

## Chapter 8.18

# Knowledge Redundancy, Environmental Shocks, and Agents' Opportunism

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### ABSTRACT

Notwithstanding the warning of myopic view, when giving too much emphasis to the short run and stable environments, efficiency is usually claimed by standard economics as the main goal of competitive firms. This is challenged by management and organization scholars, who argue that, in presence of strong uncertainty due to environmental turbulence, slack resources can be a competitive advantage. In order to put some sound block in this debate through, this paper tests four groups of hypotheses on an agent-based model of industry competitiveness based on suppliers' quality. It innovates current literature in two ways: first, it considers redundancy in terms of organizational knowledge, and not in terms of personnel or financial assets or other types of resources, which are usually taken as object of study. Secondly, it compares the effects of two forms of perturbations: environmental shock and

opportunism. The results show that these two forms impact differently on industry profitability and that knowledge redundancy can (limitedly) compensate the effects of environmental shocks but not of opportunism. Moreover, it demonstrates that, as agents exchange (and accumulate) more information, knowledge efficiency declines, but less than proportionally to the increase of knowledge exchange.

### INTRODUCTION

The aim of this contribution is to understand the relationships between profitability and knowledge at industry and segment level. In particular, by considering knowledge as a resource, the relative (dis)advantages of knowledge redundancy is discussed in different competitive environments, with a special focus on the effects of environmental shocks and opportunistic behaviors.

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Redundancy indicates an excess of some resource respect to its minimum requirement, and thus, by definition it is the reverse of efficiency. Most phenomena can be analyzed in terms of redundancy, which can be measured in many ways. In information theory it can be measured and conceptualized in terms of signals in excess to what would be required by the receiver in order to run a certain operation. In cybernetics it could be also referred to variety in excess to that required for systems survival or to excess "copies" of the qualitative types constituting the requisite variety. In network analysis it measures the number of links over the minimum. Just to mention a few examples.

Since the traditional -and still dominant view in economics- considers firms as (almost exclusively) short run profit maximizers in a rather stable or predictable environment, redundancy should be prevented because it reduces profit margins. According to that view, efficiency and the maximum exploitation of resources is always a must. Conversely, alternative approaches argue that, in the long run with a turbulent environment, redundancy can be a competitive advantage.

Of course efficiency is a multi-dimensional phenomenon, because there are different types of resources. The same amount of total cost can be given by different combinations of resources, whose actual use can be individually more or less efficient. In other words, efficiency should be always specified in reference to a certain type of resource. In this work, the focus is put on knowledge, and hence it is questioned whether knowledge efficiency is always preferable. This choice is mainly due to the fact that, according to the knowledge based view of the firm (Conner, 1991; Conner & Prahalad, 1996; Kogut & Zander, 1992, 1996), in current and future evolution of economy, knowledge is regarded as a crucial factor of competitiveness.

However, among the many ways to categorize organizational knowledge (Amin & Cohendet, 2004; Nonaka & Nishiguchi, 2001; Nonaka &

Takeuchi, 1995; Tsoukas, 1996, 2005; von Krogh and Roos, 1996; von Krogh *et al.*, 1998; Yolles, 2006), there is one particularly pertinent for the purposes of this paper: the distinction concerning the origin of knowledge, whether from external and internal sources. In fact, the effects of the acquisition of external knowledge suffer of the lack of precision or, much worst, of scarce reliability. The first failure is mainly due to cognitive distance (Fiol, 2002; Lant, 2002) and information equivocality (March, 1997; Weick, 1995), while the latter to the combination of information asymmetry (Akerlof, 1970; Mas-Colell *et al.*, 1995; Shapiro and Varian, 1999; Stigler, 1961) and opportunism (Child, 2001; Gambetta, 1988; Hall, 1992; Humphrey, 1998; Kramer & Tyler, 1996; Lane, 1995, 2001; Lane & Bachmann, 1996, 1998; Williamson, 1975, 1981, 1985, 1994, 1996). Indeed, even the internal sources of knowledge are not completely free from these two failures, but it is reasonably to assume –as most literature does– that they markedly differ in intensity, especially in the case of small-medium size organizations. These two defects play also in regard of our issue of knowledge redundancy, which here is referred only to the acquisition of external knowledge.

The role played by various forms of opportunistic behavior between firms has been extensively investigated by transaction cost economics (Williamson, 1975, 1985, 1993), according to which if only few firms do exchange and/or its products are complex, then transaction costs raise respectively, because of opportunistic behaviors and idiosyncrasy. If this latter is kept constant, the crucial variable becomes opportunism and the attention is shifted to the methods to reduce it. One of them is by increasing the ability to distinguish between opportunist and correct agents through the acquisition (and use) of information on their behaviors. Such information can come either from direct experience or from accessing others' knowledge. However, the knowledge tool is weakened if opportunism assumes the form of cheating, because such information can be false.

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