prevalently instrumental in providing the basis for continued business with existing customers, and by word-of-mouth extending the customer base, a holistic view of HRM and marketing policies – rather than as distinct functions within the organization – seems to be viable.

2.2.2. The Empirically Tested Employee-Profit Model

The employee-profit model is presented in Figure 3. As in the customer-profit module of the service-profit chain, the employee variables are relatable to attitudes that reside at the level of customers. The strongest argument here is in the case of employee satisfaction, which is directly determined by job characteristics. As the perception of what makes the job attractive may be co-influenced by how others (colleagues, customers) evaluate it, it is likely that the level of appreciation by customers – especially if they are in a position to communicate their satisfaction directly to the employee – is instrumental in the satisfaction of the employee. Taking a broad perspective of rewards, consisting of financial and non-financial rewards, it is equally likely that employees' perception of the quality that they are delivering is influenced by the expressed opinions of managers, colleagues and the consumer as the final recipient and judge of their efforts.

The empirical test of the employee-profit model indicates that the internal service quality perceived by employees is a significant determinant of employee satisfaction. Five dimensions (work environment, work resources, cooperation, leadership and rewards) define the internal service quality in the model. The results suggest that employee satisfaction has a strong influence on employee turnover intention, and a somewhat less strong influence on tenure. Tenure appears to be a less important determinant of profitability.

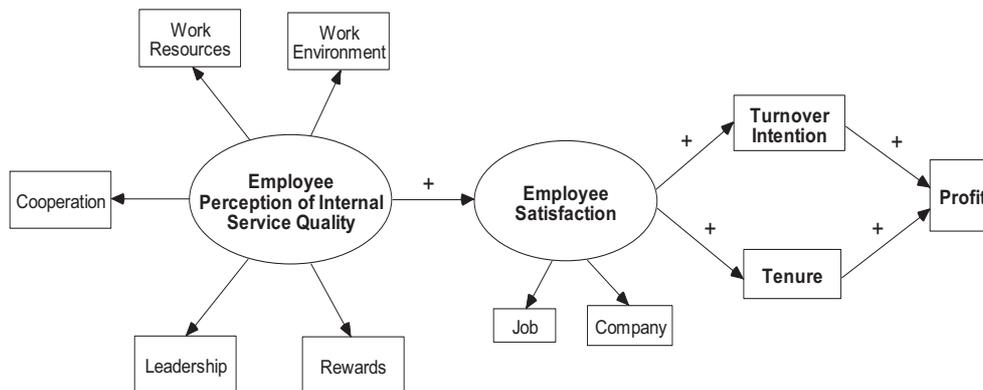


Fig. 3. The Empirically Tested Employee-Profit Model

The study shows that employee satisfaction has a positive effect on employee loyalty and profitability of the company, and that employee satisfaction is predicted by internal service quality perceived by employees. In order to make the company perform better, management should pay attention to cost efficiency measurements as well as employee satisfaction as the latter appears to significantly influence company profitability. Satisfied employees are a catalyst for alignment, as

employees deliver satisfaction to customers. They also deliver value to customers and make the company competitive in its markets through their knowledge and experience. Employee satisfaction represents feelings of the employee about the job, defined as the overall evaluation of working for the company. According to the empirically tested model, employee satisfaction is a result from how well employees' financial, professional and personal needs are being met. The results indicate that if the company pays attention to those conditions that enable employees to do a good job, the profit will grow.

In summary, tests of the two interdependent models show the expected signs, that is, they provided support for the assumed strings of events in Heskett's service-profit chain that run from both employee and customer loyalty to profit. Apart from using the empirical model to check what determinants in the model are contributing most to the performance of the service company, on a more abstract level a case can be made for making the interdependencies between the two models explicit. That is, if a method can be found to show that indeed, customer satisfaction tends to be higher whenever employees are more satisfied, and vice versa, then the argument for designing company strategies based on the mutual reinforcement of employee and customer satisfaction in the service industry gains in power. A first attempt in this respect is subject of the next sessions.

3. Toward a synthesis of the employee and customer satisfaction models

3.1. A synthesized model

In the previous section, the two interdependent models of employee satisfaction and customer satisfaction were discussed. The customer-profit model shows that customer variables have a positive impact on profit, while some of the customer variables have clear links to employee-related variables (trust; perception of employee attitude). Similarly, the employee-profit model shows the positive impact of employee variables on profit, while arguing that the employee variables are linked to customer-related variables (expressed satisfaction; job content). Both models provide partial evidence for the relationships put forward by Heskett's in his service profit chain. In order to complete the whole picture, a synthesis of the two models is called for. To bring about this synthesis, use is made of the key variables in Figures 2 and 3, being customer satisfaction and employee satisfaction, and their impact on profit. Reducing the models to their core in this fashion enables building a bridge between the two interdependent models as a means of testing the service-profit chain. A simplified synthesized employee-customer satisfaction model is proposed in Figure 4.

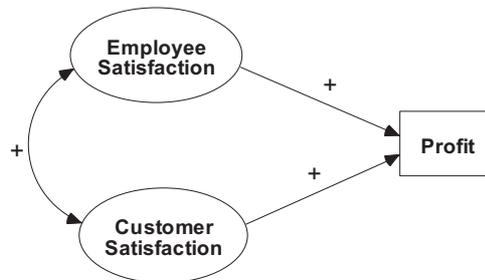


Fig. 4. The Employee-Customer Satisfaction Connection

The following hypotheses are tested with the use of this model:

H₁: Employee satisfaction is positively correlated to customer satisfaction.

H₂: Employee satisfaction positively influences profitability of the company.

H₃: Customer satisfaction positively influences profitability of the company.

Hypotheses 2 and 3 follow from the independent models. The added value of the synthesized model is that now it is assumed that both customer and employee satisfaction contribute directly to profitability, while recognizing that, within each company or part of the company, there are additional mechanisms leading from employee satisfaction to customer satisfaction and the

other way round, that have the potential to generate accumulated effects. A strong correlation between employee and customer satisfaction implies serious rethinking of separated marketing and HRM strategies.

3.2. Methodology

As discussed in Xu (2004), the data from a leading Chinese securities company fit the requirements for assessing the service profit chain. The linkages between customer variables and profitability have been tested separately in the customer-profit model and in the employee-profit model, as shortly summarized in section 2. The same data sources have been used for testing the synthesized model. Employee and customer data, and annual branch-level profit in 2002 have been collected by survey questionnaires and in-depth interviews. The reliability of the measurements has been tested in the pilot study. For all scales in the employee and customer survey, Cronbach's alpha exceeds the recommended level of 0.7. It should be understood that the procedure leads to a loss of data due to aggregation. While the employee and customer-profit models were based on extensive surveys among individual employees and customers, for the synthesis, the data were aggregated to the level of branches to which the customers and employees were connected.

680 Employees of 30 branches participated in the survey with a response rate of 66.7%. Responses from 495 customers were collected with a response rate of 41.2%. After outliers and responses with high proportion of missing answers were deleted, 428 employees from 26 branches and 476 customers from 26 branches were retained in the database. Both employee and customer data are available for 23 branches. Thus, data from these 23 branches have been used in testing the model. Data on employee and customer satisfaction were averaged by branch. The shift to the branch level as a unit of analysis, and the concomitant aggregation of data on the branch level, of course come at the expense of a loss of information on individual employees and customers. However, there is no alternative if one wants to assess the full service profit chain model, since it is the branch that connects employees to customers.

As is evident from Figure 3, *employee satisfaction* is explained by two variables based on the employee-profit model: satisfaction with the job, and satisfaction with the company. They were measured by survey questions on job ratings and of the company. *Customer satisfaction* (see also Figure 2) is explained by four variables based on the customer-profit model: satisfaction with the company, the branch of the company, its employees and service recovery. They were measured by survey questions on overall rating of the company, the branch, employees and service recovery. The dependent variable *profit* is measured by the average profit per employee for each branch. The reliability of employee satisfaction and customer satisfaction constructs has been tested. Cronbach's alpha for employee satisfaction is 0.70, and 0.89 for customer satisfaction, exceeding the recommended minimum level of 0.7 (Robinson et al., 1991). The unit of analysis in the synthesized model is each of the branches of the Chinese securities firm. Employee, customer and profitability data are averaged per branch.

3.3. Results

The results presented in Table 1 show that in support of hypothesis 1 employee satisfaction is positively correlated with customer satisfaction ($r = .35$). As expected from the tests of the two interdependent models in section 2, the data support hypotheses 2 and 3. Employee satisfaction and customer satisfaction have a positive impact on profitability.

Table 1

Correlations, Cronbach's Alpha between the Model Variables, N=23

Variables	M	SD	1	2
1 Employee satisfaction	2.92	0.13	0.70	
2 Customer satisfaction	3.13	0.15	+0.35*	0.89
3 Profitability	-7.61	12.14	+0.19	+0.13

Note: * significance exceeds 90%

The drawback of the variable-by-variable correlations is that the effects of employee and customer satisfaction on profitability are not studied simultaneously. Structural equation modeling, as used in estimating the parameters for the separate models, could not be used due to a too low number of observations. In anticipation for further research on a wider range of companies or branches, graphical analysis has been used. Figure 5 provides a three-dimensional plot of the dependent variable (profit) on the vertical axis, against the two independent variables (customer and employee satisfaction). The plane in the graph reflects the regression, and, as hypothesized, there is indeed of the profitability moving upward with increases in both employee and customer satisfaction. That is, in addition to the main effects of employee and customer satisfaction on profitability, and the positive correlation between employee and customer satisfaction, there is some evidence that profitability increases with joint increases in both employee and customer satisfaction.

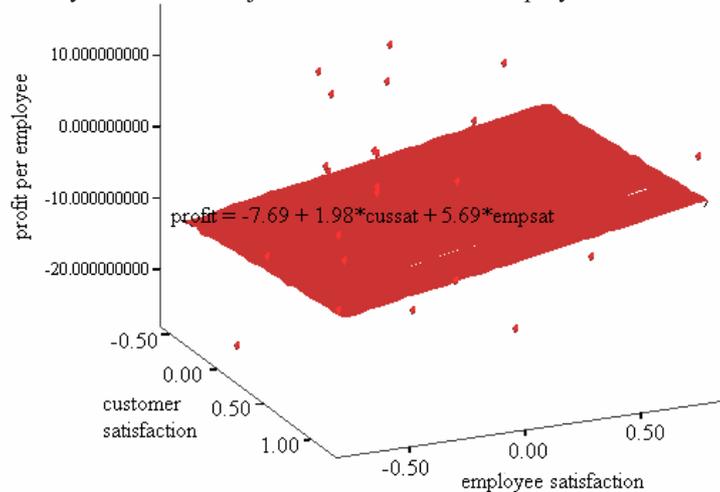


Fig. 5. Linear regression of employee-customer satisfaction and profit

It should be said that, even though findings are in line with the hypotheses put forward in theory, the evidence is not yet conclusive. First of all, the particularities of the Chinese setting may hamper the generalization of the results to other service industries in other countries. On the other hand, the fact that the relationships seem to hold in the developing market economy of China suggests robustness. Secondly, and more importantly, the analysis would gain in strength with the availability of longitudinal data on profits, as yearly profits may be influenced by (i) incidental factors that may have caused lower or higher profits for the year of investigation, and (ii) by structural factors outside the scope of the research that cause companies and branches to operate on different levels of profitability.

4. Discussion, implications and further research

4.1. Discussion and implications

This article has reviewed the customer-profit model and the employee-profit model, as parts of the service-profit chain. The separate models have been assessed for the setting of a Chinese securities firm. In addition the article has gone one step further by exploring, mainly graphically, a full model where the impact of employee and customer satisfaction on profitability is taken into consideration jointly.

Customers perceive the positive energy and the willingness of satisfied employees to provide good services in terms of higher quality of services received. In turn, they become more satisfied and loyal to the company. The key variables that link customer to employee satisfaction are trust and employee attitude. Illustrations of these generalizations can be found from case studies. Marriott who was the founder of the homonymous American hotel chain stated “*you can't make happy guests with unhappy employees*”. Satisfied employees stay with the company for longer and

therefore give a much better return on any investment (recruitment; training; pay-rises; package of benefits) put into them. The higher rate of return may stem from a prolonged use of company-specific tacit knowledge that gets lost when employees leave the organization, and from the increased trust that customers will put in the organization if a stable staff represents it.

Referring the theater metaphor, service *actors'* satisfaction is not only derived from *audience's* perception of the service performance, but also from coordination of performance teams which include strong leadership, effective communication within the organization and supportive back-stage staff. In the employee-profit model (Xu, 2004), the quality of work is a significant factor in determining employee satisfaction. Labeled internal service quality, it is constituted by the work environment, any resources for performing well on the job, effectiveness of leadership and cooperation within the organization, and rewards. The findings of the study promote the idea that employee satisfaction and customer satisfaction reinforce one another, making jobs more gratifying if customers are satisfied, thereby further enhancing the customer's perceived value. As Peck et al. (1999) have it, "*in a nutshell, if employees are more satisfied then so are customers*". Therefore, initial attempts to raise the quality of employees will increase service performance and customer satisfaction by improving internal service quality to retain valuable employees for the organization. Once this wheel is set in motion, maintaining the superior service organization is relatively easy, since customer satisfaction feeds back into the organization, both in terms of employee satisfaction and higher profits.

Regular employee surveys are instrumental in finding out what is important for them in their jobs and in keeping them loyal to the company. For the service organization it is critical to create the organizational context that supports employees in performing their jobs well. As an illustration, the employee survey shows that about 70% employees of this Chinese securities firm believe salary and opportunity of promotion do matter in the light of their satisfaction with their jobs. The knowledge resulting from this outcome is helpful for the company in keeping valuable employees by providing them an attractive salary and a growing career path. In academic institutions, it has been found that the staff values an environment that is conducive to research, as a determinant of job satisfaction. The drift of the matter is that in service organizations, the level of employee satisfaction is reflected in customer satisfaction, and therefore any source of employee dissatisfaction, via the transparent wall, is bound to affect market performance.

In the customer-profit model, the service attitude of the employee, such as willingness to respond, being courteous and friendly, is part of a customer's perception of the quality of the service, which directly translates into customer satisfaction. Employee service attitude apparently links to job satisfaction. Moreover, it is likely – and supported by the study – that satisfied employees are bound to show a better attitude. This crucial aspect ties the interdependent models together. And by implication, it ties HRM to marketing management. Service companies need to monitor customer satisfaction through regular surveys in order to keep trace how employee performance influences customer perception of the service quality.

The link between employee and customer satisfaction indicates that employee job satisfaction increases when the customers served appreciate their efforts, apart from the internal recognition given by managers and colleagues. This implies that service organizations should build effective communication channels that provide customer feedback of both positive (appreciation) and negative (complaints) signals to employees.

The relationship between employee satisfaction and customer satisfaction is complex. The synthesized model presented in this article presents a simplified model that demonstrates the logical linkage between the two. The testing of the model suggests that companies should develop a balanced approach to managing the market (its customers) and its employees, including the design of systematic tools that ensure that valuable employees translate their satisfaction into market performance. Monitoring employee and customer satisfaction and their determinants enhances understanding of the whole organization, and has the potential of creating a sustainable competitive advantage for the organization. The employee-customer-profit framework (Rucci et al., 1998) set up in the Sears company provides a very practical example of how a set of total performance indicators can be implemented, using soft measures of employee satisfaction and customer satisfaction

that enables the company to steer the company's financial performance by setting targets for HRM and marketing simultaneously.

4.2. Further research

More testing of the synthesized model is needed, across service industries and countries, in order to explore the general validity of the findings. As the employee and customer blocks of the service-profit chain are dependent on the level of personal contact, and modern technology may substitute ICT tools for human input, the frequency and nature of personal contact are a relevant extension for research in settings different from the setting in this study.

The measure of profitability has always been a complex issue, as it is influenced by many factors that go beyond customer and employee satisfaction, including incidental factors that call for longitudinal approaches, and different practices of defining and calculating profitability. For example, investments in operational resources (technology, human resource) may have a negative impact on profitability in the short-term, but may have a positive impact on it in the long-term. Innovation, competition and economic circumstances co-determine profitability. Therefore, in the absence of perfect measures of profitability, future research in this area should use a combination of longitudinal data and multiple measures of performance.

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