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Exploring the Process of Bringing the Market Inside the Firm

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Document Version

Final published version

Publication date:

2015

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Citation for published version (APA):

Friis, I., Hansen, A., & Vámosi, T. S. (2015). *Performance Targets and External Benchmarking: Exploring the Process of Bringing the Market Inside the Firm*. Paper presented at 1st International Competitiveness Management Conference, Frederiksberg, Denmark.

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PERFORMANCE TARGETS AND EXTERNAL BENCHMARKING: EXPLORING THE PROCESS OF BRINGING THE MARKET INSIDE THE FIRM

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Submitted to

THE INTERNATIONAL COMPETITIVENESS MANAGEMENT CONFERENCE
“COMPETICON”
COPENHAGEN, JANUARY 19-20, 2015

Abstract

Research on relative performance measures, transfer pricing, beyond budgeting initiatives, target costing, piece rates systems and value based management has for decades underlined the importance of external benchmarking in performance management. Research conceptualises external benchmarking as a market mechanism that can be brought inside the firm to provide incentives for continuous improvement and the development of competitive advances. However, whereas extant research primarily has focused on the importance and effects of using external benchmarks, less attention has been directed towards the conditions upon which the market mechanism is performing within organizations. This paper aims to contribute to research by providing more insight to the conditions for the use of external benchmarking as an element in performance management in organizations. Our study explores a particular type of external benchmarks - external suppliers' bids on sub-components (which can be produced either in-house or by the external suppliers) in a Danish manufacturing firm – and we study the conditions that determine the success of the mechanism in the manufacturing firm which include issues related to the calculation of the ‘inside’ costs of the sub-component, technical specifications of the product, opportunistic behavior from the suppliers and cognitive limitation. These are all aspects that easily can dismantle the market mechanism and make it counter-productive in the organization. Thus, by directing more attention towards the conditions for the use of the external benchmarks we provide more insights to some of the issues and challenges that are related to using this mechanism for performance management and advance competitiveness in organizations.

Key words: Performance Management, Performance targets, Productivity, External Benchmarking, Developing Competitive Advantages, Market Mechanisms.

1.0. Introduction

Research has been underlining the importance of external benchmarks for decades. According to Baker et al. (2001) there is a long tradition for academics, consultants, and practitioners, drawing on the intellectual heresy of prominent liberal economists like Hayek and Friedman and of course Adam Smith, proposing to ‘bring the market inside the firm’ (Baker et al. 2001) to reduce the dysfunctions of bureaucracies by exposing them to the ‘discipline of the market’ (Zimmerman, 1997, p. 102). Baker et al. (2001) see the transfer pricing papers from the 1950’s and 1960’s (ex. Dean 1955) arguing for the use of market-based prices as the first example of the widespread phenomenon, and Recent examples are financial economist advocating radical decentralisation through LBO, high-powered incentives and EVA-bonus plans and thereby introducing a rhetoric of ‘making managers into owners’ (Stewart, 1999, p. 223). Even the public sector has been the subject of the market rhetoric and practices through New Public Management, which introduces pay-for-performance, decentralization, benchmarking, transfer prices (e.g. DRG) and other market-like control techniques (Hood, 1991; Osborne & Clark, 1992), to reduce the presence of bureaucratic rule-following and adapt to the need of the ‘customers’. Market information is also used in target costing where the target is based on information on future markets (Ansari et al. 2007), and in the ‘Beyond Budgeting’ literature, which also draw on a market rhetoric calling for ‘radical decentralization’, and the use of external targets to enable and motivate managers to focus on continuous value creation (Hope & Fraser, 2003).

By using external benchmarks, the companies are ideally forced to adapt to changing conditions, since producing at higher costs than competitors is not possible in the long run (Merchant & Van der Stede 2007, p. 334; Murphy, 2001). The importance of dynamic target setting is also emphasized by for example Ferreira & Otley (2009) that argue: ‘[T]he embedding of continuous improvement into targets appears increasingly inescapable, as companies face competitive and globalised markets’ (Chenhall, 2003). Furthermore, the use of benchmarking (Elnathan et al., 1996; Speldoni, 1992, particularly the use of external benchmarks...has been strongly advocated by the beyond budgeting movement (Hope & Fraser, 2003)..’ (Ferreira & Otley, 2009, 271-272).

Despite the importance of the use of external benchmark has often been mentioned and promoted as a solution to many problems in modern organizations only scant research has been conducted on the issue. Merchant & Otley (2007, p. 795) argue: ‘The previous literature on target setting has never considered this possibility, so a new and significant research topic has opened up’ (Merchant & Otley, 2007, p. 795).

In this paper we analyze a specific attempt to bring the market inside the firm in a Danish manufacturing company (‘PRODCORP’ – a synonym for the real name of the company used to respect the wish for anonymity). Benchmarks were provided through external bids on components that were considered to be ‘non-strategic’. These were components that in principle could be produced in-house or outside, the decision on where to produce them was considered to be based on the lowest costs. Thus, if PRODCORPs own manufacturing system could match an external bid the component was produced in-house and if the could not the production where outsourced to the supplier with the lowest bid. As the in-house production of these component where the basis for many of the jobs in the manufacturing system in PRODCORP the employees in the manufacturing system had an incentive to be able to meet or beat the bid from the supplier. Thus, the external bid somehow created what John Kotter refers to as ‘a burning platform’ (Kotter 2008). If the workers where not able to match the external offer, the components would be outsourced, and consequently

the workers would be laid off. Therefore in this situation the high-powered incentives and the discipline of the market were quite present.

Our paper investigates the process of constructing market information and market incentives and illustrate that the construction of comparability between external and internal components turned out to be more challenging than initially expected. We suggest that the analysis of these challenges contribute to the literature in several ways.

First, our paper provides an analysis of the use of external benchmarks in regard to a piece rate system in the manufacturing firm. Piece rate systems are normally used in a context where the output, that is to be benchmarked with external suppliers, is standardized. Since standardized components are relatively easy to specify, we expect that external benchmarks are easier to achieve in a piece rate setting than in more complex settings with less standardized output, where the quality and other features of the output involves subjective judgments. We assume that for example the health care sector to a large extent is characterized by output, which is more difficult to specify than output in a traditional piece rate setting (Ellwood 1996; Llewellyn & Northcott, 2005; Northcott & Llewellyn, 2003). Thus investigating target setting in a piece rate context is what Flyvbjerg (1998) calls a critical case. A critical case is in general a case where you are less likely to find problems related to an issue, and thus the problems you find in a critical case, are likely to incur elsewhere. Therefore we assume that our results are of general interest, because problems regarding bringing the market inside the firm in a piece rate setting must also exist in more complex settings.

Second, whereas performance management literature has focused little on the use of market information inside the firm, the problem has received considerable attention in the piece rate literature. The piece rate literature specifies under which conditions the creation of benchmarks is more likely to take place (Carmichael & Macleod, 1993; 2000; Huberman, 1996; Kantemoto & MacLeod 1992) by drawing on Williamson's concept 'asset specificity', which is well known way to define the complexity of a transaction. The concept is well known in management accounting in for example studies of transfer pricing (ex. Helden et al., 2001; Meer-Kooistra, 1994; Spicer, 1988), outsourcing (ex. Nicholson et al., 2006; Sartorius & Kirsten, 2005; Widener & Selto, 1999) and the study of interorganizational control (ex. Cooper & Slagmulder, 2004; Dekker, 2004; Donada & Nogatchewsky, 2006; Langfield-Smith, 2008; Meer-Kooistra & Vosselman 2000). By using this well-known concept in analyzing target setting through external benchmarks, the piece rate literature links the problem of target setting to other parts of the management accounting literature, and expands the use of the concept asset specificity to an area of management accounting research, which has not been covered by the concept asset specificity before.

Third, and this is in our opinion the most important contribution of the paper, we show that the main problem in our case company was not to bring the market inside the firm, which is often highlighted in the literatures. The construction of internal benchmarks necessary to expose the employees in the manufacturing department to the discipline of the market was equally or even more difficult, than the creation of the external benchmark. This is a point little noticed in the literature on using external benchmarks (Gibbons & Murphy, 1990; Hansen et al., 2003; Östergren & Stensaker, 2011) and in the piece rate literature (Carmichael & Macleod, 1993; 2000; Huberman, 1996; Kantemoto & MacLeod 1992). Thus we argue that our [case study](#) opens up for an extended definition of complexity, which complements asset specificity. The concept asset specificity is directed towards alternatives in the market and the handling of opportunistic agents, whereas we illustrate that complexity also relates to specifying and handling the component, and calculating the product costs. Furthermore, since the problem is about creating market incentives and motivating

the workers to behave like owners (Stewart, 1999, p. 223) constructing a controllable space for the workers to thrive turned out to be a major obstacle in the creation of internal benchmark.

The rest of the paper consists of four sections. In section 2 we review literature on the notion of bringing the market inside the firm and analyses of the role of external market information in management accounting and the piece rate literature. In section 3 we discuss methodological and data collection issues for the paper. Section 4 introduces the case. Section 5 explores the issues related to the functioning of the market-information as performance targets in the case company. We analyze how the market mechanism ran into problems due to problems of comparability among the inside and outside 'market' price. We end the paper in section 6 with a discussion and conclusion.

2.0. Literature review: External benchmarks and performance targets in the performance management and piece rate literature

This section has three aims. First, the section aims to sketch out the idea using the market as a control mechanism in the firm. Second, the section intends to discuss how the use of external benchmarks has been discussed in the literature (primarily the performance management literature). Third, the section seek to discuss a particular stream of literature, which is probably the most informative stream of literature on external benchmarking so far but a stream of literature that has not been addressed much in management accounting literature. In this respect, we discuss the linkages between the piece-rate and the management accounting literature.

2.1. The market as a control mechanism – on the logics of markets

Using market information as benchmarks inside the firm is a way to use a celebrated mechanism to control the behavior of employees, and especially make them adapt to changing external conditions. Hayek (1945) is convinced that if the market mechanism (called the price system) had been the result of deliberate human design, it: ..'would have been acclaimed as one of the greatest triumphs of the human mind' (1945, p.527). It's a marvel because it communicates information about prices of goods and production factors to the companies in the market place, and if a competitor can produce a product cheaper, then the competition will force the remaining companies to adapt by lowering prices or leave the market. The market thus both provide information of competitors' (and suppliers') prices but it also provides incentives to adapt to these prices. 'The market is a marvel, therefore, not merely because of its remarkable signalling properties..., but also because of its remarkable capacity to present and preserve high-powered incentives' (Williamson 1985, p. 161). Jensen & Meckling (1992) explain in the spirit of Adam Smith and Hayek the automatic logic of the market: 'It provides incentives to make individuals take appropriate actions without anyone having to direct them' (Jensen & Meckling, 1992, p. 109). The reward for winning in the competition and the fear of losing is ideally enough to motivate managers and workers to adapt. The concepts 'sense of urgency' and 'burning platform' made famous by change management guru John Kotter (Kotter 2008) is exactly pointing to the punishing element of the market as a motivation factor.

Such a marvelous system has obviously inspired many people. Dean (1955) argued that: [T]he modern...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 that act like economic entities..' (1955, p. 67-68). The use of piece rate systems – like other performance management systems as mentioned in the introduction – is built on the assumption that it is possible to bring the market inside the firm (Baker et al. 2001). Lazear & Gibbs (2009, p. 162) e.g. argue

that: ‘Pay for performance inside an organization is analogous to the price system in market economies’. Like the market a piece rate system ideally functions automatic through radical decentralization, since the workers are motivated without any supervisor to intervene: ‘If the performance drops, the supervisor need make no comment – the drop in performance carries its own punishment’ (Miller 2002, p.105, see also Cheung, 1983). The punishment is here simply the lack of reward, and as such the outside market and hence competition plays no role.

2.2. The relevance of external benchmarks in target setting for performance measures

An important issue in performance management system design is the determination of the performance targets. Performance targets can – for example – be derived from within the organization as a ‘bottom-up exercise’ (Östergren & Stensaker 2011, p. 161). This exercise is well known for its potential for gaming and dysfunctional behaviours for example illustrated in research in budgeting (Lukka 1988; Merchant, 1985; Jensen 2003), piece rate systems (Miller 2002; Roy 1952), standard cost systems (Zimmerman 2011), cost-based transfer prices (Eccles, 1985), and performance evaluation (Gibbons & Murphy 1990; Murphy 2001). In economic terms the bottom-up exercise makes possible for self-interested employees to earn a higher wage than they are entitled if they were competing on a perfect market.

Realizing that the bottom-up approach to target setting is prone to these problems, researchers, consultants and commentators have argued for adopting an ‘outside-in’ approach (Östergren & Stensaker 2011, p. 161) by ‘externalizing’ the setting of the performance target (Murphy, 2001, p. 275).

In the research actually conducted the results concerning costs and benefits of using market information in target setting are mixed. A large part of the target costing literature emphasizes that target costing leads to better results in terms of profits, competitiveness and customer satisfaction (see Ansari et al. 2007, p. 512-513 for an overview), but since most of the literature according to Ansari et al. (2007) is based on self-reports of adopters, probably unwilling to admit failures ‘there is little research to counter the glowing stories about target costing success’ (Ansari et al. 2007, p. 513). Kato et al. (1995) report dysfunctional effects such as burnout and organizational conflict in Japanese firms using target costing. Östergren & Stensaker (2011) investigate Beyond Budgeting practices in a multinational company, and find that the use of external information as input to targets make the employees feel less empowered, than when they are part of the bottom-up target setting process. The analysis thus question whether the use of external benchmarks actually creates ‘radical decentralization’, which is the claim of the Beyond Budgeting philosophy (Hope & Fraser, 2003). Eccles (1985, p. 175 ff.) has shown that getting market prices to price internal transactions can be difficult in a non-competitive market setting, because suppliers can engage in the same type of dysfunctional behaviours as internal bottom-up transactions are haunted by (see also Akerlof, 1970).

Others have investigated the use of relative performance evaluation mainly from a theoretical perspective (Gibbons & Murphy 1990). If an employee is evaluated relative to other employees, who are exposed to the same random uncontrollable factors (common uncertainty), then the impact of the uncertainty on the performance measure can be removed, and thus employees are only rewarded or punished for factors they can control (Gibbons & Murphy 1990, p. 33s). But the use of relative performance evaluation does not work without problems. Relative performance evaluation potentially creates incentives to sabotage the measured performance of the reference group, to

collude with co-workers and to apply for jobs with inept co-workers. Furthermore relative performance measures do not provide incentives for cooperation within the reference group, which can be a problem if the reference groups are inside the organization. Finally the choice of reference groups can distort incentives, because an insider being compared with an outsider will choose an inept outsider to get an easier target (Gibbons & Murphy 1990). Relative performance evaluation seems to be especially suitable for chief executives where the potential motivational problems are absent, and the little empirical research that has been conducted in this area deals with compensation for chief executives (Antle & Smith, 1986; Gibbons & Murphy, 1990).

Hansen et al. (2003, p. 106) conjecture that relative performance evaluations are used relatively little in practice – except maybe in the public sector – because many companies do not have good performance data. Elnathan et al. (1996) argue that industry surveys and industry associations provide information for benchmarking, but little is known on how this information is used in relation to target setting inside companies. More research has been done in the public sector, where external data (external to the specific organization) is used extensively to control e.g. health care (see Abernethy et al. 2007 for a review of research in health care). Northcott & Llewellyn (2003) e.g. analyse the fabrication of hospital costs in UK to create a ‘ladder of success’, which is thought of as tool for hospitals to compare and thereby improve costs. Northcott & Llewellyn (2003) illustrate that the benchmarking process incurred many information problems related to specifying an acceptable clinical standard to measure the costs against; incommensurability between institutions and problems regarding defining a standard on how to calculate the costs. Llewellyn & Northcott (2005) argue in the paper ‘The average hospital’ that the benchmarking activities in UK health care has increased ‘averageness’ in both costs and clinical practice, but Llewellyn & Northcott (2005) argue that it is unclear how the ‘averageness’ impacts on innovation and the quality of the service the hospitals provide. The public sector is a bit different than what we would expect from the private sector, since the benchmark for example regarding DRG (Diagnose Related Groupings) is derived from the hospitals costs, and thus not from a traditional external market.

2.3. External benchmarking and the piece-rate literature

A piece rate system is a classical pay-for-performance system, where each piece of work is ‘priced’ by the company, so the workers know exactly how much they earn during a day. The piece rate is a ‘target’ in a compensation contract between the worker and the owner of the companies, since it specifies an amount that the workers receive per unit they produce, and thus creates an expectation of how long time it takes to produce a given unit (Jensen, 2003; Murphy, 2001). In many piece rate contracts - but not all - there are actually two or even three targets. Besides the piece rate there often also is a lower threshold, which the workers has to reach before they are paid per piece. This threshold guarantees the workers a minimum wage. Furthermore often there is an upper limit, which specifies the maximal amount the workers can earn. Though many of the games that are played around a piece rate system relates to both the thresholds and the piece rate (Roy, 1952, Jensen 2003, Miller 2002), the focus, when the discussions concern using external benchmarks, relates to the setting of the piece rates (Carmichael & Macleod, 1993; 2000; Huberman, 1996; Kantemoto & MacLeod 1992). Thus in our analysis the focus is on the piece rate - not on potential thresholds.

A major assumption of the functioning of the market and thus also for using the market mechanism inside the firm is the process of adaptation to the competitive environment. The central issue in the piece rate literature has exactly been on adjusting the piece rate to changing conditions. Like e.g. we consider a piece rate as one kind of a target, and the study of the setting and changing of the piece

rate contributes to the understanding of target setting, and thereby to the performance management literature. Focus in the literature has been both on setting and revising the piece rates, and that is why the piece rate literature is especially interesting regarding target setting. The literature has highlighted several problems in regard of both setting and revising the piece rates. When the piece rates are set the workers can hold back information to gain a favorable piece rate. This is what is called (ex-ante) bias in the management accounting literature (Lukka 1988) and adverse selection in contract economy (Akerlof, 1970; Milgrom & Roberts, 1992). How these initial prices are found is an interesting topic itself, but most focus in the literature and in our further analysis is on how the piece rates are changed to adapt to changing conditions in the environment. Especially focus is on 'Quota Restriction', a game Roy (1952) experienced in his famous case study. Quota restriction is a game that highlights that in a piece rate setting continuous improvement cannot be taken for granted.

'Quota Restriction' takes place when workers restrict output, when they have earned a certain amount, because the workers experienced that if they earned more than that amount, 'the whole God-damned Methods department would be down here tomorrow' (The worker Starkey quoted in Roy 1952, p. 439), to cut the rate. Quota Restriction is thus a response to the well-known Ratchet-Effect, which is the phenomenon that a performance standard (e.g. a piece rate or a budget target) is adjusted to the disadvantage of the employees based on prior performance (Berliner, 1956; Jensen, 2003; Milgrom & Roberts, 1992; Zimmerman, 2011). Quota Restriction is usually seen as a strategy that helps the workers maintain a steady income without having to work too hard, or to avoid getting laid off due to a rise in productivity (Carmichael & MacLeod, 1993, p. 142).

The literature on piece rates has focused on how management can avoid Quota Restriction and thereby create incentives for continuous improvement. Focus is on how management can provide credible commitment not to cut the rates or fire the workers, except when new technology is introduced. Many studies besides Roy's (1952) show failures of commitment, which is answered by Quota Restriction from the workers (see for example Clawson 1980, p. 416, Miller 2002, p. 115ff.), whereas Lincoln Electric Company (Berg & Fast, 1975; Koller 2010) and to some extent British Cotton Spinning (Huberman, 1996) seems to be success stories in terms of commitment. Much work has been done to explain why for example Lincoln was able to commit not to cut the rates. The literature has approached the problem of commitment from two overall perspectives: a political and an economic. In the political perspective the market and market prices plays no role and focus is on the power balance between the workers and the owners (e.g. Miller 2002). Whereas in the economic perspective market prices are the main explanation for understanding under which conditions the workers cannot restrict quota and why employers cannot cut the rate.

It is the economic perspective that provides insight to the target setting process. In this approach the market is brought into the firm and directs the behavior of both managers and workers. As Skelton & Yandle argue 'competitive forces ultimately force all pay systems to reflect the opportunity costs of all factors of production' (1982, p. 201). Huberman (1996) illustrates the theoretical point from his study in the British Cotton industry: 'The problem is that commit¹ was difficult to achieve. Faced by the threat of competition from new enterprises with the latest in technology, firms were inclined to bust the piece rate. Herein lies the failure of most piece rate schemes' (Huberman, 1996, p. 399). Carmichael & MacLeod (2000) explains on a general level some of the dynamics of the creation of a competitive market in a piece rate setting. They argue that when workers under a piece

¹ 'Commit' is a strategy in the trust game, which is used in part of the literature to model the commitment problem (Huberman, 1996; Miller, 2002).

rate setting begin to innovate, the wages and profit will start to rise, and the ideas will start to spread to other firms. On the other hand if the entry to the market of 'parasite' firms is sufficiently difficult then, according to Carmichael & MacLeod (2000, p. 3), it is easier for the firm to commit to a constant piece rate.

What is not explained in these papers is why the threat of competitors makes piece rate systems a failure. If the workers can see that competitors are cheaper, being 'canny calculators' (Roy 1952, p. 430), then they should be willing – facing a burning platform - to accept that the rate is lowered to stay competitive and thereby save their jobs, realizing that Quota Restriction is only possible in the short-term. It is in the competitive market that the 'marvel' (Hayek, 1945) of the invisible hand should work. Huberman illustrates that rates in the British cotton industry were actually adjusted to reflect external conditions: 'During the onset of a trade decline, after a period of short-hour working, it was common practice to cut rates by 5 percent' (Huberman 1996, p. 409-10).

But a competitive market does not only force the workers to accept lower rates. The competitive market also constrains the managers from cutting the rate. Kantemoto & MacLeod (1992) show that if there is a market for senior workers, the incumbent firm cannot cut the piece rate: 'When the difficulty of the job is well understood by the firm, workers are of different abilities, and the ex post labor market is sufficiently competitive, then piece-rate contracts are efficient and feasible' (Kantemoto & MacLeod 1992, p. 97). The logic is impeccable. A company that cuts the market rate will lose the workers to another company, which is willing to pay the original rate. The market thus functions in a double way; it constrains the manager from cutting the rate beyond the market price and at the same time it motivates the workers to adjust the rate to the market price. The market's constraining feature on top managers target setting has had little focus in the management accounting literature. An exception is Merchant & Manzoni (1989) where it is emphasized that the achievability of budget targets are an important part of the compensation package, and if budget target and hence the bonus are too difficult to achieve, the managers will probably leave the company to get a better deal elsewhere.

But not all markets are competitive and provide benchmark information. In the piece rate literature Williamson's concept 'asset specificity' (1985, 1996) has been used to explain when the setting of piece rates lack external benchmarks. The term 'asset' is to be understood broadly, and in a piece rate setting includes human skills possessed by workers. An asset is relationship specific when the value of the asset in its next best use is considerably lower than in the actual transaction (Williamson, 1996). The difference in value in the best and next best use is called a quasi-rent, and the contractual problem is that the quasi-rent is in danger of appropriation by the buying part after the selling part has made the investment. The problem is that since the seller has no alternatives, the buying part can negotiate a contract close to the opportunity costs of the asset. This contractual problem is called the 'Hold-up problem' (Klein et al. 1978). The cutting of a rate in a context of high asset specificity can be interpreted as a hold up act, because the owner of the company 'punish' the workers from investing in the firm specific processes, which they per definition cannot sell elsewhere. Hence Quota Restriction is a counter counterstrategy from the workers side to avoid being held up. When asset are not specific (general purpose assets) the Hold-up disappear since the workers skills can be sold but also bought in markets (Williamson, 1996), as emphasised by Kantemo & MacLeod (1992) above.

Carmichael & MacLeod (2000) argue that in noncompetitive situations – a situation where worker skills are specific to the firm - it's easier for the firm to commit not to cut the rates. They argue that if the improvement in technology cannot be copied by a competitor, then the workers do not have to

fear that the rates are cut due to market pressure. Lincoln's success is used to illustrate the argument: 'Proprietary manufacturing methods (and not just the extra effort of workers) are a major source of Lincoln Electric's cost advantage' (Carmichael & MacLeod, 2000, p. 17). Though it seems logical that in a situation where market pressure is absent or weak, it is possible not to cut the rate, this is also the situation where rate-cutting is possible without having the workers leave the company, exactly because they have nowhere to go to sell their firm specific skills. It's only in this situation where 'Hold-up', in this case through rate-cutting, is possible (Klein et al. 1976; Williamson 1985, 1996). The specificity of labor skills alone can therefore not explain why a company does not cut the rate. Carmichael & MacLeod (1993) provides some further explanation of how workers are motivated to adapt to external benchmarks. The specificity of labor skills combined with a multi-skilling approach to job organization, which characterize Japanese firms, is used to explain the self-motivated cooperation of worker through fear of punishment (a burning platform).

Though the introduction of the concept asset specificity provides insight to when and how market information and thus external benchmarks can be used, the papers by Carmichael & MacLeod (1993, 2000) are mostly theoretical, and provide little insight into how the market information of the piece rates is produced and mobilized in practice. Huberman (1996) provides some empirical data on this aspect. He investigates the British textile industry in the nineteenth and twentieth century, and show that a piece rate 'list' used by all the companies in a firm was used to prevent firms in a cartel from renege on agreements between the workers and the employees. Huberman provides an interesting study of how piece rates are set outside the firm, but it is a question whether cartel enforced lists can function in a global economy, where especially industrial goods are exposed to fierce competition beyond the local environment and where anti-trust laws are enforced much more thoroughly than in the nineteenth and twentieth century. In our analysis the creation of market information is done through bids not through lists.

3.0. Methodology and case presentation

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3.1. Methodology

The analyses put forward in this paper are based on a case study which 'investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident' (Yin 1984, p. 13). We have designed a single case study with an analytical approach to explore how the market is brought inside the firm.

To illustrate the subjects of the paper, several types of data have been used: available documentation, such as reports made by the case company, records and organisational surveys. However, the most important source has been 29 confidential, semi-structured and in-depth interviews (please see Appendix 1). Both the company and the interviewees in this paper are anonymous. The interviews took place in the company when we visited it ten times during a period of approximately a year. Interview guides had been prepared in advance, but gradually they were used less rigorously in favour of new perspectives - not the least introduced by the respondents. Efforts were made to gain a better understanding of the respondents' self-reflection regarding the objects introduced in terms of daily activities from a dynamic perspective.

After completing the interviews in PRODCORP, the interviews were printed out and analysed from the perspective of the chosen analytical and theoretical point of departure. Thus, most of the data in this study was obtained from interviews about organisational phenomena and related thoughts about actions. High priority was deliberately given to the respondents' own interpretations and perceptions, along with a classification of the observed phenomena by means of a known terminology and framework.

4.0 The case company

At the time of the study PRODCORP was an approximately 125-year-old Danish order-producing company. The company was established in the southern part of Denmark, and it designed and manufactured diesel generators for ships and stationary installations. The company quickly established an international reputation, but at the time of our study it was a part of a German industrial giant. Engines were produced by a global network of licensees that mainly generated sets for electricity on-board ships and power plants, as well as gears and propeller equipment. The German mother company employed over 7,700 staff, primarily in Germany, Denmark, France, the Czech Republic, India and China. During the field study, the Danish division (the case company) had approximately 600 employees and total revenue of about 150 million Euros annually. The worldwide market share of the specific diesel generators was about 35%, and this position had been achieved through an intense focus on quality in production, maintenance and service.

The salary for production workers was based on three elements: basic salary, qualification allowance and bonus based on the piece-rate system. The basic salary was the same for all skilled workers. The qualification allowance was given to those workers who could operate many different machines or who had taken courses that were considered to be a qualification. The bonus was based on a piece-rate system. In contrast to the basic salary and the qualification allowances, bonuses were earned in groups. The piece-rates were not changed unless a technological improvement had been made. Since the union had a strong position in the company this agreement did not seem to be a source of conflict. Though the unions had a strong position in the company, workers were dismissed if there was no work. In the company the general impression was that there was slack in the piece rates

4.1. The competitive situation and attempts to bring the market inside the firm

The company was faced with strong competition, especially from Asian competitors. To strengthen the competitiveness towards these competitors several elements of change in the manufacturing department was launched. The production processes in PRODCORP was grouped into two different categories; 1) a simple kind of production, which was exposed to outsourcing, and 2) a more complex production of strategic importance for PRODCORP, which was not exposed to outsourcing. Three key components were considered strategic important: camshafts, cranks and connecting rods. These components' competitiveness was pursued through redesigning the piece rate systems, without incorporating any external benchmarks, which therefor is not part of our analysis.

For the non-strategic components an outsourcing process was used to provide external benchmarks to motivate the workers to work more efficient. Though outsourcing of course was central in the process, we do not analyze the case as a traditional outsourcing 'story', where focus often is on

what and why to outsource and the specific control problems related to using an outside supplier (Nicholson, B. et al., 2006; Sartorius & Kirsten, 2005; Widener & Selto, 1999). The outsourcing process in PRODCORP is analyzed as a way of using external targets to create incentives to lower the piece rate inside the firm. The logic in the process in PRODCORP was that if the outside bid was cheaper than inside production, the workers were allowed to match the bid, before the production of the component was outsourced. If the bid was matched it would de facto mean that the component costs were lowered. If the outside bid was not matched the production was outsourced.

Though manipulation of internal or external information potentially could be a problem in a benchmarking process, as e.g. Gibbons & Murphy (1990) show, manipulation by the manufacturing department didn't seem to be a problem in PRODCORP. This is not a big surprise since the manufacturing department, who had the incentive to manipulate the choice of suppliers or the internal price, did not have the decision right to do so. The purchasing department e.g. chose the external suppliers, so the manufacturing department couldn't choose expensive suppliers, which would be less likely to come up with a bid, which PRODCORP couldn't match. Furthermore the manufacturing department didn't control the accounting rules, which were used for the inside calculation, so accounting manipulation was also less likely. A third potential for manipulation would be classification of costs from components that were prone to outsourcing (in PRODCORP called the non-strategic components) to components that were not prone to outsourcing (in PRODCORP called the strategic parts) (Rogerson, 1994). The type of manipulation was also difficult to carry out, since the strategic parts were produced by cells with specialized workers, who spend most of their time on these components. Though they sometimes spend a little time on some of the non-strategic parts, they had no interest in classifying time spend on the non-strategic parts to the strategic parts, because that would decrease the bonus they earned on the strategic parts. Thus in the analysis we rule out manipulation of internal and external information.

5.0 Exploring conditions for the functioning of market-information as an internal performance target – On the issue of constructing comparability

Our analysis is structured in 5 subsections. In the first section it is shown that for some of the components the use of the external benchmarks through bids from suppliers created a 'sense of urgency' (Kotter, 2008), which made the workers lower the rate. For these components the discipline of the market worked perfect. In the next section we analyze the problems related to getting external prices. In the section 'Defining the component' respectively 'Bringing the firm out on the market: the calculation of inside costs' we show that providing the internal component respectively internal cost was a demanding exercise, which in PRODCORP created larger problems than getting the external information. In section 'Defining controllable costs' we argue that the creation of market incentives was hampered due to problems of defining controllable cost.

5.1. Initial success

Though this paper deals with the problem of 'bringing the market inside the firm' it's important to emphasize that in the beginning of the process the project was a large cost reduction success in several ways. For some of the components the prices listed by the suppliers were so low that the

workers in PRODCORP did absolutely nothing to even consider competing and matching these prices. An employee in the Department of Purchase explains:

'The workers realized right away that they couldn't compete with the external price. The price from the supplier was almost cheaper than our material cost. It didn't matter how fast they worked, there was nothing to do.'

For other components with high labor content the process of listing prices actually did create the active and creative behavior that is the much heralded advantage of the market incentives. The Head of the Production Department said about the outsourcing process:

'It has created a pressure. Some of the departments, which were let us say next in the line to become outsourced, entered in a dialogue with the team responsible for the outsourcing project, where they admitted they could cut the costs a bit if production remained in the company.'

In this part of the outsourcing process there was little discussion, but after a while the outsourcing process incurred problems, concerning the calculation and specification of both the external as well as the internal price. Figure 1 provides an overview of the various problems related to establish benchmarking. We will start analyzing the problems related to getting the right market price.

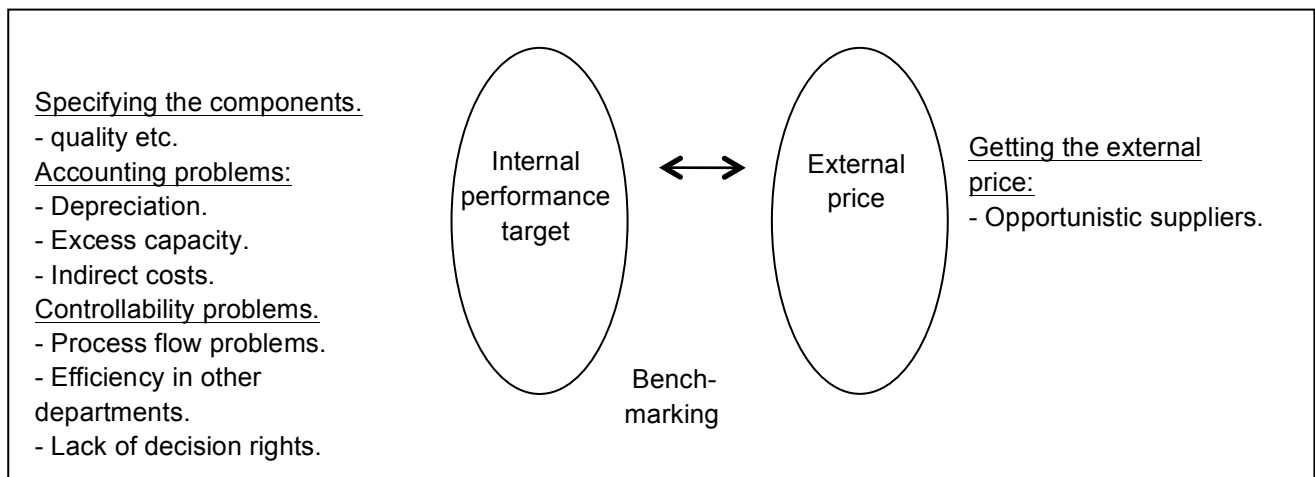


Figure 1: Issue related to comparing internal performance target and external bids

5.2. Getting the right external price

An important element in the process was obviously to get the right external benchmark. As we know from Coase (1937, 1960) in a perfect market prices are freely available, but in imperfect markets there is a cost of getting these prices. Eccles (1985) argues that when using market prices: ‘The central question is how external prices are established’ (1985, p.119). Getting prices from suppliers demanded that PRODCORP found the suppliers that could produce the products. Furthermore the suppliers had to be trustworthy, which cannot be taken for granted, since suppliers did not always have the incentives to reveal information truthfully. In some situations the suppliers did have incentives to come up with *strategic* offers, which could leave the company in a vulnerable situation prone to Hold-up (Klein et al. 1976, Williamson 1985, 1996):

'The number of suppliers for a specific component is limited. Thus sometimes when you ask the suppliers about a price, they don't take it serious because they know that the price they reveal, will only be used internally by us to compare with. When we have asked a couple of times, then they actually dumps the price or they don't spend time calculating the price precisely....So we try to watch how much the suppliers' prices increase, so we won't end up in a situation where we are caught in a trap, because if we have thrown out our own machines, then we are talking about making some really heavy investments, if we have to take the production home.' (Head of Accounting).

Thus some of the problems in PRODCORP are similar to the issues in the literature regarding finding external benchmarks (Eccles, 1985; Gibbons & Murphy, 1990; Hansen et al., 2003), and preventing being in a situation where the supplier could hold you up, due to the specificity of assets in the transaction. The paradox in the specific situation in PRODCORP was that to avoid Quota Restriction inside the company by using external benchmarks the company could end-up in a new vulnerable situation.

Another issue related to asset specificity, which actually demanded that PRODCORP interred into bilateral relations with suppliers, was the lack of incentives for suppliers to invest in assets that were specific to PRODCORP, due to the fear of being held up by PRODCORP. This problem surfaced during the discussion of the outsourcing of engine frames. Engine frames were a very important component in the production of generators, because the late delivery of the generators often was caused by the fact that the engine frames took too long time to produce. The long production time was due to the fact that the iron plates needed for the production of the frames were difficult to get. To reduce this problem a large inventory of plates would be needed, which was difficult to convince the suppliers to have:

'We had a stockpile of the plates, we even had raw materials so we could produce a frame in 8 weeks. Our suppliers do not have that stockpile today. But the thickness of the plates has changed; therefore we cannot demand that our suppliers have the material in stock. This means that the suppliers need 5 to 6 weeks to get the plates. It is not standard materials that you can get around the corner in a plumbing and heating service' (Head of Classification Dep.).

Though part of the problem was caused by the fact that plates were less standard goods at the time of the case study, than they were when engine frames were produced in house, the lack of inventory problem was caused by the situation that the company wouldn't settle on one of the suppliers. Hence it was difficult to create incentives for the supplier to maintain a stock:

'Other things has changed too. We use for the moment three suppliers and we discuss which one we should choose. If we made an agreement with one then maybe we could make him establish a stockpile of plates, so we could shorten the delivery time. But we don't really know who we should choose.' (Head of Sales Dep.).

The analysis shows that to achieve availability of frames by having the supplier hold a stock, it might be necessary to create a situation, where there is only one supplier. In this situation the supplier gains a monopoly status, and the potential for exporting the incentive problems from inside production exists, because it will be difficult to find benchmarks external to the supplier. Thus the outsourcing process in PRODCORP showed that the 'continues improvement of targets' (Ferreira & Otley, 2009, p. 271) was not guaranteed by using external suppliers, exactly because the

transaction was characterized by a high degree of asset specificity, which would require long-term contracts that would rule out continuous adaptation by bringing in new suppliers. Research in Japanese supply chains has shown that transactions between interdependent firms with a high degree asset specificity has an incentive structure, which is more like the ones used in firms, e.g. the use of ‘promotions’, than what we would expect in a market (Baiman & Rajan, 2002; Cooper & Slagmulder, 2004; Gietzman, 1996).² In these cases the company is brought out in the market to foster continues improvement instead of the other way around.

5.3. Specifying the component

Though getting the external price and potential Hold-up problems were serious problems in PRODCORP, it was equally difficult to specify and calculate the internal benchmark. These problems created huge problems in the aim of constructing comparability. After the initial success the outsourcing process came to a halt. The halt was partly caused by the experience with engine frames. The production of engine frames was outsourced to a supplier in Poland, which provided a cheaper offer than the prices from PRODCORP’s own welding department. But outsourcing the engine frames created a lot of problems:

‘We really had a lot of problems with the engine frames, a lot of problems. Problems related to getting the product in due time and getting a product that complied with the specifications. We had to use a third party to control the production in Poland. I think the problem with outsourcing is that our design plans for the components, when we made everything in this building, was dependent on that the construction department knew the persons, who made the job and they were sure that there was a certain level of craftsmanship in the construction of the components. Then you begin to outsource and I think it is wrong that it is the construction department that effectuates the outsourcing, because they simple take the design plans and use them for outsourcing. And then we got some engine frames back with big sharp edges, which is very dangerous. It looked like that my wife had welded it. We had to send it back and it was very irritating. It wasn’t specified thoroughly on the design plan, we simply assumed that the people knew how to weld. Apparently it is necessary when you outsource to specify everything’ (Head of Facility Construction Dep.).

When production was done inside the company the lack of information in the design plans was apparently less of a problem, because many of the employees had worked in the company for many years, and knew how things should be done. The problems with the Polish suppliers made PRODCORP change to a Danish supplier, but many of the understanding problems remained:

‘When we produced in-house you knew that this or that information wasn’t in the plan, but things were done in the same way, they had always been done. But when you outsource you are caught up in the plan, and you can’t simply say: ‘Smith - in this or that department - knows it.’ (Head of Classification Dep.).

Some of the specification problems related to the two different types of plans that were used in the relation between the construction department and production departments: the official design plans and the job card. The job cards were used by the workers doing the job, whereas the design plans

² Some Japanese companies rank their subcontractors in A, B, C and D categories or in family member, major supplier, subcontractor and common supplier. The A suppliers and the family members are considered excellent suppliers which the company seek to build a long-standing relationship with. The ‘promotion’ is based on quality, delivery performance and ability to achieve target price reductions periodically (Gietzmann, 1996, p. 619).

were more formal documents, which were used in the construction department. The different status of these two documents created problems regarding getting the components out on the market:

'The job cards were changed now and then by the method people. A change in the design plans is very difficult and can take very long time to get through. If we had asked several times for a change in the design plans, and nothing had happen, then we changed the job card, and it didn't matter, because as long as the job cards were okay then the workers could do the job. But if you take the design plans and use them as the basis for outsourcing, then off course things go wrong' (Head of Classification Dep.).

Specification problems were especially important for the engine frames, since they were a focal component in the production of the generators. There was a 12 weeks delivery time on engine frames, and since it often was difficult for customers and sales people to figure out in advance what type of engine frame, the specific generator would need, delivery time was an important issue, and also the ability to fix errors quickly:

'It is easier, when you have the production in house. For example if you receive an engine frame with errors, then you have to send it back to Esbjerg (another part of Denmark) to the supplier, and that has some consequences. When the frames where produced in house you could send it directly to the welding department, and they did the repair during the night. We do not have that service anymore and that costs' (Head of Classification Dep.).

In extant research on the use of external targets little focus has been on this issue. In the management accounting literature focus has been on getting external benchmark, and little focus is on specifying the internal benchmark. In transaction cost theory the focus in terms of adaptation is on opportunistic agents exploiting incompleteness in the contract to Hold-up the focal company (Williamson, 1985, 1996). Our analysis show that adaptation to a dynamic environment demands that specification of the product, and the administrative devices – job cards and design plans – that defines the product are also of major significance to construct the product, which is necessary to construct comparability and subsequently a market.

5.4. Bringing the firm out on the market: the calculation of inside costs

Specifying the product was only one part of the problem of getting the components out on the market in PRODCORP. Calculating the inside costs of the components also posed problems. These problems exist even in a potential situation, where the technical details of the product are well specified, since calculation problems relate to the technicalities of accounting, not to product specification. Product specification is an engineering problem whereas product calculation is an accounting problem. This problem is not covered in the accounting literature (mangler reference) or the piece rate literature (Huberman, 1996; Carmichael & MacLeod, 1993; 2000, Kantemoto & MacLeod 1992). As mentioned above the focus is on comparing inside and outside labor costs to understand how market forces work inside the firm. If specificity is low it is easy to get external prices, and the market's strong incentives will prevail inside the firm, whereas if specificity is high external prices are hard to get. The focus on labor costs in the literature is conceptually problematic, which we will shortly highlight before analyzing the case.

The problem is that if different organizations, which produce a given component, do not have the same input mix in their production function, benchmarking on labor costs provides a distorted picture. Labor costs alone say nothing about efficiency or the skill of the workers. A worker supported by a lot machinery probably spends less time per piece than a worker working with less

machinery support, and if they are paid according to a piece rate contract, the piece rate for the worker producing in the machinery intensive process will all else being equal be lower than for the worker using less machinery. But to say the second worker is less efficient and his/her piece rate should be lowered or the production should be outsourced based on the higher piece rate is off course problematic. Thus benchmarking only on part of the component cost is highly problematic. Thus it can be argued that the analysis conducted by Huberman (1996), Carmichael & MacLeod, (1993; 2000) and Kantemoto & MacLeod (1992) not only rests on the assumption that the products are similar but also that the production function are the same.

In PRODCORP the question of whether internal labor costs could be compared with outside labor costs was not discussed, since the focus was on the total costs of the component. But the calculation of total costs for benchmarking created its own problems for benchmarking. Two overall types of problems were emphasized in PRODCORP. First, there was a discussion of the calculation of the costs, especially regarding the calculation of depreciation and the calculation of administrative costs. These problems are classical accounting problems concerning the calculation of avoidable costs (Shillinglaw, 1957), which are the costs that disappears if a component is outsourced. The problem of simply calculating the components costs in PRODCORP created a lot of discussions that removed the focus from reducing costs to simply understanding the costs. The market incentives was thus undermined. Secondly, there was a discussion of to what extent the manufacturing department could actually influence the costs of the components, which is a problem of controllability. The problem of controllability is analyzed in the next section

The employees in PRODCORP highlighted several problems regarding the calculation of avoidable costs. Especially depreciation of the machines was considered a serious problem for the calculation of internal prices. Two elements were mentioned as creating the problems: 1) A mismatch between the chosen length of depreciation (fully depreciated in 10 years), and the real lifetime of the assets, which according to the interviewed persons was longer than 10 years, and 2) the fact that the periods depreciation was allocated to the products based on actual utilization (as opposed to a fixed amount per hour machine time). Regarding the length of depreciation the Head of Accounting told:

'Depreciation costs are really massive. The way we depreciate creates large depreciations the first 10 years, and if the machines last for 20 years then the depreciations are completely gone in the last 10 years. It is a problem, and we have discussed it with our parent company. We argued that it created a distorted picture of the whole situation, and we wanted to use calculated depreciation. But they wouldn't allow it, because then we couldn't live up to the accounting regulations.'

The length of depreciation rendered components produced on new (old) machines more (less) expensive than they would have been if the length of depreciation followed the lifetime of the machines. Another depreciation policy problem related to the fact that the machines were depreciated according to actual usage instead of a fixed amount per hour. The problem was that when machines were little used, the unit costs rose (see Kaplan & Cooper, 1998, chap. 7). In PRODCORP this was especially a problem for new machines, which had little up-time due to start-up problems, and therefore had less productive hours to absorb the depreciation. For all the components that were not considered strategically important, the depreciation policy influenced the outsourcing decision:

'When we introduce new machines, we see that our manufacturing costs increase a lot because there are huge teething problems. This means that if we are not dealing with one of these strategic areas, then the components will be in the risk zone for outsourcing' (Head of Accounting).

The calculation of avoidable support and administrative costs also posed problems:

'The major problem we have had with outsourcing is that we have had some problems getting comparable cost figures with the numbers we get from the suppliers. We have spent a lot of time on discussing the numbers. A lot of costs are allocated to us: from method people, administration and what do I know. Sometimes it is difficult for us to see whether these costs remain in the company after we outsource, or the costs are allocated to the suppliers' price' (Shop Steward).

The Head of Factory also argued that cost calculation creates problems:

'The construction department uses the numbers to say we are too expensive. But I will say that they don't understand the numbers. There are material costs, direct labor costs, indirect variable costs, fixed costs and depreciation. They don't know what each element contains'.

Though you could argue that there exist 'technical' solutions for these calculation problems, these technical solutions have to be mobilized and they incur costs and conflict. The classical accounting problems cannot be seen as trivial in an attempt to provide internal benchmarks.

5.5. Constructing controllability and controllable costs

Though avoidable costs were discussed quite a lot in PRODCORP an even more discussed topic was controllability and especially controllable costs. The controllability issue rises as an extension of the calculation of avoidable component costs, but adds an incentive issue to the complexity of calculation. A general premise of bringing market incentives inside the firm is to replicate the high level of controllability, which is assumed to exist in the market. In the literature the high level of controllability is established by organizing the firm as the market: 'The firm should be comprised of independent operating units that act like economic entities...' (Dean, 1955, p. 67-68). By organizing the firm in independent units the hardworking employees are not dragged down by the other units, and the lazy workers are not bailed out by the rest of the company.

The introduction of controllability and controllable cost adds yet a critic towards the piece rate literature and the focus on asset specificity. In the piece rate literature focus is on the piece rate, which the workers obviously can control, since they can choose to cut the rate. Since other cost elements are not taken into account in the analysis controllability problems don't enter the analysis. Surely 'bringing the market inside the firm' through the outsourcing process loose much of its motivating power, if the workers and managers perceive that they cannot influence the costs they are supposed to reduce. In PRODCORP controllability issues very much entered the discussions, since the manufacturing people perceived uncontrollability in three ways: 1) Problems with process flow; 2) Efficiency in other departments; 3) Lack of decision rights.

According to the Factory Manager a large part of the costs in manufacturing was caused by problems caused by the general flow in the company:

'We made a test, where we made sure that all the materials were present, and we obtained on exactly the same type of engine an efficiency improvement on 10-15 %. In general, our flows of tangibles are not very good. Our inputs to intermediate products are not where they should be at the appropriate time. Sometimes this is due to the fact that our orders have not been specific enough from the beginning. In other cases, our construction departments have not been on time with their design plans. Maybe the purchasing department has not bought the right stuff. If they

had done their work probably from the beginning we could gain an efficiency improvement on 10-15-20 %. But that means that we have to change the way we are working: Our processes are not optimal at present.'

The controllability discussion had yet another dimension, which did not relate to inefficiency in the flows, but to inefficiency in other departments allocated to the components. The Head of the Manufacturing Department argued that there was too much focus on direct labor efficiency compared to the efficiency of other employees in the company:

'There has always been a tradition to focus very detailed on the description of the hourly-paid work. So the work they do is compared with a norm. Whether the norm is good or bad is another story, but there is a norm. We are around 600 people employed in the company, and we are approximately 150 hourly-paid workers in the manufacturing department. I am certain that 300 of the other employees could achieve an increase in productivity on 50%. There is a potential, which is much larger than the one in our department' (Factory Manager).

In the same way the head of finance insisted on focusing on other costs than direct labor costs. Labor costs in the production department were only a small part of the total costs:

'The discussion in this company has been on improving worker efficiency. But that doesn't get us anywhere. I think it is between 15-18% of direct manufacturing costs that are labor cost. The rest is material costs. The focus should be on the purchasers. To improve the production with 10% would be nice, but to improve purchase with 10% would be really nice' (Head of Finance).

Though material costs to some extent were controllable by the manufacturing department since they can reduce scrap, the price of the materials was under the control of the purchasing department.

Whether the Head of the Manufacturing and Head of Finance were right about the efficiency of the non-manufacturing departments is not really important for the argument. The important thing is that the employees perceived a lack of controllability. If the workers perceived that they could only control a small fraction of total component costs, they would lose motivation to improve product costs by lowering the piece rate, since it will have little impact on the outsourcing decision.

The third problem related to the fact that many employees in the manufacturing department felt that they could not influence the outsourcing process. The fear of getting outsourced should, according to the logic of the market, create a strong incentive for innovation and improvement, to keep the production inside. But the much celebrated behavioral logic did not work smoothly in PRODCORP. In the following the head of the connecting rod department highlights a behavioral logic that inhibits innovation:

'I think many of us began to tread water a bit after the outsourcing process started. The interest for doing something was not large, because we didn't know what components we had, and we saw some of the components disappear. So we said - let them finish, so we can see what is left. We should probably have taken the lead and said: We want those components and then acquired the relevant technology to cut costs.'

Instead of reacting proactively towards the listed prices the workers reacted in a passive manner, due to the uncertainty created by the process.

But part of this passive behavior apparently related to the fact that the manufacturing departments did not have the decision rights to implement improvement. This problem was especially relevant

for the implementation of new technology. The creation and implementation of new technology were obviously paramount for cost reduction, but apparently the problem was not the creation of ideas, but simple to implement these ideas, which were outside the control of the manufacturing departments:

'Often we have an investment project, which is approved, but we haven't had resources to implement it. We simply do not have the people to implement it' (Factory Manager).

The problems regarding the implementation of new technology were according to several of the respondents caused by the fact that there were too few employees in the technology department, a decision the manufacturing department could not control.

6.0. Discussion and conclusion

In this paper we analyze several aspects concerning the issue of bringing the market inside the firm. As mentioned earlier the analysis contributes to the performance management/management accounting literature as well as the piece rate literature. We contribute to the literature concerning target setting based on external benchmarks. This problem has received little attention in the management accounting and the performance management literature (Ferreira & Otley, 2009; Merchant & Otley 2007; Murphy, 2001; Stringer 2007), whereas in the piece rate literature the problem has been theorized through the well-known concept asset specificity (Carmichael & Macleod, 1993; 2000; Kantemoto & MacLeod 1992). Our case study adds to both of these areas in several ways.

We show that one way of using external targets is through bids, as was the case in PRODCORP. We touch upon the issue of getting the external prices, and show that finding reliable information is problematic, as is emphasized in the literature (Hansen et al., 2003), but our main contribution is to highlight that constructing both the components as well as the cost 'price' pose huge problems. Calculating the internal benchmark as well as creating a sense of controllability is equally important as getting the external information when using external benchmarks to foster motivation inside the firm.

In our case there is no formal incentive system linked to the performance target. Incentives are provided through the market praised 'of its remarkable capacity to present and preserve high-powered incentives' (Williamson, 1985, p. 161). In PRODCORP the 'market' potentially both rewards and punishes performance. The market information achieved through bids functions as a burning platform, because it is explicitly stated that if the workers do not match the bids the components are outsourced and the workers are laid off. But if the workers can match the bids they are 'rewarded' by keeping their job.

The case study shows that PRODCORP used market information to support its piece rate system. But we also show that bringing market information as well as providing market incentives inside the firm was difficult - the project partly failed. The problem of information was both a problem of achieving reliable information in an incomplete market, and especially a problem of bringing the inside costs to the market. We show that finding reliable suppliers as well as specifying the components even in a manufacturing context, where specification should be fairly easy, was a demanding exercise. These results underline and enforce the results from Llewellyn & Northcott (2005) and Northcott & Llewellyn (2003), which shows that creating an 'average hospital' is

difficult. Also Hansen et al. (2003, p. 106) argue that many companies find it difficult to achieve external information they can benchmark with.

But getting the external information was not the major problem in PRODCORP. In the piece rate literature information problems are described as a function of asset specificity, which is well known in management accounting, but our analysis show that the emphasis on the specificity of assets in the piece rate literature was only partially useful in our study. Williamson argues that ‘asset specificity is operational in that it serves to breathe content into the idea of transactional ‘complexity’’ (2002, p. 189), but our case study opens up a venue into a different definition of complexity, which relate to accounting. Accounting complexity relates to classical accounting problems, such as calculation of depreciation, avoidable costs and allocation of indirect costs. Accounting complexity seems to follow a different path than asset specificity, and opens up for new questions related to the boundary between the market and the firm. The insight is important for both the piece rate and the management accounting literature. In the piece rate literature the ‘market’ is the labor market (Carmichael & Macleod, 1993; 2000; Kantemoto & MacLeod 1992), and the relevant dimension is the specificity of the labor skills. Thus the market prices are taken for granted and focus is on the specificity of the skills the workers acquire. The same approach is also partly taken in Merchant & Manzoni (1989) where target setting is constrained by the market for labor. Our case study introduce an apparently small but even though very important addition to the existing literature, by highlighting that the ‘rate’ paid to the workers is not the same as the cost of the piece, and therefore accounting complexity comes to the forefront of the analysis, since the creation of internal prices is difficult to establish.

But accounting complexity also relates to controllability. We add to the literature by showing that bringing the firm out in the market is not purely a calculative matter, since if the workers consider a large part of the costs uncontrollable, the benchmark won’t provide the incentive to lower the piece rate, because the workers will perceive that it won’t matter in the big picture. Like in other performance management systems controllability is important in creating motivation for hard work. In PRODCORP the attempts to make the workers more active partly failed due to lack of controllability regarding calculating costs of the administrative costs, lack of resources regarding the implementation of new technology and lack of control over the production process.

The insight that information on specificity is not the only and probably not the most important piece of information in a piece rate setting, also provides new insight to the discussion of when and how companies can commit not to cut the rate. Carmichael & MacLeod (2000) argue that in situations where worker skills are specific to the firm, it’s easier for the firm to commit not to cut the rates, exactly because there is no competitive market that rules out any difference between the focal firm’s piece rate and the markets piece rate. We argue that even in competitive markets a company can maintain a steady piece rate, if production is labor extensive. The less labor intensive the ‘piece’ is, the less important for total costs are the rate paid to the workers, and it’s much more important for the piece costs that machines and materials are used efficient, than that the piece rate is low. In this perspective the much heralded success of Lincoln through the commitment not to cut the rate could have less to do with the specificity of the labor skills as highlighted by Carmichael & MacLeod (2000, p. 17), than the weight of labor costs in total cost of the pieces. Thus efficient piece rate systems are easier to maintain in a non-labor-intensive production. This is maybe good news for western manufacturing companies struggling to keep up with low-wage Asian competitors. Wage is maybe not so important after all.

The attempt has been to change the piece rate system in a proactive manner by ‘bringing the market inside the firm’ through the outsourcing process. We have not been able to study the dynamics of the process, since it stopped due to the problems mentioned above. If a company wants to use market information to create market incentives inside the firm, it is a necessity to get bids continuously to be updated on suppliers’ prices, which is off course difficult in transactions with a high degree of asset specificity.

We don’t think that our results only are interesting in a piece rate setting. Hope & Fraser’s (2003, p. 72) argue in their ‘Beyond Budgeting’ approach that external benchmarks should be used. They report that typical KPI’s used by Bulmers, Borealis, and Rhodia are return on equity and cost-to-income. Though Hope & Fraser (2003) present the cases and the use of external benchmarks as success stories, it is easy to see that the use of these ratios could create many problems. Ratios are in general problematic to use (Jensen, 2003) because they can induce to wealth destroying actions. A high cost-to-income can be achieved by saying no to income that can cover costs by are lowering the ratio. [3]Return on equity can be improved by using less equity to finance the company’s operations, which will impose the company towards more risk.

But even if manipulation for whatever reason isn’t a possibility, measures like return on equity and cost-to-income could be completely useless as benchmarks. Obviously it makes little sense to use return on equity as benchmarks between companies with different capital structures, and the calculation of cost-to-income as well as other accounting figures depends on several accounting choices, such as allocation of common costs, depreciation rules etc. If these accounting rules differ between companies, benchmarking becomes problematic. The inside cost is also important in a sales setting where a less accounting ‘infected’ measure like sales could be used. A sales person in one company could have a lot of support, whereas a sales person in other companies could have less support. Surely using sales figures from a company with a lot of support as an external benchmark for another company with little support is highly problematic because the cost functions are completely different. Even in highly competitive markets – normally a situation where benchmarking should be fairly easy – companies may know the price of external competitors, but they still have to calculate their internal costs to figure out whether they are competitive.

Appendix 1: Interviews in PRODCORP:

Interview	Position
1. (2 interviews)	Head of Accounting
2.	Head of Sales Dep.
3.	Former head of Factory
4.	Head of Construction Dep.
5.	Employee, Logistics and Production
6.	Head of Purchase Dep.
7.	Employee in Dep. of Purchase
8. (2 interviews)	Head of Production Dep.
9.	Head of Planning Dep.
10.	Head of Factory Services
11.	Calculation Employee
12.	Employee in Assembling Dep.
13.	Head of Connecting Rod Dep.
14.	Method Employee
15.	Head of Classification Dep.
16.	Camshaft Employee
17.	Shop Steward
18.	Head of Facility Construction Dep.
19.	Method Employee
21.	Salesman, Stationary Facility
23.	Head of Finance
24.	Camshaft Employee
25.	Controller
26.	Blacksmith
27.	Method Employee

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