

## **IT INVESTMENTS AND FIRM PERFORMANCE**

### **An Analytic and Empirical investigation**

**PhD Thesis**

**Maria Federica Izzo**

**Dottorato in Sistemi Informativi Aziendali XX Ciclo**

**- Abstract -**

As managers experience more volatile marketplaces, global competition, shortened product life cycles, customer pressures for tailored offerings and tighter performance standards, they increasingly depend on new information systems (IS).

The IS components in business solutions must be constructed rapidly and effectively despite the massive changes in IT product capability, a restructured supply industry, potential shifts in system development approaches, and new ambiguities in terms of what should be regarded as a business-side versus a technical specialist task (Feeny and Willcocks, 1998).

We draw on the Resource based view theory (Penrose, 1959; Barney 1986, 1991; Grant, 1991; Wernerfelt, 1984) to examine how investments in information technology (IT) affect firm performance.

Moreover, we want to understand through which paths this effect works.

The results of past studies are inconclusive. Some of these studies have found little or negative impacts of IT on firm performance, measured as productivity, financial performance, consumer value, etc. (Barua et al., 1995; Weill, 1992; Barua et al., 1995; Dos Santos et al., 1993; etc.); while others have identified significant positive impacts (i.e. Bharadwaj et al., 1999; Thatcher and Pingry, 2004, etc.).

We assume that IT investments have not a direct impact on firm performance, but coherently with the resources complementarity argument (Clemons, 1988; Floyd and Wooldridge, 1990), we propose a model that interrelates IT decisions, IT changes, in Inside-out and Outside-in Capabilities of the firm, process performance and, only at the last step, firm performance.

According to Barua et al. (1995), nowadays, trying to understand the real usefulness of IT, a perspective switch, from the black box approaches to the process oriented model approaches, is

---

necessary. The only way to measure the IT impact on performance (if it finally exists) is to study all the prior value passages occurred at lower operational level in a firm, where, really, the technology is implemented.

In particular, we expect that the IT investment can have an impact on firm financial performance only through two intermediate and correlated steps: changes in capabilities and changes in process performance.

Support for our claim that the relationship between IT investments and firm performance is partially mediated by organizational changes stems directly from the resource-based perspective.

The Resource based view (RBV) argues that durable competitive advantage emerges from unique combinations of resources (Grant, 1991) that are economically valuable, scarce and difficult to imitate and substitute (Barney, 1991). As these resources are imperfectly mobile across firm boundaries and because firms pursue different strategies in deploying these resources, they are likely to be heterogeneously distributed across firms. Firm resources are insulated from competitive imitation by path dependencies, embeddedness, causal ambiguity and time diseconomies of imitation (Barney, 1991; Mata et al., 1995). In this frame, our thesis is that in an enterprise, trying to detect and measure the effects (if any) of IT investments, the first focus must be the process changes caused by the IT implementation, and only then the study can move toward financial indicators.

The model is empirically tested using organizational and process data collected from a survey analysis (questionnaires about key factors that enable companies to maximize the return on IT investments) and also using financial data collected from two of the major data banks of Bureau van Dijk Electronic Publishing (Osiris and Amadeus).

Due to the number of questions and the large amount of variables for each macro-section of the questionnaire, our necessities (condense the available information and avoid any loss of information) were faced using the factor analysis (performed through the SAS program) and verifying the reliability and validity of the constructs and the existence of a relationship (checked using PLS-graph software).

The hypothesis tested follow:

- (a) IT investments, reflected by the IT Penetration, leads to enhanced Financial Performance;
  - (b) IT investments, reflected by the IT Penetration, exert a positive impact on Process Performance;
  - (c) Process Performance exerts a positive impact on Financial Performance;
  - (d) The positive impact of IT Penetration on Process Performance is mediated by changes in Inside-Out and Outside-in Capabilities;
-

- (e) IT decisions exert a positive impact on Process Performance;
- (f) The positive impact of IT Decisions on Process Performance is mediated by changes in Inside-out and Outside-in capabilities.

The results provide strong support for the research model and leading to different conclusions. First of all, the direct link between IT investments (measured by IT Penetration) and Firm Performance (measured by ROA) has not a statistical relevance and doesn't explain the variation in firm performance. Moreover, Process Performance recovers a moderator role in the relationship between IT Penetration (or IT investments – IT Penetration, Degree of IT Outsourcing and IT Centralization) and Financial Performance. Finally, the positive impact of IT Decisions on Process Performance is mediated by changes in Inside-out and Outside-in Capabilities. Another aspect of our research suggests that firm size, introduced in our model as a control variable, has no effect on the relationships tested.

These results, from a managerial perspective, may be useful to understand how investments in IT affect not only the final results of a firm but firstly the bottom line, caused changes in internal and external firm capabilities at organizational and process level.

Furthermore, managers need to have a better understanding of the impact of IS on the organisational infrastructure and performance. Such understanding can help an organisation better utilise resources and improve its competitive position.

On the other hand, failure of such understanding may have disastrous consequences such as inappropriate resource allocation and result in a competitive disadvantage.