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Target Costing: Uncharted Research Territory

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Abstract: Target costing is a strategic weapon that is being increasingly adopted by a number of leading firms across the world. What first captured the attention of managers is the competitive advantage that target costing has given to the Japanese auto companies—the longest and most consistent users of target costing. Ironically, as Japan exported the technique to South Korea, a number of leading Korean firms such as Samsung and Hyundai have been gaining ground over their Japanese counterparts. In the US, Chrysler and Caterpillar attribute their financial turnarounds in the mid-1990s to the adoption of target costing. Despite a proven record of success, many managers often underestimate the power of target costing as a serious competitive tool. When general managers read the word "costing," they naturally assume that it is a topic for their finance or accounting staff. They miss the fact that target costing is really a systematic profit planning process. Rather than the inward orientation of traditional cost methods, target costing is externally focused taking its cue from the market and customers. It is market-driven costing that develops new products that meet customer price and quality requirements as opposed to cost-driven development of products that are then pushed on to customers in the hope that they will buy the products. This chapter provides a review and analysis of the target costing literature produced in the last decade. It includes more than 80 major publications written in English and more than 100 publications written in Japanese. The review builds on a comprehensive bibliography of both the English and Japanese literature contained in Ansari et al. (1997). The history of Japanese target costing efforts is discussed in a separate chapter of this handbook.[1] To organize the literature and make sense of it for the novice reader, we use the life cycle of management practice as a framework. The framework equates the maturity of knowledge in a practice-based discipline with the various stages in the life of that practice. The discipline maturity framework is used to synthesize and organize the literature as well as develop areas for future academic research on target costing. For organization and synthesis, we populated a database with target costing literature coded by five stages of our knowledge progression or life cycle approach. In addition, we also coded the database on three additional taxonomic dimensions: intended audience, nature of study, and research method used. We used the knowledge progression framework to identify gaps in existing knowledge and new research topics in the area of target costing. We use the taxonomic approach to identify areas that can benefit from replication, corroboration, and further testing.

1. Overview of Target Costing

Target costing is a system of profit planning and cost management that ensures that new products and services meet market determined price and financial return. This idea is expressed in the following simple equation:

$$\text{Target Cost} = \text{Target price} - \text{Target profit}$$

The independent variables in this equation are market price and profit. Both price and profit are

[1]On the historical review of target costing in Japanese companies, refer to the history chapter (Okano & Suzuki) of this Handbook.

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treated as exogenous variables determined by competitive forces in the product and capital markets. Prices are determined by what customers are willing to pay, and profit is determined by what financial markets expect as a return from that particular industry. The dependent variable is cost, which implies that a firm has to manage its cost to meet the external constraints imposed by the product and financial markets in which it operates.

Target costing, as we will elaborate upon later in this chapter, is a very strategic approach to profit planning and not simply a cost-reduction method. Most companies in competitive industries have used some elements of target costing since the 1970s. In fact, value engineering, a key component of target costing was born in General Electric during World War II. It was Japanese auto industry, particularly Toyota that put together the various elements of target costing as we know today and elevated it from a simple cost-reduction exercise to a strategic profit planning model (Cooper, 1992). The Japanese auto industry took the bits and pieces of target costing that other companies were using on and off, and turned it into a holistic system of profit and cost management. (See our later discussion of the boundary conditions for an explanation of the critical components of target costing.)

Target costing today is fairly mature in the Japanese assembly industries. The practice has migrated out of the auto industry in Japan to other Japanese assembly industries and even some process industries. It is, however, fairly young in the US and Europe and has traveled to the US and European auto and assembly industries. Most US and European firms still do cost driven pricing rather than price-driven costing.

In the last 20 yr, it has caught the attention of both Japanese and western academics who have begun to study the subject in earnest. This is consistent with a long and rich tradition in management accounting of nurturing and formalizing ideas that have their origins in practice. In the past, management accounting literature has developed frameworks to account for, develop, synthesize, and guide research in areas such as budgeting and divisional performance measurement, particularly the use of return on assets (ROA) and residual income. Both of these areas started as innovative corporate practices that were later adopted by academics as genuine areas for further research and development. Like the early days in the development of literature on budgeting and divisional performance measurement, academic research on target costing lags practice.

The rest of this chapter is divided into five parts. Section 2 presents a five-part knowledge maturity (life cycle) framework for organizing the literature on any management practice. Section 3 uses this framework to organize the existing literature on target costing. Section 4 looks at the literature from a taxonomical perspective and gives readers an opportunity to see the types of methodologies, intended audiences, and nature of studies that exist thus far. Finally, the last part of the chapter presents a proposed research agenda for target costing by analyzing the gaps in research that emerge from the literature review. We use our conceptual framework of knowledge maturity to develop a research program in this newly emerging area of management accounting.

2. Conceptual Approach

New research in any area typically takes on one of two forms. It either creates conceptual explanations that fill gaps in our knowledge and practices, or replicates, corroborates, and tests existing knowledge and practice techniques. A literature review organizes extant literature so that readers can understand what has been accomplished already. It also provides a way to identify opportunities to fill knowledge gaps and highlight areas that need further replication or testing. We use a knowledge progression framework to identify knowledge gaps and new research topics in the area of target costing. We then use a taxonomic approach to the literature to identify areas that can benefit from replication, corroboration, and further testing.

2.1. Knowledge Progression Framework

The knowledge progression framework recognizes that opportunities to create new knowledge vary by the maturity of a topic. When a topic is relatively young, researchers focus on developing its conceptual framework, foundation, and boundaries and generating hypotheses about them. Opportunities abound to publish literature that develops the new concept. Then as a topic moves from youth to maturity, the type of research questions and issues change. As the topic matures, hypothesis generation gets less attention and testing constructs and relationships become more salient.

The knowledge progression framework also has implications for the role of a literature review. As Salipante et al. (1982) point out, for mature or well-established topics where there is a great deal of extant research, a literature review organizes and makes sense of the research results by examining the validity of the constructs presented in the various studies. On the other hand, they recommend that when the topic is new and fragmented, "the reviewer will probably wish to emphasize the formulating function of the

review: raising hypotheses and tentative constructs rather than testing or screening them." (Salipante et al., 1982, p. 343).

Table 1 depicts the knowledge progression framework. Assume that topic variety in a research area can be represented as a progression from A, conceptualizing and hypothesizing about the construct, to Z, testing the construct and its variables. The dark area of Table 1 represents topics closer to the "A" variety while the cross-hatched area represents topics closer to the "Z" variety. Together the cross-hatched area represents the totality of research on a topic over its life. Table 1 shows that during the birth stage, only a small portion of the dark area and none of the cross-hatched area would exist. The blank or empty space in the graph would represent areas for further research. As the topic matures, more of the area gets covered but the share of topic type "A" decreases and the share of topic type "Z" increases.

Because target costing is a new and fragmented topic, the formulating function of a literature review focusing on the empty spaces seems appropriate. How does the knowledge progression framework apply to target costing?

We postulate that any new management practice goes through five stages in its life cycle. The five stages are (1) development and advocacy, (2) technical refinement, (3) situating the practice in its organizational context, (4) linkage to other processes and tools, and (5) institutionalization and diffusion. Each stage is briefly described below. We use the DuPont version of the ROA formula as an example to illustrate each of these stages.

2.1.1. Development and Advocacy

A new management practice is typically a solution to a practical problem facing industry. If the solution is successful, the practice is further developed, documented, advocated, and passed on to others within and outside the originating organization's boundaries.

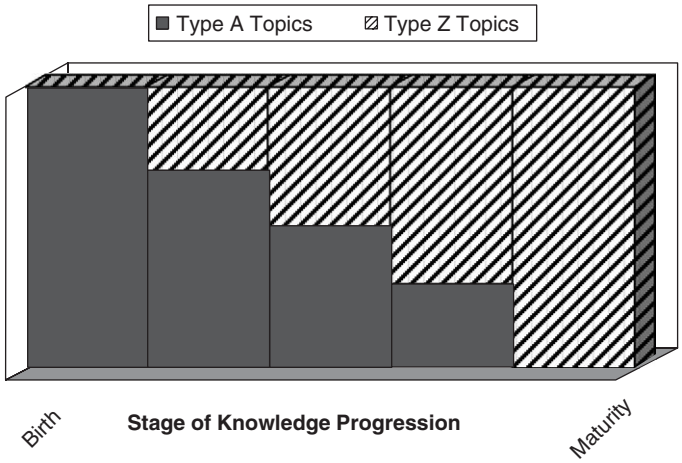
For example, the DuPont version of ROA formula came out of General Motors as a practical solution for managing large decentralized corporations that emerged during the early part of the twentieth century. After Sloan documented the practice, it was adopted by companies facing a similar problem.

During the development stage, the focus is on describing the practice, making a case for when to use it, and the likely benefits that will accrue to an organization from adopting the practice. If we look at the early literature on ROA, we find that it deals primarily with why the DuPont formula is more than a ratio and how it is a complete business model to guide management action.

2.1.2. Technical Refinement

Once a practice passes the initial test of usefulness, it generates interest from others outside the organization who would like to adopt the practice. However, this interest also brings greater scrutiny about the applicability of the technique to the particular circumstances facing different organizations. Things that proponents may have taken for granted or may not have thought about are looked at more closely, and the practice enters a technical refinement phase.

Table 1. The knowledge progression framework.



For example, much of the earlier ROA literature deals with technical issues such as what assets to use in the denominator, how to compute income used in the numerator, and the impact of different valuation rules such as replacement cost accounting. The result was a technical refinement that gave rise to different versions of ROA—for example, ROA using only working capital assets in the denominator or RONA (return on net assets).

2.1.3. Organizational Context of the Practice

As more organizations adopt the practice, there is a greater appreciation for the organizational context of the practice. The focus shifts from technical discussions to the behavioral and cultural implications of the practice. How the practice affects behavior, what behaviors it rewards, what cultural values it reinforces, and how it can be used to support organizational culture come to the forefront.

In the case of ROA, the initial technical discussions were replaced by a discussion of the possible dysfunctional effects of ROA on resource allocation decisions (Hayes & Garvin, 1982) and incentives for managers to massage data when ROA was used to measure performance (Hayes & Abernathy, 1980).

2.1.4. Links with Other Processes and Tools

As a practice matures, it becomes part of an organization's processes and tool kit. This raises issues about how it fits in with an organization's existing processes and tools. The research focus shifts to possible conflicts with or support needed from other processes and tools.

In the case of ROA, this line of research is exemplified by the literature that incorporates ROA into balanced scorecard measures (Kaplan & Norton, 1996), connecting it to the strategic planning process (Arzac, 1986), and using it as a business model to identify critical activities and goals (Wagner, 1984).

2.1.5. Institutionalization and Diffusion

As management practices become embedded in the fabric of an organization, they take on a life of their own or what Giddens (1991) calls the structuration or the ways in which social systems are produced and reproduced in social interaction. The reproduction process legitimizes the practice such that it becomes a ritual. As the ritual takes hold, it creates a discrepancy between "espoused" and "actual" practice (Argyris, 1990).

Perhaps this is why ROA continues to be a popular measure of performance despite the volumes written on its shortcomings. Maturity also brings diffusion as the practice starts to spread across industry and national lines. This creates its own set of issues around whether the practice can be translated across these boundaries. The literature on how to do foreign currency translations of financial statements of overseas subsidiaries is an example of this type of discussion in the case of ROA.

While the life cycle approach implies a chronological sequence, we do not intend it to be a surrogate for a chronological ordering of the literature. It is quite possible to have a more mature research topic show up early in the development stages of a practice. What we hope to show is that the preponderance of literature for a relatively young practice such as target costing will be in the earlier stages of the life cycle framework with less literature addressing issues in the later stages. We believe that the life cycle framework is a useful organizational scheme for the literature because it gives a rich picture of discipline maturity.

We also hope to show that the life cycle approach is consistent with a methodological approach to literature reviews by showing that the type and sophistication of research methods vary by the life cycle stage of a new practice. Specifically, we will show that early in the life of a new practice such as target costing, the dominant research methods tend to be prescriptive and descriptive. Prescriptive studies tend to be more conceptual and use analytical model building; descriptive studies tend to case studies grounded in field data.

2.2. Taxonomic Approach

While the knowledge progression framework focuses on the quantity and type of research questions available to future researchers, the taxonomic approach supplements the life cycle approach by looking at other dimensions such as intended audience for the research, the nature of the study, and the research method used.

In the case of target costing literature, these dimensions apply as follows:

The intended audience dimension differentiates research publications intended primarily for a practitioner audience as opposed to an academic audience. Publications targeted for practitioners may be valid and useful, but typically they have not been subject to the same rigor as academic research.

The nature of study dimension captures whether research is primarily *prescriptive* (designed to tell readers what should be done); *descriptive* (simply describing what firms do); and *hypothesis testing* in which a formal hypothesis is tested.

The research method dimension captures the experimental design of a study. For target costing

literature, we identify 10 different research methods: (1) description based on secondary sources; (2) theoretical or conceptual arguments; (3) single-site case study; (4) multisite case study; (5) written or interview-based survey; (6) lab experiment; (7) analytical modeling; (8) analysis using archival data; (9) simulation; and (10) ethnographic field studies.

3. Literature Organized by Stage of Knowledge

Our first sort of the database was by life cycle stage of knowledge. Table 2 shows 87 research publications in English and 90 research publications in Japanese from 1995 to mid-2005 classified by stage of knowledge. Table 3 presents this data in graphical form. We have used the dominant theme in each article or paper to guide our classification. When an item covered more than one dimension in the life cycle framework, we classified it in both places.

The knowledge progression framework in Table 1 postulates that a new practice should have a downward slope to the right. This is because most of the literature should deal with developing, explaining, and making a case for the use of a new technique. As Tables 2 and 3 show, with the exception of linkages to other tools and processes, most of the literature in English seems to be predominantly skewed in the direction of the early stages of the life cycle approach—that is, development, advocacy, and technical issues. The relatively larger proportion of publications devoted to "linkages" is not surprising as target costing is a process that is intimately linked to total quality management tools such as quality function development. It also requires a close link to supply chain management. This may be the reason why the literature is higher than expected in this area.

Table 2. Classification of literature by stage of knowledge.

Primary Focus on	English (%)	Japanese (%)
Development and advocacy	46	9
Technical refinement	14	42
Behavioral and cultural context	10	13
Linkage with other tools/processes	18	23
Institutionalization and diffusion	11	12
Total	100	100

The story is slightly different for the Japanese literature. Japan has led the practice of target costing since the 1970s, thus it is not surprising to see fewer descriptive and advocacy pieces in the Japanese literature for the 1995–2005 time period. However, what is surprising is that there is still a large body of literature dealing with technical issues in target costing and relatively fewer dealing with the behavioral and cultural issues. The proportions for behavioral articles and linkages to other tools and processes are nearly the same for both the English and the Japanese literature.

3.1. Target Costing—Description and Advocacy

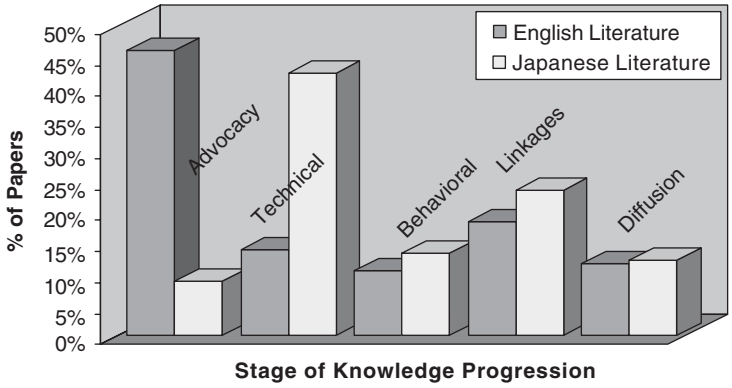
Most early literature on target costing primarily deals with describing and advocating the use of target costing. This literature can be grouped into three categories:

- Description of target costing as a practice
- The environment in which target costing provides the greatest benefits
- The benefits from using target costing

3.1.1. What is Target Costing?

While there is broad agreement on the key elements of target costing, there are some subtle differences.

Table 3. Classification of literature by stage of knowledge.



Some authors, such as Japan Accounting Association (1996), Kato (1993), and Okano (1995, 2002, 2003) in Japan and Ansari et al. (1997, 2005), Cooper (1992), Cooper & Slagmulder (1997b, 2002), Partridge & Perren (1997), take a broad view of target costing as a proactive strategic profit planning system. In their view, target costing both influences and is influenced by organizational strategy and is a system for implementing the multiyear profit plans that emerge from an organization's strategy. Cost reduction becomes a means to achieving profit goals. This is a holistic view that sees target costing as the bridge connecting strategy formulation with strategy execution and profit generation. Within this holistic, strategic view, some authors such as Ansari et al. (2005) see value engineering as an integral part of target costing while others such as Cooper & Slagmulder (1997a) see target costing and value engineering as two separate disciplines.

The other view of target costing is exemplified by writers such as Bayou & Reinstein (1997), Dekker & Smidt (2003), and Laseter (1998a,b). These authors view target costing primarily as a cost-reduction technique (Tanaka, 1977). Bayou & Reinstein (1998) even cite total cost management, cost cutting, and cost shifting as the three routes for target costing. They suggest that target costing managers should improve, cut, or shift costs, but that they must consider the potential pitfalls in doing so. All these authors emphasize the cost-reduction part of target costing as opposed to its value management part.

3.1.2. Environment in which Target Costing is Beneficial

A major theme in the advocacy literature is the environment in which target costing is particularly useful. Ansari et al. (1997), Baker (1995), Butscher & Laker (2000), and Gagne & Discenza (1995) see target costing as a critical system for companies that are operating in competitive environments and have short product life cycles. Cooper & Slagmulder (1997a,b) cite five factors that influence the adoption and benefits from using target costing. These are intensity of competition, nature of customer, product characteristics, product strategy, and supplier-base strategy. Jackson (2003) studied the factors responsible for the success of target costing. They assert that the length of product life cycles, level of competition, and customer needs and requirements determine how successful target costing is in any organization. Hibbets et al. (2003), based on their interviews of managers, conclude that organizations which face intense rivalry among competitors, high supplier power, and that use product differentiation are more likely to use and to benefit from target costing.

3.1.3. Benefits of Target Costing

The final theme in the advocacy literature on target costing is based on case studies that document the success of target costing in industry. The Japanese literature has several case studies that describe the successful implementation and positive results achieved from the application of target costing. Some of the more prominent companies written about include Daihatsu, Toyota, Nissan, Denso, Panasonic, Canon, Kubota Steel, and Olympus (Japan Accounting Association, 1996).

As the practice becomes established in the US and Europe, there are similar reports describing successful applications and results from the use of target costing. For example, Ansari et al. (1997) is based on the experience of Boeing, Chrysler, and Eastman Kodak. Ansari et al. (1999a) is a study of six major Japanese manufacturers and Ansari et al. (2002) and Swenson et al. (2003) is a survey of best practices in target costing in five major US corporations. Cooper (1992) cites target costing as a key tool used by Japanese companies as part of a review of 22 case studies of Japanese firms. Cooper & Chew (1996) use the experience of Komatsu and Olympus Optical Company to describe how these companies use the discipline of target costing to scuttle product launch if the target cannot be achieved. Cooper & Slagmulder (1997a,b, 1999), based on their field research of Japanese manufacturing firms, report that the use of market-driven costing, product-level target costing, and component-level costing helps to ensure that only profitable products are launched. The study reports that firms experience a reduction in product development time, a reduction in cost, and that they develop products that are more customer-focused. Gagne & Discenza (1993) reports that automobile companies that have used target costing have reaped the benefits of reduced cost and additional profits.

There have been several case studies of firms that document and describe the practice of target costing. Albright & Davis (1998) reports the use of target costing in the development of the Mercedes C class automobiles. Amara (1998) reports how Caterpillar successfully integrated target costing with the development of the D-10 tractors. Brausch (1994) describes the implementation of target costing in Culp, Inc. That study found that the use of target costing increased the profitability of products. Bhimani & Neike (1999) describes the application of target costing in Siemens, Germany. Based on their case study,

Butscher & Laker (2000) conclude that the only way to survive in today's environment is to introduce products that meet customer needs. This is only possible if the market drives product development and pricing, and the internal processes are adapted accordingly. Leahy (1998) states that the use of target costing leads to lower costs, higher profits, greater competitiveness, increased customer satisfaction, and better worker interactions. He reports 10–20% cost reductions from using target costing. Schmelze et al. (1996) describe the use of target costing at ITT automotive brake division—a leading supplier to automobile companies. They state that ITT used target costing to maintain profitability and increase market share during extremely competitive times. Fischer (1996) describes how target costing has become a critical tool for purchasing at HP's Vancouver plant. Among other benefits, it is helping the facility and its suppliers move from an industrial to a consumer-oriented product development and pricing strategy.

One of the few surveys on the use of target costing comes from Japan. Tani et al. (1994) found 109 corporations (out of 180 surveyed) implemented target costing. In the US, Boer & Ettlie (1999) surveyed 126 corporations. Their major findings were that many US companies now estimate costs in the design stage. There is more cooperation between product engineers and cost accountants—often the two share the same database. Finally they concluded that world-class manufacturers have a market orientation to product development.

Most of the advocacy literature is based on secondary information about the use and advantages of target costing from self reports of adopters (Partridge & Perren, 1997; Personen, 2001; Pierce, 2002). Since most corporations are loath to admit failures in public, there is little research to counter the glowing stories about target costing success. Still, Koga (1999), Koga & Monden (2000) provides a counterpoint. His study reports that only 17% of camera manufacturers achieved cost targets. Koga & Davila (1999) report that while performance goals in product development are associated with organizational learning, they are not associated with agency and coordination perspectives.

3.2. Technical Refinement of Target Costing

The reported success of a new idea convinces others to adopt it. The adoption, however, raises questions about the boundaries and the technical issues related to the practice. New adopters need to understand the idea, how it differs from other practices, what its key variables are, and what relationships exist between key variables.

In the case of target costing, the early literature was not very precise about practice boundaries nor did it differentiate the practice from existing practices such as budgets and cost plus pricing systems. For example, Booth (1995), while recognizing that target costing was different from traditional product costing, seemed to equate target costing with quality function deployment (QFD). Similarly, Hales & Staley (1995) see target costing and QFD as two separate tools as opposed to a single profit planning process. The fact that many companies referred to budgeted costs as "cost targets" and cost plus price as the "target price" did not help matters. Many companies reacted to target costing as "what we have always done around here."[2]

The first comprehensive statement of target costing boundaries was established by CAM-I (Ansari et al., 1997). The CAM-I model established six key principles for target costing. These are as follows:

1. *Price Led Costing.* Cost is a function of a market determined price.
2. *Customer Focus.* Product design is shaped continuously by the voice of the customer. Enhancements of product features take place only when they meet customer requirements and customers are willing to pay for them.
3. *Design Centered.* The key to cost management is to design costs out of a product before committing to production as opposed to relying on economies of scale, learning curves, waste reduction, and yield improvement to reduce costs.
4. *Cross-functional teams.* Cost management requires a cross-functional team that includes design and manufacturing engineering, production, sales and marketing, material procurement, cost accounting, and service and support. Involvement of downstream functions during design helps to avoid problems that might occur later.
5. *TC has a Life Cycle Orientation.* Target costing typically models the costs of owning a product over its entire life. It considers purchase price, operating costs, maintenance and repairs, and disposition costs with a view to minimizing life cycle costs.
6. *Value Chain Involvement.* Significant members of the value chain, such as suppliers, dealers,

[2]As we discussed earlier, elements of target costing have been around many companies for a number of years. However, it has been fragmented, piecemeal, or in some instances misunderstood. The boundary conditions are meant as an internal test of whether companies are practicing target costing or simply some part of it.

distributors, and service providers, participate in the target costing process. A target costing system relies on its value chain to participate as an extended enterprise to create customer value and minimize costs.

These six principles not only are meant to establish a boundary for target costing but are also intended to distinguish target costing from traditional cost management methods such as budgeting and cost plus pricing. In addition to these principles the CAM-I model also contains a detailed process description and it recognizes value engineering as a critical tool for target costing. Others, such as Cooper (1992) and Cooper & Slagmulder (1999) separate value engineering and target costing as two distinct tools that are part of Japanese cost management practice.

Laseter (1998a,b) talks about three different approaches to target costing. His three approaches are Price-based targeting—in which a firm sets a target cost through simple comparison with competitive offerings. Cost-based targeting—in which cost-plus contracts are used to ensure that contractors achieve an acceptable but not exorbitant profit margin. Value-based targeting—in which consumer requirements are matched with willingness to pay thereby ensuring that new designs provide the right value proposition.

While Laseter (1998a,b) considers cost plus pricing as a form of target costing, Ansari et al. (1997) takes great pains to exclude cost plus as a form of target costing. This is because, in competitive markets (which is true for most products in a global economy), cost plus is not an option and using a broad umbrella dilutes the power of target costing as a tool for value management. This does not mean that some of the principles and tools of target costing cannot be used by nonprofit organizations. A new Department of Defense initiative called cost as independent variable (CAIV) is an effort to tailor the target costing process for the needs of the defense sector. The CAIV initiative is an application of value-based target costing in the defense environment in which competitive market prices do not exist. It is, however, not a cost plus exercise (Ansari et al., 1999b; Bley, 1997; Mandelbaum & Pallas, 2001).

Besides establishing boundaries, the second stage of development also focuses on refining the technical aspects of the practice. Since there has to be some degree of acceptance and diffusion before refinement, it is not surprising that most of the research dealing with technical issues is in the Japanese literature. There are five themes in the practice refinement category.

The first theme focuses on the two independent variables in the target costing equation—price and rate of return. Price is determined by the competitive marketplace while return is determined by the financial markets. A typical example is Newman & McKeller (1995) who talk about "target pricing" as a companion to target costing. According to them, "in determining the target price, marketing computes the price . . . necessary to achieve their desired share of the market. That price becomes the target. Once the target price is set, the normal operating profit for the item is subtracted from the target price. This remainder becomes the target cost."

Most discussions of price are prescriptive with little empirical or analytical work to support the discussion. The one exception is analytical research that models the relationship between product attributes and prices (Monden, 1995; Tanaka, 1995). This research uses regression analysis to see if there is a systematic relationship between attributes such as horsepower and market price. The other line of price research focuses on decomposing the product-level price into the features that customers want. This is consistent with the design focus of target costing since new features can be designed only if customers are willing to pay for them. Authors such as Tanaka (1995) advocate the use of conjoint analysis for separating a product-level price into features customers are willing to purchase.

The second theme deals with the cost side of the target cost equation. This requires examining the target rate of return and ways to achieve target costs. There is very little research on the subject of the target rate of return. Following established Japanese practice, Ansari et al. (1997) advocate the use of return on sales to establish target profit. Woodlock (1999) discusses how to identify the most appropriate action to take in achieving target costs. This is because actions taken to achieve targets can have dissimilar effects on target costs.

The third theme deals with how to capture and translate customer features into functional weights. Most of the research and prescription on this topic comes from the Japanese literature. The literature applies established marketing research techniques such as the use of Likert scales, conjoint analysis, and trade-off analysis to establish the relative importance customers place on various features.

For example, automobile companies first try to establish how much value customers place on features such as safety, comfort, and performance. They next translate the importance customers place on a feature to the component and parts that contribute to this feature. For example, conjoint analysis or Likert

scales might establish that 25% of a car's value to a customer comes from safety. However, since there are several components such as brakes, seat belts, and tires that contribute to safety, the challenge is to decompose the 25% and assign it to these individual components.

This last part is discussed as the art of capturing the expert judgment of engineers. There is, however, very little formal modeling of the expert judgment of engineers. Martyniuk & Zablocka (1998) illustrate a mathematical model of calculating higher level costs of functions fulfilled by a whole product such as a roof. However, how engineers or product designers distribute the relative importance that a customer places on a feature such as safety into product components such as brakes or seat belts is still largely judgmental.

The fourth theme in the technical area deals with supplier involvement in target costing. There is broad agreement in the target costing literature that supplier involvement in cost reduction is the key to achieving target costs. Most of the research describes good practices used by leading target costing practitioners. The Japanese literature describes how leading companies such as Toyota deal with suppliers (Monden, 1995; Okano, 1995, 2003). Kim et al. (2002) describe results of field visits with Japanese and US companies. Their major findings are that leading practitioners involve key suppliers early in the product design process, treat suppliers as partners, and maintain an open book relationship in which cost and profit data is shared.

For example, in the case of Chrysler, suppliers come on board 2 yr before the launch of a new model, maintain open books, and participate in Chrysler's SCORE (supplier cost-reduction efforts) program. Key suppliers are on long-term contracts. There are also formal metrics to measure supplier performance. Despite many descriptions, there is little formal research on what works best with suppliers and how issues of trust and open sharing of books and data are resolved.

The final theme in the technical area deals with the development of appropriate financial metrics and cost estimation models for target costing. Modarres et al. (2005) discuss the development of financial metrics for target costing in Boeing's Interior Responsibility Center as part of lean production in manufacturing. The Japanese literature describes the use of cost tables (Monden, 1995; Tanaka, 1995) as the primary tool for cost estimating. The English literature has focused predominantly on the use of activity-based costing (ABC) for understanding cost driver analysis. Cokins (2002) deals with the possibility of combining ABC with target costing.

3.3. Situating the Practice in Its Organizational Context

As a practice matures, the emphasis shifts to the organizational context of the practice. The research themes address the behavioral and cultural impacts of the practice on the host organization. Compared to mature topics such as budgeting, there is very little research on target costing that explores how the adoption of target costing changes behaviors or cultural values, or what behaviors or cultural values support target costing. Much of this discussion comes from reports of corporate practice or implementations of target costing.

For example, Ansari et al. (1997) cite a list of behaviors that Chrysler Corporation endorses and requires from members of its target costing teams. The list includes behaviors such as not being discipline champions, sharing knowledge with team members, and having respect for suppliers. Bhimani & Neike (1999) report that the use of target costing at Siemens Corporation resulted in greater employee empowerment, more quality planning, and better product and process redesign decisions. Bonzemba & Okano (1998) report on the French auto maker Renault's implementation of target costing. Their study documents the changes in the internal organization and the relationships with external suppliers that followed the implementation of target costing.

In an experimental study, Choe (2002) studied the impact of information on performance in a target cost setting. The study found that information affects performance through organizational learning. For learning to occur, a target costing system must provide information frequently and quickly. Everaert & Bruggerman (2002) conducted an experimental study of cost targets on the behavior of design engineers. They found that having cost targets, as opposed to a general expectation to minimize costs, led to lower cost products without impairing design quality or development time when there was low time pressure. When time pressure was high, engineers tended to work longer on designs. Monden et al. (1997a,b) studied the motivational impact of participation in target setting. They concluded that cost-reduction performance of product designers is improved if the designers can participate in target setting and are held accountable for items under their control.

Koga (1999) studied the impact of leadership and target costing activities as they relate to product manufacturing costs. He found two behavioral variables that lower product manufacturing cost—(1) frequent interactions between product designers and process engineers and (2) the project manager's leadership in the early product development stage.

There are very few studies that deal with cultural and mindset issues in target costing. Brausch (1994) describes strategies used at Culp, Inc. to change corporate mindset. Leahy (1999) theorizes that deeply embedded cultural values in an organization can derail a target costing implementation.

Yoshida (2003), one of the few empirical studies, investigated the impact of target costing on the morale of the product designers. His study found that product designers felt undue pressure for cost reduction.

3.4. Linkage with Established Processes and Tools

New practices often rely on existing organizational tools and work with the existing processes of an organization. As a profit planning process, target costing is closely linked with many existing tools and processes in an organization.

Many early writers such as Booth (1995) and Hales & Staley (1995) saw an intimate relationship between target costing and quality management tools such as QFD. Ansari et al. (1997) were the first to provide a detailed description of the target costing process and the various tools needed for target costing. Ansari et al. (2005) provide a list of core tools that an implementer of target costing needs to have in place. Their process model describes in detail the various tools and support processes that a target costing implementer needs to consider. The major processes listed in their book include customer requirements analysis, target cost decomposition, cost estimation, cost trade-off analysis, and target cost status tracking.

The Institute of Management Accountants (IMA) has added six tools to their list. The IMA list includes QFD, analytic hierarchy process, voice of the customer analysis, component cost analysis, cost tables, and value engineering. Dutton (1998) expands the scope of target costing by linking it to a firm's strategic multiyear product and profit plan.

Since target costing originated in the automobile and assembly industries where a major portion of the costs comes from suppliers, the process of involving suppliers in target costing efforts is a major topic of interest. Cooper & Slagmulder (2002) view supplier selection and chained target costing (where cost targets are cascaded down to suppliers) as a key to cost reduction throughput the supply chain. Bozdogan et al. (1998) list enablers and contributing factors for integrating suppliers in target costing. They advocate matching product features with the specialized technical skills of suppliers.

In two different case studies (eight firms in one and ten in the other), Ellram (2000, 2002a,b) studied the relationship between supply chain management and target costing. According to Ellram, supply chain management plays a significant role in target costing, particularly during the initial stages of developing component-level target costs. Supply chain management also plays a role in managing, monitoring, and improving costs. Ellram found that giving a target price to suppliers encourages them to be more competitive. Early supplier involvement is also important because changes in specifications can have a big impact on a supplier's price. Supplier involvement also reinforces the purchasing organization's seriousness in achieving target costs. Laseter (1998a) describes a five-step process for involving suppliers in target costing. His conclusions are based on a case study of the Swiss watch maker Swatch.

Lockamy & Smith (2000) see target costing as a means for integrating customer feedback in the supply chain through the development of a total cost structure reflective of current customer requirements. Cooper & Yoshikawa (1994) report a case study of how Japanese manufacturers maintain cost pressure on their supply chain. They attribute the sharing of R&D, placing an employee in another organization, target costing, and use of QFD as means of cascading downward cost pressure.

Besides supply chain management, a few other processes and tools have been linked to target costing. Chen & Chung (2002) link target costing with cause and effect analysis. Their approach, however, is very reminiscent of the use of fish bone diagrams to study cost variances. While cause–effect analysis is helpful, target costing is primarily a design focused cost-reduction process. Booth (1995) and Cokins (2002) describe how ABC is a useful support tool not only as a methodology for cost assignment, but also by helping management understand the cost and profit margin impact of suppliers' services or products. Mills (1999) differentiates ABC and target costing. While he sees ABC as a useful tool, he considers target costing more appropriate for cost commitment decisions that are made during the planning and design stages of a product. In a case study of a US auto parts supplier, Horvath et al. (1998) come to similar conclusion. They state that target costing combined with ABC results in the more accurate calculations of costs.

3.5. Diffusion and Institutionalization

The last stage in the life of a practice is diffusion and institutionalization. The research shifts from describing and debating boundary conditions and tools to applying the practice across different industries, different types of organizations (public, private, not-for-profit), and different countries or cultures.

It also starts to look at the mechanisms such as organizational routines and rituals that enable the practice to continually reproduce and legitimate itself.

In the area of diffusion to other industries, the English literature on diffusion is primarily speculative. For example, Brausch (1994) and Hergeth (2002) look at the use of target costing in the textile industry. Van Merode (2004) concludes that the use of target costing will ensure that the delivery of health care will be better adapted to the needs of the patients. Nicolini et al. (2000) report two pilot projects applying target costing in the British construction industry. Clifton et al.'s (2003) book on target costing is based largely on the application of target costing at Lucent Technologies. Shank & Fisher (1999) describe the use of target costing in a paper mill.

The same is true for diffusion across countries and cultures. Very few studies address this issue. Bonzemba & Okano (1998) deal with the effect of target costing on organizational culture in France. Okano (1995, 2002, 2003) examined the four aspects of target costing: (1) cross-functional and policy management, (2) *genba* and *genbutsu* principles, (3) emphasis on voluntarism, (4) built-in quality, costs, delivery, as well as other key success factors. They show how these principles were transferred from the parent Toyota to NUMMI (a joint venture between GM and Toyota), Toyota Motor Manufacturing, Kentucky, USA (TMMK) and Toyota Motor UK (Bhimani & Okano, 1995). Kato (1999b), Okano (1999), Ito (1999) and Shimizu (1999) discuss the conditions and variables that matter in transferring target costing to an Italian automotive supplier. Ito & Souissi (1999) performed a case study of a Japanese automobile supplier company examining the target costing relationship between a parent company and its subsidiary. They report that the home company is responsible for the basic customer-focused product design, while the foreign subsidiary does the application or design development. Omar (1997) states that most UK-based car manufacturers employ the logic of target costing as a marketing management tool to determine the prices of new car models. Bellis et al. (1999) report on Toyota in North America. They find that US-based Japanese firms are similar to Japanese domestic firms in their use of target costing. However, they report that Japanese affiliates are also influenced by US practices in their implementation of target costing.

4. Literature Organized by Taxonomic Variables

Our second look at the literature was to sort it on three taxonomic variables: intended audience for the research, the nature of the study, and the research method used.

4.1. Intended Audience

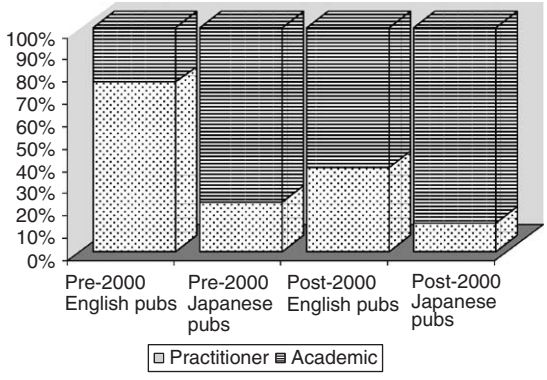
The intended audience dimension captures whether the publication is meant for practitioners or academicians. Table 4 takes the 10 yr of literature and splits it into two categories—pre-2000 and post-2000. The Table shows the research publications in English and Japanese classified by their primary research focus. Table 5 presents this data in a graphical form.

Consistent with the previous result that most papers were largely in the development and technical refinement area, it is not surprising to find that the majority of the papers in English during pre-2000 are written for practitioner audiences. As the practice has matured in the post-2000 period, the proportion of literature written for the practitioner has decreased from ~80% to 40%. This indicates greater interest by the academicians in developing a more rigorous academic base for the practice. For the Japanese literature, the percentage of the practitioner-oriented publications is relatively small in both post- and pre-2000 periods, but still has shown a decrease consistent with a knowledge progression framework.

Table 4. Classification of literature by intended audience.

Intended Audience	Pre-2000 English	Pre-2000 Japanese	Post-2000 English	Post-2000 Japanese
Practitioner	31	11	12	7
Academic	10	39	20	48
Total	41	50	32	55

Table 5. Classification of literature by intended audience.



4.2. Nature of Study

Since most of the reviewed literature was skewed toward practice, we also expected to find most studies to be either prescriptive or descriptive. A prescriptive study, as stated above, typically employs "should use" logic for advocating the use of target costing. The argument is based on pure business logic or on secondary data sources dealing with target cost success stories.

Table 6 shows the research publications in English and Japanese since 1995, classified by the nature of the study. The data is again split into pre- and post-2000. Table 7 presents this data in a graphical form.

Once again, consistent with the previous results that most papers were largely in the development and technical refinement area and intended for practitioner audiences, we found that an overwhelming majority of the papers in English during the 1990s are either prescriptive or descriptive studies based on case studies of early target costing adopters. Even though published in English, the only paper that attempted to formulate and test hypothesis prior to 2000 is by Japanese authors. None of the other studies attempted to test hypotheses. Even though the practice has been accepted, the proportion has not changed significantly. In the post-2000 period, there are still only 10% of the studies that attempt to develop theory and test formal hypotheses related to target costing. This presents many opportunities for academic researchers. Turning to the Japanese literature we find that the quantity of prescriptive articles has decreased by one third, and there has been slight increase in hypothesis testing research. This is consistent with TC knowledge maturity in Japan compared to the US knowledge maturity. Still, there are many opportunities for academic researchers to perform hypothesis testing research.

Table 6. Classification of literature by nature of study.

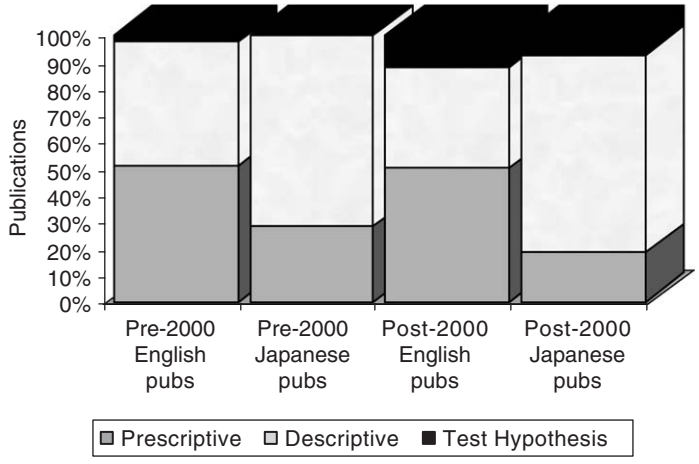
Intended Audience	Pre-2000 English	Pre-2000 Japanese	Post-2000 Japanese	Post-2000 English
Prescriptive	21	14	17	10
Descriptive	19	36	13	41
Test hypothesis	1	0	4	4
Total	41	50	34	55

4.3. Research Method

Our final look at the literature was to sort it by the research methods used. We counted each paper only once using the primary research method employed. Table 8 shows the research publications in English and Japanese, classified by their primary research method. Most studies employed one method. There are a couple of exceptions. For example, Koga (1999) combines archival data and questionnaire survey. Table 9 presents this data in a graphical form.

Consistent with the early stage of development of this field, nearly half the papers in English are non-empirical. That is, they are based on either secondary accounts of corporate practices or are conceptual in nature developing a theoretical case for target costing. Of the half that use empirical data, the majority are single-site case studies of Japanese or US corporations that use target costing. Most multisite case studies are by Robin Cooper and his coauthors

Table 7. Classification of literature by nature of study.



(Slagmulder and Chew). These cases are part of a broader study of Japanese cost management practices for the Harvard Business school conducted in the mid to late 1990s. On the Japanese side, more articles focus on theoretical/conceptual research.

5. Areas for Future Research

As stated earlier, new research in any area either fills existing knowledge gaps or it replicates, corroborates, and tests existing research findings using the same or different research methods.

Our two-dimensional view of the literature on target costing is helpful in identifying knowledge gaps as well as areas that need further replication and testing. We organize our discussion around the five categories of the knowledge progression framework.

Table 8. Classification of literature by research method used.

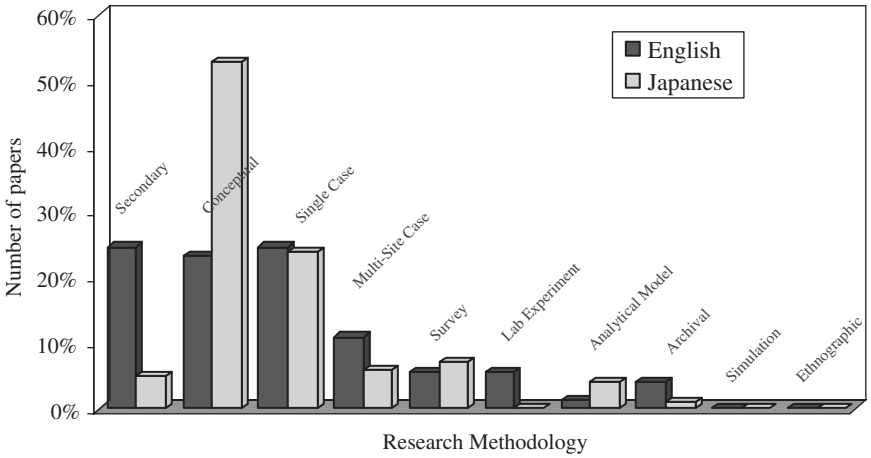
Research Method	English (%)	Japanese (%)
Secondary description	25	5
Theoretical/conceptual	23	53
Single-site case study	25	24
Multisite case study	11	6
Survey	5	7
Lab experiment	5	0
Analytical modeling	1	4
Archival	4	1
Simulation	0	0
Ethnographic field studies	0	0
Total	100	100

5.1. Future Research—Description and Advocacy

The data presented in the prior section show that most of the research to date focuses on describing and advocating the use of target costing. This research is predominantly aimed at practitioner audiences, is descriptive in nature, and uses case-based (often of one site) or survey-based research methods. Researchers will probably find little to add to existing descriptions of target costing, what environments it is best suited for, and what benefits it will produce for its adopters. There are two major exceptions.

The first has to do with the long-term effects of target costing. Some writers have asserted that the use of target costing will lead to reduced product differentiation. This hypothesis is based on the use of standardized parts across different models of a product to reduce costs—a practice common in the automobile industry. The counterview comes from authors such as Ansari et al. (1997) who view the use of value analysis by target costing as a way to identify gaps in existing product space to achieve low cost and differentiation simultaneously. Support for this view is provided by Kim & Mauborgne (2004) who discuss how companies create "blue ocean strategies" (their term for uncontested market space). These authors use the Cirque du Soleil as an example of how value analysis (a la target costing) leads to a strategic redefinition of the competitive space. As they point out, Cirque discovered that animal performances and three ring circuses were costly but added little value to circus audiences. On the other hand, Cirque found audiences were more receptive to a theater style experience. The analysis led the Cirque to combine the most valued elements of a circus, clowns, tent, and acrobatic acts

Table 9. Classification of literature by research method used.



with a Broadway musical and ballet performance to create a new uncontested space for itself. A longitudinal study that can test whether product differentiation decreases or increases with target costing can be extremely useful to help fill a major gap in the conceptual foundations of target costing.

The other gap is to rigorously examine how target costing benefits organizations. There are three possible benefits, and each could be subject to systematic development and testing. The first is that the benefits of target costing flow from early cost planning—the traditional rationale cited for the use of target costing. However, if, as Koga (2000) suggests, cost targets are often missed in practice, then cost reduction could not be the source of the reported benefits of using target costing. An alternative explanation or hypothesis is to test whether the real contribution of target costing is the cost culture and cost consciousness it creates, rather than the actual targets it achieves. This line of research would be similar to research on strategic planning that argues that the benefits of planning lie in the process itself and not in the achievement of plans. Finally, the benefits of target costing could be from its impact on related factors such as decrease in production time, producing products that are more responsive to the marketplace, and creating effective product/process teams. Ansari et al.'s (1999a) best practice survey suggests that these benefits are an important byproduct of target costing. More complex research designs could incorporate these as intervening or independent variables and examine interaction effects to better understand how target costing actually benefits an organization.

While there may be fewer conceptual gaps to fill, there is a great deal of opportunity to move the area beyond self-reported survey results and single-site case studies. For example, in defining target costing, Ansari et al. (1997) use six principles as key differentiators between those who use target costing and those who say they use it. It would be useful to test whether the six principles provide discriminant ability and can effectively separate effective and ineffective practitioners of target costing. On environmental conditions, Cooper & Slagmulder (1997a) hypothesize that the usefulness of target costing will vary depending upon intensity of competition, nature of customer, product characteristics, product strategy, and supplier-base strategy. It would be helpful to test these variables using regression analysis or discriminant analysis in which the environmental variables serve as independent variables and use of target costing is the dependent variable.

The area of reported benefits of target costing can use some replication as well. A good example to follow is Koga (1999) who used archival data to examine if targets are actually achieved in the Japanese camera industry. Another promising methodology is the use of paired samples (one firm using and the other not using target costing) to study whether the use of target costing is indeed beneficial.

5.2. Future Research—Technical Refinement of Target Costing

Most of the publications in Japanese and a significant portion in English are heavily focused on the technical aspects of target costing. They focus on variables such as determining product prices, profit margins, decomposing costs, performing value analysis, estimating costs, involving suppliers, and developing metrics for target costing. Despite the attention paid to these issues, there are still a number of issues that have to be addressed or require more testing and replication.

Ironically, the determination of target price and target rate of return, the two key variables in the target costing equation, has not been subjected to rigorous scrutiny. There are several unanswered research questions that could be examined in future research:

- The English literature is not clear whether the target price should be the price charged when a new product is introduced or if it should be an average price over the life of a product. The Japanese literature suggests that it should be the price charged when a new product is introduced (Tanaka, 1995). Which method is best?
- When a new product is part of a portfolio (e.g., different car models), how should the price be decomposed to various products in the portfolio?
- The common way to determine a target return is to use accounting return on sales. Is it better to use ROA or use some variant of economic value added metrics that include the cost of capital?
- If the cost of capital is included in computing the desired return, should it be the same (weighted average cost of capital) for all products or should it be adjusted for the riskiness of an individual product within a firm's portfolio?
- While there is some research in Japan, there is little published research in English that documents the relationship between physical attributes of products such as horsepower of an engine or speed of a CPU and the price customers are willing to

pay for the product. The presence of stable coefficients can greatly help in the determination of target prices.

A second black box technical area is customer value determination and decomposition. Target costing relies on decomposing the overall value from a product into various features that customers want and then assigning that value to individual parts and functions of a product. For example, if an automobile customer says safety is important, then target costing has to first determine what the relative value of safety is compared to other features. After determining the value of safety, that value must be assigned to the components that lead to safety. For example, if safety provides 30% of the value to customers and brakes provide 50% of safety, then brakes are said to provide 15% (50% of 30%) of customer value and their cost should not exceed 15% of the total target cost for the product.

While customer value determination and decomposition has been extensively studied in marketing, the second step, translating feature (safety) value to component (safety) value is regarded as an art or an engineering judgment. There is an opportunity to research this area using methodologies such as expert judgment modeling used in the information processing literature. In addition, information processing models used in auditing research to look at auditor judgments could be used to see how engineers come up with their judgments in translating feature value to function value.

The area of functional value determination also can be studied using probability modeling. For example, the probability of failure of a component or part could be used as a surrogate for value. For example, both a brake failure and a tire failure will compromise safety. However, if the probability of a brake failure is twice as much as tire failure, then spending twice as much on the brake may be justified.

A third major technical research area is how to manage market and technology risks during product development. In the current literature, there is an assumption that initial cost targets remain valid—that is, there is no change in market conditions or technology. In the real world, both of these variables are changing continuously, and target or design parameters may become obsolete during the product development process. This raises two broad research issues:

- What risk management strategies are best suited for dealing with changes in market profile or technology?
- When is it appropriate to work with targets that remain relatively fixed throughout the product development process, and when is it better to have more fluid targets?

5.3. Future Research—Organizational Context of Target Costing

Since the prime focus of both the English and the Japanese literature is on the first two stages of the knowledge progression framework, the research opportunities increase dramatically as we move to the later three stages of the framework. The research issues that arise from viewing target costing as an organizational practice can be grouped into three areas: research dealing with behavioral issues at the individual level, behavioral issues at the team level, and behavioral and cultural issues at the organizational level.

At the *individual* level, the behavioral issues are quite similar to the behavioral issues in budgeting. The budgeting literature has examined the effect of budgets on individual aspiration levels and how achievement of budgets affects morale and behavior. There is also a great deal of research that deals with the effect of participation on satisfaction and acceptance of budget targets. This line of research can be adapted to target costing. Some of it has already begun as evidenced by Japanese studies such as Monden et al. (1997), which document the motivational impact of participation in target setting. Others such as Kato (1993) have looked at the impact of target costing on the morale of product design engineers. Japanese studies report dysfunctional effects including burnout syndrome (Kato, 1993).

One of the problems faced by budgeting studies is tying the impact of satisfaction or improved morale to concrete performance goals. There is an implication that higher morale or acceptance of budget targets will lead to higher performance. Because target costing is intimately linked to new product development, it has some very concrete and measurable performance metrics that are built into the target cost. The product development time, the product development budget, the customer features, profit target, and cost target are prespecified. Behavioral research, therefore, can use these outcomes as dependent variables, and use participation in target setting, the use of extrinsic and intrinsic rewards, performance measurement schemes (e.g., balanced scorecard), and leadership styles as independent variables. The specific nature of these goals also allows researchers to test general theories of goal setting (Locke & Latham, 1990, 2002) that suggest that

specific goals lead to higher performance than general goals that simply ask people to do their best.

At the *organizational* level, future research can clarify what types of organizational dynamics and cultural factors support target costing and what factors inhibit its use or effectiveness. An obvious research area is team dynamics. Cross-functional teams are at the heart of target costing; yet there is little research on how team dynamics lead to achieving cost, quality, or time targets. This research area is particularly suited for experiments that can test whether individuals working in a "linear mode" can outperform a "concurrent" cross-functional team.[3] The dependent variables in such studies can be achievement of cost, quality, and time targets. An intermediate variable could be the number of design changes during the development process. The hypothesis is that cross-functional teams will have fewer design changes.

In the area of team dynamics, another open research area is the issue of how to effectively manage the tension between the demands placed on individuals as members of cross-functional teams and their functional allegiances. It would be both interesting and useful to practitioners to understand how organizational variables such as performance measurements, reward systems, and leadership styles enhance or reduce the effectiveness of cross-functional teams.

Target costing decomposes and assigns each team a unique cost target. For example, in an auto company, the overall cost of the new car model is broken into individual targets for the engine team, chassis team, brake team, and so on. Within the engine, each major component has its own target. An open research issue related to team dynamics is whether it is desirable to subsidize cost targets across teams. For example, assume the engine team will exceed its target by $1,000 but the chassis team may come under their target by $1,000. At the product level, the two amounts will wash and the automobile will meet its overall target cost. However, how do we deal with the two teams? Under what circumstances is it acceptable to let one team subsidize another team, and when might this practice lead to detrimental morale and performance effects?

Organizational culture is an important variable in supporting target costing. In addition to teams, target costing requires openness, inclusion of suppliers as partners, sharing information between and across organizational boundaries, and taking and sharing risks. These are variables that comprise a portion of an organization's culture. These cultural variables are hypothesized to be important to TC, but they are untested. Research can shed light on the cultural values that best support target costing. If two organizations with very different cultures can implement target costing successfully, then culture may not be important. If organizational culture plays a significant role in implementing target costing, then what are the variables that mediate this relationship?

Finally, as Argyris (1990) has pointed out, there is a difference between espoused theories and theories in use in organizations. A number of self-reported case studies raise this as a valid research question for target costing. Is it possible that firms only pay lip service to target costing and do business the old fashioned way—that is, use cost plus with all functions working in their silos? As the practice matures, it can and should withstand the type of scrutiny that independent researchers bring.

5.4. Future Research—Linkage with Processes and Tools

The fourth stage in the life cycle of any management practice is establishing links to other support processes and tools. Other processes and tools are necessary to further the emerging practice. Additionally, the interaction between the emerging practice and existing support tools and processes is important to understand and model. For target costing, there are four main interactions that are important. Each is discussed briefly in this section.

The first important interaction area for target costing is *supplier involvement*. Target costing requires major suppliers to get on board early, participate in the product development process, and provide useful market and technological information. While there is a large body of literature in the supply chain and logistics area that deals with how to involve suppliers, build trust, and get them to participate as partners, very little is focused on target costing. For target costing, the interaction effects that matter the most are (i) how to assign targets and make them credible for suppliers; and (ii) how to create a partnering arrangement that extends beyond the product design phase to the maintenance and support phase.

The area of supplier involvement is an area where the espoused and actual practice may be different. Research can document whether target costing practitioners treat their suppliers as partners or simply push cost targets down to them. While this question is

[3]Linear product development is sequential; it begins with design that is then given to manufacturing to produce, suppliers to bid on, and marketing to sell or push. Concurrent development uses a cross-functional team that designs the product and process on the basis of customer input and early supplier involvement.

best studied using field research, the topic can be supplemented with experimental research. The latter method can be used to isolate independent and intervening variables that cause pressure to push targets down the line. Ansari et al. (1999c) found *market power* to be an intervening variable in how firms deal with their suppliers. Another intervening variable may be the presence of *dual suppliers* and suppliers' unwillingness to share data with competing suppliers.

In many industries, the customer–supplier relationships extend beyond the product design phase to the support and maintenance phase. For example, suppliers to defense contractors, aircraft manufacturers, and major construction projects often involve suppliers in not just designing and building a product, but also maintaining and supporting it. This research area needs a framework that can address changing risk profiles for a project over time and how to devise the optimal risk and profit sharing structures. This issue may be best addressed initially with analytical modeling of the type used by agency theory and information economics.

The second interaction effect important for target costing is the link between target costing and *performance measurement* systems such as a balanced scorecard. In some ways both the balanced scorecard and target costing do similar things. They start with the voice of the customer and the demands of the shareholder, they use these demands to streamline the internal organizational structure and processes, and they translate the final outcomes into profits and costs. A good research issue is whether the introduction of a balanced scorecard for a firm using target costing will reinforce or detract from the focus on profitability. They may detract if having two systems that focus on profitability creates information overload and distracts rather than focuses organizational efforts.

The third important area is the interaction between target costing and *other cost management techniques* such as ABC and resource consumption accounting (RCA). Since ABC is popular in the US, and RCA in Germany, it seems logical to conduct a cross-sectional study of target cost adopters in these two countries to see if and how the two systems support target costing. Another interesting research area might be to test whether the usefulness of the two techniques varies for product versus process design. Since ABC is based on process understanding, it is likely to help target costing in the area of process redesign. On the other hand, since RCA focuses on resource consumptions, it might be more useful for product design.

The final area is the interaction between target costing and value engineering. Value engineering is critical for cost-reduction efforts. What is not known is how the frequency of value engineering benefits target costing. Frequency has to do with how many times value engineering is performed during the product development phase. Many Japanese firms use three rounds of value engineering: at the concept stage, at the initial design stage, and at the design development stage. A good research question is: how does the effectiveness of target costing increase with the increase in the frequency of value engineering?

5.5. Future Research—Diffusion and Institutionalization of Target Costing

Target costing is gaining popularity across the globe including in less-developed industrial countries such as India and Malaysia (Sulaiman et al., 2004). With this diffusion, a research opportunity arises to determine how national cultures influence target costing. Do all the components of target costing, such as cross-functional teaming and customer focus, translate the same way across countries? Researchers can use cultural variables such as power-distance first popularized by Hofstede (2001) as independent variables in studies that examine questions such as:

- Does the use of cross-functional teams vary across cultures? Do traditional authoritarian cultures make use of cross-functional teaming difficult?
- How will supplier participation be guaranteed in cultures that rely on trust rather than formal contracting? Will supplier involvement be easier or more difficult?
- Does the use and amount of intrinsic or extrinsic rewards to promote target achievement vary across national cultures? Do cultures high on authoritarianism rely more on extrinsic rewards? Are the rewards larger or smaller than in cultures low on authoritarianism?
- When multinational companies set up operations in other countries, do they export the system "as is" from their home operations or do they modify it? If they modify, what variables account for the modification?
- What is the relative weight of national versus company culture when exporting a practice such as target costing?
- How will target costing evolve (or how is TC evolving) as firms become increasingly global?

There is another side to diffusion that has to do with target costing moving from assembly industries to process, service, and the not-for-profit sectors. The big research question here is how target costing will adapt as it moves into these industries. Some possible hypotheses to test include:

- Target costing in process industries will be characterized by heavier focus on process design and ABC.
- Target costing in service industries will be characterized by heavier focus on value index computations and rethinking strategy.
- Target costing in not-for-profit industries will be characterized by use of surrogates such as budget for price and functional design for value index.

Some preliminary research along these lines has begun to emerge. For example, Kim & Mauborgne's (2004) research on blue ocean strategy suggests that target costing can be a good way to rethink a firm's product strategy and help it to focus on empty value spaces. Ansari et al. (1999b) have looked at how target costing principles are being used by the Department of Defense. They report that the initiative called CAIV applies target costing to products such as fighter aircraft. Congressional budget limits represent the target cost and fighter preferences for safety and maneuverability, and bomb payloads serve as customer requirements to guide product design.

Finally, as the practice matures, it will offer research opportunities related to institutionalization. While testing hypotheses in the field will be difficult until the field matures, it is possible to theorize that like other practices such as operational and capital budgeting, target costing may become an organizational symbol of rationality (a ceremony or ritual) rather than a serious cost management practice. Another theoretical dimension is Gidden's work on how social practices tend to reproduce themselves.

Currently, opportunities to research institutionalization are more promising in Japan because Japanese firms have used the practice for quite some time now. Indeed this type of research has begun to emerge in Japan (Okano, 1999; Yoshida, 2003). Research along these lines in the West is likely to emerge as firms practice target costing for a longer time period.

6. Conclusion

The overall conclusion from this brief look at the target costing literature is that the topic offers researchers many opportunities to undertake new research. We used a two-dimensional organizing scheme for the literature.

The first dimension was a knowledge progression framework that is based on the life cycle of management practices from birth to maturity. The use of this framework shows that the discipline is fairly young. The primary opportunities for identifying knowledge gaps and building novel research hypotheses, therefore, are in the later stages of the life cycle. In the case of target costing these later stages translate into looking at the practice within its organizational context, linking it to other tools and processes, and its diffusion and institutionalization. This research should begin to appear in Japan first, since target costing has been practiced longer in that country.

The other dimension was a taxonomic look with a primary emphasis on research methodology. The research method dimension shows that most existing research uses survey or single-site case studies. It also shows that while the first two stages of practice maturity—development and technical refinement—may not have as many interesting research issues, they do offer researchers an opportunity to replicate and corroborate existing findings and results using different methods such as experiments, analytical modeling, and simulation.

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