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Shifting frontiers of control during closedown processes

Rune Wigblad
Department of Economy and Society, Dalarna University College, Borlänge, Sweden

Magnus Hansson
Swedish Business School, Centre for Empirical Research on Organisational Control (CEROC), Örebro University, Örebro, Sweden

Keith Townsend
Centre for Research on Work, Organisation and Wellbeing, and The Department of Employment Relations and Human Resources, Griffith University, Brisbane, Australia, and

John Lewer
School of Business and Management, The University of Newcastle, Callagham, Australia

Abstract

Purpose – This paper aims to explore and analyse how shifting frontiers of control emerge and change the labour process so that restrictions to output become diminished, subsequently affecting organisational performance.

Design/methodology/approach – Multiple case study design. Interviews with 104 respondents. Analysis of productivity statistics in order to test for the statistical significance of the closedown effect. Single multiple regression analysis of the comparative strength, of the closedown effect, between cases.

Findings – Shifting frontiers of control arise during the closedown process, a control system characterised by markedly unrestricted autonomy for the workers as the management frontiers of control abate. This provides an operative space for informal work practices, innovation and emerging new industrial relations, accounting for the higher levels of output.

Research limitations/implications – A multiple case study of three different manufacturing organisations, with comparably long closedown periods. The authors do not analyse the sustainability of the increase in output or the generalisibility of the closedown effect to other industries.

Practical implications – It is possible to anticipate improved productivity if shifting frontiers of control are rapidly replacing the old. If management abandons the old control mechanisms, previous to the closedown decision, and provides operative space for workers' initiatives and informal leadership during the closedown process, it is possible to expect good performance, enabling a scope for extended closedown periods.

Originality/value – This is the first study that analyses the comparative strength of the closedown effect and how restricted work practices change under the process of closedown.

Keywords Autonomy, Closedown effect, Frontiers of control, Manufacturing consent, Plant closure, Manufacturing industries, Manufacturing systems, Control

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Introduction

Business closures or plant closures as it is sometimes referred to in the extant literature, can occur in a variety of ways (c.f. Marks and Vansteenkiste, 2008). However, when a factory or other facility is closed there is a period of time – which can vary significantly – from the closure announcement until the final day viz. the closedown period. This period itself can be divided between the length of the advanced notice period (ANP), i.e. the period between the announcement of the closure and the finalisation of (any) retrenchment negotiations, and the countdown period (CDP), i.e. the time from the end of the advanced notice period and to final day. Empirical evidence suggests that each period is dependent on local conditions, particularly the character of management and union/employee workplace relations and levels of conflict (Hansson, 2008b).

Managers who have overseen closures have reported that they had anticipated difficult industrial relations and diminished productivity after the closure was announced because the workers, their collective agencies and possibly the wider community had to deal with resentment, uncertainty and distress over the job losses. Sometimes, and contrary to managers' expectations, strong, counterintuitive improvements in productivity have been recorded during the countdown period (Cameron and Levine, 2006; Hansson and Wigblad, 2006b; Lewer, 2001; Sutton, 1987). Bergman and Wigblad (1999) refer to this "unexpected, puzzling social phenomenon" as the "closedown effect", for which a final explanation, they proposed, was yet to be found. Wigblad *et al.* (2007) provide a definition of the Closedown effect, stating that: "the Closedown effect occurs when, without any change to capital investment, a productivity increase is observed during the closedown period". In addition, Hansson (2008b) and Hansson and Wigblad (2006a) argue that: "the Closedown effect is a human driven productivity increase effect." Its presence is determined by measuring and comparing productivity levels before and after the closedown announcement, including data during the advanced notice and countdown periods. This paper contributes to our understanding of the closedown effect through examining data from three Swedish case studies.

Notwithstanding the pervasiveness of closures, the empirical investigation of the closedown effect has been limited. Indeed, it was not until the 1990s following a serendipitous observation of increased performance in a plant which was closing down in Sweden that the closedown effect phenomenon was identified and reported in the literature (cf. Bergman and Wigblad, 1999). Since then further research has been published investigating the generalisibility of the effect (Hansson and Wigblad, 2006b). In some of these cases differing productivity patterns occurred during the advance and countdown periods, however the closedown effect appears in the case study evidence most persistently during the countdown period (Hansson and Wigblad, 2006b).

The closedown effect has also been reported in a number of closures in the US (e.g. Brown *et al.*, 2004; Sutton, 1987) and in Australia (Lewer, 2001; Littler, 1999). Although the US cases spanned across a variety of organisations including manufacturing firms, administrative functions/departments, retail facilities and a hospital (Sutton, 1987), the cases were characterised by the relatively short closedown periods from a few weeks to no more than six months. This factor makes it difficult to identify the countdown periods in these cases, if any.

In considering explanations for the productivity increase, we recognise that some single cause and effect factors may occur, for example that workers will pursue increased earnings if bonus payment for performance was implemented during the countdown period. Potentially, management in some closedowns may feel obliged to provide bonus incentives to the workers. However, in two of the three cases reported later, no bonus systems were involved. Also, the explanations to date have tended to rely on psychological factors – how management and workers felt – without a sufficient consideration of an organisational and economic analysis. Such explanations for the Closedown effect specifically, are ad hoc, and have primarily been identified as psychological, organisational and/or economical (e.g. Hansson, 2008b; Hansson and Wigblad, 2006b; Sutton, 1987).

Workers (individually and collaboratively) seek to exercise control over their ordinary work situation. Burawoy's (1979) analysis of worker strategies designed to both resist and cooperate with managerial control, provides a critical frame for the analysis of worker performance under closure conditions. Roy (1952, 1954) and Burawoy (1979) conceptualise workers as the players of a game in which they have not been allowed to determine any of the rules. This notion is particularly instructive for cases considering the closedown effect. When opportunities arise for employees to have a greater level of control over the labour process they are able to engage in determining the "rules" of the game. However, when a closedown decision is made we propose that the frontiers of control in the workplace shifts; in other words, the workplace has reached "the end of the game". The frontiers of control refer to the real and day-to-day practiced management control over daily formal and informal practices in the workplace and the dialectic interplay with the workers. This article uses this framework to analyse how shifting frontiers of control emerge and changes in the labour process occur in closure contexts and how, in turn, this affects productivity and organisational performance.

The article is divided into the following parts: first, the literature is reviewed and an analytical framework is developed; second, the research design and data collection is outlined, and third, empirical evidence based on three Swedish closedown cases is presented, analysed and discussed. From this data it is argued that the closedown effect occurs as a result of shifting frontiers of control created under the closure conditions, predominantly causing changes in levels of worker control and worker autonomy.

Analytical framework

We argue; closedown processes may usefully be explored by assessing the labour process and any changes in this process during the closedown period. Braverman's (1974) seminal work has inspired scholars to elaborated and develop labour process theory. Labour process theory has been accused of too great a level of homogenisation of labour and its interests without adequate consideration of individual subjectivity (Sturdy and Fineman, 2001), considering that this subjectivity takes into account various intentions and motives. This is the primary reason why we turn to Burawoy (1979) as a starting point for our analysis. Burawoy (1979) claims that the traditional Marxist approach, of the control/resistance framework, does not fully explain the cooperative nature that can be found in many workplaces by most employees much of the time. Burawoy (1979) addresses this through the suggestion that consent in the

workplace arises from the organisation of the processes in the workplace that leaves employees with the perception that they have choices and the "participation in choosing [. . .] generates consent" (p. 27). In essence, there is a shift from coercion to consensual regimes in the labour process (Thompson, 1989).

Industrial sociology provides a well established recognition that employees construct "games" in an attempt to relieve the frustrations that can appear within repetitive work (Beynon, 1973; Beynon and Nichols, 1977; Burawoy, 1978, 1979; Roy, 1973). Crozier (1964) suggested that management should eliminate games and power struggles in the labour process. Homans (1950) contended that games in the workplace are expressions of informal sentiments that spring up in opposition to management. Following Burawoy (1985, p. 38) "what these perspectives share is their concern with the marginal effects of games". Burawoy (1985) treats the game of "making out" as a core concept in his theory. Burawoy (1985) explains how workers use games to reduce the negative impact of their subjective alienation and, sometimes directly, regulate the levels of labour productivity.

Burawoy (1979) develops our understanding with an analysis of the "games" that employees play to tolerate the difficult aspects of the labour process and the oft-times dehumanising workplace environment. Primarily, these games are organised around constantly negotiating and re-negotiating the wage/effort bargain, labour productivity and causes of alienation. The opportunity to gain small victories throughout the working day disguises the basic disadvantage of workers within capitalism (Kitay, 1997). Burawoy (1979) himself, through an ethnographic study, was puzzled to find himself "breaking (his) back to make out [. . .] risking life and limb for that extra piece" (p. xi). Burawoy (1979) refers to employees "making out" and argues that such a term cannot be viewed simply as "achieving greater earnings" (p. 85).

Another reason to turn to Burawoy (1979, 1985) is that in recent times, the research literature on commitment to work, employment and the organisation rarely concentrates explicitly on the effect of conflict; instead, a considerable focus has been directed at, for instance, commitment systems and similar unitarist approaches (c.f. Hult, 2003). Closedown contexts are usually about extensive conflicts between management and workers. The labour process at the plant is subject to restructuring when closedown decisions are made. The conflict is related to the dialectics of capital and the labour process.

Braverman (1974) in particular has been criticised for focusing too greatly on worker resistance and not adequately examining worker consent (Burawoy, 1985). An important element of the labour process is the range of potential employee responses to managerial control or managerial prerogative that "makes" the game. Hodson's (1995) analysis of different cases showed that employee resistance to managerial control has a negative impact on labour productivity. Hodson (1995) identified four principal agendas of resistance: deflecting abuse, regulating the amount of work, attaining autonomy and expanding workers' control through participation. Resistance connected to how a workforce may seek to exert control over output is fundamental to an analysis of the closedown effect. Importantly, any labour process involves elements of consent and there is rarely unrestrained hostility (Edwards and Scullion, 1982). Burawoy (1979) argues that due to the interdependence of labour and management, the two parties are obliged to accommodate some of the other party's preferences and expectations. Hence, labour may achieve some control over issues such as the pace at which work will be

performed, the amount that will be performed, and who is expected to perform particular tasks (Burawoy, 1979; Tolliday and Zeitlan, 1992).

The game of "making out" primarily discusses the rules of the game in the limited context of piece-work situations (Burawoy, 1979). Others have however found workers seeking to control work in differing work environments. Beynon (1973) and Swados (1957), for example, report on games taking place in line production. Efforts by workers to restrict output have also been reported by Haraszti (1978), Juravich (1985), Pollert (1981), Montgomery (1979), Stempien (1983), and Hodson (1995). Whilst there can be a strong yet informal peer control there can be those who do not conform to the shop floor rules. Those who do not join the game of restricting output for the benefit of all employees is variously (pejoratively) referred to as a "rate-breaker", "hog", "rooter", "chaser", "rusher", "runner" and the like (Montgomery, 1979, p. 13). "Rate-breakers" are likely to have different motivations for their actions; however, stepping beyond the employee developed "rules" of the game often labels this person as an outsider. This group pressure on the individual worker has been analysed by Lysgaard (2001).

According to Lysgaard (2001) the "technical/economic system" is propelled by efficiency and profitability and management's desire for optimal solutions to technical/economic problems. The demands are potentially infinite, and the system is unyielding, while the individual has limits and seeks security (Lysgaard, 2001, p. 81). Even though the potential extremes of this technical/economic pressure are normally curbed by more humane societal values (Lysgaard, 2001, p. 77), an employee can never feel fully secure against the threat of an ever-accelerating work tempo, unfulfilling tasks, or unfair treatment. The important point here is the assumption that employees find different ways to cope with this escalation of work pressure.

Lysgaard (2001) also discusses the notion of a "workers" collective' across group and organisational levels which reacts against the potentially infinite pressure from the "technical/economic system". A strong and fully developed collective operates through social control and through a value system which tend to put the norms in the "technical/economic system" upside down in order to mitigate the pressure and to restore some status to this subordinated group. The collective imperatives can be such notions as: "you should not put too much effort in to your work", "you should not be too loyal to your company", and "you should share the collective's values and goals above those of the company". It is always a matter of "us" and "them", and, from the collective point of view, the subordinated should never try to stand out like a representative of the "technical/economic system" (Lysgaard, 2001). Furthermore, in order for the workers to develop a strong collective there needs to be physical closeness that facilitates interaction among workers, and similarity among workers concerning work content, forms of pay, working hours and the like (e.g. Hoel and Beale, 2006; Hodson, 1991; Bélanger *et al.*, 2003).

The literature shows that in permanent organisations there is continuous interplay between the demands of management and labour which is manifest in a frontier of control, of conflict, resistance and consent and of games by workers. These forces affect organisational performance. The fundamental category of consent is radically changed by a closedown decision. Under normal operations a game of "making out" between management and the workers is prevalent and restrictions to output are present. The temporariness in closedown situations, which can exist for considerable time to the final day, provides a space for the re-ordering of management and labour

relations. There is evidence from previously published cases which shows that productivity improvements – the closedown effect – have occurred during these closure conditions (e.g. Bergman and Wigblad, 1999; Hansson and Wigblad 2006a, b; Wigblad *et al.*, 2007). With the above described framework that we apply in a closedown context, we explore and analyse how shifting frontiers of control emerge and changes the labour process, so that restrictions to output become diminished, subsequently affecting organisational performance.

Research design and data collection

This article draws together expanded data from two previously examined closure cases, Fundia Steel's Smedjebacken plant and Continental A.G.'s factory in Gislaved (Hansson, 2008b; Hansson and Wigblad, 2006b), and one new case study, Gusab Stainless AB. All were located in Sweden.

Case study research can provide in-depth knowledge and an opportunity for the researcher to generate a broader understanding of a complex phenomenon such as the closedown effect. These cases were selected because it was possible to enter the firms shortly after the public announcement in order to gather prospective data and to follow the process of closedown. Full access was granted, both in time (e.g. for interviews and observations) and materials (e.g. collection of documents, productivity statistics, reports and protocols).

Interviews were formal, tape-recorded and transcribed, and were conducted with management, representatives of the labour union, team leaders and shop-floor workers. Respondents were selected by reviewing the organisational structure in order to cover respondents from all parts of the administrative and manufacturing processes in each case. The transcribed interviews were sent back to the respondents for validation and, in some instances, fuller elaboration. Interviews from management, unions and various levels of employees within the organisational hierarchy assisted in the triangulation of the data. When the empirical saturation was reached, the data collection through interviews was ended. Interviews focused on changes that occurred after the closedown decision compared to the period before the closure announcement (see Table I).

In the cases presented below we present production statistics and measurements of productivity. All productivity measures are calculated on output per employee and

	Characteristics	
Case	Number of employees affected by closedown	Respondents and number of interviews
Gusab Stainless (Gusab)	104 employees (87 blue collar, 17 white collar)	Management (4 respondents) Labour union (3 respondents) Workers (40 respondents)
Fundia Steel Wire Rod	34 employees (33 blue collar)	Management (2 respondents) Labour union (2 respondents) Workers (10 respondents)
Gislaved Studding	150 employees (110 blue collar, 40 white collar)	Management (5 respondents) Labour union (3 respondents) Workers (35 respondents)

Table I.
Population and sample from the cases

time unit. We were able to apply this simple measurement as we in all cases got both production statistics and statistics over the numbers of employees. The production statistics contained information on output per time unit and the employee statistics contained information on the subsequent downsizing. We did not find any significant market related restrictions, affecting the possibilities to increase the production rate. We ran a descriptive statistical analysis on the collected production statistics.

We elaborate on production statistics and outline an analytical table (see Table II). The calculation of the change in productivity is based on production statistics starting twelve months before the closure announcement and its average growth/decline, expressed in a percentage value. The same measure is taken into account for the countdown period, from the closure announcement to the final closure. We also outline a mean productivity value and standard deviation for the twelve months before the closure announcement as well as for the countdown period. We consider the mean productivity, the standard deviation for the advance notice period (ANP), the period from the closure announcement until the negotiations between management and worker representatives are set, for each respective case. Similarly, we outline the same measure but for the countdown period (CDP), the period from when negotiation are set until the final closure. Further we apply the same statistical test as Hansson and Wigblad (2006b) when they test for parallelism (of the two linear trend lines, regarding the productivity development, before and after the closure announcement) in order to distinguish the statistical significance of the Closedown effect. This measure takes into account the linear trend lines of the productivity development between the periods before and after the closure announcement (cf. Hansson and Wigblad, 2006b; Kleinbaum *et al.*, 1998; Hair *et al.*, 1998). In order to distinguish the strength of the closedown effect and to be able to compare cases a comparative value is outlined. This comparative value is based on a test of the use of a single multiple regression model comparing intersecting lines, given unequal slopes and unequal intercepts between the periods pre and post the closedown decision (cf. Kleinbaum *et al.*, 1998).

Empirical evidence

The Fundia Steel Wire Rod case

Fundia Steel Wire Rod (Fundia) was a part of the Rautaruukki Oyj Group and manufactured wire rods, with two production plants located in Scandinavia: one at Smedjebacken and the other at Mo i Rana. The roller mill at the Smedjebacken plant manufactured wire rods with continuous process-based production.

Due to a market downturn in Asia and as part of a restructuring plan the firm decided to close the Smedjebacken plant. The closedown decision was announced in October 1998 and was scheduled to be completed within nine months. Management and the local labour union negotiated an extensive redundancy program for the workers, including severance payments, early retirement and educational programs. However, an alternative restructuring plan suggested by local labour unions was rejected by management. For the trade unions, they were able to negotiate a human resource program incorporating retraining, early retirement, job search aid and severance payments. By January 1999 negotiations over the closure was concluded and the countdown period of five months had begun.

In the beginning of the countdown period, up until January 1999, productivity dropped, but then recovered dramatically to an all-time high during the spring of 1999

Case	Measures							
	Productivity before closure announcement Δ (%)	Productivity during the closedown period (%)	Mean productivity and standard deviation before closure announcement	Mean productivity and standard deviation for closedown period	Productivity and standard deviation ANP	Productivity and standard deviation CDP	Test for parallelism	Significant closedown effect ($p = 0.05$)
Fundia Steel Wire Rod								
Type of data	47.22[a]	48.64[b]	45.69 [$\delta = 5.84$]	46.53 [$\delta = 7.34$]	41.10 [$\delta = 4.36$]	50.88 [$\delta = 3.84$]	26.532	Yes
Calculation based on linear trends of (ton/hour)/employee. The test for parallelism is based on the average of the 44 tonnes/hour assortment. Advance notice period = 3 months, Countdown period = 4 months								
Gusab Stainless								
Type of data	37.53[a]	60.13[b]	5110.50 [$\delta = 927.1027$]	5808.29 [$\delta = 1201.151$]	6632.43 [$\delta = 536.23$]	5955.00 [$\delta = 799.84$]	3110.267	Yes
Calculation based on linear trends of (kilos/month)/employee. Advance notice period = 2 months, Countdown period = 16 months								
Gislaved Studding								
Type of data	78.26[a]	64.81[b]	3204.30 [$\delta = 1779.03$]	3760.84 [$\delta = 1510.94$]	2491.02 [$\delta = 728.90$]	3724.00 [$\delta = 1603.49$]	6510.466	Yes
Calculation based on linear trends of total number of (studded tires/month)/employee. Advance notice period = 2 months, Countdown period = 16 months								

Notes: [a]Refers to the productivity development until the announcement of the closedown decision; [b]refers to the productivity development from the announcement of the closedown decision to the final closure

Table II.
Productivity analysis

(Hansson and Wigblad, 2006b). At Fundia 44 tonnes per hour were the previous average prior to the announcement and management demands for productivity increases were absent during the closedown period. No investments or other improvements were planned by management and the production manager was replaced by a foreman, coming from the shop floor. The subsequent mean outcome was 49 tonnes per hour during the five-month countdown period. Productivity increased throughout the countdown period. From the analysis of the productivity development during the countdown period a test for parallelism indicated a statistically significant closedown effect (T = 26,532) (see also Figure 1 and Table II).

An analysis of the Fundia case data showed that a number of factors were at work, all underpinning the extensive rise in closedown effect (Wigblad *et al.*, 2007). Workers were unsure who and how many of them would be offered employment in the same location but in another production unit. Ultimately eight out of 34 employees were made redundant. None of the interviewees reported that they were anxious to ensure that they received a good referral or reference from their employer. Notably and different from some other closedown cases, no monetary incentives such as productivity related bonuses were paid in the Fundia case.

Collectively, the workers expressed their sense of hurt pride and were motivated to prove to the Fundia management that their output estimate was wrong. For example, some employees commented: "Let's show management that we can do better than 44 tonnes per hour – it's unfair to close down this plant". Others believed an exceptional performance may save the plant, commenting that "most of us did not think that the production would be terminated" and "we're not finished before the last shift is ended". It appears that this hope for prolongation is unjustified in most cases, as it also was in the Fundia case.

Management control faded during the countdown period allowing far greater flexibility in the labour process, in part, facilitated by the appointment of a "foreman"

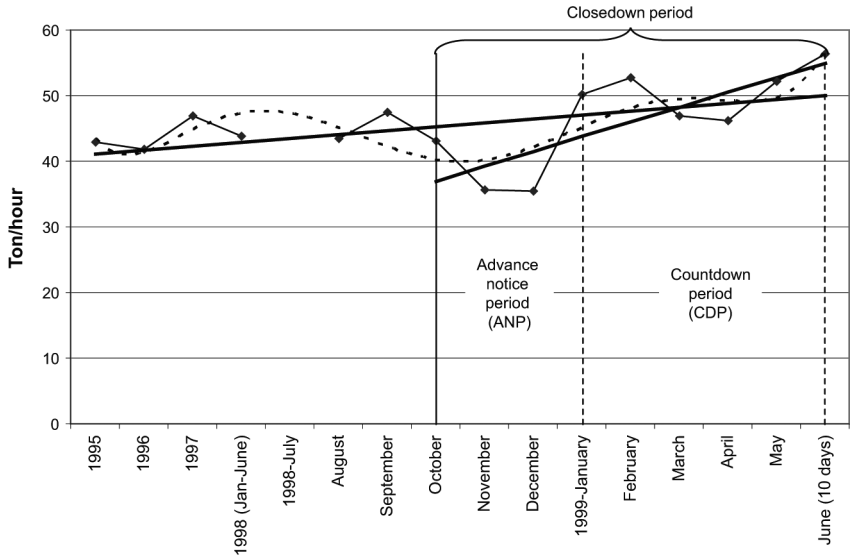

Figure 1.
Productivity development, Fundia Steel Wire Rod

as the plant manager. He adopted an informal leadership style which allowed space for incremental and more radical improvements in production. Again, and importantly for this case, many of these informal changes positively impacted on labour productivity and workplace performance. For instance; change over times between batches and start-up times were reported to have been reduced by 10 to 15 minutes and breakdowns and maintenance were more efficiently handled after the previously tight controls of management were relaxed. Some temporary job sharing activities took place allowing workers time "off-site" for education programs. However, overall, no workers left permanently prior to the shut down.

The Gusab Stainless case

Gusab Stainless AB (Gusab) was a part of the Sandvik Steel Division and manufactured cold-heading steel wires. Gusab conducted a customer adjusted, process-based production with a certain degree of specialisation due to the challenge in fine-tuning consistent dimensions of produced steel wires. Due to restructuring and reduction of the production capacity within the division it was decided by upper management that the Gusab plant was to close.

The closedown decision was announced in January 2002 and was scheduled to be completed within 18 months. Management and the local labour union negotiated an extensive HRM program for the workers, including severance payments, early retirement, educational programs and a production bonus.

It was evident that both management and the formal leaders' attention and presence in the day-to-day activities diminished over time. Management came, at an early stage in the closedown process, to abolish the requirements on certain performance levels, such as the productivity. No capital investments had been carried out at the Gusab plant during a period of five years and there were no plans for investments during the closedown period. Following the diminished management control, production planning became deployed to the shop floor level

Interviews revealed that when the closedown decision was announced, formal group leaders, together with the labour unions, encouraged the employees to maintain their production and an attitude of leaving the organisation with pride. The formal group leaders assigned to different work-groups shared information concerning the actual situation and passed this information to the workers.

It was also evident that some people who were not in positions of formal leadership took greater leadership roles. For example, some employees adopted a role of greater responsibility encouraging and motivating their colleagues and took a greater role in managing the day-to-day activities, incremental rationalisations and enhanced efforts. Some workers became keen on keeping the machines running, even during coffee breaks, as well as rationalising some work practices going beyond previously defined routines.

The informal leadership grew stronger throughout the closedown process and was granted a high degree of legitimisation by the workers in the plant. This experience of "natural leaders" developing on the shop floor encouraged all workers to continue working hard and to maintain high levels of production. The formal work groups were abandoned in favour of a spontaneous self-organising. This organising came into practice as a consequence of collective decision and the actions of the informal leaders. Also, job-rotation came to decrease as the specialisation came to increase

Prior to the closedown decision the business had experienced little industrial conflict and that which had occurred was quickly resolved. Work was controlled and managed through well-defined policies, procedures and hierarchical decision-making. After the closure announcement and in the advance notice period there was a high level of conflict as the workers and the union sought to preserve jobs by pressuring the company to reverse the closure decision. Disputes over other issues also occurred. In the countdown period the level of conflict decreased and when disputes did arise they were often resolved in a speedy manner.

Productivity increased throughout the countdown period. From the analysis of the productivity development during the countdown period a test for parallelism indicated a statistically significant closedown effect ($T = 3110{,}267$) (see also Figure 2 and Table II). In time, the volume of orders decreased and the workers were given an opportunity to have time off with full pay for the remainder of the countdown period. This offer of paid time off was contingent upon all orders being completed. The workers indeed completed the orders; however, they rejected this offer and continued production according to the scheduled closedown. All of the case study respondents claimed that no changes in routines, processes or activities occurred; rather they tried to work harder for the personal satisfaction of leaving the organisation with pride. Still, the workers wanted to show the upper management at Sandvik Steel that the closedown decision was wrong and they maintained hopes to keep the plant alive.

The Gislaved Studding case

Announced in February 2002, the closedown of Continental A.G.'s plant in Gislaved was given much attention in the media, particularly as the plant was the dominant employer in the town. Some 150 employees (110 blue collar and 40 white collar workers) in the Studding department as well as approximately 500 employees in the tire manufacturing department were affected.

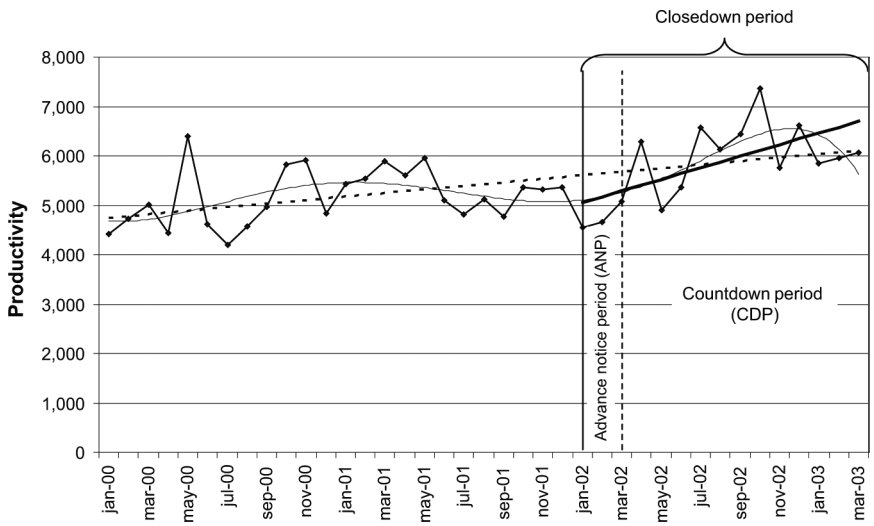

Figure 2.
Productivity development, Gusab Stainless

Characterised as not having typical cooperative industrial relations, the Gislaved closedown entailed severe conflict between the management and the plant's workforce. Workers manifest their discontent over the shutdown in protests, torchlight-processions and strikes. Concerned about potential sabotage, management hired security guards to patrol the plant; however, no skirmishes or violence occurred. In the non-socially responsible managerial setting no production bonuses were offered to the workers, similar to the conditions before the closedown decision. However, severance payments were given as workers left the organisation (cf. Hansson and Wigblad, 2006b).

Corporate management, located in Germany, provided no support to the workforce to find new employment. Locally, however, action was taken by the municipality in collaboration with the local management to assist employees with their job search. The region in which the Gislaved plant was situated was characterised by entrepreneurship and a multitude of small and medium-sized enterprises within the manufacturing sector.

It was evident that both management and the formal leaders' attention and presence in the day-to-day activities diminished over time. Management came, at an early stage in the closedown process, to abolish the requirements on certain performance levels, such as the productivity. No capital investments were made during the closedown period.

Two group leaders were assigned by management and provided with increased workspace. In addition, the group leaders were given increased responsibilities and authority including production planning, staffing responsibilities and quality control. In essence, there were two reasons for these changes: firstly, the reduced number of on-site managers led to an opportunity for the increased span of responsibility; and secondly, the group leaders had been given a level of legitimised authority from the shop floor. This shop floor authority proved to be more instrumental than managerial imposed authority.

Initially, the closedown decision and corresponding threat of unemployment generated discontent and opposition among the workers who maintained hope for continued plant operation. In time, work groups came closer together in order to handle the anger, frustration, stress and anxiety about the ambiguous present and uncertain future. According to a majority of the interviewees, the workers' attitudes changed and they were keener to help each other out and enhancing efforts in the day-to-day activities and ease the workload collectively during the closedown period than before.

The studding department measured the number of studded tyres and was dependent on the tyre manufacturing and imports from other production units. Production in the studding department was characterised as a highly standardised piece-rate production. No restrictions were put on the studding department regarding production volume. The productivity measure of the studding department is based on constant staffing (as employees were transferred from the tyre manufacturing when employees were absent) and the utilisation levels of the production equipment. From the analysis of the productivity development during the countdown period, a test for parallelism indicated a statistically significant closedown effect ($T = 6510{,}466$) (see also Table II). Notably, the productivity development during the closedown period appears to be lower than in the period before the closure announcement. Still, the two trend lines holds different intercepts and it is evident that the mean productivity for the closedown period is higher than the period before the closure announcement.

The productivity continued to increase throughout the entire closedown process (Figure 3). All respondents in this case study, similar to the Gusab case, claimed that no changes in routines, processes or activities occurred; rather they tried to work harder, wanting to leave the organisation with pride. Workers were also keen to show the corporate management that the closedown decision was wrong and they maintained hopes to keep the plant alive.

Analysis and discussion

All cases show a statistically significant closedown effect, based on a statistical test for parallelism between the productivity trends before and after the closedown decision (see Table II).

In the three cases in this article, the empirical evidence demonstrated that management control over daily operations diminished creating shifting frontiers of control. As a consequence, shop floor level employees became more involved in decision-making. In addition, positive informal work practices allowed greater flexibility in labour processes. In effect, the case findings supported the theoretical assumption that the frontier of control shifts when a closedown decision is made and announced. The workplace has reached "the end of the game" and new frontiers of control slowly replace the previous control system. Management no longer demands increased performance, monitoring is reduced, investment stops, and top-down efforts for improvements cease. Consequently, the game of "making out" no longer applies.

Changes in these conditions provided a subjective response from the shop floor in terms of different forms of improvements and rationalisations which consequently increased the productivity. This as managers provided greater autonomy to those that they supervised, empowering them both formally and informally to make decisions over their work and daily responsibilities. Workers and work groups have released innovative skills when control and restrictions over output are no longer critical to the workforce, unlike cases that were noted by Burawoy (1979) and Hodson (1995) under

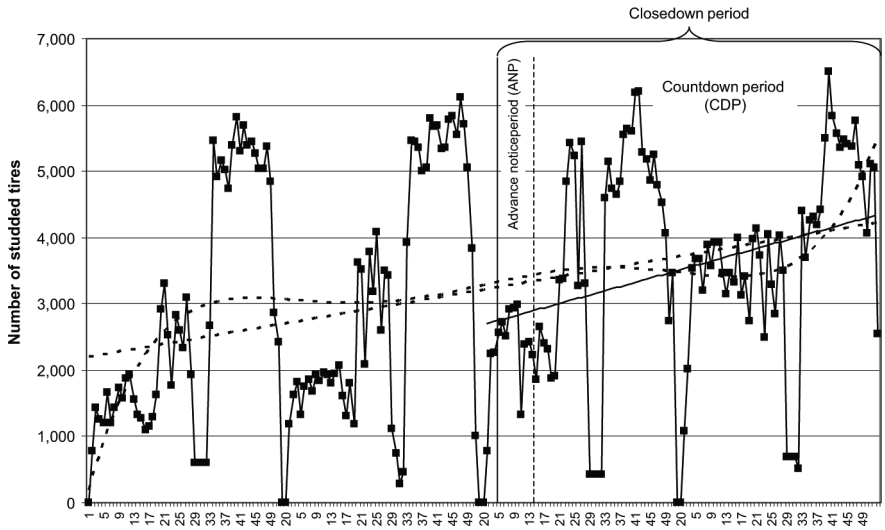

Figure 3.
Productivity development, Gislaved Studding

permanent operations. All of the mentioned changes together facilitated more productive work, i.e. new types of rationalisations, change of work methods and increased discipline. Enhanced efforts even generated radical or incremental new types of improvements which were noted in two out of the three cases. The Fundia and Gusab cases showed the highest productivity increase as well as radical and incremental new types improvements (see Table III).

It is not "responsible autonomy" (cf. Freedman, 1977) or similar concepts connected to permanent operations that we observe in the closedown context. For all the reported cases it was evident that management's interest in the labour process faded, generating a situation with increased real operative space for the workforce, i.e. shifting the frontiers of control. The responsible part of the "responsible autonomy" concept was altered with an absent management, which for the first time ever, raised no demands for increased performance. We propose the new concept "unrestricted autonomy" for this phenomenon that allowed far greater flexibility in the labour process. Our findings support some earlier research (Bergman and Wigblad, 1999) which indicates that managers "retreat" from the shop-floor, provides some kind of greater control to the workforce. Sometimes this is necessitated as workers leave and are not replaced during the closedown period. Our findings from three cases support that whilst this may result in a degree of work intensification, it also provides opportunities for the development of workers' initiatives, extension of job-sharing arrangements, improved informal leadership and self-organising work groups, while planning is deployed to the lower levels in the hierarchy. These variables together created a new pattern in the labour process. Significantly, less formalised work patterns commonly emerged, which often leads to the release of the inefficiencies of the bureaucracy – an empirical result also supported (cf. Hansson, 2008a; Hansson and Wigblad, 2006b; Wigblad *et al.*, 2007).

Our findings support the arguments of Bergman and Wigblad (1999) that within closedown plants innovative skills acquired through individual and collective experiences at work can flourish. These skills can find operative space within the worksite allowing for an increase in scope for worker autonomy. The reason for this is rather straightforward. To a large extent the managers and supervisors lose interest in

			Outcomes		
Case	Type of production	Type of new rationalisation	Type of new improvement	Classification and lengths of ANP[a] and CDP[b]	Comparative value of the closedown effect
Fundia Steel Wire Rod	Process	Rationalisation of work methods	Radical	Middle range: ANP = 3 months, CDP = 4 months	2,864
Gusab Stainless	Process	Increased discipline	Incremental	Long term: ANP = 2 months, CDP = 16 months	3,612
Gislaved Studding	Mass	Enhanced efforts	None	Long term: ANP = 2 months, CDP = 16 months	1,515

Notes: [a]Advance notice period (ANP); [b]countdown period (CDP)

Table III.
Case specific outcomes

maintaining the established frontiers of control as the organisation now maintains a very limited lifespan. Plans for operations, including major investments, no longer head the management agenda, as management's control over daily operations diminishes and productivity actually increases, due to human driven rationalisations and improvements.

There are a number of important similarities between the reported cases. First, no capital investments were made during the closedown periods. Second, there were no future plans for the use of the plants, in essence, terminating all operations at the local site with, in all cases, production relocated to other sites. Third, all reported cases show a statistically significant closedown effect. However, notably, important differences existed between the three cases. The duration of the closedown periods were not the same, however, each was still sufficiently long to warrant investigation. Most importantly though, different managerial approaches to social responsibility were evident particularly in terms of the employment support programs offered throughout and beyond the closedown; Gusab provided an extensive redundancy program whereas the Fundia case included a redundancy program similar to the Gusab program but without any production bonuses. The Gislaved case only included severance payments and job search aid.

A fine-tuned comparative analysis of the three closedown cases with statistically significant closedown effects reveals that the Gusab case shows the highest comparative value (3,612), followed by the Fundia case (2,864) based on the 44 tonnes/hour assortment. The Gislaved case shows a relatively lower comparative value (1,515) (see Table II). In analysing the case-specific differences (see Table III) we note that the closedown periods are different among the cases as well as the production character. Both Fundia and Gusab were characterised by process production, whereas Gislaved had mass-production. Notably, the Fundia production was one continuous rolling mill process whereas the Gusab production consisted of multiple processes.

The Fundia case had a comparably shorter closedown period than the other two cases. However, unlike the other two cases, there was a scope for the workers to conduct radical improvements, i.e. decreasing the change-over-time between batches, indicating that the rationalisation of work methods came into practice during the closedown period. In the Gusab case on the one hand, workers were keen on increasing the up-time on the production equipment as well as conducting incremental improvements. Both radical and incremental improvements were possible due to increased unrestricted autonomy. On the other hand due to the mass production character, the scope for improvements in the Gislaved case, did not allow for more than enhanced efforts.

Besides the case specific characteristics there are some common denominators for all cases. When management had finalised the negotiations over the conditions for the closedown process, shifting frontiers of control were established in all cases. More informal leadership evolved, empowering the workers. These informal changes, especially following the supervisors' changed roles, had positive impacts on industrial relations generally as well as labour productivity and workplace performance more specifically. These shifting frontiers of control are, however, not established momentarily; on the contrary – it takes some time of transition for the new control system to evolve.

The workers' collective has no counterpart during the countdown period, since the game that took place under more permanent conditions is over. The longer the closedown period, the stronger becomes the impact of the new control system, which in turn affects productivity positively. When the frontiers of control are changing, more

relaxed attitudes are spread around on the shop floor. As Burawoy (1979) might suggest, the workers are gaining a greater opportunity to determine the rules of the game in which they are involved – an opportunity that they would not otherwise have experienced. Furthermore, when the workers' collective eventually loosens the grip over restricted work practices, workers adopt new ways of working.

Conclusions

The purpose of this article was to explore and analyse how shifting frontiers of control emerge and changes the labour process so that restrictions to output become diminished, subsequently affecting organisational performance. Our analysis pointed out that in the closedown context there are no capital investments or future plans for the closedown plants, which makes the productivity increase related to human driven subjective processes. Both Burawoy (1979) and Hodson (1995) address this subjectivity in a permanent operations context, which is different from ours. These authors observed restricted work practices in the game, between management and the workers that is going on in a plant. Primarily, these games are organised around constantly negotiating and re-negotiating the wage/effort bargain. These games seem to be a generalisable pattern in permanent operations. However, we argue that the frontier of control shifts when a closedown context appears. The workplace has reached "the end of the game" and shifting frontiers of control are slowly replacing the old control system. Management no longer demands increased performance and the game of "making out" does not apply any more. When opportunities arise for employees to have a greater level of control over the labour process, they are able to engage in determining the "rules" of the new game which eventually evolve into, what we label as, unrestricted autonomy.

We found, in our three cases, empirical evidence supporting that shifting frontiers of control slowly becomes established during comparably long closedown processes. In a closedown situation where management control is replaced by more unrestricted autonomy, we identify several interrelated commonalities among the cases: workers' initiatives, improved informal leadership, self-organising work groups, deployed planning to lower levels of hierarchy, positive informal work practices, higher levels of involvements in decision making, managements no longer had demands for increased performance and that there were no future plans for investments or improvements. Based on the new conditions, workers become empowered and take new initiatives, in terms of rationalisations and improvements.

Evidently, productivity increased when management control over daily operations diminished. Our analysis of the productivity development in all three empirical cases shows a statistically significant productivity increase effect during the closedown process. From the empirical evidence it is possible to conclude that the Gusab case shows the strongest comparative value of the closedown effect, whereas the Gislaved case shows the weakest. Our analysis indicates that the reasons for the comparably good performance at Gusab are both a relatively long closedown period.

The scope for improvements is dependent of the production character. All three cases show different kinds of self- rationalisations, covering a range from a rather narrow to a broad scope and indicating that a broader scope provides better opportunities for increase in productivity. We argue that when group pressure towards restricted work practices disappears, different types of self-rationalisations are set free,

depending on the production character. Our empirical evidence indicates that a process production system tends to provide a broader scope for rationalisations.

As pointed out in the analysis, increased unrestricted autonomy and lack of group pressure towards restricted work practices provides operative space for practicing workers' initiatives. In all three cases such initiatives have been identified. It is our proposition that depending of the length of the closedown period and type of worker initiative, the impact on productivity increase differs. Our empirical evidence indicates that when workers and work groups have scope for either radical or incremental improvements, it is possible to anticipate a relatively strong productivity increase. Similar to this, when considering the length of the closedown processes, a long closedown period enables the new control system to become more established, which has a positive impact on the productivity development. We argue that it is of importance to consider both the length of the closedown period as well as the scope for improvements as the productivity increase effect is based on the unrestricted autonomy which depends of both the length and the scope.

The results from this study apply to temporary organisations, specifically closedown contexts. It is an interesting question for future research to compare this kind of autonomy with self-managed organisations in permanent organisations: Is unrestricted autonomy, as identified in this study, connected to the absence of management control systems, and are these conditions possible to reproduce in more permanent operations?

One managerial implication indicated by our results is that we can anticipate improved productivity if the new frontiers of control are rapidly replacing the old. If management abandons the old control mechanisms, previous to the closedown decision, and provides operative space for workers' initiatives and informal leadership during the closedown process, it is possible to expect good performance. Good performance is important for various reasons. It enables a scope for extended closedown periods, simplifying transition of production equipment to other facilities and provides better opportunities for the market in transition, maintaining or increasing levels of product quality and provides time and space for workers to find new jobs.

This article has argued that following a closedown decision, new frontiers of control comes into practice, which, in turn alters the approach of the workforce and how they take on their tasks. Increased levels of productivity are clear outcomes. However, one question can be raised: for how long would this increase in output be sustainable? With limited but growing case study evidence in existence, future research is required to understand and generalise the extent of the closedown effect.

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About the authors

Rune Wigblad is Associate Professor in Engineering Management and is currently working at Dalarna University College, Sweden. Associate Professor Wigblad is also working as supervisor for doctoral students and has given several doctoral courses in scientific methodology, pragmatism, restructuring etc. His main research interest is in restructuring – early development of a restructuring model that also has been implemented in practice. The model concerns the re-build-up of new industry structure when factories close down operations. During that research he discovered the closedown effect, the productivity increase that occurs during the process of organisational closedown. Rune Wigblad is the corresponding author and can be contacted at: rwi@du.se

Magnus Hansson is PhD and Assistant Professor at Swedish Business School at Örebro University in Sweden. He is a member of Centre of Empirical Research on Organisational Control (CEROC). His primary research has been on plant closures, downsizing and corporate restructuring and in particular focusing on productivity effects during the process of closedown. Dr Hansson's most recent work has focused on both workers' psychological reactions as well as institutional change during the process of plant closure. He is also working as a Lecturer in Strategy, Marketing, Organisational Theory and Research Methodology.

Keith Townsend is a Senior Research Fellow in the Centre for Research on Work, Organisation and Wellbeing at Griffith University. He also holds a substantive post as a Senior Lecturer in the Department of Employment Relations and Human Resources at Griffith University. His research interests include work-life balance, employee misbehaviour and resistance and high performance work systems.

John Lewer is a member of the Organisational Studies and Employment Relations group in the Faculty of Business and Law at the University of Newcastle, Australia. His doctoral thesis investigated the remarkable performance by the workforce at a steelworks in Newcastle during the wind down period to the plant's closure. Apart from researching in the field of plant closure, his recent publications have considered the impact of socially responsible investment on human resource management and a critique of the institutional arrangement which determines the remuneration of parliamentarians, judicial officers and senior public servants in Australia.