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CUSTOMER SIGNALING, AGENCY MORAL HAZARD, AND
SERVICE PERFORMANCE: AN EMPIRICAL INVESTIGATION

by

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Submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy

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GRADUATE STUDIES

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CUSTOMER SIGNALING, AGENCY MORAL HAZARD, AND SERVICE PERFORMANCE: AN EMPIRICAL INVESTIGATION

Abstract

by

DEBI PRASAD MISHRA

Marketing relationships between buyers and sellers are often characterized by the presence of information asymmetry, or a situation where sellers possess more information about the object of an exchange (e.g., a service) than buyers. Consequently, sellers make use of signals (e.g., price) and promise the delivery of a certain level of quality to buyers.

Sellers are often thwarted in their attempts to deliver promised quality because many market situations like services invariably introduce a second level of information asymmetry into the buyer-seller relationship. Specifically, sellers find it difficult to completely and costlessly monitor agents (e.g., car mechanics) who are hired to provide service to customers. The presence of this second level of information asymmetry between managers and agents can therefore adversely compromise the efficacy of various signals which sellers use to manage their primary relationships with buyers.

Given the preceding observations, this dissertation is motivated by a realization that signaling theory, which concerns the use of marketplace signals, is perhaps incomplete in its present formulation to adequately explain the structure of buyer-seller
relationships involving multiple levels of information asymmetries. Note that economists who developed signaling theory, perhaps made an implicit assumption that managers who transmit signals to customers also have full control over production processes, suggesting thereby that signaling, in and of itself, will lead to performance. This assumption may hold for "goods" producing firms where the production itself might be standardized, but seems to be inapplicable in a service setting where managers cannot completely control the actions of agents.

Given the preceding observations, this dissertation seeks to address two questions: (a) if service firms use signaling in conjunction with proper control of intermediaries (e.g., service providers), will service performance for firms indeed be enhanced?, and (b) are there interrelationships among multiple signals which sellers direct at buyers in the marketplace?

The rationale for pursuing the second research question is that sellers may choose from many different signals that they have at their disposal. Given this choice set, can sellers make selective use of some salient signals or even combine some signals for achieving maximum effect? Investigation of such potential interrelationships is justified because buyers may use more than one signal for making quality decisions. More specifically, buyers may draw upon differential amounts of information from multiple cues and then selectively integrate them in order to arrive at quality perceptions. In this regard, it may be noted that existing laboratory studies are stymied by their inability to manipulate more than one signal at a time. We therefore observe how extant empirical signaling studies have just focused on individual signals (e.g., use of warranties), to the virtual exclusion of any systematic consideration of multiple signals.
The research hypotheses of this study were empirically examined in the automobile service context by using a cross-section mail survey. Data obtained from 287 service managers were analyzed by employing the technique of latent variable structural equations modeling (LVSE).

The results of this dissertation provide relatively strong evidence for the interrelationships among certain signals. For instance, price premium signals are used by sellers only if another signal such as visible investments in sunk assets is also present. Hence, sellers who want a future stream of revenues by charging price premiums, also have to make investments in such non-price and non-service assets such as the decor of a particular service setting. Such peripheral investments seem to signal the presence of collateral assets against which sellers borrow price premiums from buyers. These results also suggest that marketers' avowed devotion to providing customer value and satisfying customer needs may indeed be a myth as firms rush to differentiate their services along seemingly meaningless attributes like physical surroundings.

Only mixed support for hypotheses pertaining to the joint effect of signaling and monitoring are found. Thus, the results of this dissertation cannot conclusively state that service performance is enhanced by a firm's decision to pursue signaling and monitoring strategies in tandem.
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CHAPTER 1

INTRODUCTION

In keeping with the growing importance of services in today’s economy (Bateson 1989; Gershuny 1978; Koepp 1987), marketers have produced an impressive and growing body of literature on service quality (Babakus and Boller 1992; Boulding et al. 1993; Crompton and Mackay 1989; Cronin and Taylor 1992; Finn and Lamb 1991; Parasuraman et al. 1988; Zeithaml 1990). Specifically, researchers have attempted to define, empirically identify, and even replicate the dimensions (Babakus and Boller 1992; Carman 1990; Parasuraman et al. 1991; Zeithaml et al. 1988) along which customers perceive service quality (e.g., reliability, tangibility, empathy, assurance, and responsiveness). Furthermore, marketers (Boulding et al. 1993; Cronin and Taylor 1992; Zeithaml et al. 1988; Zeithaml et al. 1993) have also focused on understanding those psychological processes like expectations, perceptions, and tolerance zones which customers use for making judgements about service quality.

While the thrust of present research has been on understand customer perceptions of service quality, relatively little attention has been directed at how service quality is achieved in organizations. Since services are intangible, and possess subjective quality measures, managers often face difficulty in evaluating and monitoring service providers. Furthermore, owing to intangibility, customers are thwarted in their attempts to properly evaluate a service and gain accurate information for making better purchase decisions (Murray 1991). These evaluation problems,
which are a direct consequence of intangibility and information asymmetry, can be formalized as performance ambiguity, which arises when any dimension of an exchange makes it difficult for one party to evaluate the performance of the other (Bowen and Jones 1986; Jones 1987, 1990; Siehl, Bowen, and Pearson 1992, Larsson and Bowen 1989).

Incomplete monitoring of service providers may cause deterioration of service quality and adversely affect a firm's profitability (Zeithaml et al. 1988; Mills 1990). For example, doctors who typically possess specialized knowledge about a surgical procedure cannot be completely monitored by management and patients. Such incomplete monitoring may therefore motivate physicians to over-provide services to patients, thereby affecting service quality.

Monitoring and control of service providers is essentially an agency problem (Bergen et al. 1992; Fama 1980; Jensen 1983; Jensen and Meckling 1983) which exists at two levels in a service organization as depicted in Figure 1.1. At the first level (Level 1 of Figure 1.1), buyers often find it difficult to evaluate a company's service offering because of performance ambiguity. In this sense, the final customer (principal) can also be viewed as engaged in an agency relationship with the company (agent) (Bergen, Dutta, and Walker 1992). Management has an incentive to solve this agency problem primarily to gain competitive advantage. More specifically, since service customers seek risk reducing information (Biehal 1983; Murray 1991), companies which provide quality assurances stand to gain from increased customer patronage. Management may use signals of quality like warranties or even certification to reduce performance ambiguity for final buyers and solve the agency problem.
Figure 1.1

Two Levels of Agency Relationships in Service Settings

CUSTOMER

Level 1 Agency Relationship

MANAGER

Level 2 Agency Relationship

SERVICE PROVIDER
A second agency problem (Level 2 in Figure 1.1) between managers and service providers arises because of intangibility, i.e., a situation where services cannot be seen, felt, tasted, or touched (Zeithaml, Parasuraman, and Berry 1985). In other words, it is possible for agents to exert less than complete effort while providing a service because management cannot completely monitor all aspects of the service delivery process. Consequently, managers have to design mechanisms (e.g., reward and control systems) for ensuring that service providers will not compromise on quality.

In addition to performance ambiguity, services are characterized by "simultaneous production and consumption", "perishability", and "non-standardization" (Berry 1975; Rathmell 1966; Regan 1963; Sasser 1976; Uhl and Upah 1980; Upah 1980; Zeithaml, Parasuraman, and Berry 1985). Simultaneous production and consumption implies that customers and service providers are in active contact during the service encounter which introduces uncertainty into the system because of idiosyncratic customer demands. Perishability refers to difficulty on the part of a service organization to inventory output, while non-standardization makes it problematic for a firm to supply routine services. The attributes of simultaneity, perishability, and non-standardization, can be conceptualized as customer induced input uncertainty (Argote 1982; Siehl, Bowen, and Pearson 1992; Larsson and Bowen 1989), which essentially provides a firm with the incentive to standardize its operations. For instance, when customer demands are routinized, management may automate the service delivery process (e.g., the use of automated teller machines by banks). Furthermore, when input uncertainty is low, and customer demands can be predicted accurately, management may make use of formal rules and routines for coordinating service providers (Chase and Tansik 1983; Northcraft and Chase 1985).
The preceding discussion suggests that performance ambiguity which exists at two levels in a service firm, leads to two principal-agent levels, i.e., between management and final customers, and between management and service providers (refer Figure 1). Successful resolution of these agency problems by management is the key to delivering superior service quality. In addition, input uncertainty determines whether or not a firm can use standard operating procedures. When performance ambiguity is low, management is not faced with agency problems and may therefore standardize its operations for delivering better quality.

**Purpose and Scope**

Although researchers (Bateson 1979; Berry 1980; Lovelock 1981; Shostack 1977) have recognized that intangibility is the critical difference between goods and services, the literature on managerial strategies for coping with the effects of intangibility appears to be incomplete and largely descriptive. For example, marketers have focused rather narrowly on a few managerial techniques for reducing intangibility for final buyers, i.e., "tangibilizing" cues (Berry 1980; Booms and Bitner 1982; Shostack 1977), using "word-of-mouth communications" (Biehal 1983; Davis, Guiltinan, and Jones 1979; George and Berry 1981), engaging in "post-purchase communication" (Fisk 1981; Zeithaml 1981) with buyers, and using "personal sources" (Donnelly 1980) for conveying a company's message to customers. In this sense, researchers have failed to acknowledge the adverse effect of intangibility on management's attempts to monitor and control service providers (see Zeithaml et al. 1988 for an exception). In sum, though marketers have recognized that intangibility is the most important characteristic of a service, comparatively little attention has been
directed at the effect of intangibility on evaluation problems for management and customers, and its concomitant agency problems.

The main point of this dissertation is that intangibility leads to performance ambiguity at two levels in a service organization, i.e., between customers (principals) and management (agent), and between management (principal) and service providers (agents) (see Figure 1). As noted earlier, extant literature fails to explicitly acknowledge the existence of these two levels of agency relationships, and offers largely descriptive strategies for tackling them. This is a major gap in our understanding of service quality which the present study seeks to address.

In addition to intangibility, input uncertainty is the other service characteristic which management has to cope with. Input uncertainty primarily provides a firm with the incentive to standardize its operation. Note that marketers who have called for "industrialization" (Levitt 1979), "designing" (Shostack 1984), "engineering" (Shostack 1987) and even a "production line approach" (Levitt 1976) to services, have essentially focused on managing input uncertainty to the virtual exclusion of tackling performance ambiguity. In other words, despite the importance of recognizing agency relationships within service organizations, previous research has focused rather narrowly on standardization issues and customer perceptions of service quality (e.g., research on service quality dimensions). This black box attitude of neglecting agency problems inside a service organization is a major gap in our understanding of service quality which this dissertation seeks to address.
Proposed Theoretical Contributions

Till date, theory construction and concept development efforts in the services area reveal a surprising lack of attention to understanding the effect of organizational processes on the delivery of quality. Echoing this viewpoint, Edvardsson and Gustavsson (1991) note that service quality is a process "that starts within the service company and often includes a number of internal service encounters that are affected by different company conditions". These authors recommend that "marketers should abandon the "black box" approach of ignoring organizational issues and instead "consider the service processes not only in the service encounter but also within the company" (p. 323).

Despite Edvardsson and Gustavsson's (1991) call, the focus of recent studies has still not expanded beyond the customer to include a systematic study of how organizational processes affect quality. Whatever little insight is available about the effect of organizational processes on service quality is often inferred by proxy. For instance, in a recent study, Keaveney (1995) highlights how customer switching behavior in service settings is affected by a host of factors like customer dissatisfaction with respect to pricing, unsatisfactory employee-customer interactions, etc. On the basis of this finding she concludes that "customer defections caused by unsatisfactory employee-customer interactions may be reduced by teaching employees to listen to customers, return telephone calls promptly, keep customers informed, and by training employees in state-of-the-art knowledge" (p. 80). However, Keaveney's (1994) recommendation is an inferred one, which merely suggests what organizations should do in a normative way. This research still does not answer the more basic question of
whether investing in customer service training results in better quality of the delivered service or not.

In fact, in services marketing, this obsession of just focusing on the customer in isolation, without paying any systematic attention to organizational processes has given rise to a stream of recent research which seeks to model the relationship between service quality and profitability (Anderson, Fornell, and Lehmann 1994; Rust, Zahorik, and Keiningham 1995; Rust and Zahorik 1993; Zahorik and Rust 1992). In other words, only now researchers seem to be seeking an answer to the more basic issue of whether an isolated focus on the customer is warranted or not.

The present study seeks to contribute to an important area in services marketing, i.e., understanding the effect of such organizational processes like customer service training, compensation schemes, service culture, and employee screening procedures on service performance. To achieve this objective, this research models the internal interactions between managers of a service firm and their employees as an agency relationship. To specify how this internal agency relationship is resolved, this dissertation develops a conceptual model that draws heavily upon research that has been carried out in the field of economics (agency theory and signaling theory), industrial psychology (studies on service culture), and strategic management (studies about information asymmetry) among others.

This dissertation also attempts to make a direct contribution to the signaling theory literature. Specifically, the study seeks to understand the interrelationships among the multiple signals of price premiums, advertising, sunk asset investments, warranty, and certification that sellers direct at buyers in service settings. Despite the well documented discussion about these signals (Akerlof 1970; Klein and Leffler
that sellers may use to convince buyers of final quality, practically no research investigates multiple signaling strategies of sellers.

**Managerial implications**

A distinct trend in today's economy is a pronounced shift toward the service sector. In fact, even purely goods producing firms like automobile manufacturers are realizing the critical role which customer service can play in differentiating their products in the marketplace. This realization has prompted firms across the board to adopt internal systems (e.g., customer service training) for enhancing service quality. In this context, the present study may contribute to managerial practice in two distinct ways. First, the findings of this study can be used by managers to understand which of the many different customer enhancement programs that are potentially available to firm are maximally effective in providing service. For example, is customer service training of employees always recommended, or is a control mechanism like a particular compensation system based on inputs from final customers a better means of delivering service? Second, managers may use the results of this study to understand which of the many different signals that they might direct at buyers may be maximally effective for communicating quality to final customers.
Organization

The organization of this dissertation is as follows. As a precursor to the development and discussion of the conceptual model contained herein, an extensive, synthetic, interdisciplinary literature review of related research is provided in the chapters labeled 2 thru 7.

Chapter 2 focuses on the research that has been conducted in organizational theory and fleshes out in detail the concepts of input uncertainty and performance ambiguity which characterize the client-service firm interface. Chapter 3 provides a focused theoretical perspective on sellers' use of marketplace signals by considering studies that have been conducted in the fields of economics (signaling theory) and strategic management. Chapter 4 is concerned with a discussion about agency theory concepts that may be used to model the relationship between managers and employees in a service firm. In Chapter 5, an extensive appraisal of the contributions of operations management research concerning services is presented, while Chapter 6 reviews the literature in the marketing field and outlines the most appropriate basis that researchers may use for measuring service performance. The conceptual model of this dissertation itself is described in Chapter 7 together with the specification of various hypothesis for empirical investigation. Chapter 8 describes the process that was adopted for developing the survey instrument. In Chapter 9, I provide an in depth discussion of issues surrounding the research design, the procedure which was followed for administering the questionnaire, and the response rate that was obtained. Chapter 10 presents the evaluation of data quality and describes various construct validation tests that were conducted. In Chapter 11 results of the empirical tests of the model are described. Finally, implications for future research, contributions of this
study to managerial practice, and the limitations of this dissertation are outlined in Chapter 12.
CHAPTER 2

PERFORMANCE AMBIGUITY AND INPUT UNCERTAINTY IN ORGANIZATIONS AND THEIR CONSEQUENCES: ORGANIZATIONAL THEORY PERSPECTIVES

The purpose of this chapter is to provide a focused theoretical perspective on the conceptualization of the key concepts of input uncertainty and performance ambiguity which characterize the customer-service firm interface. Specifically, I will review the literature in organizational theory (Argote 1982; Bowen and Jones 1986; Jones 1990; Larsson and Bowen 1989; Mills and Turk 1986; Mills and Margulies 1980; Siehl et al. 1982) and discuss the conceptual meaning of two sources of customer induced uncertainty, i.e., performance ambiguity and input uncertainty. By identifying the conceptual underpinnings of customer-service firm dimensions, I will be in a better position to relate them in a compelling and logical manner to the other theoretical constructs (e.g., customer signals, agent monitoring) that I have discussed in my conceptual model.

This chapter is organized in the following manner. First, I will review the organizational theory literature as it pertains to the notion of environmental uncertainty. Following this discussion, I will discuss two specific sources of uncertainty, i.e., performance ambiguity and input uncertainty, by isolating their conceptual meanings and also by specifying their theoretical antecedents. Finally, I will describe the consequences of performance ambiguity and input uncertainty.
Specifically, I will discuss how input uncertainty is related to organizational structure and the related concepts of formalization, centralization, and specialization. Likewise, I will also discuss how performance ambiguity that buyers experience in evaluating a service is related to firms' signaling strategies. I will conclude this chapter by discussing how performance ambiguity which managers experience while evaluating service providers is related to the concepts of agent monitoring and socialization (e.g., culture).

**Uncertainty in Organizations**

According to Galbraith (1973), uncertainty is "the difference between the amount of information required to perform the task and the amount of information already possessed by the organization" (p. 5). More specific to service organizations, "customer participation in service production and delivery (is) a source of input uncertainty" (Larsson and Bowen 1989; p. 213). This source of uncertainty rarely exists for manufacturing organizations, which can "buffer" their technical core (Thompson 1967) to reproduce the ideal process. According to Argote (1982), for a service firm, uncertainty is greatest when the alternatives are many and are equally likely to occur.

Within contingency theory, researchers have generally focused on "uncertainty" as an independent variable which originates from many environmental sources and affects organizational structure and effectiveness. For instance, Burns and Stalker (1961) and Lawrence and Lorsch (1967) have conceptualized environmental uncertainty as the "rate of change" of markets and technology. Later studies however, have incorporated more global conceptualizations of the environment for
understanding environmental uncertainty. For instance, Thompson (1967) described environments as varying along two continua, i.e., homogeneous/heterogeneous and stable/shifting. An elaborate classification of environments is presented by Jurkovich's study (1964) which covered 64 different types of environments.

Since different conceptualizations of the environment have been used, researchers have generally reported conflicting results between environmental uncertainty and the dependent variables of structure and effectiveness (Tosi and Slocum 1984). As a means of remedying this situation, Tosi and Slocum (1984) have urged scholars to focus on one or more of four "sectors" and not treat the environment of a firm in a global fashion. These four sectors are: (a) customers (or users) of a single or multiple output (s), (b) capital sources, i.e., stockholders, bondholders, banks, and other creditors, (c) raw product supplies, and (c) technology and science. As I noted earlier, customer induced uncertainty differentiates service firms from goods producing firms. This input uncertainty arises from those defining characteristics of a service (intangibility, simultaneous production and consumption, and customer participation in the service operation) on which there is near agreement among researchers (Bowen and Schneider 1988).

In classical economics, the customer-firm interface is conceptualized as the aggregate meeting of supply and demand curves (Smith 1937) which are coordinated by the invisible hand of the price mechanism. Neo classical economists, on the other hand, assume away anonymity between buyers and sellers by incorporating the concept of information asymmetry into the client-firm interface. Starting with the pioneering work of Stigler (1961), later economists (Nelson 1970; Darby and Karni 1973) argue that products differ in terms of search, experience, and credence qualities. Specifically, information asymmetry is minimum for search goods and maximum for
experience goods. The contingency of information asymmetry in the client-firm interface provides a firm with strategic options to influence customers (Nayyar 1990). For instance, companies may use signals of quality to reduce information asymmetry between buyers and sellers (Klein and Leffler 1981; Rao and Bergen 1992). Different strategies that firms may use (warranties, certification, price premiums, ornate settings, advertisements) are described in the review section on signaling theory (Chapter 3).

In contrast to classical economists, service researchers in organizational theory (Argote 1982; Bowen and Jones 1986; Jones 1987; Jones 1990; Larsson and Bowen 1989; Mills and Turk 1986; Mills and Margulies 1980; Siehl, Bowen, and Pearson 1992) have conceptualized the client-firm interface along two main dimensions: (a) performance ambiguity, which stems from information asymmetry, and (b) input uncertainty or the complex demands that customers place on service organizations. These studies are discussed more fully in the following sections.

**Input Uncertainty and Performance Ambiguity**

*Input Uncertainty*

In organizational theory, Mills and Margulies (1980) made the first formal attempt at identifying the dimensions of the client-service firm interface. These authors claimed to have followed a contingency approach and suggested that seven dimensions described the client-firm interface, i.e., (a) *Information*, involving quality, quantity, and confidentiality, (b) *Decision*, or the nature and importance of employee decisions, (c) *Time*, or the contact duration between employee and client, (d) *Problem*
Awareness, indicating the extent to which clients are knowledgeable about problems and whether they can evaluate services, (e) Transferability, or whether employees are substitutable or not, (f) Power involving notions of dependency between employees and clients, and (g) Attachment implying conflict potential between employees and clients.

In a later empirical study, Mills and Turk (1986) studied the interrelationship between three sub-dimensions of their typology, i.e., dependence, information processing, and task characteristics. Though Mills and Margulie's (1980) typology has merit, two main criticisms critically undermine its usefulness for further research. First, Snyder, Cox, and Jesse (1982) argue that the typology is neither exhaustive, nor mutually exclusive. In other words, as Mills and Turk (1986) observe, some of the dimensions may be dependent on others. The second main criticism of the typology is that the dimensions fall outside of a contingency framework. For instance, the dimension of "transferability" is contingent upon the nature of work which service workers face. In sum, a multidimensional conceptualization of the client-firm interface appears to be inappropriate and undesirable.

Recognizing the importance of carefully delineating the domain of uncertainty facing a service organization, Argote (1982) called for a movement "from diffuse characterizations of an organization's environment or task to more precise descriptions of the uncertainty characterizing a particular element of an organization's task environment" (p. 422). In her study of hospital emergency units, Argote (1982) conceptualized input uncertainty as "the number of choices or alternatives in a given situation (e.g., patient condition) and the probability of the various alternatives occurring" (p. 422). The primary contribution of Argote's study is its micro focus on
customer induced uncertainty as a contingency variable which affects organizational structure and effectiveness.

Larsson and Bowen (1986), in an attempt to further clarify and refine the meaning of input uncertainty, define this concept as "the organization's incomplete information about what, where, when, and how customer input is going to be processed to produce desired outcomes" (p. 217). Another analogous conceptualization of input uncertainty is provided by Jones (1990), who notes that customer uncertainty refers to "the amount of information necessary to conduct and complete successfully a transaction with the customer" (p. 24).

The concept of input uncertainty is similar to task uncertainty, or lack of information about how tasks are to be performed. For instance, Argote (1982) observes:

The concept of input uncertainty bridges the somewhat artificial distinction between environmental and task-related uncertainty. Input uncertainty is a specific type of uncertainty. Its specificity enables us to move from diffuse characterizations of an organization's environment or task to more precise descriptions of the uncertainty characterizing a particular element of an organization's task environment (p. 422).

Organizational theorists, in contrast to service researchers, have focused on input uncertainty in an indirect way. For instance, researchers (Woodward 1965; Perrow 1967; Hasenfeld and English 1974) have focused on the broader concept of "technology" or approaches to describing tasks in an organization. For instance, Hickson et al. (1969) focus on work-flow integration, while Tinker (1973) considers automation and mechanization as components of the technology construct.
More relevant to service organizations and input uncertainty is the concept of variability in raw materials (Perrow 1967; Woodward 1970). The concept of variability in raw materials is described by Overton, Schneck, and Hazlett (1977) as "differences between patients in the degree of criticalness of their health problems and the frequency with which emergency situations may occur" (p. 205). In an empirical study of human service organizations, the authors (Overton et al. 1977) found that variability emerged as a distinct facet of the technological construct. Hence, the current conceptualization of "customer induced input uncertainty" is analogous to the "variability" facet of the technology construct.

*Performance Ambiguity*

Realizing that the singular focus on "customer induced input uncertainty" may not adequately capture customers' evaluation problems (Darby and Karni 1973; Zeithaml 1981), some researchers (Bowen and Jones 1986) have introduced an additional dimension into the customer-service firm interface in order to represent customers' uncertainty about the service provided. In this sense, organizational theorists have identified and discussed the dimension of **performance ambiguity**.

The notion of performance ambiguity about a service relates to problems which customers face while evaluating a service. The origins of this concept can be traced to the information asymmetry literature in economics (Akerlof 1970; Nelson 1970; Darby and Karn 1973). It appears that the dimension of performance ambiguity is related more to incomplete information that customers possesses about the service organization. In contrast, input uncertainty is related more to incomplete information that a service organization possesses about its customers. Taken together, input
uncertainty (with an organizational focus) and performance ambiguity (with a customer focus) seem to adequately describe the client-firm interface. A more focused discussion of the concept of performance ambiguity follows.

According to Bowen and Jones (1986), "performance ambiguity arises when any dimension of an exchange makes it difficult for one party to evaluate the performance of the other" (p. 431). In a similar vein, Jones (1990) notes that "performance ambiguity is particularly prevalent when the goods or services being purchased are intrinsically complex, and their quality can only be really evaluated after purchase and use" (p. 24).

Jones (1987) provides yet another definition of performance ambiguity:

Performance ambiguity refers to clients' inability to monitor and evaluate the performance of other parties and to determine the value of the objects of exchange. First, it is often difficult for clients to monitor and evaluate the quality of goods and services when these are intangible—like medical advice—or are produced and consumed simultaneously. Second, the quality of many products and services depends on the skills and abilities of specialized personnel, such as doctors and lawyers, whose very specialization often makes it difficult for clients to evaluate their performance... Under such conditions, clients may perceive high uncertainty and risk in the exchange process. (pp. 201-202).

Note that performance ambiguity stems from information asymmetry, i.e., a situation when one party to the exchange possesses more information than the other party (Rao and Bergen 1992). The concept of performance ambiguity is directly related to signaling strategies that managers employ to convince final customers of service quality and also to agency problems characterizing a service organization (Bergen, Dutta, and Walker 1992).
Recently, Siehl, Bowen, and Pearson (1992), have tried to formalize the client-service firm interface along the dimensions of input uncertainty and performance ambiguity. Specifically, Siehl et al. (1992) observe that input uncertainty and performance ambiguity relate to service provider and customer perspectives on information processing. Furthermore, services may be classified based on varying amounts of performance ambiguity and input uncertainty. In this vein, Siehl, Bowen, and Pearson (1992) observe that:

Different types of services can be associated with different levels of input uncertainty. Examples of services with low input uncertainty are fast food operations, movie theaters, and simple retail banking; intermediate examples include car repair and retail stores; high input uncertainty examples include education, estate planning, and health care...Performance ambiguity is a function of the intangibility of services. Retail stores and fast food operations exemplify services characterized by low intangibility. Services that are moderately intangible include restaurants and banking...Legal and medical services are examples of highly intangible services that are especially difficult for customers to evaluate even after the production and consumption of service. (p. 540; emphasis added).

It is important to note that extant discussion of the concept of performance ambiguity (c.f., Jones 1986) does not sufficiently distinguish between the various "levels" at which this concept might operate. Specifically, managers in service firms have to deal with two distinct types of performance ambiguity. The first type of performance ambiguity concerns difficulties which consumers face while evaluating a service. This type of customer performance ambiguity may be tackled by managers through the use of appropriate signaling strategies like investments in physical surroundings, the use of warranties, etc. The second type of performance ambiguity which managers face concern the difficulty involved in monitoring the work of service
providers. Specifically, the service act itself is performed by an employee whose actions cannot be easily monitored by managers and employees (Anderson and Oliver 1987; Bowen and Schneider 1988). This ambiguity which managers face in relation to employees can be resolved through the use of appropriate agency control and monitoring strategies (Bergen, Dutta, and Walker 1992) and also through the use of informal control mechanisms like a customer oriented service culture in the organization. In light of the preceding observations, I will discuss performance ambiguity separately as it pertains to the customer and the service provider.

**Consequences of Performance Ambiguity and Input Uncertainty**

The dual conceptualization of the client-service firm interface provides us with three theoretical approaches for investigating the internal structuring of service firms. First, customer performance ambiguity can be directly related to signaling theory (or informational economics theory), which sheds light on how firms might actually signal the quality of their service to customers in the presence of information asymmetry. Furthermore, the consequences of service provider performance ambiguity can be studied by appraising agency theory concepts which specify how the relationship between management and service providers is managed. Finally, input uncertainty is related to organizational theory and operations management concepts.

It may be worthwhile to note that the two dimensional categorization of the client-firm interface also incorporates the defining characteristics of services. For instance, intangibility, which is defined as a condition where services "cannot be seen, felt, tasted, or touched in the same manner in which goods can be sensed" (Zeithaml, Parasuraman, and Berry 1985; p. 33) is closest in meaning to customer performance
ambiguity. This view is endorsed by Siehl, Bowen, and Pearson (1992) who explicitly define intangibility as performance ambiguity. The other characteristics of services, i.e., *inseparability of production and consumption* (Booms and Nyquist 1981; Bateson 1977; George 1977; Gronroos 1978), *heterogeneity*, and *perishability* (Berry 1980; Booms and Bitner 1981; Sasser 1976) are related to input uncertainty. More specifically, as Zeithaml, Berry, and Parasuraman (1985) note, perishability makes centralized mass production of services difficulty, while heterogeneity and perishability imply that services cannot be standardized or inventoried.

Some authors have attempted to describe the client-firm interface by using additional dimensions. For instance, Bowen and Jones (1986) suggest that the client firm-interface may be described along two dimensions: performance ambiguity and goal incompatibility. The dimension of goal incompatibility is however dependent on performance ambiguity. In these sense, the dimensions are not mutually exclusive. In other words, low and high combinations of these dimensions may yield "empty cells" (Hunt 1983) thereby defeating the basic objective of any typology which should parsimoniously classify the objects of a phenomenon. In a related vein, Jones (1987) initially distinguishes between performance ambiguity and input uncertainty, but later combines these dimensions into "transaction uncertainty" from which organizational structure is predicted. More recently, Siehl, Bowen, and Pearson (1992) suggest that input uncertainty may lead to performance ambiguity.

While attempts at identifying more dimensions of the client-firm interface are noteworthy, they do not stem from theory and well reasoned logic. Incorporating these dimensions into a research study might unnecessarily complicate the conceptualization of the client-firm interface. It is proper at this stage to rely on the dimensions of performance ambiguity and input uncertainty because they are closely
related to the definitional characteristics of a service on which there is near unanimous agreement among service researchers in organizational behavior (Bowen and Schneider 1988), marketing (Zeithaml, Parasuraman, and Berry 1988), management strategy (Nayyar 1990), and operations management (Northcraft and Chase 1985).

In the following sections, I describe the consequences of performance ambiguity and input uncertainty in more detail. Specifically, I attempt to answer the following question: "If service firms follow the structural prescriptions of organizational theory, do they achieve quality?". In other words, if performance ambiguity and input uncertainty are managed in accordance with theoretical prescriptions, is there any evidence that a firm will indeed achieve the desired level of performance?

Consequences of input uncertainty

The extant literature does not provide a very coherent view of the main consequence of input uncertainty on service firm's internal structure and organization. First of all, researchers don't seem to agree on what should be the relevant set of dependent variables to study. Second, contingency theory as well as operations management make different predictions about the consequences of input uncertainty. I have attempted to resolve some of the controversies surrounding this issue while discussing my conceptual model. In the following paragraphs, I describe the different consequences of input uncertainty as they have been identified in the literature.

It appears that service researchers have attempted to predict the mode of service operations from contingent client-firm interface dimensions (e.g., input uncertainty), to the virtual exclusion of organizational structure (see Argote 1982;
Jones 1987 for exceptions). More importantly, effectiveness issues have been largely ignored, though it is implied that service quality (or some form of performance) is the relevant dependent variable. This trend is disheartening because contingency theory (and agency theory) is built around the notion of performance. If service marketers indeed follow the prescriptions of these normative theories, performance of service firms should be assessed as a logical corollary.

The concern with specifying the appropriate criterion of "effectiveness" in contingency theory is critical. Specifically, Tosi and Slocum (1984) note that "contingency theories construe organizational effectiveness either too broadly or too narrowly" (p. 11). For instance, some studies (Lawrence and Lorsch 1967; Snow and Hrebinak 1980) construe effectiveness too narrowly to mean profitability, while other researchers define effectiveness more broadly as attraction of resources (Mott 1972). Profitability as a measure of effectiveness has perhaps been broadly accepted because of the capitalistic orientation of our society where corporate success is measured by the bottom line. This view is however being increasingly challenged. For instance, in an insightful study on the effects of marketing orientation, Kohli and Jaworski (1990) report that profitability is not a component of the "marketing orientation construct". Yet another theme which emerges from the effectiveness debate is that it may be a multidimensional construct incorporating notions of efficiency, outcome preference of organizational members, and social responsibility (Tosi and Slocum 1984). Echoing this viewpoint, Noordewier, John, and Nevin (1990) note that "managers should not focus exclusively on transaction cost minimization given the multidimensional nature of performance" (p. 92).

A majority of contingency studies in services have predicted "operations" and structure of service firms from input uncertainty. Larsson and Bowen (1989) suggest
that under conditions of low input uncertainty, firms would "standardize" their services, allocate most work to the "back office", and reap the benefits of "specialization". When input uncertainty is high, tasks are non standardized and most work shifts to the "front office". Using a transaction-cost argument, Bowen and Jones (1986) suggest that relational ties between the service provider and the customer may be inappropriate when input uncertainty is low. Argote (1982) observes that low input uncertainty results in "programmed" means of coordination while high input uncertainty calls for "non-programmed" coordination. Jones (1990) indirectly incorporates some "agency" theory logic by suggesting that low performance ambiguity leads to "market compensation" of employees (i.e., piece rates or hourly rates). Furthermore, standardized procedures would be supplemented by a bureaucratic structure which engenders a culture of "bottom line" performance. When performance ambiguity is high, the firm may not use "output" control mechanisms. On the other hand, rewards should be based on the number of returned goods or customer complaints. Firms may also use guarantees to signal the quality of their products. At the level of structure, firms will tend to be more specialized. This point is also made indirectly by Mills and Margulies (1980) who observed that "substitutability" of employees may vary across different service contexts, being highest for maintenance interactive firms (e.g., banks) and lowest for personal-interactive services (e.g., schools and professionals).

The relationship between client-firm interface dimensions and organizational structure was empirically investigated by Jones (1987). The most important finding of this study is that "in general transaction uncertainty is a better predictor of structure than performance ambiguity" (p. 212). Note that Jones' definition of transaction uncertainty as "the degree to which organization-client transactions are unstandardized
or unpredictable" is similar to the definition of input uncertainty discussed earlier. Since Jones' (1987) study is one of the few empirical tests of the impact of client-firm interface variables on operations and structure, I discuss his findings in more detail below.

Jones (1987) reported a positive relation between transaction uncertainty and the number of hierarchical levels. Higher transaction uncertainty was also related to narrow spans of control suggesting increasing specialization. Furthermore, at the operations level, complex forms of task interdependence were observed under high transaction uncertainty. Finally, formalization is not related to transaction uncertainty. Interestingly, performance ambiguity which is closer to agency theory is negatively related to both output and behavior control suggesting that these methods of controlling agents may be inappropriate. In other words, management may use complex compensation systems for rewarding employees.

In sum, Jones' (1987) empirical study lends considerable credence to my earlier position that performance ambiguity and input uncertainty are distinct constructs. Furthermore, opportunism which "to some degree (is) a consequence of (the) level of performance ambiguity" (Jones 1987; p. 215) is directly related to agency theory and informational economics theory. On the other hand, input uncertainty is related to structure and operations. I elaborate on structure and operations in more detail below.

It seems appropriate that input uncertainty has two effects, one on organizational structure, and the other on operations (or tasks) of service providers. As Comstock and Scott (1977) point out, this distinction brings into sharper focus the "macro" (i.e., the structure) and the "micro" (i.e., operations) aspects of organizing the activities of a firm. Echoing this view, Ruekert, Walker, and Roering (1985) suggest that "one necessary step toward improving the long-run performance of adaptability of
American business is to develop more flexible 'macro level' structures, and to pay more attention to organizing individual activities and work units in ways that are appropriate for the specific situations and objectives they face" (p. 19).

Recently, marketing scholars (Ruekert, Walker, and Roering 1985) have noted that "there is little in terms of conceptual development or empirical evidence that gives insight to marketing managers in developing appropriate organizational structures" (p. 13). In a similar vein, service marketers (Zeithaml, Berry, and Parasuraman 1988) have noted that "an understanding of service quality and how it is achieved in organizations has become a priority for research" (p. 35). Specifically, Zeithaml, Parasuraman, and Berry (1988) have incorporated organizational theory concepts (e.g., levels of management, task standardization, teamwork) into a model of "communication and control processes in the delivery of service quality". Organizational theory constructs can therefore shed some light on how internal activities of a service firm may be efficiently organized for delivering quality. For instance, as Comstock and Scott (1977) note, "work that is more routine can be done effectively by bureaucratic organizations, whereas less routine work requires more flexible, less hierarchical, and less formalized organizations" (p. 177).

According to contingency theory (Lawrence and Lorsch 1967), some service organizations offering relatively tangible services (i.e., groceries) may be more "formalized" and "centralized" than firms offering highly intangible services (i.e., medical care). Using organizational theory to study the structure of service firms may provide additional insight into the working of these organizations.

Note that the earliest studies (Comstock and Scott 1977; Glisson 1978) in organizational theory on the relationship between "technology and structure" were conducted in service organizations (hospitals, human service organizations). To this
extent, a review of organizational theory studies about the internal structure of service organizations may seem appropriate.

Modern organizational theory recognizes that there is no best way to organize the internal activities of an organization. More specifically, the modern approach is integrative in nature and assumes that "the only meaningful way to study an organization is to study it as a system" (Scott 1961; p. 11). Simply put, organization structure (e.g., formalization, centralization, and specialization) depends upon the nature of the environment that a firm faces. These views are discussed more fully under the "contingency" approach to organizing. As an example, using principles from organizational theory, we may argue that service firms which face different degrees of task routinization may be organized differently. Specifically, for relatively tangible services (i.e., groceries, fast food services) tasks facing the service provider are routinized. Consequently, these services may be efficiently organized by a high degree of task standardization and formalization (i.e., dependance on written rules and instructions).

Structure is "the logical relationships of functions in an organization, arranged to accomplish the objectives of the company efficiently" (Scott 1961). The main function of an organizational structure is to introduce logical and consistent relationships among the diverse functions which comprise an organization. The main concepts subsumed under organizational structure are formalization, centralization, and specialization (Reukert, Walker, and Roering 1985).

Formalization is concerned with the extent to which expectations regarding the means and ends of work are specified and written (Blackburn 1982; Grinyear and Masoud Yasai-Ardekani 1980; Ivancevich and Matteson 1987; Ruekert, Walker, and Roering 1985; Walton 1981). In a highly formalized organization rules and
procedures are often available to specify what each individual should be doing. Organizations which such structures will have standard operating procedures, specified directives, and explicit policies.

*Centralization* relates to the location of decision making activities in the organization. This concept refers to the delegation of authority among jobs in the organization (Blackburn 1982). While discussing centralization, it is important to focus on the nature of decisions. Specifically, not all decisions are equally important. Managers may have authority over routine decisions and not over strategic decisions (Ford 1979). Centralization is therefore a complex construct.

*Specialization* relates to the degree to which tasks are divided into unique elements (Reukert, Walker, and Roering 1985). Some researchers have suggested that specialization leads to complexity (Ivansevich and Matteson 1987). Simply put, the fundamental idea behind complexity and specialization is that a great many types of jobs and units create complicated managerial and organizational problems than those with fewer jobs and departments.

Generally, we expect that centralization and formalization in service organizations will increase with the routinization of tasks. On the other hand, specialization of tasks will decrease with routinization. Basic support for this expectation comes from studies that focus on the relationship between tasks and structure (Reukert, Walker, and Roering 1985; Jones 1987).

*Span of control* (Graicunas 1937) refers to the number of subordinates a manager can effectively supervise. This concept directs attention to the complexity of human interrelationships.

More central to service organizations, different organizational structures are appropriate under different boundary conditions. Note that services are characterized
by varying amounts of customer induced input uncertainty (Argote 1982). The
specific organizational structure that a service firm develops is therefore "contingent"
on the input uncertainty it faces.

Within organizational theory, the main contingency factor relates to uncertainty
and instability of the environment (Tosi and Slocum 1984). The underlying intuitive
appeal of contingency theory and the remarkably congruent results of early studies
(Burns and Stalker 1961; Galbraith 1977; Lawrence and Lorsch 1967) paved the
way for more rigorous examination of the relationship between environmental
uncertainty and structure. In general, early studies found that task uncertainty (i.e.,
the amount of information required to perform a task) is positively related to structure.

The early euphoria over contingency theory gave way to disenchantment and
disillusionment as later studies which tried to explore the link between environmental
uncertainty and structure reported conflicting results (Dewar and Werbel 1979; Miller
1981). For instance, Duncan (1973) found that increased environmental uncertainty
resulted in "loosening" of organizational sub units. On the other hand, Huber,
O'Connel, and Cummings (1975) reported that higher environmental uncertainty
resulted in "tightening" of sub units. The main reason for discrepant results was the
erroneous conceptualization of key contingency variables. For instance, uncertainty
was often treated as an all encompassing "summated" variable. Argote (1982) notes
that "different conceptual and measurement approaches to uncertainty have been used
in the different studies, and the specification of exactly what is meant by uncertainty
has often been vague" (p. 422). In other words, environment uncertainty was
combined with other sources of uncertainty (induced by the customer, induced by the
technology), yielding at best a fuzzy independent variable.
An exception to this approach is a study by Argote (1982) who specifically focused on only one dimension of uncertainty: *customer induced uncertainty*. Argote (1982) reported that programmed means of coordination made a greater contribution to organizational effectiveness under conditions of low uncertainty than under conditions of high uncertainty. More importantly, Argote (1982) conceptualized effectiveness as the quality of care. This study provides me with a theoretical basis for linking various structural arrangements in a firm to quality of care.

*Consequences of performance ambiguity*

As discussed earlier, performance ambiguity operates at two levels in a service firm. Customer performance ambiguity is resolved by managers through the use of appropriate signaling strategies. Various signaling strategies that managers might use is discussed in Chapter 3. Service provider performance ambiguity is resolved through the use of appropriate monitoring and control strategies. These strategies are discussed in Chapter 4. The focus of this section is on the use of culture for managing service provider performance ambiguity.

*Organizational culture as a control mechanism*

Though culture is a nebulous concept, Kroeber and Kluckhohn (1952) after reviewing over a hundred definitions of the concept state that:

Culture consists of patterns, explicit and implicit of and for behavior acquired and transmitted by symbols, constituting the distinctive achievement of human groups, including their embodiment in artifacts; the
essential core of culture consists of traditional (i.e., historically derived and selected) ideas and especially their attached values; culture systems may, on the one hand, be considered as products of action, on the other as conditioning elements of further action (p. 181)

More specific to organizations, Deshpande and Webster (1989) define organizational culture as:

The pattern of shared values and beliefs that help members of an organization understand why things happen and thus teach them the behavior norms in the organization (p. 4; emphasis added).

Studying organizational culture, especially for service firms, is important for four reasons. First, organizational culture theories by explicitly relying on norms of behavior offer a radically different perspective on a firm's internal environment than organizational economics theories (agency theory and TCA) which are based on human opportunism. Recognizing these divergent viewpoints, recently researchers have not only empirically tested the relevance of these competing perspectives (Heide and John 1992) but also called for comparing "culture" theories with theories of "human opportunism" (Donaldson 1990; Lawless and Price 1992; Williamson 1989). Second, scholars have noted that traditional models of organization (structural theory, contingency theory) which ignore culture concepts may yield at best an incomplete understanding of the relationship between organization goals and outcomes (Ouchi and Wilkins 1985; Pascale and Athos; Schwartz 1981; Tosi and Slocum 1984). Third, strategic management, which assumes an "efficiency motivation" for firms, has espoused the value of an "efficiency-based theory of culture" wherein "cultural rules
can effectively administer contracts between firms and employees" (Camerer and Vepsalainen 1988; p. 124). Finally, services are characterized by performance ambiguity (Siehl, Bowen, and Pearson 1992) and simultaneous production and consumption (Booms and Nyquist 1981; Upah 1980) which not only makes it difficult for management to strictly specify and enforce service scripts (Zeithaml, Berry, and Parasuraman 1988), but also for customers to evaluate the offering (Zeithaml 1981). Specifically, service customers may be considered "partial employees" of the firm (Mills and Morris 1986) who are in active contact with the firm's internal environment. As such, "the face-to-face, for-profit service sector (which) brings employees and customers physically, organizationally, and psychologically close " (Webster 1991; p. 348; emphasis added) may benefit from a consideration of culture issues.

Though it is conceptually appealing to incorporate "culture" for studying service organizations, a careful scrutiny highlights a lot of confusion and debate among academicians about the most appropriate research approach. These controversies can be grouped under five headings: (a) *definitional* problems (b) the difference between *culture* and *climate*, (c) *methodological* concerns, (d) *levels of analysis* issues, and (e) confusion about the *independent* or *dependent* nature of culture. I discuss these issues in the following sections.

*Definitional issues pertaining to culture*

Neither anthropologists nor management scholars have defined culture consistently (Alder, Doktor and Redding 1986). For instance Tylor (1877) defined culture as "that complex whole which includes knowledge, belief, art, morals, customs
and any capabilities and habits acquired by man as a member of society" (p. 1). Linton (1945) described culture as "the configuration of learned behavior whose component elements are shared and transmitted by members of a particular society" (Alder, Doctor, and Redding 1986; p. 298). In summarizing the vast body on literature on culture, Alder, Doctor, and Redding (1986) note:

Culture is, therefore, (a) something that is shared by all or almost all members of some social group, (b) something that the older members of the group try to pass on to the younger members, and (c) something (as in the case of morals, laws, or customs) that shapes behavior or structures one's perception of the world (Carrol, 1982, p. 19).

Furthermore, Alder, Doctor, and Redding (1986) conclude that culture is "the shared ideas which shape and influence social action" (p. 299), a point shared by Child (1981, p. 324; Keesing 1974; Kroeber and Parsons 1958, pp. 582-583; Parsons 1973, p. 36). In agreeing with this definition, culture theories seem to reject the concept's meaning as "the action itself as played out in the social system" (Alder, Doctor, and Redding 1986, p. 299), a point made by Hofstede (1980). To me, the definition of culture used by researchers is more a matter of convenience than scholarly rigcr. In this context, a recent seminal article by Hofstede et al. (1990) notes that "Culture has become a fad, among managers, among consultants, and among academics, with somewhat different concerns. Fads pass, and this one is no exception" (p. 286). Echoing the notion of conveniently constructing "culture" Hofstede et al. (1990) note:
Most authors will agree on the following characteristics of the organizational/corporate culture construct: it is (1) holistic, (2) historically determined, (3) related to anthropological constructs, (4) socially constructed, (5) soft, and (6) difficult to change. All of these characteristics of organizations have been separately recognized in the literature in the previous decades; what was new about organizational culture was their integration into one construct” (p. 286).

The debate over the proper definition of culture has been rather acrimonious in the cross-cultural field. The debate is discussed in detail by Segall (1986). The main concern of cross-cultural theorists appears to be over the emic-etic issue. The emic issue pertains to whether concepts are valid only in particular cultures while the etic issue is related to the universality of concepts. The point of this "tension between the culturally relative and the culturally universal" (Berry 1984, p. 337) is that comparisons of concepts between cultures presuppose the existence of "equivalence" at the conceptual, functional, and measurement levels (Hui and Triandis 1985).

Expanding on the notion of shared meaning, Deshpande and Webster (1989) define organizational culture as "the pattern of shared values and beliefs that help members of an organization understand why things happen and thus teach them the behavioral norms in the organization". (p. 4). This definition is particularly important because services are loosely scripted and management may not be able to draw up service quality specifications for every contingency. This situation, in turn, may create a "service performance gap" (Zeithaml, Berry, and Parasuraman 1988) which can adversely affect service quality. However, if something like a "customer satisfaction" culture (Deshpande and Webster 1989) exists in the sense that employees internalize its values and follow "norms" of behavior, the service performance gap may be reduced. How this service culture is created is not a focus of my investigation. For instance, extensive member socialization or elaborate rituals may shape this culture.
More central to services research, it is useful to conceptualize culture as a variable exogenous to the firm (Deshpande and Webster 1989). In the next section, I discuss the difference between "culture" and "climate".

**Culture and climate**

Starting with the early conceptual work of Schneider (1975) recent empirical studies have demonstrated a strong positive association between climate and service quality (Burke, Borucki, and Hurley 1992; Rentsch 1990; Schneider, Wheeler, and Fox 1992). Early researchers (Schneider and Bartlett 1968) conceptualized climate as "enduring organizational or situational characteristics that organizational members perceived" (Rentsch 1990; p. 668). Later researchers (James and James 1989; James, Joyce and Slocum 1988) have focused on individual perceptions using an information processing perspective. Schneider and Rentsch (1987) define organizational climate as "the ways (in which) organizations operationalize the themes that pervade everyday behavior... the routines of organizations and the behaviors that get rewarded, supported and expected by organizations ('the what happens here')" (p. 7). The difference between climate and culture is clearly underscored by Deshpande and Webster (1989): "Culture refers to the history and norms and values that members believe underlie climate (the 'why do things happen the way they do') and the meanings organizational members share about the organization's imperative "(p. 5).

In terms of psychometric theory (Nunnally 1978), culture may be termed as a second order factor that causes co-variation among climate variables. Some support for this statement comes from a recent study by Burke, Borucki, and Hurley (1992) who found that employee work-climate perceptions were composed of two higher
order factors—concern for employees and concern for customers. Echoing this macro-micro theme more articulately, Schneider, Wheeler, and Fox (1992) observe that "decision making, personnel selection, pay, and so forth are viewed as rationally based. In the symbolic approach to understanding organizations, the meaning of the rational decisions and actions is considered to be of primary importance. Here, research on organizational culture would be seen as a candidate for inclusion (pp. 713-714; emphasis added).

As a means of clarifying the distinction between climate and culture, consider the Sears example. Employees thought that it was proper to oversupply services because they were on a commission based reward system. Employees perceived the climate as one that rewarded oversupply of services (what happens here). The culture of Sears was not customer service or customer satisfaction oriented. On the other hand, the culture was probably "survival" oriented or even had a "market share" connotation. The recent competition from small repair shops perhaps engendered a "market share" or "survival" culture in Sears where customer service occupied a back seat. Note that merely having slogans in the workplace stressing "customer satisfaction is our goal" may not lead to a service culture. Culture develops in a historical context. For instance, at Nordstrom, a commission based compensation system did not result in degradation of quality because organizational members believed in a culture of service quality. The difference between climate and culture is further discussed under the methodology section.

Within marketing, a recent study by Qualls and Puto (1989) uses "organizational climate" as one of the independent variables influencing the buyer's choice. In this study, organizational climate is defined as "the set of perceptions held by individuals in an organization that reflect the extent to which the expectations of the
organization are defined, the routines of the work environment are specified, and the
work behavior that is supported and revealed by the organization is rewarded" (p.
182). In other words, "organizations affect the attitudes and behaviors of individuals
directly". This conceptualization of climate is in line with the practice dimension of
Hofstede et al. (1980). However, Qualls and Puto (1989) view the organizational
climate construct along two dimensions: work environment, and reward orientation.
The work environment facet incorporates notions of leadership behavior, work group
relationships, and dimensions of role stress. Reward orientation is defined as general
practices of the firm in rewarding overall performance of its employees. Some of the
propositions for which Qualls and Puto (1989) found "reasonable" support were:

A positive work environment tends to produce more difficult to attain
initial reference points (p. 183).

The more positive a buyer's reward orientation, the more likely the buyer
is to set a difficult to attain reference point (p. 184).

Qualls and Puto's (1989) study indirectly supports my earlier assertion that
organizational climate and not organization culture is the relevant variable for
investigation.

Methodological issues in culture research

A difference between climate and culture pertains to the methodology for
assessing these constructs. Specifically, climate perceptions (what happens here) are
often assessed in a quantitative manner through paper and pencil tests (Rentsch 1990). Culture, on the other hand is generally assessed using qualitative techniques. The reason for these different methodical approaches is not convenience of measurement. This is because "climate questionnaires directly assess descriptions, indirectly assess patterns of relationships among these descriptions, and do not assess organizational members' interpretation of these events. Culture research focuses on assessing the sense-making meaning of events" (Rentsch 1990; p. 669). Consequently, culture researchers have focused on multiple data sources for assessing culture: organizational stories (Feldman 1990), signs and symbols (Barley 1983), and transactions (Jones 1983). In measurement parlance, climate methodology allows for quantitative variance in description of events and does not allow for qualitative variance in meaning (which relates to culture). In sum, quantitative measures are not suitable for studying culture.

Despite the obvious problems associated with quantitative assessment of cultures, some researchers (Hofstede, Neuijen, Ohayev and Sanders 1990; Ott 1989; O'Reilly, Chatman, and Caldwell 1991) have used these techniques. Dismissing these quantitative assessments as inappropriate, Rentsch (1990) notes "many suggested measures, however, are either similar to existing descriptive climate measures or measure norms and values rather than the meaning of events" (p. 669). This however is an overtly polarized view. Deshpande and Webster (1989) suggest that cross-sectional survey research may be appropriate for studying "contingency marketing management" issues, i.e., "research on impact of customer needs satisfaction-oriented culture vs. stockholder wealth maximization-oriented culture on market performance" (p. 9). Logically, the survey method is appropriate because much of organizational culture theory and marketing theory is "philosophically grounded in the structural-
functional paradigm" (Deshpande and Webster 1989; p. 10). In a recent study, Hofstede et al. (1990) observed that "differences among organizational cultures will be partly quantifiable and can be meaningfully described using perhaps five to seven practice dimensions" and that "the usefulness of an approach that quantifies is that it makes a fuzzy field at least somewhat accessible" (p. 313).

The "practice" items used by Hofstede et al. (1990), e.g., "major emphasis on meeting customer needs", are clearly "climate" related. Furthermore they are "service oriented" in nature. On the other hand, "value" items, e.g., "working relationships with boss important" are more directly related to culture than to climate. The findings of Hofstede et al.'s (1990) study are important because they bring into sharp focus the difference between "culture" and "climate". More importantly, they may help me justify what concept, i.e., "climate" or "culture" to use in my dissertation. I analyze Hofstede et al.'s (1990) findings in greater detail in the following paragraph.

Hofstede et al. (1990) in a study on organizational cultures in twenty units from ten different countries found that organizational culture differences resided at the level of practices, i.e., ("what the member feels is" variables). These practices are therefore akin to "climate" (Rentsch 1990) variables discussed earlier. Variables pertaining to "values" (i.e, what should be variables) could not explain variation across organizations. In other words, shared perceptions of daily practices and not shared values constitute the core of an "organization's culture". The Random House Dictionary defines values as "ideals, customs, institutions, etc., that arouse an emotional response, for or against them in a given person". In this vein, it is conceivable that people attach qualitatively different meanings to symbols, rituals, and folklore. The difference observed in Hofstede et al.'s (1990) study is related more to
the difference between climate and culture than to differences between values and practices.

Deshpande and Webster (1989) erroneously conclude that culture may be measured using cross-sectional survey methods. On the other hand, I believe that we should measure "climate" and not "culture". This assertion stems from five considerations. First, Hofstede et al. (1990) found climate variables (not culture variables) to vary significantly across organizations. Second, values which are often laden with meaning are difficult to measure quantitatively. Third, there is conceptual evidence that a firm's values (culture) manifests itself as practices which individuals engage in. For instance, as Hofstede et al. (1990) note, "the values of founders and key leaders undoubtedly shape organizational cultures but that the way these cultures affect ordinary members is through shared practices" (p. 311). In other words, organizational members learn practices through socialization. Fourth, there is empirical evidence that climate is a first order factor which in turn is determined by a higher order factor analogous to culture (Burke, Borucki, and Hurley 1992). To the extent that we cannot directly measure second order factors, measuring empirical referents of a first order factor (i.e., climate) appears appropriate. Finally, and most importantly, there is empirical evidence that service climate is positively related to service quality (Schneider and Bowen 1985; Schneider, Wheeler, and Fox 1992).

Level of analysis issue in culture studies

Hofstede et al.'s (1990) study raises a very important issue. Contrary to the reification of the concept in western societies, where management gurus (Peters and Waterman 1982) have positioned organizational culture as the core of shared values
of the organization, there is empirical evidence which suggests that "organizational culture" resides at the level of tasks performed by individuals. There is a difference between "values of founders and significant leaders and the values of the bulk of the organizational members" (Hofstede et al. 1990; p. 311), a point often missed by American authors.

It is therefore conceivable to expect that founder's values are transferred to members' practices. As Hofstede notes:

This process of a transfer of the founders' values into the members' practices has already been recognized by Weber (1948; 297): "... When the organization of authority becomes permanent, the staff supporting the charismatic ruler becomes routinized". In Weber's typology of social action, he distinguished (among other types) action toward a value (coordination) from action dominated by habitual response ("traditional"; Burrel and Morgan, 1979; 83). Our findings suggest that ordinary organization members are more often traditional than coordination (p. 311; emphasis original).

Simply put, companies hire people with certain individual values and traits and socialize them in the organization. Members are socialized by learning the "rules of the game". If these individual members are asked what the values of their founding fathers were, a lot of qualitative difference in meaning would be observed across respondents. On the other hand, members may agree on how a particular situation is normally tackled in an emergency. For instance, by tradition, members may invoke the opinion of superiors for tackling emergency problems. However, if established traditions reward customer satisfaction, members may take on the spot decisions thereby serving customers better. Asking customers to describe the culture may create stories (Feldman 1990) where members assign meaning to events. Consider for instance the
Dean Witter motto: "we measure success one investor at a time". This statement is perhaps transmitted to employees through rules and guidelines that stress service quality. For instance, one policy of the company may be "to give customers information about competitors". The practices or climate may therefore be determined by an overarching culture of "concern for customers". In light of this discussion it is proper to measure culture at the "practices level".

Another type of concern with "levels of analysis" is whether culture varies across departments in an organization or not. Gregory (1983) argues that any organization is comprised of multiple cultures, a point of view endorsed by Deshpande and Webster (1989). Specifically, different departments within the same organization may have different practices. The marketing department may socialize its members in a particular way and so may the R&D department. In fact, as Deshpande and Webster (1989) note, examining cultural differences between "sales and marketing" departments may be an important area of research.

In summary, as Whiting (1976) notes, culture is more akin to a "packaged variable" existing at an abstract level. measuring climate inside the marketing department is the most appropriate avenue for research.

As Deshpande and Webster (1989) observe, culture may be considered an exogenous variable that explains differences across firms. More specifically, for any comparative study, i.e., cross-sectional, cross-national, culture is most appropriately considered "exogenous". In other words, the exogenous culture variable influences the development of beliefs and values within the organization, which in turn, explains differences across organizations. However, this conventional view has recently been challenged by Hofstede et al. (1990) who did not observe differences across firms on
the "core values" dimension. Differences, however were found along the "practices" or climate dimension.

More specific to services marketing, and the "contingency management" perspective that I have adopted from organizational theory (Tosi and Slocum 1984), culture is viewed as an endogenous variable (i.e., it resides within the firm). This independent variable is endogenous and consists of "beliefs and values developed by and within the organization (Deal and Kennedy 1982; Peters and Waterman 1982)... in contingency models, measures of corporate performance are influenced in significant and systemic ways by the shared values, beliefs, identities, and commitment of organizational members" (p. 6). The endogenous view of culture rhymes with contingency models (Lawrence and Lorsch 1967) adopted from organizational theory and helps us hypothesize that "a company with a customer oriented service climate will deliver better service quality than a company which does not stress customer satisfaction".

This concludes my review of the dimensions of the customer-service firm interface dimensions. Summary findings of this review appear in Tables 2.1 thru 2.4.
<table>
<thead>
<tr>
<th>Concept</th>
<th>Definition</th>
<th>Source</th>
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<tbody>
<tr>
<td>Performance Ambiguity</td>
<td>Customers have difficulty evaluating the quality of the service received. Performance ambiguity stems from an inability to measure the performance of parties to an exchange, or an inability, even if performance is measured, to accurately value it. For example, performance ambiguity arises when the object of exchange is complex... As intangibility increases, performance ambiguity increases (p. 540).</td>
<td>Siehl Bowen, and Pearson (1992)</td>
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<td>Performance ambiguity is particularly prevalent when the goods or services being purchased are intrinsically complex, and their quality can only be really evaluated after purchase and use (p. 24).</td>
<td>Jones (1990)</td>
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<td>Performance ambiguity refers to client's ability to monitor and evaluate the performance of the other parties and to determine the value of the objects of exchange (p. 201).</td>
<td>Jones (1987)</td>
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<td>Performance ambiguity (measures) respondent's assessments of the level of effort a buyer must put forth to assess the quality of the product supplied by a supplier (p. 276).</td>
<td>Heide &amp; Miner (1992)</td>
</tr>
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<td></td>
<td>It is often difficult to monitor and evaluate the quality of goods or services when these are intangible --like medical advice (p. 201).</td>
<td>Jones (1987)</td>
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<tr>
<td>Concept</td>
<td>Definition</td>
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<tr>
<td><em>Input</em></td>
<td><em>Uncertainty</em></td>
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<td></td>
<td>At the point of contact in the service encounter, the customer is a source of input uncertainty because the organization has <em>incomplete information</em> about the nature of customer inputs. These customer inputs can be (a) his specification of desired outcomes; (b) his body, mind, and/or goods to be serviced; (c) his actions as he participates in the service production. (p. 538).</td>
<td>Siehl, Bowen, and Pearson (1992)</td>
</tr>
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<td></td>
<td>The difference between the amount of <em>information required to perform</em> the task and the amount of information already available to the organization (p. 5).</td>
<td>Galbraith (1973)</td>
</tr>
<tr>
<td></td>
<td>Customer-induced input uncertainty is the organization's <em>incomplete information</em> about what, where, when, and how customer input is going to be processed to produce desired outcomes (p. 217)</td>
<td>Larsson and Bowen (1989)</td>
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<td>There is <em>uncertainty about the overall composition</em> of patient inputs, such as the number of patients in various conditions. [This] uncertainty is called &quot;input uncertainty&quot; (p. 422)</td>
<td>Argote (1982)</td>
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### Table 2.1 (Cont’d)

**Dimensions of the "Client-Firm" Interface: Performance Ambiguity and Input Uncertainty**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Definition</th>
<th>Source</th>
</tr>
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<tbody>
<tr>
<td><strong>Input Uncertainty</strong></td>
<td>Transaction uncertainty exists to the degree that organization-client transactions are unstandardized or unpredictable... The greater the level of such uncertainty, the greater the amount of information that an organization has to process to complete transactions efficiently, and thus the higher are its costs (p. 200).</td>
<td>Jones (1987)</td>
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<td><strong>Variability</strong> in clients (or patients) may be a continual source of ambiguity for organizational action (p. 205).</td>
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<td>Areas into which customer-induced uncertainty may be classified are: <strong>What</strong>: the degree to which customers can demand customized outputs... <strong>How</strong>: the degree to which the customer is required/allowed to engage in co-production of the service output (p. 57).</td>
<td>Overton, Schneck, and Hazlett (1977) Tansik and Chase (1988)</td>
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</table>
Table 2.2
Organization "Structure" Variables

<table>
<thead>
<tr>
<th>Concept (Source/s)</th>
<th>Meaning</th>
<th>Antecedent condition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Formalization</strong></td>
<td>The extent to which expectations regarding the means and ends of work are specified and written. In highly formalized organizations, rules and procedures are often available to specify what each person should be doing.</td>
<td>Environmental uncertainty (Lawrence &amp; Lorsch 1967)</td>
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<td>(Blackburn 1982)</td>
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<tr>
<td>(Reukert et al.)</td>
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<tr>
<td>(1985)</td>
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<tr>
<td><strong>Centralization</strong></td>
<td>Relates to the location of decision making activities in an organization.</td>
<td>Environmental uncertainty</td>
</tr>
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<td>(Blackburn 1982)</td>
<td></td>
<td></td>
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<tr>
<td><strong>Specialization</strong></td>
<td>Degree to which tasks are divided into unique elements.</td>
<td>Environmental uncertainty</td>
</tr>
<tr>
<td>(Reukert et al.)</td>
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<tr>
<td>(1985)</td>
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<tr>
<td>Author</td>
<td>Definition of Climate/Culture</td>
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<tr>
<td>Rentsch (1990)</td>
<td>Organizational members perceive and make sense of organizational policies, practices, and procedures in psychologically meaningful terms. These policies, practices, and procedures are considered to be objective properties of the organization and to exist in lasting patterns (p. 668).</td>
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<tr>
<td>Schneider (1975)</td>
<td>Climate research has been concerned with a description of the forms or styles of behavior in organizations. In nearly all instances research from a number of vantage points has assumed that, on the basis of organizational practices and procedures, individuals develop a global or summary perception of their organization (p. 461).</td>
<td></td>
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<tr>
<td>Kelley et al. (1992)</td>
<td>Organizational climate is a set of descriptive characteristics that differentiate an organization from other organizations and influence the behavior of individuals in the organization (Johannesson 1973). It is particularly important in organizations that provide services (Schneider 1986). In many cases, the interaction that takes place between employees and customers cannot be specified beforehand. However, the climate provides an ad-hoc means of specifying the activities that should be carried out during the service encounter (p. 200).</td>
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<tr>
<td>Burke, Borucki, and Hurley (1992)</td>
<td>Organizational service orientation reflects the extent to which employees perceive the [organization] and its employees as assisting customers... it reflects a set of behaviors and organizational practices aimed at assisting customers (p. 718).</td>
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Table 2.3 (Cont'd)

Definitions of the "Climate" and "Culture" Construct

<table>
<thead>
<tr>
<th>Author</th>
<th>Definition of Climate/Culture</th>
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<tbody>
<tr>
<td>Schneider, Wheeler, and Fox (1992)</td>
<td>Employee's perceptions of events, practices, and procedures as well as their perceptions of the behaviors that are rewarded, supported, and expected constitute the climate of the work setting (p. 705). Just as different climates can exist for each organization, different climates can also exist for various organizational goals and imperatives. For example, there are climates for safety, climates for productivity, and climates for service (p. 705).</td>
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CHAPTER 3

INFORMATION ASYMMETRY AND SELLERS' USE OF CUSTOMER SIGNALS: SIGNALING THEORY AND STRATEGIC MANAGEMENT PERSPECTIVES

In Chapter 2, I described in detail how performance ambiguity which customers encounter while evaluating a service presents a strategic opportunity for service firms to capitalize upon. Specifically, service firms can use signals of reputation to convince final buyers about the quality of service being offered. This chapter discusses the use of quality signals by sellers, and is organized as follows. First, the basic ideas conveyed by signaling theory are described. Next, I present a synthesis of the literature pertaining to the use of different types of signals by reviewing relevant research in economics. Finally, I discuss the contribution of strategic management studies to our understanding of signaling strategies.

Signaling Theory

The convenient assumption in neoclassical economics of buyers and sellers in the marketplace being equally informed about the quality of goods and services is rarely met in practice (Stiglitz 1987). On the other hand, when the object of exchange is a complex good or service (e.g., health care, automobile repair), sellers usually possess more information about the quality of the offering than buyers. This information differential “where buyers (unlike sellers) are not fully informed about
product quality" (Rao and Bergen 1992; p. 413) is called information asymmetry. Owing to information asymmetries, customers are invariably thwarted in their attempts to evaluate a service properly and gain accurate information for making better purchase decisions (Murray 1991). These evaluation problems may be formalized as performance ambiguity which arises when any dimension of an exchange makes it difficult for one party to evaluate the performance of the other (Bowen and Jones 1986; Jones 1987, 1990; Larsson and Bowen 1989; Siehl, Bowen, and Pearson 1992).

When performance ambiguity for a service is high, firms might use signals like price premiums, advertising, investments in physical surroundings, warranties, or certification to convince final buyers of quality. Signals may be defined as "marketer-controlled easy-to-acquire informational cues, extrinsic to the product themselves, that consumers use to form inferences about the quality or value of those products" (Bloom and Reve 1990; p. 59).

Signaling theory involves the systematic study of marketplace signals under conditions of information asymmetry. Although the emergence and growth of signaling theory has usually been associated with the economics discipline (Akerlof 1970; Caillaud and Hermalin 1993; Cho and Kreps 1987; Hellwig 1992; Kihlstrom and Riordan 1984; Klein and Leffler 1981; Kreps and Wilson 1982; Mailath, Okuno-Fujiwara, and Postlewaite 1993; Milgrom and Roberts 1982; Rogerson 1982; Spence 1973, 1974), the origins of the theory can be traced to the strategic thoughts of Schelling (1963), the sociological approach of Goffman (1961, 1969, 1974, 1981), and communications theory (Schramm 1948, Westley and MacLean 1970). For instance, Goffman's discussion of "self-presentation" is an attempt by one person to signal his or her type to another individual. Among economists, the earliest signaling
model was developed by Akerlof (1970), who formally recognized the interaction between information asymmetry and quality. However, Spence (1973, 1974) has widely been credited with developing the first formal signaling model which studied information asymmetries in labor markets.

There are three major reasons why service firms may rely on signals to convince final customers of quality. First, firms can use signals as a strategic weapon for attaining competitive advantage in the marketplace (Nayyar 1990). Services are composed primarily of experience (Nelson 1970, 1974) and credence (Darby and Karni 1973) attributes, while goods generally possess search (Nelson 1970, 1974) characteristics. Search attributes in a product can be easily evaluated by customers even before purchase (e.g., is the shirt white?). Services with experience characteristics can be evaluated only after use (e.g., was the restaurant meal delicious?). Credence attributes cannot be evaluated by customers even after consumption (e.g., did I really need an appendix operation?). A number of service researchers (Iacobucci 1992; Mills 1990; Siehl, Bowen, and Pearson 1992; Zeithaml 1981) have argued that the predominance of experience and credence attributes in a service makes it difficult for customers to evaluate its quality before purchase. As discussed earlier, this evaluation problem is described as performance ambiguity (Bowen and Jones 1986; Jones 1987, 1990; Siehl, Bowen, and Pearson 1992). Since service customers desire risk reducing information (Biehal 1983; Murray 1991) in order to make better purchase decisions (Stigler 1961), firms which provide quality information to buyers through the use of signals may expect to gain competitive advantage in the marketplace from increased customer patronage.

Second, quality signals prevent market failure by providing honest firms with incentives to operate in imperfect markets which are characterized by high information
asymmetries between buyers and sellers. Specifically, customers cannot distinguish between the offerings of honest and dishonest firms in the market because of performance ambiguity. Dishonest firms which offer poor quality services and face low production costs can therefore reap super-normal profits because customers experience high performance ambiguity while evaluating complex goods and services. On the other hand, honest firms producing high quality services face steep costs of production and a selling price whose range is determined by dishonest firms. In an economic sense, honest firms operating in such imperfect markets experience a penalty (through reduced profits) for producing high quality. In equilibrium, these markets will be populated by dishonest firms selling low quality services or "lemons". This phenomenon, which is formally dubbed as the "lemons" problem in economics (Akerlof 1970), can be prevented if honest firms use signals to convince buyers of quality. Dishonest firms find signaling to be a costly strategy to mimic because of the potentially high legal costs of contractual nonfulfillment. Consequently, these "low-quality" firms which can no longer sell "lemons", are forced to exit the market.

Finally, service firms may use the benefits of signaling to pursue related diversification strategies (Nayyar 1990, 1993). For instance, high-quality firms use signals to build a good reputation for their service in the minds of customers. When these firms offer new services, customers can easily transfer their favorable impressions about the earlier service to the new one. The concept of transfer of reputation is particularly relevant for services which are characterized by performance ambiguity. Customers minimize evaluation costs by associating a firm's existing reputation with a new service. For example, American Express, which started off by offering travel related services, could very easily diversify into insurance services because customers transferred their earlier favorable impressions about travel to
insurance (Nayyar 1990). Likewise, the American Automobile Association Company (AAA) which initially offered only travel related service to customers successfully diversified into automotive and other types of insurance services. In particular, AAA successfully diversified into automotive insurance because customers perceived a fit between the existing core service (automotive travel) and the diversified service (automotive insurance).

Signaling strategies of service firms can be studied under two headings: (a) *direct* signals of quality, and (b) *indirect* signals of quality. Direct signals (e.g., warranties, certification) are in the nature of explicit promises which firms make to customers about the quality of their service. For example, Domino's Pizza used to offer a guarantee stating that customers would get the pizza free if it was not delivered to them within thirty minutes of their placing the order (this guarantee has recently been cancelled by the company; Wall Street Journal, December 17, 1993). Indirect signals (e.g., price premiums, specific assets, advertising) on the other hand, stress a company's reputation and *imply* that the firm has no incentive to sacrifice long-term profitability for short-term gains from quality dilution. I discuss these signals more fully in the following sections.

**Sellers' Use of Multiple Customer Signals**

One of the first economists to realize the interaction between information asymmetry and quality was Akerlof (1970), who suggested that under conditions of high uncertainty, sellers had an incentive to cheat. The presence of uncertainty, could in turn, explain the presence of a set of "counteracting" institutions acting as surrogate barometers of quality. These surrogates may be considered as *signals* and defined as
"marketer-controlled easy-to-acquire informational cues, extrinsic to the products themselves, that consumers use to form inferences about the quality or value of those products" (Bloom and Reve 1990; p. 59). More technically, signals are defined by Cooper (1992) as follows:

In many markets, one agent has private information that could help others in making their decisions. The uninformed agents would usually adjust their actions to suit their environment better if they could learn the private information before making choices. Because of this potential to change actions, sharing the private information could benefit the more informed agents or society as a whole. One method of disclosing private information is signaling (p. 431).

Akerlof (1970) identified four such signals: (a) guarantees, which shift the risk of purchase from the buyer to the seller and ensure some level of quality, (b) brand-names, which are synonymous with quality, (c) chains, e.g., hotel chains which are variants of brand names, and (d) licensing practices, or certification (of doctors, lawyers, schools). Akerlof's discussion of the emergence of hotel and restaurant chains along highways is particularly insightful. Along highways, most customers are from out of town. Not being very familiar with the area, customers would hesitate to visit local restaurants because of information asymmetry, but would readily patronize national chains (e.g., McDonalds) by associating quality with brand names and logos. Information asymmetry may therefore result in degradation of quality in the absence of counteracting institutions. As Akerlof notes, "the difficulty of distinguishing good quality from bad is inherent in the business world; this may indeed explain many economic institutions and may in fact be one of the most important aspects of uncertainty" (p. 500). In sum, marketers use signals to reduce information asymmetry.
Heal (1976) developing on Akerlof's model suggested that the problem of information asymmetry would be considerably reduced if people were assumed to deal repeatedly with each other (thereby developing trust and cooperation) in which case the incentive to cheat would be minimized. In his reply, Akerlof contended that Heal's analysis was unstable because "bad" behavior by a party in any particular instance could result in a loss to his reputation. In other words, trust and norms could not substitute for counteracting institutions.

Government regulation to ensure quality appears to be another alternative to trust (Heal 1976) or counteracting institutions (Akerlof 1970). However, as Rashid (1988) notes, government regulation cannot fully achieve quality control in the absence of a supportive market structure. Specifically, Rashid (1988) suggests that "the most effective check to this deterioration (of quality) appears to be the increase of irrevocable fixed assets. . . "When significant amounts of money are invested, the businessman tells that he plans to stay for some time to come. . . in the long run the only way to stay is by pleasing customers; this requires providing them with the goods they really want, and this long-term dependence of producers upon consumers is perhaps the most effective guarantee of quality" (Rashid 1988; p. 248, emphasis added). This observation brings us to the concept of reputation, which is formally defined as "a set of attributes ascribed to a firm, inferred from the firm's past actions" (Weigelt and Camerer 1988; p. 443).

Economists have recognized that "reputations" and "brand names" are private devices which act as incentives for contract performance (Hayek 1948, p. 97; Marshall 1949, vol. 4, p. xi). However, as Klein and Leffler (1981) argue, "the determinants of the efficacy of these methods of contractual performance (reputation and brand names) and therefore the conditions under which we are likely to observe its
use remain unspecified" (p. 616). Consequently, these authors suggest that there are two primary means of ensuring quality promises: (a) the presence of a price premium, and (b) the presence of non-salvageable capital. Furthermore, it appears that Klein and Leffler's arguments hold under conditions where the buyer cannot costlessly monitor the attributes of the product prior to purchase. In other words, situations involving "experience goods" (Nelson 1970) are considered.

The first quality safeguard considered by Klein and Leffler (1981) is the existence of price premiums. In other words, firms can signal high quality by charging prices above the market price (i.e., charging a price premium). However, if these firms cheat on quality, the future stream of profits would be lost. Under these circumstances, firms have an incentive to maintain the quality of their products. Rao and Bergen (1992) find partial support for the existence of this phenomenon in a recent marketing study.

The second quality safeguard a firm employs is along a non-price dimension, i.e., the presence of firm-specific capital investments. Simply put, a firm may signal quality through expensive advertisement, implying in turn, that future rent streams would be lost if customers switched companies owing to poor quality. The company would therefore give no incentive to a customer for switching. In other words, the company would never compromise on quality. For instance, as Klein and Leffler (1981) note, "the expenditures on brand name capital assets are therefore similar to collateral that the firm loses if it supplies output of less than anticipated quality and in equilibrium the premium stream provides only a normal rate of return on this collateral asset" (p. 627). Some examples of firm specific investments, which act as collateral are (a) logos and expensive signs, (b) ornate settings like expensive carpets and upholstery which yield no direct consumer service, (c) human entrepreneurial skills and
idiosyncratic knowledge, (d) expensive and extensive advertising, and (e) non-informative or 'celebrity' advertisement.

Underscoring the importance of identifiable brand names and their implication for reducing agency costs between management and customers, Brickley and Dark (1987) note:

Companies involved in franchising generally have identifiable brand names that help to assure the customer of uniform product quality. Quality assurance is especially important in businesses in which individual units cater to non-repeat customers... a major problem facing companies with valuable brand names is controlling the actions of agents throughout the organization to assure the continued value of the trademark (p. 403).

Thus, signals appear to be a double edged sword. More the performance ambiguity of a service, more the investment in fixed assets by the company for signaling reputation. Consequently, more is the need for monitoring agents. Kihlstrom and Riordan (1984) suggest that while a great deal of advertisement conveys no direct credible information about product qualities, they may indirectly signal quality. In this sense, they buttress Klein and Leffler's (1981) position. The role of advertising as a reputation signal is also described by Rubin (1990):

Here, expensive advertising conveys the following message: We have spent a lot on advertising this product. It would not be worth our while to spend this much if consumers were only going to buy the product once. Therefore, we think it is a good enough product to generate repeat purchases, and it is in your best interest to try it (p. 152).
Rubin (1988) further states that for experience goods (Darby and Karni 1973), it is important to establish long-term relations with customers. In economic terms, the firm has something to lose (a future stream of quasirents) if customers stop patronizing. Some examples of building customer relationships include mailing of cards, reminding customers of scheduled maintenance, and establishing customer-specific records.

Developing upon the concept of reputation, Shapiro (1983) suggests that "a firm with a good reputation owns a valuable asset" (p. 659). Furthermore, the author notes that "the idea of reputation makes sense only in an imperfect information world". If product attributes were perfectly observable prior to purchase, then previous production of high quality items would not enter into consumers' evaluations of a firm's product quality. Instead, quality beliefs could be derived solely from inspection" (Shapiro 1983; p 659). Shapiro also notes that high quality items may sell at a premium above cost, buttressing Klein and Leffler's (1981) contention that price premiums may act as quality safeguards.

The central role of reputation is also highlighted by Allen (1984) who suggests that guarantees are imperfect. In other words, "full warranties distort consumers' incentives to look after products. . . in such cases partial warranties will be offered, and reputation will again be important in ensuring that firms produce high quality " (Allen 1984 p. 312). The use of warranties as a means of signaling for quality and closing the information gap has been suggested by Grossman (1981), who notes that "warranties seem like an incredibly useful device for getting around asymmetric information about product quality" (p. 479).

We may also note that "quality signals" are similar to the use of credible commitments (Williamson 1985). Credible commitments may be established when
agents post a "bond" forfeitable under malperformance (Alchian and Woodward 1985). Anecdotal evidence supporting the strategic role of reputation in services is provided by Weigelt and Camerer (1988), who cite the following story from the Wall Street Journal (1986; p. 6):

The nation's 11th-largest accounting firm is having problems obtaining new clients and partners, retaining current clients, and keeping its executive suite intact. The firm's travail illustrates the pressures on a professional firm—whether it be in accounting, law, architecture or another field—when its reputation is threatened.

Before concluding this review, it is important to specifically discuss some conflicting views that have appeared in the signaling literature on the use of guarantees. In the financial economics literature, use of reputation models have been reported by Dejong et al. (1985), and Beatty and Ritter (1986). The Dejong et al. (1986) study combines signaling theory and agency theory concepts for studying the "moral hazard" problem in a "stock brokers" market. The results of the study indicate that "reputation" serves as a partial safeguard against moral hazard. Using Dejong et al.'s (1986) study as a basis, I explicitly connect information asymmetry to agency theory in the next section. Note that even in the marketing literature, the concepts of reputation and signaling have received some attention. The empirical study by Rao and Bergen (1992) represents an important first step and has already been discussed. Furthermore, in a recent article, Czepiel (1990) states:

"Relationships between individuals and organizations present some difficult conceptual issues surrounding the "existence" of those organizations and"
the ability of an individual to have a relationship with an organization per se. How do the employees who represent the organization fit into the relational net, and what is the balance between the personal and the professional in the performance of the relational duties on behalf of the organization? How can a client trust an abstract entity such as an organization? How do such concepts as image and reputation work to help consumers establish relationships with organizations or their offerings? (p. 317).

Czepiel's (1990) article is an indirect call for incorporating signaling theory constructs for studying marketing relationships. Though Czepiel does not directly suggest the notion of agency, the tone and tenor of his statement clearly suggests the applicability of agency and related theories. For instance, Czepiel's (1990) concern about "how do the employees who represent the organization fit into the relational net, and what is the balance between the personal and the professional in the performance of the relational duties on behalf of the organization?" is clearly an articulation of agency problems between management and the service provider. In the absence of information asymmetry, no major agency problem would ensue.

In concluding this section, I wish to comment on a question Klein and Leffler (1981) raise: do consumers really process signals of reputation the way the company intends them to? Unfortunately, no definitive answer to this question can be supplied from consumer research. It is worthwhile to note that Wright (1986) in an address to the Association of Consumer Research noted:

At Stanford I'm surrounded by microeconomists active in the "information economics area", like Bob Wilson and Dave Kreps and John Roberts, who are making all kinds of interesting assumptions about first-order and second-order signalling between sellers and buyers, and working out some implications. The major explanatory theories should... come from researchers who define themselves as consumer researchers (p. 2).
Though there is near unanimity among economists (Allen 1984; Grossman 1981) about the power of guarantees, there is some confusion in the marketing literature about the effectiveness of guarantees as quality signals. Note that guarantees are direct quality signals (unlike 'indirect' advertising or ornate company settings which serve as proxy signals of quality). For instance, Wiener (1985) found that extensive warranty can serve as a signal of product quality, whereas Bergen, Dutta, and Walker (1992) suggest that "such warranties can pose a potential hidden action problem because they make it more vulnerable to possible abuses by buyers" (p. 16). The use of warranties as a "bonding mechanism" has recently been suggested by Hill and Jones (1992):

For example, consider the consumer contemplating entering an exchange relationship with a manufacturer of consumer durables. The purchase of durables presents consumers with a difficult agency problem. Consumer durables are purchased infrequently and involve large expenditure. In such circumstances, the consumer is vulnerable to opportunistic action on the part of management. Management may misrepresent the quality or durability of the product in an attempt to close the sale. The agency problem is solved by the \textit{ex-ante} introduction of a warranty into the contracting scheme. (p. 139).

Enforcement of warranties is easier for manufactured goods because non-performance is easily evaluated. For instance, it is possible to detect through visual inspection whether or not a good was damaged because of mishandling by the customer. On the other hand, detecting non-performance for services may be difficult. For instance, barring obvious glitches (like an aircraft not taking off on time, or a
patient being able to prove that a physician's medication was incorrect), service guarantees make sense only when they are tied to customer satisfaction. For example, Hart, Schlesinger, and Maher (1992) note that an example of unconditional guarantee for professional service companies is "customer satisfaction" (p. 20). Satisfaction however, is a latent construct, inferred from what the patients' self reports. Companies have few objective benchmarks for determining whether a customer invoking a guarantee is actually satisfied or not. In other words, a customer may lie and engage in "moral hazard" just to invoke the benefits of the guarantee. This is a classic case of the principal engaging in "moral hazard".

Despite the concern about residual agency losses owing to principals' "moral hazard" proclivities, the role of guarantees as signals of service quality is well justified. For instance, Schlesinger, Hart, and Maher (1992) note:

Bad service from a restaurant can ruin someone's evening; bad service from a medical center or law firm can ruin someone's life. The greater the client's expected aggravation, expense, and time lost, the greater the guarantee's power (p. 20).

Furthermore, these authors suggest that "clients tend to purchase professional services very cautiously... an unconditional guarantee can effectively overcome resistance and close the sale" (Hart, Schlesinger, and Maher 1992; p. 20). More importantly, as the following example suggests, the existence of a service guarantee may motivate employees to deliver quality service:
When Delta Dental began researching the viability of service guarantees, it was committed to full employee participation. In general, Delta Dental employees were enthusiastic about the concept of service guarantees, primarily as they recognized the quality and value of their own work (Hart, Schlesinger, and Maher 1992; p. 21).

Echoing a similar point of view, Hart (1988) suggests that "a guarantee pushes the entire company to focus on customers' definition of good service -- not on executives' assumptions" (p. 57). Further evidence of the efficacy of warranties comes from a recent study by Kelley and Conant (1991) who report that "consumers view extended warranties as a means of reducing risk" (p. 68). In the same study these authors also report that extended warranties were considered inappropriate by manufacturers' of simple products, suggesting thereby that performance ambiguity is related positively to the use of warranties (Kelley and Conant 1991).

Despite the obvious benefits of warranties as signals of quality, research findings on the efficacy of warranties for solving agency problems appears mixed both in terms of theoretical prescriptions and empirical findings. For instance, as noted earlier, Bergen, Dutta, and Walker (1992) cite "moral hazard" problem as an impediment to the adoption of guarantees. More relevant to the signaling literature, a study by McNeil and Miller (1980) reports that performance of warranties represents a strategic choice "to maintain continuing relationships with customers through a reliance on the proprietary control of the market rather than through investments in goodwill assets" (p. 407).

Against the preceding backdrop, the challenge for future research is to reconcile these divergent views by undertaking theoretically based empirical tests of appropriate hypotheses. Such an exercise is the objective of the present dissertation.
Despite the intuitive appeal of "signals" for studying service quality, some researchers (Bergen, Dutta, and Walker 1992) have noted that assumptions about the economic rationality of receivers (of signals) may be overtly simplistic. Furthermore, Bergen, Dutta, and Walker (1992) opine that "one contribution marketers might make, then, is to incorporate social and psychological factors that influence the interpretation of and behavioral responses to different signals by customers, competitors, and other audiences" (p. 17). In a similar vein, Heil and Robertson (1991) suggest that similarity between sender and receiver may facilitate signal interpretation.

As an example of achieving this synthesis, let us hypothesize that firms which explicitly communicate "quality" signals (directed at customers') to employees shall deliver higher quality than firms that do not communicate signals (based on Zeithaml 1981). As a rationale for this hypothesis, we may argue that firms which clearly communicate quality signals to employees reduce their "role ambiguity" levels (Singh 1993, Forthcoming) thereby facilitating the delivery of service quality. In other words, the inclusion of "role ambiguity" as a psychological complement to the signalling construct may further our understanding of the delivery of service quality. My dissertation offers avenues for complementing signalling theory constructs with behavioral concepts.

**Strategic Management Perspective on Signaling**

The field of strategic management also sheds some light on the use of signals by service firms under conditions of information asymmetry. The field of strategic management received its biggest boost in the 70's because of practical challenges
facing the manager. In particular, managers found erstwhile "planning" models to be inadequate tools in a turbulent environment, and demanded practical solutions to solve their problems. This realization led to the development of strategies for "competitive advantage" (Porter 1985) which were concerned with mastering the uncertain environment.

Studies in the strategic management field hold that companies which sell highly intangible services have an incentive to signal their credibility to customers. Since customers cannot physically inspect a company's offering, they have to rely on cues for making judgements. A company can substantially ameliorate the 'information asymmetry' gap with customers by signaling its reputation. In other words, management is saying: by investing in costly advertising and ornate ambience, we have put our reputation on the line. We will always fulfil our promises, because if we don't, you will boycott us. All the investment that we have made in our reputation will be lost if we fail to deliver quality. Though it is prudent to imagine that management really thinks along the above lines, we have little empirical evidence to support our assumption. For instance, what is the practical significance of reputation? As Klein and Leffler (1981) themselves note, the theory is not based in practice. It is therefore prudent to ask a more fundamental question: why should managers be concerned with safeguarding their company's reputation? After all, they are only agents of stockholders. Fortunately, the strategic management literature suggests that managers may have incentives to safeguard their companies' reputation. In other words, Klein and Leffler's (1981) basic ideas about reputation have practical import. This point is further discussed in the next section.

Camerer and Vepsalainen (1988) state that managers may always have an incentive to maintain the reputation of their firms. The owner-manager has an
incentive to maintain his firm's reputation so as to increase its salvage value. On the other hand, for firms where ownership and control is separated, "managers are continuously 'selling' the firm to new owners, through capital markets... managers who erode the firm's reputation are depreciating an intangible asset and are vulnerable to market discipline like takeover attempts" (p. 118). In other words, reputation building is a managerially relevant and practical activity.

Having realized that managers do indeed have an incentive to safeguard their reputation, do we have any practical evidence to suggest that buyers value reputation effects? A few recent studies suggest an affirmative response to the preceding question. First, Rao and Bergen (1992) found some support for the hypothesis that buyers of industrial products indeed value the sellers' reputation. Second, Nayyar in a recent review article (1990) suggests that informational asymmetry may be exploited by service companies to gain a competitive edge in the market place. Specifically, Nayyar notes: "reputation forms an implicit contract... it is enforced by the seller's concern about future demand for the product" (p. 516).

Nayyar (1990) introduces the conceptually useful distinction between "signals for quality" and "reputation". Signals are used by firms to reduce information asymmetry while reputation refers to a favorable impression among buyers about the service provider. Examples of "signals for quality" which directly reduce information asymmetry are certification and guarantees. Signals of reputation, on the other hand, do not explicitly relate to the details of a service, but are more general. Some examples of reputation signals are brand names, type of advertising, ornate physical settings etc. Nayyar (1990) does not however distinguish sufficiently between these concepts, though he states that reputation effects may be exploited by companies for diversification.
In another recent empirical study, Nayyar (1992) reports that service firms often have difficulty in replicating their success abroad. Nayyar (1992) does not use an information asymmetry logic to explain his findings. It is conceivable to argue that in international settings, informational asymmetries are further magnified for foreign firms leading to reputational disadvantage vis-a-vis local firms. In sum, the acknowledgement of reputation effects in the strategic management literature provides us with ample practical justification for including the construct in our hypotheses. A summary of the main studies that I have just reviewed together with the important concepts that have been discussed appear in Tables 3.1 thru Tables 3.4.
<table>
<thead>
<tr>
<th>Author</th>
<th>Concept</th>
<th>Definition/Illustration</th>
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<tr>
<td>Nayyar</td>
<td>Information Asymmetry</td>
<td>Buyers face a difficult and costly task in ascertaining the attributes of services before purchase due to information-asymmetries in the buyer-seller relationships (p. 513).</td>
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<td>Levitt</td>
<td></td>
<td>Intangible products—travel, freight forwarding, repair, consulting, computer software, investment—banking, brokerage, education, health care, accounting—can seldom be tried out, inspected, or tested in advance (p. 96).</td>
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<td>Rao &amp; Bergen</td>
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<td>Often, buyers (unlike sellers) are not fully informed about product quality. This situation is termed information asymmetry and can occur for a variety of reasons (p. 413).</td>
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<tr>
<td>Akerlof</td>
<td></td>
<td>After owning a specific car, however for a length of time, the car owner can form a good idea of the quality of this machine; i.e., the owner assigns a new probability to the event that his car is a lemon. This estimate is more accurate than the original estimate. An asymmetry in available information has developed (p. 489).</td>
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<td>Urbany</td>
<td></td>
<td>The existence of less informed buyers allows some sellers to charge higher prices and results in a dispersion of prices (p. 257).</td>
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<td>Grossman</td>
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<td>An important case involves information about product quality. Sellers may know the quality of the item they sell but it may be</td>
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<tr>
<td>Grossman</td>
<td>Information Asymmetry</td>
<td>in their interest to withhold that information (p. 461).</td>
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<td>(1981)</td>
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<tr>
<td>Dejong et al.</td>
<td>A feature common to most agency relationships (is) that services provided by the agent have a hidden characteristic (p. 809).</td>
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<td>(1985)</td>
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<td>Nelson</td>
<td>Search goods are those for which attributes can be determined by the customer prior to purchase. For experience goods, attributes can be determined only after purchase or during consumption. (Zeithaml 1981; p. 191).</td>
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<td>(1970)</td>
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<tr>
<td>Darby &amp; Karni</td>
<td>Credence goods are those which the customer may find impossible to evaluate even after purchase and consumption. (Zeithaml 1981; p. 191).</td>
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<td>(1973)</td>
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<tr>
<td>Weigelt &amp; Camerer (1988)</td>
<td><em>Reputation</em></td>
<td>A set of attributes ascribed to a firm, inferred from the firm's past actions (p. 443)</td>
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<tr>
<td>Klein &amp; Leffler (1981)</td>
<td></td>
<td>&quot;Reputations&quot; and brand names are private devices which provide incentives that assure contract performance in the absence of a third party enforcer (p. 616).</td>
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### Table 3.2 (Cont’d)

**Summary of definitions of the "Reputation" concept**

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<th>Author(s)</th>
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<th>Consequences/Examples</th>
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<tr>
<td>Dejong, Forsythe, &amp; Lundholm (1985)</td>
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<td>&quot;Reputable&quot; agents receive a quality assuring price which is in excess of their costs of providing high quality services (p. 814).</td>
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<td>Rubin (1990)</td>
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<td>The most important guarantee is the reputation of one's trading partner. A reputation for not behaving opportunistically is very valuable under such circumstances, and a firm with such a reputation would have strong incentives not to cheat and lose an asset (p. 36).</td>
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<td>Author(s)</td>
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<td>Shapiro (1983)</td>
<td>The idea of reputation makes sense only in an imperfect information world. A firm has a good reputation if consumers believe its products to be of high quality (p. 659).</td>
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<td>Shapiro (1983)</td>
<td>When product attributes are difficult to observe prior to purchase, consumers may plausibly use the quality of products produced by the firm in the past as an indicator of present or future quality. In such cases a firm's decision to produce high quality items is a dynamic one: the benefits of doing so accrue in the future via the effect of building a reputation. In this sense, reputation formation is a type of signaling activity (p. 659).</td>
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Table 3.2 (Cont'd)

Summary of definitions of the "Reputation" concept

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<th>Consequences/Examples</th>
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<tr>
<td>Rashid (1988)</td>
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<td><em>Reputation</em> is a widely used means by which quality is ensured (p. 247).</td>
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<tr>
<td>Beaty &amp; Ritter (1986)</td>
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<td>Because of the repeat business with potential purchasers, an investment banker can develop a reputation and earn a return on this <em>reputation</em> (p. 216).</td>
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<tr>
<td>Wall Street Journal (1986)</td>
<td></td>
<td>The firm's travail illustrates the pressures on a professional firm—whether it be accounting, law, architecture or another field when its <em>reputation</em> is threatened.</td>
<td></td>
</tr>
<tr>
<td>Nayyar (1990)</td>
<td></td>
<td><em>Reputation</em> performs as an implicit contract. It is enforced by the seller's concern about future demand of the service provided (p. 516).</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.2 (Cont'd)

**Summary of definitions of the "Reputation" concept**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Concept</th>
<th>Definition/Illustration</th>
<th>Consequences/Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rao and Bergen (1992)</td>
<td></td>
<td><em>Reputable</em> sellers will receive price premiums to a greater degree than sellers lacking such a reputation (p. 415).</td>
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</tr>
<tr>
<td>Weigelt &amp; Camerer (1988)</td>
<td></td>
<td><em>Reputations</em> play a strategically important role in the services marketing literature because, like experience goods, the pre-purchase evaluation of service quality is vague and partial (p. 450).</td>
<td></td>
</tr>
<tr>
<td>Hall (1992)</td>
<td></td>
<td><em>Reputation</em>, which represents the knowledge and emotions held by individuals about, say, a product range, can be a major factor in achieving competitive advantage through differentiation (p. 138).</td>
<td></td>
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<tr>
<td>Author</td>
<td>Concept</td>
<td>Definition/Illustration</td>
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<tr>
<td>Bloom &amp; Reve (1990)</td>
<td>Signals</td>
<td>A <em>signal</em> (is) a marketer-controlled, easy-to-acquire informational cue, extrinsic to the product itself, that consumers use to form inferences about the quality and value of that product (p. 59).</td>
<td></td>
</tr>
<tr>
<td>Porter (1980)</td>
<td></td>
<td>A market <em>signal</em> is any action by a competitor that provides a direct or indirect indication of its intentions, motives, goals, or internal situation (p. 75).</td>
<td></td>
</tr>
<tr>
<td>Spence (1973)</td>
<td></td>
<td><em>Signals</em> (are) those observable characteristics attached to an individual that are subject to manipulation by him (p. 357).</td>
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<tr>
<td>Milde &amp; Riley (1988)</td>
<td></td>
<td>The credit market is characterized by information asymmetries between lenders and borrowers... such asymmetries can be resolved via the <em>signaling</em> process (p. 101).</td>
<td></td>
</tr>
<tr>
<td>Kihlstrom &amp; Riordan (1984)</td>
<td></td>
<td>A great deal of advertising appears to convey no direct credible information about product qualities. Nevertheless, such advertising may indirectly <em>signal</em> quality if there exist market mechanisms that produce a positive relationship between product quality and advertising expenditures (p. 427).</td>
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<tr>
<td>Author</td>
<td>Concept</td>
<td>Definition/Illustration</td>
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<tr>
<td>Weigelt and Carmerer (1988)</td>
<td></td>
<td>If a colleague always fulfills her promises, then you say she has a reputation for reliability. That is, based on her past actions you infer that reliability is one of her attributes she is a 'reliable' person. By doing so, you make judgements about past observations, and use these signals to form beliefs in predicting future actions (p. 444).</td>
<td></td>
</tr>
<tr>
<td>In-Koo and Kreps (1987)</td>
<td></td>
<td>Much of information economics has been concerned with situations in which the following simple signaling game is embedded: one party,... A possesses private information. On the basis of this information, A sends a signal to a second party B, who thereupon takes action (p. 179).</td>
<td></td>
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<tr>
<td>Rubin (1990)</td>
<td></td>
<td>If a firm spends money advertising its own name, then this can be a signal to customers that the firm will not cheat by degrading the name, for this behavior would reduce the value of advertising to zero (p. 148).</td>
<td></td>
</tr>
<tr>
<td>Author</td>
<td>Signals</td>
<td>Antecedent Conditions</td>
<td>Consequences/Remarks</td>
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</tbody>
</table>
| Bloom & Reve (1990) | • Easy-to-read labels.  
• Informative ads.  
• Educational-sales. presentations.  
• Warranties  
• Quantity of ads rather than content.  
• Ambience.  
• Professional demeanor of servers. | Search goods, which can be evaluated easily before making a purchase.  
Ex: paper towels.  
Experience goods, which can be discovered and evaluated only after use.  
Ex: restaurant meals. | Consumers may use signals to evaluate value of services.  
Signals can help consumers in making choices about services. |
| Levitt (1981) | • Dress.  
• Tangibilize the intangible. | Credence goods, which can never be evaluated effectively.  
Ex: professional services, i.e., law and health care. | A firm may gain competitive advantage.  
Increased sales and quality. |
<table>
<thead>
<tr>
<th>Author</th>
<th>Signals</th>
<th>Antecedent Conditions</th>
<th>Consequences/Remarks</th>
</tr>
</thead>
</table>
| Nayyar (1990) | • Warranties  
• Certification  
• Firm specific investments.  
• Price-premiums.  
• Word-of-mouth more effective than informational advertisements. | Information asymmetry | Strategic advantage of diversification and merger, by carrying over reputation of a service. |
| Mills (1990) | • Bonding, i.e., obtaining credentials.  
• Warranties, only for "certain" output.                                                   | Difficulty of measuring service output. | Better service quality.                                   |
Table 3.4 (Cont’d)

Types of "Signals", their Antecedents, and some Consequences

<table>
<thead>
<tr>
<th>Author</th>
<th>Signals</th>
<th>Antecedent Conditions</th>
<th>Consequences/Remarks</th>
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</thead>
<tbody>
<tr>
<td>Rubin (1990)</td>
<td>• Ads stressing price and availability.</td>
<td>Search goods.</td>
<td>Warranties will be effective only when &quot;moral hazard&quot; and &quot;adverse selection&quot; problems are non existent.</td>
</tr>
<tr>
<td></td>
<td>• Ads which are expensive.</td>
<td>Experience goods.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Warranty.</td>
<td>Credence goods.</td>
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<tr>
<td></td>
<td>• Relationships.</td>
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<td></td>
<td>• Bundling of service with superior products/services.</td>
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<tr>
<td></td>
<td>• Firm-specific investments.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• Backloading prices.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not specified.</td>
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<tr>
<td></td>
<td></td>
<td>Limits to efficacy of low prices.</td>
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</table>
Table 3.4 (Cont'd)

Types of "Signals", their Antecedents, and some Consequences

<table>
<thead>
<tr>
<th>Author</th>
<th>Signals</th>
<th>Antecedent Conditions</th>
<th>Consequences/Remarks</th>
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</thead>
<tbody>
<tr>
<td>Klein &amp;</td>
<td>- Price-premiums&lt;br&gt;- Firm specific investments.</td>
<td>Cost to customer of detecting quality prepurchase.</td>
<td>- Assumes no &quot;moral&quot; hazard on part of customer.</td>
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<tr>
<td>Leffler</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1981)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Grossman</td>
<td>- Warranties</td>
<td>Information asymmetry.</td>
<td></td>
</tr>
<tr>
<td>(1981)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Nelson</td>
<td>- Direct information or &quot;hard&quot; ads. &lt;br&gt;- Indirect information or &quot;soft&quot; ads.</td>
<td>Search goods.</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3.4 (Cont'd)

Types of "Signals", their Antecedents, and some Consequences

<table>
<thead>
<tr>
<th>Author</th>
<th>Signals</th>
<th>Antecedent Conditions</th>
<th>Consequences/Remarks</th>
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</thead>
<tbody>
<tr>
<td>Shostack (1977)</td>
<td>• Informative ads.</td>
<td>Low intangibility.</td>
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<td></td>
<td>• &quot;Tangibilizing&quot; ads.</td>
<td>High intangibility.</td>
<td></td>
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<tr>
<td>Hart et al. (1992)</td>
<td>• Guarantess</td>
<td>Professional services.</td>
<td></td>
</tr>
<tr>
<td>Onkvist &amp; Shaw (1989)</td>
<td>• Tangible cues in ads.</td>
<td>Intangibility.</td>
<td></td>
</tr>
<tr>
<td>Rashid (1988)</td>
<td>• Irrevocable fixed assets.</td>
<td>Information asymmetry.</td>
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CHAPTER 4

MONITORING AND CONTROLLING SERVICE PROVIDERS: AGENCY THEORY PERSPECTIVES

In chapter 2, I underscored the fact that managers in service firms often find it difficult to costlessly and completely monitor the activities of service providers because of the presence of performance ambiguity. This chapter is concerned with understanding how this type of performance ambiguity may be resolved by managers. I have organized this chapter along the following lines. First, I discuss the nature of the agency problem in a service setting. This is followed by a discussion of the basic principles of agency theory together with a description of how this theory differs from transaction cost theory. Finally, I discuss how agency theory concepts are applicable to the service setting.

Nature of the Agency Problem in Service Settings

Service companies which transmit quality signals to customers have an incentive to deliver quality consistently, because failure to do so may result in the appropriation of future quasi-rents (Klein and Leffler 1981). However, in a service organization, quality is finally delivered to the customer by a boundary spanning (Aldrich and Herker 1977) service provider (agent), whose actions have to be carefully monitored and controlled in order to ensure conformance to standards. In
other words, reputation alone cannot safeguard quality in the presence of agency problems. Klein and Leffler (1981), comment on this agency problem as follows:

The existence of independent competitive retailers that do not have any ownership stake in this firm-specific asset and yet can significantly influence the quality of the final product supplied to consumers creates a severe quality-cheating problem for the manufacturer. Manufacturers may protect their trademarks by imposing constraints on the retailer competitive process including entry restrictions, exclusive territorial grants, minimum resale price maintenance, and advertising restrictions that will assure quality by creating a sufficiently valuable premium stream for the retailers (p. 633).

Though Klein and Leffler (1981) are referring to the "agency" difficulties between a manufacturer and a retailer, in a service setting, an analogous agency problem arises between management and the service provider. In other words, management sends quality signals to customers. However, service is actually delivered by service providers whose actions are typically difficult to monitor because of performance ambiguity. These agents have an incentive to engage in "effort aversion" thereby compromising quality. In such a situation, management has an incentive to design appropriate control systems to keep agent opportunism under check.

A situation which highlights how agency problems interact with reputation is provided by Dejong, Forsythe, and Lundholm (1985). These authors explicitly model reputation effects in studying a principal-agent problem in the stock market. The findings of this study indicate that "while there is evidence of reputation effects in these markets, seemingly reputable agents are often able to use opportunities for false advertising to their advantage and 'rip-off' principals" (p. 809). More importantly, these authors observe that reputation effects alone do not guarantee quality because
"the presence of moral hazard does indeed lead to the provision of non-optimal levels of services in an agency relationship" (p. 819).

Under certain conditions, reputation effects alone are expected to curb agent opportunism. For instance, Axelrod (1980, 1981, 1984) using an iterative prisoner's dilemma model observed that when parties expected to transact frequently in the future, they had an incentive to behave cooperatively (c.f., Heide and Miner 1992). The "shadow of the future" acting backwards could substantially reduce agency problems. In general, agency problems will be inflated if parties do not expect to transact frequently in the future. This made is eloquently espoused by Hill (1990):

Reputation may be difficult to establish due to dispersion problems or a lack of communication among the population of potential participants to an exchange.... geographical dispersion, along with the absence of mechanisms for achieving communication between mobile consumers, may be the reason that a local trader continually charges mobile customers exorbitant prices" (Hill 1990; p. 509).

In general, reputation effects alone cannot solve the agency problem completely. However, under conditions of high "anticipated interaction", parties have an incentive to behave cooperatively. This point is important because extant mathematical agency models assume a single-period setting. Only recently, multi-period models, which explicitly recognize that parties can learn from past actions, are beginning to appear in the literature (Hosios and Peters 1989). For the purpose of this dissertation, I believe that companies which signal quality still have to manage associated agency problems. At the same time, agency costs will significantly decrease
with the possibility of anticipated interactions (Dranove and White 1987; Heide and Miner 1992).

Briefly, the focus of the preceding studies can be summed up by the following statement: *A service company that signals its reputations to customers thereby promising them consistent quality, needs to efficiently manage the agency relationship with the service provider to ensure that customer service quality will not be compromised*. The means to successfully managing this relationship is detailed in the agency theory literature which is reviewed next.

Agency problems are widespread in marketing (Bergen, Dutta, and Walker 1992) and other business disciplines (see Hill and Jones 1992; Eisenhardt 1989, for recent reviews in the business area). Agency theory (and Transaction cost theory or TCA) offers an internal perspective about a firm’s behavior in contrast to the extant "black-box" model of neoclassical economics. It is therefore important to briefly comment upon the historical evolution of agency theory. Note that in the ideal world, sans agency problems, internal organization of a firm would approximate a "black box". Unfortunately (fortunately for researchers), this paradise does not exist.

The purpose of appraising the controversy about agency theory is to lay the groundwork for an empirical test of the primacy of one approach (the humanistic) over the other (opportunistic) (c.f., Donaldson 1990). Specifically, some researchers (Williamson 1988) have hinted at the possibility of organizational culture acting as a check against agent opportunism. Despite a lot of confusion about the meaning of the culture construct, researchers seem to agree that culture implies a common shared meaning among organizational members (Deshpande and Webster 1988). In a company, if strong cultural effects are indeed present, one may expect the goals of management and agents to be congruent, because of a shared meaning about what
constitutes service quality (Webster 1990; Webster 1992). In other words, the "gap" between management and service providers would be reduced (c.f., Zeithaml, Berry, and Parasuraman 1988). This, in turn, would imply that fewer agency strategies or "counteracting institutions" (Akerlof 1970) would be present in a service setting. I begin the review by describing the historical evolution of agency theory.

**Agency Theory: Historical Development and Basic Concepts**

According to Levinthal (1988), "agency models constitute the response of conventional microeconomic theorists to the gaps left by the conventional, neoclassical theory of the firm" (p. 181). The earliest economic models [Chamberlin 1966 (first published in 1933); Robinson 1969 (first published in 1933)] assumed that the firm was a black box or a production function which balanced supply with demand. The equilibrium between supply and demand created "price" which in turn, acted as the mechanism for equating supply with demand. For instance, if a firm priced its products above marginal cost, it would go out of business because other competitors would still produce at marginal cost. Note that according to the "perfect competition" model, firms could not earn excess profits. However, Chamberlin (1933) found the existence of monopoly profits and market power which contradicted the basic tenets of the "perfect competition" and the "pure monopoly" model. This, in turn, triggered the need among researchers to focus on the internal working of the firm and delineate those strategies that firms used not only for generating super normal profits but also for attaining market power.

Not much research on the internal working of the firm was carried out till the work of Berle and Means (1932), who suggested that managers maximized sales (and
not profits) because they had an incentive to earn higher bonuses. This finding questioned the assumption of profit maximization. Around the same time, Hall and Hitch (1939) reported that business decisions were not made in a 'marginalist' way as assumed earlier. On the other hand, owing to uncertainty surrounding the decision making process, managers often used 'rules of thumb' or simple heuristics to make decisions. These studies were precursors to "managerial theories of the firm".

The main feature of managerial theories of the firm was the recognition that separation of ownership and control could give managers incentives for maximizing their own utility. Models by Baumol (1962), and Marris (1964) are illustrative of this focus.

While traditional managerial theories assumed that managers maximized a simple objective function (sales or profit) subject to an arbitrary constraint, behavioral theories (Cyert and March 1963; organizational slack) tried to explain how firms actually took decisions given complexity and uncertainty in the environment. Note that Simon's (1955) concept of "bounded rationality" formalized the notion of uncertainty surrounding decision making and spurred the development of "behavioral" theories of the firm.

Agency theory has its origin in managerial theories of the firm which recognized the difference between ownership and control. At the same time, agency theory incorporates behavioral aspects (i.e., decision making under uncertainty) of decision making. Work in agency theory developed from initial theoretical contributions by Spence and Zeckhauser (1971) and Ross (1973). These ideas have been formalized by Jensen and Meckling (1976), Shavell (1979), Holmstrom (1979), Fama (1980), Jensen (1983) and Arrow (1984). The actual analysis of the principal-
agent problem is mathematically complex. Consequently, in the following section, I focus on the basic ideas of agency theory.

Whenever "one party (the principal) engages another party (the agent) to undertake actions on his behalf in situations of information asymmetry", a principal-agent problem arises (Clark and McGuiness 1987; p. 8). Problems arise because the principal possesses less information about the agent than the agent himself. Under these conditions, the agent has an incentive to pursue his own interests by engaging in opportunistic behavior. Note that the agent may pursue opportunistic behavior either because he has greater knowledge than the principal or because the principal cannot observe the agent's action. The key point to consider is that information asymmetry leads to agency problems as the following real life examples illustrate:

There is widespread concern that ownership by physicians of testing or treatment facilities to which they refer patients leads to overuse of such facilities (Swedlow et al. 1992; p. 1502).

We found MRI (Magnetic Resonance Imaging) scans to be medically inappropriate 38 percent more often when ordered by self-referring physicians (who referred patients to facilities of which they were owners), suggesting increased rates of use in this group (Swedlow et al. 1992; p. 1506).

In both the situations that have been depicted above, agents (physicians) possessed more information than principals (patients). Furthermore, if patients were to monitor the actions of the physician, they had to incur additional costs, i.e., going to another doctor and paying examination fees, or seeking alternative medical advice.
The presence of asymmetric information, and the principals' (patients') problem with costlessly monitoring the physicians' actions caused the agents (physicians) to engage in moral hazard. In the physician-patient example cited above, one means by which patients (principals) can monitor the actions of physicians (principals) costlessly, is the development of long term relations. For instance, patients, who visited the physician over a period of time, could better appraise the physicians' honesty, mannerisms, and work. Though asymmetric information (i.e., task characteristics) would still be present, the potential loss of a future stream of quasi rents would keep physician opportunism in check (Dranove and White 1987).

This situation may also explain why most physicians prominently display their qualifications or even have ornate and plush offices. More specifically, physicians are signalling to potential patients that a lot of non salvageable investment has been made by them (i.e., in expensive furnishings, costly and quality education). Physicians cannot "rationally" fritter away this reputation by providing poor quality service because the future stream of quasi rents from this firm specific capital would be lost. Recognition of the importance of "physicians' reputations" may perhaps explain the burgeoning number of "malpractice suits", which are being undertaken by patients. It seems that patients "sue" not only to get monetary compensation but also to damage the credibility of the physician through negative publicity. In other words, the mentality seems to be: hit him where it hurts the most.

Given the existence of agency problems, principals often devise ways of monitoring the agent to reduce moral hazard and ensure efficiency. In the context of the shareholder--board of directors relationship, shareholders may devise appropriate compensation mechanisms, e.g., profit related bonuses or even stock options, for reducing goal divergence. Since agency theory was developed in the context of the
shareholder–board relationship, most empirical studies in business have focused on ways and means for managing this relationship. For instance, a number of arrangements for managing the shareholder–board agency relationship, i.e., *greenmail* (Kosnik 1987) *golden parachutes* (Wade, O'Reilly, and Chandratat 1990), and *poison pills* (Davis 1991) have been suggested in the literature. I will not review these studies because they fall within the domain of "positive financial economics". The focus of these "positive" studies however, is on the efficient management of the principal-agent relationship. While recognizing the importance of studies in "financial economics", I will direct my review only toward studies which have a bearing on managing agency relationships within a service firm. In other words, I eschew the more appealing buzzwords that characterized the era of leveraged buyouts and crashes on Wall Street: *greenmail, poison pill, golden parachute*. Before reviewing agency theory studies, it is important to more fully discuss ways in which a principal can monitor the actions of agents to prevent shirking.

There are two types of problems associated with an agency relationship. The first set of problems relates to whether an agent possesses the necessary characteristics which the principal is seeking. This is referred to as "adverse selection", "hidden action", or the "pre-contractual" problem. For instance, a hospital which is trying to hire an eye specialist has to first ensure that the candidate indeed possesses appropriate qualifications. The second problem stems from the inability of management to costlessly monitor the actions of agents. These difficulties are variously labeled as "moral hazard", "hidden action" or "post-contractual" problems. An example of "moral hazard" is the inability of a patient to determine whether a particular medication was necessary or not.
According to Bergen, Dutta, and Walker (1992), *hidden information* problems may be ameliorated through three strategies; (a) *intensive screening*, including personal interviews, tracking down personal references, and administering aptitude tests, (b) *signaling by agents*, or the amount of time and energy that an agent willingly puts in for making himself attractive to the employer, and (c) *self selection*, or lengthy and rigorous training and socialization for new recruits.

*Hidden action* problems, on the other hand, are almost exclusively tackled through either behavior-based or outcome-based contracting. In other words, hidden action strategies focus on the best way of appraising performance and distributing rewards (Gomez-Mejia and Balkin 1992), which in turn, are expected to motivate employees (Fierce, Stevenson, and Perry 1985). The assumption of hidden action models is that the most appropriate form of compensation will lead to performance. On the basis of Eisenhardt’s studies (1985, 1989), Bergen, Dutta, and Walker (1992) put forth the following propositions:

1. *As the cost of monitoring an agent’s action decreases, the greater is the efficiency of behavior-based contracts in relation to outcome based contracts.*

2. *The greater the difficulty of measuring the outcomes of an agent’s task, the greater is the efficiency of behavior-based contracts in relation to outcome-based contracts.*
3. As the level of goal conflict between a principal and an agent decreases, the greater is the efficiency of behavior-based contracts in relation to outcome-based contracts.

4. As environmental uncertainty increases, behavioral based contracts become more efficient in relation to outcome-based contracts.

5. As an agent’s aversion to risk decreases, the greater is the efficiency of outcome-based contracts in relation to behavior-based contracts.

It is important to note that monetary incentives are not the only mechanism for aligning the interests of agents and principals. For instance, Pratt and Zeckhauser (1985) note that:

The real world has many more instruments available to reward its players than found in most analytic models. Arrow stresses social rewards, such as reputation in the community or returns that come from adhering to a set of ethics. Friendship, family, and connections also play a substantial role in creating additional types of incentives. The real world, we would argue, may be much more sophisticated than economic models in using the rich palette of instruments (p. 17).

As a rival to compensation, White (1985) suggested two mechanisms which could be used to align the interests of agents and principals: (a) Liturgy, which
involves giving public recognition to an agent for his actions, with a commensurate obligation to perform certain duties, and (b) *Appointment*, or an obligation created through appointment to a position of power and respect. The display of "employee of the month" titles in many service settings is an example of non monetary rewards. In a recent article, Lawless and Price (1992) suggest that non-monetary rewards and sanctions may be more effective under the influence of a common organization culture (Williamson 1988). Ouchi (1980) also suggests that divergence between principals and agents can be bridged through organizational culture.

Recall that in an earlier paragraph I mentioned my intention to eschew discussion of a branch of agency theory that dealt with arrangements between stockholders and managers for solving the agency problem (through use of greenmail, poison pills, and golden parachutes). This branch of agency theory, often called the positive branch, exclusively focuses on "the design of contracts and control structures that are most successful at inducing managers to behave in a manner most consistent with the interests of the firm's shareholders, and how the effects of those control mechanisms can be mediated by environmental factors such as the labor market" (Bergen, Dutta, and Walker 1992; p. 7). Though the positive branch has much in common with the "hidden action" model, it is mathematically less formal, and makes the rather simplifying assumption that agents are risk neutral rather than risk averse. As discussed earlier, I will not review studies relating to the positive branch of agency theory in any detail.

In sum, agency theory can offer rich insights into the internal working of a service firm. At the heart of most quality glitches in services is an agency problem. Efficient management of this "agency problem" holds the key to success for a company. I now turn my attention to a discussion of transaction cost economics.
which has a lot in common with agency theory. However, there are differences between these theories too that need to be explored in order to justify the theoretical focus of this dissertation.

*Agency theory and transaction cost theory*

Coase (1937) attempted to answer a very fundamental question: why did firms exist? Recall that economic models of that time were based on the assumption of frictionless and faceless transactions among human beings. In other words, every economic actor could costlessly obtain information about any other economic agent. Coase, however, observed some anomalies in the extant micro-economic models. For example, advertising by companies was based on the realization that consumers’ were ignorant of a firms’ output and had to be informed. A company had to incur costs of advertisement for informing customers. This commonsensical observation was counter to the assumption of micro economic models that information was free. A more fundamental issue that Coase attempted to tackle was the rationale for existence of firms. If every economic actor could indeed obtain costless information about any other actor, the market (using price), would suffice as the only economic institution for regulating exchange. For example, a company making automobiles could enter into costless contracts with suppliers and employees on the basis of price. Price alone would guarantee the efficient performance of any contract because everybody possessed costless information. Under these circumstances, the “company” would “reduce” to a unit economic agent.

The existence of firms led Coase to hypothesize that transactions were not “frictionless”. This revolutionary idea changed the way of economic thinking, and
Coase's work was appropriately recognized with the 1991 Nobel Memorial Prize in Economics. The interested reader is directed to Brunner (1992), and Barzel and Kochin (1992) for an extended discussion on Coase's contribution to economics.

The basic premise of the TCA approach is that economic contracts are only partially complete. In other words, problems regarding ex-post contracting may explain the existence of firms. Coase's ideas about problems with ex-post contracting were formalized by Williamson (1971). Specifically, Williamson posited that transactions varied along three dimensions: asset specificity, frequency, and uncertainty. Furthermore, human beings were "boundedly rational" (Simon 1955) as well as opportunistic. Under these conditions, some transactions would be extremely difficult to govern through contracts. In other words, an agent could economize on transaction costs by organizing activities within his domain, i.e., by creating a firm. As an example, consider the earlier illustration about the automobile company where we assumed that price could guarantee contract performance. Let us now assume that at least one supplier is highly opportunistic and supplies a critical engine component. Furthermore, let us assume that the company has invested a lot of resources in the supplier's plant for developing the technology. If the supplier were to switch, the company would lose the idiosyncratic asset (investment in technology). Knowing the opportunistic nature of the supplier, the company would be better off by vertical integration. Briefly, TCA logic focuses on ex-post contracting. In contrast, agency theory focuses on ex-ante contracting. The similarities and differences between TCA and agency theory are discussed next.

As Bergen, Dutta, and Walker (1992), Mahoney (1992), and Williamson (1988) note, the basic unit of analysis in agency theory is the individual (i.e., the agent), while the basic unit of analysis in TCA is the transaction. The implication of
this difference is that TCA is more focused on governance structures than agency theory, which focuses on individual characteristics of agents. The implication of this difference can be explained using a hypothetical example: consider an Indian doctor whose exceptional work prompts an Indian hospital to send him abroad a number of times for training. The cost of training the doctor is a specific investment by the company which would be lost if the doctor quit. While agency theory would focus on ex-ante problems like designing the proper training program, or determining the appropriate reward structure, TCA would concern itself with means to protect the specific investment in the doctor (i.e., a salary system of compensation, or even stock options).

According to Williamson's (1981) research on efficient employment relations, the design of a contract would involve consideration of two factors: (a) investment in specific-assets by the firm (Indian doctor's example), and (b) difficulty of evaluating or monitoring the agent's work, i.e., uncertainty. At first glance, it may appear that uncertainty is similar to information asymmetry in agency theory. However, there is a subtle difference between the two concepts. For instance, Griesinger (1990) notes, "When he discussed uncertainty, Williamson focused on the problems associated with determining the contribution of individuals in a work group when tasks are highly interdependent" (p. 494). This form of uncertainty is also called the "metering problem" (c.f., Alchian and Demsetz 1972). This view of uncertainty seems to be at variance with Anderson and Oliver's (1987) concept of environmental uncertainty. More generally, uncertainty as it relates to the design of efficient employment contracts refers to the difficulty of separating out individual contribution from that of the team as a whole. In contrast, agency theory is focused on information asymmetry and the possibility that an agent, if not monitored efficiently, will shirk. Put simply,
TCA states that spot market contracting is most appropriate. Hence, companies should always use outcome based controls (commissions) unless specific assets (ex-post contractual problem) are present. In my dissertation, I consider TCA variables (i.e., asset specificity and uncertainty) as they affect the employment contract of a service provider in a service firm. In other words, I shall retain the focus of Agency Theory in my dissertation.

Needless to say, the basic differences between TCA and agency theory applications are beginning to blur as researchers are paying attention to both ex-ante and ex-post costs (Grossman and Hart 1986, *backloading of wages* implying that earnings in later periods are contingent upon good performance in earlier periods; Heide and John 1992, *norms*). The idea that agency costs and transaction costs should be considered in conjunction is noted by Mahoney (1992): "measurement costs and transaction costs should be considered simultaneously for the purpose of predicting organizational form" (p. 567). As discussed earlier, I see the potential of complementing agency concepts with TCA concepts in the area of "agent compensation". Specifically, I propose to apply TCA concepts for studying the compensation problem of agents as suggested by Anderson and Oliver (1987). This exercise will also help me undertake an empirical comparison of two competing theoretical perspectives for agent compensation: *transaction cost theory and agency theory*. In the next section, I discuss studies which have used agency theory in service or related settings.
Agency Problems in Services

In keeping with the substantive focus of this dissertation, and before applying agency theory to services, I study three issues in greater detail: (a) are agency problems reflected in real world settings?, (b) have researchers called for the application of this theory to services? If so, what are their propositions and what have they specifically suggested by way of hypotheses? and (c) what implications do extant studies in the services area that have used agency (or related) theories have for this dissertation?

Some examples of agency problems in service settings

Consider the following vignettes. In each case, a service, conceptualized as an agency relationship has gone awry.

He (the doctor) "cuts us up, and orders us to bring him money... as if he were exacting tribute... he should be put under rigid control," by calling an assembly of all the people and inviting opinions about "disease and how drugs and surgical instruments should be applied to patients”. We should "elect our physicians from among our number for one year terms, and severely penalize them if they fail to carry out the letter of the law" (Plato in The Statesman, quoted in Nelson 1990; p. 421).

There is widespread concern that ownership by physicians of testing or treatment facilities to which they refer patients leads to overuse of such facilities (Swedlow et al. 1992; p. 1502).

We found MRI (Magnetic Resonance Imaging) scans to be medically inappropriate 38 percent more often when ordered by self-referring physicians (who referred patients to facilities of which they were owners), suggesting increased rates of use in this group (Swedlow et al. 1992; p. 1506).
Sears, the nation's largest independent auto-repair concern, agreed to refund $50 each to nearly one million customers for auto-repair work that may have been unnecessary (The Wall Street Journal; October 2, 1992).

A federal court jury in Montgomery, Ala., found that employees at the company's ConAgra Inc poultry-processing plant at enterprise Ala., had deliberately made trucks seem heavier than they were before they left the plant, then tinkered with the scales when trucks returned loaded, so as to make them appear lighter than they were. Growers were paid on the basis of the weight difference (The Wall Street Journal; October 9, 1992).

For consumers, the hope is that certification (of lawyers) will serve, if not as a guarantee of exceptional expertise, at least as a protection from lawyers who don't know a reorganization plan from a divorce decree. For lawyers, certification may help them market themselves more aggressively and intelligently (The Wall Street Journal; April 16, 1992).

Afraid an auto mechanic will take all your money? GE Capital Fleet Services hopes to cash in on that fear. The General Electric subsidiary is betting that recent publicity about repair-shop fraud will persuade owners to pay $49 a year for access to a new telephone service that provides information about car maintenance and repair problems (The Wall Street Journal; July 31, 1992).

When unqualified people are passed through the medical-screening process and hired, these workers are more likely to fail to perform, to become injured, and then to cause the increased costs so familiar to the employer (Carman 1992).

As each of the situations depicted above shows, agency problems are widespread in the services setting. Furthermore, each case highlights the information asymmetry between agents and principals. Typically, agents possess more information than principals. Furthermore, in each setting it is difficult for the principal to costlessly monitor the work of the agent.

Several academicians have recognized the presence of widespread agency relations in marketing (Bergen, Dutta, and Walker 1992). Some studies have intuitively suggested the presence of agency relations between customers and
companies (Coughlan 1988; Devinney 1988), while others have highlighted the agency relationship between customers and service providers (Rao and Bergen 1992). In each case, customers interpret signals from their agents within an agency context as a means of managing the relationship. For example, Rao and Bergen (1992), using Klein and Leffler’s (1981) logic, hypothesized that customers interpreted price premiums as a source of reputation. In other words, agents risked the loss of future quasi rents (i.e., price premiums) by compromising on quality. Though mixed results for one of the main hypotheses were found, the basic point that these studies make is that agents often use signals of reputation (i.e., price premiums) to convince principals that opportunism would be kept at bay. More appropriately, companies send signals to customers as a means of structuring the agency relationship with final buyers. Note however, that Rao and Bergen recognize that many alternative mechanisms for signalling quality may be available to the seller, i.e., seller’s investment in non-salvageable assets like R&D facilities, symmetric investments, and certification programs. As Rao and Bergen note, “future research will be required to suggest which of these many devices is most appropriate for a given situation” (p. 421).

A handful of studies within the health care area have recognized the importance of an agency perspective for understanding quality of care as well as financial and organizational issues (Arrow 1963; Barnea, Haugen, and Senbet 1987; Dranove and White; 1987; Feldstein 1974; Harris 1977; McLean 1989). Two of these studies (Dranove and White 1987; and McLean 1989) focus explicitly on the impact of managing agency relationships for health care quality. The other studies dealing more with the positive branch of agency theory (i.e., design of stock options, greenmail, etc.) will not be reviewed here.
The McLean (1987) study underscores the familiar agency problem inherent in a doctor-patient relationship:

The physician, in such a temporary firm (association with the patient), is an agent in exactly the same sense as is corporate management. As such, the physician has an incentive to overconsume perquisites in the form of reduced effort and/or higher fees. The situation is exacerbated by the fact that the principal (the patient) will rarely (if ever) have the technical knowledge necessary to monitor the agent's inputs effectively. The agency cost generated is the present value of all unnecessary agent-induced spending on the part of the patient (p. 67).

Beyond highlighting the applicability of agency theory to health-care services, McLean does not specifically suggest how this agency problem may be resolved. Specifically, there is no mention of whether the patient would develop relationships (bonds) with the doctor to prevent agent opportunism or not. However, McLean does hypothesize that HMO's (Health Maintenance Organizations) with a stock payment (or profit sharing) option for doctors would deliver better quality of care (measured by lower costs) than HMO's paying salary or fee-for-service arrangements. In the latter forms (HMO's and fee-for-service) mechanisms for checking agent opportunism are insignificant, thereby prompting opportunism. The McLean study has merit since it suggests possible variations in the quality of care across organizations because of differentially efficient (or inefficient) agency relationships. No empirical tests of hypotheses are provided however.

Dranove and White's (1987) study is particularly insightful because various doctor-patient governance forms (e.g., fee-for-service, autonomous physician, employee physician, HMO's) are explained using agency theory arguments. The fee-
for-service arrangement, at first glance, appears to be an inefficient relationship. There is high informational asymmetry between the parties because the doctor (agent) typically possesses more detailed technical information than the patient (principal). Furthermore, the patient cannot costlessly monitor the doctor. It seems that this situation is ideal for rampant opportunism. In fact, as reports in the popular press reveal, some opportunistic behavior by doctors goes on (Swedlow 1992). Dranove and White (1987) suggest however, that this agency relationship works because patients typically develop close relationships with the doctor through repeat visits (c.f., Hosios and Peters 1989; multi-period agency models).

Every time a patient visits a primary care physician with whom he has established a long-term relationship, he gathers increasing information about the ability of the physician, including the quality of his care, his bedside manner, waiting times, and so on. In these ways, the patient continually monitors the physician, rewarding physicians of above-average ability (p. 410).

Though the development of a relationship may keep agent opportunism at bay, how is an agency relationship efficiently maintained in a single-period situation? In other words, how does the fee-for-practice service work for infrequent contacts like one time specialized care or surgery? Dranove and White (1987) argue that in single-period situations, referral networks which are sought out by patients form an implicit mechanism to discipline doctors. These referral networks are similar to Akerlof's (1970) counteracting institutions and Hill and Jones' (1992) institutions. Referral networks typically maintain a data base about doctors. Information from this data
base can be easily secured by the patient (costless monitoring) thereby ameliorating information asymmetry and rendering the agency relationship more efficient.

Hospitals typically engage the services of autonomous physicians. This is another example of how the doctor-patient relationship is organized. The agency problem (between the doctor and the patient) is solved primarily because of close monitoring by patients. However, in these situations, doctors may not treat resources very efficiently, thereby increasing the cost of care to insurers and employees. This is perhaps the main reason why HMO's are becoming so popular. By employing a doctor, the HMO designs strategies for curbing opportunism. In other words, management directly controls the doctor through multiple strategies, i.e., socialization, salary compensation etc. Interestingly, on the issue of "signals", Dranove and White (1987) suggest that "by investing in establishing national identities, HMO's signal to the public that they have withstood market scrutiny over a period of time in many different markets, thus suggesting that their physicians produce high technical quality and have good bedside manner" (p. 413).

Finally, Dranove and White (1987) note that companies providing intangible services may partially standardize their service delivery system thereby "solving" the agency problem (e.g., brake and muffler repairs, grinding eyeglass lenses). However, the authors note that "the potential for standardization in medical care is limited, and that for the most part consumers will seek out the quality of the individual provider" (p. 414). The failure of "doc in the box" outpatient clinics is a typical example. In sum, effective resolution of agency problems is the sine-qua-non for delivering quality, and ensuring a firm's profitability. It may however, be instructive to compare the relative contribution of standardization (through an 'operations' focus) and resolution of agency problems on the quality of care in a service setting.
A few studies with a focus purely on the "compensation" of agents has also been reported in the literature (Basu, Lal, Srinivasan, and Staelin 1985; Coughlan and Narasimhan 1992; Eisenhardt 1985, 1988; John, Weitz, and Weiss 1987; John and Weitz 1988; Lal and Staelin 1986; Lal, Outland, and Staelin 1990; Oliver and Weitz 1991). Note that we have to carefully consider the meaning of some exogenous variables used in the salesforce compensation literature before transplanting hypotheses to a service setting. Two constructs from these studies which need some more discussion are: (a) risk preferences, and (b) environmental uncertainty.

Let us consider environmental uncertainty first. In the salesforce literature, this construct means uncertainty in the relationship between effort expended and results (sales) (Oliver and Weitz 1991). John and Weitz (1988) measure this construct as uncertainty of "product sales", while Eisenhardt (1985,1989) uses task programmability as the independent variable. Eisenhardt (1985) defines task programmability as "the amount of service in the selling process... here service implies a less programmable job because service is a highly abstract and variable commodity which is difficult to monitor (e.g., Sasser, Olson, and Wyckoff 1978)" (p. 141). The construct of task programmability is more central to the problems faced by management in directly monitoring the quality of service offered to customers, and is closer to the concept of information asymmetry. Furthermore it is technology based (Argote 1982), because it focuses on task characteristics. Accordingly, I consider Eisenhardt's "task programmability" measure to be more appropriate as an exogenous variable for a service setting.

The results of "compensation" studies cited above appear mixed (refer Bergen, Dutta, and Walker 1992 for a summary). However, as Eisenhardt suggests, according to agency theory, for services involving low task programmability, simple behavior
control appears most adequate. On the other hand, for services involving low task programmability, management may reward the agent based on purchased information (i.e., customer reports; mystery shoppers' reports) or on an outcome system (percent of sales or profits). However, agents may behave in a way which may adversely affect customer satisfaction. For instance, as Anderson and Oliver (1987) state "the inherent lack of direction in such systems (outcome based) can permit sales behaviors that harm the organization in the long run, e.g., lack of attention to customer satisfaction" (p. 78). Furthermore, as Eisenhardt (1985) notes, the decision between using the behavior system (e.g., using customer satisfaction scores for compensation) and the outcome system "rests upon the trade-off between the cost of measuring behavior, and the costs of measuring outcomes and transferring risk to the agents" (p. 137). Eisenhardt (1985) observes that behavior control increases with increasing task programmability.

The second exogenous concept in the compensation literature, i.e., risk preferences of agents also determines compensation. In agency theory, agents are assumed to be risk averse. Hence, if there is a lot of environmental uncertainty (about future sales or even survival), paying agents purely on an outcome basis will not motivate them to perform. In other words, as Eisenhardt (1985) reports, with increasing environmental uncertainty, management would adopt behavior control instead of output control. I consider this approach appropriate. Furthermore, it would be instructive to consider TCA variables in the compensation scheme, i.e., the extent to which employees are considered "specific assets" by management. To the extent that employees are considered "transaction specific" investments, we should expect behavior control, i.e., salary plus clan like structures (Anderson and Oliver 1987). As I have discussed elsewhere, there is some confusion about what constitutes
uncertainty with reference to designing the most efficient employment contract. Assuming the Anderson and Oliver's (1987) position is correct, the problem of predicting the appropriate compensation mechanism is compounded by the TCA assumption that agents are risk neutral. However, in a situation of high uncertainty and outcome control, management cannot properly direct the salesforce. Under these circumstances, behavior control appears to be the most important alternative.

Yet another perspective on compensation is "backloading" of wages (Grossman and Hart 1986), i.e., a compensation plan wherein "firms initially pay wages below the workers' alternative wage and later pay wages above the alternative wage to discourage shirking when monitoring is imperfect" (Krueger 1991, p. 75)). Furthermore, if legal constraints prevent backloading, an efficiency model may be used. In an efficiency model a company raises the present value of compensation to increase the cost of job loss and discourage shirking (see Becker and Stigler 1974 and Lazear 1981 for additional details). Mixed support for these propositions were reported by Krueger (1991).

I wish to also consider the presence/absence of non monetary reward systems (White 1985) on performance and motivation. Note that the use of "employee of the month" and related honors is becoming very common as a means of ensuring employee motivation. Furthermore, as Lawless and Price (1992) suggest, the use of non-monetary reward systems would increase with the importance of organizational culture. I also wish to test this interaction.
Implications and potential extension of agency theory

The focus of the preceding studies has been on the applicability of agency theory to a highly intangible service, i.e., health care. More applications in other areas are forthcoming in the business discipline (Gomez-Mejia and Balkan 1992; Mills 1990). For instance, Gomez-Mejia and Balkan (1992) contend that business schools engage in complex reward structures to effectively monitor professors (agents). Education is an intangible service, and a professor cannot be monitored on a daily basis. A compensation scheme linked to the number of top quality journal publications serves as the best method of managing this agency relationship. Mills (1990) explicitly suggests that the way in which an agency relationship is managed determines the quality of service delivered. More specifically, Mills (1990) suggests that "moral hazard and adverse selection reduce the value, and thus, the quality of the service consumed by clients/customers" (p. 35).

Though the studies reviewed here have a lot of merit, they are explicitly based on the "hidden action" model. In other words, the focus of investigation has been too narrow. For instance, Gomez-Meza and Balkan (1992) study the efficacy of various compensation mechanisms for solving the agency problem in a university setting. On the other hand, these authors totally neglect the hidden information model, i.e., activities like screening, and agents' signal evaluations, which precede a professor's entry into academia. A more complete understanding of agency problems should involve considerations of three main areas: (a) signaling, or strategies directed by the management to the final customer, (b) hidden information, or efforts undertaken by
management to select the right person, and (c) hidden action, implying the design of appropriate reward and compensation schemes. Note that the study by Mills (1990) attempts to model some variables from the hidden information paradigm. However, no empirical tests of propositions are provided. More importantly, the pivotal role of management is neglected.

The second drawback of these studies is the "singular" focus on compensation as a dependent variable. Since most "empirical" agency applications are based on the "hidden information" model, the focus on "compensation mode" as a dependent variable is not surprising. However, while considering the gamut of strategies available for managing agency relationships, the overall quality of service provided should more appropriately serve as the dependent variable of interest. There are compelling theoretical arguments too for considering overall service quality as a dependent variable. For instance, Zeithaml, Berry, and Parasuraman (1988) have proposed that the gap model be used to studying internal delivery processes within organizations. While being critical of some propositions about the model, I believe that the existence of a perceptual service quality gap between management and service providers is appropriate for my dissertation. Specifically, agency theory postulates that designing effective strategies should align the interests of management and service providers. To this extent, the gap between management and service providers regarding the quality of service delivered should decrease with successful resolution of agency problems.

Two competing theories which prescribe how the gap between management and service provider can be reduced thereby ensuring quality are: (a) organizational theory, i.e., development of the appropriate organizational structure, and (b) organizational culture, or the extent to which shared meaning among employees and
management is present. In my dissertation I propose to study these competing viewpoints and empirically determine which perspective contributes the most to service quality.

Recently, some scholars within the business discipline (Donaldson 1990; Greisinger 1990) have voiced their disenchantment over TCA and agency theory which rely on the underlying "immoral" behavioral norm of human opportunism. This controversy is not new to agency theory and TCA. For instance, Granovetter (1985), in a seminal article, indicates that trust and cooperation among human beings may explain why some contracts are more efficient than others. In this sense, theories based on human opportunism may be overtly rigid in their prescription about the structuring of contracts. Similar concerns about human opportunism have been voiced by Francis et al. (1980), Knapp (1989), and Perrow (1986). Though it is worthwhile to recognize this debate, it is important to note that in reality one may expect both opportunism and human cooperation (i.e., norms and trust) to exist cheek by jowl. Some evidence in this regard is forthcoming in the marketing literature (Heide and John 1992).

A stream of literature falling under the rubric of "relational contracting" (Dwyer, Schurr, and Oh 1987; Kaufmann and Stern 1988, Macneil 1980) explicitly incorporates the historical and social context of transactions. In other words, this literature is similar to Ouchi's (1979) concept of clans and Deshpande and Webster's concept of culture (1989). In a service organization, by using agency theory and theories of organizational culture in conjunction, we may better explain the quality of service delivered. For instance, we have shown that agency theory can perhaps justify why there is degradation of service quality (Sears' customers being overcharged). At the same time, a growing body of literature on service climate (Burke, Borucki, and
Hurley 1992; Rentsch 1990; Schneider and Reichers 1983; Schneider, Wheeler, and Cox 1992) and organizational culture (Hofstede, Neuijen, Ohayv, and Sanders 1990; Sheridan 1992) suggests that proper socialization of organizational members by using the medium of culture may guarantee service quality. In other words, culture implies a shared meaning among organization members (Deshpande and Webster 1992). If there are strong effects of culture in a service organization, the gap between management and service providers will reduce (i.e., agency problems would reduce) and a company will deliver better service quality. Can these competing viewpoints be reconciled? Perhaps more research may be needed to answer the question.

Note however, that even Williamson (1988) has acknowledged the role of culture in reducing costs of governance within a hierarchy. Furthermore, Williamson (1991a) has recognized scholars' objections to TCA and the need to consider the social and historical determinants of transactions.

Four objections to prior work in this (transaction-cost economics) area are especially pertinent. One objection is that the two stages of the new institutional economics research agenda—the institutional environment and the institutions of governance—have developed in disjunct ways. The first of these paints on a very large canvas and emphasizes the institutional rules of the game: customs, laws, politics (North 1986) (p. 269).

A summary of the main concepts and findings pertaining to agency theory appear in Tables 4.1 thru 4.3.
## Table 4.1
Definitions of "Agency" Relationships

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Definition of &quot;agency&quot; relationship</th>
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<tr>
<td>Mills (1990)</td>
<td>When participants to service encounters are utility maximizers, the service provider <em>may not always act in the best interests of the client/customer</em>, or the service provider may have preferences for his or her actions that may not be consistent with those of the client/customer (p. 34).</td>
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<tr>
<td>Hill &amp; Jones (1992)</td>
<td>An agency relationship is defined as one in which one or more persons (the principal(s)) engages another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent (p. 132).</td>
</tr>
<tr>
<td>Fama &amp; Jensen (1983)</td>
<td>Agency problems arise because contracts are not costlessly written and enforced. Agency costs include the costs of <em>structuring, monitoring, and bonding</em> a set of contracts among agents with conflicting interests, plus the residual loss incurred because the cost of full enforcement of contracts exceeds the benefits.</td>
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<td>Eisenhardt (1989)</td>
<td>Agency theory is concerned with resolving two problems that can occur in agency relationships. The first is the <em>agency problem</em> that arises when (a) the desires or goals of the principal and agent conflict and (b) it is difficult or expensive for the principal to verify what the agent is actually doing (p. 58).</td>
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<tr>
<td>Author(s)</td>
<td>Definition of &quot;agency&quot; relationship</td>
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<td>Strong and Waterson</td>
<td>The principal-agent problem characterizes a number of situations where self interested individuals enter into an implicit or explicit contractual arrangement (p. 19).</td>
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<td>(1986)</td>
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<tr>
<td>Clarke &amp; McGuiness</td>
<td>A principal-agent problem arises when one party to a contract (the principal) engages another party (the agent) to take actions on his behalf in situations of information asymmetry (p. 8).</td>
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<td>(1986)</td>
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<tr>
<td>Levinthal</td>
<td>An agency relationship is said to exist between two (or more) parties when one, designated as the agent, acts on behalf of the other, designated the principal (p. 155).</td>
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<td>(1988)</td>
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<tr>
<td>Bergen et al.</td>
<td>An agency relationship is present whenever one party (the principal) depends on another party (the agent) to undertake some action on the principal's behalf. Hence, an employment relationship is an agency relationship (p. 1)</td>
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<td>(1992)</td>
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<tr>
<td>Author(s)</td>
<td>Strategy</td>
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<td>Author(s)</td>
<td>Strategy</td>
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<td>Collins</td>
<td>Screening for</td>
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<td>(1979)</td>
<td>control</td>
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<tr>
<td>Bergen et al.</td>
<td>Agent's Signaling</td>
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<td>Bergen et al.</td>
<td>Self-Selection</td>
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<tr>
<td>(1992)</td>
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</table>
Table 4.3
The "Hidden Action" or "Moral Hazard" Problem
(Variables and Definitions)

<table>
<thead>
<tr>
<th>A: Assumptions of the hidden action model</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Incompatible goal and risk preferences</td>
<td>Bergen, Dutta, and Walker (1992)</td>
</tr>
<tr>
<td>• Information asymmetry.</td>
<td></td>
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<tr>
<td>• Realized outcomes depend in part on environmental conditions, i.e., economic conditions, competitor's actions, technological changes, agent's behavior.</td>
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<table>
<thead>
<tr>
<th>B: Type of control</th>
<th>Examples</th>
<th>Antecedent Conditions</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior</td>
<td>• Call reports.</td>
<td>Low information asymmetry.</td>
<td>Bergen et al. (1992)</td>
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<td></td>
<td>• Field observations.</td>
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<td></td>
<td>• Narrow span of control.</td>
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<td></td>
<td>• Behaviorally anchored rating scales</td>
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<td>Outcome</td>
<td>• Straight commission.</td>
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</table>
Table 4.3 (Cont’d)

The "Hidden Action" or "Moral Hazard" Problem
(Variables and Definitions)

<table>
<thead>
<tr>
<th>$B$: Type of control</th>
<th>Examples</th>
<th>Antecedent Conditions</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process or behavior</td>
<td>• No of calls made.</td>
<td>Performance documentation</td>
<td>Jaworski &amp; McInness (1989)</td>
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<tr>
<td></td>
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<td>Procedural knowledge.</td>
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<td>Output</td>
<td>• Outcomes or sales quotas.</td>
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<td>Professional</td>
<td>• Peer evaluation.</td>
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<tr>
<td>Self</td>
<td>• Individual commitment.</td>
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<td></td>
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<tr>
<td>Behavior &amp; Outcome</td>
<td>• Salary to commission ratio</td>
<td>Risk aversion.</td>
<td>Basu et al. (1985)</td>
</tr>
<tr>
<td>Behavior &amp; Outcome</td>
<td>• Salary to commission ratio.</td>
<td>Risk preferences environmental uncertainty.</td>
<td>Lal et al. (1990)</td>
</tr>
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<td></td>
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<tr>
<td>Behavior &amp; Outcome</td>
<td>• Proportion of salary.</td>
<td>Proportion of non-selling activities.</td>
<td>John et al. (1987)</td>
</tr>
<tr>
<td>Behavior &amp; Outcome</td>
<td>Assumptions of Hidden Action Model</td>
<td>Antecedent Conditions</td>
<td>Source</td>
</tr>
<tr>
<td>--------------------</td>
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<tr>
<td>Behavior</td>
<td>• Salary</td>
<td>Task programmability.</td>
<td>Eisenhardt (1985)</td>
</tr>
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<td></td>
<td>• Management direction &amp; intervention.</td>
<td>Environmental uncertainty.</td>
<td></td>
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<tr>
<td>Outcome</td>
<td>• Low degree of monitoring.</td>
<td></td>
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<tr>
<td></td>
<td>• No management direction &amp; intervention.</td>
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<td>• Objective evaluation methods.</td>
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Table 4.3 (Cont’d)
The "Hidden Action" or "Moral Hazard" Problem (Variables and Definitions)
<table>
<thead>
<tr>
<th>A: Assumptions of Hidden action Model</th>
<th>Antecedent Conditions</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior</td>
<td>• Observed behaviors.</td>
<td>Task progra-mmability.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outcome measurab-ility.</td>
</tr>
<tr>
<td>Behavior plus outcome</td>
<td></td>
<td>Exact mechanism not specified.</td>
</tr>
<tr>
<td>Clan</td>
<td>• Ritualized control.</td>
<td>Information asymmetry. (not measured)</td>
</tr>
<tr>
<td>Outcome (salary)</td>
<td>• Number of top quality publications.</td>
<td>Gomez-Mejia, &amp; Balkin. (1992)</td>
</tr>
</tbody>
</table>

Adapted and modified in part from Bergen et al. (1992).
CHAPTER 5

MANAGING CUSTOMER INDUCED INPUT UNCERTAINTY:
OPERATIONS MANAGEMENT PERSPECTIVES

In chapter 2, I had briefly discussed the consequences of customer induced input uncertainty on a service firm's internal operations. In this chapter, I describe more fully how the relevant literature in the operations management field can shed some light on our understanding of the consequences of customer induced input uncertainty which service firms face at their boundary. I have organized this chapter as follows. First, I define operations management and highlight how it differs from organizational theory. In the next section I appraise the deductive-inductive debate in the OM field. This is followed by a commentary on marketing's use of OM concepts for studying services. Finally, the OM literature as it relates to customer induced input uncertainty and its consequences is reviewed.

Operations Management--An Overview

Operations (or production) management has a triple focus. At one level, it deals with task areas, i.e., capacity utilization and capacity establishment issues. At other stages, it concerns itself with task levels (i.e., continuous or batch production) and task assignment (i.e., matching of people to tasks) (Jelinek and Burnstein 1982). Let us consider each focus in turn.
Capacity utilization and capacity establishment functions essentially pertain to demand management. According to Orlicky (1970), demand is of two types, dependent or independent. Purely independent demand is demand for finished goods and products. On the other hand, demand is considered dependent when it is directly related to or derived from the demand for other items or end products (Wallace 1980). Within operations management, purely independent demand is mathematically estimated with queuing models or other stochastic models (Snyder, Cox, and Jesse 1982). Dependent demand, on the other hand, is modeled using the MRP (materials requirement planning) technique. In MRP, final demand is broken down into intermediate demand with a view to achieving better planning and control. The objective of any demand analysis in manufacturing organizations is to break down independent demand into dependent demand so that effective planning and control of intermediate stages is achieved. For instance, consider the demand for a car. This is independent demand. However, based on some forecasting technique (say Markov chain models) if the company is able to estimate demand, the next challenge is to "derive" the quantity and occurrence of demand for each preceding manufacturing/assembly stage, i.e., the amount of painting, fabrication, welding, etc. Converting uncertainty of demand (independent) into rational demand is the essence of capacity planning. Note that the convenient MRP logic does not apply to service firms dealing with highly intangible offerings involving human interactions. For instance, high input uncertainty, i.e., when will the consumer arrive? how much service will he demand?, how long will he stay inside the firm?, render MRP approaches futile for most complex services. However, some degree of intermediate planning is perhaps present in most service firms. As Snyder, Cox, and Jesse (1982) observe, "dentists and physicians can provide better customer service and minimize their idle time by
establishing bills of service showing the dependent relationships in given types of services provided... these services may be thought of as either preventive or remedial" (p. 464). The degree to which the demand for a service can be anticipated and planned for appears to be closely related to the amount of input uncertainty that the firm faces.

Task levels refer to whether the production process is flexible or not. In a way, the decision about flexibility is related to demand. For instance, as Hayes and Wheelwright (1979) observe, production processes may be of four types: (a) job shop, implying low standardization and one of a kind product, (b) batch, or multiple products with a low volume of production, (c) assembly line, involving few major products but higher volume, and (d) continuous, or high volume, highly standardized commodity products. The implication of this categorization is that service firms too may be arrayed along a continuum varying from high flexibility in production process (i.e., demand for health care in a hospital) to low flexibility (i.e., demand for a burger in a restaurant). Task standardization appears to be a dependent "operations" variable which can be predicted from input uncertainty.

Finally, assignment of people to tasks may differ depending on the nature and type of demand. This phenomenon can be thought of as "defining appropriate-individual task matches" (Jelinek and Burnstein 1982). For certain production processes, high task substitutability may not affect production. For instance, at fast food restaurants, employees may alternatively serve as cashiers or burger makers. Furthermore, one cashier may substitute for the other. However, for services characterized by inflexible production processes (i.e., medical care), high role specialization may not allow for substitutability. For instance, nurses may not ordinarily take over responsibility of doctors and one doctor who is treating a
particular patient may not be ordinarily substituted for another physician. In addition, services which are relatively intangible, may offset peak demands by hiring part-time employees, a trend which is perhaps not seen in hospitals. In sum, substitutability of tasks may be predicted from input uncertainty.

Operations management is similar to organizational theory (at least the modern "contingency theory" version) in terms of its contingency nature (Jelinek and Burnstein 1982) and its exclusion of behavioral concepts. In other words, different environmental conditions (e.g., input uncertainty) may be matched to different task characteristics. Recall that according to contingency theory (Lawrence and Lorsch 1967), organizational structure may also be predicted from input uncertainty. Organizational structure exists however, at a higher level in the organization than tasks. In general, organizational structure and nature of tasks (operations) will often supplement one another. For instance, low input uncertainty may lead to centralization as well as standardization of operations. It is useful to consider the structure vs task difference as a "macro" vs a "micro" issue. There is a possibility that firms may dovetail their organization structures to "fit" production processes and strategy. This interrelationship is not explored here. The interested reader is referred to Jelinek and Burstein (1982) for a discussion. My objective in reviewing the "Operations Management" literature is to clearly identify the differential disciplinary origin of "organizational structure" and "task characteristics" (or operations) concepts.

The fact that structure and task variables may correlate highly does not mean that they belong to the same discipline. In the following section, I discuss the current debate in operations management over the proper philosophical orientation for the discipline and the implication of the controversy for service marketing theorists.
Operations management (OM) has historically followed a deductive approach to understanding organizations. Deductive methods from management science, operations research, and even statistics have been predominant in OM (Swamidass 1991). The deductive method offers a sharp contrast to the "inductive approach" which draws conclusions from specific observations. The inductive approach is also called empiricism (Sax 1968). As an example of a deductive approach, consider the following question. "For a given demand, set-up costs, and order costs, what is the optimal order policy?" (Swamidass 1991; p. 803). In contrast, a question which can only be answered by empirical observations may take the following form: "In a given production system, what is the magnitude and direction of influence of a given set of independent variables on the level of work-in-process inventory?" (Swamidass 1991; p. 803).

The predominantly deductive emphasis in operations management has been challenged on two grounds. First, researchers (Buffa 1980; Chase 1980; Chase 1981; Chase and Prentis 1987), recognizing the "contingency" and interrelated nature of production variables (Swamidass 1991) have called for the development of "middle range" theories (Bluedorn and Evered 1980) which use empirical methods to study delimited aspects of a phenomena. In this connection, it is interesting to note that the JIT system developed and implemented so successfully in Japan marks a shift in OM's emphasis from deduction to induction. Second, and more relevant for services research, academicians (Sullivan 1982; Sprague 1977) have noted that OM's disproportionate focus on mathematically elegant and deductive models does not model "organizational behavior" or "organizational theory" concepts in theories. Classical OM research, with its emphasis on sophisticated mathematical models (waiting lines, inventory, scheduling, line balancing) and rationality may therefore be
an oversimplified reflection of a complex phenomena. For instance, Tversky and Kahneman (1986) note that "the most basic rules of the (rational choice) theory are commonly violated by decision makers" (p. 252). Both the preceding concerns, taken together suggest that OM should move away from purely deductive models to models with an empirical (or inductive) focus.

The inductive-deductive debate is particularly relevant to service organizations because barring totally automated services (ATM's, laundromats, automated car wash), most services involve some amount of "customer contact" (Chase 1978; Chase 1980; Chase and Tansik 1983). In other words, since production and consumption of services is often simultaneous (Booms and Nysquit 1981) and services cannot be inventoried (Bateson 1977; Sasser 1976), the convenient "deductive" logic so successfully applied by OM researchers to manufacturing processes breaks down. Fearing a challenge to the foundations of their discipline, OM researchers (Chase 1978; Chase 1980; Chase and Aquilano 1980; Chase and Erikson 1988; Dilworth 1979; Chase and Tansik 1983; Chase and Garvin 1989; Chase and Hayes 1991; Tansik 1990) have been in the vanguard of a movement to recognize service contingencies (e.g., low contact vs high contact) in OM models. Echoing this trend, Chase and Erikson (1988) note that the traditional manufacturing logic (Thompson 1967) of "placing organizational buffers (marketing, product design, etc.) between the customer and the production system" (p. 191) may not be applicable to services. They argue therefore, that "there are, however, fewer and fewer markets that can be effectively served by this closed system philosophy. What is needed today is quite the opposite--an open system that includes the customer--one that can gather and act on information from the marketplace in real time" (p. 191). Consequently, they invent the
label of a "service factory" to describe these open systems (Chase and Erikson 1988, pp. 194-195).

**Services Marketing and Operations Management**

Early marketers (Levitt 1972; 1976) perhaps encouraged by the attention of OM researchers to services, called for "industrialization" (Levitt 1979) "designing" (Shostack 1984) "engineering" (Shostack 1987) and even a "production line" (Levitt 1976) approach to services. It is interesting to question why marketers also jumped on to the "OM" bandwagon in their quest for understanding services. After all, production issues did not belong to the marketing domain. Note however, that marketers did not totally embrace the deductive mathematical models of OM, but tried to stress that services could be understood with a manufacturing logic as far as production issues were concerned. In other words, marketers embraced the deductive-inductive model from OM in keeping with concerns about service contingencies voiced by early OM researchers (Chase 1978; Chase and Tansik 1981).

No definitive answer to the question as to why early service marketers embraced the "production line" concepts of "industrialization" and "engineering" is possible. In a retrospective fashion, I offer two possible answers to this question, one "philosophical", and the other "societal".

A philosophical question (how issues) that every discipline faces is whether it has advanced mankind's knowledge about a phenomena (Leshan and Margenau 1982). The method used to investigate phenomena and understand linkages among various theoretical concepts is often called science (Kerlinger 1986). Science derives legitimacy from a particular philosophical orientation (e.g., relativism, positivism, post
modernism, critical theory). At various stages of its development, a discipline is often in "philosophical turmoil", trying to justify use of the most appropriate scientific method. This turmoil is engendered from two simple questions: (a) how do we know that "what" we know is "truth"? and (b) does research knowledge ameliorate the problems of mankind? The spate of recent writings on "philosophy" issues in marketing (Hunt 1990; Hunt 1991; Hunt 1992; Hunt 1992a; Lutz 1990; Murray and Ozanne 1991; Peter 1992; Zinkhan and Hirschheim 1992) clearly highlight this debate.

In the context of services marketing, researchers were aware that services differed from goods. In fact, one of the earliest articles in marketing was by Shostack (1977) titled "Breaking Free From Product Marketing". During the early stages of a discipline, focus is mainly directed at prediction and control of phenomena in order to gain philosophical legitimacy. In other words, if a researcher cannot predict one entity from the other in a theoretical context, how good is his theory?, how good is this knowledge for mankind?. As a precursor to the scientific endeavor, it behooves upon researchers to develop valid taxonomies of a phenomena (see Singh 1988 for an excellent illustration, i.e., the first valid and reliable taxonomy for modes of customer complaints). Service marketers were facing a philosophical dilemma. On the one hand, they were laying the groundwork for subsequent theory development by stressing the difference between goods and products, i.e., by suggesting a simple taxonomy of differences, while on the other hand, they were not sure of how to proceed with theory building. For instance, Shostack (1977) made a strong case for "tangibilizing" services as a means of achieving competitive advantage. Specifically, she notes that "a service is already abstract... to compound the abstraction dilutes the "reality" that the marketer is trying to enhanced" (p. 43). In other words, marketers in
the early days sought to focus on the 4P model for suggesting different marketing strategies for services (e.g., different advertising for services; Shostack 1977). However, service marketers also had to consider production issues because customer presence in the production process was the rule rather than the exception. How service marketers attempted to study production issues is discussed next.

As a starting point, service marketers perhaps thought that studying "services" through the goods model, already established in operations management would be desirable. In fact, some services (fast foods, groceries) had a lot in common with "goods" producing organizations. Furthermore, marketers for the first time were forced to think of production issues because of the simultaneous mode of service production and consumption. There was no "production" model available for marketers who had historically been concerned with understanding and satisfying consumers who existed "outside" the boundaries of the firm. Interestingly, Shostack (1977) who poignantly articulated the goods-service difference by stating that "squeezing services into the Procrustean phrase 'intangible' products is not only a distortion of the AMA's definition but also a complete contradiction in terms" (p. 38; emphasis added) in a later article (Shostack 1987) dealing with production issues, called for "engineering services on a more scientific, rational basis" (Shostack 1987; p. 34). It seems that borrowing OM concepts and stressing "similarity" in the production processes of "goods and services" appeared a desirable, convenient, and logical approach to theory development. It also made practical sense because in the early seventies, life was not very complex, and customer demands were mainly concerned with basic services, in sharp contrast to the more complex and interactive (between buyers and sellers) nature of today's service demands (psychiatry, counselling, health care). Note that most of the earliest studies (e.g., Shostack 1977) focused on basic
services like groceries or banking which were rather non-interactive in nature. I discuss this point more fully in the next paragraph.

Today's society is far more complex and fast faced than the easy going life of yesteryears. Theoretically, the rapid proliferation of complex services can be explained by Engel's Law which states that as a society progresses, the proportion of income that a family spends on basic requirements, i.e., food, will decrease while expenditure on "services" will increase. In brief, societies have followed the logical transition to a service economy in three successive stages: agrarian, industrial, service. This structural change in the highly developed U.S. economy is highlighted by Koepp (1988) who estimates that 85% of all jobs created in the U.S. since 1982 have been in the service sector.

Rapid industrialization and technological development has radically changed today's social environment in two ways. First, women go to work and do not sit at home doing household chores. In fact, technological revolutions have made it easier for women to work outside their homes. For instance, consider a non-automated plant which manufactures steel. In this plant, women are not expected to undertake physically demanding tasks. However, computer technology has made it possible for women to serve in steel pants by providing "programming services". Given this development, families have to rely on a variety of personal services (tax preparation, baby sitting, home maintenance). It is pertinent to mention the recent controversy over Ms. Baird's nomination to the post of U.S. Attorney General by President-Elect Clinton. Ms. Baird hired two Peruvian workers (illegal immigrants) to help her with household chores (read 'personal services') while working as a legal counsel for Aetna Inc. The controversy stems from Ms. Baird's failure to pay Social Security Tax to the IRS on compensation she paid to the workers. In this connexion, The Wall Street
Journal (January 15, 1993) noted that millions of working American families relied on personal services in some form or the other to manage their family lives. This controversy reveals yet again as to how important "personal services" have become in today's economy. A recent article (Soberon-Ferrer and Davis 1991) reports that full-time working wife household tended to spend more money on certain categories of services (e.g., child care) than household where the wife worked only part time. In a conceptual sense, people have to rely on "agents" for providing services. This brings the complexity of the modern "agency" problem into sharp focus.

Second, rapid industrialization and the competition for scarce resources have led to a stressful working environment. Not surprisingly, personal counselling, psychiatry, and other highly interactive services have come to stay in today's economy (Schoell and Ivy 1981).

The preceding societal developments in turn, have made services not only more interactive, but also more complex (i.e., difficult for customers to evaluate). These services are radically different in nature from near tangible services like groceries and fast food outlets. Agency problems have come to dominate service relationships. As a consequence, problems of "information asymmetry" have assumed great importance. This complex transition from standardized to more complex services is adequately described by the failure of the "doc in the box" approach (Dranove and White 1987). Recall that at one time Levitt (1976) had extolled "mechanized" health care service to great heights:

The Damon Corporation in Needham Heights, Massachusetts, operates 125 such clinics (specialized, highly automated medical diagnostic clinics) throughout the nation which, with the help of modern machines, 125 salaried M.D.s, 22 Ph.D.s, and 1,400 medical technologists, perform a wide range of diagnostic tests that formerly required patients to visit
several doctors and clinics at costs in time and money several multiples above those of Damon's (p. 69)

These 'canned' medical care outlets however failed. This is because hospitals which sought to provide medical care by trying to standardize internal practices did not foresee the complex nature of today's social interactions (Dranove and White 1987) where customers (as principals) are constantly seeking to manage the "agency relationship" with service providers (agents). Furthermore, a vast majority of today's patients suffer from AIDS, cancer, and other diseases which render mechanized care all but obsolete. The emergence of different forms of medical organizations (Specialities, HMO's) reflect the underlying complexity of today's health care environment. In addition, "technical" standards of quality (time of recovery) have given way to "functional measures" of quality (courtesy, empathy) and a multiplicity of "principals", i.e., patients, government, and insurance companies in the health care environment. Not surprisingly, Total Quality Management (TQM) with a focus beyond the "narrow" dimensions of yesteryears, has emerged as the dominant business philosophy for competitive advantage, profitability, and corporate success for the nineties (see Casalou 1991; Garvin 1991; and Lanning 1990 for details).

Given the relative standardization of services in the seventies, marketers were perhaps justified in using the "industrial" model borrowed from Operations Management. Initially, the focus of marketers was on somehow casting services into a rational paradigm for attaining efficiency (Levitt 1972). Services were by and large simple to perform. This point is aptly described by Levitt (1972):
This kind of resistance to retailing efficiency reflects a profoundly persistent cultural manifestation with its ancestral roots in distant centuries. Historically, the way to "serve" was in the form of one person for the benefit of another—the butler, the footman, the parlor maid, the upstairs maid, the solicitor, the butcher, the greengrocer, the tailor, and the cook—each performing one-on-one, highly personalized service, whether laying out the clothes or cutting the roast just right to the exacting specifications of each familiar customer (p. 65).

Services in the early seventies could therefore be appropriately studied using "applied rationality which (had) produced such magnificent efficiencies in the industrial system" (Levitt 1976; p. 65; emphasis added). However, today's radically complex service environment demands a fundamental shift in research emphasis from the production philosophy of yesteryears. In this context, Schlesinger and Heskett (1991), realizing that "for more than 40 years, service companies successfully followed an industrial model based largely on the principles of traditional mass-production manufacturing", describe the approach as "obsolete... (because) it sets in motion a cycle of failure that is uniformly bad for customers, employees, shareholders, and the country" (p. 71). What should this new service model be? In a way this is the question that my dissertation attempts to answer as it integrates literature across diverse disciplines. One point that emerges from this discussion is that the "OM technique" may not be uniformly applicable to all services. On the other hand, OM concepts are perhaps more adequate for services which have low levels of input uncertainty in their client-firm interfaces. Incidentally, this 'contingency' approach (low contact vs high contact) was first recognized by Chase (1978). What these OM concepts are and how they relate to services is therefore the focus of the next section.
Consequences of Customer Induced Input Uncertainty--An OM Perspective

As noted earlier, OM has historically been concerned with demand issues and has modeled organizations by using a "closed" systems perspective. Conceptually, the emphasis has been on shielding (or buffering) the technical core so that the ideal process is reproduced (Thompson 1967). One of the earliest studies in services by Chase (1978) used a contingency approach and suggested that some services cannot be modeled using a closed systems philosophy. Thus, the first OM model for services (Chase 1978) uses the contingency of "contact" for prescribing appropriate "service organizational designs". In brief, Chase's (1978) model assumed that low contact services (i.e., time spent by the customer within the system is less) could be modeled using a "closed systems" approach while "high contact" services were akin to an open system. Service organizations were urged to gravitate toward a "closed system" wherever possible in order to "leverage" profits because the customer was essentially considered a "disturbance" in the system. The concepts and theoretical linkages of this model are more fully developed and discussed by Chase and Tansik (1983).

Chase and Tansik (1983) developed the "customer contact model" for predicting "organization design". Before describing their study, I wish to focus on the "low-contact" vs "high-contact" contingency that they used. Some researchers have noted that the "customer contact dimension fails to differentiate between active versus passive customer presence" (Schmenner 1986; cited by Bowen and Larsson 1989, p. 214). In other words, a customer may spend one hour at a restaurant and with a physician. In Chase and Tansik's (1983) scheme, both services may be considered "high contact". However, the customer and the physician typically exchange more complex information with one another than the customer and the restaurant waiter. In
other words, the nature and amount of information exchange (which is determined by input uncertainty) is a more appropriate basis for classifying services than mere "contact" duration (Larsson and Bowen 1989). This view is echoed by Lovelock (1983) and Maister and Lovelock (1982) who propose that the notion of customer presence should be expanded to include both the degree of customer interaction and the degree of customization. Recognizing that "input uncertainty" may be a more appropriate contingency variable than "contact", Tansik (1990) notes:

Tansik and Chase (1988) identify three areas into which customer-induced uncertainty can be classified:

* **Where and When**: If there are multiple-service facilities locations, customers can choose among them, based upon convenience. Thus, demand at any single location is problematic. Also, if lost sales are not permitted because of the unavailability of a server or raw materials, each site will have to be staffed and inventories maintained at peak, rather than average, demand levels (p. 57).

* **What**: The degree to which customers can demand customized outputs (sic) affects the organization's ability to standardize production (p. 57).

* **How**: the degree to which the customer is required/allowed to engage co-production of the service output influences the degree to which customers must be trained and managed (p. 57).

Recently, Chase and Hayes (1991) reversed Chase's (1978) earlier call for service firms to move toward a closed systems perspective by noting that "in retrospect, this closed system philosophy overlooked the fact that there are positive
benefits to both the customer and the organization by having the customer closely linked to the server..." (p. 24). In sum, "input uncertainty" and not "the degree of contact" appropriately serves as a defining dimension of the client firm interface—a point noted in an earlier section where I reviewed studies on the client-firm interface.

Chase and Tansik (1983) used the "contact" dimension for developing several propositions about a service organization's internal activities. Most pertinent for this review is their discussion about managing demand. Specifically, the authors developed the following propositions relating the degree of customer contact to the nature of operations:

(1). In high-contact systems, capacity must be set to match peak demand if lost sales is not permitted. In low-contact systems, storable output permits setting capacity at some average demand level (p. 75).

(2). In high-contact system productions planning is inherently inexact. In low-contact systems, production planning can exactly match production to resource availability (p. 75).

(3). All high-contact subsystems tend to require some minimal capability to handle non-routine tasks even if they are imbedded in a mechanistic organization structure. Perrow's (1967) notion of routine and non routine tasks is relevant here (p. 75).

Routine tasks: "there are well-established techniques which are sure to work, and these are applied to essentially similar raw materials. That is, there is little uncertainty about methods and little variety or change in the tasks that must be performed" (p. 75).

Non-routine tasks: "there are few well-established techniques; there is little certainty about methods, or whether or not they will work. But it also means there may be a variety of different tasks to perform, in the sense that raw materials are not standardized, or orders for customers ask for many different custom-made products (p. 75).
(4). Decoupling is favoured when face-to-face contact for all operations is not technologically required. Decoupling is not favored when face-to-face contact is seen as an essential marketing element of the service (pp. 1042-1047).

A closer look at Chase and Tansik’s propositions (1983) reveals three operations management concepts which can be predicted from the degree of customer contact (or input uncertainty): (a) demand management, (b) routinization, and (c) coordination. Demand management may be carried out for “low-contact” services by hiring part-time workers (as is often the case in fast food restaurants). For high-contact services, such a strategy may be inappropriate. For instance, business schools explicitly tie in demand projections to expected student enrollments and often plan their recruitment efforts almost a year in advance. Furthermore, protection planning is easily achieved in low-contact systems. Task routinization, which refers to the extent to which tasks for service providers can be well scripted, appear more appropriate for hospitals than for grocery stores. Finally, decoupling is conceptually analogous to Argote’s (1982) concept of coordination. Note however, that decoupling as described by Chase and Tansik (1983) refers to inclusion or exclusion of the customer from the production site. In this sense, it is similar to an external perspective on Argote’s (19820 concept of internal coordination. For instance, a physician has to interact closely with various departments (nursing, administrative) for delivering the service. On the other hand, the server at McDonald’s does not have to interact with many departments. In one case (the physician), there is very little opportunity to exclude the customer from the system boundary, while in another case (McDonald’s) customers may be explicitly excluded from the boundary (e.g., drive thru’ takeout services).
It is important to note that Chase and Tansik (1983) recognize "operating efficiency" as the result of a match between input characteristics (degree of contact) and operations. Efficiency is defined by them as "the ratio of outputs and inputs for a given service facility; it does not account for customer utility functions or for organization-wide production or marketing performance" (p. 1039). This position is in contrast to a later study by Northcraft and Chase (1985) who recognize that matching an employee's ability to task requirements may result in better "motivational health" of the work force (Hackam and Oldham 1980), and question whether "the simple prescriptions of the propositions (linking customer contact to types of operations) affect quality (Adam 1981)" (p. 75; emphasis added). These conflicting viewpoints on the appropriate measure of service effectiveness underline OM's transition from a purely mechanical model to one that incorporates notions of quality.

Northcraft and Chase (1985) attempt to determine how "demand" affects operations in service firms. These authors define demand management as "real time control of demand at the point of service delivery in order to increase service production and delivery efficiency" (Northcraft and Chase 1985; p. 66). Furthermore, the authors suggested four methods of demand management, i.e., routinization, decoupling, delegation, and mechanization. The independent contingency variable was not explicitly identified by the authors however. The focus of this study was on "industrializing" "some tasks in (any) service process" (Northcraft and Chase 1985; p. 67). I discuss the four demand management strategies identified by the authors in the following section.

Routinization refers to "a standard service with some tolerance for variation, depending upon customers' perceptions and needs" (Northcraft and Chase 1985; p. 67). In other words, routinization is a response to some contingency, which may be
input uncertainty (Tansik 1990). _Decoupling_ means whether the customer can be excluded from the boundaries of the firm or not. In certain situations (e.g., ATM's) customers may be explicitly excluded from the boundaries of the system in order to maximize production efficiency. _Delegation_ implies whether a particular service activity can be provided by many employees or not. This concepts appears similar to "substitutability". For instance, Chase and Tansik (1983) note that "an apprentice or even novice often can carry out the service production or delivery function, as long as the qualified professional has decided what needs to be done" (p. 68). Finally, mechanization explores the practicability of "substituting a machine for a person when possible...(to) remove the possibility of human error from the production or delivery process" (Levitt 1972) (p. 68).

Taken together, Chase and Tansik (1983), and Northcraft and Chase's (1985) studies have routinization and decoupling in common. On closer look, Chase and Tansik’s (1983) mention of "average capacity planning" appears conceptually similar to Northcraft and Chase's (1985) strategy of "delegation". In other words, some services use average capacity planning techniques and hire part-time workers to meet excess demand. In these services, delegation is easily possible because service providers do not need specialized training to carry out their duties. The concept of mechanization seems to overlap with the decoupling dimension. For instance, if one can totally automate a service (ATM machines), the production process is in effect de-coupled from the customer. In sum, Northcraft and Chase's (1985) study complements Chase's (1983) work in terms of identifying relevant operations variables. Northcraft and Chase's (1985) study differs from Chase and Tansik's (1983) in that no contingency (or antecedent) conditions for the operations variables are explicitly identified.
Mills and Moberg (1982) identify two contingencies facing a service firm, i.e., (a) workflow uncertainty which involves "the lack of predictability of client arrival, service, and exit patterns", and (b) task uncertainty, or "the lack of knowledge about how to affect desired service outcomes" (p. 472). Workflow uncertainty may be handled by having "buffers of clients waiting for entry and exit" and "anticipating arrival patterns" (p. 472). Task uncertainty, on the other hand may be managed by two strategies: (a) client selection and socialization, (b) routinization of the conversion process.

Client selection and socialization is a means of either excluding from the workflow those customers about whom the company has insufficient information or properly socializing customers. Initial research in this area has already begun to yield interesting insights. For instance, Kelly, Skinner, and Donnelly (1992) observe that "the level of organizational socialization achieved by service customers has an impact on their perceptions of the service organization" (p. 208). However, the measures used to tap the "organizational socialization" construct appear rather crude because they do not assess the "process" of socialization. For instance, the item "I feel comfortable in this organization" (Kelley et al. 1992; p. 210) ignores how socialization was brought about. A study by Siehl, Bowen, and Pearson (1992), more appropriately describes how organizational socialization may actually be brought about, i.e., by using "rites of integration" (Trice and Beyer 1984). I will not pursue this topic any more because it may relate to a "different research stream altogether.

Routinizing the transaction, according to Mills and Moberg (1982) may be effectively used to manage task uncertainty. Mills and Moberg (1982) explicitly recognize the role of "coordination" across various departments as a means of managing task uncertainty. Though they label coordination as a "structure" variable, it
can be more appropriately considered an operations variable (c.f., Argote 1982). Accordingly, when task and workflow uncertainties are high, "the resultant structure in the service operation is coupled loosely with and buffered from the administrative core... control is collegial, relating more to the possession of skills than the actual process of service delivery" (Mills and Moberg 1982; p. 474). When workflow and task uncertainties are low, "the high degree of role routinization permits service workers to possess low levels of professionalism, a narrower technical repertoire and limited discretion in structuring the operation" (Mills and Moberg 1982; p. 474) The preceding statements suggest that "coordination" across departments may be an important variable to research in the context of operations management (in addition to routinization).

Tansik (1988) explicitly recognizes the "contingency" nature of services by noting that "based on an emerging services literature, the nature of customer-induced uncertainty is taken as a strategic variable rather than as the target of an attempt to affect an organization design to eliminate it" (p. 59). More importantly, he calls for some "balance" in the service organization between attempts to exclude or include the customer within the boundaries of the firm. In other words, there is no best "operations" design for service organizations. Though no specific operations variables are identified, Tansik (1988) makes a point similar to Mills and Moberg's (1982) concept of "customer socialization", by calling for "scripting of the server interaction with customers" (Tansik 1990; p. 60). Tansik's (1990) study is important because it directs our attention to behavioral concepts which OM researchers have to deal with while managing service organizations. Furthermore, by insisting on "organizational socialization" of customers, researchers (Mills and Moberg 1982; Siehl, Bowen, and Pearson 1992; Tansik 1990) are recognizing that the appropriate measure of
operations efficiency may be customer service quality. This realization is important because it provides us with a theoretical basis for testing the relationship between operations variables and quality. Although test of this link may be largely empirical, even service companies have tried to relate operations functions (e.g., cost cutting) to quality. For instance, Chase and Hayes (1991) observe that "in the case of the banking industry, efforts to cut labor costs frequently result in higher total costs because of the need to fix quality problems" (p. 19). Buttressing this notion, Chase and Hayes (1991), label service "operations, (as) the function that controls the service encounter" and call for a "manufacturing strategy paradigm" that incorporates behavioral constructs like "service quality" and "empowerment". In short, the highly deductive OM model of yesteryears can no longer be applied to services.

Before closing this review it is pertinent to appraise one of the few marketing studies (Shostack 1987) that attempted to use OM concepts for studying services. In her study Shostack (1987) identified two "operations" concepts, i.e., complexity and divergence for "engineering" better services. Divergence, defined by Shostack (1987) as "execional latitude (and) the degree of freedom allowed or inherent in a process" (p. 35) is close in meaning to routinization. On the other hand, complexity which is defined as "the number and intricacy of the steps required to perform (the service)" (p. 35) is a production concept. Shostack's (1987) study does not identify any antecedent conditions. On the other hand, she suggests that a service firm may manipulate divergence and service complexity in order to gain market share. For instance, some services may reduce divergence (increase routinization) and produce services at lower cost for gaining competitive advantage. Some highway gas stations that allow a customer to "fill up" and "charge it" without even seeing the store clerk is a good examples of perfect routinization. Though Shostack's (1987) study has a lot of merit,
one expects that divergence and complexity have limiting conditions. In other words, a grocery store (which is already routinized) can be made more routinized. However, medical service (non routinized) can hardly be made fully routinized. Shostack's (1987) study is insightful because it suggests that services may selectively routinize their operations. To this extent it is worthwhile to investigate which of the multiple strategies available to a particular firm (agency management, signaling, routinization) are salient in determining quality. In some hospitals some routinization definitely goes on (c.f., Snyder et al. 1982; indirect demand planning). However, if these hospitals are to deliver quality, managing human agency relationships (e.g., management-employee) may be more important than routinization. Findings pertaining to the main studies that have been reviewed thus far are depicted in Table 5.1.
Table 5.1
Operations Management Concepts, their Antecedents, and their Consequences

<table>
<thead>
<tr>
<th>Author</th>
<th>Concept</th>
<th>Definition</th>
<th>Antecedents</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shostack (1981)</td>
<td>Divergence</td>
<td>In highly divergent services virtually every performance of the process is unique. In low divergence service, it is standardized.</td>
<td>Not specified</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Complexity</td>
<td>Number of steps needed to perform the service.</td>
<td>Not specified</td>
<td>NS</td>
</tr>
<tr>
<td>Author</td>
<td>Concept</td>
<td>Definition</td>
<td>Antecedents</td>
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<tr>
<td>Chase &amp; Tansik</td>
<td>Demand capacity</td>
<td>Capacity to match demand.</td>
<td>High contact</td>
<td>Operating Efficiency</td>
</tr>
<tr>
<td>(1983)</td>
<td></td>
<td>Average demand planning.</td>
<td>Low contact</td>
<td>Operating Efficiency</td>
</tr>
<tr>
<td>Routinization</td>
<td></td>
<td>Standard methods of carrying out tasks.</td>
<td>Low contact</td>
<td>Operating Efficiency</td>
</tr>
<tr>
<td>Decoupling</td>
<td></td>
<td>Separate customers and contact people.</td>
<td>Low contact</td>
<td>Operating Efficiency</td>
</tr>
<tr>
<td>Author</td>
<td>Concept</td>
<td>Definition</td>
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</tr>
<tr>
<td>Norbeck &amp; Chase (1985)</td>
<td>Routinization</td>
<td>Standard service</td>
<td>Not specified</td>
<td>Service quality</td>
</tr>
<tr>
<td></td>
<td>Decoupling</td>
<td>Remove customer from the production system</td>
<td>Not specified</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delegation</td>
<td>Substitutability</td>
<td>Not specified</td>
<td></td>
</tr>
<tr>
<td>Northcraft &amp; Chase (1985)</td>
<td>Mechanization</td>
<td>Automate the service</td>
<td>Not specified</td>
<td></td>
</tr>
</tbody>
</table>
Table 5.1 (Cont'd)
Operations Management Concepts, their Antecedents, and their Consequences

<table>
<thead>
<tr>
<th>Author</th>
<th>Concept</th>
<th>Definition</th>
<th>Antecedents</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coordination</td>
<td>Communication across departments</td>
<td>Workflow uncertainty</td>
<td>Not specified</td>
</tr>
<tr>
<td>Argote (1982)</td>
<td>Coordination</td>
<td>Communication across departments,</td>
<td>Input uncertainty</td>
<td>Service quality</td>
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</tbody>
</table>
CHAPTER 6

ON THE MEASUREMENT OF SERVICE PERFORMANCE: MARKETING PERSPECTIVES

The purpose of this chapter is to provide a detailed exposition of the current conceptualization about service performance, which is the final dependent variable in my theoretical model. I have organized this chapter along the following lines. First, I discuss the current controversy in our discipline about the appropriate conceptualization of the constructs of satisfaction, quality, and attitudes. The second section focuses on the service quality construct and describes its conceptualization as well as its domain. The penultimate section describes those studies that have attempted to replicate the dimensionality of the service quality construct.

Satisfaction, Perceived Quality, and Attitude

A debate is currently raging within marketing about the most appropriate conceptualization of "service quality", and its relationships with "satisfaction" and "attitude". Consider the following statements in turn:

Marketing's current conceptualization and measurement of service quality are based on a flawed paradigm... Service quality is an antecedent of customer satisfaction... Customer satisfaction exerts a stronger influence on purchase intentions than does service quality" (Cronin and Taylor 1992; pp. 64-65; emphasis added).
Perceived quality is the consumer's judgement about an entity's overall excellence or superiority (Zeithaml 1987). It differs from objective quality (as defined by, for example, Garvin 1983 and Hjorth-Anderson 1984); it is a form of attitude, related but not equivalent to satisfaction, and results from a comparison of expectations with perceptions of performance (Parasuraman, Zeithaml, and Berry 1988, p. 15; emphasis added).

Perceived service quality is a global judgement, or attitude, relating to the superiority of a service, whereas satisfaction is related to a specific transaction" (Parasuraman, Zeithaml, and Berry 1988, p. 16; emphasis added).

Satisfaction researchers have stressed the idea that satisfaction is a function of the gap (contrast) between obtained and expected outcomes (Oliver 1980; Woodruff et al. 1983). A similar conceptualization dominates current work on perceived quality (Bolton and Drew 1991; Parasuraman et al. 1985, 1988; Zeithaml, Berry, and Parasuraman 1988). However, some of this work may need reexamination. If satisfaction or quality ratings are lower when outcomes are below expectations than when the identical outcomes exceed expectations, we cannot rule out the possibility that expectations change how subjects label satisfaction or quality-scale categories without changing true perceptions of satisfaction or quality" (Lynch, Chakravarti, and Mitra 1991, p. 294; emphasis added).

Two main standards of expectations emerge. One standard represents expectation as a prediction of future events (Miller 1977; Gilly 1979; Swan and Trawick 1980; Gilly, Cron, and Barry 1983; Prakash 1984). This is the standard typically used in the satisfaction literature. The other standard is a normative expectation of future events (Miller 1977; Swan and Trawick 1980; Prakash 1984), operationalized as either desired or ideal expectations. This is the standard typically used in the service quality literature (Parasuraman, Zeithaml, and Berry 1988). Although these literatures use different expectation standards, expectations and perceptions are usually linked via the disconfirmation of expectations paradigm (Boulding, Kalra, Staelin, and Zeithaml, [in press], p. 2 of typed copy).

Our model (of service quality) differs from the disconfirmation formulation in that we postulate individuals' overall quality assessments, and thus behaviors are affected only by their current perceptions of the service, and not the current expectations. These current perceptions are, in turn, the result of customers' two types of prior expectations of the service and the most recent service encounter (Boulding et al., [in press] pp. 3-4 of typed copy).
It is worthwhile to appraise this debate within the framework of my dissertation. Accordingly, I have structured this discussion as follows. First, I discuss the "attitude" concept as it has been studied and suggest why marketers are "hesitant" to label service quality as an attitude. Second, I offer a plausible explanation for marketers' use of the "disconfirmation paradigm" (Oliver 1980) for studying service quality. Third, I focus on the difference between service quality and satisfaction. I hope to offer some perspective on the current debate in marketing over differences between "satisfaction", "quality" and "attitude". Finally, I interpret Boulding et al.'s (in press) work as it relates to my dissertation. Specifically, I suggest that Boulding et al.'s findings that perceptions of customers influence service quality is directly related to agency theory prescriptions (Fama 1980).

There is near common agreement on the definition of attitude as "a general and enduring positive or negative feeling about some person, object, or issue (Petty and Cacioppo 1981; p. 7). If attitude is indeed enduring, marketers can profit by generate positive feelings about their products. In the consumer behavior literature, numerous studies have focused on attitude change, attitude formation (Lutz 1978), and the links between attitudes, purchase intentions, and behavior (see Petty and Cacioppo 1981). This body of research has not yielded any common finding on relationships among the various constructs. Marketers, realizing that services were intangible, found it difficult to suggest managerial strategies from inconclusive results of attitude research. For instance, a service usually has both tangible and intangible components. In order to influence service attitudes positively it is not clear whether managers should attempt to change beliefs or values. Using attitude theory, a service marketer had to simultaneously determine (and influence) customer attitudes for a lot of objects in the service system (ambience, reliability of equipment). Certainly,
attitude theory, with its micro focus was not conceptually appealing to service marketers.

Marketers were interested in developing a broad measure of service effectiveness. As I noted earlier, this may explain why attitude theory concepts appeared unsuitable. However, marketers were also interested in understanding the process preceding positive evaluation of the product. Satisfaction theory (Oliver 1980) offered a promising avenue because of its emphasis on the disconfirmation paradigm. The paradigm posits that "the predictions customers make in advance of consumption act as a standard against which customers measure the firm's performance... higher the expectation relative to actual performance, the greater the degree of disconfirmation and the lower the satisfaction" (Boulding et al., [in press], p. 3 of typed copy). Service marketers assumed that by using the disconfirmation paradigm (as a 'process') it was possible to suggest managerial strategies for delivering service quality. For instance, as Boulding et al. (in press) note, "the strategic implication (of the service quality model) is that firms can either try to increase perceptions or lower expectations in their quest for quality (p. 33 of typed copy). In other words, use of the disconfirmation paradigm appeared to be managerially relevant.

Researchers tried to differentiate between service quality and satisfaction because services are experiences with multiple objects in the service system. They are not evaluated in a transaction specific way (as is satisfaction). However, recently Cronin and Taylor (1992) found very little support for the "gap" formulation of service quality. Specifically, in a study involving customers' assessments of banks, pest control, dry cleaning, and fast food services, overwhelming evidence was found for the
"perceptions" only model of quality. Moreover, the authors (Cronin and Taylor 1992) reported that service quality is an antecedent of satisfaction.

I will interpret this finding only as it relates to my dissertation. Different interpretations from the one presented here are certainly possible. Cronin and Taylor's (1992) finding suggests that customer expectations about the service are irrelevant to service quality. Only performance matters. Does this mean that marketers should not try to influence customers' expectations about the service? Should they focus only on providing the service most efficiently thereby expecting the customer to be satisfied with "technical" (e.g., promptness) dimensions of service? I think Cronin and Taylor's findings are interesting. Most of the services investigated by the authors (i.e., dry cleaning, pest control, fast food, and banks) are relatively tangible and easy to evaluate. In these situations, marketers can (and perhaps do) signal mainly "technical" aspects of the service. Grocery stores normally advertise "low prices", "availability" and "fast service", attributes which may not affect customers' expectations because this is what customers seem to expect. In other words, they have a fairly constant "expectation" level for these services. This may explain why perceptions are more important than expectations. Some emerging literature in the service area indicates that customers have "zones of tolerance" where expectations may not be very salient (Berry, Parasuraman, and Zeithaml 1992).

The construct of customer expectations has an interesting "history" which to a very large extent endorses Cronin and Taylor's (1992) view. Cronin and Taylor (1992) do not tell us why "expectations" may be irrelevant. A historical digression may shed some light on the construct of "perceptions".

Bellamy (1888) talked about a preference for the most automatic, routinized interaction possible. Echoing this viewpoint, Hollander (1985) notes:
Yet we all know that a large number of service encounters occur daily without overt aggression between the participants and often with some, or even substantial, pleasure on one or both sides. This may be attributable in part to fairly low expectations. We all know that Bellamy's (1988) utopia has not yet arrived, and we adjust our demands accordingly. Lombard (1955) and Stone (1954) show that many customers do not want much service; Reisman (1950) held that *the pretense of personalized service in an impersonal situation was a nuisance* (p. 53; emphasis added).

Hollander's (1985) comments have recently been supported in a study by Sutton and Rafaeli (1988). These authors found that "clerks in rapidly paced stores with high sales and long waiting lines were less likely to display positive feelings than clerks in slow-paced stores" (Sutton and Rafaeli 1988; p. 461). In other words, for "low involvement" services expectations may be fairly low. This condition may be caused by a desire for convenient service or even norms. It is important to note that the earliest services involved a "powerful" principal and a "subordinate" agent (in contrast to today's agency relationships). Information asymmetry was not a problem for the principal because the customer could exactly specify standards and verify the work of agents, often using power. Adam Smith in his Wealth of Nations (1789) explicitly acknowledges the power differential in the agency relationship by noting: "the Sovereign... with all the officers of justice and war who serve under him". In fact, servers were considered to be lower in status. The *Random house dictionary* defines "service" as "the performance of duties or the duties performed, as by a waiter or a servant". In prehistoric times, servers were not expected to deviate from historic roles often legitimatized by the social system (e.g., the caste system in India). Servers were evaluated based only on the perceptions of service. In today's society, people
perhaps do not hold strong expectations about services they are familiar with, i.e., "services" which were rendered by "servants" in the past. Expectations may not be relevant for these services. It may be noted however, that some early scholars (Hughes 1945; Williams 1946) did speak of "auxiliary characteristics" of a server, i.e., age, sex, race, appearance, dress, or setting as quality determinants. These authors were perhaps referring to "functional" quality of care which are salient to some services.

It is worthwhile to note that Cronin and Taylor (1992), in support of their results state " a study by Churchill and Surprenant (1982) also partially supports the efficacy of using only performance perceptions to measure service quality... they conducted two experiments to examine the effects of expectations, performance, and disconfirmation on satisfaction... the results of one experiment suggested that performance alone determines the satisfaction of subjects" (p.57). A closer look at Churchill and Surprenant's (1982) study reveals that the product in question (a video disc player) was an "innovative, technological complex, durable product" (Churchill and Surprenant 1982; p. 502). It appears that for this product, consumers had no expectations since they had not seen it before. Hence, only perceptions appeared relevant. Customers would rather go and try out the product for themselves than rely on expectations. Hence, Cronin and Taylor's (1992) sweeping statement that expectations are irrelevant for customers' assessment of service quality appears incorrect. More appropriately, we may use a contingency framework to suggest that under certain situations (i.e., high performance ambiguity), perceptions of a service are indeed important. In fact, for medical services, perceptions may play an important role in determining quality because a customer may not be able to fully evaluate the performance of an object even after repeated use (e.g., credence goods; Darby and
Karni 1973). Note that we find a gradual shift in "power" from principals to agents, commensurate with society's development (Mitnik 1984; Rao and Neilsen 1992).

Recognizing that their results may be influenced by the type of service studied, Cronin and Taylor (1992) note that "perhaps high involvement services such as health care or financial services have different service quality definitions than low involvement services such as fast food or dry cleaning" (p. 67). The observation that expectations may perhaps be more important for "highly tangible" services is supported by three recent studies. First, Webster (1989) notes that "consumers' demographic characteristics have a significant effect on their quality expectations for professional services, but not for nonprofessional services" (p. 39). Second, Babakus and Mangold (1992) in applying the "SERVQUAL" (expectations minus perceptions) scale to hospitals note that "the measurement of patient expectations as well as perceptions provides a valuable dimension of insight into the process by which the quality of health care service is evaluated" (p. 780). Finally, Sutton and Rafaeli (1988) note that expectations may be influenced by societal norms. Specifically, Sutton and Rafaeli (1988) found that in busy stores clerks were not "expected" to display emotion because customers wanted fast service. My position on the "perceptions" debate is that expectations are indeed important because companies can influence expectations in order to gain strategic advantage (Nayyar 1990, 1992). Today's customer is often evaluating highly intangible services to assess quality. The "balance" of power has shifted from the customer to the server in keeping with economic development and role specialization. "Servers" therefore have an incentive to "manage" the agency relationship by influencing customers' expectations.

In an important study, Boulding et al. (forthcoming) note that both perceptions as well as expectations of service are related to service quality. Furthermore, they
differentiate between two types of expectations: will and should. Will expectations refer to what customers expect will happen in their next encounter with the service firm. Should expectations are normative. Initially, Boulding et al. (forthcoming) state that "an example of the influence of new information might be when a firm raises its price and the customers shift their should expectations upward to reflect their belief that the service should be better than before the price increase" (p. 7 of typed manuscript). This conceptualization is similar to the concept of price premiums used by firms to signal quality (Klein and Leffler 1981; Rao and Bergen 1992). Note however, that in their study, Boulding et al. manipulate should expectations using information about competition. Will expectation, on the other hand, is manipulated using word of mouth communications and information from expert sources.

The findings of this study present offer some interesting insights for my dissertation. Specifically, only will expectations, and not should expectations (as manipulated) affect service quality in conjunction with current perceptions. From a managerial standpoint the authors suggest that will expectations and current perceptions should be managed upwards and should expectations should be managed downward. Since should expectations were defined and manipulated only in terms of the competition, it is unclear whether price premiums referred to earlier by the authors (p. 7) is a will expectation or a should expectation. Without taking recourse to semantics, from an agency theory perspective, this finding supports Klein and Leffler’s (1981) observation that signaling "firm specific investments" may be a way of managing customers’ perceptions about the service. Recall that for highly intangible services, customers often have ambiguous cues. Therefore, their expectations may be managed upwards by the company to reduce information asymmetry and render the agency relationship (between company and customer) more efficient. Furthermore,
current perceptions may be managed by properly handling the agency relationship between the employee and the company. In other words, once the company sends signals about its service to customers (increases expectations), it has to necessarily focus on the agency relationship with its employees (thereby managing perceptions). This may be an interesting hypothesis to investigate in my dissertation.

The Service Quality Construct: Definition and Domain Issues

Service quality, in its present formulation has been undeniably influenced by historical changes as society has progressed from an agrarian set up to modern role specialization (Mitnik 1984). How these historical forces have shaped the service quality construct is discussed in the first part of this review. The second part focuses on technical issues dealing with service quality (e.g., definition and dimensions).

According to Hollander (1985), "people have provided and consumed services for many millennia... their behaviors, interactions, and feelings have been chronicled in various records and accounts for centuries" (p. 49). A constant theme that emerges from a review of this "early" literature is that services were often evaluated objectively by principals. In other words, the highly complex agency problems of today were absent. Moreover, services often involved "familiar" principals and agents. The agency theory implication is that "principals" experienced little difficulty in monitoring the actions of their agents. Commenting on the nature of early services, Levitt (1972) notes:

Historically, the way to "serve" was in the form of one person for the benefit of another—the butler, the footman, the parlor maid, the upstairs maid, the solicitor, the butcher, the greengrocer, the tailor, the cook—each
performing one-on-one, highly personalized service, whether laying out the clothes or cutting the roast to the exacting specifications of each familiar customer (p. 65).

The main point to note here is that relatively "objective" criteria were available for principals to evaluate their servers (agents). Not surprisingly, quality standards were often technical. For instance "A barbering textbook (AMBBA 1950) advised that it is improper to shave a customer with a dull razor even if he is a "squirrel", that is, a crazy or eccentric person—an outsider" (Hollander 1985; p. 50).

Agency problems were also minimized by the relatively "social" nature of service relationships. Moore (1897) has documented the "lively conversation that once flowed between the corner barkeeper and his regular patrons" (Hollander 1985; p. 55). Adburgham (1964) has noted that customers returned to the same salespeople year after year during their visits to London stores. These customers only knew the salespeople's numbers (not names), yet exchanged familiar gossip with the clerks. The notion of familiarity in the service encounter has also been documented by Harrington (1962), and Bluestone (1981).

As society developed, role specialization became widespread and service exchanges became more anonymous. This trend was initiated by the "division of labor" philosophy. To some extent, the advent of automation (ATMs) also rendered the service encounter more anonymous. This however, happened for few services. A majority of complex services came to the fore where providers often possessed more information than the customers. This led to the classic agency problem of today. In other words, though few technical criteria were still available for judging service quality, anonymous exchanges with "highly specialized" providers often made it difficult for customers to evaluate services. Familiarity could no longer act as a
safeguard in service encounters because service providers were often anonymous. Unable to evaluate service quality customers came to rely on collectivized agencies (Mitnick 1984; Rao and Nielsen 1992). Some customers also attempted to solve the agency problem on their own by developing closer ties with service providers (Dranove and White 1987). Agency problems of today have presented firms with an opportunity to establish competitive advantage by 'signaling' quality (Nayyar 1990). It is therefore reasonable to expect that some of today's "SERVQUAL" dimensions would reflect the influence of agency problems.

Examples of an agency influence on the "SERVQUAL" construct are items used to measure reliability and credibility. For instance, reliability which "means that the firm honors its promises" (Zeithaml, Berry and Parasuraman 1985; p. 47) is directly related to the agency problem faced by a customer in evaluating a service. Another example of an agency impact is credibility, which captures notions of trustworthiness, believability, and honesty of the service provider. Note that credibility is combined with other dimensions in the final SERVQUAL model (Parasuraman, Zeithaml, and Berry 1988). The importance of understanding an "agency" influence on service quality is important because most studies on service quality start off with "yet another GNP figure" and proceed to empirically isolate the dimensions of quality.

There seems to be yet another influence on service quality, i.e., the "ambience" of the service setting (Bitner 1992; Bitner 1990; Kotler 1973). In brief, physical surroundings or "atmospherics" (Kotler 1973) may affect customers' (and employees') perceptions of service quality. Though there is an underlying "psychological" explanation for this observation, it is possible that firms use expensive ornate settings as "firm specific investments" to 'signal' quality (Klein and Leffler 1981) as has been
discussed earlier. For instance, Bitner (1992) notes that the "servicescape" is often managed using signage and symbols. Note that proper management of physical surroundings may provide "comfort" to customers in the service encounter. Signs and symbols, on the other hand, might influence quality perceptions (Bitner 1992) when performance ambiguity in the service encounter is high.

In her typology of service organizations, Bitner states that "interpersonal services" (e.g., banks, hotels, hospitals) have "rich" servicescapes. The implication is that "signs" and "symbols" are perhaps used in equal measure by all "high contact" (c.f., Chase and Tansik 1983) services. Based on literature from "informational economics" it is appropriate to hypothesize that services (e.g., hospitals) characterized by high "performance ambiguity" in their client-firm interfaces may make greater use of signals (signs and symbols) than firms characterized by "low" performance ambiguity (Dranove and White 1987; Klein and Leffler 1981).

Indirect support for the potency of signals comes from a recent study by Parasuraman, Berry, and Zeithaml (1991) who found that "tangibles consistently split into two subdimensions--one focusing on equipment and facilities and the other focusing on personnel and communication materials" (p. 442). The two items pertaining to one of the 'tangibles' subdimension, i.e., (a) the company has modern-looking equipment, and (b) the company's physical facilities are visually appealing, seem to capture the construct of firm specific capital investments as suggested by Klein and Leffler (1981). The other tangibles sub-dimension which captures issues related to appearance of employees and communication materials (e.g., company pamphlets and statements) perhaps does not relate to firm specific investments.

Parasuraman, Zeithaml, and Berry (1988) (hereinafter called PZB) defined service quality as the difference between customers' expectations and perceptions of
service. "Expectations" as defined by the authors "differs from the way it is used in the customer satisfaction literature" (Parasuraman, Zeithaml, and Berry 1988; p. 17). In particular, "in the satisfaction literature expectations are viewed as predictions made by consumers about what is likely to happen during an impending transaction or exchange... in contrast, in the service quality literature, expectations are viewed as desires or wants of consumers, i.e., what they feel a service provider should offer rather than would offer (Parasuraman, Zeithaml, and Berry 1988; p. 17; italics original). Perceptions, on the other hand, refers to actual performance of the service firm.

Based on the preceding conceptualization, PZB administered the "SERVQUAL" scale to respondents across five service categories (i.e., appliance repair and maintenance, retail banking, long-distance telephone, securities brokerage, and credit cards). The authors found evidence for five dimensions of quality: (a) tangibles, or physical facilities, equipment, and appearance of personnel, (b) reliability, or the ability to perform the promised service dependably and accurately, (c) responsiveness, meaning willingness to help customers and provide prompt service, (d) assurance, defined as knowledge and courtesy of employees and their ability to inspire trust and confidence, and (e) empathy, or caring individualized attention provided by the firm.

Despite the conceptual and intuitive appeal of the SERVQUAL scale, replications have not been entirely supportive of the original SERVQUAL dimensions. In an application of the SERVQUAL scale to different service settings (dental school patient clinic, business school placement center, tire store, acute care hospital), Carman (1990) could not exactly replicate the original quality dimensions. Though Carman (1990) could administer the "expectations" part of the instrument only in case
of one service (placement center), he noted that "expectations should differ between settings... one does not expect the ambience of an expensive restaurant at a pizza parlour... thus it is reasonable to expect that perceptions of quality are influenced by expectations" (p. 47).

A study by Babakus and Boller (1992) conducted on customers of utility services found no support for the existence of SERVQUAL dimensions. More importantly, the authors noted that "the difference scores do not provide any additional information beyond that already contained in the perceptions of the SERVQUAL scale" (p. 28). Furthermore, Babakus and Boller (1992) observed that psychological constraints may make deficiency scores (difference between expectations and perceptions) problematic by introducing response bias. For instance, people may rate expectation levels consistently higher than perception scores purely from a psychological point of view (c.f., Cronbach and Furry 1970; Wall and Payne 1973). A related psychometric problem with difference scores has been described by Prakash (1984) in the context of the disconfirmation paradigm (which uses difference scores for measuring satisfaction). In a subsequent application of the SERVQUAL scale to hospitals, Babakus and Mangold (1992) found that both expectation as well as perception scores tapped a unidimensional quality construct. This led the authors to believe that expectations score were indeed important for understanding and measuring service quality in hospitals.

Finn and Lamb (1991) failed to replicate the SERVQUAL dimensions in a "retailing" environment. Specifically, the authors noted that "results do not support the proposition that the instrument can be used to assess perceived quality in retailing (Finn and Lamb 1991; p. 483). More important the authors observed that "the service categories that were used in the development of SERVQUAL (appliance repair and
maintenance, retail banking, long distance telephone, and credit cards) are very
different from goods retailing, and clearly fall closer to the pure service end of the
continuum than store retailing (Finn and Lamb 1991, p. 489).

In an important study, Johnson, Dotson, and Dunlap (1988) applied the
SERVQUAL scale to a "real estate brokerage" setting. Though the authors did not
replicate the original dimensions of the "SERVQUAL" scale, they did find that
expectations as well as perceptions are important determinants of service quality in the
real estate brokerage industry. Note that in real estate settings, customers may have to
contend with more performance ambiguity than services which are relatively tangible.
Expectations therefore emerge as a primary determinant of service quality in case of
highly intangible services, a point made by Babakus and Mangold (1992).

Crompton and Mackay (1989) applied the SERVQUAL scale to assess "user's
perceptions of the relative importance of service quality dimensions in selected public
recreation programs". It appears that Crompton and Mackay (1989) measured only
perceptions of service and did not measure expectations. The authors found that
responsiveness, empathy, and assurance were less important determinants of quality
than tangibles and reliability. Whether expectations are important in a "public
recreation" setting is not answered by the study. However, the superiority of tangibles
and reliability seems to indirectly support Sutton and Rafaeli's (1988) finding that
"emotion" is perhaps unimportant in certain service settings. As Crompton and
Mackay (1989) themselves note "the self-directed nature of these activities (public
recreation) makes interaction with staff less prominent, and consequently
responsiveness, empathy, and assurance are less important".

Responding to this growing controversy about the "dimensionality" and
"replicability" of the service quality construct, Parasuraman, Berry, and Zeithaml
(1991) attempted to "refine and reassess the SERVQUAL scale". In particular, they change the definition of expectations from "should" to "will" and administered the 'scale' across three service environments, i.e., telephone repair, retail banking, and insurance. Results of the research were remarkably similar to their original study (Parasuraman, Zeithaml, and Berry 1988), suggesting that the 'gap' definition of service quality was valid.

The change in definition of expectations from "should" to "will" appears to be the fundamental contribution of recent research toward understanding service quality determinants. "Should" expectations are normative (based on competition) (Boulding et al.; forthcoming) while "will" expectations are related to what the customer can reasonably expect in a service encounter. Furthermore, perceptions of a service are also important. From a managerial standpoint, companies should manage both "will" expectations as well as current perceptions. It is however important to note that the nature of will expectations may differ from service to service. For grocery stores advertisements may tout "low prices", i.e., what the customer will expect. On the other hand, companies providing highly intangible services, i.e., medical care may signal quality through expensive advertisements which tout firm specific investments. Normative or "should" expectations appear to be important quality determinants for highly intangible service (e.g., medical care) (c.f., Babakus and Mangold 1992). As I noted earlier, Boulding et al. (forthcoming) manipulate only one form of "should" expectations (based on competition). It is not clear whether charging price premiums by a company is an example of will expectations or should expectations. Leaving semantics aside, it is plausible that companies manage some form of expectation through their advertisements. In case of low performance ambiguity, companies perhaps stress the relatively observable nature of their services, i.e., tangibles and
reliability for managing customers' expectations. For firms dealing with high performance ambiguity, customers a focus on company image and reputation appears to be a viable strategy. In any case, managing perceptions of quality is important. In case of "high performance ambiguity" firms, companies perhaps use "agency theory principles" to manage the boundary spanner. When performance ambiguity is low, companies use organizational theory, or operations management concepts (routinization, standardization) for managing the boundary spanner. These points are discussed further under the hypotheses section.

This section has mainly been concerned with research into the SERVQUAL dimensions. In the next section, I focus on the "gap" model as it applies to service organizations.

Recently, Zeithaml, Berry, and Parasuraman (1988) proposed that the existence of four "service quality gaps" within an organization affected the delivery of service quality. Gap 1 was defined as the "difference between consumer expectations and management perceptions of consumer expectations". Gap 2 was operationalized as the "difference between management perceptions of consumer expectations and service quality specifications". Gap 3 refers to "the difference between service quality specifications and the service actually delivered". Finally, Gap 4 means "the difference between service delivery and what is communicated about the service to customers" (Zeithaml, Berry, and Parasuraman 1988; pp. 35-36). The existence of these four gaps within a firm leads to a gap between consumer expectations and perceptions of service. In other words, a firm's "internal" service quality 'gaps' affect the delivery of quality.

The focus of this dissertation is on two internal gaps: gap 3 and gap 4. Gap 3 can be conceptualized as "the extent to which service providers do not perform at the
level expected by management" (Zeithaml, et al. 1988; p. 41). A service performance "gap" occurs when employees are unable and/or unwilling to perform the service at the desired level. Gap 4 which is described as the "discrepancy between service delivery and external communications" (p. 35) also affects the quality of service delivered.

The notion of a "service performance gap" is similar to the "service orientation discrepancy" studied by Parkington and Schneider (1979). Parkington and Schneider (1979) defined service orientation as "the philosophy implied by (or attributed by other to) the policies, procedures, and goals of management" (p. 270). Furthermore, Parkington and Schneider (1979) noted that "a discrepancy between each employee's orientation to service and his/her perception of management's orientation to service would be related to experienced role ambiguity and role conflict" (p. 272).

According to Zeithaml et al. (1988), the service performance gap can be gauged through "employee questionnaires that address their perceived ability to deliver established standards. Furthermore, Gap 4 can be measured using "employee perceptions of what they deliver in comparison with what external communication promises they will deliver" (p. 45). In sum, the use of perceptual data has been recommended by researchers in service settings. A similar point is made by a lot of organizational theorists (Heider 1958; Miller, Galanter, and Pribram 1960; Bowers 1973).

A number of studies (Parkington and Schneider 1979; Schneider, Parkington, and Buxton 1980; Schneider and Bowen 1985) report high correlations between employee and customer perceptions of service. Using a one item scale, Parkington and Schneider (1979) reported a correlation of 0.67 between customer and employee perceptions of service quality. In a later study, Schneider, Parkington, and Buxton (1980) observed an identical correlation (0.67) between employee and customer
perceptions of overall service quality. In Schneider and Bowen's (1985) study, employee and customer perceptions of overall service quality had a correlation of 0.63. Jones (1987) used results of these studies to assess customer performance ambiguity using employee perceptions.

The preceding observations suggest that customer service quality may be inferred using employee perceptions of quality delivered. This however leaves open the possibility of a "service quality" gap between employee and customer perceptions of service quality. Beyond acknowledging this point here, I do not discuss the matter in any great detail.
<table>
<thead>
<tr>
<th>Source</th>
<th>Characteristic</th>
<th>Definition/Illustration</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kotler (1991)</td>
<td>Intangibility</td>
<td>Cannot be seen, tasted, felt, heard, or smelled before they are bought.</td>
<td>Buyer looks for signs or evidence.</td>
</tr>
<tr>
<td></td>
<td>Inseparability</td>
<td>Produced and consumed at the same time.</td>
<td>Service provider has to manage the evidence.</td>
</tr>
<tr>
<td></td>
<td>Variability</td>
<td>Variability depends on who provides them and where they are produced.</td>
<td>Organization has to train and motivate workers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Standardize the service-performance process.</td>
</tr>
<tr>
<td>Source</td>
<td>Characteristic</td>
<td>Definition/Illustration</td>
<td>Consequences</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td>Inseparability</td>
<td>In the buyer's mind those who provide the service are the service.</td>
<td>Employee training.</td>
</tr>
<tr>
<td></td>
<td>Perishability</td>
<td>Services cannot be stored.</td>
<td>Demand management by firms.</td>
</tr>
<tr>
<td></td>
<td>Non-standardization</td>
<td>The same service is not demanded by all customers.</td>
<td>Selective entry of customers.</td>
</tr>
</tbody>
</table>
### Table 6.1 (Cont'd)

Defining Characteristics of "Services"

<table>
<thead>
<tr>
<th>Source</th>
<th>Characteristic</th>
<th>Definition/Illustration</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Customer Involvement</td>
<td>Customer involved in production.</td>
<td>Appearance of service providers is important.</td>
</tr>
<tr>
<td></td>
<td>Perishability</td>
<td>Cannot be inventoried</td>
<td>Predict fluctuations. Manage capacity to balance supply and demand.</td>
</tr>
<tr>
<td></td>
<td>Inseparability</td>
<td>Harder to mass-produce</td>
<td>Strong training of providers.</td>
</tr>
<tr>
<td>Source</td>
<td>Characteristic</td>
<td>Definition/Illustration</td>
<td>Consequences</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------------</td>
<td>-------------------------------------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Perishability</td>
<td>Cannot be inventoried.</td>
<td>Not specified.</td>
</tr>
<tr>
<td></td>
<td>Simultaneous production and consumption</td>
<td></td>
<td>Service provider production roles are important.</td>
</tr>
<tr>
<td></td>
<td>Non-standardization</td>
<td>Offering consistent quality is difficult.</td>
<td></td>
</tr>
<tr>
<td>Berkowitz et al. (1992)</td>
<td>Intangibility</td>
<td>Difficult to evaluate before use.</td>
<td>Make cues more tangible.</td>
</tr>
<tr>
<td></td>
<td>Inconsistency</td>
<td>Quality of service may vary with service provider</td>
<td>Standardization &amp; training.</td>
</tr>
<tr>
<td></td>
<td>Inseparability</td>
<td>Simultaneous production and consumption.</td>
<td>Not specified.</td>
</tr>
<tr>
<td></td>
<td>Inventory</td>
<td>Cannot be stored</td>
<td>Commission.</td>
</tr>
</tbody>
</table>
Table 6.1 (Cont’d)

Defining Characteristics of "Services"

<table>
<thead>
<tr>
<th>Source</th>
<th>Characteristic</th>
<th>Definition/Illustration</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>McCarthy &amp; Perrault</td>
<td>Tangibility</td>
<td>Cannot be seen or touched.</td>
<td>Most services are combinations of tangibles and intangibles.</td>
</tr>
<tr>
<td>(1992)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McCarthy &amp; Perrault</td>
<td>Preproduction</td>
<td>Cannot be produced before it is sold.</td>
<td>Not specified.</td>
</tr>
<tr>
<td>(1992)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inventory</td>
<td>Cannot be stored.</td>
<td>Harder to balance supply and demand.</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1992)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Inseparability</td>
<td>Cannot separate production from consumption.</td>
<td>Can delegate work to specialists.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heterogeneity</td>
<td>Output cannot be standardized.</td>
<td>Not specified.</td>
</tr>
</tbody>
</table>
Table 6.1 (Cont’d)
Defining Characteristics of "Services"

<table>
<thead>
<tr>
<th>Source</th>
<th>Characteristic</th>
<th>Definition/ Illustration</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamb et al. (1992)</td>
<td>Intangibility</td>
<td>Cannot be seen, felt, or touched.</td>
<td>Stress cues, i.e., ambience.</td>
</tr>
<tr>
<td></td>
<td>Inseparability</td>
<td>Simultaneity of production and consumption.</td>
<td>Not specified.</td>
</tr>
<tr>
<td></td>
<td>Perishability</td>
<td>Cannot be stored.</td>
<td>Synchronize demand with supply.</td>
</tr>
<tr>
<td>Author</td>
<td>Gap</td>
<td>Definition</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Zeithaml, et al. (1988)</td>
<td>Service Performance gap</td>
<td>Difference between service quality specifications and the service actually delivered. A service performance &quot;gap&quot; occurs when employees are unable and/or unwilling to perform the service at the desired level. This gap can be measured by &quot;employee&quot; questionnaires that address their perceived ability to deliver established standards.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>External Communications gap</td>
<td>Discrepancy between service delivery and external communications. This gap can be measured by asking employees what they deliver in relation to what is communicated to customers.</td>
<td></td>
</tr>
<tr>
<td>Parkington &amp; Schneider</td>
<td>Service Orientation</td>
<td>The philosophy implied by (or attributed by others to) the policies, procedures, and goals of management.</td>
<td></td>
</tr>
<tr>
<td>(1979)</td>
<td>Service Orientation Discrepancy</td>
<td>A discrepancy between each employee's orientation to service and his/her perception of management's orientation to service.</td>
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</tr>
</tbody>
</table>
CHAPTER 7

CONCEPTUAL MODEL AND RESEARCH HYPOTHESES

In this chapter, I present and describe the conceptual model of my dissertation together with a discussion of various hypotheses that will be subjected to empirical testing. The organization of this chapter is as follows. First, I identify and briefly describe how performance ambiguity that exists between service firms and their customers, and also between service managers and boundary spanning service providers engenders two distinct levels of agency problems in service settings. In this section, I also discuss the consequences of customer induced input uncertainty which service firms have to manage. Next, I describe the general strategies which management uses to solve the preceding types of agency problems. This is followed by a description of the conceptual model. Finally, I develop and discuss various research hypotheses pertaining to the conceptual model.

Background--Levels of Agency Problems in Service Settings and Consequences of Input Uncertainty

While the thrust of present research in marketing has been on understanding customer perceptions of service quality, relatively little attention has been directed at uncovering how service quality is achieved in organizations. Since services are intangible, and possess subjective quality measures, managers often face difficulty in evaluating and monitoring service providers. Furthermore, owing to intangibility,
customers are thwarted in their attempts to properly evaluate a service and gain accurate information for making better purchase decisions (Murray 1991). These evaluation problems, which are a direct consequence of intangibility and information asymmetry, can be formalized as **performance ambiguity**, which arises when any dimension of an exchange makes it difficult for one party to evaluate the performance of the other (Bowen and Jones 1986; Jones 1987, 1990; Larsson and Bowen 1989; Siehl, Bowen, and Pearson 1992).

Incomplete monitoring of service providers may cause deterioration of service quality and adversely affect a firm's profitability (Zeithaml et al. 1988; Mills 1990). For example, doctors typically possess specialized knowledge about a surgical procedure and cannot be completely monitored by management and patients. Incomplete monitoring may therefore motivate physicians to over-provide services to patients, thereby affecting service quality.
Two Levels of Agency Relationships in Service Firms

CUSTOMER

Level 1 Agency Relationship

MANAGER

Level 2 Agency Relationship

SERVICE PROVIDER
Monitoring and control of service providers is essentially an agency problem (Bergen et al. 1992; Fama 1980; Jensen 1983; Jensen and Meckling 1983) which exists at two levels in a service organization as depicted in Figure 7.1. First, agency problems (Level 1 in Figure 7.1) arise between customers (principals) and management (agent) because buyers often find it difficult to evaluate a company's service offering because of performance ambiguity. In this sense, the final customer (principal) can also be viewed as engaged in an agency relationship with the company (agent) (Bergen, Dutta, and Walker 1992). Management has an incentive to solve this agency problem primarily to gain competitive advantage. More specifically, since service customers seek risk reducing information (Biehal 1983; Murray 1991), companies which provide quality assurances stand to gain from increased customer patronage. Management may use signals of quality like warranties or even certification to reduce performance ambiguity for final buyers and solve the agency problem.

A second agency problem (Level 2 in Figure 7.1) arises between management (principal) and service providers (agent) whose actions cannot be completely and costlessly monitored. In other words, service is delivered to final customers not by the manager but by an employee who essentially acts alone (Bowen and Schneider 1988). Given such a situation, it is possible for agents to exert less than complete effort while providing a service because management cannot completely monitor all aspects of the service delivery process. Consequently, managers have to design mechanisms (e.g., reward and control systems) to ensure that service providers will not compromise on quality.

In addition to performance ambiguity, services are characterized by "simultaneous production and consumption", " perishability", and "non-
standardization" (Berry 1975; Rathmell 1966; Regan 1963; Sasser 1976; Uhl and Upah 1980; Upah 1980; Zeithaml, Parasuraman, and Berry 1985). Simultaneous production and consumption implies that customers and service providers are in active contact during the service encounter which introduces uncertainty into the system because of idiosyncratic customer demands. Perishability refers to difficulty on the part of a service organization to inventory output, while non-standardization makes it problematic for a firm to supply routine services. The attributes of simultaneity, perishability, and non-standardization, can be conceptualized as customer induced input uncertainty (Argote 1982; Siehl, Bowen, and Pearson 1992; Larsson and Bowen 1989), which essentially provides a firm with the incentive to standardize its operations. For instance, when customer demands are routinized, management may automate the service delivery process (e.g., the use of automated teller machines by banks). Furthermore, when input uncertainty is low, and customer demands can be predicted accurately, management may make use of formal rules and routines for coordinating service providers (Chase and Tansik 1983; Northcraft and Chase 1985).

The preceding discussion suggests that performance ambiguity which exists at two levels in a service firm, leads to two principal-agent levels, i.e., between management and final customers, and between management and service providers (refer Figure 7.1). Successful resolution of these agency problems by management is the key to delivering superior service quality. In addition, input uncertainty determines whether or not a firm can use standard operating procedures. When performance ambiguity is low, management is not faced with agency problems and may therefore standardize its operations for delivering better service performance.
Conceptual Overview

This section is organized around the following lines. First, I present the conceptual model of my dissertation. Second, I identify the concepts that have been depicted in the model. Finally, as a precursor to the discussion of the various hypotheses, I provide a general description of the interrelationships among the various concepts that have been described in the conceptual model.

The conceptual model is depicted in Figure 7.2. There are five parts to this model labeled A thru E in Figure 7.2. The box labeled A in Figure 7.2 contains the independent variables pertaining to the client-firm interface. Specifically, the variables of (1) customer performance ambiguity, and (2) customer induced input uncertainty are depicted.

Panel B in Figure 7.2 depicts the consequences of performance ambiguity. The consequences of customer performance ambiguity that have been depicted are the signals of (1) price premiums, (2) specific assets, (3) advertising intensity, (4) warranties, (5) certification, and the control variables of (6) firm reputation, (7) organization size, and (8) price competition.

Part C in Figure 7.2 depicts those variables which managers use to solve agency problems that they face with respect to service providers. In this section, the antecedent variable of (1) employee performance ambiguity, together with the ex-ante strategies of (2) employee screening effort, and (3) employee service training effort, and the use of ex-post approaches of (3) service culture, and (4) customer oriented incentives are outlined.
Box D in Figure 7.2 describes two dependent variables that have been used to measure firm performance. Specifically, (1) customer service performance, and (2) financial performance are depicted.

Panel E shows how the construct of input uncertainty is related to a service firms' structure and operations. Specifically, the constructs of (1) formalization, and (2) centralization are depicted here.

General description of the conceptual model

Performance ambiguity and input uncertainty seem to capture the defining characteristics of a service. For instance, intangibility which has been defined in marketing as a situation where services "cannot be seen, felt, tasted, or touched in the same manner in which goods can be sensed" (Zeithaml, Parasuraman, and Berry 1985; p. 33) is closest in meaning to performance ambiguity. On the other hand, input uncertainty captures the notions of "inseparability" or simultaneous participation of service providers and consumers in the service encounter, (Booms and Nyquist 1981; Bateson 1977), "heterogeneity", i.e., the potential for variability in the quality of service provided by employees, (Berry 1980; Booms and Bitner 1981), and "perishability" which refers to the difficulty in maintaining an inventory of service (Bateson 1977; Sasser 1976).

Information asymmetry between buyers and sellers leads to performance ambiguity for customers. Consequently, management (agent) faces an agency problem with the customer (principal). Firms have an incentive to solve this agency problem in order to gain competitive advantage (Nayyar 1990), and pursue related diversification strategies (Nayyar 1990) because customers may transfer favorable impressions from
an existing service to a new one. In addition Akerlof (1970) suggests that signaling prevents market failure by providing an incentive for honest firms to remain in business. In other words, some service companies may cheat on quality and deliver lemons in the market. These dishonest firms drive out honest firms from the market. In the extreme case, no competitive market may exist for an intangible service.

Signals of reputation, i.e., warranties (Akerlof 1970; Grossman 1981; Hill and Jones 1992; Wiener 1985), certification (Akerlof 1970; Holmstrom 1985; Nayyar 1990), price premiums (Klein and Leffler 1981; Rao and Bergen 1992; Shapiro 1983), investment in specific assets (Dranove and White; Klein and Leffler 1981; Rashid 1988; Rubin 1990) and advertising intensity (Klein and Leffler 1981; Nelson 1974) may be used by management (agent) to reduce customers’ (principal) performance ambiguity and solve the attendant agency problem.

Management (principal) is also locked in a second agency relationship with service providers (agents) because of performance ambiguity in evaluating boundary spanners. Given the need to safeguard the reputation which management conveys to customers through signals, the company has to devise effective monitoring schemes for controlling service providers (Brickley and Dark 1987; Dejong, Forsythe, and Lundholm 1985; Klein and Leffler 1981). First, management may use *ex-ante* monitoring strategies like screening and training (Bergen, Dutta, and Walker 1992; Cohen and Pfeffer 1986; Chatman 1991; Ouchi 1980), for solving agency problems with service employees. Screening and training strategies serve to align the goals of a company with those of its service providers, thereby solving the agency problem for management. Second, *ex-post* management may use behavior control mechanisms (Bergen, Dutta, and Walker 1992; Gomez-Mejia and Balkan 1992; Ouchi and McGuire 1975; Ouchi 1979, 1980; Eisenhardt 1985, 1989) like customer based
compensation systems for service providers. Management might also be able to socialize service providers if there is an appropriate service culture in place (Ouchi and McGuire 1975).

Input uncertainty essentially refers to the degree to which the client-firm interface is standardized (Bowen and Jones 1986; Larsson and Bowen 1989; Jones 1987, 1990; Siehl et al. 1992). When client demands can be predicted and are standardized, input uncertainty is low. Hence, management can design the organization's structure to fit the environment. Specifically, reduced input uncertainty for service firms leads to formalization of rules, and centralization of decision making with respect to the service.

On the output side, customer service performance of providers, which is defined as the extent to which management perceives boundary spanners as delivering performance, serves as the first dependent variable. This operationalization is a measure of the effectiveness of monitoring strategies within service firms, which affects quality. For instance, Zeithaml et al. (1988) note that "the extent to which service providers do not perform at the level expected by management" (Zeithaml et al. 1988; p. 41) results in a "gap" which affects service quality. The use of service performance as a measure of the match between input conditions (performance ambiguity at two levels and input uncertainty) appears justified because the most important environment facing a service firm is the customer. Note that contingency theorists (Lawrence and Lorsch 1967; Tosi and Slocum 1984), realizing that "organizational effectiveness" has been construed "either too broadly " to mean "attraction of resources" (Mott 1972), or "too narrowly" (Tosi and Slocum 1984) to mean "profitability" (Snow and Hrebeniak 1980), have called for effectiveness
measures which relate to the firm's most important environment. In this vein, the use of service performance as a dependent variable appears justified.

The second dependent variable in this model is financial performance. The inclusion of this variable of financial performance is consistent with emerging research in services marketing (Anderson, Fornell, and Lehmann 1994; Rust, Zahorik, and Keiningham 1995; Zahorik and Rust 1992) which attempts to model the impact of various service management strategies on profitability. The key idea behind most of this research on the relationship between service quality and profitability is that customer service programs might not always have an obvious financial feedback. To this extent, it is worthwhile to explore whether the resolution of different agency problems in a service firm does actually result in improved financial performance or not.

The basic premise of my conceptual model is that when appropriate monitoring strategies and structural arrangements are not matched to input conditions (performance ambiguity and input uncertainty), service performance will deteriorate. For example, in case of Sears, management faced high performance ambiguity in evaluating mechanics. Because of this agency problem, output control mechanisms (e.g., commission systems) were inadequate and service performance was affected.

Research Hypotheses

Managers' use of customer signals and resolution of level 1 agency relationship

There is an agency relationship between management (agent) and customers (principal) who experience performance ambiguity in evaluating services. This
scenario has already been depicted in Figure 7.1. Management has an incentive to "solve" this agency problem in order to gain competitive advantage (Nayyar 1990), prevent market failure (Akerlof 1970), or pursue related diversification strategies (Nayyar 1990). The general strategy which management employs to cope with this agency problem is signaling, which reduces information asymmetry for the final buyer. Signals may be considered as surrogate barometers of quality and defined as "marketer-controlled easy-to-acquire informational cues, extrinsic to the products themselves, that consumers use to form inferences about the quality or value of those products" (Bloom and Reve 1990; p. 59). For example, hospitals prominently advertise the professional qualifications of its doctors (e.g., MD, FRCS) to assure patients, who cannot properly evaluate the service even after consumption, of a certain level of quality. In this sense, by promoting the professional qualifications (or certification) of doctors, hospitals reduce information asymmetry for patients. The display of professional qualifications therefore acts as a quality signal, and solves the agency relationship between patients (principals) and hospitals (agents). According to the literature, service firms may use a number of signaling strategies to reduce information asymmetry for the final buyer, i.e., *price premiums, investment in specific assets, advertising intensity, warranties,* and *certification.* These strategies are and the interrelationship among various signals are described in more detail below.
Price Premiums as a Stream of Quasi-Rents

Potential "Quasi Rents" Over Time

Rents

TIME
(a) Customer performance ambiguity and price premiums

Firms may use "price premiums" as signals to convince final customers who face high performance ambiguity about the quality of a service offering (Klein and Leffler 1981; Shapiro 1983). Price premiums are akin to "the excess price paid, over and above the fair price that is justified by the true value" (Rao and Bergen 1992; p. 412; emphasis original). Price premiums are different from "premium prices" or prices that are considerably above average cost (Klein and Leffler 1981). Although price premiums are also higher than average cost, the use of price premiums may result in economic profits for a firm (Klein and Leffler 1981). On the other hand, premium prices do not consider opportunity cost and will not normally lead to economic profits.

Economic profits, as opposed to accounting profits, take all possible firm costs into account, including opportunity cost. Premium price, with its primary focus on production costs may not necessarily result in economic profits. In other words, premiums price may lead only to accounting profits and not economic profits because the practice of accounting does not explicitly consider opportunity costs (e.g., the presence of sunk investments) (Klein and Leffler 1981; Klein, Crawford, and Alchian 1978; Rao and Bergen 1992).

The explanation for the efficacy of price premiums is that "unless repeat purchases exist, sellers' claims of high quality with an accompanying high price are not necessarily credible: the seller could simply provide low quality while charging high price" (Rao and Bergen 1992; p. 414). To overcome this problem, the buyer may pay the seller a "monetary incentive" or a "price premium" (Klein and Leffler 1981; Shapiro 1983) for the added cost of producing high quality, with the assurance of a continued source of such an incentive provided that the seller does not compromise on
quality. Price premiums are therefore analogous to future quasi-rents (Klein, Crawford, and Alchian 1978), which would be lost by a firm if it cheated on quality. In other words, price premiums theoretically represent an infinite quasi-rent revenue stream which is subject to appropriation if firms engage in short run quality deception. This scenario is depicted in Figure 7.3.

In Figure 7.3, the vertical arrows represent future revenue streams (profits) which will be theoretically available to a firm for an infinite duration as long as it provides quality service and does not engage in deception. The existence of this potential revenue stream, in effect, is a signal by the firm to customers that the company has something to lose (the future revenue) if it does not provide quality on a continuous basis. Stated differently, customers are expected to form positive associations in their minds between price premiums and the existence of an appropriable future revenue stream. Price premiums can therefore serve as signals of quality when customer performance ambiguity is high. In other words, price premiums are akin to "self-enforcing agreements" (Rubin 1990) which firms use to signal their long term commitment to providing quality service.

Although extant research in signaling theory (Klein and Leffler 1981; Shapiro 1983, Scitovsky 1990) suggests that price premiums might be used as signals by firms in asymmetric markets, very little empirical evidence is forthcoming in the literature to back up this proposition. However, related empirical studies in this area buttress the notion that price premiums may be used by exchange parties as quality signals in asymmetric settings. First, Wolinsky (1983) observed that in many asymmetric markets, consumer prices tended to remain stable over time even when demand and supply conditions suggested that prices for products should decrease. Wolinsky's finding may be interpreted in light of the existence of price premiums in such markets.
Specifically, it is possible that many firms in such markets use price premiums to signal
the quality of their products and services to final customers. Second, Rao and Bergen
(1992) observed that buyers who cannot evaluate products completely prior to
purchase (e.g., credence goods) might offer price premiums to sellers in order to
ensure quality. Given the preceding theoretical discussion about price premiums and
the evidence form empirical studies, I hypothesize that:

**H1. Managers' perceptions of customer performance ambiguity will be
positively related to a firm's use of price premium signals.**

(b) Price premium signals and specific assets

There appears to be a major problem associated with the preceding theoretical
explanation about the existence of price premium signals in asymmetric markets. In
particular, when price premiums are being used in certain markets, competitors might
enter them and erode the profits of honest firms (Klein and Leffler 1981). In other
words, when performance ambiguity is high, quality can rarely be detected by
customers even after a particular service has been consumed (e.g., automobile repair).
Under such conditions, dishonest firms, whose sole purpose is to skim premiums and
harvest revenues in the short run, may enter the market and reduce the informational
efficacy of this signal for honest firms. If such entry by dishonest firms continues, the
market will eventually be populated by "lemons" (Akerlof 1970). After some time,
customers might realize that they are buying low quality service at high prices and that
no honest firm exists in the market. This situation will lead to market failure because
customers will stop demanding the service. How is this potential market imperfection remedied?

My argument is that honest firms prevent market entry by investing in specific assets which act as collateral for charging price premiums. Specific assets like investments in expensive upholstery and ornate surroundings do not yield any direct consumer benefit (Klein and Leffler 1981). By definition, these assets are non-salvageable because they find very little use outside the focal relationship between a firm and its customers. Some other examples of firm specific assets are investments in signs and logos (Klein and Leffler 1981; Rubin 1990), research and development expenditures (Balakrishnan and Fox 1993), and expenses incurred in developing human entrepreneurial skills and idiosyncratic knowledge (Klein and Leffler 1981; Rashid 1988; Rubin 1990). Investments in specific assets send a strong signal to customers that a firm does not intend to cheat in the short-run because of the sunk nature of such investments. This strategy also deters dishonest firms from entering the market. Specifically, potential entrants need to undertake substantial investments in fixed assets before they can reap the benefits of price premiums. The relationship between price-premiums and firm-specific assets is shown in Figure 7.4. The arrows pointing upward depict the future revenue stream that is available to the firm if it did not cheat on quality. However, as we noted earlier, a firm will be able to collect these future revenue stream from customers only if it offers some fixed investment up front as a collateral. The magnitude of this fixed investment (e.g., investments in logos, decor, etc.) is represented by the arrow pointing downward. In sum, the existence of specific assets deters entry by dishonest firms and also serves to assure customers that a collateral is in place against which the firm is collecting price premiums.
Figure 7.4

Relationship Between Price Premiums and Specific Assets

Potential "Quasi Rents" Over Time

Magnitude of "Initial Sunk Assets" Needed by a firm to command a price premium
The preceding discussion about firm-specific assets offers a different perspective on the primacy of physical surroundings of services than those offered by service researchers (Bitner 1990, 1992; Berry and Clark 1986; Kotler 1973; Shostack 1977, 1987; Ward, Bitner, and Barnes 1992). In brief, one theoretical explanation for "managing physical surroundings" (Bitner 1990) or "atmospherics" (Kotler 1973) is psychological. For instance, by using Mehrabian and Russel's (1974) framework, Bitner (1992) argues that ambient conditions affect customers (and employees physiologically). In a similar vein, Hui and Bateson (1991) studied how a customer's "perceived control" mediated his or her emotional and behavioral responses to the physical environment. Though mention is made of the impact of signs and symbols on quality and that physical surroundings act as cues of quality (Berry and Clark 1986; Shostack 1987; Ward, Bitner, and Barnes 1992), what managerial considerations influence the design of physical surroundings is not clear. Though physiological reasons are certainly plausible, signaling theory provides a different perspective on management of physical surroundings. Specifically, the theory posits that managers consciously design physical surroundings in order to signal to customers the presence of sizable sunk investments, which in turn justifies the existence and use of price premiums as quality signals.

Some empirical evidence from other business settings also attests to the effect of collateral investments on signaling intentions. For instance, in the context of franchising, Lafontaine (1993) observes that franchisors usually signal their honest intentions (e.g., continual downstream sales and marketing support) to franchisees by charging them high royalty rates. A high royalty rate may act as a signal of franchisor commitment because the franchisee might conclude that lower sales will decrease a franchisor's potential revenue. In particular, royalty on sales provides a franchisor with
a steady stream of economic rents. This potential revenue stream prevents the franchisor from withdrawing support to the franchisee after the relationship has been initiated. However, when a franchisor does not have a strong reputation (like McDonald's or Burger King), there may be no credible basis for a franchisee to translate a signal of high royalty into an expectation of future honest behavior on the franchisor's part. In practice however, this possibility is negated because those reputationless franchisors who charge high royalty rates also own and operate many outlets. Such investments in company owned stores send a strong signal to the franchisee that the franchisor is committed to staying in the market for some time to come and is not a fly-by-night operator who is merely pursuing short term gains by maximizing revenues from initial licensing fees.

While conducting international business, many host countries signal their good intentions and commitment to potential investors (from foreign countries) by promising them post-entry incentives like reduced taxes and lowered licensing fees (Veugelers 1993). These signals however, are just promises and a host country may renege on them after the relationship has been initiated. Under these situations, how do host countries make their signals appear credible to potential investors? As Veugelers (1993) notes, many host countries undertake investments in sunk assets like lands, buildings, and lowered across the board tariffs, in order to signal their credibility to potential investors. These assets are akin to collateral and serve to strengthen the host country's commitment to potential investors.

Recent research in strategic management also highlights the use of collateral investments by firms as signals which facilitate the borrowing of funds from the capital market. For instance, Balakrishnan and Fox (1993) note that many firms with low levels of fixed investments (e.g, service firms) cannot borrow money from lenders by
offering them tangible assets as collateral. Debt holders, unlike equity holders, have no ownership stake in the firm and may not consider profit projections and future growth potential to be a credible signal. In other words, signals like projected profits are more relevant to insiders like equity holders than to outside lenders such as debt holders who are just interested in recouping the principal amount with interest. Firms with low asset bases find it difficult to credibly signal the presence of visible collateral investments to potential lenders. How do such firms borrow capital from the market on a recurring basis? Note that there are statutory and practical limits on the frequency with which firms can generate capital through equity issues. Balakrishnan and Fox (1993) argue that firms signal their investments in intangible assets like research and development to potential lenders. The presence of significant sunk costs (i.e. expenses incurred on research and development, though not a tangible asset) signals to the capital market a firm's intention to remain in business over a long time horizon. In this way, firms may indirectly use intangible assets as collateral for borrowing capital from the market. Given the preceding discussion, the following hypothesis is offered:

\[ H2. \text{ A firm's use of price premium signals will be positively related to a firm's investment in specific assets.} \]

\[ (c) \text{ Price premium signals and advertising intensity} \]

Signaling theory also sheds some light on how price premiums may be related to advertising intensity. In a series of articles, Nelson (1970, 1974) argued that advertisements for credence goods did not emphasize tangible product related
information. On the other hand, customers appeared to associate the level and intensity of advertising (or expenses) with quality. According to Nelson (1970, 1974, 1978), high quality firms whose products satisfied many customers, were expected to generate more repeat sales than low quality firms. Consequently, such high quality firms were more profitable and had the wherewithal to expend resources in the market through heavy advertising which customers could associate with quality.

Milgrom and Roberts (1986) were the first to model Nelson's ideas within a signaling context by considering the interaction between advertising expenses and price. These authors found that both high prices and advertising expenses were highly correlated with quality. In other words, under high performance ambiguity, firms were expected to use high prices as well as high advertising expenses for signaling quality in the marketplace. The basis for this argument is that high quality firms earn higher profits because they are able to command a price premium for their service in the marketplace. Higher profits, in turn, permit these firms to spend heavily on advertising. In sum, Milgrom and Robert's (1986) findings closely parallel those reached by Nelson (1970, 1974).

Klein and Leffler's (1981) insight is that advertising is a conscious firm-specific investment undertaken by high quality firms in order to signal the superior nature of their offering to final customers. As Klein and Leffler (1981) note, "advertising does not directly signal the presence of a best buy but signals the presence of firm-specific selling costs and therefore the magnitude of the price premium" (p. 630; emphasis added). A firm's advertising expenses are therefore no different than other sunk firm-specific investments in signs, logos, and ornate settings. By using Klein and Leffler's (1981) logic, we expect advertising expenses (or advertising intensity) to be positively related to price premiums, analogous to the strong association between firm-specific
assets and price premiums described earlier. This observation would also support the conclusions of Milgrom and Roberts (1986) and Steenkamp and Hoffman (1994) about the equal importance of advertising and price in signaling service quality.

The preceding logic, which suggests that there may be a positive relationship between advertising and price premiums needs some additional consideration. In particular, recently Hertzendorf (1993) has observed that because there is "signal loss", not all advertisements put out by a company can possibly be viewed by customers. In other words, advertisements are less visible to customers than other firm-specific assets like signs and logos. This, in turn, implies that advertising expenses of a firm do not fully convey the extent of sunk assets to a customer. In this vein, although advertising expenses may still be positively related to price premiums, this relationship is expected to be weaker than that of the association between firm-specific assets and price premiums because some advertisement never reaches its intended audience owing to signal loss.

Using the preceding logic, it is also possible to expect that potential customers may never be able to "see" for themselves all the specific investments which firms undertake. For example, customers can never observe the amount of investments that firms have undertaken in training their employees (a fixed asset). It is therefore imperative that a firm make its investments in specific assets visible to customers.

Since specific assets are visible to customers to different degrees, advertising expenses and other specific assets may not be equally strong signals of quality. In other words, specific assets and advertising intensity might convey differing information to customers about the amount of sunk investments undertaken by a service firm. In particular, customers who patronize a service firm are more likely to
observe fixed investments in physical surroundings than investments in advertising.
Based on the preceding discussions, the following hypotheses are offered.

\[ H3 \,(a). \quad \text{A firm's use of price premium signals will be positively related to a firm's advertising intensity.} \]

\[ H3 \,(b). \quad \text{The positive relationship between the use of price premium signals by a firm and its advertising intensity will be lower than the corresponding positive relationship between the use of price premium signals by a firm and its investment in specific assets.} \]

(d) Customer performance ambiguity, specific assets and advertising intensity

It is worthwhile to hypothesize about the direct effects of performance ambiguity on a firm's use of specific assets and its advertising intensity. While studying these theoretical ramifications, it is important to keep in mind that the model presented here takes the sellers' perspective. In other words, we are interested in understanding how sellers perceive their customers' knowledge in certain markets (or lack of it) and transmit signals to them. In general, in asymmetric markets, customers rely upon "tokens of reliability" (Scitovsky 1990) for evaluating complex credence products and services. In such markets, customers perhaps compensate for their lack of expertise by attaching importances to signals that are transmitted by sellers. This would imply that customer performance ambiguity is positively related to the signals of specific assets and advertising intensity.
From a sellers' perspective, signaling through the use of specific assets and advertising is expensive. As Klein and Leffler (1981) notes, to remain economically profitable, firms that uses such costly signaling strategies must be able to recover their investments. In other words, although the use of specific investments and advertising might well reduce customers' performance ambiguity, this strategy may prove to be uneconomical for the firm. However, when price premiums are used in conjunction with specific asset investments and advertising, firms will be in a position to balance price premium revenue against collateral expenses in specific assets and advertising. Given the preceding discussion, I hypothesize that:

**H4. Managers' perceptions of customer performance ambiguity will not have any direct significant effect on a firm's use of specific assets.**

**H5. Managers' perceptions of customer performance ambiguity will not have any direct significant effect on a firm's advertising intensity.**

(e) Customer performance ambiguity and warranties

As Udell and Anderson (1968) note, "a warranty is an obligation assumed by the seller. It is an expressed or implied statement of responsibility which promises certain services or satisfactions to the buyer" (p. 5). Grossman (1981) notes that "warranties seem like an incredibly useful device for getting around asymmetric information about (quality)" (p. 479). Guarantees essentially shift the risk of purchases from buyers to sellers (Akerlof 1970). The effectiveness of guarantees is enhanced because service customers seek risk reducing information (Murray 1991).
Hill and Jones (1992) observe that the ex-ante introduction of warranties solves management's agency problem by reducing performance ambiguity for the buyer.

Extant empirical evidence (Kelly and Conant 1991; Wiener 1985) is also supportive of warranties as "accurate signals" (Wiener 1985) of quality. In general, the focus of these studies is that company guarantees are effective only when an agency relationship exists between final customers and management (Hill and Jones 1992), i.e., when information asymmetry is high for the final buyer. This is usually the case for "experience goods" (Nelson 1970) which can be evaluated by consumers only after purchase (e.g., auto repair service) and "credence goods" (Darby and Karni 1973) which cannot be fully evaluated by consumers even after consumption (e.g., health care and education).

Based on the preceding discussion, we expect that service warranties will be needed only when performance ambiguity for the final customer is high. However, warranties seem to exist across all service categories. In fact, Nayyar (1990) observes that service warranties are so "widespread" that they do not provide "competitive advantage" to a firm. For instance, Domino's Pizza (low performance ambiguity service) promises "delivery within 30 minutes or the pizza is free" (Hart 1988; p. 56). Similarly, Denny's promises "your breakfast in 10 minutes or it is free". Furthermore, highly services like "Delta Dental Plan" of Massachusetts also use service guarantees (Hart et al. 1992).

Service firms also seem to be using different types of warranties for their core service. For instance, some firms use, conditional guarantees (Hart 1988) which relate to easily observable aspects of a service (free service is conditional on some aspect of the service not being met, e.g., promptness). For example, at Denny's, violation of the "ten minute" promise can be easily observed by management as well as
by customers. By using the promise of promptness, restaurants efficiently manage their production process. In other words, guarantees do not serve to reduce performance ambiguity because an agency problem (between management and customers) does not exist. Agency problems between management and service providers are successfully managed using "rules" and "specifications" because input uncertainty is the dominant exogenous variable which management has to address. On the other hand, the purpose of conditional guarantees is to maintain market share for the firm by promising observable aspects of a service, or even as a response to competitor's offerings. Note that conditional guarantees are not signals of quality in the sense discussed earlier (i.e., for managing agency relationships).

The basic idea behind offering service guarantees is to improve quality. In other words, guarantees are essentially information asymmetry reduction mechanisms, and their use is expected to improve the performance of service providers because quality standards are often incorporated in a guarantee. Specifically, service providers may not dilute clearly specified quality standards because deviations can be easily detected by management as well as by customers.

Services which are intangible (e.g., dental care) cannot provide part guarantees. In other words, since service is an experience with relatively few tangible components, it is not possible to break it down into constituent parts. Companies may signal quality to customers by offering unconditional service guarantees, i.e., total customer satisfaction (Hart 1988, Hart et al. 1992). However, the use of unconditional guarantees when performance ambiguity is high (e.g., credence services, Darby and Karni 1973) may not be practical. For example, when services exhibit credence properties (e.g., surgery), it is difficult for a customer to assess the performance of a service even after consumption. Under such situations, the provision
of a warranty clause makes little practical sense because in the first place, customers cannot even evaluate the service after it has been performed. In other words, as Mills (1990) notes, "with highly uncertain service output, assessing successful performance is more difficult (for customers), and guarantees are inappropriate" (p. 36).

It appears that when performance ambiguity is high, management uses other signals of quality (e.g., certification, expensive advertising) to reduce customers' information asymmetry. Based on the preceding discussion, service guarantees are expected to be effective under low and medium amounts of performance ambiguity. In other words, we expect an inverted U shaped relationship between performance ambiguity and the use of warranties. When performance ambiguity is low, companies may use "money back guarantees" (Hart et al. 1992). On the other hand, when services possess moderate amounts of performance ambiguity, (e.g., dental care; refer Hart et al. 1992) companies may use unconditional guarantees. The following proposition is therefore advanced.

A major impact of unconditional service guarantees (e.g., total customer satisfaction) is that "it works backwards" throughout the organization (Hart et al. 1988). In other words, when service providers are aware of the existence of an unconditional guarantee, their propensity to over-provide or under-provide the service is low (Hart et al. 1992), because the possibility of customers' invoking the guarantee deters opportunistic behavior. For example, by paying attention to the number of guarantees invoked by customers, management can make objective assessments about the performance of boundary spanners. Clear communication of a guarantee's provisions to employees also reduces the "gap" between what is promised to customers and what is delivered (Zeithaml et al. 1988). In this way, guarantees help management solve agency relationships at two levels: they reduce performance
ambiguity for final customers and also aid management in more effective monitoring of service agents. In sum, guarantees, if communicated and understood by service providers, will lead to better service quality. Based on the preceding discussion, the following proposition is advanced:

As discussed earlier, when customer’s performance ambiguity is high, guarantees are perhaps inadequate. We therefore expect that guarantees will be more effective in the low to moderate range of performance ambiguity. When performance ambiguity is high, companies perhaps use certification, price premiums, or even investment in fixed assets as quality signals.

In sum, based on the previous discussion, the literature suggests that different types of guarantees may be offered by service firms to customers. Given the apparent diversity in the literature, it is difficult to exactly hypothesize the relationship between customer performance ambiguity and the use of warranties. However, Nayyar (1990) notes that many firms, irrespective of the markets that they operate in might offer guarantees essentially because other firms in the market are doing so. Thus, the mere use of a guarantee signal might not distinguish one firm from the other. What might be more effective for firms instead, is the number of different types of guarantees that are offered with a service purchase (e.g., parts, labor, extended warranty, etc.). Thus, I hypothesize that:

**H6. Managers' perceptions of customer performance ambiguity will be positively related to the total number of different warranties that are offered by a firm with its service.**
Certification has also been suggested in the literature as an information asymmetry reduction mechanism (Akerlof 1970). For instance, Grossman (1981) notes that "it would be very costly for a doctor to explain to a patient, in detail, his contribution to the study of ulcers... this might involve imparting four years' worth of medical school training to the patient... yet if the patient must choose between two doctors, this information gross of acquisition costs is very valuable" (p. 464). In other words, certification assures the customer of a minimum level of competent performance by signaling the competence of service providers. It also reduces customers' information acquisition costs, leading to better choices (Stigler 1961). Note that the efficacy of certification as a signal is enhanced only when it is prominently advertised. For instance, all hospitals rigorously screen doctors prior to entry. However, not all hospitals aggressively promote the superior qualifications of doctors. When all hospitals indeed use "certification", its efficacy as a differentiating factor is lost (Nayyar 1990). This leads to a situation where patients (principals) cannot observe a "separating equilibrium" across multiple physicians (principals) (Spence 1973). Leaving alone competitive advantage issues, to the extent that some services are highly intangible, firms may use certification as a quality signal. Note that certification is not limited to the qualifications of individual service providers. In other words, certification may stress not only the qualifications of service providers, but also the competence of a company as a whole. For instance, many highway motels prominently display their "AAA" affiliations because out of town motorists are wary of staying in hotels with which they are not familiar. The "AAA" logo is an example of certification which stresses company reputation. Many auto repair shops also display
their "AAA" affiliation in order to reduce customer's performance ambiguity. The use of certification is perhaps more prevalent for services like health care, which are highly intangible, than for relatively tangible services like groceries. Hence, the following hypothesis is suggested.

**H7. Managers' perceptions of customer performance ambiguity will be positively related to a firm's use of certification.**

(g) *The effect of control variables, i.e., reputation, price competition, and firm size*

It is difficult for any one study to exhaustively model all factors that might possibly affect the different types of signals which firms may use under conditions of information asymmetry. However, in the following sections, I discuss three factors which have been mentioned in the literature as possible extraneous factors which might control for the possibility of confounding effects. The three factors that I consider further are (i) firm reputation, (ii) price competition, and (iii) firm size.

A number of studies (Caves and Porter 1977; Wilson 1985) have suggested that firms can credibly signal the quality of their offering to customers through the use of their reputation. The sociology literature (Shrum and Wuthnow 1988) suggests how reputation effects might serve to separate out and stratify industrial firms. More relevant to the current context, favorable reputations may enable firms to charge price premiums for their products and services (Klein and Leffler 1981; Milgrom and Roberts 1986; Nayyar 1990).

As Klein and Leffler (1981), Rashid (1992), and Nayyar (1990) have noted, reputed firms are most vulnerable to the effects of short-run quality deception that
dishonest firms in a market might engage in. In a service setting since quality can rarely be detected by customers prior to consumption, firms which have a short-run profit maximization objective may enter a market and erode away the effect of an entrenched firm's reputation. Specifically, as discussed earlier, dishonest firms might promise high quality to customers by charging low prices. Reputed firms may not be able to match and sustain these lower market prices because they face a much steeper production cost function than that experienced by dishonest firms. Hence, reputed firms have every incentive to deter entry by dishonest firms and maintain a "separating equilibrium" between "honest" and "dishonest" firms in a particular market. It is therefore conceivable that reputed firms will increase the one time fixed costs of market entry for dishonest firms by investing heavily in advertising as well as other sunk assets. Given this discussion, I offer the following hypotheses:

H8. A firm's perceived reputation will be positively related to its use of price premium signals.

H8 (a). A firm's perceived reputation will be positively related to its advertising intensity.

H8 (b). A firm's perceived reputation will be positively related to its investments in specific assets.

A firm's ability to realize price premiums for its service might also be affected by price competition in a particular market. This is especially true in case of certain
services like groceries where everyday low pricing seems to be rule rather than the exception (Hoch et al. 1994). I therefore hypothesize that:

**H9. Price competition in the marketplace will be negatively related to a firm's use of price premium signals.**

Many organizational decisions are impacted upon by a firm's resources (Bruderl and Schusler 1990). Firms which posses such resources may be in a better position to undertake investments in expensive advertising as well as in specific assets. Hence, I hypothesize that:

**H10. Organizational size will be positively related to firm's advertising intensity.**

**H11. Organizational size will be positively related to a firm's investment in specific assets.**

(h) Summary observations on signaling

Though a number of signaling strategies have been suggested in the literature (e.g., warranties, certification, investments), existing theory does not clearly comment upon the relative importance of these signals for solving agency problems. Echoing this point, Rao and Bergen (1992) note that "future research will be required to suggest which of these many devices is most appropriate for a given situation" (p. 421). There is some discussion in the strategic management literature (Nayyar 1990)
that firms may focus more on indirect signals of quality (e.g., reputations) than on warranties and certification. As Nayyar (1990) notes "certification, too, is so widely prevalent as to make it of no consequence in consumer choice behavior" (p. 514). At the present time, to some extent, determining the relative importance of quality signals remains an empirical exercise. There is a possibility, however that one signal may act as a substitute for another. For example, as discussed earlier, warranties are clearly inappropriate as a quality signal when customer's performance ambiguity is high. In this situation, management perhaps uses other quality signals, e.g., investments in fixed assets, or even price premiums for reducing customer's performance ambiguity. On the basis of theoretical evidence, I have however been able to identify the interrelationships among the signals of price premiums, specific assets, and advertising intensity.

**Level 2 agency problems and interrelationships with signaling strategies**

(a) *Interrelationship between signaling practices and management-employee agency problems*

Thus far, our discussion has centered around signaling strategies which managers use to convince final buyers about the quality of a service. Signals take on the nature of promises which management makes to customers about quality. However, in practice, this promised quality may be difficult to provide because service is delivered to customers not by a manager but by an employee who essentially "acts alone" (Bowen and Schneider 1988). In other words, management is locked in an agency relationship with service providers who in turn, can severely compromise
quality. Consequently, signaling, in and of itself, is no guarantee of performance unless the agency relationship between managers and service providers is managed.

Recognition of the existence of an agency relationship between management and service providers serves to highlight the incompleteness of signaling theory in its present form for predicting firm performance. In particular, signaling theory implies that the use of signals by management automatically results in better firm performance. This view assumes that managers have full control over the production process and that they are in a position to guarantee quality.

A number of researchers have recognized the need to model the interaction between signaling strategies and agency relationships involving principals and agents in firms. For instance, Klein and Leffler (1981) observe that "the existence of independent competitive retailers (e.g., agents or service providers) that do not have any ownership stake in this firm-specific asset (e.g., reputation conveyed to customers by signaling) and yet can significantly influence the quality of the final product supplied to customers creates a severe quality-cheating problem for the manufacturer" (p. 633). Likewise, in the context of franchisor-franchisee relationships, Brickley and Dark (1987) note that "management faces the problem of controlling the actions of agents throughout the organization". Echoing a similar point, Valley et al. (1992) observe that "while agent rewards are directly tied to the negotiated outcome, managers' rewards may come in the form of organizational reputation, enhanced reputation, long-term increases in productivity, and other rewards" (p. 233). In a related vein, Caillaud and Hermelin (1993) ask "what economic significance they (agency problems) have in the context of signaling models?" (p. 83).

Despite the need to consider the interaction between signaling strategies and agency relationships, very little research which dovetails these two theories (signaling
theory and agency theory) and draws out the implications for a service firm's performance is currently forthcoming in either the economics or the management literature. In the next section, I describe the nature of agency problems between management and service providers in more detail and focus on those monitoring strategies which firms may use to control service providers.

(b) Agency problems between managers and service providers

Note that there would be no "agency" problem between management and service providers if the goals and interests of the two parties were compatible. However, agency theory is based on the assumption (like Transaction Cost Theory; Williamson 1975) that human opportunism dominates exchange relationships (Donaldson 1990). In other words, parties to a transaction often have divergent interests, and there is a possibility for one party to behave opportunistically in order to pursue its own interest. Agents may therefore engage in opportunistic behavior when information asymmetry is high because management cannot use complete and costless monitoring techniques.

In a service setting, management and service providers often have divergent interests. For example, management is interested in preserving (and enhancing) corporate reputation so as to maintain the firm's salvage value and to ward off takeover attempts (Camerer and Vepsalainen 1988). Agents, on the other hand, attempt to maximize their returns from effort expended, either by not taking enough care of customers (e.g., by shirking), or by over-providing services in order to earn higher commissions. For example, doctors who deliver a highly intangible service and possess more knowledge than either patients or management, have an incentive to
over-provide the service, which may affect quality. In this vein, recently Swedlow et al. (1992) noted that "MRI (Magnetic Resonance Imaging) scans were medically inappropriate 38 per cent more often when ordered by self-referring physicians, suggesting increased rates of use in this group" (p. 1506). In an analogous illustration, Gomez-Mejia and Balkan (1992) observed that "in a university setting, principals (administrators) face a classical agency problem with respect to faculty and "that information asymmetries between faculty and administrators create steep agency costs for the latter if they attempt to directly monitor faculty behavior" (p. 923). Furthermore, most professors in universities have a lot of freedom in designing courses and conducting research. There is a possibility that a professor may put in less effort into teaching and research than into consulting. University administrators are therefore faced with the "classic agency problem of preventing faculty members (agents) from taking advantage of their privileged and non-programmable position" (Gomez-Mejia and Balkan 1992; p. 924). In sum, the divergent interests of management and service providers, together with the presence of performance ambiguity (in evaluating employees), results in a situation where service quality can be adversely affected. Consequently, management has an incentive to align the interests of the two parties (service providers and management) by designing appropriate monitoring and control systems (e.g., compensation).

A number of strategies which management uses to monitor and control service providers thereby "solving" the second level of agency problems, have been suggested in the literature. First, management can use appropriate compensation schemes for workers. For example, when a service provider's behavior can be easily evaluated, management uses a salary (or hourly) system of compensation (e.g., behavior control). In situations where a service provider's work cannot be easily evaluated (e.g., a
physician), management may use complex compensation systems (e.g., bonuses based on customer satisfaction scores). Second, management may provide rigorous training to service providers so that they internalize the goals and values of the company, which in turn, deters opportunistic behavior. Finally, service companies use rigorous screening procedures to ensure that only reliable service providers are hired. These strategies are discussed more fully in the following section.

(c) Compensation

According to agency theory, compensation has a major role in aligning the divergent interests of parties (Anderson and Oliver 1987; Eisenhardt 1985, 1989; Jensen and Zimmerman 1985). Specifically, agency theory posits that compensation systems should make principals as well as agents "well off" (Conlon and Parks 1990). In an economically rational system like a firm, compensation plans are usually linked to performance, because the basic objective of a corporation is to survive and earn profits (Conlon and Parks 1990). The fundamental compensation decision therefore boils down to accurately and costlessly "measuring" and "rewarding" the performance of agents (Eisenhardt 1985). Note that organizational theorists (Ouchi and McGuire 1975; Ouchi 1979,1980; Thompson 1967) also discuss the importance of measuring and rewarding performance (e.g., by using output and behavior control). However, organization theory does not assume (unlike agency theory) that the interests of parties are divergent. In other words, rewards motivate an employee to pursue his or her individual goals which are assumed to be co-aligned with those of the company (Eisenhardt 1985).
When agents and principals do not "labor" (Bergen, Dutta, and Walker 1992) under conditions of information asymmetry, behavior control is justified (Anderson and Oliver; Basu et al. 1985; Eisenhardt 1985, 1989; John and Weitz 1989). Behavior control refers to a situation where an employee's behavior can be costlessly and completely observed by management. For instance, the behavior of grocery store clerks can be easily observed by supervisors. When behavior based systems are in place, "the principal might write a contract specifying that the agent will be evaluated and rewarded on the basis of information about his or her actual behavior" (e.g., not absenting oneself from a cash register without finding a replacement) (Bergen et al. 1992; p. 4). For relatively tangible services, management can costlessly and completely observe the behavior of service providers. For instance, fast food restaurants enter into contractual relationships with service providers, which rewards desirable (and observable) behavior (e.g., punctuality, cleanliness). Agents have no incentive to cheat because managers can easily detect shirking. A compensation system based on salary (or hourly rate) adequately solves the agency problem for management.

According to the salesforce compensation literature (see Bergen et al. 1992, for a good summary), when environmental uncertainty (i.e., difficulty in determining the relationship between sales and effort expended) is high, a salary based compensation system is appropriate. The logic of this approach is that management cannot costlessly determine the extent to which a salesperson's efforts are linked to sales. For example, when economic conditions (like a recession) dampen sales across the board, sales is not a good indicator of actual effort expended. Specifically, management does not know whether low sales are due to less effort on the salesperson's part or due to economic conditions outside his or her control. Therefore,
there is information asymmetry for management in evaluating the performance of salespeople. Furthermore, agency theory assumes that agents are risk averse. When environmental uncertainty is high, salespeople will not opt for a commission system (win or lose), but will be better off by accepting some salary. A salary system therefore assures management of some minimum effort on the part of salespeople. In sum, when environmental uncertainty is high, the risk averse nature of agents warrants the use of a salary system.

The concept of risk aversion is not relevant to service settings, because service organizations stress quality and not volume. When services are highly intangible, management cannot monitor its agents costlessly and completely. A commission based system under these circumstances will compromise customer satisfaction because agents may use performance ambiguity to their advantage by diluting customer service (Anderson and Oliver 1987). However, the use of salary may compromise agent's *incentive compatibility* (Hurwicz 1972). In other words, either a firm has to offer super normal salaries to its employees or it should provide some incentive to agents so that they deliver quality. The presence of salary does not preclude the possibility of agent's providing less than desired service. Primarily, when information asymmetry is high, agents know that salary does not reward all aspects of their behavior because management is not in a position to objectively evaluate them. Consequently, salary alone does not guarantee quality, nor does it serve to align the interests of the parties engaged in an agency relationship.

Some approaches have been suggested in the literature for alleviating the preceding problem. For instance, Grossman and Hart (1986) suggest that "backloading of wages" may be an effective compensation mechanism. In other words, compensation in future periods is contingent upon "good" performance in
earlier periods. For example, hospitals may "pay premiums to doctors who attract and retain the most patients" (Dranove and White 1987; p. 412). Furthermore, hospitals may base a part of a doctor's compensation on patient satisfaction ratings (Dranove and White 1987). By using customer satisfaction scores, management essentially shifts the burden of monitoring its agents to final customers. This is an example of how "agency" relationships at multiple levels interact with each other. Pay raises based on student evaluations are a good example of this method of compensation, which aligns the interests of universities with those of professors. The Wall Street Journal recently noted (January 25, 1993) that in a hospital, a doctor's "incentive pay for 1992 was tied in part to his score on patient questionnaires" and that "incentive pay systems for doctors are catching on, spurred by the belief that they may upgrade the quality of medical care" (p. B1). We term any compensation method linked in part to inputs from final customers as "complex" systems, primarily because the exact method may vary from firm to firm (no of patients retained, satisfaction ratings, peer evaluations), while retaining the main thrust of promoting customer satisfaction. The following hypothesis suggests itself.

H12. Managers' perceptions of employee performance ambiguity will be positively related to a firms' use of customer oriented incentive schemes for service providers.

The use of customer oriented incentive schemes may also enable managers to fulfill the promises that they make to customers through the use of signals. Essentially, price premiums, specific assets, and advertising intensity serve to signal a firm's intention to provide quality service to customers. Hence, greater is the use of
such signals by management, greater will be the need for a firm to ensure that the agency relationship with service providers is properly managed. Hence, I hypothesize that:

**H13.** A firm's use of price premium signals will be positively related to a firm's use of customer oriented incentives for its service providers.

**H14.** A firm's investment in specific assets will be positively related to a firm's use of customer oriented incentives for its service providers.

**H15.** A firm's advertising intensity will be positively related to a firm's use of customer oriented incentives for its service providers.

(d) **Service culture**

In recent years a sizable body of literature on the topic of culture has emerged in the field of marketing (Deshpande and Webster 1989; Deshpande, Farley, and Webster 1993) and the disciplines of organizational behavior and industrial psychology (Burke, Borucki, and Hurley 1992; Hofstede 1990; Rentsch 1990; Schneider, Wheeler, and Fox 1992). While a universally agreed upon definition of culture still appears elusive, researchers agree upon the fact that culture deals with shared meanings about events and situations among constituent members in an organization (Deshpande and Webster 1989).
More specific to service settings, Bharadwaj, Varadarajan, and Fahy (1993), and Webster (1990, 1992) argue that a customer oriented service culture enables employees to consistently deliver superior quality to customers. In the context of agency theory, White (1985) also argues that many agency problems between transacting parties can be ameliorated if parties share common meanings about the terms of the transaction. In a similar vein, Camerer and Vepsalainen (1988) note that culture helps the organization of implicit contracts between employees and bosses better "without rampant cheating and shirking, than written contracts". Similar ideas about the efficacy of culture in aligning the interests of transacting parties is also forthcoming in research by Kreps (1985), Schein (1985), Schwartz and Davis (1981), Peters and Waterman (1982) and Weigelt and Camerer (1988). In sum, in a service setting, the presence of a customer oriented culture will align the interests of service providers with those of the principal.

Given the preceding discussion, it appears that managers who signal their intention to deliver quality service to final customers can benefit from the use of culture as a safeguard. Though culture is an endogenous concept that resides within organizations, managers who use signals of quality for final customers also consciously develop customer oriented cultures to make good on their promises to customers. Hence, I hypothesize that:

**H16.** A firm's use of price premium signals will be positively related to firm's customer oriented culture.

**H17.** A firm's investment in specific assets will be positively related to firm's customer oriented culture.
H18. A firm’s advertising intensity will be positively related to firm’s customer oriented culture.

(e) Screening

Management has an incentive to implement ex-ante strategies to curb ex-post agent opportunism. Recall that the underlying assumption of agency theory is that parties to an exchange have the potential to behave opportunistically. However, the underlying behavioral norm of human opportunism has often been criticized as being too restrictive (Donaldson 1990; Granovetter 1985; Heide and John 1992). The general argument advanced by researchers opposed to the opportunistic model of human behavior is that shared values and interests among exchange partners may result in individual self-interest being virtually synonymous with the interest of the other party. For example, by using a lengthy period of socialization (Ouchi 1979, 1980), management inculcates its employees with the company’s beliefs and values. This exercise is expected to align the interests of employees with those of the company, thereby reducing goal divergence and deterring opportunistic behavior by service providers. Ex-ante strategies which are used by management to socialize employees are therefore an alternative to direct control which is effected through the design of appropriate compensation strategies.

Two ex-ante strategies that can be gainfully employed by management are: screening, and providing service providers with customer oriented training. Consider screening first.
Screening acts as a safeguarding mechanism and comprises ex-ante efforts on the part of management to evaluate the capabilities, reputation, and intentions of service providers (Leenders et al. 1985). The basic idea behind using screening is that the service provider will not behave opportunistically once he or she starts working for the company. According to the "organizational hiring" literature (Bowles and Gintis 1976; Edwards 1976; Collins 1979), firms seek a reliable and loyal workforce. Specifically, Collins (1979) notes that organizations emphasizing "a public image of service ideals, safeguards and/or confidentiality" (p. 33) desire more loyal employees than other organizations, presumably because of the potentially adverse consequences of mismanaging agency relationships in service firms. Since management finds it difficult to evaluate employees who are in active contact with customers seeking "confidential" (Collins 1979) and highly intangible services, pre entry screening is a desirable strategy. By hiring employees whose goals and values are congruent with those of the company, management essentially enforces normative control. In other words, control is assured by "hiring educated workers who have presumably acquired the required value through education" (Cohen and Pfeffer 1986; p. 4).

Though education is an important barometer for predicting the subsequent behavior of employees, the purpose of screening is basically to "gather" more information about the service provider (Bergen et al. 1992). Though screening may be costly, it still is a desirable strategy for companies providing highly intangible services. Elements of an elaborate screening procedure may involve personal interviews, tracking down references, administering a battery of aptitude tests, or even a multi-layered selection process involving several rounds of screening (e.g., the hiring of entry level professors). In general, when firms face high performance ambiguity in evaluating service providers, they may trade off initial screening costs for
desired future behavior. For instance, Carmean (1992) notes that "when unqualified people are passed through the medical-screening process and hired, these workers are more likely to fail to perform, to become injured, and then to cause the increased costs so familiar to the employer" (p. 86). On the other hand, when services are relatively tangible, evaluation of service providers is easy. It is therefore not economically efficient for management to incur high screening costs. Hence, the following hypotheses are offered:

**H19. Managers' perceptions of employee performance ambiguity will be positively related to a firm's use of intensive employee screening efforts.**

Consistent with the logic advanced earlier about the need for service firms to deliver on the promises that they make to customers through the use of signals, it is expected that customer signals will be positively related to ex-ante screening efforts of service providers by firms. Consequently, I offer the following hypotheses:

**H20. A firm's use of price premium signals will be positively related to a firm's use of intensive employee screening efforts.**

**H21. A firm's use of specific assets will be positively related to a firm's use of intensive employee screening efforts.**

**H22. A firm's advertising intensity will be positively related to a firm's use of intensive employee screening efforts.**
Customer service training of employees

Management may also provide opportunities to service providers for self selecting themselves into the organization. For instance, organizations may use a rigorous and lengthy training schedule for new hires by paying particular attention to how customer service should be provided (Bergen et al. 1992). In this way, organizations may attempt to socialize their employees. Socialization is defined as "the process by which an individual comes to understand the values, abilities, expected behaviors, and social knowledge that are essential for assuming an organizational role and for participating as an organizational member" (Chatham 1991, p. 462).

Customer training seems to achieve two objectives. First, persons who experience goal incompatibility (with management) may drop out of the process thereby decreasing training costs. Second, by internalizing an organization's values, members are expected to be better performers on their jobs thereby offsetting initial training costs incurred by the company. Training also seems to achieve the function of an informal control mechanism (Ouchi 1979). In general, whenever management finds it difficult to evaluate a boundary spanner's job, it is more likely to use training as a means of socialization. Based on the above, I hypothesize that:

H23. Managers' perceptions of employee performance ambiguity will be positively related to a firm's adoption of customer service training programs for its employees.

Consistent with the logic offered in the preceding section about the need for management to dovetail its signaling strategy with agent monitoring and control efforts, I hypothesize that:
H24. A firm’s use of price premium signals will be positively related to a firm’s adoption of customer service training programs for its employees.

H25. A firm’s investment in specific assets will be positively related to a firm’s adoption of customer service training programs for its employees.

H26. A firm’s advertising intensity will be positively related to a firm’s adoption of customer service training programs for its employees.

(g) Interactive effects of signaling and monitoring strategies on performance

Agency theory, like Transaction Cost Theory, is normative in its prescriptions. In other words, the implicit assumption behind these theories is that if particular organizational arrangements are carried out in accordance with theoretical propositions, performance will ensue. However, not much empirical testing of this implicit assumption has actually been carried out (for exceptions in the TCA literature see Heide and John 1992; Noordewier, John, and Nevin 1990; and Heide and Stump 1995). However, to the best of my knowledge, no empirical study has empirically investigated the performance implications of agency theory.

It is conceivable to expect that if firms which signal the quality of their offering to final customers also employ safeguarding mechanisms to control service providers,
these firms will be able to deliver better service performance. Against the preceding backdrop, I offer the following hypotheses:

**H27.** A firm's use of price premium signals and a firm's use of customer oriented incentives for its employees will have an interactive positive effect on customer service performance as well as financial performance.

**H28.** A firm's investment in specific assets and a firm's use of customer oriented incentives for its employees will have an interactive positive effect on customer service performance as well as financial performance.

**H29.** A firm's advertising intensity and a firm's use of customer oriented incentives for its employees will have an interactive positive effect on customer service performance as well as financial performance.

**H30.** A firm's use of price premium signals and the presence of a customer oriented service culture in a firm will have an interactive positive effect on customer service performance as well as financial performance.
H31. A firm’s investment in specific assets and the presence of a customer oriented service culture in a firm will have an interactive positive effect on customer service performance as well as financial performance.

H32. A firm’s advertising intensity and the presence of a customer oriented service culture in a firm will have an interactive positive effect on customer service performance as well as financial performance.

H33. A firm’s use of price premium signals and a firm’s use of intensive employee screening efforts will have a positive interactive effect on customer service performance as well as financial performance.

H34. A firm’s investment in specific assets and a firm’s use of intensive employee screening efforts will have a positive interactive effect on customer service performance as well as financial performance.

H35. A firm’s advertising intensity and a firm’s use of intensive employee screening efforts will have a positive interactive effect on customer service performance as well as financial performance.
H36. A firm's use of price premium signals and a firm's adoption of customer service training programs for its employees will have a positive interactive effect on customer service performance as well as financial performance.

H37. A firm's investment in specific assets and a firm's adoption of customer service training programs for its employees will have a positive interactive effect on customer service performance as well as financial performance.

H38. A firm's advertising intensity and a firm's adoption of customer service training programs for its employees will have a positive interactive effect on customer service performance as well as financial performance.

Managerial Strategies for Tackling Input Uncertainty

In addition to agency problems which service organizations encounter with customers and employees due to performance ambiguity, management also has to cope with input uncertainty, or the extent to which customer demands are unstandardized and therefore unpredictable. According to contingency theory (Lawrence and Lorsch 1967), uncertainty affects the organizational structure of a firm. For instance, a company which operates in a market characterized by uncertain demand, cannot use standardized forecasting techniques. For a service organization, the most important
environment is the customer. If customer requests can be easily predicted, firms can
design standard operating procedures for service providers. Input uncertainty
essentially determines to extent to which a firm can use formalization, standardization,
or even specialization. These strategies are discussed more fully in the next section.

(a) Formalization

Formalization refers to the existence of written rules and procedures for
coordinating work and is concerned with the extent to which expectations regarding
the means and end of work are specified and written (Blackburn 1982; Ivansevich and
leads to greater efficiency because rules serve to routinize repetitive activities and
transactions" (p. 15). When input uncertainty is low, contingency theory states that
organizations achieve efficiencies by instituting formalized systems. However, when
input uncertainty is high, rules are less effective because customer demands are
idiosyncratic and working procedures (i.e., service delivery scripts) cannot be
standardized. For example, for relatively tangible services like grocery stores, rules
and procedures are often available which specify what each individual should do.
Thus, grocery stores develop standard operating procedures and explicit policies.

**H39. Managers' perceptions of customer induced input
uncertainty will be negatively related to a firm's use of formalized
service decisions.**
(b) Centralization

Centralization refers to the delegation of authority among jobs in an organization (Blackburn 1982; Ford 1979; Reukert et al. 1985). In other words, centralization refers to the location of decision making authority in an organization. In a service organization, the primary focus of companies is on decisions regarding service quality. When input uncertainty is low, i.e., when customers demand a standardized service, management can plan, coordinate, and control the activities of service providers by centralizing decision making (Blackburn 1982; Ford 1979; Reukert et al. 1985). For example, when a service is relatively tangible (e.g., fast food restaurants), management has a clear idea of customer demands. Under these circumstances, service related problems are often referred to higher ups by service providers. For instance, at McDonalds, if a customer wishes to substitute one item (e.g., a hamburger) with another (e.g., french fries), service providers often seek permission from management before making a decision. On the hand, physicians do not seek permission from management about tackling customer requests. In sum, when input uncertainty is low, management is knowledgeable about the service delivery system and there is no need to delegate authority to service providers. This situation is reversed when input uncertainty is high because management lacks the knowledge to deal with many non routine customer requests. Hence I advance the following proposition.

H40. Managers' perceptions of customer induced input uncertainty will be negatively related to a firm's use of centralized service decisions.
(c) Performance effects

Purely from an organization theory perspective, it can be argued that firms which are able to cope with environmental uncertainty through the use of proper structures might be in a better position to deliver performance (Tosi and Slocum 1984). Accordingly, I hypothesize that:

H41. Managers' perceptions of customer induced input uncertainty and a firm's use of formalized service decisions will have an interactive positive effect on customer service performance as well as financial performance.

H42. Managers' perceptions of customer induced input uncertainty and a firm's use of centralized service decisions will have an interactive positive effect on customer service performance as well as financial performance.
CHAPTER 8

DEVELOPMENT OF THE SURVEY INSTRUMENT

In this chapter, I describe how I developed the instrument which was administered to potential respondents via a mail survey procedure. First, I outline the procedures that I used to develop scale items together with the pretesting method that I used. Next, I present preliminary results of the pilot study that I conducted to identify those scale items which I retained in the final version of my survey. Finally, I present those scale items that I retained in my survey questionnaire.

Item Generation and Pretesting

Item generation

A systematic procedure was followed to generate and pretest those scale items that appear in the final version of the questionnaire. This procedure is outlined in Figure 8.1. First, the conceptual domain of each construct was defined based upon relevant theory (Nunnally 1978). Theoretically, this process is known as "domain sampling" (Nunnally 1978). Note that if one could specify all possible items that belonged to a particular domain, the resulting correlation matrix of all items for a construct would contain infinite cells (rows and columns). However, it is not feasible to specify all items that might form this infinity x infinity (row x column) matrix. Hence, efforts were made to identify a sample of items from this domain which best represented each focal construct. Specifically, I followed procedures described by Nunnally (1978), Churchill (1979), and Gerbing and Anderson (1988), to generate

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scale items for each construct. Second, wherever possible, I used existing scale items after modifying them to suit the present context. Third, I also generated new items on the basis of my reading of material in the trade press, i.e., *Automotive News, Car and Body Shop*, and other trade publications. Fourth, new items were also generated on the basis of interviews and discussions that I had with managers in automotive repair service companies.

During the measure development stage, I spent approximately thirty hours with automotive repair service managers in the greater Cleveland, Ohio area. I ensured that I spent roughly equal time interviewing managers in each of the three different service categories which I had chosen as the context for my study. In particular, I spent roughly ten hours each on interviewing managers in the three different automotive repair sectors of (a) *transmission repair* (SIC code 7537-01), (b) *brake service* (SIC code 7539-14) and (c) *lubrication service* (7549-03). The objectives of the interviews that I conducted were: (a) to investigate whether the phenomenon of interest that I was studying existed in the particular context at hand, (b) to develop and correctly frame research propositions, and (c) to learn more about the selected research context.
Figure 8.1

Outline of the Pretesting Process

- Generate Item Pool
  - Pretest Items in Brake Category
    - Pretest Items in Transmission Service Category
      - Pretest Items in Lubrication Service Category
        - Generate Likely List of Final Items
          - Conduct Pilot Study via Mail Survey
            - Identify Final Set of Items
Pretesting

A pretest is a small study which can determine how a questionnaire can be improved to minimize response errors (Bolton 1993; Converse and Presser 1986). Response errors occur because respondents might misinterpret a particular question. Questionnaire pretesting therefore is an important activity since response errors constitute a major portion of total survey error (Assael and Keon 1982).

Although pretesting is an important activity which precedes the development and administration of a questionnaire, there is no clear consensus among researchers as to what steps should be methodically followed during this process. For instance, Hunt et al. (1982) focus on identification of question defects while Converse and Presser (1986) recommend iterative testing with small sample sizes. Some researchers (Jadine et al. 1984; Lessler and Sirken 1985) have also discussed how various cognitive psychology approaches like process tracing methods might be used. Furthermore, recent research (Bolton 1993) also discusses how concurrent verbal protocols may provide a rich source of information about respondents' cognitive processes.

Despite the seemingly divergent prescriptions that researchers have offered about the proper approach to pretesting, it appears that there are some common threads among these divergent findings. First, most researchers agree that the first pretest itself should be administered by personal interview even though subsequent pretests might be administered through the mail. This first step in the pretesting process enables researchers to identify those items which are ambiguous. Furthermore, this exercise enables researchers to also correct any items in the questionnaire that might appear to be defective. Second, the initial pretest itself should invariably be followed by revision and modification by experts. This step is
analogous to the "polishing" approach discussed by Converse and Presser (1986). Finally, the revised questionnaire itself should be administered to a fairly moderately sized sub-sample, though there is no clear consensus as to the actual size of the sample that should be used. The last step is supposed to be an iterative process which should continue until the researcher is sure that all items that have been included in the questionnaire are indeed free from ambiguity.

My pretesting approach closely paralleled the steps that have been depicted in Figure 8.1. First, I interviewed seven managers in the transmission repair category and asked them to comment on my draft questionnaire. These managers suggested that I make modifications to certain items and reword other items in order to reduce ambiguity. For instance, some managers pointed out that it may be better to replace the term "service providers" with the word "mechanics". Other managers suggested that I drop certain items which were either not relevant to the present context or which had the potential to confuse respondents. I implemented all the suggested changes in my questionnaire and repeated this refinement process in the other two categories of brake service and lubrication service respectively.

In the next step, I personally administered the preliminary version of the questionnaire to seven managers in the greater Cleveland area. I also encouraged managers to note down any comments that they might have about certain items on the side of the questionnaire itself. On an average, each manager took about 38 minutes to complete the questionnaire. The maximum time that any one manager took was about 59 minutes and the minimum was about 28 minutes. Following this exercise, I carefully analyzed each of these seven responses in detail and made modifications to different scale items as suggested by the respondents. On the basis of this modification, I developed an initial version of the questionnaire which I administered
to 163 respondents in a pilot study. The preliminary eighteen page version of the questionnaire that I used is contained in Appendix A.

**Pilot Test**

I conducted a national pilot study in order to further refine the questionnaire. I randomly selected one hundred service establishments from each of the three categories of transmission repair service, brake service, and lubrication service. Next, I attempted to establish telephone contact with a manager in each establishment prior to my mailing out of the questionnaire to them. I obtained the telephone number of each establishment from the mailing list compiled by a national list broker (American List Counsel). During my telephone conversation with managers I identified myself and my affiliation, and explained the objectives of my study. Next, I requested their participation in the pilot study and promised to send them copies of the final results when they would become available.

Of the three hundred establishments that I had chosen, I could manage to establish telephone contacts with managers in two hundred and twenty seven firms. Of these two hundred and twenty seven firms, managers in one hundred and sixty three of them agreed to participate in the study. I mailed a packet containing the questionnaire together with a cover letter to each manager who had agreed to participate.

The national pilot study yielded 41 usable responses. I studied all responses and identified items with biased wording as had been indicated by respondents. I also conducted preliminary statistical tests on each item response. Specifically, I computed coefficient alpha for each multi-item scale that was included in the survey. Though the
alpha coefficient is often influenced by sample size (Peterson 1994), I nevertheless computed these values in order to identify items which did not belong to a common core. This exercise enabled me to eliminate certain items which had low item to total correlations. On the basis of the alpha values thus obtained, I decided to retain only those items which exhibited sufficiently high item-to-total correlations.

The results of the initial reliability analysis are depicted in table 8.1. As may be noted from the table, all items belonging to a certain construct indicated acceptable values of reliability and approached or exceeded the 0.7 cut-off level that has been suggested in the literature for exploratory research (Nunnally 1978).
Table 8.1
Results of Pilot Study (N = 41)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Initial number of items</th>
<th>Final number of items</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Customer Service</td>
<td>10</td>
<td>10</td>
<td>0.95</td>
</tr>
<tr>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Financial Performance</td>
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<tr>
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<td>3. Price Premium</td>
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<td>4. Specific Assets</td>
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<td>5. Advertising Intensity</td>
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<td>13. Customer Oriented Incentives</td>
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<tr>
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<tr>
<td>15. Centralization</td>
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Note: Only the alpha values for reflexive scale items have been computed and reported.
Construct Operationalization and Final Scale Items

All reflexive constructs were operationalized by using multiple items. Recall that reflexive items are indicators of a latent construct. In other words, covariation among the items measuring a construct is caused by the latent construct itself. In line with exhortations by researchers (Churchill 1979) I used multi item scales to measure theoretical constructs in order to minimize measurement error.

The final version of the questionnaire together with the accompanying cover letter is contained in Appendix B.

Final Scale Items

Customer Service Performance refers to management’s perceptions of how well service providers are performing their roles (Roth 1993; Zeithaml et al. 1988). The final scale for measuring customer service performance consisted of ten items measured on a seven point Likert scale anchored at "Relatively Poor Performance" (1), "Met Industry/Competitor Standards" (4), and "Relatively Superior Performance" (7) respectively. The introductory paragraph to these measures in the questionnaire read:

Please judge the performance of your location on the following dimensions relative to your largest competitor or the prevailing industry norm. Please use the last 24 months as the time frame.

Specific scale items were adapted from Roth (1993), different versions of the "perceptions" section of the SERVQUAL scale developed by Zeithaml et al. (1988), and modifications of this scale as reported in studies by Carman (1990), and Babakus and Boller (1992) among others. Some items for these scale were also developed on
the basis of interviews that were conducted with managers in three different service settings. Specific scale items are shown below.

1. Responsiveness to customer inquiries.
2. Accuracy of repair (or service) estimates provided to customers.
3. Overall customer needs.
4. Timeliness of repairs (or service) performed for customers.
5. Retaining existing customers.
6. Attracting new customers.
7. Customer complaint volume.
8. Reliability of repairs (or service) provided to customers.
9. Workmanship of repairs (or service).

Financial Performance is a construct that is reflected in a number of commonly accepted measures like profitability, market share, sales volume and sales growth.

The final scale consisted of four items measured on a seven point Likert scale anchored at "Relatively Poor performance" (1), "Met Own Goals" (4) and "Relatively Superior Performance" (7). The introductory section to this scale read:

How do you rate your own performance in the past twelve months relative to your own objectives?
The specific scale items were adapted from the financial performance scale used by Roth (1993) after modifying them to suit the present context. The actual items are depicted below.

1. Profitability
2. Market share
3. Sales volume
4. Sales growth

**Customer Performance Ambiguity** refers to difficulties that customers face while evaluating a service (Jones 1986; Jones 1990; Siehl, Bowen, and Pearson). This construct has been operationalized here as managers' perceptions of customer performance ambiguity in keeping with Jones' (1987) approach.

The final scale item for this construct consists of seven items measured on a seven point Likert-type scale ranging from "Strongly Disagree" to "Strongly Agree". The introductory paragraph to these measures reads:

The statements below describe the difficulties faced by customers in evaluating the service at your location. Please indicate your perceptions about how easy or how difficult it is for customers to evaluate the service that your location provides by circling the appropriate number on the scale.
Specific scale items were adapted from the performance ambiguity scale used by Jones (1987) after modifying them to suit the present context. Actual items are depicted below.

1. If customers watch mechanics at work they can easily tell how well mechanics are doing their job.

2. It is difficult for customers to estimate the time or resources that it takes to provide the service.

3. Customers can always tell if they have received good service from us.

4. Customers have to assume that they are getting good service because there is no other way they can tell.

5. It would be very time consuming for customers to check up on how well a mechanic is performing his or her job.

6. Customers are very knowledgeable about the service that we provide.

7. Customers can easily determine the amount of service that is needed by them.

**Customer Induced Input uncertainty** refers to the degree to which the client-firm interface is standardized (Jones 1987). More specifically, input uncertainty is defined as "the organization's incomplete information about what, where, when, and how customer input is going to be processed to produce desired outcomes" (Larsson and Bowen 1989; p. 24).

The final scale for this construct consists of seven items measured on a seven point Likert scale ranging from "Strongly Agree" to "Strongly Disagree". The introductory paragraph to the measures read:

The following items pertain to the work of mechanics. For each item please indicate the work that mechanics perform by circling the appropriate number on the scale.
Specific scale items for this study were adapted from the transaction uncertainty scale developed by Jones (1987) after modifying them to suit the present context. These items are depicted below:

1. Mechanics usually encounter the same customer problems in their day-to-day work.
2. It is easy for mechanics to predict the needs of customers.
3. Customers often come up with problems that mechanics have never encountered before.
4. The same procedures can be used by mechanics to solve all customer problems.
5. The work performed by mechanics does not vary a great deal from one customer to another.
6. Mechanics depend on direct contact with customers for completing their jobs.
7. Mechanics have a great deal of direct face-to-face contact with customers.

**Price Premiums** refer to the price for a particular service that is considerably higher than prevailing market prices and is higher than what the average cost of production would justify (Klein and Leffler 1981; Rao and Bergen 1992).

The final scale for price premiums consisted of seven items measured on a seven point Likert scale ranging from "Strongly Disagree" to "Strongly Agree" and one item measured on a seven point Likert scale anchored at "Much Below Market Price" (1), "Market Price" (4), and "Much Above Market Price" (7). The introductory paragraph to these measures read:
The items in this section refer to pricing of the service at your location. Please answer the following questions.

Specific scale items were adapted from the scale used by Rao and Bergen (1992) after modifying them to suit the present context. Additional scale items were also developed on the basis of concept definition for this construct as provided by Klein and Leffler (1981). The actual scale items are shown below:

1. Our service commands a price premium in the market.
2. Our customers are willing to pay us a price premium for our service.
3. The typical price that we charge for our service is considerably higher than what our competitors charge for the same service.
4. We earn gross margins that are higher than normal in general.
5. Unless we price low, customers will not buy from us.
6. Customers do not mind paying us a price premium as long as they get good quality service from us.
7. The price that customers pay is more important to them than the service that they receive from us.
8. How would you describe the price of the service provided by your location (anchored at "Much Below Market Price", "Market Price" and "Much Above Market Price").

**Specific Assets** are defined as those investments made by a firm which have little salvage value outside a focal relationship (Klein and Leffler 1981). These assets are sunk investments and are "transaction specific" in the sense described by Transaction Cost Theory (Williamson 1985).
The final scale for specific assets consisted of nine items measured on a seven point Likert scale ranging from "Strongly Disagree" to "Strongly Agree". The introductory paragraph to these measures read:

The questions in this section refer to the investments in buildings and equipment undertaken at your location. Please indicate your agreement or disagreement with the following statements by circling the appropriate numbers on the scale.

Specific scale items were adapted from scales which were used by Anderson (1985) and Heide and John (1990, 1992) to measure transaction specific investments. These items are depicted below.

1. If this particular location closed down, it would be very difficult for us to recover the investments that we have made in the decor of our buildings.

2. Selling our particular service has required us to develop specialized procedures and systems which cannot be easily adapted for other uses.

3. We have made significant investments in facilities and equipment dedicated to the needs of our customers.

4. We have undertaken significant investments in the decor of our buildings.

5. From time to time we undertake extensive investments in interior and exterior remodeling of our buildings.

6. We have undertaken significant investments in modern looking equipment.

7. We have spent significant resources for developing and displaying our company's logo to our customers.

8. At our location, waiting areas for customers are neither elaborately nor expensively furnished.
9. We have spent significant amounts of money in designing and displaying signs (e.g., name of a department, entrances, exits, and posters) in our building.

**Advertising Intensity** refers to the frequency with which a firm advertises its service to the market and how much cost a particular firm incurs on advertising its service (Klein and Leffler 1981; Nelson 1970, 1974).

The final scale for measuring advertising intensity consists of nine items. Three of these items are measured on a seven point Likert scale ranging from "Strongly Disagree" to "Strongly Agree". The introductory section to these measures read:

The questions in this section refer to the nature of advertising that is undertaken for your service. Please consider advertising that is undertaken by your location and also any advertising undertaken by corporate headquarters or by the franchisor (if applicable). Please indicate your agreement or disagreement with the following statements by circling the appropriate number on the scale.

Five items were measured on a four point Likert scale anchored at "Much more than twice as much as largest competitor" (1), "Less than twice as much as largest competitor" (2), "Same as the largest competitor" (3) and "Less than the largest competitor" (4). The introductory paragraph to this section read:

Compared to your largest competitor, how much did you spend on advertising in the last financial year? Please include any advertising costs for your location that were met by corporate headquarters (or franchisor) if applicable.

One item was used to assess the total dollar value of advertising costs. The introductory section for this measure read:
What is the total dollar value of advertising costs incurred by your location in the last fiscal year? Please include expenses that were met by corporate headquarters (or the franchisor) if applicable.

Specific scale items were developed for this dissertation on the basis of concept definitions provided in the literature (Nelson 1970, 1974). Items were then pretested to ensure their relevance to the present context. These scale items are depicted below.

Seven point Likert scale

1. We spend significant amounts of money for advertising our service.

2. We advertise our service on a very regular basis.

3. We usually undertake large scale advertising for our service.

Four Point Likert scale

1. Television

2. Radio

3. Newspaper

4. Other media like Yellow pages or Trade Publications

5. All media in total

Category scale

1. < $1,000

2. $1,000 to $9,999

3. $10,000 to $24,999

4. $25,000 to $99,999

5. $100,000 to $499,000

6. $500,000 to $999,000
7. $\geq 1,000,000$

Warranties refer to an obligation assumed by the seller which promises certain services or satisfactions to the buyer (Grossman 1981; Udell and Anderson 1968).

Specific items were developed to measure the number of different types of warranties offered by a service firm. Four dichotomous (Yes/No) items were used to measure the number of warranties. The introductory section to this scale read:

What aspects of your service are covered by the standard warranty? Please check all that apply.

Specific scale items were developed for this study on the basis of conceptual definition about warranties that is forthcoming in the literature (Anderson and Udell 1968). These items were then pretested before their inclusion in the questionnaire. The scale items for this construct are described below.

1. Warranty on parts.
2. Warranty on labor.
3. Warranty on price.
4. Unconditional warranty covering all aspects of the service.

Certification is defined as information provided through qualifications, titles, and affiliations of an entity like an individual or an organization (Akerlof 1970).

The final scale for measuring certification consists of three seven point Likert type items anchored at "Not Prominently Displayed" and "Prominently Displayed". The introductory section to these measures read:
The items below pertain to the use of certification at your location. Please indicate how prominently the following certification items are displayed at your location.

Specific scale items for this construct were developed from the conceptual definitions provided in the literature (Akerlof 1970; Grossman 1981). These items were then pretested to ensure their applicability to the present context. Scale items for this construct are depicted below.

1. Awards and recognitions that we have received for our service.
2. Signs which depict the training and qualifications of mechanics.
3. Membership in professional organizations (like AAA and ASE).

**Firm Reputation** refers to a certain image or summary impression that is conveyed through its current activities and past history to different constituencies (Fombrun and Shanley 1990).

The final scale for measuring firm reputation consists of three items measured on a seven point Likert scale anchored at "Poor Reputation" (1), "Average Reputation" (4), and "Excellent Reputation" (7). The introductory section to this scale read:

How would you rate the reputation of your location on the following dimensions?
Specific scale items used or this study were adapted from Fombrun and Shanley (1990) after modifying them to suit the present context. These scale items are describe below.

1. Quality of service.
2. Quality of employees.
3. Quality of management.

**Price Competition** refers to market competition for a particular service (Klein and Leffler 1981) which reduces the amount of flexibility which a firm has for making pricing decisions.

The final scale consists of three items measured on a seven point Likert scale ranging from "Strongly Agree" to "Strongly Disagree". The introductory section to this scale read:

The items in this section refer to pricing of the service at your location. Please answer the following questions.

Specific scale items for this construct were developed on the basis of concept definitions provided by Klein and Leffler (1981) and Shapiro (1983). Items were also pretested to ensure their applicability to the present context. These items are depicted below.

1. If competitors lower the price for this service, we have to match it.
2. Our customers usually shop around for the lowest available price.
3. We offer price discounts to our customers form time to time.
Employee Performance Ambiguity refers to difficulties which managers face in evaluating the performance of employees who carry out non-programmable jobs (Anderson and Oliver 1987; Eisenhardt 1985; Jones 1987).

The final scale for the employee performance ambiguity construct consists of seven items measured on a seven point Likert scale ranging from "Strongly Agree" to "Strongly Disagree". The introductory section to this scale read:

The statements below describe the difficulty faced by supervisors in evaluating the work of mechanics. Please indicate your agreement or disagreement with the following statements by circling the appropriate number on the scale.

Specific scale items were adapted from scales used by Heide and John (1990), Heide and Miner (1992), and John and Weitz (1989). These items are depicted below.

1. Assessing the performance of mechanics is a complicated matter for supervisors.

2. Evaluating the performance of mechanics involves expensive monitoring by supervisors.

3. There are significant costs associated with monitoring the activities of mechanics.

4. It is difficult for supervisors to know whether mechanics provide agreed upon service to customers.

5. Precise standards by which to assess mechanics' performance are not readily available to supervisors.

6. Evaluating the performance of mechanics is a highly subjective matter for a supervisor.

7. Mechanics perform so many different tasks that it is difficult for a supervisor to ascertain whether a good job is being done or not.
Employee Screening Effort refers to ex-ante strategies that are used by management to evaluate the capabilities, reputation, and intentions of service providers (Leenders et al. 1985). The basic idea here is that through screening companies gather more information about service providers prior to hiring them, which in turn, minimizes the potential of employee opportunistic behavior later on.

The final scale for measuring employee screening effort consisted of seven items measured on a seven point Likert scale ranging from "Strongly Agree" to "Strongly Disagree". The introductory section to this scale read:

The questions in this section refer to the hiring practices which you follow for recruiting mechanics. Please indicate your agreement or disagreement with the following statements by circling the appropriate numbers on the scale.

Specific scale items were developed for the study based on concept definitions provided by Bergen, Dutta, and Walker (1992). These scale items are depicted below.

1. We place a large weight on the educational qualifications of mechanics for making our hiring decision.

2. Ascertaining the professional skills of mechanics before hiring them is an important part of our recruitment process.

3. A thorough background check of mechanics is conducted before they are hired.

4. We do not incur considerable costs on hiring mechanics.

5. Managers usually conduct personal interviews with mechanics before they are hired.

6. It is relatively easy for managers to find out if a mechanics who applies for a job possesses the required skills or not.

7. Even if a mechanic with considerable experience applies to us, we still undertake a thorough screening process for him or her.
Employee Service Training Effort refers to ex-post strategies which companies use to impart requisite knowledge to employees so that they are properly socialized in line with their job expectations (Bergen, Dutta, and Walker 1992).

The final scale for this construct consisted of ten items measured on a seven-point Likert type scale ranging from "Strongly Disagree" to "Strongly Agree". The introductory section to this scale read:

The questions in this section refer to training practices for mechanics at your location. Please indicate your agreement or disagreement with the following items by circling the appropriate numbers on the scale.

Specific scale items for this construct were developed on the basis of concept definitions described in Bergen, Dutta, and Walker (1992), and Ouchi (1985). The final scale items are depicted below.

1. We spend considerable time teaching mechanics the importance of providing superior customer service.

2. Our training programs help mechanics deliver superior customer service.

3. A new mechanics coming to us with experience still needs training in customer service.

4. Our training programs stress to mechanics the importance of achieving customer satisfaction.

5. Our mechanics are provided training in customer service on an ongoing basis.

6. Training our mechanics to meet customer needs has not involved substantial commitments of money.

7. Most of the training that our mechanics go through has been designed to meet the specific needs of our customers.
8. Information about all the services that we sell is provided to mechanics during training.

9. Mechanics are well trained in how to interact effectively with customers.

10. Mechanics receive adequate training on how they should handle customer complaints.

Service Culture is defined as shared norms about service conduct which operate in organizations (Bharadwaj, Varadarajan, and Fahy 1993; Hofstede 1990). Webster (1990, 1992) defines service culture as a system of values and meanings which all organizational employees share about a service.

The final scale for service culture consists of seven seven point Likert scales anchored at "Strongly Disagree" and "Strongly Agree" respectively. The introductory section to this scale read:

The questions in this section refer to training practices for mechanics at your location. Please indicate your agreement or disagreement with the following items by circling the appropriate numbers on the scale.

Specific scale items were adapted from Webster (1990, 1992) after modifying them to suit the present context. The final scale items are depicted below.

1. Mechanics are made to understand the policies of our company.

2. Mechanics are taught those values that are important to our company.

3. Major decisions involving our service are often made unilaterally by one group of employees.

4. When customer problems occur, they are treated as joint responsibilities of all employees rather than individual responsibilities.
5. In our company mutual consultation among employees about all aspects of the service is the norm.

6. All our employees are committed to working together so that the company benefits as a whole rather than one individual employee.

**Customer Oriented Incentives** refer to organizational reward systems for service providers which are based on how well employees take care of their customers (Dranove and White 1987; Hauser 1990).

The final scale for customer oriented incentives consisted of five seven point Likert type items anchored at "Not at all Important" and "Extremely Important". The introductory section to this scale read:

Which of the following factors are important considerations in deciding upon financial rewards for mechanics? Financial rewards may include salary increases, commission payments, and bonus.

Specific scale items were adapted from the scale used by John and Weitz (1989). Final scale items are described below.

1. The mechanic's record of courteous service to customers.

2. The mechanic's ability to resolve customer complaints or service problems in an efficient manner.

3. The mechanic's ability to deal with unique situations and/or meet customer needs.

4. The mechanic's commitment to customers.

5. Customer feedback
Formalization refers to the degree to which work activities are structured through rules and procedures (Blackburn 1982; Hall 1976).

The final scale for formalization consisted of five items measured on a seven point Likert scale ranging from "Strongly Disagree" to "Strongly Agree". The introductory section to this scale read:

The items in this section pertain to the rules and procedures that govern the work of mechanics. Please indicate your agreement or disagreement with the following statements by circling the appropriate numbers on the scale.

Specific scale items were adapted from John and Reve (1982) after adapting them to the present context. The final items are described below.

1. Mechanics' dealings with customers are subject to a lot of rules and procedures stating how various aspects of the job are to be performed.

2. When rules and procedures regarding the service exist, they are usually written agreements between the company and mechanics.

3. If a written rule does not cover some aspect of the mechanic's job, we make up informal rules for doing things.

4. There are many aspects of a mechanics job that are not covered by some formal procedure.

5. Written rules dealing with service quality standards are made available to mechanics.

Centralization refers to the delegation of authority among jobs in the organization (Blackburn 1982; Reukeret et al. 1985).

The final scale for centralization consisted of three items measured on a seven point Likert scale ranging from "strongly Disagree" to "Strongly Agree". The introductory section to this scale read:
The items in this section pertain to the rules and procedures that govern the work of mechanics. Please indicate your agreement or disagreement with the following statements by circling the appropriate numbers on the scale.

Specific scale items used here were adapted from John and Reve's (1982) study after modifying the items to suit the present context. The final items are depicted below.

1. Mechanics take very little action on their own until it is approved by supervisors.

2. In dealing with customers, mechanics have to refer even quite small matters to someone higher up for a final answer.

3. Mechanics are left alone to make day-to-day decisions for dealing with customers.
RESEARCH DESIGN, QUESTIONNAIRE ADMINISTRATION, RESPONSE RATE, AND SAMPLE CHARACTERISTICS

In this chapter I provide a detailed discussion of the research design that was employed for the present study together with a description of those procedures that I utilized to administer the questionnaire. Furthermore, I provide information pertaining to response rates that were obtained for the survey.

This chapter is organized along the following lines. First, I describe the context of automotive service establishments that was used for the present study. Included in this discussion is a justification for selecting the automotive service category as the research context. Next, the sampling frame that was employed for the present study is described. Following this description, I discuss the questionnaire administration procedure. Specifically, I discuss how key informants were chosen for the present study. In the next section, I discuss the response rate obtained for the present study, compare this rate with those studies that have employed similar design techniques in the past, and provide an assessment of non-response error bias. Finally, I present selected firm characteristics (e.g., annual sales, number of employees) for the sample of responding firms.
Research Design

A mail survey has been used for the present research in order to study how performance ambiguity and input uncertainty which are present in the client-service firm interface affect signaling and monitoring (agency) strategies of service firms. The focal constructs in the present study and all relevant control variables have been measured by using managers' perceptions about theoretical concepts and variables. The use of a mail survey procedure is justified because data pertaining to measures of focal constructs in the conceptual model of this research (e.g., performance ambiguity) are unlikely to found in proxy records and statements like company annual reports and accounting data.

Context

The context for this research comprises firms which specialize in providing automotive service to customers. Specifically, three different service categories have been chosen: (a) lubrication service (SIC code 7549-03), (b) brake service (SIC code 7539-14), and (c) transmission repair service (SIC code 7537-01).

Justification of the Chosen Context

The underlying basis for selecting the present context was two fold: (a) to ensure that the concepts and phenomenon being investigated (e.g., signaling strategies and agency problems) naturally occurred in the present setting, and (b) to make sure that the present context would indeed provide adequate variation and co-variation
among the concepts outlined in the conceptual model. The preceding approach of investigating the adequacy of a research setting has been discussed and recommended by Campbell and Stanley (1963), Coporaso (1973), and Cook and Campbell (1979) among others. In the following sections, I describe in more detail why the present context of automotive service appears well suited for investigating the research propositions associated with the conceptual model.

(a) Agency problems in automotive service settings

Whenever one party to a transaction (the principal), employs another party (the agent) to perform some work on his or behalf, an agency problem is established between the two parties (Bergen, Dutta, and Walker 1992; Fama 1980). An antecedent condition which leads to agency problems between principals and agents is information asymmetry (or performance ambiguity) between the parties (Bergen, Dutta, and Walker 1992; Rao and Bergen 1992). For instance, managers (and customers) acting as principals may find it difficult to adequately monitor car mechanics whose jobs are nonprogrammable (Eisenhardt 1985) because mechanics possess specialized knowledge about a particular service.

Incomplete monitoring of car mechanics may thus result in their consciously diluting customer service in order to reap pecuniary gains. For instance, car mechanics who are compensated on the basis of a commission system may prescribe unnecessary repairs for customers thereby resulting in poor quality of delivered service. In other words, agency problems between principals (managers, customers) and their agents (mechanics) may result in customer dissatisfaction and poor service quality. Given this
backdrop, it may be worthwhile to investigate the existence and ramifications of agency problems in the automotive service sector.

A careful consideration of available evidence in the academic and trade press suggests that it is fairly common for automotive service customers to get overcharged for unnecessary services recommended by mechanics. This is because it is difficult for customers and managers (principals) to know whether mechanics (agents) are providing the correct level of service or not. For instance, a study of 62 automobile repair shops conducted by the U.S. Department of Transportation found that 53% of service charges were for needless repairs (The New York Times; May 8, 1979). In this vein, Wolinsky (1993) observes that in the car repair industry "the seller is also the mechanic who determines how much of the service is needed" by customers (p. 380) and that "this information asymmetry creates obvious incentives for opportunistic behavior by sellers" (p. 380). Likewise, Sears, the nation's largest independent automotive repair concern was forced to refund $50 each to nearly one million customers for automotive repair work that may have been unnecessary (The Wall Street Journal; October 2, 1992). Furthermore, capitalizing on publicity about automotive repair fraud, GE capital Fleet Services recently introduced and publicized a new telephone service for customers costing $49 per year which would provide reliable information to customers about car maintenance and repair problems (The Wall Street Journal; July 31, 1992).

Existing research also supports the notion that automotive service customers experience a lot of risk and ambiguity while evaluating a particular service provider. As a consequence of this ambiguity, automotive service customers are more likely to be significant complainers (Day and Bodur 1978). In a similar vein, Biehal (1983) documents how customers who experience lot of risk in choosing an automotive repair
company might rely on their past experience and information from close acquaintances to guide their choice decisions. Likewise, Iacobucci (1992) documents that both brake relining service as well as car repair service are considered to be complex purchases by customers. In sum, extant evidence which is forthcoming in the academic as well as the trade press is fairly supportive of the existence of the adverse consequences of agency problems in automotive service settings.

(b) Signaling strategies of automotive service firms

Owing to information asymmetry which customers of automotive repair service face, managers need to signal the quality of their offering to the market. In these situations, the use of signals by managers as an asymmetry reduction mechanism is widely discussed in the literature. For instance, Biehal (1983, p. 90) notes that automotive repair firms might stress certification of mechanics (mechanic's competence) and service warranties in their mass communication efforts. As an illustration, Biehal (1983) notes that an automotive service firm might use an advertising strategy which suggests that "our company gives a 90-day warranty, has experienced mechanics and does the repair on the first visit" (p. 90).

Noting the use of brand name signaling devices in the automotive service sector, Dranove and White (1987) observe how "for many auto services, such as brake and muffler repairs, the auto service industry has solved the agency problem through national branding and standardization of services" (p. 414). More recently, the Wall Street Journal (1995; March 23) notes how Sears has turned to Jiffy Lube to bring back some of the automotive services it trimmed in the wake of a scandal. In other words, Sears' choice of Jiffy Lube is perhaps designed to send a signal to customers
that the company has tied up with a reputable firm and that it will provide quality service in the future. In a related example of signaling, Grove, Fisk, and Bitner (1992) document how automotive service establishments might use their physical surroundings to signal quality to customers:

When Speedi Lube started in Seattle, Washington, the owners knew that they were offering an unfamiliar service to customers. The concept of an efficient 10-minute, no-appointment necessary, efficient car lubrication and oil change was unknown to car owners. To communicate clearly the new concept to potential customers, Speedi Lube made use of every element of physical evidence at its disposal. It communicated efficiency through crisp and clear exterior signage, tidy employee uniforms and an organized shop area painted in bright colors (p. 106).

In sum, it appears that automotive service establishments make widespread use of such signals like warranties and certification (Biehal 1983), advertising (Biehal 1983), tailored physical surroundings (Grove, Fisk, and Bitner 1992), and brand name investments (Dranove and White 1987) to signal the quality of their service to customers. By juxtaposing the adverse effects of agency problems in automotive service settings discussed earlier, with the widespread use of different signaling strategies by automotive repair firms, it appears that the context of automotive service is well suited for investigating the main research objectives of this study.

(c) Expected variation across service categories

I selected the three different service categories of transmission service, brake service, and lubrication service "within" the automotive service sector because I expected to find sufficient variability in my data for focal constructs across these categories. This expectation of uncovering sufficient variability was justified by my
reading of material in the academic and popular press as well as from insights about
the structure of automotive repair service that I gleaned from my interviews with
managers. I discuss these issues more fully in the next paragraph.

Commenting on the expected variability of price across service categories,
Nayyar and Templeton (1991) note that "10-minute oil change services are routine
services" where "price--lowest among auto service providers is posted" in contrast
with situations where customers demand more complex services (Table provided in
Appendix 1). In other words, the use of price premiums as a quality signal is expected
to be low for routinized services. Likewise, Iacobucci (1992) documents that
customers considered general car repair service to be more complex in nature than
brake relining service, suggesting thereby that customers are expected to look for
more quality cues as an automotive service becomes more complex. Likewise, Biehal
(1983) while selecting his sample noted that customers who desired preventive and
scheduled maintenance service (e.g., oil changes) perceived less risk than customers
who demanded more complex services like general repair.

While a systematic study focusing on "within category" differences in the
automotive service sector is not forthcoming, I used the preceding evidence to select
my service categories after some additional considerations that I describe next.

(d) Additional considerations

I summarily excluded from further consideration those automotive services
which were completely automated (e.g., car washes) because an agency problem (in
the sense described earlier) between a customer and a mechanic is not present. I also
excluded from consideration services like body repair because my preliminary
interviews with managers suggested that in these settings, customers seemed to be less price sensitive than they are for services like brake relining or engine repair. This is because pricing issues for automotive body repair service invariably involve insurance companies. In other words, body repair shops cater in general to customers who have been involved in a collision or an accident. In such situations, it is the insurance company which pays for the costs of repair (minus deductibles if any). Consequently, pricing decisions are negotiated between companies and insurance agents. Furthermore, any repair estimate that a body shop produces is independently verified by the concerned insurance company through the use of a standard industry software which computes costs of part and labor. I also excluded from consideration towing services because here also a majority of the towing cost is incurred by a third party (e.g., The American Automobile Association) as opposed to customers themselves. It is therefore important to consider only those services where customers directly incur costs of obtaining the service. This is because our objective is to understand how firms signal quality to final customers and not to understand how firms signal quality to constituencies like insurance firms.

Based on my discussion with managers and the available evidence in the literature, I expected that on a continuum of customer performance ambiguity ranging from "low" to "high", lubrication service would be at the low end of the continuum (Biehal 1983; Nayyar and Templeton 1991). I also expected that general car repair service like transmission service would be at the high end of the continuum and that brake service would occupy an intermediate point on the continuum (Iacobucci 1992).

A relevant question to consider at this stage is why I restricted myself to just one service sector and why I did not sample from different service sectors. The main reason as to why I chose to investigate my phenomenon in only one sector is that it
offers me some control over extraneous variation that I might otherwise not be able to explain. In other words, a service category like health care is markedly different from automotive service on a number of dimensions. First, the health care industry is subject to far greater regulatory control than a sector like automotive service. Second, the sheer size of individual firms in the health care sector is not comparable to firms in other service sectors. Finally, third party influences (e.g., insurance companies) are far greater in health care as oppose to other services. Given the preceding observations, I decided against pooling data from multiple service categories.

The automotive service context also appears well suited for investigating agency problems because of the relatively small size of responding firms (average of 11.9 employees per firm). In these small firms, managers can definitely comment about both firm characteristics like signaling strategies as well as on monitoring and control strategies. In contrast, it would be difficult to obtain any meaningful measure of agency variables by interviewing managers at the corporate level who are far removed from service providers and the actual scene of action. Furthermore, at the corporate level, managers might be in a position to provide meaningful estimates of such firm characteristics like advertising expenses, but may be totally ill equipped to comment upon store characteristics like investments in physical surroundings.

It may be noted that by focusing on just one service sector, I have perhaps sacrificed external validity in favor of obtaining internal validity. This, in turn, might have certain implications for the generalizability of my findings. However, to the extent that this study is more exploratory in nature than being confirmatory, a reliance on internal validity does not seem totally out of place (Cook and Campbell 1979). In fact, many studies dealing with agency and monitoring issues use concepts from other disciplines like economics, and as a first step researchers seem interested in finding out
whether the phenomenon of interest can be analyzed using theories borrowed from other disciplines. In this vein, it may be noted that recent studies that have studied franchising issues by using different theories (e.g., agency theory) rely either on regional samples (Agrawal and Lal 1995; Dant and Schul 1992) or on convenience samples (Eisenhardt 1985, 1989). In contrast, it is hoped that this dissertation, which employs a national sample will provide more generalizable findings than those cited earlier (Agarwal and Lal 1995; Dant and Schul 1992; Eisenhardt 1985, 1989).

**Sampling Frames**

As discussed earlier, three different sampling frames were used, corresponding to automotive transmission service (SIC code 7537-01), brake service (SIC code 7539-14) and lubrication service (SIC code 7549-03). A national mailing list obtained for each service category from American List Counsel, a commercial list broker (88 Orchard Road, Princeton NJ 08543) constituted the sampling frames for this study. Each list provided the name and address of companies, selected demographic company information (i.e., company sales and number of employees), together with the name of a prospective key informant for each company. This key informant was identified as the owner or customer service manager for each location. Each firm listing also provided a phone number for the location. The purchased list for each category consisted of 3042 names.

Given the time and resources needed to conduct a census of each list, and keeping in mind the overall sample size requirements for obtaining statistical results, the initial list for each category was trimmed in a systematic way. First, duplication (of key informant names and company names) was removed after visual inspection. It
appears that some list companies include dummy names in their mailing lists to prevent users from engaging in multiple mailing from the same list. List companies can easily verify whether a list is being used for multiple mailing if a solicitation from a company is directed to the same dummy on multiple occasions. An effort was made ex-ante to ascertain the number of such dummy companies/names in each list by contacting the list broker. The list broker reported that not more than 3% of dummy companies/names would be contained in any mailing list. Removal of duplicate names from each list resulted in 2892 names for the transmission category, 2916 names for the brake service category, and 2800 names for the lubrication service category.

An effort was also made to verify the accuracy of each mailing list. In particular, 100 names were selected at random from each list and phone calls were made to check whether the address of the company and names depicted in the list were current and correct. In the transmission service category, phone contacts could be established with 64 companies, while the corresponding numbers for the brake service category and lubrication service category were 71 and 59 respectively. While making the phone calls, a decision rule was invoked whereby I moved on to another company if I could not establish contact with a company by the fourth ring. Hence, the frequencies of contact established do not necessarily suggest that firms that could not be contacted had wrong addresses or telephone numbers. In the transmission service category, 57 firms (90.1%) reported that their address depicted on the mailing list was correct. The corresponding figures for brake service and lubrication service were 60 (84.5%) and 49 (85.7%) respectively. Given the seemingly high proportion of firms which reported that their mailing address was correct, I concluded that the mailing lists for this study were fairly accurate.
Second, I investigated whether each company's dominant line of business corresponded to the category in which it appeared. I made telephone calls to a sample of firms in each category chosen at random. In the transmission service category, I could establish contact with 57 firms while the corresponding numbers for brake service and lubrication service categories were 61 and 65. In each case, the contacted firm confirmed that they were primarily in the line of business depicted in the mailing list. Thus, I concluded that cross classification or mis-classification of firms was not a major issue.

**Questionnaire Administration**

**Key Informants**

Before the questionnaire was administered, efforts were made to identify key informants within each company. This procedure of correctly identifying a key informant is expected to result in better quality of data because only individuals who are knowledgeable about a particular phenomenon provide responses. Second, it is expected that correct identification of a key informant will also result in higher response rates because the questionnaire will appear more meaningful to the key informant.

Recall that the context of the present study calls for responses from firm managers who are conversant about (a) their customer base, and (b) company characteristics relating to the service. In other words, informants within each firm are expected to be knowledgeable about signaling practices as they relate to customers and also regarding agency/monitoring problems which they face in relation to
mechanics. In this sense, given the level at which constructs are being measured for the present study, my strategy for identifying key informants differs from procedures followed in the channels literature (John and Reve 1982; Phillips 1981). Specifically, the focus of channel studies has been on identifying informants who are knowledgeable about a dyadic phenomenon. Usually, the "other" entity about which an informant is asked to provide information is either an organization or an individual. In this study, the "other" entities about whom informants were required to provide information were "mechanics" in the service organization and a group of "final customers" instead of another specific firm or another individual. Hence, in order to identify key informants, I used two screening questions. First, during my phone conversations I asked individuals as to "how knowledgeable they were about the company's policies and procedures regarding the service" and I also enquired how long they had worked in their present position in the company.

**Questionnaire mailing**

In order to obtain a favorable response rate from each category, I first decided to establish telephone pre-contacts with potential key informants before mailing the survey instrument to them. This approach is consistent with past practices that have used the key informant method in the channels field (Heide and John 1990, 1992).

During the initial telephone calls that I had made to establish the accuracy of the mailing lists, I noted that on an average 50% to 60% of individuals who were contacted over phone would eventually agree to participate in the survey. Of this number, based on my pilot study results, I estimated that about 25% would actually respond to the survey.
Assuming that I would need an overall sample size of 250 (pooled across all categories), in order to conduct meaningful statistical tests of my hypotheses, I worked backwards and arrived at the number of firms with whom I should establish telephone pre-contacts. Specifically, I realized that an actual response of 100 per category (300 total) would provide me with a sufficient sample size from which to proceed. Given this expectation, I worked backwards and noted that if I started off by establishing contacts with 800 people in each category, roughly 400 would agree to participate. Of these 400, roughly 25% would be expected to complete the survey resulting thereby in 100 actual responses. I built in a cushion of 200 names and therefore decided that I should establish telephone pre-contacts with 1000 names in each sample (3000 in all). Accordingly, I decided to draw a random sample of 1000 names from each mailing list. In order to do so, I selected every third name from each list at random. Since each list was trimmed in order to get rid off duplicate names, by utilizing the "every third" rule, I ended up with less than 1000 names from each sample. In particular, the random sample for transmission service consisted of 965 names, while the figures for the brake and lubrication categories were 990 and 988 respectively.

A systematic procedure was followed to establish telephone contacts with each name on each list. First, a one paragraph script was prepared which introduced the researcher and described the purpose of the call. Next, a request was made to the respondent to participate in the present study. At this respondents was assured that all responses would remain confidential, and that a copy of the survey findings would be provided them. If the respondent replied in the negative, the call was terminated and the next person on the list was contacted. If the respondent replied in the affirmative, an effort was made to thank him/her for doing so. Next, he/she was asked two screening questions. First, he/she was asked about his/her title or designation.
Second, he/she was asked to rate his/her knowledge about overall company policy on a scale of ranging from 1 (not at all knowledgeable) to 7 (extremely knowledgeable). Finally, each respondent was thanked again and told that a questionnaire packet would be mailed to him/her shortly.

On an average, wherever a telephone contact could be made and if the respondent agreed to participate, the whole conversation took an average of about 3.5 minutes to complete. This figure was estimated by analyzing telephone bills for the period when calls were made. The telephone company billed me for approximately 47 hours worth of calls.

In the transmission service category, contacts could be established with 760 names (out of 965). Figures for the brake service and lubrication service categories were 715 (out of 990) and 800 (out of 988).

In the transmission service category, 514 people representing 67.6% of the contacted sample agreed to participate. The remaining 246 individuals representing 22.4% of the contacts declined either citing no reason at all or that they were not interested. Others declined saying that they were not qualified to address the issues.

For the brake service category, 443 individuals representing 61.9% of the contacted sample contacts agreed to participate in the survey. The remaining 275 individuals representing 39.1% of the contacts declined either citing no reason at all or that they were not interested. Others declined saying that they were not qualified to address the issues.

For the lubrication category, 506 individuals representing 63.2% of the contacted sample agreed to participate in the survey. The remaining 294 individuals representing 36.8% of the contacts declined either citing no reason at all, or that they
were not interested. Others declined saying that they were not qualified to address the issues.

After analyzing the responses that individuals had provided to certain screening questions, it was decided to exclude 18 respondents from the transmission category, 12 from the brake category and 26 from the lubrication service category who had earlier agreed to participate in the survey. This step was necessitated because the designations that these individuals had provided suggested that they would not qualify as key informants based on the criteria identified earlier. Specifically, these excluded individuals had mentioned their designations as either head mechanic, secretary, handyman, or janitor. Thus, it was finally decided to mail out 496 questionnaires in the transmission category, 431 questionnaires in the brake service category, and 480 questionnaires in the lubrication service category for a total of 1407 questionnaires across the three categories.

In order to ensure that responses could be properly identified with the category that they belonged to, a color coding scheme was employed. Specifically, all questionnaires pertaining to the transmission category were printed in ivory while brake and lubrication category questionnaires were printed in white and yellow respectively.

Packets containing the questionnaire, a cover letter, and a reply paid envelope were mailed to all individuals who had earlier agreed to participate in the study. Each cover letter was individually signed and was addressed to the respondent who had indicated his/her willingness to participate in the survey during the pre-contact phase. All mailing activity was completed over a five day period between August 11 and August 16 1994.
Five weeks after the initial mailing was completed, a reminder postcard was sent to all non-respondents. A total of 1201 reminder postcards (across the three categories) were mailed in the fifth and six weeks following the initial mailing. Constraints of cost and time precluded contacting non-respondents via telephone. Eight weeks after the first mailing, the survey was closed out.

Response Rates and Non Response Bias

Response Rates

In this section I discuss the response rates of this survey for each category followed by a consideration of overall response rates. Next, I compare the response rates for this survey with other surveys that have studied similar phenomenon. First, I consider the transmission category followed by the brake and lubrication categories. Results for this section are tabulated in Table 9.1.

Automotive transmission service

Of the four hundred ninety six (496) surveys that were mailed out, eighty nine (89) surveys were returned. Twenty one (21) surveys were returned as being undeliverable. Hence the effective response rate for this category is 18.7%.
Brake service

Of the four hundred thirty one (431) surveys that were mailed out, ninety eight (98) surveys were returned. Twenty six surveys (26) were returned as being undeliverable. Hence the effective response rate for this category is 24.19%.

Lubrication service

Of the four hundred and eighty (480) surveys that were mailed out, one hundred and seventeen (117) surveys were returned. Seventeen (17) surveys were returned as being undeliverable. Hence the effective response rate for this category is 25.26%.

Overall response rate across categories

Of the fourteen hundred and seven (1407) surveys that were mailed out across the three categories, a total of three hundred and four (304) surveys were returned. Overall, sixty seven (67) surveys were returned as being undeliverable. Hence the effective overall response rate for this survey is 22.6%.
Table 9.1

Assessment of Response Rates

<table>
<thead>
<tr>
<th>Category</th>
<th>Trans$^1$</th>
<th>Brake$^2$</th>
<th>Lube$^3$</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firms in sample</td>
<td>2892</td>
<td>2916</td>
<td>2800</td>
<td>8608</td>
</tr>
<tr>
<td>Firms in random sample</td>
<td>965</td>
<td>990</td>
<td>988</td>
<td>2943</td>
</tr>
<tr>
<td>Firms pre-contacted</td>
<td>760</td>
<td>715</td>
<td>800</td>
<td>2275</td>
</tr>
<tr>
<td>Firms agreeing to participate</td>
<td>514</td>
<td>443</td>
<td>506</td>
<td>1463</td>
</tr>
<tr>
<td>Firms dropped from sample$^4$</td>
<td>18</td>
<td>12</td>
<td>26</td>
<td>56</td>
</tr>
<tr>
<td>Firms targeted</td>
<td>496</td>
<td>431</td>
<td>480</td>
<td>1407 A</td>
</tr>
<tr>
<td>Surveys returned by post office as undeliverable</td>
<td>21</td>
<td>26</td>
<td>17</td>
<td>64 B</td>
</tr>
<tr>
<td>Completed Responses</td>
<td>89</td>
<td>98</td>
<td>117</td>
<td>304 C</td>
</tr>
<tr>
<td>Response Rate$^5$</td>
<td>18.7%</td>
<td>24.19%</td>
<td>25.26%</td>
<td>22.60</td>
</tr>
</tbody>
</table>

$^1$Transmission service category.

$^2$Brake service category.

$^3$Lubrication service category.

$^4$Firms with unqualified informants.

$^5$Computed as $C/(A-B)*100$
Comparison of current response rates with other studies

The response rate of 22.6% for this survey appears to be low. However, this figure compares favorably with the response rates obtained by researchers who have employed the key informant methodology in the channels area (Heide and John 1990, 1992) where response rates have varied between 20% and 27%.

It may also be instructive to compare the response rate for the present study with those figures reported by researchers who have attempted to study similar phenomenon. In this context, Eisenhardt (1985, 1989) studied agency problems in retail stores which employed 8.1 people on an average. She obtained a response rate of 56.8%. Though Eisenhart's figure is much higher than the present study, it should be kept in mind that she conducted her survey in a suburban shopping center and used a preponderance of single item scales in her survey. This is in contrast to the national survey which has been adopted here by using multi item scales.

In a recent study of agency problems in franchising arrangements, Agrawal and Lal (1995) obtained a response rate of 77%. However, this study used a telephone survey method and employed a very short questionnaire with a preponderance of single-item scales. Moreover, the survey was administered regionally. Thus, Agrawal and Lal's (1995) response rate cannot be directly compared to that obtained in the present study. Likewise, the response rate of 47.1% reported by Dant and Schul in the context of a franchising study cannot be compared to mine because Dant and Schul (1992) used a telephone survey method in a regional setting.

A study which provides a better basis for comparison was conducted by Jackson and Schuler (1992) who investigated human resources practices in service
organizations. Many concepts that these authors measured like service training and employee compensation, are similar to the ones employed by the present dissertation study. Furthermore, a national mail survey of service firms similar to the present dissertation study was used by Jackson and Schuler. Jackson and Schuler obtained a response rate of 20.5% and this figure compares favorably with the response rate obtained for this dissertation. In sum, a comparison of the response rate in the present study with those studies that have used a similar methodology (e.g., Jackson and Schuler 1992) suggests that the present response rate of 23% for this study is acceptable.

The response rate of 23% obtained in the present study is also justified in view of the rather exploratory nature of the present research. Specifically, the objective of this study is to investigate whether the phenomenon of signaling and monitoring exists in the context of automotive service. In other words, the idea is not to generalize findings across a number of service categories. In this vein, one might note that Morgan and Hunt (1994), in a recent survey of automotive tire dealers obtained a response rate of only 11%, but went on to conclude that this low response rate neither detracted from the merits of their study, nor did it violate basic philosophy of science principles (Hunt 1990) given the exploratory nature of their research.
Assessment of Non Response Bias

To investigate whether non response bias is an issue in the present research, two procedures were employed. The first procedure is an extrapolation method popularized by Armstrong and Overton (1977). The basic logic of this approach is that late respondents will most likely approach the characteristics of non respondents. Specifically, the procedure calls for dividing responses into two groups on the basis of an arbitrary cut-off date. The groups are then compared on key demographic variables. Statistically speaking, a t-test comparing the means of key demographic variables across these groups should not yield a significant statistic. In other words, we should not reject the null hypothesis of no group differences.

The second method of assessing item non-response entails comparing sample values to those of the population. Here again, a relevant t-test statistic which compares the means of key demographic variables across the two groups (e.g., sample and population) should not be significant.

In the present study both approaches described above were used to investigate non response bias. First, the total responses were divided into two groups on the basis of a cut-off date which was decided as the completion of the fourth week after the last survey was mailed out. The early responding group refers to those responses received before the cut-off date (N=170). All responses received after the fourth week were considered as belonging to the late group (N=117). Relevant t-test comparisons across the early and late groups were conducted for the variables of employee size and sales. The results of this analysis appears in Table 9.3. As can be seen from this table, we cannot reject the null hypothesis of no mean differences across the early and late responding groups for the demographic variables of "number of employees" (t=1.43,
p=0.153) and "annual sales volume" (t=1.36, p=0.174). Thus, the results of the early vs late respondent analyses suggest that non response bias is not a consideration in this study.

Further evidence for lack of non response bias is forthcoming from the results of t-tests which compared "number of employees" and "annual sales volume" for the responding sample (N=287) and the non responding sample (N=1029). The results for this analysis are depicted Table 9.4. Specifically, the null hypothesis of no mean differences across the responding and non-responding groups cannot be rejected for "number of employees" (t=1.27, p=.154) and "annual sales volume" (t=1.316, p=.168). Taken together, results of the wave analysis of Armstrong and Overton (1977) as well as those of the test comparing respondents to non respondents suggest that non response bias may not be an issue in the present study.
### Table 9.2
Non Response Bias Assessment  
(Early vs Late Respondents)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Early (N_1=170^{**})</th>
<th>Late (N_2=117^{**})</th>
<th>(t^1)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Employees</td>
<td>11.58 (13.451)</td>
<td>13.8 (19.226)</td>
<td>1.43</td>
<td>.153</td>
</tr>
<tr>
<td>Annual Sales(^2)</td>
<td>1.257 (996601.825)</td>
<td>1.067 (728515.749)</td>
<td>1.35</td>
<td>.174</td>
</tr>
</tbody>
</table>

\(^1\)Tests the null hypothesis of equal means across \(N_1\) and \(N_2\).

\(^2\)In Million $

\(^{**}\)Note that the total number of respondents in the sample analyzed here, i.e., 287 \((170+117)\) does not correspond to the total number of responses received, i.e., 304. This is because some surveys were discarded as they contained missing data about the variables of interest.
Table 9.3
Non Response Bias Assessment
(Respondents vs Non Respondents)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>t&lt;sup&gt;1&lt;/sup&gt;</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Respondents N&lt;sub&gt;1&lt;/sub&gt;=287**</td>
<td></td>
<td>Non respondents N&lt;sub&gt;2&lt;/sub&gt;=1029</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Employees</td>
<td>11.99 (16.66)</td>
<td>9.88 (14.53)</td>
<td>1.26</td>
<td>.154</td>
<td></td>
</tr>
<tr>
<td>Annual Sales&lt;sup&gt;2&lt;/sup&gt;</td>
<td>1.275 (897743.621)</td>
<td>1.250 (798213.749)</td>
<td>1.32</td>
<td>.168</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup>Tests the null hypothesis of equal means across N<sub>1</sub> and N<sub>2</sub>.

<sup>2</sup>In Million $ 

**Note that the total number of respondents in the sample analyzed here, i.e., 287 does not correspond to total number of responses received, i.e., 304. This is because some surveys were discarded as they contained missing data about the variables of interest.
Firm Characteristics

Selected demographic characteristics of the sample are depicted in table 9.3. In particular, a sizable proportion of stores in the sample (60.1%) are independently owned and operated. It is difficult to compare this figure of 60.1% with population values because the mailing list does not provide a breakdown of store ownership. In an indirect vein though, the distribution of companies does appear to represent population values quite well. For instance, from Table 9.4 it may be noted that 26.2% of companies are constituents of a national chain. I used my a priori knowledge about the identity of national chains (e.g., AAMCO Transmissions, Speedy Lube) and methodically examined the mailing list to determine whether the same proportion of national chain stores that were found in the sample could be observed in the population. My exercise yielded figures of 36%, 24% and 27% across the three categories. It should be noted that this approach of mine is crude at best because I relied on my a priori knowledge to code the identity of every store.

The average number of employees employed at each store is 12, and the average annual sales at each location is $1.25 million. As described earlier, these figures are consistent with population values as described in Table 9.2.

CHAPTER 10

ASSESSMENT OF CONSTRUCT VALIDITY

This chapter describes the procedures that I utilized for assessing construct validity of measures that were used in the survey and is organized as follows: First, I provide a psychometric perspective on construct validity by delineating its forms and also its relationship with the associated notion of reliability. Next, I outline and describe the various steps that I adopted for assessing construct validity of measures. Finally, I depict the results of my analyses.

A Perspective on Construct Validity

According to Churchill (1979), "Construct validity, which lies at the very heart of the scientific process, is most directly related to the question of what the instrument is in fact measuring--what construct, trait, or concept underlies a person's performance or score on a measure" (p. 70). In other words, constructs are latent entities which are constructed by researchers for describing and understanding an underlying phenomenon of interest. Since these constructs are latent, they can only be indirectly determined by using a set of observable measures.

The fundamental construct validity question can be phrased as follows: Given that a set of items purportedly measures a latent construct, how confident is the researcher about a correspondence between these measures and the construct in question? For instance, when a researcher measures a latent construct such as
"performance ambiguity" by using observables (e.g., measured scale items), can he or she confidently assert that these indicators a valid measure of performance ambiguity? Though this fundamental premise of construct validity is rather simple to acknowledge, investigators have to pay careful attention to the underlying psychometric processes that are related to establishing validity. More specifically, the relationship between scaling, reliability, measurement error, and validity needs to be fully explored by researchers. The following paragraphs discuss the interrelationship between validity and other psychometric concepts (scaling, reliability, measurement error).
Interrelationships Among Measurement Processes

- Establish Correspondence
  - With Latent Construct

- Assess True Score

- Record Observed Score

- Administer Scale Items

- Validity
  - Convergent
  - Discriminant
  - Nomological

- Reliability
  - Cronbach's $\alpha$
  - Test-retest

- Scaling
  - Rating scale
  - Semantic differential
  - Obtrusive measures
Let us consider the conceptual process involved in measuring a latent construct such as "performance ambiguity". This process is outlined in Figure 10.1. As a first step, a researcher specifies the domain of the construct from which items are sampled to form a scale. The process of selecting a relevant subset of items from a universal set of items is called domain sampling (Nunnally 1978). Note that the universal set is an infinite set of all possible items which relate to the latent construct. Owing to constraints of time and costs, a researcher typically selects a few representative items from this domain to form a "scale" on which respondents assign numbers to questions. This process of transforming responses into scores is called scaling. Scores obtained from scales are called "observed scores".

Before proceeding further, researchers determine the relationship of the observed score to the score which would have been obtained had all items from the infinite set (i.e., the construct domain) been administered to an infinite set of respondents across an infinite set of situations. The score on such an infinite set (of items, situations, and respondents) is called the true score. Furthermore, the relationship between the observed score (from a finite set) and the true score (from an infinite set) is called reliability. Mathematically, reliability is calculated as the ratio of the observed variance to the true variance (Churchill 1979). Note that high reliability for a set of items merely implies that the correlations between items constituting a scale reflect an underlying latent factor. In other words, if one administered a scale with high reliability across multiple situations and respondents, the amount of variance in the observed score would be low, i.e., the scale would be consistent and repeatable.

Whether a scale exhibiting high reliability actually measures the underlying construct of interest is a question of validity. For example, as Nunnally (1978) illustrates, "how far stones were tossed on one occasion might correlate highly with
how far they were tossed on another occasion, and thus, being repeatable, the measure would be highly reliable; but obviously the tossing of stones would not constitute a valid measure of intelligence" (pp 191-192). In other words, "reliability is a necessary but not sufficient condition for validity" (Nunnally 1978, p. 192).
Figure 10.2

The Construct Validation Process

Step 1
Start with initial pool of items

Step 2
Conduct EFA

Step 3
Generate a range of solutions

Step 6
Drop bad items

Step 4
Choose the best solution

Step 5
Is $\alpha$ acceptable?

Step 7
Assess Validity

Convergent

Discriminant

Nomological
A systematic procedure for assessing the reliability and validity of various multi-item scales was adopted. This procedure, which is depicted in Figure 10.2 closely follows the guidelines of Churchill (1979). In addition, I used insights from recent published research to modify and improve the procedure suggested by Churchill (1979). I discuss this procedure below.

Prior to carrying out the data analysis, I inspected all returned questionnaires in order to check for missing data. Of the 304 responses, I discarded 17 of them because these surveys did not contain data on many focal variables which were of interest. Hence, the results of the present analysis is based on 287 responses.

For assessing the construct validity of measures, I first submitted all items representing a construct to a common factor analysis. In choosing which items to pool together for inclusion in a particular common factor model, I relied on the advice provided by Gerbing and Anderson (1988). Specifically, it was decided that those items which were expected to be closely related should be included in an independent factor analysis. The preceding decision led to my selecting seven groups of variables for further analysis which I describe next.

I pooled all items pertaining to customer performance ambiguity and input uncertainty and submitted them to a "two factor" analysis because extant theory (e.g., Jones 1987) posits that these constructs represent the client-firm interface dimension. Likewise, as items representing employee performance ambiguity, formalization, and centralization were expected to be related (e.g., Bowen and Jones 1976), I submitted all variables representing these constructs to a "three factor" specification. In a similar fashion, items belonging to the constructs of specific assets, price premiums, and
advertising expenses were pooled since their corresponding underlying constructs were expected to be interrelated (e.g., Klein and Leffler 1981). Proceeding in the same fashion, and by using appropriate theory as a basis, I grouped variables pertaining to employee screening effort and customer service training (e.g., ex ante socialization efforts, per agency theory) and ran a "two factor" specification. In an analogous vein, because the constructs of service culture and customer oriented incentives represented ex-post agency monitoring efforts (see Bergen et al. 1992), I ran a "two factor" model for the relevant measures. Likewise, I grouped variables pertaining to the constructs of customer service performance and financial performance and used a "two factor" analysis procedure. Finally, I grouped variables representing certification, reputation, and price competition and ran a three factor exploratory analysis. I grouped price competition variables with those of certification and reputation based on theoretical evidence provided by Klein and Leffler (1981).

Second, I examined whether pooling variables and submitting them to a common factor analysis procedure violated statistical assumptions about this technique or not. To test for these possible violations, I inspected the Kaiser Meyer Olkin (Kaiser 1974) measure of sampling adequacy and the Bartlett Test of sphericity statistic (H0: The population correlation matrix is identity, Bartlett 1951) for each analysis. For each factor analysis, I was able to reject the Bartlett hypothesis and I also obtained high KMO values ranging from 0.78 to 0.92. Hence, I was able to infer that variables indeed shared a significant amount of common variance core and that they could be analyzed using a common factor analysis method.

Third, I used the maximum likelihood procedure and extracted a range of factor solutions for each group of variable noted earlier. For example, variables pertaining to certification, reputation, and price competition were successively
submitted to 2, 3, and 4 factor specifications respectively. By submitting items to a range of factor solutions, one can "pick" the best solution by comparing estimates (such as the overall root mean square of off diagonal elements in the reproduced correlation matrix) for each alternative model specification. After inspecting these residuals, the model with the lowest residuals may be chosen (Norusis 1985).

In the present analysis, for every group of variables, the lowest residuals corresponded to the hypothesized factor structure, as expected from theory. Furthermore, I also inspected the scree plot of each factor solution. The scree plot depicts the relationship between eigen values and the number of factors that have been extracted. In every case I observed a sharp break in the plot corresponding to the hypothesized number of factors, thereby suggesting that the number of extracted factors indeed explained a significant amount of "shared" variance among the variables.

Fourth, I inspected factor loadings in the pattern matrix of each solution. As Stevens (1986) suggests, the cut-off point for identifying a significant loading is determined by sample size as well as the need to control overall alpha (Stevens 1986, p. 344, provides these "cut-off" values). Given the present sample size, and by adopting an alpha value of 0.05, I arrived at the cut-off level of 0.46, which I chose in order to determine which variable(s) to retain for further consideration.

After inspecting the pattern matrix of factor loadings, I dropped from further analysis those variables which: (a) did not exhibit significant loadings on any one factor, and (b) which exhibited significant cross loadings.

At this point, I computed the Chronbach alpha (Chronbach 1951) value for each scale and dropped those items which exhibited poor item-to-total correlations. I
only retained for further analysis those items which had alpha values of 0.6 or greater, per recent recommendations by Peterson (1994).

I repeated the above two steps until the factor solution for each group of variables appeared to be clean (no significant cross loadings) and till all scales had acceptable reliabilities (greater than 0.6, see [Peterson 1994]).

Finally, I conducted a restricted factor analysis on each group of selected variables. Figures 10.3 thru 10.10 depict each restricted model that was analyzed. I used the EQS program (Bentler 1993) for restricting a particular variable to load only on its hypothesized latent factor. I assessed goodness-of-fit for each restricted model by using multiple criteria. Specifically, I used Average Off Diagonal Standardized Residuals (AOSR) of 0.05 or lower as evidence of good fit (Bagozzi and Yi 1988). Furthermore, I used a Comparative Fit Index (CFI) value of 0.9 or higher for assessing the degree of overall fit, as recommended by Bentler (1990). I examined convergent validity by inspecting the parameter estimates of each restricted model. Specifically, large (>0.4), positive, and statistically significant estimates (t>2) indicated that all loadings are not trivially different from zero. Finally, I assessed discriminant validity by restricting factor intercorrelations pair wise to 1 and then computing a $\chi^2$ difference statistic with 1 degree of freedom (Bagozzi and Yi 1988). A significant $\chi^2$ difference test provides evidence of discriminant validity.

In the following section, results of the restricted factor analysis which were conducted, together with a description of all items, their means, standard deviations, and alpha reliabilities are depicted in Tables 10.1 through 10.21. As may be noted from these tables, all criteria for construct validity for the various multi-item scales were satisfied. Thus, these items were retained for computing structural estimates.
The results of various structural analyses that were carried out is provided in the next chapter (Chapter 11).

**Results of Construct Validity Tests**

Results pertaining to the various construct validation tests that were carried out are depicted in Table 10.1 through Table 10.21. The various measurement models that were estimated are outlined in Figures 10.3 thru 10.9. For each combination of variables that was used in the analyses, first the overall goodness of fit results are presented. This is followed by a depiction of results pertaining to the measurement model. Finally, scale items together with their associated means, standard deviations, and reliabilities are shown.
Note:

Ovals represent latent constructs ($\zeta$)

Boxes represent measured variables ($x$)

Arrows connecting ovals represent correlations ($\phi$) among latent constructs

Arrows leading into boxes represent error for the measured variable (random and specific) ($\varepsilon$)

Arrows between boxes and ovals represent relationship between $\zeta$ and the measured variable
Measurment Model for Employee Performance Ambiguity, Formalization, and Centralization

Note:

Ovals represent latent constructs ($\xi$)
Boxes represent measured variables ($X$)
Arrows connecting ovals represent correlations ($\phi$) among latent constructs
Arrows leading into boxes represent error for the measured variable (random and specific ($e$))
Arrows between boxes and ovals represent relationship between $\xi$ and the measured variable
Figure 10.5

Measurement Model for Customer Performance Ambiguity and Input Uncertainty

Note:
- Ovals represent latent constructs ($\xi$)
- Boxes represent measured variables ($x$)
- Arcs connecting ovals represent correlations ($\delta$) among latent constructs
- Arrows leading into boxes represent error for the measured variable (random and specific) ($\epsilon$)
- Arrows between boxes and ovals represent relationship between $\xi$ and the measured variable.
Figure 10.6
Measurement Model for Price Competition, Certification, and Reputation

Note:
Ovals represent latent constructs ($\xi$)
Boxes represent measured variables ($x$)
Arrows connecting ovals represent correlations ($\phi$) among latent constructs
Arrows leading into boxes represent error for the measured variable (random and specific) ($\epsilon$)
Arrows between boxes and ovals represent relationship between $\xi$ and the measured variable
Figure 10.7
Measurement Model for Service Culture and Customer Oriented Incentives

Note:
Ovals represent latent constructs (ξ)
Boxes represent measured variables (x)
Arrows connecting ovals represent correlations (δ) among latent constructs
Arrows leading into boxes represent error for the measured variable (random and specific) (ε)
Arrows between boxes and ovals represent relationship between ξ and the measured variable
Figure 10.8

Measurement Model for Customer Service Performance and Financial Performance

Note:

- Ovals represent latent constructs (ξ).
- Boxes represent measured variables (x).
- Arcs connecting ovals represent correlations (θ) among latent constructs.
- Arrows leading into boxes represent error for the measured variable (random and specific) (ε).
- Arrows between boxes and ovals represent relationship between ξ and the measured variable.
Figure 10.9

Measurement Model for Employee Screening Effort and Service Training

Note:

Ovals represent latent constructs ($z$)
Boxes represent measured variables ($x$)
Arrows connecting ovals represent correlations ($\phi$) among latent constructs
Arrows leading into boxes represent error for the measured variable (random and specific $e$)
Arrows between boxes and ovals represent relationship between $z$ and the measured variable
Table 10.1
Overall Goodness of Fit Results
Model for Specific Assets, Advertising Intensity and Price Premium
(N=287)

<table>
<thead>
<tr>
<th>Statistic/Model Comparison</th>
<th>Value</th>
<th>p</th>
<th>df</th>
<th>Δχ²</th>
<th>Δdf</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOSRA</td>
<td>0.065</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>χ²B</td>
<td>253.5</td>
<td>&lt;0.01</td>
<td>130</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFI C</td>
<td>0.864</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NNFI D</td>
<td>0.919</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI E</td>
<td>0.929</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model Comparisons

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Value</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invest--Ad</td>
<td>82.15</td>
<td>1</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Invest-PP</td>
<td>66.78</td>
<td>1</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Ad--PP</td>
<td>51.12</td>
<td>1</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

Notes:

a Average off-diagonal squared residuals of the reproduced correlation matrix
b Tests the null hypothesis that the population covariance matrix and the covariance matrix implied by sample parameters are equal
cNormed Fit Index per Bentler and Bonnet (1980)
dNon Normed Fit Index per Bentler and Bonnet (1980)
eComparative Fit Index per Bentler (1990)
fTests the null hypothesis that the unconstrained and constrained models fit the data equally well
Table 10.2
LVSE Parameters for Measurement Modela (Factor Loadings)
Model for Specific Assets, Advertising Intensity, and Price Premium
(N=287)

<table>
<thead>
<tr>
<th>(Construct)b Parameter</th>
<th>Estimate</th>
<th>Tc</th>
</tr>
</thead>
</table>

Specific Assets (ξ1)c

| λ11 | .697 | 5.04 |
|λ12 | .626 | 7.49 |
|λ13 | .667 | 8.11 |
|λ14 | .681 | 8.34 |
|λ15 | .772 | 9.87 |
|λ16 | .722 | 8.99 |
|λ17 | .589 | 6.95 |
|λ18 | .389 | 4.19 |

Advertising Intensity (ξ2)

| λ21 | .957 | 13.71 |
|λ22 | .896 | 12.41 |
|λ23 | .689 | 8.670 |

Price Premium (ξ3)

| λ31 | .789 | 10.03 |
|λ32 | .873 | 11.51 |
|λ33 | .662 | 7.99 |
|λ14 | .560 | 6.516 |

aThese are the standardized factor loadings computed by EQS using the iteratively re-weighted generalized least squares method
bOnly parameters for latent constructs are shown
cThis statistic tests the null hypothesis that the parameter is zero
dThis parameter was fixed to 1 for determining the scale of the corresponding latent construct
eConstructs are symbolically represented as ξ.
Table 10.3

Scale Items and Reliability

Specific Assets, Advertising Intensity, and Price Premium Constructs

(N=287)

<table>
<thead>
<tr>
<th>(Construct) Items</th>
<th>$\mu^1$</th>
<th>$\sigma^2$</th>
<th>$\alpha^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Specific Assets)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We have spent significant resources for developing and displaying our company's logo to our customers</td>
<td>5.04</td>
<td>1.7</td>
<td>0.84</td>
</tr>
<tr>
<td>We have undertaken significant investments in the decor of our surroundings</td>
<td>3.99</td>
<td>2.02</td>
<td></td>
</tr>
<tr>
<td>From time to time we undertake extensive investments in the interior and exterior remodeling of our buildings</td>
<td>3.97</td>
<td>1.97</td>
<td></td>
</tr>
<tr>
<td>We have spent significant amounts of money in designing and displaying signs in our building</td>
<td>5.33</td>
<td>1.59</td>
<td></td>
</tr>
<tr>
<td>We have undertaken significant investments in our facilities dedicated to the needs of our customers</td>
<td>5.62</td>
<td>1.56</td>
<td></td>
</tr>
<tr>
<td>Selling our service has required us to develop specialized procedures and systems</td>
<td>4.37</td>
<td>2.07</td>
<td></td>
</tr>
<tr>
<td>If this particular location closed down it would be very difficult for us to recover the investments that we have made in the decor of our buildings</td>
<td>4.82</td>
<td>2.03</td>
<td></td>
</tr>
<tr>
<td>We have undertaken significant investments in modern looking equipment</td>
<td>3.11</td>
<td>1.66</td>
<td></td>
</tr>
</tbody>
</table>
Table 10.3 (Cont’d)

Scale Items and Reliability

Specific Assets, Advertising Intensity, and Price Premium Constructs

(N=287)

<table>
<thead>
<tr>
<th>(Construct) Items</th>
<th>μ¹</th>
<th>σ²</th>
<th>α³</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(Advertising Intensity)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We advertise our service on a very regular basis</td>
<td>4.82</td>
<td>2.07</td>
<td>0.82</td>
</tr>
<tr>
<td>We usually undertake large-scale advertising for promoting our service</td>
<td>5.05</td>
<td>2.03</td>
<td></td>
</tr>
<tr>
<td>We spend significant amounts of money for advertising our service</td>
<td>3.24</td>
<td>2.05</td>
<td></td>
</tr>
<tr>
<td><em>(Price Premium)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our service commands a price premium in the market</td>
<td>5.07</td>
<td>1.60</td>
<td>0.79</td>
</tr>
<tr>
<td>Our customers are willing to pay us a price premium for our service</td>
<td>4.99</td>
<td>1.58</td>
<td></td>
</tr>
<tr>
<td>The typical price that we charge for our service is considerably higher than</td>
<td>5.66</td>
<td>1.45</td>
<td></td>
</tr>
<tr>
<td>what our competitors charge for the same service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How would you describe the price of the service provided by your location?</td>
<td>3.77</td>
<td>1.65</td>
<td></td>
</tr>
</tbody>
</table>

1^Item mean  
2^Item Standard Deviation  
3^Scale Reliability (Cronbach's alpha)
<table>
<thead>
<tr>
<th>Statistic/ Model Comparison</th>
<th>Value</th>
<th>p</th>
<th>df</th>
<th>( \Delta \chi^2 \text{f} )</th>
<th>( \Delta df )</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOSR(^a)</td>
<td>.908</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \chi^2 \text{b} )</td>
<td>71.2</td>
<td>.03</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFI(^c)</td>
<td>.908</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NNFI(^d)</td>
<td>.966</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI(^e)</td>
<td>.973</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Model Comparisons**

<table>
<thead>
<tr>
<th>Comparison</th>
<th>( \chi^2 )</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amb--Formal</td>
<td>34.11</td>
<td>1</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Amb--Centr</td>
<td>22.11</td>
<td>1</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Cent--Form</td>
<td>36.17</td>
<td>1</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

\(^a\) Average off-diagonal squared residuals of the reproduced correlation matrix

\(^b\) Tests the null hypothesis that the population covariance matrix and the covariance matrix implied by sample parameters are equal

\(^c\) Normed Fit Index per Bentler and Bonnet (1980)

\(^d\) Non Normed Fit Index per Bentler and Bonnet (1980)

\(^e\) Comparative Fit Index per Bentler (1990)

\(^f\) Tests the null hypothesis that the unconstrained and constrained models fit the data equally well
Table 10.5

LVSE Parameters for Measurement Model\textsuperscript{a} (Factor Loadings)

Model for Employee Performance Ambiguity, Formalization, and Centralization (N=287)

<table>
<thead>
<tr>
<th>(Construct)\textsuperscript{b} Parameter</th>
<th>Estimate</th>
<th>T\textsuperscript{c}</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Employee performance Ambiguity (ξ₁)\textsuperscript{c}</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>λ₁₁</td>
<td>.552</td>
<td>8.05</td>
</tr>
<tr>
<td>λ₁₂</td>
<td>.450</td>
<td>6.41</td>
</tr>
<tr>
<td>λ₁₃</td>
<td>.567</td>
<td>8.28</td>
</tr>
<tr>
<td>λ₁₄</td>
<td>.621</td>
<td>9.19</td>
</tr>
<tr>
<td>λ₁₅</td>
<td>.608</td>
<td>8.97</td>
</tr>
<tr>
<td>λ₁₆</td>
<td>.589</td>
<td>8.66</td>
</tr>
</tbody>
</table>

**Formalization (ξ₂)**

| λ₂₁                                     | .404     | 5.74              |
| λ₂₂                                     | .621     | 8.86              |
| λ₂₃                                     | .823     | 11.3              |
| λ₂₄                                     | .478     | 6.82              |

**Centralization (ξ₃)**

| λ₃₁                                     | .997     | 21.53             |
| λ₃₂                                     | .589     | 10.11             |

\textsuperscript{a}These are the standardized factor loadings computed by EQS using the iteratively re-weighted generalized least squares method.
\textsuperscript{b}Only parameters for latent constructs are shown.
\textsuperscript{c}This statistic tests the null hypothesis that the parameter is zero.
\textsuperscript{d}This parameter was fixed to 1 for determining the scale of the corresponding latent construct.
\textsuperscript{e}Constructs are symbolically represented as ξ.
<table>
<thead>
<tr>
<th>(Construct) Items</th>
<th>$\mu^1$</th>
<th>$\sigma^2$</th>
<th>$\alpha^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(Employee Performance Ambiguity)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluating the performance of mechanics involves extensive monitoring by supervisors</td>
<td>3.07</td>
<td>1.88</td>
<td></td>
</tr>
<tr>
<td>Assessing the performance of mechanics is a complicated matter for supervisors</td>
<td>3.51</td>
<td>1.88</td>
<td></td>
</tr>
<tr>
<td>It is difficult for supervisors to know whether mechanics provide agreed upon service to customers</td>
<td>2.30</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>Precise standards by which to assess mechanics' performance are not readily available to supervisors</td>
<td>2.88</td>
<td>1.89</td>
<td></td>
</tr>
<tr>
<td>Evaluating the performance of mechanics is a highly subjective process for a supervisor</td>
<td>3.43</td>
<td>1.62</td>
<td></td>
</tr>
<tr>
<td>Mechanics perform so many different tasks that it is difficult for a supervisor to ascertain whether a good job is being done or not</td>
<td>2.14</td>
<td>1.44</td>
<td></td>
</tr>
<tr>
<td><em>(Formalization)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When rules and procedures regarding the service exist, they are usually written agreements between the company and mechanics</td>
<td>4.18</td>
<td>1.93</td>
<td></td>
</tr>
<tr>
<td>If a written rule does not cover some aspect of a mechanic's job, we make up</td>
<td>3.34</td>
<td>2.00</td>
<td></td>
</tr>
</tbody>
</table>

**Table 10.6**

Scale Items and Reliability

Employee Performance Ambiguity, Formalization, and Centralization Constructs

(N=287)
### Table 10.6 (Cont'd)

**Scale Items and Reliability**

**Employee Performance Ambiguity, Formalization, and Centralization Constructs**

(N=287)

<table>
<thead>
<tr>
<th>(Construct) Items</th>
<th>$\mu^1$</th>
<th>$\sigma^2$</th>
<th>$\alpha^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(Formalization)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informal rules for doing so</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written rules dealing with service quality standards are available to mechanics</td>
<td>4.24</td>
<td>2.18</td>
<td></td>
</tr>
<tr>
<td>Customer complaints are usually handled according to standard procedures</td>
<td>4.24</td>
<td>2.10</td>
<td></td>
</tr>
<tr>
<td><em>(Centralization)</em></td>
<td></td>
<td></td>
<td>0.74</td>
</tr>
<tr>
<td>In dealing with customers, mechanics have to refer even quite small matters to someone higher up for a final answer</td>
<td>3.75</td>
<td>2.16</td>
<td></td>
</tr>
<tr>
<td>Mechanics are left alone to make day-to-day decisions for dealing with customers</td>
<td>5.12</td>
<td>1.99</td>
<td></td>
</tr>
</tbody>
</table>

1 Item mean  
2 Item Standard Deviation  
3 Scale Reliability (Cronbach's alpha)
Table 10.7

Overall Goodness of Fit Results

Model for Customer Performance Ambiguity and Input Uncertainty
(N=287)

<table>
<thead>
<tr>
<th>Statistic/Model Comparison</th>
<th>Value</th>
<th>p</th>
<th>df</th>
<th>Δχ²</th>
<th>Δdf</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOSR&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.051</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>χ²&lt;sup&gt;b&lt;/sup&gt;</td>
<td>51.2</td>
<td>.002</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFI&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.923</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NNFI&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.945</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI&lt;sup&gt;e&lt;/sup&gt;</td>
<td>.960</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model Comparisons

CPA–IU 78.55 1 <.01

<sup>a</sup>Average off-diagonal squared residuals of the reproduced correlation matrix
<sup>b</sup>Tests the null hypothesis that the population covariance matrix and the covariance matrix implied by sample parameters are equal
<sup>c</sup>Normed Fit Index per Bentler and Bonnet (1980)
<sup>d</sup>Non Normed Fit Index per Bentler and Bonnet (1980)
<sup>e</sup>Comparative Fit Index per Bentler (1990)
<sup>f</sup>Tests the null hypothesis that the unconstrained and constrained models fit the data equally well
Table 10.8
LVSE Parameters for Measurement Model \(^a\) (Factor Loadings)

Model for Customer Performance Ambiguity and Input Uncertainty
\((N=287)\)

<table>
<thead>
<tr>
<th>Construct (^b) Parameter</th>
<th>Estimate</th>
<th>(T^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\lambda_{11})</td>
<td>.559</td>
<td>7.98</td>
</tr>
<tr>
<td>(\lambda_{12})</td>
<td>.612</td>
<td>8.79</td>
</tr>
<tr>
<td>(\lambda_{13})</td>
<td>.553</td>
<td>7.88</td>
</tr>
<tr>
<td>(\lambda_{14})</td>
<td>.628</td>
<td>9.03</td>
</tr>
</tbody>
</table>

Customer Performance Ambiguity \((\xi_1)^e\)

Input Uncertainty \((\xi_2)\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>(T^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\lambda_{21})</td>
<td>.599</td>
<td>8.91</td>
</tr>
<tr>
<td>(\lambda_{22})</td>
<td>.648</td>
<td>9.72</td>
</tr>
<tr>
<td>(\lambda_{23})</td>
<td>.568</td>
<td>8.39</td>
</tr>
<tr>
<td>(\lambda_{24})</td>
<td>.295</td>
<td>4.14</td>
</tr>
</tbody>
</table>

\(^a\)These are the standardized factor loadings computed by EQS using the iteratively re-weighted generalized least squares method

\(^b\)Only parameters for latent constructs are shown

\(^c\)This statistic tests the null hypothesis that the parameter is zero

\(^d\)This parameter was fixed to 1 for determining the scale of the corresponding latent construct

\(^e\)Constructs are symbolically represented as \(\xi\).
Table 10.9

Scale Items and Reliability

Customer Performance Ambiguity and Input Uncertainty Constructs

(N=287)

<table>
<thead>
<tr>
<th>(Construct)</th>
<th>Items</th>
<th>μ(^1)</th>
<th>σ(^2)</th>
<th>α(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Customer Performance Ambiguity)</td>
<td>0.66</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is difficult for customers to estimate the time or resources that it takes to provide the service</td>
<td>4.55</td>
<td>1.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers have to assume that they are getting good service from us because there is no other way they can tell</td>
<td>4.14</td>
<td>2.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It would be very time consuming for customers to check up on how well a mechanic is performing his or her job</td>
<td>4.55</td>
<td>1.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers can easily determine the amount of service that is needed by them (Reverse Coded)</td>
<td>5.40</td>
<td>1.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Input Uncertainty)</td>
<td>0.69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanics usually encounter the same problems in their day-to-day work</td>
<td>4.00</td>
<td>1.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers often come up with problems that mechanics have never encountered before</td>
<td>4.46</td>
<td>1.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The same procedures can be used by mechanics to solve all customer problems</td>
<td>5.53</td>
<td>1.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The work performed by mechanics does not vary a lot from one customer to another</td>
<td>3.23</td>
<td>1.67</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\)Item mean \hspace{1cm} \(^2\)Standard deviation \hspace{1cm} \(^3\)reliability


<table>
<thead>
<tr>
<th>Statistic/Model Comparison</th>
<th>Value</th>
<th>p</th>
<th>df</th>
<th>$\Delta \chi^2$</th>
<th>$\Delta df$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOSR&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.037</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\chi^2&lt;sup&gt;b&lt;/sup&gt;$</td>
<td>25.85</td>
<td>.36</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFI&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.961</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NNFI&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.996</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI&lt;sup&gt;e&lt;/sup&gt;</td>
<td>.997</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Model Comparisons**

| Comp--Cert | 125  | 1  | <.01 |
| Comp--Rep  | 129  | 1  | <.01 |
| Rep--Cert  | 118  | 1  | <.01 |

<sup>a</sup>Average off-diagonal squared residuals of the reproduced correlation matrix

<sup>b</sup>Tests the null hypothesis that the population covariance matrix and the covariance matrix implied by sample parameters are equal

<sup>c</sup>Normed Fit Index per Bentler and Bonnet (1980)

<sup>d</sup>Non Normed Fit Index per Bentler and Bonnet (1980)

<sup>e</sup>Comparative Fit Index per Bentler (1990)

<sup>f</sup>Tests the null hypothesis that the unconstrained and constrained models fit the data equally well
Table 10.11
LVSE Parameters for Measurement Model\(^a\) (Factor Loadings)
Model for Price Competition, Reputation, and Certification
(N=287)

<table>
<thead>
<tr>
<th>(Construct)(^b) Parameter</th>
<th>Estimate</th>
<th>(T)(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\lambda_{11})</td>
<td>.856</td>
<td>10.92</td>
</tr>
<tr>
<td>(\lambda_{12})</td>
<td>.771</td>
<td>9.94</td>
</tr>
<tr>
<td>(\text{Price Competition (~}\xi_1\text{)})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\lambda_{21})</td>
<td>.762</td>
<td>10.73</td>
</tr>
<tr>
<td>(\lambda_{22})</td>
<td>.870</td>
<td>12.41</td>
</tr>
<tr>
<td>(\lambda_{23})</td>
<td>.681</td>
<td>9.51</td>
</tr>
<tr>
<td>(\text{Certification (~}\xi_2\text{)})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\text{Reputation (~}\xi_3\text{)})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\lambda_{31})</td>
<td>.873</td>
<td>13.49</td>
</tr>
<tr>
<td>(\lambda_{32})</td>
<td>.827</td>
<td>12.58</td>
</tr>
<tr>
<td>(\lambda_{33})</td>
<td>.776</td>
<td>11.64</td>
</tr>
</tbody>
</table>

\(^a\)These are the standardized factor loadings computed by EQS using the iteratively re-weighted generalized least squares method
\(^b\)Only parameters for latent constructs are shown
\(^c\)This statistic tests the null hypothesis that the parameter is zero
\(^d\)This parameter was fixed to 1 for determining the scale of the corresponding latent construct
\(^e\)Constructs are symbolically represented as \(\xi\).
### Table 10.12

**Scale Items and Reliability**

**Price Competition, Reputation, and Certification Constructs**

(N=287)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>$\mu^1$</th>
<th>$\sigma^2$</th>
<th>$\alpha^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(Price Competition)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Our customers usually shop around for the lowest available price</td>
<td>4.12</td>
<td>2.13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If competitors lower the price for this service we have to match it</td>
<td>3.78</td>
<td>1.66</td>
<td></td>
</tr>
<tr>
<td><em>(Certification)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Awards and recognition that we have received for our service</td>
<td>5.48</td>
<td>1.88</td>
<td><strong>0.88</strong></td>
</tr>
<tr>
<td></td>
<td>Signs which depict the training and qualifications of mechanics</td>
<td>5.57</td>
<td>0.98</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Membership in Professional organizations (like AAA or ASE)</td>
<td>5.26</td>
<td>2.13</td>
<td></td>
</tr>
<tr>
<td><em>(Reputation)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quality of Service</td>
<td>4.99</td>
<td>1.78</td>
<td><strong>0.81</strong></td>
</tr>
<tr>
<td></td>
<td>Quality of Employees</td>
<td>5.03</td>
<td>2.02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quality of Management</td>
<td>5.43</td>
<td>1.99</td>
<td></td>
</tr>
</tbody>
</table>

$^1$Item mean

$^2$Item Standard Deviation

$^3$Scale Reliability (Cronbach's alpha)
Table 10.13
Overall Goodness of Fit Results
Model for Service Culture, and Customer Oriented Incentives (CUST)  
(N=287)

<table>
<thead>
<tr>
<th>Statistic/Model Comparison</th>
<th>Value</th>
<th>p</th>
<th>df</th>
<th>Δχ²</th>
<th>Δdf</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOSRa</td>
<td>.048</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>χ²b</td>
<td>208</td>
<td>&lt;.01</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFIc</td>
<td>.887</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NNFI d</td>
<td>.902</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFIe</td>
<td>.911</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model Comparisons

Cult--cust 57 1 <.01

ₐAverage off-diagonal squared residuals of the reproduced correlation matrix
₇Tests the null hypothesis that the population covariance matrix and the covariance matrix implied by sample parameters are equal
₈Normed Fit Index per Bentler and Bonnet (1980)
₉Non Normed Fit Index per Bentler and Bonnet (1980)
ₐComparative Fit Index per Bentler (1990)
₁Tests the null hypothesis that the unconstrained and constrained models fit the data equally well
Table 10.14
LVSE Parameters for Measurement Model\textsuperscript{a} (Factor Loadings)
Model for Service Culture and Customer Oriented Incentives (CUST)
(N=287)

<table>
<thead>
<tr>
<th>(\textit{Construct})\textsuperscript{b}</th>
<th>Parameter</th>
<th>Estimate</th>
<th>(T\textsuperscript{c})</th>
</tr>
</thead>
<tbody>
<tr>
<td>\textit{Service Culture} ((\xi_1))\textsuperscript{c}</td>
<td>(\lambda_{11})</td>
<td>0.68</td>
<td>5.29</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{12})</td>
<td>0.42</td>
<td>5.04</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{13})</td>
<td>0.39</td>
<td>3.68</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{14})</td>
<td>0.48</td>
<td>4.50</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{15})</td>
<td>0.48</td>
<td>4.59</td>
</tr>
<tr>
<td>\textit{Customer based incentive} ((\xi_2))</td>
<td>(\lambda_{21})</td>
<td>0.39</td>
<td>10.08</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{22})</td>
<td>0.71</td>
<td>9.26</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{23})</td>
<td>0.84</td>
<td>11.79</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{24})</td>
<td>0.88</td>
<td>12.29</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{25})</td>
<td>0.62</td>
<td>8.011</td>
</tr>
</tbody>
</table>

\textsuperscript{a}These are the standardized factor loadings computed by EQS using the iteratively reweighted generalized least squares method.
\textsuperscript{b}Only parameters for latent constructs are shown.
\textsuperscript{c}This statistic tests the null hypothesis that the parameter is zero.
\textsuperscript{d}This parameter was fixed to 1 for determining the scale of the corresponding latent construct.
\textsuperscript{e}Constructs are symbolically represented as \(\xi\).
Table 10.15
Scale Items and Reliability

Service Culture and Customer Oriented Incentives (CUST) Constructs

(N=287)

<table>
<thead>
<tr>
<th>(Construct) Items</th>
<th>µ¹</th>
<th>σ²</th>
<th>α³</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(Service Culture)</em></td>
<td></td>
<td></td>
<td>0.76</td>
</tr>
<tr>
<td>Major decisions involving our service are often made unilaterally by one group of employees (Reverse coded)</td>
<td>5.84</td>
<td>1.29</td>
<td></td>
</tr>
<tr>
<td>When customer problems occur they are treated as joint responsibilities of all employees rather than individual responsibilities</td>
<td>6.06</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>In our company mutual consultations about among employees about all aspects of the service is the norm</td>
<td>5.06</td>
<td>1.77</td>
<td></td>
</tr>
<tr>
<td>All employees are committed to working together so that the company benefits as a whole rather than one individual employee</td>
<td>4.24</td>
<td>1.38</td>
<td></td>
</tr>
<tr>
<td>Mechanics are made to understand the policies of our company</td>
<td>3.79</td>
<td>1.56</td>
<td></td>
</tr>
<tr>
<td><em>(Customer oriented Incentive)</em></td>
<td></td>
<td></td>
<td>0.85</td>
</tr>
<tr>
<td>The mechanic's record of courteous service to customers</td>
<td>3.93</td>
<td>1.54</td>
<td></td>
</tr>
<tr>
<td>The mechanic's ability to resolve customer complaints or service problems in an efficient manner</td>
<td>3.81</td>
<td>1.37</td>
<td></td>
</tr>
<tr>
<td>(Construct) Items</td>
<td>$\mu^1$</td>
<td>$\sigma^2$</td>
<td>$\alpha^3$</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>---------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>Customer oriented Incentives</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The mechanics ability to deal with unique situations and/or meets customer needs</td>
<td>6.00</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>The mechanics commitment to customers</td>
<td>5.23</td>
<td>1.61</td>
<td></td>
</tr>
<tr>
<td>Customer feedback</td>
<td>4.57</td>
<td>1.68</td>
<td></td>
</tr>
</tbody>
</table>

1 Item mean  
2 Item Standard Deviation  
3 Scale Reliability (Cronbach's alpha)
Figure 10.16

Overall Goodness of Fit Results

Model for Customer Service Performance and Financial Performance
(N=287)

<table>
<thead>
<tr>
<th>Statistic/Model Comparison</th>
<th>Value</th>
<th>p</th>
<th>df</th>
<th>$\Delta \chi^2$</th>
<th>$\Delta df$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOSR&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.951</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\chi^2$&lt;sup&gt;b&lt;/sup&gt;</td>
<td>96.95</td>
<td>&lt;.01</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFI&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.951</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NNFI&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.971</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI&lt;sup&gt;e&lt;/sup&gt;</td>
<td>.977</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Average off-diagonal squared residuals of the reproduced correlation matrix

<sup>b</sup>Tests the null hypothesis that the population covariance matrix and the covariance matrix implied by sample parameters are equal

<sup>c</sup>Normed Fit Index per Bentler and Bonnet (1980)

<sup>d</sup>Non Normed Fit Index per Bentler and Bonnet (1980)

<sup>e</sup>Comparative Fit Index per Bentler (1990)

<sup>f</sup>Tests the null hypothesis that the unconstrained and constrained models fit the data equally well

Model Comparisons

<table>
<thead>
<tr>
<th>Model Comparisons</th>
<th>Value</th>
<th>df</th>
<th>$\Delta \chi^2$</th>
<th>$\Delta df$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fin Perf--CSF</td>
<td>95</td>
<td>1</td>
<td></td>
<td></td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

Model Comparisons

Fin Perf--CSF
Table 10.17
LVSE Parameters for Measurement Model \textsuperscript{a} (Factor Loadings)

Model for Customer Service Performance and Financial Performance
(N=287)

<table>
<thead>
<tr>
<th>(Construct) \textsuperscript{b} Parameter</th>
<th>Estimate</th>
<th>(T) \textsuperscript{c}</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customer Service Performance ((\xi_1))\textsuperscript{e}</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\lambda_{11})</td>
<td>0.549</td>
<td>7.33</td>
</tr>
<tr>
<td>(\lambda_{12})</td>
<td>0.607</td>
<td>8.25</td>
</tr>
<tr>
<td>(\lambda_{13})</td>
<td>0.709</td>
<td>9.99</td>
</tr>
<tr>
<td>(\lambda_{14})</td>
<td>0.730</td>
<td>7.28</td>
</tr>
<tr>
<td>(\lambda_{15})</td>
<td>0.708</td>
<td>10.37</td>
</tr>
<tr>
<td>(\lambda_{16})</td>
<td>0.878</td>
<td>11.88</td>
</tr>
<tr>
<td>(\lambda_{17})</td>
<td>0.827</td>
<td>13.11</td>
</tr>
<tr>
<td>(\lambda_{18})</td>
<td>0.881</td>
<td>9.67</td>
</tr>
<tr>
<td><strong>Financial Performance ((\xi_2))</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\lambda_{21})</td>
<td>.740</td>
<td>10.71</td>
</tr>
<tr>
<td>(\lambda_{22})</td>
<td>.811</td>
<td>12.11</td>
</tr>
<tr>
<td>(\lambda_{23})</td>
<td>.962</td>
<td>15.46</td>
</tr>
<tr>
<td>(\lambda_{24})</td>
<td>.864</td>
<td>13.19</td>
</tr>
</tbody>
</table>

\textsuperscript{a}These are the standardized factor loadings computed by EQS using the iteratively reweighted generalized least squares method

\textsuperscript{b}Only parameters for latent constructs are shown

\textsuperscript{c}This statistic tests the null hypothesis that the parameter is zero

\textsuperscript{d}This parameter was fixed to 1 for determining the scale of the corresponding latent construct

\textsuperscript{e}Constructs are symbolically represented as \(\xi\).
Table 10.18
Scale Items and Reliability
Customer Service Performance and Financial Performance Constructs
(N=287)

<table>
<thead>
<tr>
<th>Construct</th>
<th>μ</th>
<th>σ²</th>
<th>α³</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Items</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Customer Service Performance)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsiveness to customer inquiries</td>
<td>5.97</td>
<td>1.49</td>
<td></td>
</tr>
<tr>
<td>Accuracy of repair</td>
<td>6.00</td>
<td>1.30</td>
<td></td>
</tr>
<tr>
<td>Overall customer needs</td>
<td>5.01</td>
<td>1.45</td>
<td></td>
</tr>
<tr>
<td>Timeliness of repair</td>
<td>5.23</td>
<td>1.51</td>
<td></td>
</tr>
<tr>
<td>Retaining new customers</td>
<td>4.87</td>
<td>1.82</td>
<td></td>
</tr>
<tr>
<td>Attracting new customers</td>
<td>4.68</td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td>Customer Complaint Volume (R)</td>
<td>4.37</td>
<td>1.30</td>
<td></td>
</tr>
<tr>
<td>Reliability of repairs</td>
<td>6.11</td>
<td>0.98</td>
<td></td>
</tr>
<tr>
<td>(Financial Performance)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profitability</td>
<td>5.02</td>
<td>1.30</td>
<td></td>
</tr>
<tr>
<td>Market share</td>
<td>5.16</td>
<td>1.34</td>
<td></td>
</tr>
<tr>
<td>Sales Volume</td>
<td>5.27</td>
<td>1.26</td>
<td></td>
</tr>
<tr>
<td>Sales Growth</td>
<td>5.19</td>
<td>1.18</td>
<td></td>
</tr>
</tbody>
</table>

1Item mean
2Item Standard Deviation
3Scale Reliability (Cronbach's alpha)
Table 10.19
Overall Goodness of Fit Results
Model for Employee Screening Effort and Service Training
(N=287)

<table>
<thead>
<tr>
<th>Statistic/Model Comparison</th>
<th>Value</th>
<th>p</th>
<th>df</th>
<th>Δχ²</th>
<th>Δdf</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOSR^a</td>
<td>.060</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>χ²^b</td>
<td>116.84</td>
<td>0.005</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFI^c</td>
<td>.886</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NNFI^d</td>
<td>.876</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI^e</td>
<td>.889</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model Comparisons

| SR–TR | 88 | 1 | <.01 |

^aAverage off-diagonal squared residuals of the reproduced correlation matrix
^bTests the null hypothesis that the population covariance matrix and the covariance matrix implied by sample parameters are equal
^cNormed Fit Index per Bentler and Bonnet (1980)
^dNon Normed Fit Index per Bentler and Bonnet (1980)
^eComparative Fit Index per Bentler (1990)
^fTests the null hypothesis that the unconstrained and constrained models fit the data equally well
Table 10.20
LVSE Parameters for Measurement Model\textsuperscript{a}

Model for Employee Screening Effort and Service Training
(N=287)

<table>
<thead>
<tr>
<th>(Construct)\textsuperscript{b} Parameter</th>
<th>Estimate</th>
<th>T\textsuperscript{c}</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\lambda_{11})</td>
<td>.601</td>
<td>7.24</td>
</tr>
<tr>
<td>(\lambda_{12})</td>
<td>.672</td>
<td>8.01</td>
</tr>
<tr>
<td>(\lambda_{13})</td>
<td>.773</td>
<td>8.86</td>
</tr>
<tr>
<td>(\lambda_{14})</td>
<td>.513</td>
<td>6.01</td>
</tr>
</tbody>
</table>

**Employee Screening Effort (\(\xi_1\))\textsuperscript{c}**

| \(\lambda_{21}\) | .612 | 7.22 |
| \(\lambda_{22}\) | .714 | 8.81 |
| \(\lambda_{23}\) | .728 | 9.22 |
| \(\lambda_{24}\) | .600 | 7.07 |

\textsuperscript{a}These are the standardized factor loadings computed by EQS using the iteratively re-weighted generalized least squares method

\textsuperscript{b}Only parameters for latent constructs are shown

\textsuperscript{c}This statistic tests the null hypothesis that the parameter is zero

\textsuperscript{d}This parameter was fixed to 1 for determining the scale of the corresponding latent construct

\textsuperscript{e}Constructs are symbolically represented as \(\xi\).
<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>( \mu )</th>
<th>( \sigma )</th>
<th>( \alpha )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Employee Screening Effort</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>We place a large weight on the educational qualifications of mechanics before hiring them</td>
<td>4.44</td>
<td>1.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A thorough background check of mechanics is conducted before they are hired</td>
<td>5.19</td>
<td>1.64</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We do not incur considerable costs on hiring mechanics (Reverse coded)</td>
<td>3.35</td>
<td>1.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Managers usually conduct personal interviews with mechanics before they are hired</td>
<td>4.71</td>
<td>1.88</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Even if a mechanic with considerable experience applies to us, we still undertake a thorough screening process for him or her</td>
<td>6.11</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Customer Service Training</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>We spend considerable time teaching mechanics the importance of providing superior customer service</td>
<td>5.56</td>
<td>1.44</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Our training programs help mechanics deliver superior customer service</td>
<td>5.69</td>
<td>1.73</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A new mechanic coming to us with experience still needs training in customer service</td>
<td>5.46</td>
<td>1.49</td>
<td></td>
</tr>
<tr>
<td>Construct</td>
<td>μ (^1)</td>
<td>σ (^2)</td>
<td>α (^3)</td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>---------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td><strong>Customer Service Training</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our training programs stress to mechanics the importance of achieving customer satisfaction</td>
<td>4.93</td>
<td>1.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Warranty</strong></td>
<td></td>
<td></td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Warranty on Price (0,1; offered, not offered)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warranty on Labor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warranty on Parts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unconditional Warranty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The score for warranty is a composite measure having a maximum value of 4 and a minimum value of zero.

\(^1\) Item mean  
\(^2\) Item Standard Deviation  
\(^3\) Scale Reliability (Cronbach’s alpha)
EMPIRICAL TESTS OF RESEARCH HYPOTHESES AND DISCUSSION OF RESULTS

In this chapter I focus on the empirical tests that were conducted for investigating the research hypotheses outlined in Chapter 7 and also discuss the substantive results which were obtained. The organization of this chapter is as follows. First, I discuss the analysis strategy that was used for empirically investigating the research propositions. In this context, I describe the technique of Latent Variable Structural Equations modeling (LVSE) which was employed for empirical investigation of research propositions. Second, I present results of empirical tests for those hypotheses which characterize the first level of agency relationship between managers and customers (depicted as Level 1 in Figure 7.1). Finally, results of empirical tests relating to the second level of agency relationship between managers and employees (Level 2 in Figure 7.1) are described.

Latent Variable Structural Equations Methodology

The technique of Latent Variable Structural Equations (or LVSE) modeling was originally developed by Goldberger (1973), and has been extensively used by researchers in recent years to empirically investigate social science phenomena (refer special issue on "Tests for Structural Equation Models", Sociological Methods and Research 1992). In brief, the LVSE approach "merges the logic of multiple
regression, path analysis, and confirmatory factor analysis within a single data-analytic framework" (Breckler 1990, p. 260). LVSE appears to be particularly well suited for analyzing hypothesized causal structures like the one in the present study, for a number of compelling reasons. First, this technique explicitly enables researchers to specify and empirically estimate the strength of relationships among latent variables in a model (Bollen and Long 1992). Second, unlike multiple regression, LVSE permits the simultaneous estimation of relationships among latent and observable variables in a research design. While path analysis (Duncan 1975), and some econometric approaches (Goldberger 1973) also allow a researcher to model simultaneous relationships among variables, only LVSE provides an estimate of overall fit of such models (e.g., the CFI Index [Bentler 1990]). Finally, the LVSE technique can be used by researchers to estimate the effect of measurement error in latent and observable variables on parameter estimates as well as on overall model fit. Given the well documented pervasive effect of measurement error on construct validity (Cote and Buckley 1987; Cote and Buckley 1988; Williams, Cote, and Buckley 1989), use of the LVSE method can enable investigators to model measurement error in research designs thereby enhancing scientific validity and generalizability of their findings.

In view of the relative superiority of structural equations modeling over other competing measurement approaches, the LVSE method of analysis was adopted for the present study. In the following section I describe the LVSE technique in more detail and also discuss the criteria that were used to evaluate various estimated models.
Analysis Strategy

(a) Data distribution issues

Prior to implementing the LVSE method, it is imperative that researchers determine the type of data distribution for variables included in the model. (Breckler 1980). The maximum likelihood extraction procedure assumes that variables follow a multivariate normal distribution in the population (Hayduk 1987; Mardia 1970, 1974). Hence, the use of a maximum likelihood procedure for analyzing non normal data is likely to bias the standard errors of various parameter estimates (Joreskog and Sorbom 1984). A recommended statistic for calculating multivariate normality which is provided by Mardia (1974) can be computed by using the EQS software program (Bentler 1993). If inspection reveals that data are not multivariate normal, a number of normalizing transformations of variables may be conducted in order to achieve data normality (Stevens 1986).

As an alternative to the maximum likelihood method, researchers have investigated the properties of several other extraction approaches (e.g., elliptically weighted least squares or ERLS) and their robustness to violation of the multivariate normality assumption. After evaluating a number of extraction methods, Sharma, Durvasula, and Dillon (1989) recommend that "when in doubt about data normality, one should use ERLS because the performance of ERLS is equivalent to ML for normal data and superior to that of other estimation techniques for non-normal data" (p. 230). In view of Sharma et al.'s (1989) suggestion, all estimates for the present analysis were based on the elliptically re-weighted least squares procedure (ERLS), which was implemented by using the EQS software (Bentler 1993).
(b) Overall goodness-of-fit issues

In LVSE, statistics (e.g., $\chi^2$) and indices (e.g., CFI) which assess overall fit essentially test the null hypothesis that the population covariance matrix ($\Sigma$) is equal to the sample covariance matrix ($\Sigma_t$) that is implied for a model (Bentler 1993; Bollen and Long 1992). Any statistic which is computed to evaluate model fit should therefore not reject the null hypothesis of equality between the population and sample covariance matrices (in other words, non-significant p values are desirable). A $\chi^2$ statistic which tests the preceding null hypothesis may be used to evaluate overall model fit. However, the p value associated with the likelihood $\chi^2$ statistic suffers from two major limitations which affect its ability to distinguish a well fitting model from a non-fitting one. First, as sample size increases, the $\chi^2$ statistic tends to reject the null hypothesis of equality between the population and sample covariance matrices even when a hypothesized theoretical structure truly exists in the population (Bentler and Bonnet 1980; Marsh and Balla 1988). Second, even when sample size is not an issue, mere non-significance of the $\chi^2$ statistic does not indicate the degree to which a particular hypothesized model fits the theoretical structure in the population (Gerbing and Anderson 1992). Responding to the preceding criticisms about the limitations of the $\chi^2$ statistic, a number of researchers have developed alternatives to the $\chi^2$ statistic for evaluating model fit (see Marsh, Balla, and McDonald 1988).

No clear consensus has yet emerged on the most appropriate fit index that researchers should use as an alternative to the $\chi^2$ statistic. A complete discussion of these indices and the controversies surrounding their appropriateness for evaluating fit is beyond the scope of the present study (Please refer Gerbing and Anderson 1992, and Marsh, Balla, and McDonald 1988 for good summaries on this topic). However,
researchers (Breckler 1990) have recommended that multiple fit criteria should be used to evaluate the fit of a model. These criteria are briefly described below.

An index which appears to be less sensitive to sample size than $\chi^2$ is the Comparative Fit Index (CFI) which was developed by Bentler (1990). The primacy of CFI as a fit index has recently been articulated by Gerbing and Anderson (1992) after they evaluated a multiplicity of fit indices using Monte Carlo simulations.

In addition to inspecting the CFI, researchers may also analyze the distribution of residuals in order to investigate whether a hypothesized model reproduces covariations within sampling error or not. Specifically, the distribution of residuals should be centered as close to zero as possible, and the average off-diagonal squared residuals (AOSR) should not be very large. Bentler (1993) and Bagozzi and Yi (1988) suggest that an AOSR value of 0.05 or lower indicates good model fit.

(c) Significance of parameter estimates

Software programs like EQS (Bentler 1993) and LISREL (Joreskog and Sorbom 1989) compute and display the standard error for each parameter (e.g., factor loading) together with its estimate. By dividing a particular parameter estimate by its corresponding standard error, one can obtain a $t$ statistic which tests the null hypothesis that a parameter estimate is zero. An absolute $t$-value of 1.96 suggests that parameter estimates differ non-trivially from zero.
(d) One-step versus the two-step approach

In estimating a hypothesized theoretical structure, an informed decision has to be made as to whether the measurement model (without interrelationships among latent variables) and its structural counterpart (with latent variable relationships) should be estimated separately or simultaneously. In this context Anderson and Gerbing (1988) suggest that the measurement and structural models should be estimated separately. The assumptions of Anderson and Gerbing's (1988) approach are well summarized by Fornell and Yi (1992):

First, theory and measurement are independent of each other and thus the measurement and structural models should be estimated separately. Second, measurement validity that is established in the first step (using CFA) can be extended to other model specifications (e.g., the structural model) later on. Third, the estimators of a two-step approach are (asymptotically) unbiased, consistent, and efficient. Finally, the statistical test for the measurement model is independent of the statistical test for the structural model (p.295).

Although Anderson and Gerbing's (1988) two-step recommendation has merit, Fornell and Yi (1992) have questioned some of the preceding assumptions of this approach. For instance, the assumption of independence between theory and method violates basic philosophy of science issues. Some more criticisms of this approach are described in detail by Fornell and Yi (1988). At this stage, a fuller consideration of the merits and demerits of the two-step approach does not appear germane to the objectives of this study. Given the unresolved controversy surrounding the selection of a proper approach for model testing, I decided to analyze the measurement and structural models in tandem. However, in the future, it may be instructive to analyze
the present hypothesized model by using both the one step as well as the two step approaches.

**Results of the The Signaling Model: Level 1 Agency Relationship between Managers and Customers**

The empirical model pertaining to the agency relationship between management and final customers is depicted in Figure 11.1. In this model, ovals represent latent constructs and boxes depict measured variables. Independent arrows connecting boxes with ovals denote structural relationships while arrows joining boxes with ovals represent measurement relationships. Single arrows leading into boxes and ovals represent measurement error (specific and random) in observables and latent variables respectively. All latent variables depicted in Figure 11.1 have been measured by using multiple indicators. For instance, the latent construct of customer performance ambiguity has been measured by using four indicators labeled X1 thru X4.

*Data distribution.* Prior to estimating the structural model, distribution of data was assessed by computing the Mardia's coefficient (Mardia 1970). These results are presented in Table 11.1. As may be noted from this table, the normalized value of Mardia's coefficient of 21.4 is well beyond the cutoff range of +2 and -2 recommended by Mardia (1970), thereby suggesting that variables significantly depart from a multivariate normal distribution.

In order to reduce non-normality, I deleted from further analysis those cases which significantly contributed to multivariate non-normality. Specifically, I eliminated cases with identification numbers 84, 157, 170, 241, and 282 respectively.
As such, results of all subsequent analyses pertaining to the signaling model are based on an analysis of 282 cases. As a further precaution against obtaining biased parameter estimates, I used the elliptically re-weighted least squares extraction method recommended by Sharma et al. (1989).
Table 11.1

Assessment of Multivariate Normality

Signaling Model for Level 1 Agency Relationship
(N=287)

<table>
<thead>
<tr>
<th>Multivariate Normality Estimate</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mardia's Coefficient(^a) (G2,P)</td>
<td>107.48</td>
</tr>
<tr>
<td>Normalized Value of (G2,P)</td>
<td>21.47</td>
</tr>
<tr>
<td>Mardia Based Kappa(^b)</td>
<td>0.1196</td>
</tr>
<tr>
<td>Mean Scale Univariate Kurtosis</td>
<td>0.219</td>
</tr>
</tbody>
</table>

<----------Largest Contributors to Non Normality---------->

<table>
<thead>
<tr>
<th>Case No</th>
<th>Estimate(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>1267.07</td>
</tr>
<tr>
<td>157</td>
<td>1222.17</td>
</tr>
<tr>
<td>170</td>
<td>729.17</td>
</tr>
<tr>
<td>241</td>
<td>701.17</td>
</tr>
<tr>
<td>282</td>
<td>838.47</td>
</tr>
</tbody>
</table>

\(^a\)This is computed per Mardia (1970)
\(^b\)Based on Elliptical Theory Kurtosis Estimates
\(^c\)These are estimates which contribute the most normalized multivariate kurtosis
**Goodness-of-fit.** Overall goodness-of-fit of the estimated model was evaluated by computing the $\chi^2$ statistic as well as by inspecting additional criteria like distribution of residuals. These results are depicted in table 11.2. As may be noted from this table, the estimated $\chi^2$ statistic is significant ($\chi^2 = 613.038; p < 0.001$) suggesting thereby that the hypothesized model does not reproduce the sample correlations perfectly. However, as noted earlier, the $\chi^2$ statistic is not a reliable indicator for assessing fit when sample sizes exceed 150 (Gerbing and Anderson 1992). Hence, an attempt was made to evaluate model fit by examining additional criteria like the AOSR, the CFI, the NFI, and the NNFI.

The relatively low value (0.0508) of Average Off Diagonal Standardized Residuals (AOSR) in the reproduced correlation matrix, together with the high CFI of 0.945 for the Comparative Fit Index (CFI) suggest that the present hypothesized conceptual structure provides a good fit of the model to data. The present value of AOSR is comparable to the 0.05 cut off level recommended by Bagozzi and Yi (1988), Bentler (1993), and Anderson and Gerbing (1988) for evaluating model fit. Likewise, the CFI of the present model exceeds the 0.9 level which has been recommended as evidence of good fit by Bentler (1990). Additionally, the relatively high values obtained for the Normed Fit Index (0.878), and the Non Normed Fit Index suggest that the sample covariance matrix does not differ trivially from the population covariance matrix.
### Table 11.2

**Overall Goodness of Fit Results**

_Signaling Model for Level 1 Agency Relationship_  
(N=282)

<table>
<thead>
<tr>
<th>Statistic/Index</th>
<th>Value</th>
<th>p</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOSR&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.0508</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\chi^2$&lt;sup&gt;b&lt;/sup&gt;</td>
<td>613.038</td>
<td>&lt;0.001</td>
<td>358</td>
</tr>
<tr>
<td>NFI&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.878</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NNFI&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.938</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.945</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Average off-diagonal squared residuals of the reproduced correlation matrix  
<sup>b</sup> Tests the null hypothesis that the population covariance matrix and the covariance matrix implied by sample parameters are equal  
<sup>c</sup> Normed Fit Index per Bentler and Bonnet (1980)  
<sup>d</sup> Non Normed Fit Index per Bentler and Bonnet (1980)  
<sup>e</sup> Comparative Fit Index per Bentler (1990)
Measurement model. The results of the measurement model which are depicted in Figure 11.3 indicate a good degree of correspondence between observed variables and their respective latent constructs. Specifically, each parameter estimate is positive and large, and all associated t-values are greater than 1.96 implying thereby that all factor loading estimates differ trivially from zero. For example, parameter estimates for the specific asset construct range from a low of 0.56 to a high of 0.72 with associated t values varying from 5.32 to 9.86.
Table 11.3
LVSE Parameters for Measurement Model\textsuperscript{a} (Factor Loadings)

Signaling Model for Level 1 Agency Relationship
(N=282)

<table>
<thead>
<tr>
<th>(Construct)\textsuperscript{b} Parameter</th>
<th>Estimate</th>
<th>$t$\textsuperscript{c}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Performance Ambiguity ($\xi_1$)\textsuperscript{e}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\lambda_{11}$</td>
<td>0.89</td>
<td>18.04</td>
</tr>
<tr>
<td>$\lambda_{12}$</td>
<td>0.84</td>
<td>16.40</td>
</tr>
<tr>
<td>$\lambda_{13}$</td>
<td>0.75</td>
<td>14.26</td>
</tr>
<tr>
<td>$\lambda_{14}$</td>
<td>0.77</td>
<td>12.11</td>
</tr>
<tr>
<td>Specific Assets ($\xi_2$)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\lambda_{21}$</td>
<td>0.72</td>
<td>9.86</td>
</tr>
<tr>
<td>$\lambda_{22}$</td>
<td>0.68</td>
<td>8.66</td>
</tr>
<tr>
<td>$\lambda_{23}$</td>
<td>0.61</td>
<td>9.34</td>
</tr>
<tr>
<td>$\lambda_{24}$</td>
<td>-----d</td>
<td>-----d</td>
</tr>
<tr>
<td>$\lambda_{25}$</td>
<td>0.68</td>
<td>9.60</td>
</tr>
<tr>
<td>$\lambda_{26}$</td>
<td>0.63</td>
<td>7.89</td>
</tr>
<tr>
<td>$\lambda_{27}$</td>
<td>0.56</td>
<td>5.32</td>
</tr>
<tr>
<td>$\lambda_{28}$</td>
<td>0.72</td>
<td>6.16</td>
</tr>
<tr>
<td>Advertising Intensity ($\xi_3$)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\lambda_{31}$</td>
<td>0.94</td>
<td>18.98</td>
</tr>
<tr>
<td>$\lambda_{32}$</td>
<td>-----d</td>
<td>-----d</td>
</tr>
<tr>
<td>$\lambda_{33}$</td>
<td>0.66</td>
<td>12.74</td>
</tr>
<tr>
<td>Price Premium ($\xi_4$)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\lambda_{41}$</td>
<td>0.92</td>
<td>7.49</td>
</tr>
<tr>
<td>$\lambda_{42}$</td>
<td>-----d</td>
<td>-----d</td>
</tr>
<tr>
<td>$\lambda_{43}$</td>
<td>0.57</td>
<td>6.16</td>
</tr>
<tr>
<td>$\lambda_{44}$</td>
<td>0.77</td>
<td>6.12</td>
</tr>
<tr>
<td>Certification ($\xi_5$)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\lambda_{51}$</td>
<td>0.78</td>
<td>11.86</td>
</tr>
<tr>
<td>$\lambda_{52}$</td>
<td>0.87</td>
<td>11.94</td>
</tr>
<tr>
<td>$\lambda_{53}$</td>
<td>-----d</td>
<td>-----d</td>
</tr>
</tbody>
</table>
## Table 11.3 (Cont’d)

LVSE Parameters for Measurement Modela (Factor Loadings)

**Signaling Model for Level 1 Agency Relationship**  
(N=282)

<table>
<thead>
<tr>
<th>(Construct)b Parameter</th>
<th>Estimate</th>
<th>Tc</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Firm Reputation (ξ6)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>λ61</td>
<td>0.85</td>
<td>14.49</td>
</tr>
<tr>
<td>λ62</td>
<td>0.66</td>
<td>9.92</td>
</tr>
<tr>
<td>λ63</td>
<td></td>
<td>12.40</td>
</tr>
<tr>
<td><strong>Price Competition (ξ7)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>λ71</td>
<td>0.40</td>
<td>5.68</td>
</tr>
<tr>
<td>λ72</td>
<td>0.54</td>
<td>6.23</td>
</tr>
<tr>
<td><strong>Warranty Frequency (ξ8)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>λ81</td>
<td>_____d</td>
<td>_____d</td>
</tr>
<tr>
<td><strong>Size (ξ9)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>λ91</td>
<td>_____d</td>
<td>_____d</td>
</tr>
</tbody>
</table>

---

*aThese are the standardized factor loadings computed by EQS using the iteratively re-weighted generalized least squares method  
bOnly parameters for latent constructs are shown  
cThis statistic tests the null hypothesis that the parameter is zero  
dThis parameter was fixed to 1 for determining the scale of the corresponding latent construct  
eConstructs are symbolically represented as ξ. This notation changes to η in the structural model
Table 11.4
Parameter Estimates for the Structural model
Signaling Model for Level 1 Agency Relationship
(N=282)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>$\beta^a (t)^b$</th>
<th>System $R^2c$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price Premium</td>
<td>Perf Ambiguity</td>
<td>.185 (2.28)</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>Reputation</td>
<td>.155 (2.10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Price Compt</td>
<td>.245 (2.10)</td>
<td></td>
</tr>
<tr>
<td>Advertising Intensity</td>
<td>Price Premium</td>
<td>.261 (2.34)</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Reputation</td>
<td>.155 (4.16)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Size</td>
<td>.276 (4.61)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perf Ambiguity</td>
<td>-.16 (-2.6)</td>
<td></td>
</tr>
<tr>
<td>Specific Assets</td>
<td>Price Premium</td>
<td>.134 (2.10)</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>Reputation</td>
<td>.424 (5.45)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Size</td>
<td>.223 (3.55)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perf Ambiguity</td>
<td>.092 (1.41)</td>
<td></td>
</tr>
<tr>
<td>Certification</td>
<td>Perf Ambiguity</td>
<td>.124 (1.72)</td>
<td></td>
</tr>
<tr>
<td>Warranty Frequency</td>
<td>Perf Ambiguity</td>
<td>.250 (3.82)</td>
<td>0.17</td>
</tr>
</tbody>
</table>

$^a$Standardized path coefficients
$^b$T statistic which tests the null hypothesis that the parameter estimate is zero
$^c$This is the coefficient of determination for the system of equations: computed as 1-($\varepsilon)^2$, where $\varepsilon$ is the estimate of error variance (random and specific) in the dependent variable.
Structural model. The results for the estimated structural model are depicted in Table 11.4. As may be noted from this table, customer performance ambiguity has a direct and statistically significant positive impact on price premium ($\beta = 0.185$, $t = 2.28$), thereby supporting H1. In other words, managers' perceptions of customer performance ambiguity is positively related to their use of price premium signals. This positive relationship between performance ambiguity and price premiums holds even after the direct effect of control variables like reputation ($\beta = 0.155$, $t = 2.10$) and competition ($\beta = 0.245$, $t = 2.10$) on price premiums is accounted for. Hence, managers seem to use price premium signals in a market not only because their strong reputation in the marketplace permits them to do so, but also because the use of price premiums perhaps reduces customers' ambiguity about a service. As discussed in Chapter 7, price premiums signal to a market the presence of a stream of quasi-rents, which may be appropriated in the future if a seller does not deliver on quality. Specifically, a firm which uses price premiums might experience reduced customer patronage if deterioration in the quality of a service is detected. In this vein, a price premium signal serves as a classic illustration of a self-enforcing agreement which sellers may adopt to communicate with customers in markets like those for services which are characterized by customer uncertainty (Rubin 1990).

Price premium has a significant positive impact on advertising intensity ($\beta = 0.261$, $t = 2.34$) and specific assets ($\beta = 0.134$, $t = 2.10$) thereby supporting H2 and H3(a). Support for H2 and H3(a) implies that a price premium signal cannot be sustained by a service firm in isolation. Specifically, in order to reap the benefits of price premiums, firms have to convey additional information to customers such as the amount of collateral investment that have been undertaken in sunk assets like advertising expenses and physical surroundings.
Empirical support for H2 and H3(a) is noteworthy given that I also controlled for the direct effects that firm reputation and firm size might have on advertising intensity and specific assets respectively. These hypothesized links are positive, statistically significant, and in the expected direction. For example, reputation is positively related to advertising intensity ($\beta = 0.155$, $t = 4.16$) as well as to specific assets ($\beta = 0.424$, $t = 5.45$). Likewise, firm size also exhibits a significant and positive relationship with advertising intensity ($\beta = 0.276$, $t = 4.61$) and specific assets ($\beta = 0.223$, $t = 3.55$). Hence, even after controlling for the effect of potential control variables, the results of this analysis strongly support the hypothesized interrelations between the signals of price premiums, specific assets, and advertising intensity.

The results depicted in Table 11.4 do not support H3(b). In other words, the expectation that price premiums will be more strongly related to specific assets than to advertising intensity is not supported. In the hypothesis section I had developed the argument that such a differential relationship would be expected because investments in surroundings are visible to a greater degree to customers than advertising signals. As the results of Table 11.4 suggest, the relatively large and positive standardized coefficient for the price premium $\rightarrow$ advertising intensity path ($\beta = 0.261$, $t = 2.34$) is nearly twice that of the price premium $\rightarrow$ specific assets path ($\beta = 0.134$, $t = 2.10$), thereby rejecting H3(b).

I also conducted an additional test for investigating hypothesis H3 (b). Specifically, I estimated a nested structural model in which the coefficient for the price premium $\rightarrow$ specific assets path was constrained to be equal to the corresponding $b$ coefficient for the price $\rightarrow$ premium and advertising link. A $\chi^2$ difference test between the nested model described here and the structural model estimated without this equality constraint is statistically significant ($\Delta \chi^2 = 27.23$, $\Delta df = 1$, $p < 0.01$).
Thus, the null hypothesis that the original unconstrained model and the present constrained model are equally effective in their ability to reproduce model intercorrelations is rejected. Rejection of the model comparison statistic suggests that the paths leading from price premium to specific assets and advertising intensity respectively differ significantly from one another.

The present results also indicate that performance ambiguity has no direct effect on specific assets ($\beta = 0.092$, $t = 1.41$) as hypothesized by H4. This non-significant result suggests that managers do not perceive that customers' performance ambiguity can be eliminated only by undertaking investments in specific assets. On the other hand, as described earlier, it is perhaps the combined effect of price premiums, specific assets, and advertising intensity which ameliorates customer performance ambiguity.

Contrary to the non-significant effect predicted by H5, performance ambiguity is significantly related in a negative manner to advertising intensity ($\beta = -0.16$, $t = -2.6$). This finding suggests that as managers perceive customer ambiguity for a particular service to increase, a firm will make less investments in advertising. This finding is contrary to expectations, but can be justified because advertisement for many services (e.g., transmission repair) cannot convey factual information to customers (Abernathy and Butler 1992). Hence, managers perhaps rely on the combined interplay of many signals in order to communicate with buyers about final quality.

Table 11.4 also presents the results of tests which were conducted for investigating the direct effect of performance ambiguity on warranties and certification respectively. These results support H6 which states that performance ambiguity is positively related to the use of warranties ($\beta = 0.250$, $t = 3.82$). However, the results
(β = 0.124, t = 1.72) fail to support H7 which hypothesizes a direct positive effect of performance ambiguity on certification.

Turning now to the results of some hypothesis pertaining to the effect of various control variables, we find that H8, which posits that a firm's reputation will have a significant positive impact on its use of price premium (β = 0.155, t = 2.10) is supported. Likewise, the hypothesized positive effects of reputation on specific assets and advertising intensity as described in Hypotheses H8(a) and H8(b) are also supported (β = 0.155, t = 4.16 for advertising intensity; β = 0.424, t = 5.25 for specific assets). Furthermore, the effects of company size on specific assets (β = 0.233, t = 3.55) and advertising intensity (β = 0.276, t = 4.61) suggest that H10 and H11 are also supported. In brief, hypotheses pertaining to most of the control variables that were included in the signaling model are supported by the results of the present analysis. Only results of the hypothesis test pertaining to the relationship between price competition and price premium (H9) are contrary to expectations. Specifically, the relationship between price competition in a market and a firm's use of price premiums (β = 0.245, t = 2.10) is positive and in a direction opposite to that of the hypothesized one.
Results of the The Signaling Model: Level 2 Agency Relationship between Managers and Service Providers

In this section I describe the results of the empirical tests that were conducted for investigating hypotheses pertaining to the second level of agency relationship (Level 2) between managers and service providers in a service firm. The three empirical models that were tested are depicted in Figures 11.2, 11.3, and 11.4 respectively.

The main ideas that were tested in this section are depicted in the LVSE empirical models outlined. Specifically, Figure 11.2 depicts the hypothesized effects of the specific assets signal as well as employee performance ambiguity on various agency variables like screening effort and the final dependent variable of customer service performance. Likewise, Figure 11.3 models the impact of price premiums and employee performance ambiguity on agency variables and customer service performance. Finally, in Figure 11.4, the interactive effects of advertising intensity and agency variables on customer service performance is depicted.

As a first step in conducting this analysis, an effort was made to specify a LVSE model which contained all observables of latent constructs in the model. In all, there were 57 measured variables corresponding to the 9 latent constructs being investigated. This initial model could not be estimated because the EQS program failed to achieve convergence. Even after increasing the maximum number of iterations to 500, which is the upper limit for the program, estimation of parameters could not be accomplished.

Given the possible difficulties associated with factor analyzing a 57x57 variance-covariance matrix, an effort was made to systematically reduce the number of
Figure 11.2 Empirical Model for Level 2 Agency Relationship with Specific Assets as Antecedent

Note. All error terms in observed and measured variables are omitted for clarity.
Figure 11.3 Empirical Model for Level 2 Agency Relationship with Price Premium as Antecedent

Note: All error terms in observed and measured variables are omitted for clarity.
Figure 11.4 Empirical Model for Level 2 Agency Relationship with Ad Intensity as Antecedent

Note: All error terms in observed and measured variables are omitted for clarity.
items for each construct. Such an approach, which is consistent with past research (e.g., Singh 1991, 1993) enables the estimation of models which contain a large number of observed variables. Furthermore, by avoiding the use of a pure path analytic technique, one is still able to incorporate measurement error (both random as well as specific) in latent variables and their observable indicators.

In order to obtain a reduced model specification, items belonging to the specific assets construct were summed, two at a time, and four composite indicators of this construct were obtained. Likewise, price premium was gauged by combining its respective indicators into two measures. Advertising intensity was measured by three composite indicators. Customer service training effort, and customer based incentives were assessed by using three composite indicators each, while the constructs of screening effort and employee performance ambiguity were scaled by using two measures each. Finally, customer service performance was measured by using four composite indicators.

My decision to use composite indicators was based on the strong values of reliability and validity that were obtained for each scale. Specifically, as depicted and discussed in Chapter 10, each multi-item scale exhibits sound psychometric properties of reliability, convergent validity, and discriminant validity.

As a further test of the psychometric properties of the composite measures that were used, I estimated nine different one-factor models. For each such model, composite measures comprising a construct were restricted to load on to their corresponding latent variables only. The results of these nine one-factor analyses suggest that the use of composite measures to gauge latent constructs in the present study does not materially alter the psychometric properties of each scale. For instance, I obtained CFI values ranging from 0.92 to 0.99 for the one-factor models.
Furthermore, all factor loadings were large (in excess of 0.5), and statistically significant ($t > 2$) suggesting thereby that combining items to form composite variables preserves the measurement properties of each scale.

*Data distribution issues.* I calculated Mardia's coefficient of non-normality as described earlier and deleted four cases which exhibited significant multivariate kurtosis. Hence the present analysis is based on 283 observations. Results pertaining to non-normality tests are depicted in Table 11.5.

*Agency model with specific assets as an antecedent variable (Figure 11.2)*

*Measurement model and goodness of fit.* The measurement model as well as its corresponding goodness of fit statistics are reported in Tables 11.6 and 11.7 respectively. The values depicted in the tables suggest that the present model fits the data very well (CFI = 0.95; AOSR = 0.039). Furthermore, the parameter estimates of the measurement model are large and statistically significant implying that there is a strong correspondence between latent constructs and their operational measures.
Table 11.5
Assessment of Multivariate Normality
Agency Model for Level 1 Agency Relationship with all Signaling Variables as Antecedents
(N=287)

<table>
<thead>
<tr>
<th>Multivariate Normality Estimate</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mardia's Coefficient&lt;sup&gt;a&lt;/sup&gt; (G2,P)</td>
<td>113.56</td>
</tr>
<tr>
<td>Normalized Value of (G2,P)</td>
<td>30.96</td>
</tr>
<tr>
<td>Mardia Based Kappa&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.236</td>
</tr>
<tr>
<td>Mean Scale Univariate Kurtosis</td>
<td>0.464</td>
</tr>
</tbody>
</table>

<--------------Largest Contributors to Non Normality-------------->

<table>
<thead>
<tr>
<th>Case No</th>
<th>Estimate&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>950.269</td>
</tr>
<tr>
<td>57</td>
<td>1674.149</td>
</tr>
<tr>
<td>157</td>
<td>1236.311</td>
</tr>
<tr>
<td>183</td>
<td>1925.779</td>
</tr>
</tbody>
</table>

<sup>a</sup>This is computed per Mardia (1970)
<sup>b</sup>Based on Elliptical Theory Kurtosis Estimates
<sup>c</sup>These are estimates which contribute the most normalized multivariate kurtosis
Table 11.6
LVSE Parameters for Measurement Model\textsuperscript{a} (Factor Loadings)

Agency Model for Level 2 Agency Relationship with Specific Assets as Antecedent
(N=283)

<table>
<thead>
<tr>
<th>(Construct)\textsuperscript{b} Parameter</th>
<th>Estimate</th>
<th>$T$\textsuperscript{c}</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific Assets ($\xi_1$)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\lambda_{11}$</td>
<td>0.48</td>
<td>4.65</td>
</tr>
<tr>
<td>$\lambda_{12}$</td>
<td>0.51</td>
<td>4.87</td>
</tr>
<tr>
<td>$\lambda_{13}$</td>
<td>0.42</td>
<td>4.77</td>
</tr>
<tr>
<td>$\lambda_{14}$</td>
<td>0.55</td>
<td>5.80</td>
</tr>
<tr>
<td><strong>Screening Effort ($\xi_2$)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\lambda_{21}$</td>
<td>0.68</td>
<td>7.89</td>
</tr>
<tr>
<td>$\lambda_{22}$</td>
<td>----d</td>
<td>----d</td>
</tr>
<tr>
<td><strong>Customer Service Training ($\xi_3$)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\lambda_{31}$</td>
<td>0.90</td>
<td>20.45</td>
</tr>
<tr>
<td>$\lambda_{32}$</td>
<td>----d</td>
<td>----d</td>
</tr>
<tr>
<td>$\lambda_{33}$</td>
<td>0.69</td>
<td>12.79</td>
</tr>
<tr>
<td><strong>Service Culture ($\xi_4$)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\lambda_{41}$</td>
<td>0.90</td>
<td>17.04</td>
</tr>
<tr>
<td>$\lambda_{42}$</td>
<td>----d</td>
<td>----d</td>
</tr>
<tr>
<td>$\lambda_{43}$</td>
<td>0.78</td>
<td>12.26</td>
</tr>
<tr>
<td><strong>Customer Based Pay Incentive ($\xi_5$)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\lambda_{51}$</td>
<td>0.81</td>
<td>13.14</td>
</tr>
<tr>
<td>$\lambda_{52}$</td>
<td>----d</td>
<td>----d</td>
</tr>
<tr>
<td>$\lambda_{53}$</td>
<td>0.82</td>
<td>13.30</td>
</tr>
<tr>
<td><strong>Employee Performance Ambiguity ($\xi_6$)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\lambda_{61}$</td>
<td>0.66</td>
<td>6.21</td>
</tr>
<tr>
<td>$\lambda_{62}$</td>
<td>0.78</td>
<td>8.02</td>
</tr>
<tr>
<td>Constructs b</td>
<td>Parameter</td>
<td>Estimate</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
<td>----------</td>
</tr>
<tr>
<td>Customer Service Performance ((\xi_7))</td>
<td>(\lambda_{71})</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{72})</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{73})</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{74})</td>
<td>0.54</td>
</tr>
</tbody>
</table>

a These are the standardized factor loadings computed by EQS using the iteratively re-weighted generalized least squares method.
b Only parameters for latent constructs are shown.
c This statistic tests the null hypothesis that the parameter is zero.
d This parameter was fixed to 1 for determining the scale of the corresponding latent construct.
e Constructs are symbolically represented as \(\xi\) s. This notation changes to \(\eta\) in the structural model.
### Table 11.7

**Overall Goodness of Fit Results**

*Agency Model for Level 2 Agency Relationship with Specific Assets as Antecedent*  
*(N=283)*

<table>
<thead>
<tr>
<th>Statistic/Index</th>
<th>Value</th>
<th>p</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOSR(^{a})</td>
<td>0.0390</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\chi^2$(^{b})</td>
<td>316.948</td>
<td>&lt;0.001</td>
<td>178</td>
</tr>
<tr>
<td>NFI(^{c})</td>
<td>0.887</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NNFI(^{d})</td>
<td>0.937</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI(^{e})</td>
<td>0.946</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^{a}\) Average off-diagonal squared residuals of the reproduced correlation matrix  
\(^{b}\) Tests the null hypothesis that the population covariance matrix and the covariance matrix implied by sample parameters are equal  
\(^{c}\) Normed Fit Index per Bentler and Bonnet (1980)  
\(^{d}\) Non Normed Fit Index per Bentler and Bonnet (1980)  
\(^{e}\) Comparative Fit Index per Bentler (1990)
<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent</th>
<th>$\beta^a$ (t)$^b$</th>
<th>System $R^2$ $^c$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening Effort</td>
<td>Specific Assets</td>
<td>0.374 (3.83)</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td>Emp Perf Amb</td>
<td>-0.029 (-.32)</td>
<td></td>
</tr>
<tr>
<td>Cust Service Training</td>
<td>Specific Assets</td>
<td>0.892 (12.73)</td>
<td>0.81</td>
</tr>
<tr>
<td></td>
<td>Emp Perf Amb</td>
<td>-0.078 (-1.2)</td>
<td></td>
</tr>
<tr>
<td>Service Culture</td>
<td>Specific Assets</td>
<td>0.810 (11.13)</td>
<td>0.66</td>
</tr>
<tr>
<td>Cust Based Pay</td>
<td>Specific Assets</td>
<td>0.290 (3.784)</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>Emp Perf Amb</td>
<td>0.163 (0.992)</td>
<td></td>
</tr>
<tr>
<td>Cust Service Perf</td>
<td>Screening Effort</td>
<td>0.059 (0.612)</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>Cust Serv Trng</td>
<td>0.212 (1.998)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Service Culture</td>
<td>0.089 (1.880)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cust Based Pay</td>
<td>0.050 (1.670)</td>
<td></td>
</tr>
</tbody>
</table>

$^a$Standardized path coefficients

$^b$T statistic which tests the null hypothesis that the parameter estimate is zero

$^c$This is the coefficient of determination for the system of equations: computed as $1 - (e)^2$, where e is the estimate of error variance (random and specific) in the dependent variable
Structural model. Turning to the results of the structural model which are depicted in Table 11.8, the specific assets variable has a strong, statistically significant, and positive effect on screening effort (β = 0.374, t = 3.83), service training (β = 0.892, t = 12.73), service culture (β = 0.810, t = 11.13) and customer based incentives (β = 0.290, t = 3.784) thereby providing resounding support for H21, H25, H17, and H14 respectively. However, contrary to expectations, none of the effects of employee performance ambiguity on either screening effort, service training, and customer based incentives is significant. In fact, coefficients for the paths linking the employee performance ambiguity variable to other agency variables are very low, ranging in magnitude from -0.029 to 0.163.

Of the various hypotheses (labeled H27 to H38 in Chapter 7) pertaining to the expected positive interactive effects of signaling and monitoring strategies on customer service performance, only H37 is supported. In other words, those firms which use specific assets to signal their quality commitment to final customers and also at the same time adopt a customer service training program for their employees, deliver superior service performance (β = 0.212, t = 1.998).

The hypothesized positive interactive effect of specific assets and service training on performance was further investigated by conducting a series of nested model comparisons. Specifically, a new nested model which contained a direct path from specific assets to service performance was specified and estimated. The model comparison statistics depicted in Table 11.15 suggest that the nested model does not provide a better fit to the data than the original model which does not have a direct path linking specific assets to performance. In other words, the use of customer signals alone does not result in better service performance.
The preceding results strongly support the notion that a firm's motivation to manage the agency relationship with its employees is dictated to a great extent by the commitments that managers in these firms make to final customers through the use of various signals. This preceding finding assumes more importance in view of the nonsignificant relationship between employee performance ambiguity and various other agency variables. Stated differently, managers seem to adopt safeguarding mechanisms like the use of customer service training programs for employees irrespective of their ability to manage service providers. Thus, even if managers are in a position to resolve internal agency problems which they face in relation to service providers, they will still institute safeguarding mechanisms in order to deliver on the promises that are made to final customers.

Agency model with price premium as an antecedent variable (Figure 11.3)

The empirical model which is depicted in Figure 11.3 investigates the effects of price premium and employee performance ambiguity on the various agency variables like customer service training as well as on the outcome variable of customer service performance. The measurement model pertaining to this hypothesized causal structure as well as the associated goodness of fit indices are depicted in Tables 11.9 and 11.10 respectively.

Measurement model and goodness-of-fit. As depicted in Table 11.10, the comparative fit index for this model is 0.99 and the AOSR is 0.0386. Furthermore, the parameters of the measurement model are all positive, large, and statistically significant suggesting thereby that the hypothesized model fits the data very well.
**Structural model.** The parameter estimates of the structural model which are presented in Table 11.11 suggest that the use of price premium signals has a strong, positive, and statistically significant effect on a company's decision to adopt a customer based incentive scheme for its employees ($\beta = 0.284, t = 3.64$) thereby supporting H13. Likewise the paths linking the price premium variable to service culture ($\beta = 0.886, t = 9.96$), customer service training ($\beta = 0.856, t = 9.92$) and screening effort ($\beta = 0.406, t = 4.12$) are all statistically significant thereby supporting hypotheses H16, H24, and H20 respectively.

Looking at the other results that have been depicted in Table 11.11, none of the hypothesized interactive effects of price premiums and agency variables on service performance are statistically significant. The relationship which is closest to attaining significance is the interactive effect of price premiums and customer service training on service performance ($\beta = 0.212, t = 1.68$).

The preceding results strongly support the direct effects of price premiums on various agency and monitoring arrangements in a service firm, but provide no support for the interactive effects of signaling and monitoring strategies on firm performance.
Table 11.9

LVSE Parameters for Measurement Modela (Factor Loadings)

Agency Model for Level 2 Agency Relationship with Price Premium as Antecedent
(N=283)

<table>
<thead>
<tr>
<th>Construct b</th>
<th>Parameter</th>
<th>Estimate</th>
<th>Tc</th>
</tr>
</thead>
</table>

**Price Premium (ξ₁)**

<table>
<thead>
<tr>
<th>λ₁₁</th>
<th>0.56</th>
<th>5.87</th>
</tr>
</thead>
<tbody>
<tr>
<td>λ₁₂</td>
<td>-----d</td>
<td>-----d</td>
</tr>
</tbody>
</table>

**Screening Effort (ξ₂)**

<table>
<thead>
<tr>
<th>λ₂₁</th>
<th>0.67</th>
<th>7.77</th>
</tr>
</thead>
<tbody>
<tr>
<td>λ₂₂</td>
<td>-----d</td>
<td>-----d</td>
</tr>
</tbody>
</table>

**Customer Service Training (ξ₃)**

<table>
<thead>
<tr>
<th>λ₃₁</th>
<th>0.91</th>
<th>20.12</th>
</tr>
</thead>
<tbody>
<tr>
<td>λ₃₂</td>
<td>-----d</td>
<td>-----d</td>
</tr>
<tr>
<td>λ₃₃</td>
<td>0.69</td>
<td>17.19</td>
</tr>
</tbody>
</table>

**Service Culture (ξ₄)**

<table>
<thead>
<tr>
<th>λ₄₁</th>
<th>0.89</th>
<th>6.57</th>
</tr>
</thead>
<tbody>
<tr>
<td>λ₄₂</td>
<td>-----d</td>
<td>-----d</td>
</tr>
<tr>
<td>λ₄₃</td>
<td>0.43</td>
<td>5.49</td>
</tr>
</tbody>
</table>

**Customer Based Pay Incentive (ξ₅)**

<table>
<thead>
<tr>
<th>λ₅₁</th>
<th>0.82</th>
<th>12.93</th>
</tr>
</thead>
<tbody>
<tr>
<td>λ₅₂</td>
<td>-----d</td>
<td>-----d</td>
</tr>
<tr>
<td>λ₅₃</td>
<td>0.81</td>
<td>12.09</td>
</tr>
</tbody>
</table>

**Employee Performance Ambiguity (ξ₆)**

<table>
<thead>
<tr>
<th>λ₆₁</th>
<th>0.38</th>
<th>5.19</th>
</tr>
</thead>
<tbody>
<tr>
<td>λ₆₂</td>
<td>0.44</td>
<td>7.98</td>
</tr>
</tbody>
</table>
Table 11.9 (Cont'd)

LVSE Parameters for Measurement Model\(^a\) (Factor Loadings)

Agency Model for Level 2 Agency Relationship with Price Premium as Antecedent
\(^b\)\(^c\)\(^d\)\(^e\)
(N=283)

<table>
<thead>
<tr>
<th>(Construct)(^b) Parameter</th>
<th>Estimate</th>
<th>T(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Service Performance ((\xi_7))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\lambda_{71})</td>
<td>0.59</td>
<td>6.19</td>
</tr>
<tr>
<td>(\lambda_{72})</td>
<td>0.64</td>
<td>7.24</td>
</tr>
<tr>
<td>(\lambda_{73})</td>
<td>0.74</td>
<td>8.16</td>
</tr>
<tr>
<td>(\lambda_{74})</td>
<td>0.55</td>
<td>5.88</td>
</tr>
</tbody>
</table>

\(^a\) These are the standardized factor loadings computed by EQS using the iteratively re-weighted generalized least squares method
\(^b\) Only parameters for latent constructs are shown
\(^c\) This statistic tests the null hypothesis that the parameter is zero
\(^d\) This parameter was fixed to 1 for determining the scale of the corresponding latent construct
\(^e\) Constructs are symbolically represented as \(\xi\) s. This notation changes to \(\eta\) in the structural model
Table 11.10
Overall Goodness of Fit Results
Agency Model for Level 2 Agency Relationship with Price Premium as Antecedent
(N=283)

<table>
<thead>
<tr>
<th>Statistic/Index</th>
<th>Value</th>
<th>p</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOSR&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.0386</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\chi^2&lt;sup&gt;b&lt;/sup&gt;$</td>
<td>161.459</td>
<td>&lt;0.001</td>
<td>141</td>
</tr>
<tr>
<td>NFI&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.930</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NNFI&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.988</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.990</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Average off-diagonal squared residuals of the reproduced correlation matrix
<sup>b</sup>Tests the null hypothesis that the population covariance matrix and the covariance matrix implied by sample parameters are equal
<sup>c</sup>Non-Normed Fit Index per Bentler and Bonnet (1980)
<sup>d</sup>Non-Normed Fit Index per Bentler and Bonnet (1980)
<sup>e</sup>Comparative Fit Index per Bentler (1990)
Table 11.11
Parameter Estimates for the Structural model

Agency Model for Level 2 Agency Relationship with Price Premium as Antecedent
(N=283)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>$\beta^a (t)^b$</th>
<th>System $R^2^c$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening Effort</td>
<td>Price Premium</td>
<td>0.406 (4.12)</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>Emp Perf Amb</td>
<td>-0.008 (-1.4)</td>
<td></td>
</tr>
<tr>
<td>Cust Service Training</td>
<td>Price Premium</td>
<td>0.856 (9.92)</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>Emp Perf Amb</td>
<td>-0.029 (-0.58)</td>
<td></td>
</tr>
<tr>
<td>Service Culture</td>
<td>Price Premium</td>
<td>0.886 (9.96)</td>
<td>0.78</td>
</tr>
<tr>
<td>Cust Based Pay</td>
<td>Price Premium</td>
<td>0.284 (3.64)</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>Emp Perf Amb</td>
<td>0.088 (1.26)</td>
<td></td>
</tr>
<tr>
<td>Cust Service Perf</td>
<td>Screening Effort</td>
<td>0.057 (0.56)</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>Cust Serv Trng</td>
<td>0.212 (1.68)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Service Culture</td>
<td>0.085 (0.64)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cust Based Pay</td>
<td>0.155 (1.98)</td>
<td></td>
</tr>
</tbody>
</table>

$^a$Standardized path coefficients
$^b$T statistic which tests the null hypothesis that the parameter estimate is zero
$^c$This is the coefficient of determination for the system of equations: computed as 1-$(\varepsilon)^2$, where $\varepsilon$ is the estimate of error variance (random and specific) in the dependent variable
Agency model with advertising intensity as an antecedent variable (Figure 11.4)

Measurement model. The measurement model estimates are depicted in Table 11.2 while the overall goodness of fit statistics are shown in Table 11.13. A closer look at the estimates that have been depicted in these tables suggest that the estimated model fits the data relatively well. In particular, the high CFI of 0.932 indicates good model fit. However, the AOSR value of 0.071 is higher than the cut-off level of 0.05 recommended by Bentler (1993) and Bagozzi and Yi (1988). Thus, the fit indices depicted in table 11.13 provide evidence of a moderate to good fit. On the other hand, the measurement model results that have been depicted in Table 11.12 reveal that parameter estimates are all large and statistically significant thereby suggesting that these estimates are statistically different from zero.

Structural model. The estimated parameters for the structural model are depicted in Table 11.14. These results suggest that advertising intensity has a direct, positive, and statistically significant effect only on customer service training ($\beta = 0.218$, $t = 3.08$) thereby supporting H26. In contrast to hypothesis H22, advertising intensity has a negative effect on screening effort ($\beta = .132$, $t = -.19$) which is marginally significant. It is difficult to justify this negative of advertising intensity on screening.

Of the various interactive hypotheses that were formulated, only H26 which concerns the combined effect of customer service training and advertising intensity on customer service performance ($\beta = 0.220$, $t = 2.74$) is supported. Further evidence for the strength of this test is forthcoming from the nested model comparison test which was conducted. Specifically, as Table 11.15 depicts, a nested model containing a
A direct path from advertising intensity to service performance differs trivially from the original model which did not have such a direct path. Hence, it can be assumed that advertising intensity has no direct effect on service performance.
**Table 11.12**
LVSE Parameters for Measurement Model\(^a\) (Factor Loadings)

Agency Model for Level 2 Agency Relationship with Advertising Intensity as Antecedent  
(N=283)

<table>
<thead>
<tr>
<th>(Construct)(^b)</th>
<th>Parameter</th>
<th>Estimate</th>
<th>(T^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advertising Intensity ((\xi_1)^c)</strong></td>
<td>(\lambda_{11} =)</td>
<td>0.95</td>
<td>11.22</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{12} =)</td>
<td>0.88</td>
<td>11.33</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{13} =)</td>
<td>-----d</td>
<td>-----d</td>
</tr>
<tr>
<td><strong>Screening Effort ((\xi_2))</strong></td>
<td>(\lambda_{21} =)</td>
<td>0.49</td>
<td>8.60</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{22} =)</td>
<td>-----d</td>
<td>-----d</td>
</tr>
<tr>
<td><strong>Customer Service Training ((\xi_3))</strong></td>
<td>(\lambda_{31} =)</td>
<td>0.88</td>
<td>17.07</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{32} =)</td>
<td>-----d</td>
<td>-----d</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{33} =)</td>
<td>0.67</td>
<td>11.84</td>
</tr>
<tr>
<td><strong>Service Culture ((\xi_4))</strong></td>
<td>(\lambda_{41} =)</td>
<td>0.88</td>
<td>9.62</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{42} =)</td>
<td>-----d</td>
<td>-----d</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{43} =)</td>
<td>0.42</td>
<td>6.00</td>
</tr>
<tr>
<td><strong>Customer Based Pay Incentive ((\xi_5))</strong></td>
<td>(\lambda_{51} =)</td>
<td>0.81</td>
<td>12.94</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{52} =)</td>
<td>-----d</td>
<td>-----d</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{53} =)</td>
<td>0.85</td>
<td>12.98</td>
</tr>
<tr>
<td><strong>Employee Performance Ambiguity ((\xi_6))</strong></td>
<td>(\lambda_{61} =)</td>
<td>0.38</td>
<td>5.99</td>
</tr>
<tr>
<td></td>
<td>(\lambda_{62} =)</td>
<td>0.56</td>
<td>7.81</td>
</tr>
</tbody>
</table>
Table 11.12 (Cont'd)

LVSE Parameters for Measurement Model\(^a\) (Factor Loadings)

Agency Model for Level 2 Agency Relationship with Advertising Intensity as Antecedent
(N=283)

<table>
<thead>
<tr>
<th>(Construct)(^b) Parameter</th>
<th>Estimate</th>
<th>(T^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\lambda_{71})</td>
<td>0.58</td>
<td>6.65</td>
</tr>
<tr>
<td>(\lambda_{72})</td>
<td>0.64</td>
<td>6.98</td>
</tr>
<tr>
<td>(\lambda_{73})</td>
<td>0.77</td>
<td>5.93</td>
</tr>
<tr>
<td>(\lambda_{74})</td>
<td>0.58</td>
<td>5.87</td>
</tr>
</tbody>
</table>

\(^a\)These are the standardized factor loadings computed by EQS using the iteratively re-weighted generalized least squares method  
\(^b\)Only parameters for latent constructs are shown  
\(^c\)This statistic tests the null hypothesis that the parameter is zero  
\(^d\)This parameter was fixed to 1 for determining the scale of the corresponding latent construct  
\(^e\)Constructs are symbolically represented as \(\xi\) s. This notation changes to \(\eta\) in the structural model
<table>
<thead>
<tr>
<th>Statistic/Index</th>
<th>Value</th>
<th>p</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOSR&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.071</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\chi^2$&lt;sup&gt;b&lt;/sup&gt;</td>
<td>330.730</td>
<td>&lt;0.001</td>
<td>159</td>
</tr>
<tr>
<td>NFI&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.878</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NNFI&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.899</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.932</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Average off-diagonal squared residuals of the reproduced correlation matrix

<sup>b</sup>Tests the null hypothesis that the population covariance matrix and the covariance matrix implied by sample parameters are equal

<sup>c</sup>Normed Fit Index per Bentler and Bonnet (1980)

<sup>d</sup>Non Normed Fit Index per Bentler and Bonnet (1980)

<sup>e</sup>Comparative Fit Index per Bentler (1990)
### Table 11.14

Parameter Estimates for the Structural Model

**Agency Model for Level 2 Agency Relationship with Advertising Intensity as Antecedent**

(N=283)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>β&lt;sup&gt;a&lt;/sup&gt; (t)&lt;sup&gt;b&lt;/sup&gt;</th>
<th>System R&lt;sup&gt;c&lt;/sup&gt;&lt;sup&gt;2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening Effort</td>
<td>Ad Intensity</td>
<td>-.132 (-1.9)</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td>Emp Perf Amb</td>
<td>-.034 (-.50)</td>
<td></td>
</tr>
<tr>
<td>Cust Service Training</td>
<td>Ad Intensity</td>
<td>0.218 (3.08)</td>
<td>.06</td>
</tr>
<tr>
<td></td>
<td>Emp Perf Amb</td>
<td>-.102 (-1.5)</td>
<td></td>
</tr>
<tr>
<td>Service Culture</td>
<td>Ad Intensity</td>
<td>0.077 (1.06)</td>
<td>.09</td>
</tr>
<tr>
<td>Cust Based Pay</td>
<td>Ad Intensity</td>
<td>-.042 (-.58)</td>
<td>.06</td>
</tr>
<tr>
<td></td>
<td>Emp Perf Amb</td>
<td>0.070 (0.98)</td>
<td></td>
</tr>
<tr>
<td>Cust Service Perf</td>
<td>Screening Effort</td>
<td>0.059 (0.81)</td>
<td>.08</td>
</tr>
<tr>
<td></td>
<td>Cust Serv Trng</td>
<td>0.220 (2.74)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Service Culture</td>
<td>0.096 (1.23)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cust Based Pay</td>
<td>0.166 (2.03)</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Standardized path coefficients

<sup>b</sup>T statistic which tests the null hypothesis that the parameter estimate is zero

<sup>c</sup>This is the coefficient of determination for the system of equations: computed as 1-(ε)<sup>2</sup>, where ε is the estimate of error variance (random and specific) in the dependent variable
Table 11.15

Nested Model Comparison Statistics

Interactive Effect of Signaling and Monitoring on Performance
(N=283)

<table>
<thead>
<tr>
<th>Description</th>
<th>Model Statistics</th>
<th>Comparison Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>χ²</td>
<td>df</td>
</tr>
<tr>
<td>M1 (SA only)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>316.948</td>
<td>178</td>
</tr>
<tr>
<td>M2 (SA → Perf)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>161.459</td>
<td>141</td>
</tr>
<tr>
<td>M3 (PP only)</td>
<td>330.730</td>
<td>159</td>
</tr>
<tr>
<td>M4 (PP→ Perf)</td>
<td>317.116</td>
<td>177</td>
</tr>
<tr>
<td>M5 (AI only)</td>
<td>162.108</td>
<td>140</td>
</tr>
<tr>
<td>M6 (AI→ Perf)</td>
<td>331.400</td>
<td>158</td>
</tr>
<tr>
<td>M4-M1&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.16</td>
<td>1</td>
</tr>
<tr>
<td>M5-M2</td>
<td>0.65</td>
<td>1</td>
</tr>
<tr>
<td>M6-M3</td>
<td>0.07</td>
<td>1</td>
</tr>
</tbody>
</table>

<sup>a</sup>Tests the null hypothesis of no difference between the original model and a competing nested model
<sup>b</sup>Original model without any direct path from the respective signaling variable to customer service performance
<sup>c</sup>Model with a direct path from the respective signaling variable to customer service performance
<sup>d</sup>Represents model comparison
General Discussion of Results

Given the central importance of signals as tools which can be used by managers to effectively communicate quality to customers (Bloom and Reve 1990; Mishra 1995), one would hope that unequivocal guidelines about the appropriate use of such signals are presently be available to service firms. However, a critical appraisal of the services marketing literature belies this expectation. For instance, Zeithaml (1981) notes that "the potential importance of price and physical facilities as indicators of service quality suggests that the marketer should manipulate these cues to his own advantage" (p. 197). On the other hand, Steenkamp and Hoffman (1994) state that "market signals such as advertising and price, are information that [service] firms transfer to their customers" (p. 95). Down-playing the relative importance of advertising, Abernathy and Butler (1992) observe that "word-of-mouth information about a service provider's performance and quality tends to have greater credibility and a stronger impact on the choice of a provider than advertising" (p. 399). Arguing for the primacy of advertising, Zinkhan, Johnson and Zinkhan (1992) note that "in 1990 $6.8 billion was spent advertising services on television" (p. 59) and that "unique marketing characteristics of services can be conveyed through television advertisements" (p. 65). Underscoring the importance of physical surroundings as quality cues, Ward, Bitner and Barnes (1992) observe that service "consumers may rely on external and internal environmental cues to make inferences about the products and services offered by retailers" (p. 195). In a different vein, Hart, Schleisinger, and Maher (1992) document the increasing use of warranties by observing that "a growing number of service organizations have found that one of the most effective ways to affect customers' perception of reliability is to offer an unconditional guarantee of
satisfaction” (p. 19). In sum, the existing literature in marketing has not thus far yielded a systematic body of research on the topic of marketplace signaling.

The aforementioned discussion raises some practical and unresolved questions for service firms regarding the efficacy and differential ability of marketplace signals for communicating quality. For example, should a firm use all possible cues (e.g., advertising, price, physical surroundings, warranty, certification) for signaling the quality of a service to final customers? Stated differently, are all signals expected to be equally effective in communicating quality to buyers? or are some cues (e.g., price) more salient than others (e.g., advertising)? Furthermore, should different types of service firms (e.g., low-contact/high-contact, Chase 1978; Chase and Tasnik 1983; standardized/customized, Lovelock 1983) use a common set of signaling strategies? For example, will some cues (e.g., warranties) be more effective for a relatively tangible service like fast-food (Siehl, Bowen and Pearson 1992) than for a highly intangible service like psychiatry (Jacobs and Parasuraman 1988)?

Another critical problem facing service firms is the potentially deleterious impact of incomplete monitoring (Zeithaml, Berry and Parasuraman 1988) of agents (e.g., a mechanic) on the quality of service that is signalled to customers. Signals are akin to promises which managers make to final buyers about a firm's commitment to delivering superior quality. However, in practice, service is actually delivered to customers by agents who cannot be completely and costlessly monitored by managers. This, in turn, might prompt a service provider to consciously dilute customer service in order to earn pecuniary and personal benefits at the expense of sacrificing customer satisfaction and company reputation. For example, automobile-repair mechanics at Sears who could not be fully monitored by managers prescribed unnecessary repairs for customers in order to earn higher commissions (Wall Street Journal; June 23
1992). As the preceding example illustrates, an understanding of signaling strategies cannot be divorced from the need for a systematic consideration of monitoring and control issues, or agency problems which service firms encounter in their quest for delivering superior quality.

The results reported in this section attempt to address some of the foregoing issues and provide a more focused perspective to researchers and practitioners alike for understanding signaling and monitoring strategies of service firms. First, customer performance ambiguity is positively related to the use of price premiums and is not directly related either to a firm's investments in sunk assets like physical surroundings or to a company's advertising intensity. However, customer performance ambiguity is indirectly related through the signal of price premiums to specific assets as well as to advertising intensity. The preceding observation backs up the claim made in the literature on signaling theory (Klein and Leffler 1981; Shapiro 1983) that advertising intensity as well as sunk assets justify to customers the presence of a price premium. Furthermore, the need for a firm to make collateral investments before charging a price premium from customers perhaps increases the one-time fixed costs of entry for dishonest firms. I discuss this point more fully in the next paragraph.

The finding about the interrelationship between price premiums and sunk assets ties in nicely with Rao and Bergen's (1992) research by providing an explanation as to why the mere presence of price premiums in asymmetric markets does not automatically lead to market entry by dishonest firms. In this vein, Rao and Bergen (1992) had observed that the existence of price premiums in a market will invariably attract other firms. In the long run, if such marketplace entry goes on unchecked, the efficacy of price premiums as a signaling device will be compromised because of the sheer number of firms in the marketplace and the attendant variability in service quality.
that will ensue. As the results of this research suggests, price premiums do not operate in such markets in isolation. In other words, firms which want to reap the rewards of price premiums first have to make collateral investments in such assets as physical surroundings. These assets, in turn, act as "entry deterring strategies" (Porter 1980) which prevent firms from entering "price premium" markets with gay abandon.

The results of this section also suggest why competition in many markets like those for services often takes on a "non-price" dimension which requires that incumbent firms invest in peripheral aspects of a service in order to gain competitive advantage. For instance, lawyers rent fashionable "Beverly Hills" addresses for their offices, investors talk about their connection with "Wall Street", and retailers "rent" the reputation of entrenched firms.

The findings depicted here also demonstrate that customer performance ambiguity is positively related to warranties, thereby supporting the existing evidence in the literature (Boulding and Kirmani 1993). However, customer performance ambiguity is not related to certification. Taken together, the preceding findings are in tune with Nayyar's (1990) observation that certification is perhaps not a very potent information asymmetry reduction mechanism because its use is widespread and also because such signals can be very easily "imitated" by competitors.

Finally, the results pertaining to the agency models (depicted in Figure 11.2, Figure 11.3, and Figure 11.4) conclusively prove the strong association between the signals of price premiums and specific assets with other internal agency variables (e.g., screening of service providers). In a general sense, recognition of the preceding interrelationship among signaling and agency variables strongly suggests that a firm's quest for delivering service is contingent upon its adoption and implementation of monitoring and control strategies for service providers. In this vein, the recent
discussion in marketing on the topics of "service culture", "internal marketing", and managing "moments of truth" appear directly related to agency problems which managers face in dealing with service providers.
CHAPTER 12

THEORETICAL CONTRIBUTIONS, POTENTIAL EXTENSIONS, MANAGERIAL IMPLICATIONS, AND LIMITATIONS OF THE PRESENT STUDY

Contributions to Theory

The results of this study seek to make some unique contributions to theoretical developments in the field of economics, marketing, and strategy. More specifically, findings of the various hypotheses that were empirically investigated attempt to extend the domains of (a) signaling theory, (b) transaction cost theory, (c) services marketing theory, (d) product differentiation theory, and (e) competitive strategy. Consider each of the aforementioned claims in turn:

(a) Contributions to signaling theory. Signaling theory, which basically involves the systematic study of marketplace signals that are exchanged between buyers and sellers under conditions of information asymmetry developed from the earliest contributions of Akerlof (1970), Spence (1973, 1974), and Nelson (1970, 1974) among others. A major focus of these early studies was on understanding how one party to a transaction made used of one dominant signal for communicating with the other party. For instance, in a study of job market signaling, Spence (1973) noted that employers gleaned knowledge about a job applicant by evaluating the signal of an applicant's educational background. Likewise, Nelson (1970, 1974) documented that advertising acted as a signal under conditions of information asymmetry, while

In contrast to the early research in the signaling area which focused on the study of just one dominant signal, recent research (Caillaud and Hermalin 1993; Klein and Leffler 1981; Milgrom and Roberts 1982; Rogerson 1982; Okuno-Fujiwara and Postlewaite 1993; Wolinsky 1993) has begun to recognize the fact that buyers and sellers often exchange multiple signals in order to communicate with each other. For instance, Klein and Leffler (1981) suggest that sellers might use signals like warranties, advertising levels, and price premiums to communicate with buyers. The use of such multiple signaling strategies in asymmetric markets has also been suggested by Wolinsky (1993) and Rashid (1988).

Given the prevalence and use of multiple signaling strategies by buyers and sellers in asymmetric markets, a logical question that emerges is how are these multiple signals related? In other words, does the use of a signal like a price premium reduce the importance of another signal like advertising? To the best of my knowledge, no study thus far has systematically investigated the interrelationships among these multiple signals. Furthermore, recent empirical investigations of signaling theory still focus on the study of just one dominant signal in isolation. For instance, Boulding and Kirmani (1993) studied the use of warranties, while Rao and Bergen (1992) researched the signal of price premiums.

The results of this study prove that understanding the differential importance of multiple signals is not an empirical issue and should not be treated as such. For instance, this research has conclusively proven that price premiums, advertising intensity, and sunk investments are interrelated because extant theoretical analysis justifies these linkages. In short, the relationship between price premiums and specific
assets is perhaps expected in view of the predictions made by the entry barrier literature in economics. As a first step toward our understanding of the differential importance of multiple signals in asymmetric markets, this study suggests that the signal of price premium perhaps creates a separating equilibrium between “honest” and “dishonest” firms in the marketplace.

It is important to understand multiple signaling issues from a practical standpoint too. Specifically, if firms can know which of the many different signals that they use is maximally effective for communicating with buyers, they can avoid expending resources on using other signals. In sum, this study marks a small first step toward our understanding of multiple signaling strategies and therefore makes a contribution to the literature in signaling theory.

Another contribution of this dissertation is that it provides researchers with a firm basis to investigate the performance effects of signaling theory. The implicit assumption behind signaling theory is that a firm which successfully uses signals to communicate with buyers in the marketplace will be able to attract new customers thereby reaping the benefits from increased customer patronage. An unstated expectation underlying signaling theory is that firms will essentially follow through on the promises that they make to customers through the use of signals. However, the practice of signaling, in and of itself, may not automatically lead to performance. In a "goods" producing firm, where managers have relatively more control over the production process, signaling may be directly related to performance. In contrast, in a service setting, the presence of a service provider in the production process has the potential to severely compromise quality and adversely affect performance. Therefore, performance effects of signaling strategies in service settings have to be evaluated in conjunction with the recognition and resolution of an agency problem that is invariably
present in these contexts. In this study I tried to investigate the combined effects of
signaling and monitoring strategies on service performance. Though my results are
not definitive, I believe that I have at least addressed an important theoretical issue
pertaining to the investigation of performance effects of signaling theory.

(b) Contributions to transaction cost theory. Transaction cost theory (TCA)
(Williamson 1975) seeks to address the manner in which relationships between buyers
and sellers are structured. A basic premise of this theory is that the presence of
transaction specific assets and human opportunism create a potential hold-up problem
for the vulnerable party in a transaction. Consequently, it behooves upon the
vulnerable party to develop mechanisms (e.g., vertical integration) to safeguard such
specific assets. This basic premise of TCA has received strong empirical support in a
number of recent studies (e.g., Heide and John 1990, 1992).

Although the basic predictions of TCA seem to have been borne out in
empirical research, we may also expect that one party to a transaction unilaterally
invests in "sunk" assets in order to signal the strength of his or her commitment to
another party. For example, in the context of franchisor-franchisee relationships,
Lafontaine (1993) observes that franchisors usually signal their honest intentions (e.g.,
continual downstream sales and marketing support) to franchisees by charging them
high royalty rates. A high royalty rate may act as a signal of franchisor commitment
because the franchisee might conclude that lower sales will decrease a franchisor's
potential revenue. In particular, royalty on sales provides a franchisor with a steady
stream of economic rents. This potential revenue stream prevents the franchisor from
withdrawing support to the franchisee after the relationship has been initiated.
However, when a franchisor does not have a strong reputation (like McDonald's or
Burger King), there may be no credible basis for a franchisee to translate a signal of
high royalty into an expectation of future honest behavior on the franchisor's part. In practice however, this possibility is negated because those reputationless franchisors who charge high royalty rates also own and operate many outlets. Such investments in company owned stores send a strong signal to the franchisee that the franchisor is committed to staying in the market for some time to come and is not a fly-by-night operator who is merely pursuing short term gains by maximizing revenues from initial licensing fees. As the preceding example illustrates, unilateral investments in sunk assets might therefore also signal a party's commitment to a long term relationship.

The preceding illustration about unilateral investments is also supported in recent research by Weiss and Anderson (1992) who note how exchange partners might make pledges of support to another party in a transaction. The results of the present study suggest that many service firms perhaps invest unilaterally in sunk assets in order to signal their long term commitment to providing quality in the marketplace. As such, the findings reported in this study perhaps make a contribution to theory development in the transaction cost area.

(c) Contributions to services marketing theory. In a telling observation about the state of theory development in services marketing, Hoffman and Steenkamp (1994) note:

We believe that if services marketing is to attract attention as a topic of academic inquiry, the field must move from exploratory studies toward empirical work based on rigorous theory (p. 106).

Hoffman and Steenkamp (1994) observe that most studies in the services area have been conducted in a rather ad-hoc fashion without regard to theory development. Thus, these atheoretical studies have spawned a host of scattered and fragmented research on a variety of topics like physical surroundings, tangibility, service quality,
etc. Consequently, it is difficult for a researcher to integrate this diverse body of literature into a cohesive theory.

The findings of this study about the primacy of sunk asset signals in service settings provide a different perspective to researchers on the motivation behind a firm's decision to invest in the physical surroundings. As noted in the section which developed the conceptual model for this dissertation, one theoretical explanation for managing physical surroundings is psychological. In other words, researchers (Bitner 1992; Hui and Bateson 1991) have argued that ambient conditions affect customers physiologically and that signs and symbols in the physical surrounding of a service often acts a quality cues for customers. However, the results of the present study suggest that managers consciously design physical surroundings in order to signal to customers the presence of sizable sunk investments, which justifies the existence of price premiums as quality signals.

This research, which investigated the interactive effects of signaling and monitoring strategies on performance is also able to shed some light on the current debate surrounding the appropriate conceptualization of the service quality construct. This debate has not yet conclusively resolved whether expectations as well as perceptions about a service are weighted equally by customers in arriving at judgements about quality. From the results of this study it would appear that a firm's signaling strategy serves to affect customers' expectations about a service, while a firm's resolution of the agency relationship that it faces with respect to service providers affects actual performance. Thus, service quality is perhaps affected both by expectations as well as by perceptions.

(d) Contribution to product differentiation theory. In a recent article, Carpenter, Glazer, and Nakomoto (1994) note how firms might differentiate their
products in the marketplace on the basis of irrelevant attributes. Specifically, the authors note that "if judgements about brand value depend on the information available to the consumer—that is, preferences are context dependent—competition can take on an entirely different character" because "firms may attempt to elevate the importance of one attribute over another or add distinctive but irrelevant attributes to shift competition" (p. 348). For example, a brand like "Folgers Crystals" engages in positioning by irrelevant attributes because the attribute of "crystals" is perhaps more relevant for brewed coffee. Yet, customers expect that the "Folgers Crystals" brand will taste good.

The findings of my research seem to generally support Carpenter et al.'s (1994) position because in a service setting, competition takes on many non-price dimensions like investments in physical surroundings of a service which do not directly yield any customer benefit. Successfully managing these pieces of irrelevant attributes may therefore bestow a service firm with competitive advantage in the marketplace.

(e) Contributions to strategic management. The entry barrier literature in strategy (e.g., Porter 1980) discusses how firms might prevent market entry of rivals by adopting an entry deterring price. In a related vein, economists have also studied how a firm's advertising level may inhibit market entry by other firms. However, the results of the present study suggest that firms might increase the one-time fixed costs of entry for other firms by investing in sunk assets. Thus, in a limited way, this research also speaks to some issues pertaining to the entry barrier literature discussed in strategic management.
Potential Extensions

By using the findings of this study as a starting point, researchers might be able to pursue several interesting ideas in the future. First, the investigation of multiple signaling strategies may be conducted from the customer side of the relationship and results may then be compared with the ones obtained here. It might well be possible that buyers and sellers harbor fundamentally different views about the differential impact of multiple signals. In Wright's (1986) terminology, buyers and sellers might have different schemas about signaling which can be fruitfully explored by researchers.

Second, the present study can be conducted across multiple service settings in order to investigate whether the present findings are sufficiently generalizable or not. Such an extension should concern itself with an investigation across service settings that vary systematically along the key concepts that have been discussed here.

Third, researchers might incorporate the study of other signals like organization dress (Rafaeli 1993) that sellers might use to convince buyers of quality. In a related vein, more work on measuring the concept of service reputation (Weigelt and Camerer 1986) is called for. It is possible that service reputation itself acts as a strong quality signal. Yet, what exactly constitutes service reputation has not been systematically studied. Previous research (Rao and Bergen 1992) as well as the present study assume that a concept like service reputation is endogenous as far as the market is concerned. However, service reputation might be influenced by such factors as organizational history and other factors. For instance, in certain markets where there are rating organizations like JD Powers or even Consumer Reports, market reputation is fairly easily determined. Hence, for markets where such organizations do not exist, how should reputation be actually measured?
Marketers can also study the interplay of various interpersonal determinants and agency factors on service delivery. For instance, service performance is surely influenced by such factors like a service provider's role clarity. These psychological constructs can be systematically incorporated in any model which seeks to extend the present study.

Researchers can also incorporate the concepts of trust and bonding into the present conceptual model. Following from agency theory, this research assumes that service providers if left to themselves, will always dilute service and that a proper resolution of agency relationships is the *sine qua non* for delivering quality. However, quality dilution might not occur if there is a bond between final customers and service providers (Crosby, Evans, and Cowles 1990).

Finally, an interesting area for researchers to explore is a setting where agency problems between managers and employees are absent, or a setting where managers also provide the service to customers. A case in point would be firms like Avis and United Airlines where employees are also the owners. Findings from such a setting where the employee–ownership role is fused together, might then be contrasted with findings from other settings (like the present one) where employee-manager agency problems are pervasive. A priori, one would expect that the quality of service delivered by "owner employee" firms shall exceed those of conventional firms.
Managerial Implications

Before discussing the implications of this study for advancing managerial practice, it should be noted that the research reported here has adopted only the seller's perspective. To this extent, I cannot possibly state that the evidence obtained with regard to the interrelationships among various signals parallels the view held by customers. However, one might argue that if certain signaling practices are indeed present in an industry, managers have learnt from experience and therefore know that certain strategies work in the market. In other words, if the signal of price premium is actually being used in an industry, then it does communicate some information to customers. If it doesn't, then this signal would not be valued by customers and over time a firm would cease to use it altogether. Furthermore, even though this data base does not contain customers' perceptions, managers can still learn from industry practices, i.e., they can know how other firms are communicating with customers in the marketplace.

The results of this study suggest that managers can use the price premium signal to successfully differentiate their services in the marketplace only after they have invested in commensurate collateral assets like those of physical surroundings. Furthermore, given the demonstrated strong effect of customer service training on performance, managers should adopt such programs for their service providers. The importance of service training reported in this research ties in very well with the current literature in marketing which models the relationship between quality enhancement programs and financial performance (Rust et al. 1995). In this vein, it may be noted that managers are generally wary of investing in quality programs because performance effects of these programs have not been well documented. In
this vein, the interactive model that was tested in this research proves that customer service training strongly enhances a firm's ability to achieve superior performance. Hence, the results reported here are in tune with Rust et al's (1995) findings about a positive link between investment in quality programs and firm performance.

Limitations

A major limitation of this study appears to be the reliance on just one side of the dyad (e.g., managers) for measuring various concepts. Obviously, we are in the dark about what customers think about the signals that were investigated in the present study. However, the use of data from managers was justified because this research also required the measurement of various organizational phenomenon like "customer service training effort" from a company's viewpoint. Ideally, data relating to customer service performance and firm reputation should have been measured from the customers' perspective. Resource constraints precluded my collecting data from both sides of the relationship.

Another potential limitation of this study concerns the use of just one context for collecting data. To the extent that I found sufficient variation for my constructs, the results of this study are perhaps not conservative. In other words, I might have found more robust estimates for my statistics had I collected data from other service categories. Hence, some of the results of this research have to be interpreted in view of this limitation. Finally, the relatively small size of various firms that responded to the survey casts doubts as to whether the findings of this study can be readily applied to bigger service firms.


Akaike, H. (1973), "Approaches to the Null Distribution of $b_1$, Biometrika, 60, 169-73.


Argote, Linda (1982), "Input Uncertainty and Organizational Coordination in Hospital Emergency Units," *Administrative Science Quarterly*, 27, 420-434.


Barney, Jay B (1990), "The Debate Between Traditional Management Theory and Organizational Economics: Substantive Differences or Intergroup Conflict?" *Academy of Management Review*, 15, 3 (July), 382-393.


Berry, J. W (1984), "Toward a Universal Psychology of Cognitive Competence."


Campbell, Donald T., and Donald W. Fiske (1959), "Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix," *Psychological Bulletin, 56* (March), 81-105.


Cronbach, Lee J., and Lite Furby (1970), "How should we Measure 'Change'--or Should We?," *Psychological Bulletin*, 74, 68-80.


Horn, J. L. (1965), "A Rationale and Test for the Number of Factors in Factor Analysis," Psychometrika, 30, 179.


Hughes, Everett C (1945), "Dilemmas and Contradiction of Status," American Journal of Sociology, 50 (March), 353-359.


Lanning, Joyce A. (1990), "The Health Care Quality Quagmire: Some Signposts." Hospital and Health Services Administration, 35 (1), Spring, 39-54.


Lombard, George F. F (1955), *Behavior in a Selling Group*, Boston: Harvard University Graduate School of Business.


Mills, Peter K., and Dennis J. Moberg (1990), "Strategic Implications of Service
Technologies," in Service Management Effectiveness: Balancing Strategy,
Organization and Human Resources, Operations and Marketing, in David E.
Bowen, Richard B. Chase, Thomas G. Cummings, and Associations (Eds.),
San Francisco: Josey Bass, 97-125.

Mills, Peter K., and J. H. Morris (1986), "Clients as 'Partial Employees' of Service

Mills, Peter K., and T. Turk (1986), "A Preliminary Investigation into the Influence of
Customer-Firm Interface on Information Processing and Task Activities in

Mishra, Debi P. (1995), "Signaling and Monitoring Strategies of Service Firms:
Interdisciplinary Perspectives," In Advances in Service Marketing and

Morgan, Fred W. (1990), "Judicial Standards for Survey Research: An Update and

Morgan, Robert M., and Shelby D. Hunt., "The Commitment-Trust Theory of

Mott, P (1972), Characteristics of Effective Organizations, San Francisco, CA: Josey
Bass.

the annual meeting of the Midwest Political Science Association.

Interests in Consumer Research," Journal of Consumer Research, 18 (2),
September, 129-144.

Murray, Keith B. (1991), "A Test of Services Marketing Theory: Consumer
Information Acquisition Activities," Journal of Marketing, 55 (January), 10-
25.

Nayyar, Praveen R. (1990), "Information Asymmetries: A Source of Competitive
Advantages for Diversified Service Firms," Strategic Management Journal,
11, 513-519.


Peter, J. Paul (1992), "Realism or Relativism for Marketing Theory and Research: A Comment on Hunt's 'Scientific Realism'," *Journal of Marketing*, 56 (2), April, 72-79.


Prakash, Ved (1984), "Validity and Reliability of the Confirmation of Expectations Paradigm as a Determinant of Consumer Satisfaction, *Journal of the Academy of Marketing Science*, 12 (Fall), 63-76.


Riesman, David (1950), The Lonely Crowd, New Haven, CT: Yale University Press.


Schmenner, R. W (1986), "How Can Service Organizations Survive and Prosper."

Schneider, B (1990), _Organizational Climate and Culture_, San Fransisco: Jossey-Bass.


*Sociological Methods and Research* (1992), Special Issue on Structural equation Models, 21 (2).


Webster, Cynthia (1992), "What Kind Of Marketing Culture Exists In Your Service Firm?," The Journal of Services Marketing, 6, 2 (Spring), 54-67.


Williamson, Oliver (1975), Markets and Hierarchies, New York: Free Press.


Williamson, Oliver (1979), Markets and Hierarchies, New York: Free Press.


