A model for profits brought by ISO 9000 certification

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Abstract
The number of papers relating to ISO 9000 certification may be an evidence of big impact in the recent business. When we consider the consequences of ISO 9000 certification, economical efficiency is one of the most important issues as well as the improvement of quality system, reduction of the customer complaints, and so on, discussed in the previous studies. This paper considers a model that describes profits brought by ISO 9000 certification via examination of previous studies and winning reports. Furthermore, we consider estimation of the profits based on the model in order to discuss economical efficiency by comparing the cost estimates.

Keywords Business chance, Labor cost, Profit, Quality cost, Sales

1. Introduction

The number of papers relating to ISO 9000s certification may be an evidence of the big impact in the recent business. The researches relating to ISO 9000 have been performed in various perspectives. The variation of research viewpoints can be easily found as follows: comparison between Malcolm Baldrige prize and ISO certification by Reimann and Hertz (1994), organizational behaviors by Taylor (1995), managers' recognition by Weston (1995), implementation of ISO 9000 system for small companies by McTeer and Dale (1995) and so on. The researches from specific area/industrial category have been also performed, such as Swedish industry (Carlsson and Carlsson (1996)), Turkish industry (Erel and Gosh (1997)) , small enterprises (Brown, Wiele and Loughton (1998), Italian companies (Romano(2000)), Spanish companies (Gasadesus and Gimenez (2000)), large service and manufacturing organization (Dick, Gallimore and Brown (2001) and so on.

Motivation and business performance of certification are also major research viewpoints. For example, Buttle (1997), Anderson, Daly and Johnson (1999), Huarng, Horng and Chen (1999), Dick (2000) and Romano (2000) discuss marketing motivation and relationship between certification and business performance. In addition, their main methodology is questionnaire survey of the business performance based on the models of certification motivation.

In this paper, we consider financial effect of ISO 9000s certification as well as Yamada (2001) and Fukuda and Yamada (2000). Specifically, they estimated the certification cost based questionnaire survey that is derived a cost model describing the relationship between the activities and the financial indices in profits and loss statements. Furthermore, they estimated approximately 2% to the annual sales through the data analysis of responses, where the cost includes the labor costs. The value of these researches may be quantitative estimation while previous studies describe the negative consequences by qualitative manner.

In order to obtain the financial efficiency of ISO certification, both costs and profits should be estimated. The information of the financial efficiency of ISO 9000 though the comparison between the cost and profits may be valuable for not only companies that considering to implement ISO 9000 but also the stakeholders of ISO 9000 certification system, such as registration body, auditor, education organization and so on.

This paper considers a model of profits brought by ISO 9000 certification as a first step for estimation of the profits, where the second step may be a survey based on this model. A model is derived reviews of previous studies and generalization of items pointed out by the previous studies. Furthermore, we discuss an outline to estimate the profit brought by ISO 9000 based on the model.

2. Review of previous studies

Many papers have considered the motivations and benefits of ISO 9000 certifications while some terminologies are slightly different such as consequences, effect, influence and so on. Since the discussions in the previous papers on motivations and benefits may be useful to construct a model of describes certification profits, we, first, review and summarize the discussions.

As regard the motivations and benefits, some examples are listed in Table 1, where this table is derived by making categories based on the similarity of the motivation and benefit descriptions in the previous studies. For example, the category "organizational development" involves "a step towards a total quality," "base for quality improvement," and so on. This table implies the various types of motivations and benefits as well as the variations on the generic and specific viewpoints.

Table 1. Examples of motivation and profits for ISO 9000 certification

Category	Motivations and profits in the previous studies
Organizational development	A step towards a total quality (Carlsson and Carlsson (1996)), base for quality improvement (Brown, Wiele and Loughton (1998)), better management control (Buttle (1997)), combine quality systems (Brown, Wiele and Loughton (1998)), improvement corporate
Financial performance	Business performance (Dick (2000)), improving manufacturing cost (Huarng, Horng and Chen (1999)), increase market share (Brown, Wiele and Loughton (1998)), return on sales (Gasadesus and Gimenez (2000)), sales per employee (Gasadesus and Gimenez (2000))
Customer requirement	Customer relations (Carlsson and Carlsson (1996)), demands from potential customers for an ISO 9000 series system (McTeer (1995)), forced by industrial / customer (Brown, Wiele and Loughton (1998)), keeping existing customers (Buttle (1997)), complaints
Market requirement	Foreign trade (Weston (1995)), pressure from competitors (Huarng, Horng and Chen (1999))
Market development	Anticipated demand from future customers for ISO 9000 (Buttle (1997)), develop international markets (Huarng, Horng and Chen (1999)), gain new customers (Buttle (1997))
Regulation	Compliance related, applicability or regulations, government procurement standards (Anderson, Daly and Johnson (1999)), compliance related, applicability or regulations, regulated products (Anderson, Daly and Johnson (1999)), considered for tenders (Brow
Customer satisfaction	Customer satisfaction (Gasadesus and Gimenez (2000)), increasing foreign buyers' confidence in the firm's management ability (Huarng, Horng and Chen (1999)), interactive - quality at the customer interface. the customer's satisfaction with the service en
Quality improvement	Conformance- meeting specifications, tolerances or standards (Dick, Gallimore and Brown (2001)), improve product quality (Buttle (1997)), improve service quality (Buttle (1997)), improving product reliability (Huarng, Horng and Chen (1999)), product quali
Cost reduction	Costs (Gasadesus and Gimenez (2000)), direct and indirect cost savings through the management of quality (McTeer (1995)), errors and defects (Gasadesus and Gimenez (2000)), improvements in internal quality and the consequent reduction in scrap/ waste/ err
Process efficiency	Improvement in production efficiency (Romano (2000)), improving efficiency (Buttle (1997)), on-time delivery (Gasadesus and Gimenez (2000))

Table 1 tells us the various types of motivations and benefits pointed out by the previous studies. For example, some of the motivations and benefits seem to be generic such as "cost (Gasadesus and Gimenez (2000))" while some of them seem to be specific such as "improvements in internal quality and the consequent reduction in scrap/ waste/ errors, nonconformance/ defects (Romano (2000))." We need to consider this feature when we conduct a model of profits.

3. A model of certification profits

(1) Outline
In order to conduct a model of certification profits, the category in the model should be obtained suitable for the questionnaire survey. The model proposed in this paper consists of two major parts regarding the profits as follows:

- Profits by cost reduction
- Profits by sales increase

The profit by cost reduction in the model implies the difference between the costs with following ISO 9000 and the costs without following it. On the other hand, the profit by sales increase involves the effects of advertisement of certification, getting business opportunities and so on. In terms of evaluation of certification effects, these two categories should be considered separated way since these are different financial features.

(2) Profits by cost reduction
The certification profits by cost reduction can be defined by the difference of the costs between under following ISO 9000 standard and not following it, because many organizations, almost all, had already established their standards and the role of ISO is showing the standard of their organizational standards.

As regard the evaluation of the cost reduction, "quality cost" concept may be helpful since it covers the whole quality related costs. By using this concept, the model in this paper considers the certification profits by the difference of the quality costs under following ISO 9000 and not following ISO 9000. Quality cost is usually measured by category such that prevention, appraisal and failure (internal, external) (e.g. Atkinson, Hamburg, and Lttner (1994), Campanella, J. ed., (1999),). We consider the profit model based on the category.
Table 2 summarizes the cost reduction profits based on the quality cost category. For example, labor cost for prevention costs can be reduced by following ISO 9000 comparing with the cost without following ISO 9000 since ISO 9000 can be used a guideline for implementation of ISO 9000. This cost may be related to a part of "indirect cost savings through the management of quality" pointed out by McTeer (1995). This cost may be related to selling and general administration expenses in profit and loss statements.

(3) Profits by sales increase
In the model, profits by sales increase consist of two parts. The first part implies prevention to loose business opportunity, such as a reservation to join a public tender. In this case, the certification role seems to be a driving license to be a professional driver. The second part implies that the sales increase by the advertise effect of certification. In this case, one of the important reservations is that the competitors in the same market have not obtained certification.

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Table 2. A model for quality cost reduction by certification

Category	Reduced cost	Examples in previous studites correspoinding the category	Items in P/L
Prevention	Labor costs for prevention activities by following the standardized prevention activities	Indirect cost savings through the management of quality (McTeer (1995))	SGA, overhead, labor cost
Appraisal	Labor costs for appraisal activities , such as inspection, calibration, measurement systems, by following the standardized appraisal	Combine quality systems (Brown, Wiele and Loughton (1998)), reducing staff turnover (Buttle	Overhead, labor cost
Appraisal	Inspection materials, calibration materials	Re-inspection by external quality assessors (McTeer (1995))	Raw material, overhead
Internal failure cost	Labor cost to establish quality systems by following the contents in ISO 9000	Conformance- meeting specifications, etc. (Dick, Gallimore and Brown (2001))	SGA, overhead, labor cost
Internal failure	Labor cost to repair non-conforming product by establishing standardized system	Reducing the amount of scrap (Carlsson and Carlsson (1996))	Labor cost, over head
Internal failure	Raw material cost by reducing non-conforming products in the quality system	Scrap, waste, errors, nonconformance, defects, etc.	Raw material
External failure cost	Labor cost to establish quality systems by following the contents in ISO 9000	Conformance- meeting specifications, etc. (Dick, Gallimore and Brown (2001))	SGA, overhead, labor cost
External failure	Labor cost to take actions for customer complaints and related activities	Complaints (Gasadesus and Gimenez (2000))	Labor cost, over head
External failure	Raw material cost to take actions for customer complaints and related activities	Improve product / service quality (Buttle (1997))	Raw material
Process efficiency	Production and its administration labor cost by improving quality system in terms of efficiency	Improving efficiency (Buttle (1997)), on-time delivery (Gasadesus and Gimenez (2000))	Labor cost, over head
Others	Excessive education fee by using the standard education programs	-----	SGA, overhead, labor cost

SGA: Selling and general administration

Table 3. A model for profits by prevention to loose / development of business chances

Category Sub category	Profits	Examples of descriptions in Previous studies	Items in
Prevention to loose			
Required by customer	Certification is required to conduct a company-chain	Customer relations (Carlsson and Carlsson (1996))	Sales
Required in the market	Competitors in the same market had obtained certification. Non-certified system may be a disadvantage to be in the market	Pressure from competitors (Huarng, Horng and Chen (1999))	Sales
Public requirement / Regulation	Certification is a reservation to join a public tender. Regions, countries' directive	Considered for tenders (Brown, Wiele and Loughton (1998)), EU-directive (Carlsson and Carlsson	Sales
Development of new customer			
As a license	Customer requires standard quality product by the minimum cost. Certification is an evidence of standard quality	Foreign trade (Weston (1995))	Sales
Advertisement	"Certified system" may be an advertisement word because of few competitors that have certification in the same market	Anticipated demand from future customers for ISO 9000 (Buttle (1997))	Sales
Competitive quality level	Certification brings an quality improvement of product, and the quality has gotten attention in the market	Improve product/ service quality (Buttle (1997))	Sales

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