

# Teams, Team Motivation, and the Theory of the Firm

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**A concern with teams was central to early attempts to grasp the nature of the firm but fell out of favor in later work. We encourage a return to the emphasis on teams but argue that the idea of teams as central to the nature of the firm needs to be grounded in an appreciation of the importance of We frames and group agency. We use converging insights from evolutionary anthropology, cognitive sociology and psychology and work on team agency to develop such a grounding and link it to the issues of the existence, boundaries, and success of firms. Copyright © 2012 John Wiley & Sons, Ltd.**

## INTRODUCTION: BRINGING TEAMS BACK INTO THE THEORY OF THE FIRM

What is the nature of the firm? According to a once prominent stream of research in the economics of the firm (Alchian and Demsetz, 1972; Holmström, 1982; Alchian, 1984; Kandel and Lazear, 1992), the fundamental nature of the firm lies in ‘team production’, specifically, in the firm being a team of heterogeneous, but complementary resources where precisely measuring the marginal product of each input factor is difficult. However, in the economics of the firm literature, the team production emphasis has largely been supplanted by an emphasis on specialized assets and investments and the under-investment threats and *ex post* haggling problems they may give rise to (Hart, 1995; Williamson, 1996).

In this article, we argue for a return to the emphasis on team production and management for team

production as lying at the core of our attempts to understand why firms exist and what explains their boundaries and their internal organization (on which their longer-term success depends). Teams are a basic form of human cooperation with an impressive evolutionary past. Recent work in management and economics broadly asserts that firms increasingly organize around teams of strongly complementary human resources (Lepak and Snell, 1999). This is manifested in two ways. First, the boundaries of firms shrink so that the services of less strongly complementary resources are sourced from other firms (Rajan and Zingales, 2000, 2001; Lippman and Rumelt, 2003). Second, the basic organizational unit is increasingly becoming the team/project/group (rather than the department or division) (Zenger and Hesterly, 1997). Thus, teams should be central in our attempts to understand the emerging nature of firms. However, we argue that the understanding of what teams are should go substantially beyond the narrow understanding of the economics of the firm. We also argue that an understanding of teams informed by converging advances in the understanding of teams in fields and

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disciplines, such as management, psychology research, evolutionary anthropology, and game theory (e.g., Sugden, 2000, 2003; Kozlowski and Bell, 2003; Ilgen *et al.*, 2005; Tomasello *et al.*, 2005), has the potential to significantly further our understanding of the key issues in the theory of the firm.

The team production stream was an attempt to answer the key *explananda* in the theory of the firm, as defined by Coase (1937) concerning existence, boundaries and internal organization of firms. The team production stream focused on team production because it served to highlight three fundamental features of the theory of the firm: (i) gains from trade stemming from complementarities among heterogeneous resources; (ii) team technologies that may function as covers for moral hazard; and (iii) governance mechanisms (specifically, a monitor-residual claimant) that internalize the externalities stemming from (ii). In the pioneering contribution to this stream (i.e., Alchian and Demsetz, 1972), Coase's *explananda* were addressed in terms of internalizing externalities from team production (the firm's existence), team production (which defined the scope/boundaries of the firm), and monitoring and residual claimancy in the context of a nexus of contracts (internal organization). Formal representations of these ideas utilize non-cooperative game theory in which, crucially and true to the original contributions (e.g., Alchian and Demsetz, 1972), team members' strategies do not include the goals of other team members or indeed the team itself (Holmström, 1982; Kandel and Lazear, 1992).

We revisit teams as an essential part of firm organization, but we do so from a perspective that is very different from the older team literature in economics. Fundamentally, the latter does not do justice to what it means to engage in productive activities in a team (Gold, 2005). In particular, economics approaches to teams neglect the fundamental fact that members of a well-functioning team are motivated to achieve a common goal and that they choose actions and activities in order to realize this goal (a point that is better captured in economics in Marschak and Radner (1972) team theory, as well as in management research, for example, DeChurch and Mesmer-Magnus, 2010). In situations where players have some degree of common interest and their strategies are strongly complementary, they may adopt a We frame in their strategy choice, that is, identify with the team and thus adopt collective goals as their own (Bacharach, 2006). Work in evolutionary anthropology suggests that human beings are especially equipped with cognitive and motivational faculties that are dedicated to such identification and to the framing

of their strategy choices (Tomasello *et al.*, 2005). Apparently, our social brains (Dunbar, 2003) contain a hardwired ability to recognize a situation one that involves team efforts and to trigger the special motivational and cognitive faculties to participate in these efforts (cf. Sebanz *et al.*, 2006). However, motivation for such team-oriented efforts is highly precarious, and a team situation *may* degenerate into the prisoners' dilemma predicted by Alchian and Demsetz (1972), indicating that the latter situation is a special case.

We argue that there are far-reaching implications of these ideas for our fundamental understanding of firms and other organizations (see also Lindenberg and Foss, 2011). Specifically, these ideas speak directly to the issues of coordination and motivation that constitute the core of the economics of the firm. However, they are difficult to frame in the context of the established tools of economics and game theory. Accordingly, we explicate the differences between the notions of teams in the sense of Alchian and Demsetz (1972) and the understanding of teams in the sense of jointly working on the realization of common goals with a We frame and the specific motivation this entails. We call this motivation 'team motivation' and see it as a subset of the broader set of pro-social motivations.<sup>1</sup> We also discuss recent game theoretical ideas that seem fruitful for treating the latter in a more formal manner, mainly the ideas of Bacharach (2006) and Sugden (2000, 2003; Gold and Sugden, 2007) as they pertain to team agency. We finally link these ideas to the classical questions in the theory of the firm, that is, the existence and boundaries of the firm. And we add an explanation of the longer-term success of a firm, given fixed market conditions. Although markets are not necessarily inconsistent with conditions of cooperation in teams (Bruni and Sugden, 2008), firms can generally provide conditions that are conducive to team motivation at lower cost. However, we argue that as firms grow, it becomes increasingly difficult to uphold the special motivation for cooperation in teams so that there are limits to the scope and size of firms.

## TEAMS AND THE THEORY OF THE FIRM

Two classical works on teams were published in 1972, namely Marschak and Radner's (1972) 'team theory' approach and Alchian and Demsetz' (1972) emphasis on 'team production'. Both gave rise to different research streams within the then emerging economics of the firm, namely the team theoretical stream and what

Williamson (1985) calls the ‘measurement approach’ (roughly equal to agency theory).

These two contributions characterize teams very differently and identify very different problems of team organization. Thus, Marschak and Radner (1972: 9) define a team as ‘an organization the members of which have only common interests’. They study ‘... the case in which several persons perform various tasks including those of gathering and communicating information and of making decisions; but they have common, not divergent, interests and beliefs. Hence the optimality requirement is easily defined, just as in the case of a single person. But the single person’s problem of optimizing his information instrument and its use [i.e., non-cooperative game theory] is replaced by that of optimizing the allocation of tasks among the members of a team’ (Marschak and Radner, 1972: 4). Thus, team theory assumes that team members have common goals so that it is *as if* the team is maximizing its expected net payoff.

Alchian and Demsetz (1972: 779) define teams indirectly, namely as a group of individuals who are engaged in ‘team production’, that is, ‘... production in which 1) several types of resources are used and 2) the product is not a sum of separable outputs of each cooperating resource ... [and] ... 3) not all resources used in team production belong to one person’. Team production involves super-additivities (or, ‘synergies’), and will be used when the productivity gains (relative to the ‘sum of separable production’) can ‘cover the costs of organizing and disciplining team members’. Famously, Alchian and Demsetz (1972) link minimizing these costs to the existence of a specialized monitor who assumes the role of residual claimant. Hence, the emergence of the ‘classical capitalist firm’. The elegance of Alchian and Demsetz’s explanation is that it simultaneously explains the existence, boundaries and internal organization of firms in exceedingly simple terms (too simple, as it turned out).

Marschak and Radner (1972) have enjoyed limited attention, in spite of some attempts to revitalize this research stream (e.g., Bolton and Dewatripont, 1994). The theory of the firm became pre-occupied with incentive conflicts and their potential efficiency losses, and how such conflicts may be partly remedied by contractual and governance means (for a historical account, see Foss and Klein, 2011). This left little or no room for common interest games that interested Marschak and Radner. In contrast, the Alchian and Demsetz (1972) paper enjoyed massive initial attention and is often seen as a founding contribution to agency theory (Jensen, 1983). Although the paper is still seen as a

classical and seminal contribution, its emphasis on moral hazard in a team production is, however, not regarded as a *necessary* ingredient in the theory of the firm. Alchian himself later explicitly denied that team production is a necessary ingredient in the theory of the firm (Alchian, 1984; Alchian and Woodward, 1987), and the original paper indeed suffers from a number of logical and explanatory shortcomings.<sup>2</sup>

Perhaps because the Marschak and Radner approach never became a major analytical force in the theory of the firm, and the Alchian and Demsetz (1972) analysis was abandoned as a foundational part of the theory of the firm, the emphasis on teams largely disappeared from the focus of theorists of the firm. To be sure, these contributions are still cited, and empirical (e.g., Drago and Garvey, 1998) and experimental work (Grosse *et al.*, 2009) continues to be carried out, but the last major theoretical contributions on teams (in the Alchian & Demsetz tradition) are Holmström (1982) and Kandel and Lazear (1992).<sup>3</sup>

We propose a return to the concern with teams as critical in the context of human cooperation, including the theory of the firm (see also Lindenberg and Foss, 2011). We accept Alchian and Demsetz’ basic characterization of team production, that is, productive activity that involves heterogeneous but complementary resources, a high degree of task and outcome interdependence, and the potential for super-additive outcomes. We also accept Marschak and Radner’s (1972) characterization of a team as a group of agents with a common goal that can only be achieved by an appropriate combination and coordination of the individual activities of the group members. However, we agree with Blair and Stout (1999: 267–268) that earlier analysis in economics has ‘... sidestepped some of the most interesting ... questions about teams, including: What are the sources of the economic surpluses in team production, and how can they best be harnessed and directed?’

As we shall argue, addressing the ‘most interesting questions about teams’ requires that we abandon the ‘non-cooperative’ emphasis on individual utility maximization and moral hazard (whether or not it is tempered by invocations of ‘team spirit’ (Alchian and Demsetz, 1972) and ‘peer pressure’, Lazear & Kandel, 1992). But it also requires that we break with the team theory assumption that individuals in teams always have common goals. What is needed is the recognition that individuals may adopt team goals (intentions) *or* individual goals (intentions) and that what they adopt depends on the extent to which the relevant goals are prompted and maintained by the

team itself or by circumstances outside of the team. In turn, recognizing this requires that we think of the possible precariousness of the adoption of team goals and thus also of the close interrelation between cognition and motivation, both of which aspects are virtually absent in extant research. To gain additional insight, we need to take a look at what other fields, inside and outside of economics, have had to say about team production and its governance and organization (in a broad sense).

## TEAMS: REASONING AND MOTIVATION

### What Other Fields Tell Us about Cooperation in Teams

Teams and team production are basic kinds of social organization that have existed since the first small hunting bands of *homo sapiens* roamed the savannas of Africa many millennia ago. Work in evolutionary anthropology suggests that evolution made groups of humans capable of overcoming the free-rider problem in a different way than that proposed by Alchian and Demsetz. The argument is that human beings are especially equipped with cognitive and motivational faculties that have evolved to facilitate participating in productive activities in teams (Tomasello *et al.*, 2005). These faculties created the adaptive advantage of human beings living in larger groups, and the neocortex evolved as a 'social brain' to allow primates and especially human beings to draw adaptive advantages from living in such groups (Dunbar, 2003).

Studies of perception and action in social contexts indicate that the brain contains an ability to perceive and recognize a situation as one that involves a team effort. Moreover, this recognition triggers specialized, coordinated cognitive faculties that are attuned 'to make common cause' (Sebanz *et al.*, 2006). Thus, members of a team oriented towards team goals literally perceive the environment differently than in independent action: they can recognize the endeavor as a team endeavor with common goals and see themselves as part of it; they share cognitions about the relevant tasks, interdependencies, timing, and possible obstacles to smooth coordination in terms of the common goals. They also recognize that team members have to play their own roles and take their own responsibilities with intelligent and adaptive efforts, mutually anticipating goal-related actions from others and cognitively coordinating temporal and spatial aspects of cooperation (Sebanz *et al.*, 2006; Higgins and Pittman, 2008). If necessary, they

aid other team members do their bit (Tomasello *et al.*, 2005) and sanction them if they do not (Ostrom *et al.*, 1992).

As Grosse *et al.* (2009: 2) argue, the Alchian and Demsetz team situation is an example of the kind of problems that have been studied by experimental economists as public goods games. A general finding within this literature is that individuals voluntarily contribute to public goods (Zelmer, 2003) and incur costs to punish free riders (Fehr and Gächter, 2000). The interpretation often is that individuals hold social preferences and derive utility from behaving pro-socially (Fehr and Falk, 2002). However, such preferences seem to be context dependent (Tversky and Simonson, 1993). Moreover, they seem insufficient to prevent decay of cooperation over time, unless they are supported by flanking arrangements (Ledyard, 1995).

Reviewing the evidence on game-theoretic studies of cooperation, Ledyard (1995: 172) concluded that '... it is possible to provide an environment in which almost all of the subjects contribute toward the group interest. ... Why ... this all works remains a mystery'. Apparently, situations exist that can make individuals adopt group goals and choose actions in terms of those goals. Those situations include contributing to public goods and choosing effort levels in a team production situation. However, as Ledyard suggests, it is far from clear what is going on in terms of the dynamics of framing and motivation. Extant literature presents two (partly overlapping) explanations, namely team reasoning (Sugden, 2003; Bacharach, 2006; Gold and Sugden, 2007) and goal-framing (Lindenberg and Steg, 2007; Lindenberg, 2008). The first one highlights rational deliberation, whereas the other highlights bounded rationality and more automatic mental responses brought about by cues in the environment.

### What's Going On? Reasoning About What to Do in a Team

Finding game theoretical answer to Ledyard's question is made difficult by the fact that game theory and economics at large only take the team as a context for the realization of agent's own goals; thus, actions are never deliberated upon and chosen in terms of group goals. The main exception to this claim is represented by the work of Michael Bacharach (2006) and Robert Sugden (2000, 2003; Gold and Sugden, 2009), partly drawing on earlier work by philosophers such as Gilbert (1989) and Tuomela (1995).

Bacharach's fundamental concern is with modes of practical reasoning, that is, reasoning that leads to prescriptions about what an agent should do, given what he seeks to achieve. The practical reasoning of standard game theory proceeds in terms of an 'I frame' (Tuomela, 1995), framing each player as asking, 'What should *I* do in terms of strategy choice, given that *I* wish to maximize *my* utility?' Bacharach developed a series of examples based—provocatively—on the 'Hi-Lo game'. This is an asymmetric common interest game (e.g., in the two player case, it may have (2,2) and (5,5) in the main diagonal and (0,0) and (0,0) in the other one).

Clearly, intuition (as well as theoretical argument, e.g., Crawford and Haller, 1990) suggests that coordination on the Pareto optimal equilibrium is particularly trivial here; more so than in, for example, the closely related stag-hunt game. However, Bacharach argues that classical game theory is in general *not* capable of demonstrating in terms of practical reasoning how players can choose strategies that jointly lead to Pareto optimal outcome (rather than the Pareto-inferior one). Rather, classical game theory is concerned with consistency requirements. Thus, statements such as 'if every player believes everyone else to choose actions that are consistent with equilibrium (somehow specified), then they have valid reasons to choose those actions' are not statements about the reasoning process that leads to those valid reasons but statements about the end results of such processes. Bacharach's argumentative strategy seems to be that if individual reasoning leading to I intentions cannot lead to the optimal outcome in the 'obvious' situation of the Hi-Lo game, then this holds for more complicated games (e.g., the stag-hunt game) *a fortiori*.

Now, real-world players clearly have little difficulty finding the optimum outcome in Hi-Lo games (Crawford and Haller, 1990). Bacharach's answer is that this is because real-world players reasoning about games such as the Hi-Lo game, in fact, do not adopt reasoning that proceeds in term of I intentions. On the contrary, they adopt what (Sugden, 2003) calls 'team reasoning', adopting 'team preferences' (Sugden, 2000), leading to the formation of a We frame. Team reasoning entails practical reasoning about what *we* should do as a *group* to further *our* goals. An important aspect of team reasoning as a mode of practical reasoning is that it generates action recommendations that are less conditional on what the individual believes about others' reasoning, about their personal payoffs, and strategy choices (see Sugden (2000) and Bacharach (2006) for complications). Specifically, when a team

adopts a We frame and engage in team reasoning, the underlying game form is transformed so that instead of having payoffs defined for each participating individual, there is a single scalar for any combination of strategies that represent the team payoff for this combination—which bridges the gap between practical reasoning and equilibrium outcomes.

The main part of the argument is the concern with valid reasoning from certain premises (i.e., the adoption of an I or a We frame). This is also the rational, deliberative part. Bacharach does not argue that the choice of a frame is an intentional act. Rather, he argues that the We frame is highly functional in certain situations and environments and that it has been produced by evolutionary selection (forging a link to evolutionary anthropology). Certain features of a game, especially 'common interest' and 'strong interdependence', induce individuals to adopt a We frame (Bacharach, 2006: 165–166). Common interest ranges from zero sum games (in which there is zero common interest) to (symmetrical) coordination games in which there is no conflict of interests at all and includes games with some conflicting interests (as in the battle-of-the-sexes game) (see also Zizzo and Tan, 2009). Common interest will, however, only induce a We frame in a team if the team is currently in a less-preferred state but is able to move the preferred state by means of team action. This will be the case when the game exhibits strong interdependence so that only a combination of actions by team members will be able to realize the preferred state of the team.

Clearly, the PD game possesses the feature of common interests and strong interdependence. However, Bacharach does not naïvely claim that these features invariably leads to cooperation in the PD game. In such a game '... players might see only, or most powerfully, the features of common interest and reciprocal interdependence which lie in the payoffs on the main diagonal. But they might see the problem in other ways. For example, someone might be struck by the thought that her co-player is in a position to double-cross her by playing [defect] in the expectation that she will play [cooperate]. This perceived feature might inhibit group identification' (Bacharach, 2006: 169). The question when players will see the game in one way or another is left unanswered.

### **What's Going On? Team Motivation and Goal-Framing Theory**

Bacharach and Sugden's work on We and I frames, team reasoning and so on represent important strides

forward in aligning our knowledge about teams in an evolutionary context with game theoretical thinking. However, it does less to identify the *motivational* mechanisms at work. In particular, motivation seems entirely endogenous to cognition (e.g., adopting a We frame reframes the payoffs of a game) and, hence, not worthy of a distinct treatment. Moreover, the theory presents little detail about what may prompt changes between I and We frames. It seems to impose a strict either–or status of these frames; that is, a player is either fully in an I or a We frame, and there is apparently no recognition that one of these frames may be in the cognitive foreground while the other stays in the cognitive background.<sup>4</sup> A further problem is that it does not explicitly treat the phenomenon that support for a We frame may decay unless it is scaffolded by extra arrangements (Andreoni, 1988; Fehr and Gächter, 2002). Finally, Bacharach and Sugden do not seem to allow for the simultaneous existence of multiple goals in the mind of individuals and their dynamics.

In contrast, cognitive sociology and social psychology go further with respect to identifying these crucial motivational details of the We frame and team agency. In particular, *goal-framing theory* is concerned with the motivational force of collective orientations, such as those implied by We frames and team reasoning. It suggests that there is a distinct kind of motivation that is particularly geared to collaborative activities in teams. How this works is explained by goal-framing theory (Lindenberg, 2008; Lindenberg and Foss, 2011).<sup>5</sup>

Goal-framing theory applies the insight from (social) cognition research that mental constructs have to be activated in order to affect behavior and that goals are particularly important mental constructs in which cognitions and motivations are intricately intertwined (e.g., Förster *et al.*, 2005; Kruglanski and Köpetz, 2009). There are also overarching goals that govern entire domains of sub-goals. Goals, and particularly overarching goals, govern what we attend to (Posner and Petersen, 1990); what concepts and what kinds of knowledge are being activated; what alternatives we consider; what information we are most sensitive about; what we expect others to do, and how we process information (Gollwitzer and Bargh, 1996; Förster *et al.*, 2005; Kruglanski and Köpetz, 2009). In turn, these cognitive processes have an impact on motivation by inhibiting other goals (Shah *et al.*, 2002); by influencing what we like and dislike (Ferguson and Bargh, 2004); and by governing the criteria we use to judge goal realization or failure (Carver and Scheier, 2002).

There are different overarching goals (Lindenberg and Steg, 2007) and when they are focal (i.e., when they are activated at the moment), they ‘frame’ a situation by steering important cognitive processes in their service. Each one is even linked to a separate neural system (McClure *et al.*, 2004; Moll *et al.*, 2005; Mendez, 2009). In their competition for the privilege of being focal (i.e., for being a ‘goal-frame’), they try to inhibit each other (Brewer, 2004). There are overarching goals concerning individual interests (hedonic and gain goals, see the succeeding text). But, importantly, one overarching goal is connected to a supra-individual orientation, called a *normative* goal, and it may be characterized by the desire ‘to act appropriately’ in the service of the supra-individual entity be that a dyad, group, organization, or nation (Moorman and Blakely, 1995; Van Knippenberg, 2000). The criteria for goal fulfillment are linked to the realization of joint goals and to meeting joint appropriateness standards. When the normative goal is focal, the two competing individual interest goals are pushed into the cognitive background. This suspends opportunism to various degrees, as illustrated by the finding that people act very differently in terms of cooperation when they identify a situation (i.e., the exact same prisoners’ dilemma game) as a ‘community game’ or a ‘Wall Street game’ (Lieberman *et al.*, 2004; see also Pillutla and Chen, 1999).

There is a variant of the normative goal that is directed at cooperation in a team rather than just at a focus on appropriateness (norms) and/or collective identification and a feeling of We. This is an important difference. A We frame can also apply to a situation in which individuals identify with the group in terms of a collective category (fans of a football club, or members of IBM). If that alone is the main basis for the normative goal-frame, there will be no explicit concern about the realization of collective goals that require heterogeneous inputs, close coordination of inputs and thus *personal* intelligent effort and responsibility. Social loafing (Karau and Williams, 1993) rather than contributions to the collective goal might be the result. The normative goal-frame thus can also have a dark side, stifling individual effort and creativity and even encouraging Yes Men (see Lindenberg and Foss (2011) for details). For team motivation with close coordination, personal responsibility *via-a-vis* the collective goals is essential. In short, identification with a group is important but not enough (see Lindenberg and Foss, 2011) nor is a casual commitment for intelligent effort for the group goal sufficient, because the latter cannot be easily coordinated with

the intelligent effort of others. There is also no automatic realization of team motivation that would issue simply from the inherent features of the underlying game (e.g., strong interdependence), as Bacharach (2006) would claim. Why is it so difficult to maintain the normative goal-frame?

It is important to realize that the normative goal-frame is highly precarious. From an evolutionary point of view, this is quite plausible. The group is there for individual adaptive advantages and not the other way around. Thus, the mode in which the individual identifies with group goals is a priori weaker than modes linked to the individual interest and can thus easily be sidelined by individual interest goals unless it received extra support by the environment (see Fehr and Gächter, 2002; Keizer *et al.*, 2008) or by *compatible* individual interest goals in the cognitive background (Lindenberg and Steg, 2007). For example, monetary and/or symbolic rewards can strengthen the normative goal-frame as long as they remain weak enough so that they do not displace it as goal-frame. As we will see later on, this has important consequences for the relation of contingent rewards to the maintenance of team motivation. What exactly are these competing individual interest goals?

One overarching individual interest goal, called the gain goal, is directed at maintaining or improving one's resources (e.g., status and money). When it is focal, the criteria for goal realization pertain to improvements in these resources. A gain goal-frame makes individuals highly sensitive to opportunities for and threats to the improvement of their resources and thus particularly sensitive to incentive instruments. For example, in such a goal-frame individuals will react strongly to advancement schemes, are willing to invest in education if returns are reasonably certain, will be competitive with regard to advancement, and may act opportunistically (Williamson, 1985). Because the normative goal is pushed into the background, group goals and norms are seen as constraints to be reckoned with when furthering one's own career, income, or status, rather than as guiding principles for appropriate action.

The other individual interest goal, called the hedonic goal, is directed at improvement of the way one feels at a particular moment, such as seeking direct improvement in self-esteem, seeking excitement, and avoiding unpleasant effort, negative thoughts and events, and uncertainty. The criteria for having realized the goal relate to improvements in the way one feels. The power of this goal-frame vis-à-vis rival goal-frames derives from its direct link to emotions (Ryan *et al.*, 2008). A hedonic goal-frame makes individuals oriented towards

instant gratification in different domains.<sup>6</sup> For example, if a particular cue makes a person hedonic with regard to one aspect (say having fun) the fact that it is an overarching goal will also make that person hedonic with respect to many *other* aspects (such as impatience in financial transactions).<sup>7</sup>

Both these individual interest goals are formidable competitors for the normative goal unless they can be harnessed to support the normative goal from the background. The recognition of the crucial role of the normative goal-frame and of its precariousness may be the most important ingredient for understanding firms and other organizations emerging on the basis of goal-framing theory. It has direct and concrete consequences for the theory of the firm, particularly for understanding the existence, the boundaries and longer-term success of a firm (in terms of the firm's ability to realize optimal rents from joint production). We will deal with these three aspects in order.

#### TEAMS AND THE EXISTENCE, BOUNDARIES, AND THE SUCCESS OF THE FIRM

Bacharach (2006) explicitly wanted to examine the implications of his specific approach for the understanding of organizations but unfortunately died before he could accomplish that task, and what is left from his hand does not go beyond team-theoretic (in the sense of Marschak & Radner) considerations (e.g., see Bacharach, 2001). Lindenberg and Foss (2011) apply the insights from goal-framing theory to governance structures, especially reward design and structural design (i.e., key aspects of the internal organization of firms), which is crucial for the longer-term success (see the succeeding text). But they do not address the implications of this theory for the other aspects of the theory of the firm: the existence and boundaries.

The conventional approach in the economics of organization is to begin from potential gains to trade from transactions between independent parties, ask why these gains cannot be fully realized in the context of market organization, and tell a story about how shifting these transactions to a firm mode of organizations makes it possible to create joint surplus that cannot be realized under alternative governance structures. We claim that when close coordination of human intelligent efforts is necessary *only firms can create the surplus that team motivation brings about* and we will supply a goal-framing explanation as to why this is so.

### Team Motivation and Its Consequences for Joint Surplus

The introduction of team motivation casts the understanding of the surplus from team production in a novel light. Two issues need consideration, namely, first, the efficiency yardstick that is used in assessing surplus, and, second, the sources of the additional surplus that team motivation yields.

With respect to the first issue, the economics of the firm applies notions of first- and second-best efficiency (Hart, 1995). Such efficiency yardsticks are defined relative to given preferences. Framing seems to have no explicit role to play in thinking about efficiency. However, in terms of goal-framing theory, the economics of the firm in actuality assumes that individuals are always and everywhere in the gain goal-frame, and its contribution lies in unfolding the manifold consequences for our understanding of contracts and governance structures and mechanisms of this assumption. Notions of first and second best are therefore always implicitly defined taking this goal-frame the one that obtains. The introduction of the normative goal-frame and its sustenance of team motivation change the understanding of efficiency. Thus, the point is not that if employees hold a normative goal-frames they are capable of reaching and sustaining the value maximizing outcome that is defined for a situation in which employees are in a gain goal-frame (as in repeated game approaches to organizations; e.g., Kreps, 1990). Rather, *in the normative goal-frame they can reach payoffs that they cannot reach in a gain goal-frame*, even with repeated games. What are the sources of this additional economic surplus?

Team motivation has beneficial organization-level consequences because it impacts the tasks that organizational members are willing to engage in; how much effort they will put into these tasks; and how they coordinate their actions. It is also associated with pro-social behaviors, such as spontaneous sharing of knowledge (De Dreu *et al.*, 2008), which, in turn, may positively impact work productivity and innovation performance (Tsai, 2001). It involves the heedful interrelating that has been found to assist coordination in ambiguous situations (Weick and Roberts, 1993) and to promote innovation performance (Dougherty and Takacs, 2004). As it implies a partial suspension of moral hazard/opportunism, it reduces the need for costly control mechanisms (Podsakoff and MacKenzie, 1997). Coordination costs are reduced because team motivation implies that organizational members generate shared representations of actions and tasks in terms of joint goals, reducing the need for planning and formalization.

In addition, individual intelligent efforts are channeled towards the realization of common goals (see also Osterloh and Frey, 2000).

Because individuals who are in a normative goal-frame with team motivation choose higher levels of effort towards the realization of collective goals, coordinate more easily with others, and engage more readily in pro-social activities related to reaching the common goals than individuals in a gain goal or hedonic goal-frame, the *first best under team motivation is higher than the first best as described in economics of the firm*. The difference may be called 'team motivation rents', that is, those rents that arise when team members are in the normative compared with the gain goal-frame. Because the theory of the firm assumes that individuals are always in the gain goal-frame, it is too pessimistic with respect to what can be achieved by human cooperation. And it arguably also misses out on important aspects of what explains the emergence, boundaries, and longer-term success of the firm (on internal organization, see Lindenberg and Foss, 2011).

### The Existence of the Firm in the Light of Team motivation

Explaining how firms emerge (i.e., what explains their existence) from the perspective of team reasoning and team motivation requires that we explain what we mean by a 'firm'. We here adopt the definition that a firm is 'a coalition of interspecific resources owned in common and some generalized inputs, whose owners are paid, because of difficulty of output measurability according to some criteria other than directly measured marginal productivity, and the coalition is intended to increase the wealth of the owners of the inputs by producing salable outputs' (Alchian, 1984: 275). This is not only a commonsense definition but also one that harmonizes with the team notion, because of its emphasis on the firm as a 'coalition of interspecific resources . . . and generalized inputs'. It is also a definition that is sufficiently broad to also include, for example, partnerships because it avoids defining the firm in terms of the employment contract (in contrast to Coase, 1937).

We have already summarized Alchian and Demsetz' (1972) theory of why firms in this sense should arise from the 'inseparability' feature of team production. As we have seen, their theory proceeds solely in terms of I intentions. In a pertinent discussion, Williamson (1985: 240) adds his focus on asset specificity to Alchian and Demsetz 'separability' issue in order to

highlight the importance of the zone of acceptance in employment contracts (an issue deliberately sidestepped as a non-issue by Alchian and Demsetz). Williamson describes a move from commercial contracts with separable inputs to employment contract with inseparable inputs, where procedures of internal organization, such as grievance procedures, job security, and the like, keep the zone of acceptance intact. The need for such procedures, he says, is ‘...especially great where members of the team develop idiosyncratic working relationships with one another, in which case no single member can be replaced without having disruptive effects on the productivity of the unit. More complex teams in which mutual motivation and internal monitoring are encouraged are apt to take shape in such circumstances’ (Williamson, 1985: 244). Williamson (1985: 247) also notes that the ‘...firm will engage in considerable social conditioning to help assure that employees understand and are dedicated to the purpose of the firm’. In sum, the prediction is that transactions that are characterized by inseparability and a high degree of asset specificity are best matched with the dedicated governance machinery that firms are best able to realize.

We concur with this overall conclusion but do so for reasons that differ from Williamson’s. Williamson hints at the problem of how to establish and maintain team motivation, that is, the simultaneous cognitive and motivational coordination among actors and suggests that firms may particular advantages in dealing with this. However, the specific measures that he argues that firms can uniquely leverage do not seem particularly compelling. For example, why exactly would grievance procedures and job security safeguard create and safeguard team motivation? The problem seems to be that Williamson’s approach, like the economics of the firm in general, is fundamentally dyadic (i.e., the relations that are considered are those between the individual employee and the firm) and based on I intentions, and the measures he considers are dyadic ones. Thus, the recognition that team motivation (which Williamson would seem to recognize) requires a specialized structure does not appear in Williamson’s work.

There are at least three crucial ingredients for the realization of joint production motivation with close coordination. First of all, there must be a fairly stable team membership; second of all, the normative goal-frame has to be stabilized and maintained among the team members, and third, the team members must recognize the situation as one of joint production. All three conditions can best be realized in the context of organizations. Why? Stable membership cannot be

guaranteed by market transactions. The normative goal-frame that is necessary for team motivation to arise cannot be realized in the market because there the gain goal-frame is paramount. By implication, the recognition of jointness in realizing common goals can also not be realized via market transactions.

We do not argue that firms always and everywhere arise to safeguard the particular motivation to engage in team-related activities and that this uniquely explains their boundaries. Rather, we assert that realizing the joint surplus that team motivation brings about provides *one* (albeit important) reason why firms exist and *one* explanation of their boundaries (other, complementary, reasons are economizing on bargaining costs (Coase, 1937; Wernerfelt, 1997) or protecting specific investments, Williamson, 1985; Hart, 1995). Not all firms realize team motivation to the same degree. Firms combining firms (conglomerates) may be established for very different reasons than realizing joint production motivation (such as the ability to borrow in the capital market). But our claim is that even in the case of conglomerates, the much smaller component firms do exist mainly due to their ability to realize a degree of joint production motivation that is higher than the market would allow. Of course, they may not reach the highest level of joint surplus possible (cf. also Osterloh and Frey, 2000) and thus may not realize the optimal rent from joint production. But still, they will do better than market transaction in realizing some level of joint production motivation. And thus receive the rent linked to this kind of motivation in the work force when close coordination of intelligent effort is needed to reach common goals.

Both the normative goal-frame and the realization of team motivation can be realized in an open source network. As Frey *et al.* (2011) show, ‘community enterprises’ such as open source software production and Wikipedia are not firms but are built on a high team motivation. So what does this say about our argument about the existence of the firm? The crucial differences between open source networks and firms is that (i) in the latter, close coordination of the actions of team members is necessary, whereas in open source networks, this is not the case; and (ii) in order to realize the close coordination on a continuous basis, firms need a fairly stable membership (Williamson, 1985), whereas in the open source networks, members self-select in and out, depending on their momentary team motivation.

An important reason why firms may arise, then, is because cooperating agents realize that sustaining team motivation and thus the rents from such

motivation requires the deployment of organizational instruments that are dedicated to this task.<sup>8</sup> In Alchian and Demsetz' (1972) original paper, team production is associated with synergies (i.e., super-additivities) deriving from the underlying technology, but the resulting team production rents are threatened by the potential for shirking that team production introduces<sup>9</sup> and require supporting arrangements in the form of the allocation of decision and income rights that characterize the 'classical capitalist firm' (Alchian and Demsetz' (1972)). Although the rents from team motivation are conceptually distinct from team production rents, they, too, are fragile and need supporting arrangements. This aspect is crucial for the explanation of both the boundaries of the firm and its longer-term success.

### **The Boundaries of the Firm in the Light of Team motivation**

A persistent theme in the explanation of firm boundaries has been that complementarities between actions or investments play a key role in shaping these boundaries. Thus, actions are highly complementary in Alchian and Demsetz' (1972) team production theory, and modern property rights theory (Hart, 1995) stress the importance of complementary investments. However, under market conditions, virtually all sharing rules (Holmström, 1982) give rise to inefficient effort or investment levels. In this view, the boundaries of the firm are outcomes of the (constrained) maximization of such efforts/investments.

In the team motivation view, complementarities are also crucial but for a different reason than those stressed in the aforementioned theories. As already mentioned, one of the central points of goal-framing theory is that the normative goal-frame is the weakest of the three goal-frames and highly precarious unless well supported. The fragility of team motivation synergies and their sensitivity to size stem from the precariousness of the normative goal-frame. Relative goal strength matters as to what goals will come to dominate cognitive processes.

Team motivation is bounded by the cognitive and motivational forces that depend on a structure that is easily recognized as combining individual inputs and individual intelligent efforts in a synergistic manner with close coordination. When firms get increasingly large, this unity will be lost because the objective structure will be less integrated and especially because the subjective ability to perceive jointness is limited to clear structures of functional interdependence (see Lindenberg and Foss, 2011). Also, increasing

informational distance, difficulties of maintaining commitments and problems of calibrating incentives accompany the increase in the size of the firm. These problems mean that team motivation becomes increasingly difficult to uphold as size increases. Moreover, growth may be associated with a combination of common purpose rhetoric with simultaneous strategic shifts to gain goal-frame instruments (such as special bonuses and, for extra flexibility, selective withdrawal of measures that protect the employment contract). This does not only weaken the team motivation, it also amounts to selective intervention (which, as Williamson (1985) has observed, works with physical but not with human assets) (Foss, 2003).

For open source networks, the problem of overstretching the size of the team does not occur. What would create malfunctioning in the firm because of loss of team motivation in the conglomerate does not happen in the network because of flexible self-selection. The implication is that when products do not necessitate close coordination in intelligent efforts, such networks can have a competitive advantage compared with fixed membership teams. There may also be hybrid forms that combine firms with open source networks. For example in the fashion industry, customer involvement in design has already proven to be quite viable (Pitt *et al.*, 2006; Fuchs and Schreier, 2011).

### **Longer-term Success of the Firm in the Light of Team motivation**

Even though firms are better than markets at realizing team motivation, they can be more or less successful in realizing this kind of motivation. Of course, there are various sources of success for a firm. However, if the specific rents that firms can realize depend on what they can do better than the market, and if that is to a large extent the realization of team motivation, then clearly firms that are better at establishing and maintaining an optimal level of team motivation will be more successful than firms that are not able to do this. Because of the precariousness of the normative goal-frame and the danger that gain and hedonic goal-frames will infiltrate the governance of teams and diminish team motivation, the optimal rent from team motivation will depend on the success of governance structures to maintain the normative goal-frame and the members' recognition of the enterprise as joint endeavor. Thus, the question about the internal organization of a firm turns into the question of the optimal organization of the firm, given the importance of team motivation. What are these supporting arrangements

that can realize the optimal level of team motivation? Although space does not allow us to go into great detail on this issue, a few important points should be mentioned. The full argument has been elaborated in Lindenberg and Foss (2011).

Lindenberg and Foss (2011) point to organizational and work design and argue that the first important condition is that clearly perceptible interdependences within and across team boundaries must be part of the attention structure of the firm (Ocasio, 1997). The clearer the common goals, the clearer the various roles in which individuals help to reach those goals, and the clearer the functional connections of tasks and goals between different levels of the firm (as in Nickerson and Zenger's (2004) 'consensus-based hierarchy'), the easier it is for employees to develop and sustain team motivation.<sup>10</sup> The hierarchy itself should be 'functional' in the sense that it is based on expertise rather than property rights or other external criteria. Even if common goals are specified in the task and team design, they must still be embedded in a shared sense of common direction and affect all level of the firm, even with regard to hierarchy. This will also help prevent subunit egoism in which team motivation emerges more strongly in subgroups with possibly hostile relations across teams. A suitable means for achieving a common direction is a vision and mission statement, consensually supported by top management that focuses on a common purpose rather than on operational goals that are appropriate for the task and team structure. Periodic common rituals to sustain the common purpose are thus very supportive of maintaining a common direction. This also aids a functional mode of conflict resolution that uses the realization of common goals and the importance of maintaining team motivation as heuristic device for diagnosing and dealing with conflicts. By the same token, conflicts over tasks will be less likely to turn into relational conflicts that are by and large highly dysfunctional.

Because the normative goal-frame is so precarious and needs to be supported with compatible individual interest goals in the background, employees need to be rewarded individually in a contingent manner so as to maintain their motivation to engage in activities directed at the realization of common goals. However, contingent rewards, such as status advancement and monetary rewards, can foster a gain goal-frame. In turn, contingent hedonic rewards, such as enjoyable tasks and better offices, can foster a hedonic goal-frame. In both cases, the normative goal-frame will be weakened, and intelligent effort will be selectively

driven by what leads to personal rewards (hedonic or gain) rather than by what contributes to the realization of common goals (Milgrom and Roberts, 1988; Meyer and Gupta, 1994; Frey and Oberholzer-Gee, 1997; Lindenberg, 2001). Thus, contingent rewards that are modest enough to keep gain and hedonic goals in the background are needed. Instruments such as financial (bonuses, extra pay), career (promotion), personal development (empowerment), symbolic (honors), or enjoyable task rewards; bigger offices; company cars; and expense accounts should remain modest (compared with non-contingent rewards) and should be modest and explicitly given as recognition of one's contribution to cooperative efforts in the team. Negative sanctions (financial or symbolic) for not contributing are likely to be legitimate in a team context and will strengthen the normative goal-frame, provided the behavior can be monitored correctly (Fehr and Rockenbach, 2003). Recognition must still be linked to some kind of measurement, which is often difficult in team contexts (Alchian and Demsetz, 1972). However, when organization and team design is calibrated to support team motivation, efforts will be more easily observable because goal setting, plans, and agreements provide multiple sources of information on individual performance and, importantly, the process of performance (that if often even more revealing about the goal-frame of the individual).

The governance arrangements for optimal team motivation take considerable time to be realized. For this reason, we speak of the longer-term success of firms. It is entirely possible that short-term instruments that boost gain and hedonic goal-frames in employees are more successful in the short run because they can be more quickly established and changed than instruments based on the normative goal-frame.

## CONCLUSION

We have proposed a return to the concern with teams that characterized the theory of the firm in its period of inception in the early 1970s. This is partly prompted by an observed return to teams as the core of firm organization. This is often argued to be driven by globalization and the liberalization of financial and other markets (which tend to shrink the boundaries of the firm; cf. Rajan and Zingales, 2000, 2001), and by advances in information and telecommunication technologies, cost accounting and measurement (which makes teams and projects more viable inside the corporate boundaries; cf. Zenger and Hesterly, 1997), as well

as by the increasing knowledge content in production (which tends to promote cooperative decision making among groups of peers; cf. Heckscher and Adler, 2006). However, recent advances in game theory, cognitive sociology and psychology, and evolutionary anthropology have highlighted this special motivation that, under the right conditions, may support cooperation in teams (Gold, 2005) and may contribute to the observed tendency for team-based organization. The integration of these ideas with the extant theory of the firm is a huge, but not forbidding, task. The main barrier is that the economics of the firm is formulated in terms of I intentions, whereas we have highlighted the importance of We intentions and the specific kind of motivation that accompanies such intentions in a team setting. It is, however, possible to align this collective focus with much of the received theory of the firm, such as its focus on discriminating alignment (Williamson, 1985).

Thus, we proffer the construct of team motivation and argued that it provides novel insight into the ‘sources of the economic surpluses in team production, and how ... they best [can] be harnessed and directed’ (Blair and Stout, 1999: 267–8). This allowed us to sketch where a focus on team motivation advances our understanding of the existence and boundaries of the firm, namely by directing attention to the specific organizational arrangements that need to be deployed to safeguard team motivation rents. These arrangements cannot be supplied by the market, partly because authority is required to deploy and administer them, and partly because they are opposed to the focus on the gain goal-frame and the need for high-powered incentives that are necessary for the market (Williamson, 1985).

From a team motivation perspective, firms arise to safeguard team motivation and its attendant rents, and their boundaries reflect this. It is surely possible to interpret this in standard terms: although team motivation resides in individuals (Bacharach, 2006), it works best if it is simultaneously present in all employees and in a coordinated way. In order to achieve an optimal level of team motivation, a specific organizational design is required. The specific asset that needs protection is thus the specific way in which the firm’s organizational design supports team motivation. However, it is worth repeating that the economic theory of the firm has no role for team production and therefore does not raise the issue of how organizations can be designed to sustain it. The more firms succeed in deploying the organizational flanking arrangements that call forth and sustain team motivation, the more

value they will create, *ceteris paribus*. In other words, our theory is potentially a theory of heterogeneity and differential corporate success (which the extant theory of the firm is not).

## NOTES

1. Note that we divorce this entirely from ethical considerations. Thus, a group of mafia members may exhibit team motivation. Team motivation, also called ‘joint production motivation’ (Lindenberg and Foss, 2011) can apply to any kind of group that endeavors to realize common goals, legitimate or not.
2. For example, there are shortcomings with respect to its treatment of authority (Williamson, 1985), its lack of applicability to diversified firms and its failure to explain why the monitor could not be an employee of a firm specialized in producing monitoring services (Hart and Holmström, 1989).
3. Holmström (1982) shows that in a team setting, there is no sharing rule that can simultaneously satisfy the criteria of Nash equilibrium, Pareto optimality, and budget balance. This ‘impossibility result’ is used to explain the separation of ownership and control in the modern corporation.
4. However, Bacharach (2006) allows for ‘circumspect team reasoning’ in an attempt to capture the possibility that some players may be in an I frame, whereas others are in a We frame, which analytically may have similar consequences.
5. Such motivation is distinct from ‘pro-social motivation’ (e.g., Penner *et al.*, 2005; Bénabou and Tirole, 2005) because the latter does not require that individuals interact in a team, adopting team reasoning. Sugden (2008: 402) hints at this when he criticizes one of the experiments in Colman, Pulford and Rose (2008) for failing to discriminate between pro-social motivation and team reasoning.
6. A recent experiment (Van den Bergh, Dewitte and Warlop, 2008) illustrates this point. One group of (male) subjects was exposed to photographs of young women in bikinis, the other was not. Subsequently, both groups were engaged in a completely different experimental task about impatience in monetary transactions. The exposure to the bikini women made subjects (at least temporarily) much more impatient in monetary transactions, even though the latter were not directly related to the former.
7. Goal-framing theory focuses on the three substantive goals just described. Other overarching goals, such as approach/avoidance or leaning/performance goals found in the literature are not rival to this approach but can differ within each one of the three goal-frames. There is no space to go into such ramifications in this paper.
8. This is obviously a functionalist account. However, it is possible to build causal-genetic accounts of the emergence of firms from a team motivation perspective. Thus, teams may form spontaneously, or they may be put together by an entrepreneur who perceives an opportunity in doing this (Harper, 2008). Bacharach (2006) suggests that the characteristics of common interest and strong interdependence (cf. our earlier discussion) are conducive

- to team reasoning, but by the same token, they may be seen as conditions facilitating the emergence of teams (Harper, 2008: 618–619). Indeed, as Bacharach (2006: 165–166) points out, these characteristics prompt ‘... the parties to see that they have action possibilities which provide joint agency possibilities which have possible outcomes of common interest ... Some actions only get conceived if one gets the idea of certain possible outcomes, and conversely’.
9. The social psychology of groups literature treats this under the rubric of ‘social loafing’, that is, the reduction in motivation and effort when individuals work collectively compared with when they work individually or coactively (Karau and Williams, 1993). As mentioned previously, social loafing is also possible when team members identify with the group but do not recognize their personal responsibility for realizing common goals.
  10. Note that although classical organization theory (e.g., March and Simon, 1958) also stress the important coordinating role of shared knowledge and the importance of clear goal, this is not related to team motivation.

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