

Complementary choices and management control: Field research in a flexible production environment

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Abstract

This paper examines the complex relations between the production environment and management control system design. The complementarity principle is used to develop a theoretical framework for the field research. The devised framework identifies production characteristics that are relevant for management control system design and specifies the design in a flexible as well as a conventional production environment. Overall, the empirical evidence provided by three case studies is consistent with the predictions made in the framework. The results show that the management control system of the company operating in the most flexible production environment matches best the specified flexibility-complementing design. In addition, the high level of change with regard to non-complementary design aspects and the observed direction of these changes lend support to the stated expectations. However, the findings revealed by one case study demonstrate an apparent lack of complementarity and give insight into the related struggle within this company to improve the situation. The paper ends with a discussion of the opportunities and limitations of the described contributions.

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1. Introduction

The current fast-paced business climate and the vast amount of opportunities created by technological progress are forces driving many firms to transform their production environments. In these firms, the focus of the production strategy changes and emphasizes market conditions such as product assortment, quality

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and delivery performance. The production organization becomes more flexible, while the equipment and machinery that are used become more technologically advanced. The transformations into a flexible production environment are generally expected to have implications for management control systems. The value of alignment between the production environment (PE) and the management control system (MCS) of an organization has been discussed by many accounting researchers (e.g., Kaplan, 1983; Howell and Soucy, 1987; Daniel and Reitsperger, 1991; Hemmer, 1996). The relevance of empirical research on how performance measures and reward systems may be used to support particular operational strategies and new production philosophies has been emphasized by Langfield-Smith (1997). There have been already several empirical studies on the link between production strategy and control system design. Nevertheless, a lack of knowledge in this area may still be noted, especially with regard to how these variables work together to determine performance (Sim and Killough, 1998; Ittner and Larcker, 2001). A specific problem with most empirical work in this field is that it typically assumes a sequential process, which may not be sufficient to capture the complex nature of the relations between the production environment and MCS design (Ittner and Larcker, 2001).

This paper draws on the complementarity principle in order to examine how production environment elements and design features of the management control system work together in practice. Activities are considered complements if they are related in such a way that when the level of one activity increases, then the marginal return to any of the other activities increases. Milgrom and Roberts (1990, 1995) use this principle to explain the effects of changing various elements of the production environment. For example, having a flexible production strategy and using flexible technology are complementary actions: each is more valuable when done with the other. The authors use the notion of complementarity to demonstrate the interdependencies between elements of the production environment. Their application of the complementarity principle offers the opportunity to study many related variables and their mutual interdependencies. It also puts forward a theoretical basis for the distinction between conventional and flexible production environments. This distinction is determined by the design choices with regard to production strategies, technologies and organizational forms (Milgrom and Roberts, 1990). According to Drake et al. (1999), research on complementary choices within accounting and control is beginning to appear. An important attribute of research on complementary choices is the assumption of reciprocal interdependencies between characteristics of the accounting and control system and other organizational characteristics. All these characteristics are determined jointly and not sequentially. Drake et al. state that accounting and control systems appear to offer rich ground for future study and that factors that contribute to complementary management choices are not well understood. This paper aims to provide a deeper insight into the complementarities between production environment elements and management control aspects.

The study uses a theoretical framework that builds on the dichotomy of the conventional versus the flexible production environment. Drawing on the notion of complementarity, the framework identifies PE elements that are relevant for MCS design. It then specifies a complementary MCS design for a conventional as well as for a flexible production environment, with particular regard to performance criteria, the evaluation process and the reward system. In a flexible environment, more decision rights are likely to be placed at lower levels and the subsequent need for more horizontal as well as vertical information sharing is expected to affect the MCS design. The field study was conducted in three companies chosen from different industries. The findings suggest that firms differ in the extent to which they have adopted a flexible production approach and a flexibility-complementing MCS design. The levels of complementarity encountered in the three case studies also seem to vary. Comparisons and contrasts made

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