

## Chapter 4

# Measuring the Financial Benefits of IT Investments on Coordination

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*We know from the information processing perspective within the theory of organizations that IT can reduce coordination costs by increasing an organization's information processing capacity. Purpose of this chapter is to empirically examine the relationship between greater investments in information technology and lower coordination costs on firm-level data. Two high-level measures of coordination costs are defined based on the information processing perspective within the theory of organizations. Our hypothesis that greater IT investments should be correlated with lower coordination costs is tested with both measures on longitudinal data from a cross-sectional sample of 18 large Italian companies over an 8-year period between 1988 and 1995. Results on this sample seem to support our hypothesis by showing a significant and negative correlation both aggregately and on sub-samples of data clustered by industry.*

IT benefits are often objectively difficult to quantify, since they affect aspects of performance, such as responsiveness and flexibility, which cannot be assessed in terms of direct measures such as cost reductions or productivity improvements. These objective difficulties in assessing the benefits of IT investments have been addressed in a number of different ways. For example, to support individual investment decisions, cost-benefit analysis has at-

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tempted to de-emphasize quantitative criteria in favor of qualitative ones (cf. Parker et al., 1988; Willcocks, 1992). A qualitative approach to investment justification has been proposed not only on the basis of the intangible nature of IT benefits, but also on the interdependencies among different investments. The returns of an investment can be either made contingent on, or possibly amplified by, the successful realization of other investments and are thus difficult to quantify in isolation. On the other hand, these interdependencies also suggest that benefits may be apparent at an aggregate level. Some authors have noted that, although individually intangible, benefits from different investments are captured by firm-level economic indicators which are influenced by overall IT expenditures (cf., Roach, 1989; Roach, 1991; Strassmann, 1990). This research takes this last perspective and researches aggregate measures of IT returns.

Much of the research taking this perspective has relied on analyses that tie IT investments to firm economic performance through indicators such as financial ratios (Loveman, 1988; Roach 1989; Roach, 1991; Weill, 1992; Brynjolfsson and Hitt, 1993; Venkatraman and Zaheer, 1990). As recently surveyed by different authors (Smith and McKeen, 1993; Brynjolfsson, 1993; Blyth, 1995), empirical research using these indicators has failed to provide conclusive evidence suggesting increased business performance related to higher IT investments. Some authors have found a weak or negative correlation between investments and performance (Loveman, 1988; Strassmann, 1990; Cron and Sobol, 1983; Weill, 1992; Venkatraman and Zaheer, 1990). Other studies suggest, on the contrary, a positive correlation (cf., Brynjolfsson and Hitt, 1993; Harris and Katz, 1991; Siegel and Griliches, 1991; Alpar and Kim, 1990; Krueger, 1993). A number of explanations have been advanced to try and reconcile or explain the inconsistency between these different findings. For example, in some cases, IT can be considered a necessary condition for a company to remain competitive, rather than an opportunity to increase its performance. Alternatively, IT could be beneficial to individual firms, but at the expenses of other competitors, thus resulting in tentative findings at an industry level.

This chapter focuses on the possibility that conflicting results have occurred partly due to inappropriate measures of both investment and performance variables (cf., Brynjolfsson, 1993). Smith and McKeen (Smith and McKeen, 1993) note that IT contributes to performance either by increasing the productivity of labor or by generating revenue through the creation of new products and services. Most of previous research works have relied on traditional indicators of business performance that provide assessments of productivity. For example, ROI provides indications of a company's produc-

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