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Culture and team production[☆]

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A B S T R A C T

This paper addresses theoretically the question whether culture has an effect on economic performance in team production, and what would be an optimal team culture. The members of a team are guided both by economic incentives and by personal norms, weighed according to their prevailing level of materialism. We assume that personal norms evolve following a dynamic driven by a combination of psychological mechanisms such as consistency and conformism. The different vectors of materialism, consistency and conformism shared by the group result in a continuum of cultures characterized by different combinations of individualism and collectivism.

Team culture turns out to be a fundamental determinant for long term group performance. When income distribution is not completely egalitarian or the members of the team display heterogeneous levels of skills, there is an optimal culture that maximizes steady state team production and its characteristics depend on the specific distribution of income and skills. A high average productivity or a less egalitarian dispersion of remuneration require a more collectivist culture, while a high dispersion of individual productivity requires a more individualist culture.

1. Introduction

According to an extensive empirical literature, differences in organizational and team culture play an important role in determining firms' performance differences.[1] Corporate culture is, together with firm size, team members' skills and revenue sharing rules, a key input for consideration in analyzing performance. Nevertheless, research generally falls short of establishing causality or determining the direction of a culture–performance relationship. In this paper we provide a dynamic theoretical framework for analyzing how the culture prevalent in a team or organization influences team performance as measured by the steady state aggregate production achieved in the long run. The main questions we try to answer are: In a team with given skill and remuneration distributions, what culture maximizes steady state team production? How does culture affect the changes in steady state team production caused by exogenous shocks on the skill and remuneration distributions?

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[1] See for instance in the management literature: Schein (1985), Kotter and Heskett (1992), and Boyce et al. (2015) among others. And more recently from economics literature: Greif (1994), Guiso et al. (2006), Tabellini (2010), and Fernandez (2013).

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Culture has been an ambiguous concept in economics, despite recent widespread acknowledgment that it is critical for performance. In many recent economic applications it is defined as group or social distribution of beliefs or personal norms (see for instance, Alesina and Giuliano, 2015; Van den Steen, 2010a; Van den Steen, 2010b).[2] An influential concept of culture especially popular outside economics defines culture as the deepest underlying values shared by the members of an organization (see, Besley and Persson, 2017; Hofstede et al., 2010).[3] A definition we adhere to. In our specific framework, we define culture as the primitive set of variables with a psychological content shared by the members of a group that shape the evolution and long term distribution of norms and behavior. The relevant cultural variables for our purposes are the levels of materialism, consistency and conformism which prevail among the team members.

We define materialism as the relative weight agents assign, when choosing an action, to economic incentives as opposed to the importance assigned to their own personal norms. Consistency and conformism relate to the psychological mechanisms behind the way agents update their own norms. Consistency implies that individual norms change towards an individual's actual behavior. Conformism changes an individual norm in the direction of peer average behavior. We find that the combination of these three parameters yields very different cultures over an important dimension: the individualism/collectivism dichotomy. According to Besley and Persson (2017), individualist agents are those who care solely about their own material payoffs, while collectivist agents are those who internalize the objectives of other members and whose values extend to the performance of the entire organization.

We consider a team production setting in which members choose their levels of effort and obtain a revenue from joint production. This joint production also depends on the team members' distribution of skills and the sharing rule used to divide the revenue among them. There is no budget-breaking principal in this team. We assume the usual team situation where individual remuneration cannot be linked to effort or to individual levels of skill because of the standard non-verifiability problems of these variables. The members of the team are guided by both economic incentives and by personal norms (regarding the level of effort to be made) weighed according to their prevailing level of materialism. Agents maximize their own instantaneous utility. At the end of each period agents update their own norms. We assume an updating process driven by consistency and conformism. This is an important departure from most usual models of team production, which only consider material incentives to promote the effort made by the members of the group.

First we show that individual effort in the long run is made by a combination of individual incentives (individual marginal revenue) and collective incentives (average marginal revenue) where the weight on individual revenue is the level of individualism in the culture. We prove that this level of individualism is the result of the main cultural variables we consider. In detail, we show that relatively high levels of consistency and/or materialism compared to the level of conformism result in an individualist team culture. On the other hand, we show that when the dynamics of norms is driven by high levels of conformism and there are low levels of materialism in the group, the result is a collectivist culture.

Then we analyze the effects of culture on long term team performance to characterize the optimal culture. We find that high individualism is optimal in egalitarian and heterogeneously-skilled teams while high collectivism is to be preferred in non-egalitarian teams, in homogeneously-skilled teams, and in more productive (with a higher average skill) teams.

Last, we study how team culture affects the impact on aggregate production of positive exogenous shocks on the mean and variance of individual productivity. In both cases we show that for some combinations of team culture and income distribution, this impact can be paradoxically negative. For instance, a positive shock in all individual productivity that increases average productivity while leaving its dispersion unchanged must be at first glance performance-enhancing. Similarly, a mean preserving spread of the group skills distribution should *a priori* result in an increase in team production because the more-skilled agents increase production more than the decrease of low-skilled. However, we show that this is not always the case. If there is some inequality in the group income distribution and an excessively individualist culture, then these positive shocks on productivity result in a decrease in team production.

The driving force behind our results is that culture, measured by the degree of individualism/collectivism of the group members, has two effects on team performance: an incentive or revenue effect and a cost effect. The final result on net team production depends on the heterogeneity of skills and/or remuneration. Individual effort in the long run is given by a mix of individual marginal revenue and average marginal revenue where the weight on individual revenue is the level of individualism of the culture. Therefore, an increase in the degree of individualism causes an increase in effort of those agents above the average marginal revenue and a decrease in effort in those below the average. Consequently, the dispersion of effort rises, increasing aggregate costs, because the increase in costs of the agents who make a greater effort is larger than the decrease in costs of those who diminish their effort. On the other hand, a more individualist culture, by relating efforts to individual marginal productivity more strictly, implies a higher covariance between productivity and effort, increasing team revenue. For similar reasons, collectivism operates in the opposite direction: lowering the (negative) cost effect while also reducing the (positive) incentive effect on revenue. The final optimal culture will therefore correspond to an appropriate mix of individualism/collectivism such that it trades-off the advantages and disadvantages of both features.

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[2] This definition of culture is used in Calabuig et al. (2017). This related paper studies the determinants of the levels of cultural homogeneity in a society.

[3] In their seminal book on corporate culture and performance, Kotter and Heskett (1992) find it helpful to think of organizational culture as having two levels... "At a deeper and less visible level, culture refers to values that are shared by the people in a group and that tend to persist over time even when group membership changes... At a more visible level, culture represents the behavior and norm patterns or style of an organization... ."