

PRODUCTIVITY OUTCOMES OF TEAMWORK AS AN EFFECT OF TEAM STRUCTURE

Anne Delarue,
Stijn Gryp,
Geert Van Hoote gem
Katholieke Universiteit Leuven



Work in progress.

All comments are welcome. Please do not quote or cite without the permission of the author.

ABSTRACT

Research suggests that teamwork is ‘an integral tool aiding continuous improvement in work operations’ (Banker, Field, *et al.*, 1996). However, the empirical evidence regarding team effectiveness is limited and often has the form of anecdotes or descriptive case studies; stories of huge cost savings and quality improvements abound (Gupta & Ash, 1994; Neck *et al.*, 1999; Katzenbach & Smith, 1993, Cohen & Ledford, 1994; Benders *et al.*, 1999; Glassop, 2002). The purpose of this article is to determine the impact of structural features of working teams on performance, and more specific on productivity. First, an effort is made to develop a team typology which elaborates further the ‘lean/sociotechnical’ dichotomy that is often used in literature. Second, the impact of different team types in organizations on productivity is analysed for Flemish firms utilizing a large cross-sectional sample of Flemish work organizations. Our results suggest that there is no statistically significant association between the implementation of teamwork and organizational productivity. Also team structure seems to have no significant effect on productivity, when we control for some important workplace characteristics.

Keywords Teamwork, team structure, team typology, team effectiveness, performance, productivity

1. TOWARDS A DIFFERENTIATING TEAM TYPOLOGY

In today's world of work, fundamental transformations in working structures are taking place. Organizations face complex and dynamic environments that have been attributed to increases in the globalisation and competitiveness of the global economy (Scott & Tiessen, 1999). To meet the permanently changing needs of the consumers, they are challenged to deliver new and high standard products and services in a quick and flexible way. The 'old' tayloristic structure, that proved to be effective in the past, is not longer appropriate in the current dynamic and complex context. A lot of organizations and companies are searching for new work forms and organizational concepts to comply with the demands of their internal and external environment. In this context, the team concept is an omnipresent tool in the management literature. Management fashions such as business process reengineering, lean production, the modern socio-technical approach and human resources management, all embrace the core principles of team based work (Benders & Van Hootegem, 1999; De Sitter *et al.*, 1997; Kuipers & Van Amelsvoort, 1990; Kleinschmidt & Pekruhl, 1995; Womack *et al.*, 1991). This paper examines the effect of team structure on the organizational productivity. A necessary first step is to define the team structure concept. This will be dealt with in the first part of the paper.

The idea of 'self-managing teams' has been worked out in various ways and diffused under a range of different labels. The answer to the existential question 'what teams really are' depends on the context of a particular case. However, as long as the actions are undertaken under the banner of 'teamwork', they seem to be a favourite formula for organizational redesign and are expected to be a solution for the disfunctions of a strong division of labour within organizations.

As a response to the ongoing process of reinterpretation of terms by practitioners, the academic world has undertaken efforts to clarify this semantic confusion. 'Teams or no teams' is not longer the question: an extensive discussion about definitions and the constitutional elements and adequate labels of a team typology is taking place. On the basis of some crucial features of work groups, academics have tried to develop well-delineated categories.

The distinction between ‘semi-autonomous/sociotechnical/Swedish or Scandinavian’ teams on the one hand and ‘lean/Japanese/Toyotist’ teams on the other hand, is often made in literature (Berggren, 1993; Procter & Mueller, 2000; Neumann, Holti & Standing, 1995; Benders *et al.*, 1999). Leanproduction is a more or less coherent set of practices which stems from the Japanese automobile industry. The emphasis is very much on the advantages of running production with the lowest possible level of inventories – on a ‘just-in-time’ or JIT basis, with a zero defect and a limited vertical integration. Further it is claimed that ‘the dynamic work team emerges as the heart of the lean factory’ (Womack *et al.*, 1990). In lean teams work can be standardized and requires few if any formal skills which makes on-the-job training feasible. The composition of teams can be homogenous as different jobs do not require extensive formal training and employees can be exchanged relatively easily (Benders & Van Hootegem, 1999). At the other pole, one can find a decentralized, task-integrated work organization which is connected to sociotechnical principles such as autonomous groups in order to depart fundamentally from previous Taylorist structures (Schumann, 1998). Such an organizational redesign is the indispensable condition to realise an assignment of tasks and responsibilities to the executive level. Benders & Van Hootegem (1999) give the following working definition of a sociotechnical team: “a group of workers, generally between 4 and 20 persons, responsible for a rounded-off part of the production process and entitled to take certain decisions autonomously”. Consequently, these teams have rather flat hierarchies, frequently having no formal leaders or emergent or elected leadership from within the team. Roles and responsibilities tend to be flexible and often are decided by team members to suit task and individual needs.

In this article, we choose to take the polar distinction ‘sociotechnical versus lean teams’ only as a starting point. After all, to get a complete picture of teamwork in the real economy, one must take into consideration that such strict academic classification, tends to get lost in the field of practicioning (Benders *et al.*, 1999). In theory, the completion of the team concept concerning the achievements of tasks, the responsibilities and authorities of the team members is rather divergent in the two categories. In practice however, these differences might be less significant and mixed forms are present.

From the above, it might be clear that there doesn’t exist a one-on-one relation between what is called a ‘team’ and the effective organizational work form that is meant by it. The semantic notion covers different ontological realities. One possible approach with regard to this

confusion, is to avoid the use of the term 'teamworking', as suggest Benders & Van Hootegeem (1999). They offer an analytical framework to improve the theoretical understanding of how relevant contextual factors impact on the design of jobs and organizations. But notwithstanding the fact that teams are considered to be a social construction which must be made explicit according to the time and the specific setting, the structural features of the work units can have operational effects. In several studies it is hypothesized that variation in team performance can be explained by differences in team structure (Cohen & Bailey, 1997; Hackman, 1987; Manz, 1992; Wageman, 1995; Murray & Stewart, 2000). The aim of this study is to determine how team structure relates to performance, and more specific to productivity. In order to do this, we will develop an analytical framework of team types on the basis of some crucial structural features.

A necessary first step is to select from literature the most essential characteristics of teams on which an adequate structural typology can be based. Organizational theorists have defined structure as the configuration of relationships with respect to the allocation of tasks, responsibilities and authority (Stewart & Barrick, 2000) and also the extent of recurrency plays an important role (Van Eijnatten & Van Beinum, 1993). Translated to the team context, team structure can be defined as the way tasks, responsibilities and authority are allocated within an organization to the teams and within the teams to the team members. The idealtypical definition of a sociotechnical team, as stated above, gives an indication of the importance of autonomy and interdependency as a distinguishing criterion. The underlying idea is that by enhancing the employee discretion or autonomy at work, team-based work facilitates improved work processes and improved orientations at work, from which flows improved organizational performance (Harley, 2001). In their extended review of the research on teams and groups in organization settings between 1990 en 1996, Cohen and Bailey (1997) list several recent studies which indicated that team autonomy had clear benefits on performance (Cohen & Ledford, 1994; Cohen et al., 1996; Weisman et al., 1995; Campion et al., 1993; Pearson, 1992). Tranfield & Smith (2002) examined in depth the form teamworking had taken in a number of manufacturing companies, enabling comparison of teamworking organizations across the study to ascertain their similarities and differences. They also state that the essential difference between lean and self-directed teamworking lies in the degree of discretion over work allocation, and therefore the scope for team autonomy and self-management. According to Doorewaard, Huys and Van Hootegeem (2002) ultimately, the performance in team-based working also largely depends on the employees' authorities

and the function design; i.e. to which extent the planning, performing and controlling responsibilities are integrated in the team tasks. They focus on two relevant features found in what they call the team responsibility structure: the variety of the job regulation tasks and the nature of the division of responsibilities.

This short overview does not pretend to be exhaustive, but forms the starting point for our own conceptual approach. The degree of autonomy of the team members will be the distinguishing aspect for constructing the team typology. Three variables are crucial in that: the division of labour within the organization, i.e. to which extent preparing, supporting and regulating tasks are integrated in the team responsibilities and the division of labour within the team, i.e. the division of job regulation, preparing and supporting tasks between team leader, separate indirect functions within the team or the team members. Further, the role of the team leader is analysed. As a process, leadership consists of a set of decisions concerning the coordination and regulation of the work process. This decision making process can be organized in many different ways (Bryman, 1996). In teams with autocratic leadership, the responsibility for decisions is located within a formal position of 'team-leader' who exercises hierarchic supervision over the activities of the team members. Team self-leadership on the other hand doesn't imply necessarily the absence of a leader. A self-leading team can have a leader who is a working member of the team itself and who encourages the team to lead itself (Manz & Sims, 1987).

A questionnaire was developed which should made it possible to classify teams on a team autonomy continuum going from a group of workers, which may be called a team but where is no job enrichment because preparing, supporting and regulating tasks are not delegated to the executive level of the teams, but stay concentrated at the management level and where the team leader seeks to impose hierarchical control, to a self-leading team where the team members have a large range of responsibilities and where the team leader facilitates the team's self-managing capacity. The questioning instrument was set up with a cascade structure. The consecutive questions were putted to a representative sample of Flemish firms with ten or more employees, as part of a larger organizational survey (for more detailed information see under 'method'). We got data on the work organization of 743 private profit firms. Because we only have performance data on organizational level at our disposal, we will use the data for the group of firms where 'site' and 'organization' coincide (N=336). First the

respondents were asked if teamwork is implemented in the organization. ‘Teams’ were defined here as follows:

‘Groups of employees which have at least some collective tasks and where the team members are authorized to regulate mutually the execution of these collective tasks.’

The striving for discerning ‘real’ teams from so-called ‘false’ teams is let rest by the adjustment of this minimum definition. Every work form that complies with these basic requirements may be called ‘teamwork’, but further questions on structural features must enable to discern different team types within the group of organizations where teamwork is generally applied.

A series of management principles were proposed to the respondents and they were asked to indicate to which extent these were implemented in their organization. Table 1 presents the results for teamwork:

Table 1 The occurrence of teamwork in Flemish organizations

Teamwork	%
Not applied	21,3
Applied as a pilot project	0,3
Applied for a restricted group of employees	23,6
Generally applied	54,9

weighted by sector and size (N=205, missing 131)

Remarkable is the large portion of respondents saying that teamwork is a generally applied principle in their organization. For this large group (N=113), we have to find out the structural features of the teams.

To get insight in the division of labour within the organization, it is important to know whether the teams are responsible for a complete production-cycle, which implies that preparing, supporting and executing activities are integrated in the task set of the teams. The respondents were asked if the teams provide in their own work preparation and work support.

Table 2 Division of labour within the organization

	%
The teams are responsible for the preparing and supporting activities of their own work	73,1
The preparing and supporting activities are executed outside the teams	26,9

Only for the organizations where teamwork is generally applied, weighted by sector and size (N=106, missing 7)

Subsequently, the organizations with teams with these extended authorities (N=77) got a question on the division of labour within the teams: are the preparation and support responsibilities of the team done by a team leader, other specialized indirect functions within the team or by the team members themselves?

Table 3 Division of labour within the team

	%
Team leader	50,2
Specialized indirect functions within the teams	16,7
Team members	33,1

Only for the organizations where teamwork is generally applied and where the teams are responsible for the preparing and supporting tasks, weighted by sector and size (N=74, missing 3)

Finally, the sort of leadership was mapped. The respondents were asked whether the teams in their organization had a formal position of 'team leader'. If so, the question followed if the team leadership rotates over several team members or is a fixed position within the group and whether the team leader is a working member of the team or an organization member who only occupies with the preparing, supporting and regulating tasks of the team.

Table 4 Team leader profile

	%
Fixed leadership, team leader is not a working member	10,9
Fixed leadership, team leader is a working member	78,7
Rotating leadership, team leader is not a working member	0,4
Rotating leadership, team leader is a working member	10,0

Only for the organizations where teamwork is generally applied and where the teams have a formal team leader, weighted by sector and size (N=76)

To construct the typology, the discussed team structure variables were used as the input for a cluster analysis. The cluster solution suggests four clusters which come up to our theoretical model of a continuum of team autonomy. After adding the group of organizations without teamwork as a generally applied management practice, we end up with 5 team types, depending on the structural characteristics. Only the organizations with no missing data for the different structural characteristics were preserved (N = 206).

Table 5 Team typology

Team type	Team structure	%
0	No teams	46,4
1	Lean, directed	3,9
2	Lean, semi-autonomous	35,9
3	Sociotechnical, semi-autonomous	12,1
4	Sociotechnical, self-directed	1,7

weighted by sector and size (N=206)

The table indicates that, although the majority of the Flemish firms indicate that they implemented teams, virtually no organizations have teams with all the characteristics of a self-directing work group. The largest category of firms with teams comprises organizations with teams who have restricted responsibilities (no job enrichment) but with participatory leadership. Further in the article, this scale of team types will be used as the independent variable to declare differences in outcomes.

2. THE ORGANIZATIONAL BENEFITS OF TEAMWORK

Several organizational benefits have been proposed in the literature on teams. A wide range of performance indicators are investigated. The effects can be categorised in three groups of outcomes. First, there are the indicators of operational performance, i.e. the performance outcomes with regard to the work process itself: workplace productivity (Benders *et al.*, 1999; Glassop, 2002; Wageman, 1995; Eden, 1990; Doorewaard *et al.*, 2002; Dunphy and Bryant, 1996), product or service quality (Benders *et al.*, 1999; Glassop, 2002; Doorewaard *et al.*, 2002, Hackman, 1991; Deming, 1986), adjustment time, through-put time and delivery time

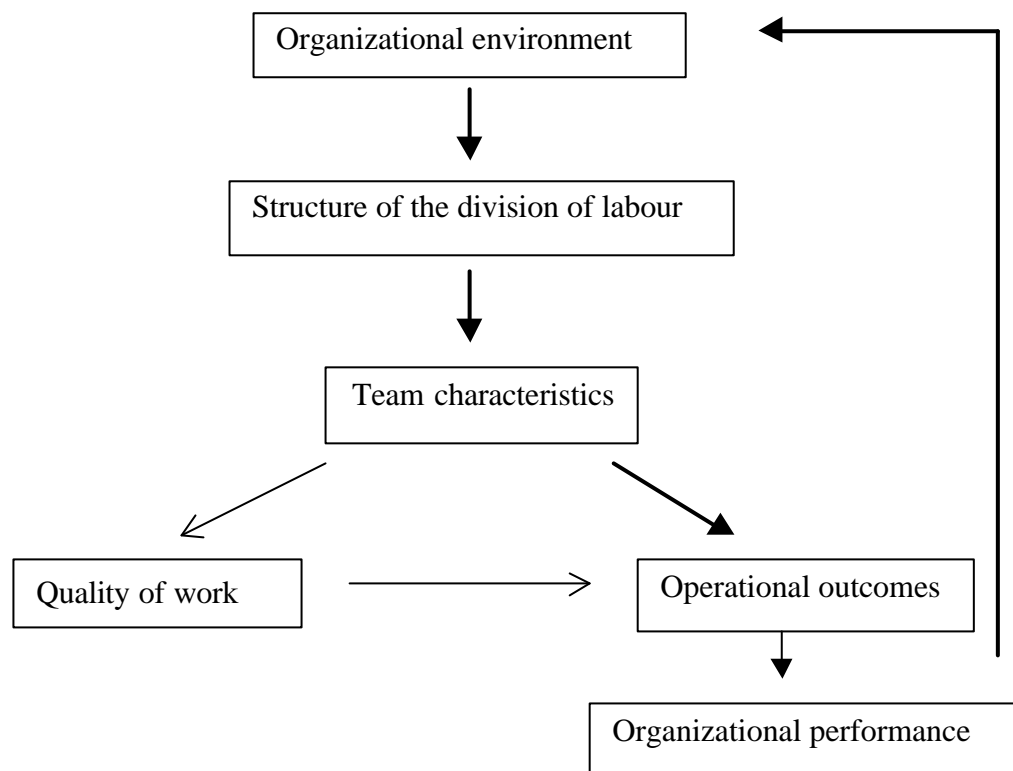
(Benders *et al.*, 1999; Doorewaard *et al.*, 2002; Hackman, 1991), work process transparency (Doorewaard *et al.*, 2002), customer satisfaction and innovation (Cohen & Bailey, 1997). A second group are the indicators of indirect labour costs or the so-called HRM outcomes which may contribute to the required performance outcomes of the organizations. Examples are the levels of absenteeism and sickness or employee turnover (Benders *et al.*, 1999; Glassop, 2002; Doorewaard *et al.*, 2002). Finally, some studies are concerned with employee outcomes such as work satisfaction, commitment or intent to leave (Glassop, 2002; Hackman, 1991; Cohen *et al.*, 1996; Cohen & Bailey, 1997). Scott and Tiessen (1999) capture the diversity of performance measures by grouping them into financial performance (cost, revenue, or return) and five categories of non-financial performance (productivity, quality, service, innovation and personnel).

For conducting an analysis of the influence of team structure on organizational performance, we concentrate on one outcome variable, namely productivity. Accordingly, we can find the choice of this performance measure theoretically. By the creation of self-containing units, the organization tries to deal with the external complexity by reducing the internal control and coordination needs. An essential condition for this approach is that the work process itself is fundamentally tackled by changing fragmented direct tasks in meaningful larger tasks and by re-integrating 'thinking and doing' or 'indirect' and 'direct' tasks (De Sitter *et al.*, 1997). Because of the task integration the employees have increased autonomy and job control and are able to make greater use of their skills and problem-solving capabilities. One can speak of task enrichment and an enlarged ability to regulate and interfere by utilization of control capacity. In this way work systems are structured so that they can meet environmental demands while remaining relatively resilient to external disruptions. Given the same level of inputs, if errors and problems can be eliminated and work continues undeterred then the resultant output would be expected to be above that of a work system that had not been designed to attend these issues; hence the notion that teamwork improves productivity (Glassop, 2002). Productivity is generally measured in terms of output per unit of composite input (capital and labour). Labour utilization is a frequently used value in this regard.

The preceding can be translated into a conceptual model. In this article, the focus lies on the impact of specific structures team types on the performance of the organization, measured by the labour productivity. The work organization may also affect the quality of labour for the employees, which in turn can have an impact on the operational outcomes (e.g. absenteeism,

employee turnover). The organizational performance generates effects on the environment in which organizations operate (e.g. customer expectations, relationships with competitors or suppliers).

Figure 1. Conceptual model



A positive relation between teamwork and productivity was established several times in previous research. Banker *et al.* (1996) report the results of a longitudinal field study in an electromechanical assembly plant, examining the impact of work teams on manufacturing performance. Their regression results showed a significant improvement in labour productivity in the months following the formation of high performance work teams. Another recent study analysed the benefits of team structures for Australian work organizations utilizing the Australian Workplace Industrial Relations Survey for 1995 (Glassop, 2002). The results indicated that firms with team structures have higher labour productivity, a flatter management structure and reduced employee turnover. Another study worth mentioning is a controlled field experiment that was carried out in two sorting centers of the Dutch Post

(Brinkmann *et al.*, 1995). The implementing of team-based work proved there to have a positive influence on the productivity, the quality of work and the experience of work.

Research also suggested that variation in productivity can be explained by differences in team structure. The findings of the EPOC-Survey (Benders *et al.*, 1999) showed that workplaces without any form of group delegation have the lowest scores on productivity measures. As the intensity of group delegation (which can be seen as an indicator of group autonomy) increases, the productivity rates are higher. To determine the impact of team responsibility on team performance, Doorewaard *et al.* (2002) analysed 36 case studies in The Netherlands. The 'shared-responsibility teams' seemed to contribute more to the team productivity than the 'hierarchical teams' and they concluded that the impact of team-based work depends on the extent to which responsibility tasks form a substantial part of the overall structure of the team and the team members. In their review of the research on teams between 1990 and 1996, Cohen & Bailey (1997) mention some studies that found autonomy positively related to productivity: Campion *et al.* (1993) did a study of 80 financial services clerical groups and they found that more autonomy correlates with a higher productivity and in a longitudinal study of autonomous and traditionally managed groups that build and maintain locomotives, Pearson (1992) found autonomy to be positively related to productivity, noting that the autonomous groups made more efficient use of their manpower, eliminated unnecessary work, and acquired more relevant work knowledge. Finally, Wageman (1995) studied interdependence in a quasi-experiment involving 150 Xerox equipment maintenance technician groups. Groups with moderate levels of interdependence were found to perform worse than groups with either highly interdependent or highly independent designs.

Basing ourselves on these results, there is the strong expectation that we will also establish a positive relationship between team-based work and organizational performance, using a large sample of Flemish work organizations. Keeping in mind that organizations today are all operating in complex and flexible environments, we can at this stage formulate very rigorously our general hypotheses that follow from literature:

Hypothesis 1: The implementation of teamwork will be positively related to labour productivity.

Hypothesis 2: Organizations with teams with a large extent of employee discretion or autonomy will record higher values of labour productivity than organizations with other team structures.

3. METHOD

3.1 Survey Sample

The hypotheses will be tested with data collected as part of the larger Panel Survey of Organizations Flanders (PASO). The PASO- project has the intention to question annually the same representative sample of Flemish organizations about their product, technology and organization policy. In 2002, the sample of this economy wide investigation consisted of 12.315 Flemish ‘sites’(2) with minimum one employee, profit as well as non profit and both private and public. To each site a questionnaire was sent, which among other things included items concerning their work forms. For the largest part of the cases, the questionnaire was conducted via a web-based survey, only the smallest sites got a written version. The response rate of 19% is rather low, but comparable with some other organization surveys (3). For this study, we focus on the private-profit organizations with at least 10 employees where ‘site’ and ‘organization’ coincide, which results in a group of 336 organizations.

This study is rather exceptional, in that the analysis is based on large-scale quantitative data drawn from a representative sample of Flemish firms. The empirical evidence regarding the influence of teamwork on organizational performance is limited. Most existing research on the effectiveness of teams uses case studies and anecdotes or surveys in single establishments or industries (Harley, 2001). Because analyses of large-scale statistically reliable data is lacking, it isn't possible to make generalisations across industry as a whole. By using the large quantitative data set resulting from the PASO survey, our study wants to make a unique contribution to the team effectiveness debate. The assumption is that if the implementation of teams is actually positively related with organizational productivity, it must be possible to establish this effect with quantitative data methods.

3.2 Measures

Team organization

The first research question is whether organizations with teamwork report higher performance levels than firms without teams. The questionnaire contained some management practices regarding employee participation (job rotation, suggestion systems, quality circles, teamwork and work consultation) and the respondents were asked to indicate for each principle if it is not applied, applied as a pilot project, applied only for a limited number of employees or generally applied in their organization. Using the teamwork item, we constructed a dichotomous dummy variable in which only the firms with teamwork as a general applied principle were allocated a value of 1 and all the others were coded as 0 (those who left the question unanswered were coded as missing). This variable has a distribution of 97 non-team organizations and 108 team organizations.

Team type

To determine the impact of team structure on organizational outcome, we constructed a team typology as explained in a previous chapter. On account of some crucial structural features of the teams (range of team responsibilities, division of labour within the teams and sort of leadership), the organizations were clustered into 4 groups with an ascending extent of autonomy for the executive employees (values 1-4). Firms without teams can also be considered as a specific type and were coded again as 0. For the distribution of the team type variable, see table 5.

Organizational performance

Above was stated that organizational performance in this study will be indicated by labour productivity. In Belgium all firms are obliged to put down their annual accounts to the Belgian National Bank. This results in an extended economy-wide population data set with financial and socio-economic information of all Belgian companies. A particular strength of this research is that we could link these financial data with our own data set which resulted from the PASO survey, by the unique registration number of each firm. For every

organization in our data set we can look up the value added per employee in 2001. However, we must take into account that the value added per employee will be different for labour intensive versus capital intensive industries. Because of the strong correlation with sector and size of the firm, we will compute the mean value added per employee in 2001 in the population for each sector and size group. The labour productivity of each organization in our data set can then be divided by the mean labour productivity of the corresponding sector-size group in the population. This resulting value will be used as the outcome variable in the further analyses.

3.3 Analysis

Because the independent variables are nominal or categorical (teams or no teams and team type), analysis of variance (ANOVA) is the appropriate technique to test the two hypotheses. For the first analysis, ANOVA reduces to a simple t-test because there is only one nonmetric independent variable, measured by a dummy variable (no teams = 0; teams = 1). Team type is an independent variable with more than two classifications, thus we will execute a one-way ANOVA, comparing firms with lean directed teams, lean semi-autonomous teams, sociotechnical semi-autonomous teams and sociotechnical self-directed teams. We work with an unbalanced design (that is, data with unequal numbers of observations for every classification factor), consequently we will use the GLM procedure, available in the SAS/STAT software for analysis of variance. The level of significance will be set at 5 percent.

4. THE IMPACT OF TEAMWORK ON ORGANIZATIONAL PERFORMANCE

Contrary to all expectations, the data provide no evidence for the positive influence of teamwork on organizational performance. The results presented in Table 6 indicate that there is no significant difference between team organizations and non-team organizations in terms of their labour productivity. This is a surprising finding. It runs counter to the mainstream literature which depicts teamwork as the success formula for a well-performing organization.

Table 6 Means test results for the first hypothesis

	PRODUCTIVITY	Mean	N
No teams		99,9	79
Teams		98,9	78
T-value 0.13 p-value 0.8934			

weighted by sector and size, N=157

In the second analysis we have tested if in companies which have implemented teams, the team type, and thus the extent of autonomy and interdependence, has an impact on organizational productivity. Initially, there seems to be a statistically significant association between team type and performance. Firms that have sociotechnical self-directed teams tend to report higher levels of labour productivity than those firms that have another team structure.

Table 7 One way ANOVA results for the second hypothesis

	PRODUCTIVITY	Mean	N
Lean, directed		81,2	9
Lean, semi-autonomous		99,2	46
Sociotechnical, semi-autonomous		90,9	15
Sociotechnical, self-directed		178,9	4
F-value 3.61 p-value 0.0174* R ² = 0.13			

weighted by sector and size, N=74

However, the organizational context in which the teams operate is likely to intervene in the association between team-based work and organizational performance (Harley, 2001). This justifies the inclusion of a number of variables which capture the most important workplace characteristics. The main activity, size, the age of the organization, the sort of products/services (standard versus customer specific) and the strategy were explored as control variables.

Table 8 One way ANOVA results controlled for main activity, size, age, sort of product/service and strategy

	F-value	p-value	R² = 0.43
General model	2,05	0,0240*	
Team type	1,96	0,1320	
Main activity	3,79	0,0056*	
Size	0,17	0,9161	
Age	1,20	0,3106	
Sort of products/services	0,14	0,8716	
Strategy	3,44	0,0237*	

weighted by sector and size, N=68

When these potentially intervening variables are controlled for, the significant effect of team type disappears. Team structure does not figure as a determinant of labour productivity. These results are very remarkable. With the PASO-dataset, we don't succeed in establishing the relation between teamwork and performance, which is constantly suggested in the management literature. The next section will provide a cumulative discussion of these findings.

5. DISCUSSION

This study has explored the links between teamwork and performance, using a large sample of Flemish firms. To cover the reality of teamwork, which is very widespread nowadays, first an attempt was made to unravel some structural features of the teams. A team typology was constructed with the extent of autonomy and interdependence as the distinctive criterion. Notwithstanding the fact that the bulk of respondents indicated that teamwork is common practice in their organization, only in a small minority of firms the teams reach the sociotechnical ideal of completely self-directed work groups. This may be interpreted as the team concept becoming an 'empty box': the management is eager to employ the term, but in several cases, there is little behind it. To use the simple fact whether teamwork is implemented in an organization or not, as the explaining variable in an effect analysis – an so lumping together a lot of different work forms - may thus be problematic. We will make here a strong plea for the use of an adequate team typology.

Two hypotheses, founded in the literature, were tested with data collected as part of an economy-wide survey of organizations in Flanders. First, we expected that teamwork would enhance the efficiency of an organization and therefore the labour productivity would increase. However, this is a rather undifferentiated approach, like we just argued. Second there was the assumption that team types with more autonomy for the team members would have a stronger positive impact on the labour productivity. The results cannot confirm the hypotheses. We are unable to determine the positive effect of teamwork on organizational productivity with the PASO-data. Keeping in mind that other studies, albeit using different kinds of research methods, have found connections between teamwork and performance, we have to think for explanations for the lack of associations in our analysis.

One possibility is that limitations inherent in the data and the analytical strategy, impede the finding of the theorised and expected associations. The current knowledge of the influence of teamwork on organizational performance, is largely based on the results of case studies, anecdotes or small-scale surveys. The particular amenity of working with the PASO-data is that this large-quantitative data-set may allow us to make generalisations about the effects of teamwork, and to apply them to the whole of the Flemish firms. However, this option implies the general limitations of the survey methodology and more specific some limitations inherent in the measures that are used.

A first obstacle is the superficiality peculiar to large-scale surveys. In a certain sense, breadth primes on depth. An explicit effort was undertaken to get a complete picture of teamwork in the organizations, but this survey doesn't address whether different sorts of teams are working within one organization, for example teams that were implemented on different moments in time. The respondents were only asked to describe the structural features of the teams in general.

As an indicator of organizational performance, we only used labour productivity (value added per employee in 2001). This uncovers an important restriction of our study. The use of other financial indicators of performance will show perhaps a complete different picture. Further, the quality of this company information can be questioned. All Belgian firms are legally obliged to pass on their financial statement to the Belgian National Bank. Yet there is the problem that for 2001, the data collection isn't rounded off already. For a few companies there is still information missing. For the data which are available, we have to rely on the

accuracy of the firms. Because we expected a strong association between labour productivity and size and sector of the firm, we tried to construct a purged measure. Further research is necessary to substantiate the robustness and validity of this derived value.

Another problem might be that the analyses are based on models that are too simple to capture the complexity of teamwork and its outcomes. Maybe the benefits of teamwork don't come to light because a web of intermediate variables stays underexposed. Again additional research must be conducted to refine the conceptual model.

Despite the importance of the difficulties stated above, the PASO-data set is a large, economy-wide, and recent source of information on the organization of work in Flemish companies. It is rather unique that we were able to use financial data from a National Bank as secondary data source. Further, most other research doesn't provide a subtle or nuanced account of the sort of teamwork that is applied. The results of this study proved that managers use the term 'team' rather loosely and that only a very small part of the questioned companies work with self-directed teams, as recommended in literature. The questionnaire that we used, was explicitly constructed to get a clear insight in the structural features of the teams, which is an important strength.

If we make abstraction of the limitations of the data and analyses, some theoretical explanations for the missing associations between teamwork and productivity are also possible. As opposed to the positive accounts of teamwork, there are some critical studies that challenge the idea of teams as the 'magic potion' for organizational improvement. Although there are differences of emphasis between various critical accounts, the element which unites them is a concern with locating teamwork in the context of the dynamics of capitalist production and therefore considering the need for managerial control of the labour process to maximise labour input (Harley, 2001). In an article that examines the relationship between team working and employee involvement, Marchington (2000) describes this other side of the coin as follows: "While some analysts suggest teamworking provides increased autonomy and discretion for employees, others view it as nothing more than the imposition of self-supervision and peer surveillance – without the offer of extra rewards for taking on additional tasks. Whereas some commentators may welcome the opportunity for employees to undertake a wider range of tasks, others see this as flexibility delivered on management's terms, which not only intensifies work but also reduces the power and security of workers who have

traditionally had some control over the use of their skills.” Following this reasoning, if teamwork intensifies work, employees might be confronted with higher stress levels and experience this work form as rather unpleasant. Obviously, an elevation of the stress of the employees will not benefit the labour productivity of an organization.

This view finds support in some articles that question the benefits of teamwork and autonomy on the basis of empirical results. In an ethnographic account of norm creation and enforcement among groups in a small manufacturing company, Barker (1993) speaks of ‘concertive control’ by which group norms evolve into group rules that are strictly enforced. This peer- and self-monitoring had assumed vast proportions, which obstructed the employees in their functioning. Harley (2001) recently investigated the link between team membership and the employees’ experience of work in terms of discretion, commitment, satisfaction, relations with management and stress. No statistically significant association between team membership and any of the outcome variables was found: no regained discretion, but also no increased work intensification and stress. Teamwork seemed not to matter much for the employees.

Regarding our own results, one could say that teamwork doesn’t matter much for the organizations neither. Perhaps we have to face the fact that certain team types will induce effects only when they are applied in a specific kind of firm. The hypotheses stated before may be too universal. There is a need to take into account more in detail the context within which teamworking is implemented and the objectives that underpin its operation and by doing so, developing a contingency approach. The management strategy, the market position, the competitiveness and the broad economic situation may be important moderating conditions in explaining how teams can positively influence the organizational productivity. Also the internal contingency must be considered. It is not the management-employment relationship (HR-policy) or the structure of the division of labour (work systems) ‘an sich’ that influence the performance of an organization, but the interaction between both aspects.

To bring these additional factors into the discussion, will require more complex research designs and this will put an extra mortgage on the measurability. In this way, the link between teamwork and performance isn’t just a theoretical-conceptual problem, but it stays a methodological challenge too.

NOTES

- 1 An earlier version of this paper was presented at the 19th EGOS Conference, July 3-5th in Copenhagen.
- 2 Each 'site' is supposed to have a relative degree of autonomy in the development of its management policies.
- 3 Prior to the development of the PASO-survey, an international benchmark of organization surveys was executed (Huys *et al.*, 2000). A comparison of the response rates of several studies learned that for written surveys, the lowest response rate is realised: EPOC (1996), Ireland, 18% response; Fortune 1000 (1999), V.S., 28%; Huselid (1996), V.S., 28%; ISI (1999), Germany, 15%.

REFERENCES

- Banker, R.D., Field, J.M., Schroeder, R.G. & Sinha, K.K. (1996), Impact of work teams on manufacturing performance: A longitudinal field study, *Academy of Management Journal*, 39(4), pp.867-890.
- Barker, J.R. (1993), Tightening the iron cage: Concertive control in self-managing teams, *Administrative Science Quarterly*, 38, pp.408-437.
- Benders, J., Huijgen, F., Pekruhl, U. & O'Kelly, K.P. (1999), *Useful but Unused Group Work in Europe. Findings from the EPOC Survey*, European Foundation for the Improvement of Living and Working Conditions, Dublin.
- Benders, J. & Van Hootegem, G. (1999), Teams and their context: moving the team discussion beyond existing dichotomies, *Journal of Management Studies*, 26,5, pp. 609-628.
- Benders, J. & Van Hootegem, G. (2000), How the Japanese got teams, in F. Mueller & S. Procter (eds.), *Teamworking*, Macmillan Business, London, pp. 43-60.
- Berggren, C. (1993), *The Volvo Experience*, Macmillan, London.
- Brinkmann, J.D.V., Vink, M.J., Siero, J.H. & Boonstra, J.J. (1996), Teamgericht werken. Effecten op werkbeleving, arbeidsklimaat, kwaliteit van de arbeid en productiviteit, *Gedrag en Orgainzatie*, 6, 1995, pp.352-367.
- Bryman, A. (1996), Leadership in organizations, in S.R. Clegg, C. Hardy & W. Nord (eds.), *Handbook of Organization Studies*, Sage, London.
- Campion, M.A., Medsker, G.J. & Higgs, A.C. (1993), Relations between work group characteristics and effectiveness: Implications for designing effective work groups, *Personnel Psychology*, 46, pp.823-850.
- Cohen, S.G. & Ledford, G.E. (1994), The effectiveness of self-managing teams: A quasi-experiment, *Human Relations*, 47, 1, pp.13-43.
- Cohen, S.G. & Bailey, D.E. (1997), What makes teams work? Group effectiveness research from the shop floor to the executive suite, *Journal of Management*, 23, pp.13-43.
- Cohen, S.G., Ledford, G.E. & Spreitzer, G.M. (1996), A predictive model of self-managing work team effectiveness, *Human Relations*, 49, 5, pp.643-676.
- Deming, W.E. (1986), *Out of the crisis*, MIT Center for Advanced Engineering Study, Cambridge.

- De Sitter L.U., Den Hertog, J.F., & Dankbaar, B. (1997), From complex organizations with simple jobs to simple organizations with complex jobs, *Human Relations*, 50, 5, pp.497-34.
- Doorewaard, H., Huys, R. & Van Hootehem, G (1997) Team responsibility structure and team performance, *Personnel Review*, 31(3), pp. 356-370.
- Dunphy, D. & Bryant, B. (1996), Teams: Panaceas or Prescriptions for Improved Performance?, *Human Relations*, 49, 5, pp.677-699.
- Eden, D. (1990), Pygmalion without interpersonal contrast effects: Whole groups gain from raising manager expectations, *Journal of Applied Psychology*, 75, 4, pp.394-398.
- Glassop, L.I. (2002), The organizational benefits of teams, *Human Relations*, 55(2), pp.225-249.
- Gupta, Y.P. & Asf, D. (1994), Excellence at Rohm and Haas Kentucky: A case study of work team introduction in manufacturing, *Production and Operations Management*, 3(3), pp.186-200.
- Hackman, J.R. (1987), The design of work teams, in J.W. Lorsch (ed.), *Handbook of organizational behavior*, pp.315-342, Prentice-Hall, Englewood Cliffs.
- Hackman, J.R. (1991), Work teams in organizations: An orienting framework, in J.R. Hackman (ed.), *Groups that work (and those that don't)*, pp.1-14, Prentice-Hall, NJ.
- Harley, B. (2001), Team Membership and the Experience of Work in Britain: an Analysis of the WERS98 Data, *Work, Employment and Society*, 15, 4, pp.721-742.
- Hut, J.A. & Molleman, E. (1998), Empowerment and team development, *Team Performance Management Journal*, 4.
- Huys, R., Sels, L. & Van Hootehem, G. (2000), *Tendrapport – Organisatieconcepten en hun arbeidsmarktimplicaties*, HIVA, KULeuven.
- Katzenbach, J.R. & Smith, D.K. (1993), *The wisdom of teams: Creating the high-performance organizations*, HarperCollins, New York.
- Kleinschmidt, M. & Pekruhl U. (1994), Kooperation, Partizipation und Autonomie: Gruppenarbeit in deutschen Betrieben, *Arbeit*, 4, 2, p.150-172.
- Kuipers, H. & Van Amelsvoort P.(1990), *Slagvaardig organiseren, inleiding in de sociotechniek als integrale ontwerpleer*, Deventer: Kluwer.
- Manz, C.C. & Sims, H.P. (1987), Leading workers to lead themselves: The external leadership of self-managing work teams, *Administrative Science Quarterly*, 32, pp.106-128.

- Manz, C.C. (1992), Self-leading work teams: moving beyond self-management myths, *Human Relations*, 45, 11, p.1119-1140.
- Marchington, M. (2000), Teamworking and employee involvement: terminology, evaluation and context, in F. Mueller & S. Procter (eds.), *Teamworking*, Macmillan Press, London.
- McGrath, J.E. & O'Conner, K.M. (1996), Temporal issues in work groups, in M.A. West (ed.), *Handbook of Work Group Psychology*, John Wiley & Sons Ltd., New York.
- Mueller, F. (1994), Teams between hierarchy and commitment: Change strategies and the internal environment, *Journal of Management Studies*, 31, 3, pp. 383-403.
- Murray, R.B. & Stewart, G.L. (2000), Team structure and performance: Assessing the mediating role of intrateam process and the moderating role of task type, *Academy of Management Journal*, 2000, 43(2), 135-148.
- Neck, C., Connerly, M., Zuniga, C. & Goel, S. (1999) Family Therapy Meets Self-Managing Teams: Explaining Self-Managing Team Performance Through Team Member Perceptions, *The Journal of Applied Behavioural Science*, 35, 2, pp.245-259.
- Neumann, J., Holti, R. & Standing, H. (1995) *Change Everything at Once: The Tavistock Institute's Guide to Developing Teamwork in Manufacturing*, Management Books 2000 Ltd., Oxfordshire.
- Pearson, C.A.L. (1992), Autonomous workgroups: An evaluation at an industrial site, *Human relations*, 45, 9, pp.905-936.
- Procter, S. & Mueller, F. (2000), Teamworking : strategy, structure, systems and culture, in Procter, S. and Mueller, F. (Eds) *Teamworking*, Macmillan, London, pp.3-24.
- Scott, T.W. & Tiessen, P. (1999), Performance measurement and managerial teams, *Accounting, Organizations and Society*, 24, pp.263-285.
- Schumann, M. (1998), New Concepts of Production and Productivity, *Economic and Industrial Democracy*, 19, pp. 17-32.
- Stewart, G.L. & Barrick, M.R. (2000), Team structure and performance: assessing the mediating role of intrateam process and the moderating role of task type, *Academy of Management Journal*, 43, 2, pp.135-148.
- Tranfield, D. & Smith, S. (2002), Organization designs for teamworking, *International Journal of Operations & Production Management*, 22, 5, pp.471-491.
- Tuckman, B. & Jenson, M. (1977), Stages of small group development revisited, *Group and Organization Studies*, 2, pp. 419-427.
- Van Eijnatten, F.M. & Van Beinum, H. (1993), *The paradigm that changed the work place*, Van Gorcum, Assen.

- Van Hootegem, G. (2000), *De draaglijk traagheid van het management*, Acco, Leuven.
- Wageman, R. (1995), Interdependence and group effectiveness, *Administrative Science Quarterly*, 40, pp.145-180.
- Weisman, C.S., Gordon, D.L. & Cassard, S.D. (1993), The effects of unit self-management on hospital nurses' work process, work satisfaction and retention, *Medical Care*, 31, 5, pp.381-393.
- Wellins, R.S., Byham, W.C. & Wilson, J.M. (1991), *Empowered teams, creating self managing working groups and the improvement of productivity and participation*, Jossey Bass Publishers, San Francisco.
- Womack, J.P., Jones, D.T. & Roos, D. (1990), *The machine that changed the world. The story of lean production. How Japan's secret weapon in the global auto wars will revolutionize western industry*, Harper Perennial, New York.

CONTACT:

Anne Delarue
Ph. D.
Katholieke Universiteit Leuven
Department of Sociology
Section Work and Organization
E. Van Evenstraat 2B
B-3000 Leuven
Belgium
Tel: + 32 16 323133
Fax: + 32 16 323365
anne.delarue@soc.kuleuven.ac.be