



# Market characteristics, intra-firm coordination, and the choice of human resource management systems: Theory and evidence<sup>☆</sup>

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## ABSTRACT

This paper begins by constructing a team-theoretical model of organizational adaptation and coordination with three distinct task coordination modes: vertical control, horizontal coordination, and hybrid coordination. The model is then used to provide fresh insights on complementarities involving team work organization, communication channels, training and hiring, and other human resource management practices, and illustrate how such choice of practices is affected by the firm's output market conditions. Our econometric analysis of new data from Japan which provide up-to-date information on the adoption of new team-based instruments for a horizontal coordination system (cross-functional problem solving project teams and Self-Managed Teams) yields results that are broadly consistent with the theory. First, new team-based instruments are more likely to be adopted by firms with well-established formal shop-floor-based communication channels (such as shopfloor committees), while they are much less likely to be adopted by firms with well-established information sharing institutions such as joint labor-management committees, which presumably enhance the efficiency of the vertical control system by minimizing labor-management communication errors. Finally, firms in more competitive markets and those with a higher concentration of sales among a small number of customers are more likely to adopt both types of team, whereas firms facing more erratic price movement tend not to adopt Self-Managed Teams.

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## 1. Introduction

Much of the literature on innovative HRMPs (Human Resource Management Practices) focuses on their effects on enterprise performance. It generally finds that HRM systems with complementary practices such as teams, joint labor-management committees, and incentive pay raise productivity or other firm performance measures.<sup>1</sup>

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<sup>1</sup> See, for example, Ichniowski et al. (1997), Freeman et al. (2000), Cappelli and Neumark (2001), Hamilton et al. (2003), Boning et al. (2007), Black and Lynch (2001, 2004), and Bartel (2004) for the U.S.; Jones and Kato (1995) and Kato and Morishima (2002) for Japan; Leoni et al. (2001) for Italy; Addison and Belfield (2000), Conyon and Freeman (2001), DeVaro (2006), and Heywood et al. (2008) for the U.K.; Eriksson (2003) for Denmark; Bayo-Moriones et al. (2003) for Spain; and Zwick (2004) for Germany.

However, relatively few attempts have been made to identify under what circumstances firms adopt these new practices and how they select a particular combination of HRMPs. Prior studies are largely empirical explorations of the determinants of the adoption of HRMPs, and different authors stress different possible determinants. For instance, [Arthur \(1992\)](#) views the firm's selection of particular HRMPs as a part of its overall business strategy, and presents evidence from minimills in the U.S. that a firm is more likely to choose HRMPs promoting employee commitment and involvement in concert with business strategies focusing on product and customer differentiation (as opposed to low cost strategies). [Pil and MacDuffie \(1996\)](#) use panel data of automobile assembly plants worldwide and show that employee involvement programs are more likely to be adopted in plants with other complementary personnel policies and practices such as hiring and training policies aimed at employee ability to learn new skills and teamwork. Another econometric case study of steel finishing lines by [Ichniowski and Shaw \(1995\)](#) demonstrates that innovative and productivity-enhancing HRMPs are more apt to be adopted by "young" plants with a relatively low cost of switching from the existing old system to the new system.

Finally, [Osterman \(1994\)](#) uses nationally representative samples of U.S. establishments encompassing diverse industries to study general patterns of the adoption and diffusion of innovative work practices.<sup>2</sup> Among other things, the study reports evidence on a relationship between the adoption of HRMPs and exposure to global competition, which is closely related to one of the key findings of this paper.

Evidence on the incidence of new innovative work practices is even more limited outside of the U.S. [Jirjahn \(2002\)](#) applies a similar methodology used by [Ichniowski and Shaw \(1995\)](#) to his German establishment-level data and identifies a number of key determinants of the adoption of innovative HRMPs by German firms. One of Jirjahn's key findings is that innovative HRMPs are more apt to be adopted by firms that rely on international markets for their products, yet less likely to be adopted by firms that consider domestic market share a primary goal. [Brown et al. \(2007\)](#) use Australian establishment-level data (Australian Workplace Industrial Relations Survey) and report evidence pointing to the importance of long-term employment relationships between the firm and workers as a significant complement to employee involvement programs. For cross-country comparative studies, [Poutsma et al. \(2003\)](#) use a survey of firms in ten EU members and stress the importance of country specific factors as determinants of the adoption and diffusion of participatory employment systems. Finally, on Japanese firms, [Jones and Kato \(1993\)](#) find that firms are more likely to adopt employee stock ownership plans when recent business performance is below average, the capital/labor ratio is relatively low, and employment growth is relatively fast. More recently [Kato \(2006\)](#), using firm-level data from Japan, shows that the employment system consisting of complementary HRMPs evolves significantly over time, pointing to the importance of a more dynamic view of HRMPs, which we will take up in this paper by examining why some Japanese firms add new forms of team-based HRMPs to the existing participatory employment system while others do not.

By reviewing the literature on the adoption of HRMPs, we are struck by the relative scarcity of coherent and testable theories on the firm's choice of HRMPs. [Milgrom and Roberts \(1990\)](#) demonstrate how we can apply Topkis's framework of monotone comparative statics to a study of complementarities among the firm's choice of technology and practices, using a very important application to flexible production system vs. mass production system. Their approach, however, neglects the information-processing nature of the organization and the resultant need for coordination, which we believe are the key mechanism that explains many differences in HRMPs among firms. Information-processing models of organizational architecture based on team theory ([Marschak and Radner, 1972](#)) have been employed by [Aoki \(1986, 1990\)](#) and [Carter \(1995\)](#). Both works illustrate important tradeoffs among organizational modes: bounded rational control (prior planning) vs. imperfect horizontal coordination (ad hoc adaptation based on posterior information) in [Aoki \(1986, 1990\)](#) and among seven organizational forms (routine, marketing dominated, production dominated, marketing-led, production-led, centrally-managed, pooled information) which differ in the degrees of information aggregation and their information sharing schemes in [Carter \(1995\)](#). Their implications for the evolution of organizational architecture are rather limited, however, because the relative efficiency of each organizational mode depends on unknown parameters which are hard to observe or interpret: rate of learning-by-doing and interdependency among units in [Aoki \(1986, 1990\)](#) and organizational costs treated as black-box in [Carter \(1995\)](#).

We believe that the literature has been mostly silent on the potentially important interplay between modes of task coordination within the organization and its choice of bundling of HRMPs. Moreover, as contingency theory in organizational behavior (developed in the 1960s) stresses, a firm's technological and output market conditions may play a crucial role in determining the firm's choice of a specific mode of task coordination within the organization, and hence its selection of a specific HRM system (provided there is an important link between task coordination modes and HRM systems).<sup>3</sup>

<sup>2</sup> For other econometric case studies, see [Boning et al. \(2007\)](#) on the steel industry and [Chi et al. \(2007\)](#) on manufacturing firms near Minneapolis. For other cross-industry studies, see [Blasi and Kruse \(2006\)](#) and a recent NBER working paper which uses a representative sample of U.S. establishments including both manufacturing and non-manufacturing ([Lynch, 2007](#)).

<sup>3</sup> The literature of contingency theory in organizational behavior attempted to make a connection between the varying technical and economic conditions outside an organization and the pattern of organization and administrative architecture that exhibit successful performance. Early works generally found that when the environment and task of the organization were certain and predictable then centralization and formalization were appropriate, but when they were uncertain and unpredictable then decentralization and lack of formalization were required. For example, [Burns and Stalker \(1961\)](#) concluded from their research on 20 English manufacturers that the more rapidly a firm's technological and market environment was changing, the more flexible or "organic" its structure tended to be. Essentially similar conclusions were reached by [Lawrence and Lorsch \(1967\)](#) in their study of 12 large American firms. Subsequent studies on contingency theory, however, seem to have lost interest in the role of purely economic and market conditions in shaping

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