

# Preservation of Incentives Inside the Firm

## A Case Study of a Quasi-market for Cost-based Transfer Pricing

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## **Preservation of incentives inside the firm: A case study of a quasi-market for cost-based transfer pricing**

### **Abstract**

According to organizational economists, the implementation of market-like control mechanisms, such as transfer prices, can never completely replicate the market since “the use of high-powered incentives in firms is inherently subject to corruption” (Williamson 1985, 140). This paper illustrates that this is not necessarily always so. By means of a case study, this paper illustrates that many problems that extant research claims are related to cost-based transfer prices were mitigated through an organizational design that created a quasi-market inside the firm. The paper contributes to extant research in several ways. First, it illustrates that strong incentives are somewhat preserved through an organizational design that foster competition between product divisions. Second, the paper shows how the specific problems related to a standard variable cost transfer price were mitigated. Finally, the paper highlights the limits of the quasi-market and describes a number of problems that required central intervention.

Keywords: incentives; transfer prices; quasi-market; organizational design

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## INTRODUCTION

According to Baker, Gibbons, and Murphy (2001), academics, consultants, and practitioners have long proposed to “bring the market inside the firm” to reduce the dysfunctions of bureaucracies.

Baker, Gibbons, and Murphy (2001) refer to transfer pricing papers from the 1950s and 1960s as an early example of this tradition. In one of these papers, Dean argues that:

The modern integrated, multiple product firm functions best if it is made into a sort of miniature of the competitive, free enterprise economic system. The firm should be comprised of independent operating units ... Each such entity of profit center will, in seeking to maximize its own profits, do what will also maximize the profits of the entire company. (1955, 67–68)

More recently, Lazear and Gibbs (2009, 162) argued that “Pay for performance inside an organization is analogous to the price system in market economies.” Ideally, markets and the competition they foster curb individual participants’ power, providing “...incentives to make individuals take appropriate actions without anyone having to direct them” (Jensen and Meckling 1992, 261; see also Williamson 1985, 161).

However, organizational economists are skeptical of the possibility of replicating the market’s self-regulating incentives inside firms through such mechanisms as transfer prices except when competitive markets exist and market-based prices can be used relatively unproblematically. In the more likely event that a transfer price system must be based on accounting data, “the use of high-powered incentives in firms is inherently subject to corruption” (Williamson 1985, 140). According to the extant literature, this corruption has two sources. First, because top management controls performance measures, it cannot credibly commit to not expropriating gains—for example, by fudging transfer prices—causing employees to reduce their innovative activities (Holmstrom and Milgrom 1991; Roberts 2004; Williamson 1985). Second, cost-based transfer prices are incomplete

and prone to manipulation by managers in selling divisions who have incentives to increase these prices and, in turn, the reimbursed amounts, thus improving their divisions' results (Williamson 1985; Zimmerman 2017; Rogerson 1994; Sahay 2003). However, little research on transfer pricing has investigated whether and under what conditions cost-based incentives are corrupted inside the firm or whether competition inside the firm could be designed to alleviate these problems.

Though extant research on transfer pricing has aimed to gain more insight into the context of transfer pricing, it has had a broader focus. The literature has used a variety of organizational theories (e.g., Williamson 1975, 1985) to determine the relations between transfer prices and other control elements, such as the performance evaluation system, the reward system, and the system to delegate decision rights (Boyns, Edwards, and Emmanuel 1999; Colbert and Spicer 1995; Eccles 1985; Helden, Meer-Kooistra, and Scapens 2001; Meer-Kooistra 1994; Spicer 1988). In this literature, focus has been on the determinants of transfer pricing change from, for example, market-based to cost-based transfer prices (e.g., Eccles 1985; Helden et al. 2001), and how to specify whether a transaction should take place inside the firm or in the market (e.g., Meer-Kooistra 1994; Spicer 1988). However, there has been little focus on the specific elements of different cost-based transfer prices and the incentive problems they potentially create.

A recent strand of research examining the effect of tax compliance on transfer pricing systems has shown that tax compliance strongly influences the design of transfer prices for internal use (Cools, Emmanuel, and Jorissen 2008; Cools and Slagmulder 2009; Rossing and Rohde 2010). In general, however, these studies have not addressed incentive issues or how incentives are balanced against decision-making once the transfer price has been set. In this paper's case, company standard

variable cost was used only for internal purposes, and the company used a different transfer price for tax.

Economic studies of cost-based transfer prices commonly focus on how specific transfer price design choices (e.g., standard, actual, full-cost, or variable cost) corrupt incentives and how these effects can be reduced either by changing the design of the transfer price or by considering the broader context in which the transaction is taking place (Bouwens and Steens 2016; Christensen and Demski 2003; Holmstrom and Milgrom 1991; Kaplan 1985; Klein, Crawford, and Alchian 1978; Klein 1996; Rogerson 1992, 1994; Sahay 2003). For example, Bouwens and Steens' (2016) study of incentives to reduce excess capacity in full-cost transfer prices showed that the risk of a death spiral that would render an organizational department obsolete created incentives for production units to reduce their capacity. Sahay (2003) investigated the conditions in which different types of mark-up policies (additive and multiplicative) most effectively supported investments in specific assets.

Economic studies commonly focus on design trade-offs that can serve the purposes of both decision-making and incentives, yielding detailed knowledge about the relation between specific designs and incentive issues. However, such studies tend to focus on just a few of the many potential problems of the specific cost-based transfer price. The present paper seeks to complement extant research by means of a case study investigating incentive and decision-making problems related to a standard variable cost transfer price. The paper illustrates that the case company, by creating a quasi-market, was able to mitigate many of the incentive problems usually associated with a standard variable cost transfer price. The term "quasi-market" is used to highlight that the

“market” inside the case company is not a “real” market in all aspects.<sup>1</sup> However, the paper illustrates that the interactions between different control elements managed to foster competition inside the firm, hence the term “quasi-market,” which provided the positive incentive effects.

The study addresses the following research questions: How is a quasi-market designed around a standard variable cost transfer price? What control elements complemented the transfer price to reduce incentive as well as decision-making problems related to the transfer price? What were the limits of the quasi-market in terms of handling incentive and decision-making problems? By answering these questions, the paper contributes to the accounting literature in three ways.

First, the case study illustrates how incentives in a cost-based transfer price can be maintained to some extent by an organizational design (or control package) that creates (market) competition among a company’s product divisions. Competition as a tool for creating strong incentives inside the firm is seldom mentioned in the transfer pricing literature or in the broader incentives literature, which have tended to focus on problems related to measurement and commitment when designing incentive systems (Zenger and Hesterly 1997; Zenger, Felin, and Bigelow 2011; Gibbons and Roberts 2013).

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<sup>1</sup> According to Le Grand (2007) a quasi-market is a market where the buyer does not pay for the goods with his or her own money. The most common example is when the State pays for goods and services the citizens’ purchase. Merchant and Van der Stede (2007, 280) use the concept ‘*quasi* market-based transfer prices’ (emphasis in the original) to name transfer prices that deviate from observed market prices. The ‘market’ in the case company is ‘quasi’ in both respects.

The design of the quasi-market can be seen as one version of a control package. This study thus complements the research that argues that transfer pricing should be seen in its organizational context (Boyns et al. 1999; Colbert and Spicer 1995; Eccles 1985; Helden et al. 2001; Meer-Kooistra 1994; Spicer 1988) and provides insight into the general claim: “Thus, the choice of a transfer pricing system may be far less important, than the process of attuning the various management accounting control systems” (Helden et al. 2001, 374). The paper illustrates that distribution of decision rights, reward systems, performance evaluation systems, and the resource allocation system were part of the quasi-market design.

Second, the paper illustrates how internal competition reduces the *specific* incentive problems associated with standard variable cost (e.g., Christensen and Demski 2003; Sahay 2003; Rogerson 1992, 1994; Zimmerman 2017), and to my knowledge, the paper is the first to investigate a standard variable cost transfer price in its organizational context. The paper also illustrates that by complementing a cost-based transfer price with additional control elements—distribution of decision rights, reward systems, performance evaluation systems, and the resource allocation system—a standard cost center under the right circumstances can induce more active and innovative behavior than normally assumed in management accounting textbooks (Merchant and Van der Stede 2007, 281). Thirdly, the paper illustrates the limits of a self-regulating market inside the firm by highlighting problems regarding collective action (Ostrom 1990) and product portfolio proliferation that could not be handled through the quasi-market and therefore required the implementation of additional control elements.

The rest of the paper is organized as follows. First, I provide an overview of the literature on incentive problems associated with standard variable cost. Then, the methodology is described and

the case company is presented, followed by the analysis. The discussion and conclusion end the paper.

## **INCENTIVE AND DECISION-MAKING PROBLEMS ASSOCIATED WITH STANDARD VARIABLE COST TRANSFER PRICES**

The literature on incentive problems related to cost-based transfer prices and cost-based contracts is immense, and it is beyond the scope of this paper to provide an overview of all the related problems, solutions, and alternatives (such as market-based transfer prices or negotiated prices). Instead, this short review will focus on problems related to standard variable cost as used in the case company. However, as many of these problems and their solutions are common to many types of cost-based prices, the review has wider applications. The review draws on both the transfer pricing and cost-based contract literature. Although the difference in incentive problems associated with transactions carried out inside or between firms is a central issue in organizational economics (e.g., Holmstrom and Milgrom 1991; Roberts 2004; Williamson 1985) and management accounting (Meer-Kooistra 1994; Spicer 1988), this short review focuses on the relation between the design of the transfer price and potential incentive and decision-making problems, not on the implications of organizing transactions inside or between firms. Table 1 provides an overview of potential incentive and decision-making problems associated with a standard variable cost transfer price. In general, incentive problems can be categorized as one of two types: adverse selection and moral hazard (see, for example, Milgrom and Roberts 1992; Williamson 1985).

**Insert table 1 here**



**Adverse selection**

Adverse selection, or the hidden information problem, arises when the selling division hides information about the true cost ex ante (Akerlof 1970; Lukka 1988; Milgrom and Roberts 1992; Miller 2002; Myerson 2008; Stiglitz 1994). Adverse selection becomes a problem when the selling division has an incentive to increase the reimbursed amount, thus improving its own results; in the case of a standard variable cost transfer price, this can be done by setting the standard higher than the true costs (e.g., by misclassifying capacity costs as variable costs) (Zimmerman 2017).

One central question in economic theory, then, concerns how to design mechanisms that ensure that the economic agent reveals information truthfully in the absence of a (perfect) market in which competition would drive out adverse selection (Milgrom and Roberts 1992). While much of this literature is highly theoretical, the application of theory to practical problems such as auction design is one example of how economists have successfully contributed to the design of market-like mechanisms that reduce adverse selection through competition (McMillan 2002). Truth-revealing mechanisms have also been developed for organizational settings in relation to setting budget targets and standard costs (Gonik 1978; Jensen 2003; Hodak 1997; Vaysman 1996); however, there is little empirical research documenting the use and applicability of these models in practice (e.g., in relation to transfer prices).

Open-book accounting, where buyers demand access to the selling firm's books, is another method of reducing adverse selection often used in inter-firm transactions (Angdal and Nilsson 2010; Caglio and Ditillo 2012). However, open-book accounting's ability to reduce adverse selection and

asymmetric information problems in general is largely dependent on the buying party's knowledge of the supplier's technology. For example, misclassification of capacity costs as variable costs or slack in a cost calculation is difficult to discover in accounting books if the buyer is not familiar with the selling party's production technology.

Ahmadjian and Lincoln (2001) provide an interesting example of this logic. According to Ahmadjian and Lincoln (2001), there was little formal contracting in the relation between Toyota and Denso. Price targets were set twice per year to take into account adjustments: "This system of price setting requires that an auto assembler have access to a supplier's cost structure and understand intimately its manufacturing process" (Ahmadjian and Lincoln 2001, 688). Ahmadjian and Lincoln (2001) shows that the bargaining situation changed when Toyota lost its understanding of Denso's technology.

In intra-firm transactions, the use of open-book accounting could involve more parties, since the accounting department could organize the open-book accounting. If the accounting department has knowledge of the selling division's production technology, the adverse effects could be reduced even though the buying division has little knowledge of the selling division's technology. There is little research in the application of open-book accounting in a transfer pricing context.

### **Moral hazard**

An extensive body of research has illustrated the types of problems that can arise because the specific features of transfer price (e.g., the standard and variable elements) distort incentives in the selling divisions after the transfer price has been set. These problems fall into two overall categories: multi-task and commitment problems. Multi-task problems arise when the transfer price

creates unbalanced incentives in the selling divisions. Because the transfer price functions as payment, the selling division will focus on elements that are reimbursed (Holmstrom and Milgrom 1991).

Both standard and variable elements of the transfer price can potentially create *unbalanced incentives*. According to extant research, focusing on creating positive variance in standard costs can remove attention from non-cost elements, such as delivery, inventory, and quality. Use of the lower-powered actual cost, additional measures, and reputation mechanisms has been proposed as a means of balancing the focus on cost reduction and delivery, inventory, and quality (Bajari and Tadelis 2001; Holmstrom and Milgrom 1991; Kaplan and Cooper 1998; McAfee and McMillan 1988; Zimmerman 2017).

The use of standard cost can also create unbalanced incentives in relation to innovation. Arrow (1962, 613–14) argues that the use of actual (cost-plus) rather than standard (fixed price) formulas in military contracts between suppliers and the government incentivizes innovation because the government carries the risk. Standard cost-based transfer pricing reduces incentives for innovation because the selling party bears the risk of innovative activities (difficulties in selling new products, problems with new processes etc.), which is often higher than for non-innovative activities (Baker and Monsler 1994 Rogerson 1989). To balance incentives and foster innovation, the literature proposes a higher profit mark-up for innovative products and processes (Rogerson 1989), as well as contracts whose cost overruns are shared by the selling and buying divisions (McAfee and McMillan 1988). However, these solutions have been little investigated or documented in the case of transactions inside firms.

As only variable costs are reimbursed, the variable element of a transfer price can create an unbalanced incentive to increase variable cost, even though this is inefficient (Rogerson 1992, 1994; Zimmerman 2017). A selling unit can misclassify capacity costs as variable costs, inefficiently overuse variable costs, or even transform capacity costs into variable costs by outsourcing components, even though in-house production would be more efficient (Christensen and Demski 2003; Kaplan 1985; Klein, Crawford, and Alchian 1978; Klein 1996; Rogerson 1992, 1994).<sup>2</sup> While these problems are most severe in cases of actual cost transfer prices in which all costs can be transferred, such strategies can also be pursued to keep the standard high in cases of standard cost transfer prices, thus avoiding adjustment of the standard (as detailed below). Rogerson (1994) argues that the problem would be reduced by a more precise calculation that accounts for all costs; however, Christensen and Demski (2003) showed that even a precise cost calculation like activity-based costing (ABC) can create unbalanced incentives if there is excess capacity and accounting costs therefore fail to reflect opportunity costs.

*Commitment problems* arise when management cannot credibly commit to not expropriating some of the gains from cost reductions achieved by the selling department. The ratchet principle, which leads to the ratchet effect, is a well-known example of this problem (Bouwens and Kroos 2011; Weitzman 1980). According to the ratchet principle, a performance standard is adjusted on the basis of prior performance. As the manager of the selling department often considers lowering the standard cost as a deterioration of the performance contract, cost reduction efforts will be reduced (or go unreported); this is called the ratchet effect (Berliner 1956; Jensen 2003; McAfee and McMillan 1988; Milgrom and Roberts 1992; Miller 2002; Zimmerman 2017).

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<sup>2</sup> The famous Fisher Body case (e.g. Klein, Crawford, and Alchian 1978; Klein 1996) illustrates this point.

The literature proposes several solutions to neutralize the ratchet effect—for example, by prolonging the period of adjustment or reducing the standard by only a percentage of the improvement, sharing the receipts from the cost reduction with the selling department manager (McAfee and McMillan 1988; Rogerson 1994). Sahay (2003) discusses how two types of mark-up methods for actual variable cost transfer prices can differentially affect incentives for cost reduction. The *multiplicative* method determines the unit transfer price by multiplying a cost measure by a fixed factor (for example, 120 percent of costs). Using the *additive* method, on the other hand, the transfer price is set at a fixed cost (e.g., the variable cost plus \$5). Although Sahay (2003) discusses actual variable cost transfer prices, the choice of the mark-up method is between one (additive) that resembles standard costs and one (multiplicative) that resembles actual costs. Satay (2003, 188) argues that although the multiplicative method is optimal for calculating the appropriate product cost since cost savings show in both cost and mark-up calculations, the additive method provides better incentives for cost reduction by the selling division, as cost reduction does not minimize mark-up, and less of the savings are transferred to the buying division.

However, the literature on topics such as piece rates and inter-firm contracts illustrates the difficulties of adhering to such arrangements and thus avoiding the ratchet effect, as standards of all types must occasionally be changed to avoid complete obsolescence (e.g., if a major technological improvement occurs) (Miller 2002; Roy 1952). Adjustments may not be problematic if top management agrees to maintain the standard unless major technological improvements are implemented; however, such an agreement will be incomplete (e.g., in terms of what constitutes a major technological improvement) and difficult to implement (Miller 2002).

If management can intervene selectively, adaptation to changing circumstances may be unproblematic; however, according to Williamson, selective intervention is impossible because the option to intervene “can be exercised both for good cause (to support expected net gains) and for bad (to support the subgoals of the intervenor)” (Williamson 1996, 150–151), and “There are many ways...in which the headquarters can use the accounting system to effect strategic redistributions (through transfer pricing changes, overhead assignments, inventory conventions, etc.), whatever the preferences of the parties” (Williamson 1996, 103). It is therefore difficult to commit credibly to not cutting standards, and incentives are subsequently corrupted.

There have been surprisingly few mentions of competition as a tool to increase efficiency using cost-based transfer prices. As one exception, Bouwens and Steens focused on the death spiral in full-cost transfer prices, arguing that managers respond to the impact of volume increases by reducing costs: “In the first place, a death spiral would backfire on them: it would eventually render their units obsolete. That would threaten their employment and thus should discipline them” (2016, 78). However, the authors do not elaborate on the specific circumstances in which the (market) discipline might be implemented.

### **Decision-making**

Unless excess capacity is present, a standard variable cost transfer price is often seen as a poor approximation of opportunity costs (Zimmerman 2017) and can distort decision-making, even in the absence of any conflict of interest. For that reason, it is sometimes argued that a transfer price calculated at variable cost “...will lead you to keep everything. It will lead you to add products, it will lead you to never drop anything” (Shank, cited in Robinson et al. 1990, 19; see also Kaplan et al. 1997). Textbooks commonly differentiate between variable and marginal costing; while the latter

varies according to capacity constraints, overtime payments, and so on, the former includes certain cost categories (direct material, direct labor, etc.) that remain constant irrespective of changes in output (Zimmerman 2017; Kaplan and Atkinson 1998). As the case company used a standard variable cost transfer price, the study in this paper focus on issues associated with this version of variable costing. The standard element of the transfer price can also distort decision-making, as only cost savings will show in the transfer price when the standard cost is reset (which normally occurs once per year).

### **Final Comments**

This short review of the literature on decision-making and incentive problems related to standard variable cost transfer prices reveals several gaps in the literature. Because studies often deal with one problem at a time, the subsequent discussion of solutions relates solely to that specific problem. This is problematic, as some incentive problems pull in opposite directions. For example, it is unclear how unbalanced incentives that favor cost reduction rather than quality might interact with disincentives to cost reduction induced by the ratchet principle. Under what circumstances will the low incentives induced by the ratchet principle—the ratchet effect—balance the incentives for cost reduction and, for instance, attention to quality?

Another issue is that much of the literature is related to inter-firm settings (Rogerson 1989, 1992, 1994; McAfee and McMillan 1988; Bajari and Tadelis 2001; Lafontaine and Slade 2013). Although these studies offer many insights, these contracts often relate to large projects, and there is little discussion of how incentive mechanisms distort product costs in a multi-product setting, which is normally the situation in which transfer prices are used inside the firm.

## METHODOLOGY

The case study method was used here to explore the complexities of how a transfer price functions. According to Yin, the case study method is valuable in cases in which one “investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin 1984, 13). This seems to apply to studies of the interactions between transfer prices and other control elements.

The case study approach was inspired by other studies of management control practices. For example, Jørgensen and Messner (2010) stated that the main task of the researcher is to inquire into a field of practice and to make sense of observations using abductive reasoning—that is, by moving back and forth between data and theory (Ahrens and Chapman 2006), where the primary requirement is close proximity to the field (Jönsson and Macintosh 1997). The use of theory during the case study clearly involves abductive reasoning. I began by focusing on issues and problems related to traditional incentive problems; however, during the field work, problems emerged that were difficult to make sense of in terms of the traditional literature. To get a better grasp of these problems, I applied other branches of economic theory that included Ostrom’s (1990) work on collective action.

Interviews were the primary data source. I conducted 21 interviews, varying in duration from 45 minutes to two hours and averaging about one hour. I interviewed a financial manager in the central accounting department and 10 persons in each division. In the Old Division, I interviewed the manager of product development, the central quality manager, the controller, the marketing manager, a product manager, a plant manager, the production manager, two production center managers, and a project manager. In the New Division, I interviewed the divisional manager, the



plant manager, the logistics manager, the manager of product development, the marketing manager, an employee in marketing, the quality manager, the production manager, and a production center manager. All the interviews were transcribed.

The interviews were semi-structured. For each interview, I prepared an interview guide covering a range of topics (the person's job, attitude towards the organization of transfers, etc.). I did not follow the guide slavishly but used it as a basis for discussion and to check whether I had covered all the issues. I made more use of the guide in the first interviews than in the later ones. I adopted an empathic but critical approach to the individual interviews (Flyvbjerg 1998) and kept an open mind about each interviewee's history, allowing them to articulate their own view of a given issue.

However, I tried to challenge each interviewee's view of reality by referring to statements from other interviewees on a specific issue that contradicted their view. Though I did not use software, I initially coded the interviews according to the incentive problems mentioned in the literature.

However, due to the logic of abductive reasoning (Jørgensen and Messner 2010), the initial coding turned out to be incomplete, as I had not been able to foresee how different incentive problems were mitigated and interrelated. Therefore, I went beyond the initial coding and revisited the data several times to gain a better understanding of how the transfer price worked.

Various internal documents concerning accounting rules for the factory were also included in the analysis. These included documents illustrating how the standard variable cost statement was designed and the adjacent rules for calculating standard variable cost; a document called "Profitability analysis for the production centers"; "The Plastic Factory Business Evaluation Model," which was used for evaluating both process improvement suggestions as well as new product development; "The company's stage gate model," which was the company's model for the

different stages that new product development should pass; and several documents related to the company's quality management (an ISO-certificate and an application for a quality award). These documents helped me gain an understanding of the control of the company.

## CASE PRESENTATION

The Plastic Factory<sup>3</sup> developed and sold products for disabled people. At the time of the study, the company had approximately 3,000 employees and sales of about €400 million. The company was organized as four product divisions located primarily in Denmark. Each product division developed and sold products for distinct types of customers suffering from different diseases. The study covered two of these product divisions, here called the Old and the New Division. The Old Division was the oldest and largest division in the company, whereas the New Division was the faster growing of the two. Having two divisions helps to highlight potential perceived problems in the quasi-market design (e.g., perceived unfairness). In addition to the product divisions, there were approximately 20 sales divisions located all over the world; the majority were in Europe and the US. The product divisions developed and manufactured products that they "sold" at the transfer price to the sales divisions.

The product divisions incorporated a marketing department that serviced the sales divisions and participated in new product development, a product development department that was responsible for the technical aspects of product development, a technical department that handled the development of the machines in the divisions, and a manufacturing department. The manufacturing

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<sup>3</sup> As the reader might have guessed the company name is disguised due to confidentiality.

department included a plant manager, who was responsible for the production in the division, and a number of production managers, who were responsible for two or three production centers that had responsible managers. Though disagreements existed within the product divisions' different departments, this paper's focus is on the behavior of the product and sales divisions as a response to the quasi-market design. Potential conflicts between, for example, the manufacturing department and the marketing department within a product division are not the focus of the paper.

The company places great emphasis on product development, and products that had been marketed during the four previous years represented between 20 and 30 percent of the revenue at the time of the study. The sales divisions were responsible for all sales and distribution in their respective countries. They sold directly to hospitals, which were their largest customers, as well as to distributors. In several of the markets in which the company competed, they were price takers—that is, prices in the different countries were primarily determined by government subsidies to patients, allowing the sales divisions little leeway in setting prices. Figure 1 illustrates the organizational structure of the company, the internal trade between the product and sales divisions (the arrows in the figure), and the transfer price.

**Insert Figure 1 here**

Management accounting in the product divisions was centered around a standard cost system for variable costs, which was used to control production and as a basis for calculation of the transfer price. As this transfer price was used only for management accounting purposes, tax compliance and related issues were not discussed after an initial interview with the financial manager in the central accounting department who stated that “We wish to measure the divisions on the contribution margin they create, and we calculate that contribution margin based on actual cost calculations instead of some fictive calculated transfer prices for tax”<sup>4</sup> (See Discussion for an elaboration of this point).

Variable product costs covered all materials directly included in individual products, as well as packing materials and direct labor. Direct labor hours related to batch activities were also included in product costs and were calculated as the average cost for the individual product variants. Up to a few years before the study, the transfer price was based on all costs listed in the parts list, but that practice changed. At the time of the study, indirect labor costs (blacksmiths, warehouse employees, etc.) were removed from the transfer price, as these were not considered variable costs. These “indirect unit costs” were added to the transfer price as a fixed percentage (11 percent) of individual products’ variable unit costs. Variable costs accounted for approximately 25 percent of total costs in the product divisions. Though it can be argued that the transfer price is not a “clean” standard variable cost transfer price since there is an 11 percent mark-up, the mark-up only covers a fraction of the total costs, and the problems related to the “variable” element as highlighted in Table 1 are not altered in any significant way by the little mark-up. To create incentives for the sales divisions

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<sup>4</sup> In this quotation ‘actual cost’ means contrary to ‘fictive’ or ‘arbitrary’ not contrary to standard cost.

to sell new products, standard variable costs for new products were set at 10 percent below the actual calculated standard cost for the first two years.

Resources were allocated to the divisions in several ways:

1. Variable costs were allocated through a flexible budget. The transfer of one more product unit authorized the spending of the materials as well as the hiring of direct labor.
2. Non-variable costs (e.g., employees working with indirect production activities) were transferred from the previous year (incremental budgeting). As the company had only experienced growth, there was no history of budget cuts.
3. Resources to hire new people and invest in new machines were allocated to the divisions through a profit-sharing scheme. Seventy-five percent of the contribution margin earned in each product division was allocated to (or remained in) that specific product division to use for investment purposes (e.g., through hiring engineers for product or process development). As will become evident below, this part of the resource allocation system was a central part of the quasi-market design.
4. Depending on the firm's current general financial status, a portion of the remaining 25 percent (100 percent minus the 75 percent) earned contribution was allocated to the product divisions based on top management's discretion to fund different types of projects related to cost reduction, quality improvement, product development, etc. These projects were often initiated by the managers in the manufacturing department but ratified by top management to align them with the overall firm strategy. Sometimes, projects were initiated from top management to increase quality or productivity at a company level.

## ANALYSIS

As mentioned above, the analysis was structured around the problems in Table 1. It has six parts: creating incentives for truthful reporting and cost improvement; distortion of input factors; distortion of non-cost elements; incentivizing the risk-averse agent; problems in getting new products on the market; and dealing with product portfolio proliferation. Figure 2 highlights the elements of the organizational design that relate to transfer pricing and the quasi-market, to which the analysis substantially relates.<sup>5</sup> The structure of the analysis follows a logic that explains the quasi-market first and then discusses how issues were dealt with “outside” the quasi-market. This means that the analysis will show that the first three problems in the bottom of the figure were dealt with through the quasi-market design, whereas the last two problems in the figure only partly (therefore the ‘some’ in the figure) was dealt with through the quasi-market design. The “dealing with product portfolio proliferation” problem was dealt with outside the quasi-market design.

**Insert Figure 2 here**

### **Creating incentives for truthful reporting and cost improvement**

In the literature on cost-based prices, the “standard” element has been said to create incentives for conservative forecasting by the producing unit (i.e., the standard is set higher than the “real” costs),

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<sup>5</sup> The concept ‘organizational design’ is taken from Roberts (2004). The concept has some similarities with Zimmerman’s (2017) concept ‘organizational architecture’ and Malmi and Brown’s (2008) ‘control package’. The organizational design illustrated in figure 2 should not be conceptualized as an illustration of all the controls that are implemented in the Plastic Factory. Figure 2 only relates to those elements that are connected to the transfer price.

making it easier to produce within the boundaries of the standard. Furthermore, the standard element can reduce cost improvement activities in the period after the standard has been set due to the fear of being “punished” by the lowering of the standard if a positive variance is produced (the ratchet effect) (Akerlof 1970; Jensen 2003; Lukka 1988; Miller 2002; Myerson 2008) (see Table 1). Figure 2 illustrates how both of these incentive problems might arise from this organizational design. First, the product divisions have decision rights in setting the standard. Second, as an increase in the standard would increase product division revenue (i.e., the transfer price in Year 1), the product divisions would have an incentive to suggest a conservative (high) standard. Finally, since a positive variance (10 DKK in contribution margin) was automatically deducted from the transfer price in Year 1 to calculate the transfer price in Year 2 (the ratchet principle), managers in the product divisions would have an incentive to reduce cost improvement activities to avoid lowering of the transfer price (the ratchet effect). However, according to the factory director in the New Division, these two incentive problems were apparently reduced by the organizational design:

*If the standards increase, then the sales divisions find that the transfer prices go up; for a lot of divisions, this means that they remove their sales resources. The sales divisions are evaluated on their contribution margin ... so, when the transfer prices go up, they move their resources to products, which give a higher contribution margin. In this way, there is competition between the product divisions to have the most attractive products. (Factory Director, New Division)*

The organizational design illustrated in Figure 2 created a quasi-market where competition thrived. Although the product divisions produced different products that were not in direct competition, the sales divisions could freely choose which products they wanted to sell, and the product divisions

had to compete for the sales divisions' attention and time. This competition was facilitated by the organization of the sales divisions. In most of the sales divisions, sales personnel sold products from all product divisions, and this way of organizing the sales force (combined with the right to choose which products they wanted to sell) made it possible for the sales divisions to "punish" the product divisions by not selling the products of those product divisions that failed to lower their prices sufficiently.

The two potential incentive problems were therefore reduced by the quasi-market, which was made possible by the sales divisions' possibility, to a large extent, to choose between the different product divisions' products. As cost reduction was shared between the product divisions and the central office, there were additional incentives for the product divisions to engage in cost reduction:

*That relates to how our manufacturing cost and capacity cost are allowed to grow in relation to our contribution margin. If our contribution margin grows by 10 percent each year, our capacity cost must only grow by 7.5 percent. So, there is constant pressure on cost improvements, and it is primarily on the manufacturing cost that these can be realized. It is difficult to reduce capacity cost because the development department needs engineers, so we try to make cost reductions on the variable cost. (Director of Manufacturing in the New Division)*

The resource allocation system (in which 75 percent of the reduction in variable costs remained in the product divisions) meant that product division growth depended on the division's ability to generate a contribution margin. The contribution margin was achieved by a combination of low transfer price ex ante and a continuous reduction in prices to remain competitive with other product



divisions, which also had to reduce costs to remain competitive. The reductions in unit (variable) costs were realized in several ways. Many of employees not directly involved in production were allocated to cost reduction projects through the yearly business plan. As the planned cost reductions were not deducted from the transfer price until the following year, the combined planned and potential non-planned cost reductions were transformed into a contribution margin for investment in new activities (see Figure 2). The sharing scheme balanced potential incentives fueled by the competition to set the standard lower than the real cost of remaining competitive, as a low standard would make it difficult to produce a positive variance.

Although there was no variable pay at the management level, indirect incentives to participate in the competition were provided through the resource allocation and reward systems. Incentives were provided indirectly through the prospect of promotion (and fear of getting fired). Managers were largely recruited from within, and, as the company had been expanding its activities for several years, the prospect of promotion for hardworking managers was promising. An important criterion for promotion was growth, and, as allocation of resources to the divisions (the basis for growth) was closely linked to low transfer prices, the product divisions had a strong incentive to continuously reduce the costs that determined the transfer price.

### **Distortion of input factors**

According to the literature, a variable cost transfer price can potentially create unbalanced incentives, as only variable costs are reimbursed. A selling unit can inefficiently overuse the transferred cost category at the expense of the non-transferred cost categories, even misclassifying capacity costs as variable costs to increase the transfer price and, consequently, the reimbursed

amount (Christensen and Demski 2003; Holmstrom and Milgrom 1991; Kaplan 1985; Klein, Crawford, and Alchian 1978; Klein 1996; Rogerson 1992, 1994). These incentive problems were also reduced by the organizational design (see Figure 2), as any misclassification of capacity costs as a variable cost or overuse of variable costs compared to capacity costs would increase the product price, which could lead to a decrease in sales due to the competitive situation.

Another possible balance problem emerged as a result of the focus on reducing variable costs. Were there incentives to misclassify variable costs as capacity costs or to overuse capacity costs at the expense of variable costs to make products more competitive? Surely this was a potential problem, as variable and capacity costs were not similarly “priced” in the transfer price. As mentioned above, while only 75 percent of the savings in variable costs remained in the product divisions, all (100 percent) of the reduction in capacity costs remained in the product divisions. On the other hand, reductions in variable costs were important in the competition for sales resources.

None of the respondents mentioned misclassification as an issue; however, they emphasized that there was a considerable focus on the reduction of variable costs (especially direct labor). However, this focus should not necessarily be categorized as “unbalanced” (and therefore as an incentive problem) because it was a deliberate attempt to implement production strategies. Using transfer prices or cost allocations to implement a production strategy that focuses on reducing direct labor is widely reported in the literature (see also Hiromoto 1988; Merchant and Shields 1993; Zimmerman 1979), and in this case, the apparent purpose of the design was to support strategies for implementing more automated, and thus more technologically advanced, production.

The Old Division had the explicit and specific objective of using automation to double production without increasing the use of labor. Outsourcing was not considered an option at the time of the study, and most of the product divisions shared this focus on automation. Several arguments were advanced to explain the benefits of the automation strategy (as well as the negative side effects of using direct labor). According to a production center manager in the Old Division, automation provided more flexibility, as many different products could be produced on the same machines, and the new machines could use cheaper and better materials than traditional labor-intensive processes. According to one production center manager, automation often reduced quality problems by ensuring more stable and uniform production than manual labor. Automation was also seen as an important element in attempts to reduce sick leave; according to the Old Division controller, much of the 20 percent sick leave among production workers was caused by monotonous work processes, which could be eliminated by automation. As induced by the transfer price, the concerted focus on reducing direct labor was seen not as a problem but as a solution to a problem.

### **Distortion of non-cost elements**

A classic point of criticism in using standard costs is that the intensive (high-powered) focus on cost reduction creates incentives to lower costs on materials by purchasing poor quality in large quantities, which keeps unit costs down but creates large inventories and quality problems (Kaplan and Cooper 1998; Zimmerman 2017). However, distortion problems in the Plastic Factory were minimal due to material in-substitutability, job-design, and the use of a fairly complete set of performance measures.

Since, for technical reasons, it was not possible for many of the materials used in the production to substitute good materials with potential low-quality, low-cost materials, the purchase of low-quality

materials was not possible. When it was possible to purchase lower-quality materials, the incentives for the logistic department were somewhat balanced. The logistic department was simultaneously responsible for the prices of materials, the delivery of finished products from the product divisions to the sales divisions, and the size of the stock, which means that the purchase of poor quality material would cause production problems (such as a large amount of scrap), which again would lead to delivery problems. Because it is fairly easy to specify how these parameters should be measured, the purchase of poor quality materials, delivery problems, and stock size were not major problems in the product divisions unless uncontrollable events, such as strikes at suppliers, occurred.

#### *Quality issues in the manufacturing departments*

In the Plastic Factory, quality was measured both by the employees inside the company (the error system) and by the customers through a complaint system (the complaint system). The production centers were held responsible for a specific level of quality (between 1 and 2 percent allowed errors, depending on the production center). The company had implemented visual control of all its products, and products that were scrapped were categorized as waste in the standard variable cost system and thus included in the standard cost system.

The company also had a complaint system in which customers could return error-ridden products. Error-ridden products were sent back to the production units to be replaced, without the production centers getting further reimbursed. The practice, which theoretically can be conceptualized as a guarantee (Akerlof 1970), is well-known from case studies from other manufacturing companies as

a way to balance cost and quality (Berg and Fast 1975; Friis, Hansen, and Vámosi 2015; Lazear 2000).<sup>6</sup>

### **Incentivizing the risk-averse agent**

As mentioned in the section titled “*Incentive and decision-making problems associated with standard variable cost transfer prices,*” a transfer price calculated at standard cost allocates the risk in producing new products to the selling division, which can reduce the incentive for innovation. According to Rogerson (1989), one way of addressing this problem is to compensate the selling division for the risk by setting a higher profit mark-up (called a “prize”) for newly developed products. However, Rogerson’s (1989) advice was not followed by the Plastic Company. On the contrary, rather than providing a prize, the product divisions were actually punished for launching new products! In the first two years, the pricing of new products was downward-biased (10 percent compared to the actual cost) in order to incentivize the sales divisions to sell new products, making it difficult for the product divisions to cover costs and make a contribution margin on these products. However, the organizational design (see Figure 2) helped to mitigate some of these innovation problems by providing somewhat long-term incentives for developing new products.

The organizational design’s capacity to somewhat incentivize product innovation was linked to the life cycle of most of the company’s products. According to several respondents, constant technological development within the industry has made it difficult to increase sales of existing products because new users would almost always choose a newer, more technically refined product.

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<sup>6</sup> However, several of the respondents emphasized that there were problems within the company as well as with the customers in terms of *defining* what quality was. In terms of this paper’s focus on the potential unbalanced incentives created by the transfer price, this quality problem is of less relevance since it is not really an incentive problem.

If the product divisions failed to develop new products, new customers would choose external competitors' products that were technologically better. Product development was therefore considered vital in increasing and even maintaining the product division's revenue since existing products, after a while, showed a downward sliding demand curve.

Managers who had hoped to make a career in the company were effectively forced to innovate. Divisions that failed to innovate would, after a while, not be able to produce a contribution margin and subsequently, due to the resource allocation system, lose resources, leading to the possibility of managers losing their jobs. Product division managers, therefore, had to balance short-term and long-term risk in respectively new and old products. On the one hand, the introduction of new products created a short-term risk due to problems in covering the costs and thereby making a contribution margin in the short-run; however, long-term sales projections were promising. On the other hand, the old, cheaper products that created high contribution margins per unit (some would call these products "cash cows") but had poor long-term sales volume projections (see also Figure 2) introduced a long-term risk. In this way, the organizational design and the quasi-market somewhat balanced the incentives between the short-term (selling old products) and the long-term (developing and selling new products).

### **Problems in getting new products on the market**

Although the organizational design created incentives for the product divisions to develop new products and the transfer price was downward-biased to provide additional incentives for sales divisions to focus on selling those new products, there were still some problems related to product innovation. The quasi-market's decentralized organizational design, which granted the sales

divisions the freedom to choose which products they wanted to sell, also inhibited the introduction of new products due to the sales divisions' somewhat (at least from the product divisions' perspective) conservative and myopic perspective:

*New products are expensive to produce in the beginning. Then we have the problem of sometimes having to argue very hard with the sales divisions—"goddammit, now you have to take the products." Even though all our technical tests tell us it is a good product, and all our user tests say it is the right product, they [the sales divisions] will not take it because it is too expensive. (Production Manager, New Division)*

According to the production manager, new products were "too expensive" for the sales divisions for at least two reasons. First, new products were more time-consuming to sell than established products because the sales force needed additional training and new customers needed to be persuaded to buy the products, which was less the case for established products with established customers. Second, new products were expensive to produce in the introduction phase because of the diseconomies of scale caused by a lack of quantity discounts on materials, small batch sizes that made batch costs per unit high, and start-up problems that created waste in the production process. The problems of introducing new products highlight a difference in time perspective between the product and sales divisions caused by the organizational design. The plant manager in the New Division argues:

*In the product divisions, we are measured as a cost center, and the sales divisions are responsible for sales; they are measured on contribution margin. The advantage is that there*

*is clear and unambiguous division of responsibility. We shall produce as cheap as possible and at the same time have a product portfolio that is easy to sell. But there are some disadvantages. Because who is responsible for the business, who is responsible for us reaching our goals? We can develop a lot of new products, but if the sales divisions for some reason are not interested in selling them, then they have no reason to sell them. (Plant Manager, New Division)*

According to the marketing manager in the New Division, the quasi-market design is especially a problem for the New Division, as much of the sales force historically is oriented towards the Old Division's products. However, the marketing manager in the New Division still feels that they can influence sales:

*It (areas where sales can be influenced etc.) can, for example, be through the support material. That is where much of the competition exists. The better the support material is, the easier it is to get the sales divisions to work with the products. It is the same with product development; the better you are at developing your products, the more documented they are and the more the sales divisions are interested in selling your products. (Marketing Manager, New Division)*

Both the Old Division and the New Division made several initiatives to come closer to the market. These initiatives included the use of focus groups for customers and seminars for the sales divisions.



*We have some seminars with the sales divisions where we agree on what products we should develop. It works much better now than it did earlier because the marketing manager and the divisional manager talk a lot with the sales divisions. We have become much more outgoing, and we have a better dialogue with the sales divisions. (Plant Manager, New Division)*

The Old Division also emphasizes problems with the division of responsibility:

*The sales divisions' focus is the problems yesterday and the sales tomorrow. Our perspective is years because we have a longer perspective and cover the whole world. They have a narrow perspective, the next promotional campaign, and so on; they are very short-sighted. (Product Manager, Old Division)*

However, there still seems to be an acceptance, even in the New Division, of the overall quasi-market design and the incentives it created:

*But I think—all else being equal—that the competition is damn healthy. It makes the product divisions jump, forces them to make some good products, and forces them to make excellent support material. The competition is good. Sometimes when you feel you are under-prioritized, okay, then you get a bit frustrated. But again—all else being equal—I think it is healthy with that competition. (Marketing Manager, New Division).*

Irrespective of the additional initiatives created by the quasi-market design, the introduction of new products remained a problem in both divisions. The combination of higher sales costs and higher production costs for new products meant that the contribution margin earned per sales hour was considerably lower for new products than for established products. As the 10 percent downward bias was clearly insufficient to solve the incentive problem, surely a greater downward bias could eliminate the problem and maintain the autonomy of the sales divisions. However, this solution was not adopted, perhaps because the company feared it would make the introduction of new products too expensive for the product divisions.

Instead, sales division autonomy (and therefore trust in the quasi-market) was reduced, and top management regulated some of the sales activities. For example, all sales divisions were mandated to participate in synchronized marketing strategies, including a presentation of new products to customers. It was hoped that the problem would at least be reduced to some extent if demand increased in all sales divisions at the same time, thus creating economies of scale. The introduction of centralized regulation of the sales is an illustration of how the decentralized quasi-market was complemented by another control system element.

### **Dealing with product proliferation**

A cost-based transfer price calculated at variable cost is often considered a poor approximation of opportunity costs unless excess capacity is present (Shank, cited in Robinson et al. 1990, 19; see also Kaplan, Weiss, and Desheh 1997). The problem is that opportunity costs of capacity are by

definition not included in a variable cost transfer price, and if there is no excess capacity, products are undercosted, leaving too many sold products. This was a problem in the Plastic Factory, as the “low” transfer price at variable cost was leading to excessive customer orientation. The company pursued two types of product development: new products (as discussed above) and incremental adjustments of existing products. The problems caused by the low transfer price were related to the ongoing development called “range-care,” in which many new product variants were developed and added to the permanent product line to satisfy emerging customer needs. The general problem caused by a transfer price that is too low is increased by the standard cost if the standard is lower than the actual cost, as was often the case in the Plastic Company. However, as the use of variable cost instead of full-cost was a much more severe problem, this analysis focuses on that design element. The process of “range-care” development is illustrated in Figure 3.

### **Insert Figure 3 here**

The logic on which Figure 3 illustrates is quite simple. The product divisions launch a new product (Product A), and the sales divisions introduce the new product to customers, who request modifications to the product (A.1, A.2, and A.3) to satisfy local needs. As these modifications are profitable for the company if they cover variable costs plus the small mark-up, almost all enquiries for new product variants are ratified by the product divisions. The product divisions produce the new product variants and “sell” them to the sales divisions, which subsequently sell them to the customers at a price above the transfer price. The result is that the product lines proliferate and the

transfer price fuels a diseconomy of scale.<sup>7</sup> The plant manager in the Old Division commented on the sales division's demand for more product variants:

*Instead of making a product of a certain size, we are asked to make a product where the hole in the middle is a little bit larger or smaller. And of course, that doesn't require any big changes; you don't even need the development department to make it, we (the production eds.) can do it ourselves. Then, we have three new variants that also need different packing for Spain and Germany. Then, one subsidiary wants to have the product packed together with other products when they ship the products to the USA, and so on. It grows like a tree that just keeps growing and growing in all directions, all the time...  
(Plant Manager, Old Division)*

The product divisions did not know what the additional variants would cost because only variable costs were calculated:

*It presents a dilemma. The more new products we make, the more variants we will get. So, unless we start to shake things up, then .... I mean, it is clearly a challenge—we simply cannot go on. We need to figure out what it actually costs to produce a new variant of a product and then use the estimates in deciding whether to make the additional variant. Today, we say that if we have all the components, it is easy to put them together; it is easy to change the configurations a bit. But we don't consider that it actually means an additional adjustment. (Marketing Manager, Old Division)*

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<sup>7</sup> Surely it was not enough that the products were profitable to incentivize the sales personnel to sell them, because the sales personnel maximized their contribution margin per time unit. But since the new product variants were sold jointly with the other products, the sales personnel incurred very few extra selling costs for the new variants.

Because the large product portfolio created a lot of production activities (with variable costs amounting to only 25 percent of the total product division costs), there was a general perception in the product divisions that a calculation that linked indirect costs (e.g., support activities and depreciation) to products would render many of the new variants unprofitable. Why not, then, change the transfer price to some version of a full-cost calculation to take account of the costs of producing in small numbers, thus reducing the problem? What kind of reasoning, if any, justifies using variable costs as the transfer price? Apparently, the “low” transfer price was used to handle customer sensitivity issues. The marketing manager in the New Division explained the relation between customers and products:

*One of the company's problems is that it is a very traumatic experience for users to become ill. It may take as long as a year and a half before you learn to use the product. The new products are certainly a much better alternative and a more elegant solution to the problem, and we would like to say that when we introduce a new product line, we remove all the old products because we know that the new products are better—otherwise, we would not introduce them. But it is difficult because users have a hard time getting used to the product, and once they are used to it, they learn to live with the problems it contains. (Marketing Manager, New Division)*

According to the marketing manager in the Old Division, sales of some of the division's products fell by 10–12 percent each year as users passed away. Although the products became less profitable for the company due to a lack of scale, the marketing manager argued that it would be unwise to abandon these products, as that would negatively impact the company's reputation as a reliable supplier. The key to the problem was the relation between the user and the product. The product was an important part of the user's life, as it helped to alleviate serious problems created by their

disease. As it was a struggle to learn to use the product, many users were “locked in” and did not change to the new product even though it was “objectively” and technically better. In these circumstances, the marketing manager of the Old Division said that users expected the company to keep producing that product for the rest of the user’s life.

According to the marketing manager, if the company abandoned old products, users would consider this a violation of an implicit agreement between them and the company. As most users were organized in patient communities whose activities included distributing magazines among their members, this perceived cynicism would almost certainly be communicated to other users. In economic terms, these communities functioned as efficient reputation mechanisms<sup>8</sup> that would communicate the company’s “deceit” to others within the patient community and perhaps even other patient communities that used other company products. The company feared that it would be “punished” by losing customers to suppliers that were perceived as more reliable.

Because individual sales personnel have no information about the total reputational effects for the whole company of marginal products, they might choose not to sell the product if a higher transfer price rendered variants unprofitable for them, indirectly reducing the firm’s reputational value. It would probably be wrong to see this as a free-rider problem, as it is reasonable to assume that the autonomous sales divisions have little knowledge of reputational effects beyond their own sales districts. However, it is of little importance whether the problem was caused by opportunism or a

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<sup>8</sup> Efficient communication mechanisms are of paramount importance for reputation mechanisms to work (Dixit 2004; Grief 2006).

simple lack of knowledge because, in both situations, the low transfer price offered a means of reducing potential problems.

Nevertheless, product line proliferation remained a problem, and several additional control elements were implemented to reduce the problem of the transfer price, thus reducing market failure. When new products were developed, older products were sometimes abandoned if a thorough analysis of costs and benefits showed it was profitable to do so. Although this limited the product range, several respondents mentioned that the product divisions still hesitated to remove products for the reasons mentioned above. The same thorough analysis was also done ad hoc, as the large and growing product portfolio required continuous adjustments. Various profitability analyses (a type of Activity-Based Costing) were used in which cost information beyond variable costs was combined with more elaborate market data than individual salespeople could access. This type of analysis was performed in both divisions for products as well as for entire business areas.

## **DISCUSSION**

In this section, I reflect upon the insights from the paper and discuss the limitations of the study. The discussion section has two parts. The first is an overview in which I further discuss the main findings from the paper and elaborate on the two problems of “getting new products on the market” and “product proliferation.” Second, I discuss the limitations of the study, especially the fact that my study took a somewhat static view focussing on how the transfer and the organizational design works instead of focusing on the process that brought about the design.

## **Designing market incentives inside the firm**

This paper set out to answer three research questions: How is a quasi-market designed around a standard variable cost transfer price? What control elements complemented the transfer price to reduce incentives as well as decision-making problems in the transfer price? And what were the limits of the quasi-market in terms of handling incentive and decision-making problems? Table 2 provides an overview of the paper's findings and the answers to the three research questions. The table provides an overview of the types of control elements that was used to reduce the potential problems of the standard-variable cost transfer price and thereby create a quasi-market, which answers the first two research questions. In Table 2, some of the control elements are underlined, which illustrates that they are not directly part of what this paper calls the "quasi-market." This distinction makes it possible to discuss the limits of the self-regulating quasi-market and thereby answer the third research question.

## **Insert table 2**

This paper adds to the long discussion on using market incentives inside the firm. Some would argue that transfer prices enable companies to "bring the market inside the firm" (Baker, Gibbons, and Murphy 2001), designing responsibility centers as independent units (Dean 1955) where managers pursuing their own interests also serve the company's best interests. Zenger and Hesterly (1997) argue (optimistically) that advances in performance measurement techniques and information technology will make it easier to measure subunit performance, which is one condition for implementing market-like incentives inside the firm. Others are more skeptical; for example, organizational economists argue that cost-based transfer prices can never replicate the high-



powered incentives of the market because they are used when there are no market prices and therefore no competition to discipline the transacting parties. Therefore, cost-based prices are prone to manipulation (Holmstrom and Milgrom 1991; Hart 1995; Roberts 2004; Williamson 1985). However, relatively little research has examined the specific context in which transfer prices function or whether competition can be designed among firms to alleviate some of the problems of cost-based transfer prices.

In the case company, competition between divisions was created by designing a quasi-market. Apart from the transfer price, the quasi-market consisted of the sales division's decision rights to choose products from the product divisions, the resource allocation problem that provided incentives to reduce standard variable costs, and a reward system based on promotion. Le Grand (2007) used the term "quasi-market" to describe markets for public services in which independent providers (e.g., hospitals and schools) compete for customers, the state pays for the goods, and the money follows the users according to a funding formula. In management accounting research, there has been less focus on the use of the system to allocate resources to divisions or departments as part of an incentive system (see, for example, Malmi and Brown 2008; Merchant and Van der Stede 2007). In the Plastic Factory, the quasi-market consists of the partitioning of decision rights, the resource allocation system, and a reward system that focuses on promotion together with transfer price.

The case study provides insight into discussions on the use of transfer prices in responsibility centers. In textbooks (e.g., Merchant and Van der Stede 2007; Zimmerman 2017) transfer prices are normally used between profit centers, and there is a long tradition of seeing the profit measure as a way to mimic the "real market" as paramount to creating incentives in responsibility centers (Dean 1955). Though Cools and Slagmulder (2009, 173) showed that managers resist being transformed from a cost center into a profit center if the change was not matched by an increase in autonomy in

regard to pricing and sourcing, there is little empirical research that investigates the use of transfer prices in, for example, cost centers. This paper illustrates that transfer prices can be used even between cost centers and profit centers and create strong market-like incentives in these cost centers.

The paper also illustrates that much more important than labeling financial responsibility centers as, for example, cost centers or profit centers in terms of understanding, for example, incentives are, is an understanding of how responsibility for specific areas influence incentives (Merchant and Van der Stede 2007, 275). Though the product divisions in the Plastic Factory are considered cost centers and do not have the decision right to define price, they are indirectly held responsible for revenue and therefore have incentives, as the analysis revealed, to be attentive towards the market, which normally is seen as an advantage of profit centers (though see Merchant and Van der Stede 2007, 277).

While the case study to some extent highlights the success of quasi-market design, it is important to note that the internal market is not without friction. The quasi-market inside the case company is not in any way a perfect market, and it is not the intention here to participate in the glorification of the market as compared to other ways of organizing economic activity. To underline this point, I will briefly discuss and elaborate on two of the problems that were not solved by the quasi-market design. In this discussion, I will also briefly discuss some of the alternatives that were discussed during the interviews as solutions to solving the problems and relate these solutions to the literature.

As mentioned in the section titled '*Problems in getting new products on the market,*' the central problem in the case company arguably was the introduction and sale of new products. Though the product divisions tried to persuade the sales divisions to sell new products, a closer look at the problem reveals that the problem has a nature that is difficult to solve through a quasi-market design.

The problem can be classified as a classic free-rider problem known as a "collective action problem" or "tragedy of the commons problem," which markets are perceived as ill-fitted to solving (Chwe 2001; Olson 1971; Ostrom 1990). A tragedy of the commons refers to the depletion of a shared resource by individuals acting independently and rationally according to their own self-interest despite understanding that depletion of the common resource is contrary to their long-term interests. In the case company, the shared resource was cheap competitive products. This "resource" had to be renewed continuously, and, to this end, it was necessary to sell the products in large quantities to achieve economies of scale. At the same time, it was in the individual sales divisions' interest to wait before selling until the other sales divisions had increased the demand for the product and the unit costs had been reduced by economies of scale. The "tragedy" was that if all the sales divisions waited, larger amounts would never be produced, the cost would not go down, and new products would never be available at a low price, which would be a "tragedy" for both product and sales divisions.

In Ostrom's (1990) seminal work, a central discussion is that a tragedy of the commons can be avoided through the construction of norms that are enforced through mutual monitoring. However, in the current study, since the sales divisions were located in different countries, it would be

difficult to making mutual monitoring among the sales divisions work. Another possibility that was also discussed during the interviews was use of the non-financial measure, which defines the percentage of sales that consisted of new products that were developed within the last three years. Though perhaps this measure could have been used to induce the implementation of new products, it was seen as being of low quality since the definition of what a “new” product was varied across the divisions. Therefore, although the central intervention was a violation of the self-regulating logic of the quasi-market, it was chosen due to the lack of better alternatives.

The problem with the introduction of new products in the present design also points to a potentially severe structural weakness in quasi-market design. As mentioned in the section titled *‘Problems in getting new products in the market,’* the plant manager in the New Division stated that the competitive quasi-market design does not create strong enough incentives for cooperation between the sales divisions and the product divisions. To the extent that the need for cooperation in product development further increases, perhaps the efficiency of the competitive design will decline, and another design could be more efficient. Eccles (1985, 275) distinguishes between four different organizational types: collective, cooperative, competitive, and collaborative. The Plastic Factory’s present design is competitive; thus, it functions best when there are few interdependencies between the units. However, if the need for cooperation between product divisions and sales divisions increases, then a more collaborative or cooperative model could be more sufficient. These models focus more on joint responsibility through, for example, collective rewards between product divisions and sales divisions. However, since the present model has a long history in the company (see also *Limitations*), a change to a more collaborative or cooperative model would be a major change that would have to consider the many positive effects that the present competitive design produces.

The other problem is product portfolio proliferation. If the quasi-market worked perfectly, the assessment of each product would mirror the total cost and benefit of that specific product. The analysis revealed that a “low” transfer price spurs the proliferation of the product portfolio; at the same time, it is difficult to calculate the total revenue for each product because sales of individual products contribute both to the direct revenue and to the company’s reputation as a reliable supplier. To complement the quasi-market, the company conducted a more comprehensive analysis in order to understand product costs and the role that products play in the market (e.g., in terms of reputation). This practice illustrates that several cost principles (e.g., variable costing and ABC) can be used simultaneously instead of being seen as direct alternatives (e.g., Shank et al. 1990). In the Plastic Factory, variable costing functions as the transfer price and ABC as an ad hoc “clean-up” tool to reduce the product portfolio. A transfer price that included more capacity costs was not seen as a viable solution for the company since the depreciation rules (old products were often produced on fully depreciated machines) and the complexity of new products would increase the costs of new products compared to older products.

Both of these problems illustrate the following general point made by Helden et al. (2001, 383): “As such there may be no unique ‘solution’ to the transfer pricing problem, rather there may be a number of ‘satisfactory’ alternatives each of which could be used as part of a balanced package of management controls.”

## **Limitations**

The paper focused on the workings of the transfer price and not so much on why the company chose the specific design. In that sense, the present study took a rather static view in terms of examining what makes the system work. I focused on what can be called “the context of justification” instead of “the context of discovery” (Swedberg 2012). Though these concepts are traditionally applied to theories, the workings of a quasi-market and complementing control elements can be seen as theories that have to be justified. Justification here means to be able to show that the transfer price worked reasonably well, which is what I have attempted to do. On the other hand, an investigation of how the standard variable cost had been chosen and how it was linked to other control elements (the context of discovery) could have provided insight that is difficult to achieve when looking only at how the transfer price works here and now (context of justification).

Other studies have focused more on the context of discovery using longitudinal case studies to gain insight into how transfer pricing evolved over a long-time span (Boyns et al. 1999; Helden et al. 2001). A central insight from these studies is that the emergence and change of transfer pricing systems are path-dependent and difficult to understand without taking into account the history of the organization. Conducting such an analysis on the Plastic Factory would provide more insight into how the present design came about and perhaps also highlight problems that the relatively ahistorical analysis did not reveal. The initial choice in deciding on a variable cost model perhaps laid out a path-dependent evolutionary track on which the rest of the control elements adapted to the standard variable cost transfer price when change was necessary instead of changing the transfer price to, for example, full-cost.

The embeddedness of variable costing in the company could also have the effect that problems—for instance, problems with the variable cost transfer price—are “hidden” in the cultural context. Two potential problems could be fairness and tax. Eccles (1983) argued that variable costing can be perceived as unfair because fixed costs are not covered, and therefore, the cost centers consistently produce red numbers. Furthermore, there is a general reservation against the use of standard variable cost centers and the types of responsibility they produce in the literature (Merchant and Van der Stede 2007; Zimmerman 2017). However, the design seems to be accepted in the Plastic Factory. An explanation for this acceptance could be that the embeddedness of variable costing in the history of the company has arguably internalized the variable costing and the type of responsibility it creates. Furthermore, perhaps employees who disliked the system have left the company in a self-selection process (Lazear 2000). The analysis revealed that employees in both the New Division and the Old Division seemed to accept the system. A longitudinal study could have revealed more insight into how the acceptance of the system came about, which is not possible with the present focus on the end result and hence the context of justification.

Another issue, which was not raised during the interviews, was tax. As mentioned in *Case Presentation*, the company only used the standard variable cost transfer price for internal purposes, whereas another transfer price was used for tax purposes. The literature states that companies that have two sets of transfer prices are more vulnerable to tax disputes since the transfer price used for internal purposes can become evidence in a dispute with the tax authority (Baldenius, Melumad, and Reichelstein 2004). Though I did not investigate this question in the present case study, an analysis of the development of the transfer pricing system for internal transfers perhaps would have revealed some issues in relation to the transfer price used for tax purposes.

### **Reflections on the generalizability of the case study**

A common argument is that the insight from case studies can seldom be generalized. This is also the case in this study, especially if one believes that a specific design is embedded in the history of the organization. In his discussion on designing an effective organizational design, Roberts (2004) contends that the design “has to be crafted” (Roberts 2004, 282) and that “solving the problems of strategy and organization is an act of real creativity” (Roberts 2004, 286). Roberts (2004) also states:

Clearly, much of this creativity can take the form of putting existing things together in novel ways. Not every element of the strategy and organizational design has to be absolutely new and unique, and there is much to be learned from experience. But chasing after apparent best practices is largely futile if the aim is to achieve distinctiveness. (Roberts, 286–287)

Roberts argues that control system designers can learn much from experience (e.g., case studies), but he is skeptical about the use of apparent best practices—that is, a search for generalizable knowledge of management control system effectiveness when, for example, using a specific transfer price. Roberts (2004) differentiates his approach from the search for best practices, emphasizing that his approach, as presented in his book *The Modern Firm* (2004), offers a set of frameworks, concepts, and tools that can help a skilled manager design effective control systems. These frameworks, concepts, and tools are existing elements that can be combined in multiple ways in the individual organizational setting; however, their significance and impact will not be clear until we learn more about the specific conditions under which they operate. Roberts’ (2004) ideas correspond to the ideas of this paper, and studies that argue on the understanding of transfer prices should be examined from both a historical and evolutionary perspective (Boyns et al. 1999; Helden et al. 2001).



Roberts' (2004) book is full of “examples of firms that have developed strategies and organizational designs that allowed them to deliver exceptional performance” (281). According to Roberts (2004), however, these are only examples and thus should not be used as best-practice propositions. They function as input on how control elements can complement and substitute each other in specific organizational settings. I suggest that a case study—like the one presented in this paper—may contribute to the development of our understanding of how specificities in organizations affect the significance of, for example, a transfer price at standard variable cost with respect to organizational effectiveness.

Future case study research could investigate if and how potential incentive and decision-making problems in full-cost and market-based transfer prices are reduced through organizational designs and thereby create more insights into the workings of transfer prices. These studies could focus on both how a specific design *works* here and now, as in the present study, and on the *development* of that specific design through longitudinal studies.

## CONCLUSION

The present case study of the creation of a quasi-market around a standard variable cost transfer price illustrates that many of the potential problems mentioned in the literature were reduced by means of an organizational design that fostered competition (a quasi-market). This paper is the first to investigate a standard variable cost transfer price in its organizational context. Drawing on the theoretical ideas of the control package (Malmi and Brown 2008) and organizational design

(Roberts 2004), the paper illustrated that the distribution of decision rights, reward systems, performance evaluation systems, and resource allocation systems were part of the quasi-market design; thus, it is not only the choice of the specific transfer price that is important but also the supporting control elements. The analysis also showed that the market did not work automatically and that control elements beyond the quasi-market design had to be implemented.

This paper illustrates that transfer prices in general and cost-based transfers in particular can be useful despite their many potential problems. For practitioners, the paper provides insight into how different control system elements can be linked and especially how competition can be designed inside organizations.

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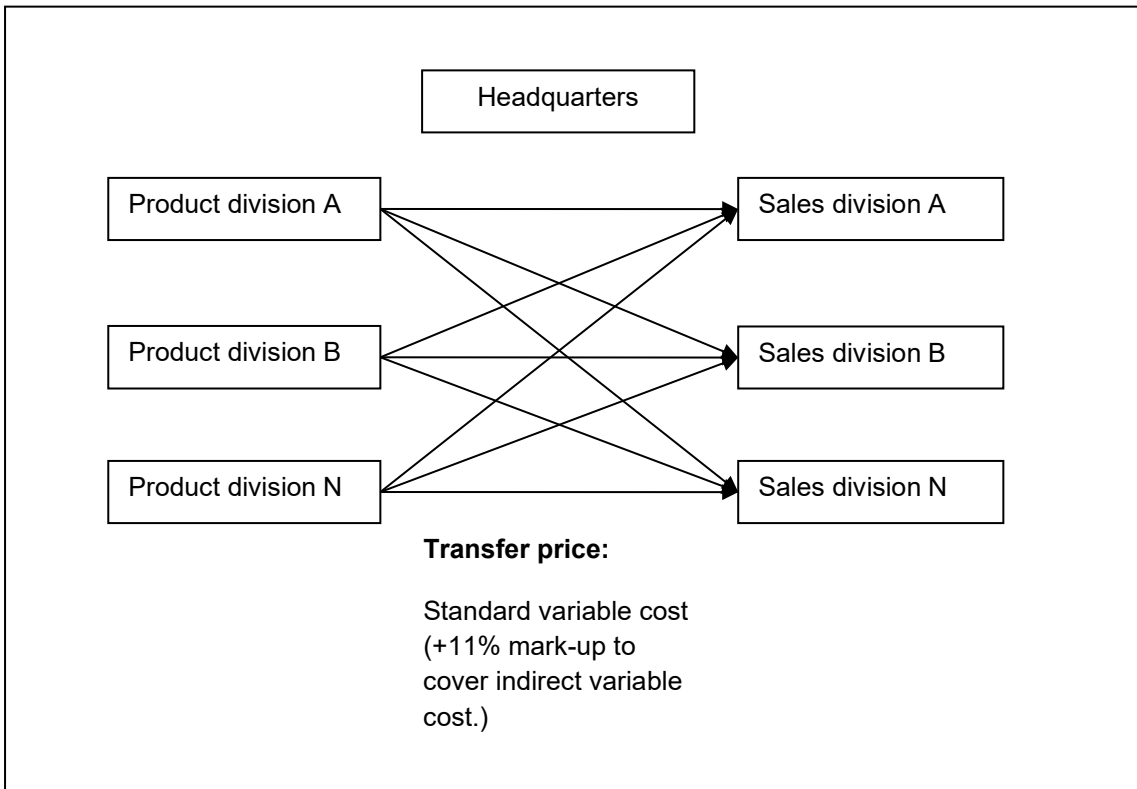
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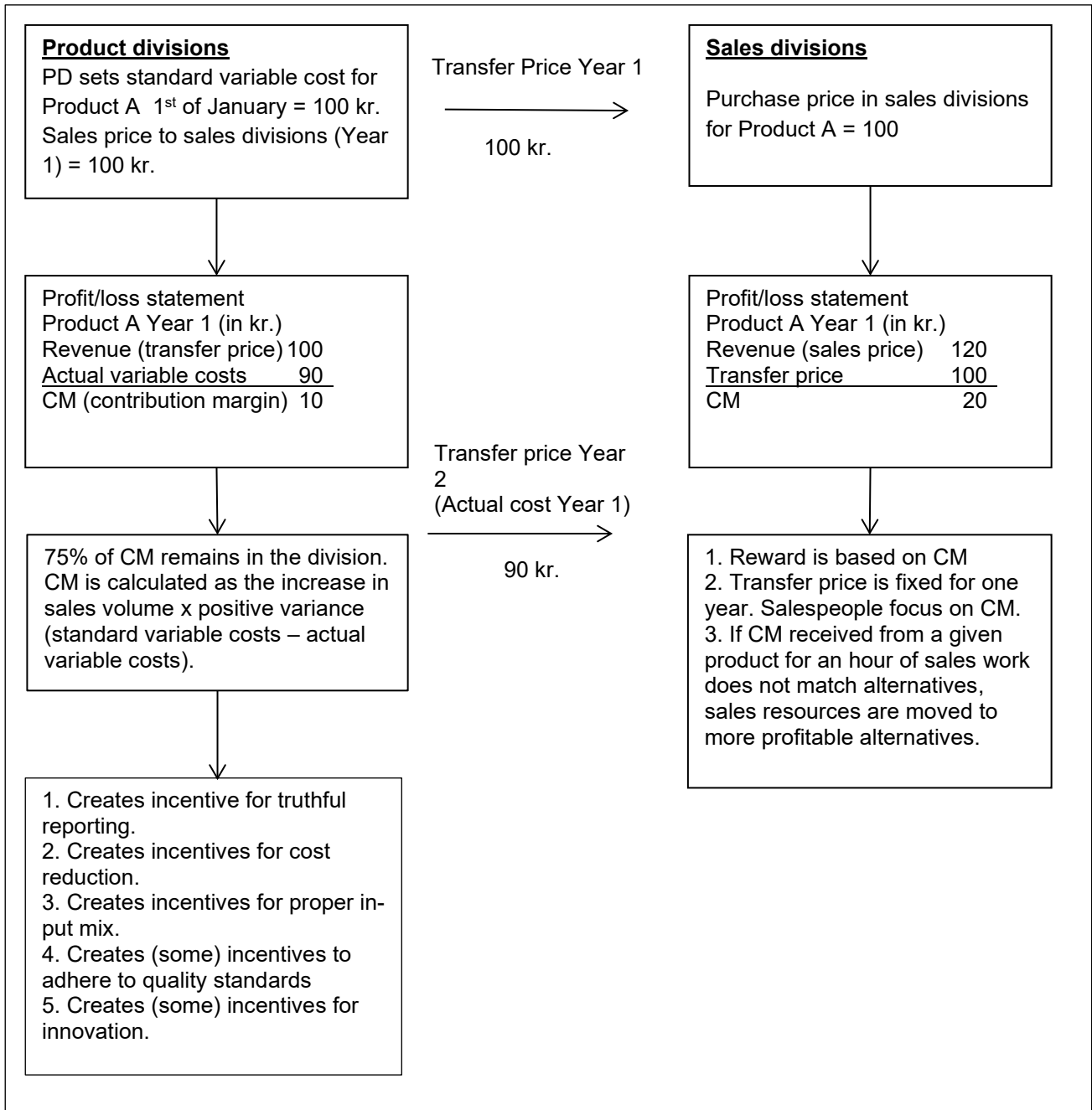
**Table 1.** Potential problems related to standard variable cost transfer price

	Standard	Variable
Adverse selection	- Lack of incentive to reveal information about standard costs	- Misclassification of capacity costs as variable costs
Moral hazard	- Incentive to under-provide elements other than costs (e.g., delivery, inventory, and quality) - Incentives to under-provide risky process and product innovation - Lack of incentive to reduce costs	- Misclassification of capacity costs as variable costs - Lack of incentive to reduce variable costs (compared to capacity costs) - Conversion of efficient capacity costs to inefficient variable costs (e.g., outsourcing)
Decision-making	- Too few (or too many) products sold if standard cost is above (or below) actual cost	Too many products sold because of a “low” price (ignoring capacity cost)

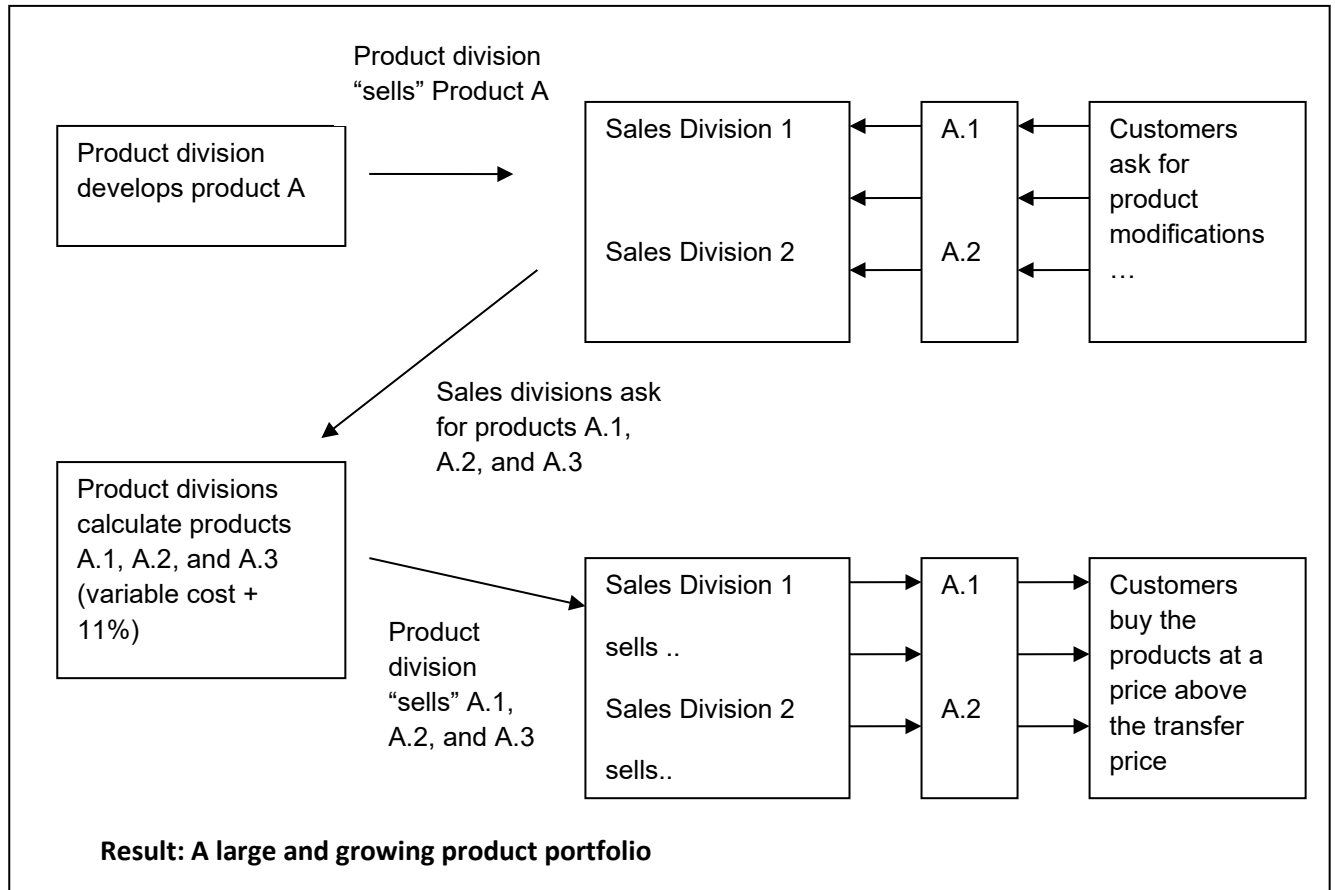




**Figure 1.** The organizational structure, internal trade, and transfer price.



**Figure 2.** Organizational design elements related to the transfer price: the quasi-market.



**Figure 3.** The logic behind excessive proliferation of the product portfolio “caused” by a “low” transfer price.

**Table 2.** Overview of how problems with transfer price were reduced

	Standard	Variable	Reduction of the problem through transfer price interactions with other control system elements
Adverse selection	- Lack of incentive to reveal information about standard costs	- Misclassification of capacity costs as variable costs	The quasi-market: Partition of decision rights, resource allocation system, and reward system
Moral hazard	- Lack of incentive to reduce costs	- Misclassification of capacity cost as variable costs  - Lack of incentive to reduce variable costs (compared to capacity costs)  - Conversion of efficient capacity costs to inefficient variable costs (e.g., outsourcing)	The quasi-market: Partition of decision rights, resource allocation system, and reward system

Moral hazard	- Incentive to under-provide elements other than costs (e.g., delivery, inventory, and quality)		The quasi-market: Partition of decision rights, resource allocation system, reward system, <u>non-financial performance measures, and guarantees</u>
Moral hazard	- Incentives to under-provide risky processes and product innovations		Partition of decision rights, resource allocation system, reward system, <u>and central authority</u>
Decision-making	- Too few (or too many) products sold if standard cost is above (or below) actual cost	- Too many products sold because of a “low” price	<u>Central authority, Ad-hoc profitability analysis</u>