

9 July 2011

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ISBN: [978-1-86435-644-1]; Doctoral consortium paper

Recommended Citation

Lazic, Miroslav, "IT Governance And Business Performance - A Resource Based Analysis" (2011). *PACIS 2011 Proceedings*. 103.
<http://aisel.aisnet.org/pacis2011/103>

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IT GOVERNANCE AND BUSINESS PERFORMANCE

A RESOURCE BASED ANALYSIS

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Abstract

This dissertation project aims at developing a theory-based model that explains the positive impact of IT governance on the business performance of the firm. The research takes the perspective of the resource based view of the firm and integrates the economic theory of complementarities as well as the concept of relatedness. The increase of business performance is rooted in the generation of sustainable competitive advantage. The model is grounded on a thorough literature review and has been developed in eleven exploratory case studies with senior IT executives of major multinational corporations. The results propose that IT governance is positively related to business performance through the mediators IT relatedness and business process relatedness. It is argued that the latter two are complementary in the sense that they do not only increase business performance independently, but provide additional value if available in combination.

Keywords: IT Governance, Business Performance, Resource Based View, Theory of Complementarities, Resource Relatedness.

1 PROBLEM STATEMENT

The fundamental importance of information technology (IT) in today's business operations can hardly be refuted. While IT spending is constantly rising, the continuous debate surrounding the IT productivity paradox has decreased (Melville et al. 2004; Remenyi et al. 2007; Turban 2008). In 2009, IT costs represented an average of 4.1% of revenue within corporations (Gartner 2011b). This can represent over 50% of the annual capital investments (Weill and Ross 2004). Gartner further expects that worldwide IT spending will surpass \$3.6 trillion in 2011, which accounts for a 5.1% increase from 2010 (Gartner 2011a). Following a recent article in the Wall Street Journal, 87% of business leaders believe that information systems (IS) are critical to strategic success (Chen 2010; Worthen 2007).

These numbers explicitly show that IT has become crucial for the support, sustainability and growth of businesses. With yearly IT costs exceeding \$1 billion in large multi-national corporations (Gartner 2011a), the impact of the governance of this asset on business performance is undisputable (Csaszar and Clemons 2006). IT governance (ITG) is a key enabler and success factor for business performance itself (De Haes and Van Grembergen 2009). Weill (2004) even argues that ITG can account for a 20% increase in profits.

Boosted by the passage of the Sarbanes-Oxley Act in 2002, many organisations started with the implementation of ITG, but academic research within this area is still in its early stages, with theoretical models explaining the impact of ITG on business performance being unavailable (De Haes and Van Grembergen 2009).

In face of this significant lack of research, this dissertation project aims at opening the black box of the relationship between ITG and business performance, which leads to the central research question:

How are IT governance and business performance related?

Analysing the relationship between ITG and business performance will contribute to theory within two domains: On one hand the body of knowledge on ITG and on the other the applied theoretical lens itself, which is the resource based view (RBV) on IT business value (ITBV) creation.

This dissertation project aims at providing a fundamental theoretical contribution to the area of IT governance with a model that is the first to analyse and explain the relationship between ITG and business performance in detail. This model intends to show what the direct impacts of ITG are, how these create value and how this value can generate sustainable competitive advantage. By drawing on profound theories from reference disciplines, the presented research endeavour is to provide a second prominent contribution to the ITG domain as it lays the basis for the formulation of a generalisable body of knowledge concerned with value creation through ITG.

While Melville et al. (2004) state that the RBV is missing the necessary underlying mechanism which assures that IT as a resource is applied to its best use (Rivard et al. 2006), this research endeavour proposes that this mechanism can be found in a good application of ITG. Closing this research gap would be a major contribution to the resource based view. The research endeavour further has direct implications for practice. By showing what ITG can generally achieve, and what is to be considered within every ITG implementation, the outcomes can serve as a basic frame for planning and implementing ITG in practice. Today, the latter happens based on best practices and intuition, as no explanatory model of ITG value creation is available.

2 RESEARCH DESIGN

The epistemological stance of this dissertation project is positivist, based on the assumption that reality exists independently of human consciousness and cognition (Orlikowski and Baroudi 1991). Although the object of analysis is clearly determined as the organization that implements ITG, this research endeavour acknowledges that organizational behaviour is influenced by individual action. The research project follows a qualitative research design which is deemed promising in order to

answer the question of how ITG and business performance are related (Yin 2009). This dissertation project comprises three sequential stages.

The completed first stage was exploratory in nature and included a thorough review of IS and non-IS literature as well as eleven exploratory case studies with organisations currently implementing or refining ITG. To guarantee comparability of the results, all firms were large and globally active corporations. Making sure the observations were not industry specific, the data was gathered from various sectors. The perspective taken was that of the top management; only CIOs and heads of CIO offices were interviewed. The number of case studies carried out was decided upon according to Eisenhardt's (1989) recommendation for theory building. In order to guide the expert interviews preliminary conceptualisations of the basic constructs IT governance and business performance were derived from existing literature (Eisenhardt 1989). The expert interviews were transcribed and analyzed in-depth through coding relevant text passages and making sense of the emerging concepts (Miles and Huberman 1994). The gathered information resulted in more than 82,000 words of qualitative data. Table 1 gives an overview of the conducted case studies.

#	Case Company	Sector	Core Business	Turnover 2009	Bal. Sheet 2009	Interview Partner(s)
1	ALPHA	INDUSTRY	Manufacturing	> €30 bn		CIO
2	BETA	INDUSTRY	Chemical industry	> €30 bn		CIO, head of controlling, head of IT services
3	GAMMA	INDUSTRY	Chemical industry	> €30 bn		Head of CIO office
4	DELTA	INDUSTRY	Manufacturing	> €30 bn		CIO
5	EPSILON	INDUSTRY	Chemical industry	> €5 bn		Head of CIO office, head of quality management
6	ZETA	SERVICE	Media	> €10 bn		CIO
7	ETA	SERVICE	Communication	> €30 bn		Division CIO
8	THETA	SERVICE	Transportation	> €10 bn		Head of CIO office
9	IOTA	FINANCE	Property, infrastructure and public finance		> €350 bn	CIO
10	KAPPA	FINANCE	Finance and insurances		> €350 bn	CIO
11	LAMBDA	FINANCE	Property, infrastructure and public finance		> €350 bn	Head of CIO office

Table 1. Case companies

In the second and current phase of the dissertation project, the insights gained from the exploratory case studies were then compared again with the relevant existing literature in order to develop a theoretical framework that analyses and explains the relation between ITG and business performance. In order to provide a comprehensive but parsimonious explanatory model, the goal is to define, connect, and extend the preliminary constructs and integrate them with the relevant identified ones, which are mediating the relationship between ITG and business performance within the case studies. This approach is in line with Eisenhardt (1989) and helps to build a model that is based on empirical data as well as a rigorous theoretical background.

The evolving framework will be substantiated empirically and enriched with emerging moderating effects in the third and last phase of the dissertation project. This phase is scheduled from July 2011 to March 2012. Allowing both, analytical generalisation (Yin 2009) and theory refinement, this phase will comprise ten to twelve confirmatory case studies of comparable corporations. By substantiating the constructs that emerged throughout the study, the explanatory model will be made amenable to quantitative theory testing (Eisenhardt 1989).

3 THEORETICAL FOUNDATION

3.1 IT governance

IT governance has become an important topic in practice and research in recent years (De Haes and Van Grembergen 2009). Brown and Grant (2005) and Webb et al. (2006) provide a thorough analysis of the existing literature on ITG, illustrating the evolvement of the research field and the prevailing definitions of the term ITG. They point out the diversity of topics that are collected under the umbrella term ITG. These are: strategic alignment, delivery of business value through IT, performance management, risk management, control and accountability. Bearing the wide field of ITG in mind, it is not surprising that several definitions are in use. In recent decades, research in what is now called ITG has focused mainly on the locus of control and governance structures (Boynton and Zmud 1987; Burlingame and John 1968; Ein-Dor and Segev 1978; Golub 1975; Jelinek 1977; Jenkins and Santos 1982; Keen 1981; King 1983; Olson and Chervany 1980; Rockart et al. 1979; Von Simson 1995; Wetherbe 1988; Zmud et al. 1986), contingency analysis (Ahituv et al. 1989; Allen and Boynton 1991; Boynton et al. 1992; Brown 1997; Brown 1999; Brown and Magill 1998; Dixon and John 1989; Ein-Dor and Segev 1982; Henderson and Venkatraman 1993; Olson and Chervany 1980; Sambamurthy and Zmud 1999; Tavakolian 1987) and the combination of these two streams (Brown and Grant 2005; Weill 2004). Despite the great practical value of this research, the outcomes and models developed within these research streams are often descriptive and prescriptive, and mostly lacking a solid theoretical foundation.

Theoretical models explicitly dealing with ITG are scarcely available. Recent exceptions consider ITG mainly in relation to business/IT alignment (BITA), which in turn is understood in relation to business performance (Sabherwal and Chan 2001). Such examples are De Haes and Van Grembergen (2009), Silva and Chaix (2008), Cszaszar and Clemons (2006) or Luftman et al. (2008). Although a very important first step, this is still inadequate, as ITG is only one out of six major input factors of BITA (Luftman et al. 2008), while BITA is not the only desired effect of ITG. Therefore, the relation between ITG and business performance should be analysed separately from the very complex concept of BITA. ITG furthermore comprises both, preservation and generation of value, and both can lead to higher business performance. This dissertation project is clearly focused on the value generating component.

Within this dissertation project, ITG is regarded in line with Weill (2004, p.2) as “*specifying the framework for decision rights and accountabilities to encourage desirable behavior in the use of IT*”. Following Peterson (2003), a clear distinction between ITG on top-management level, and IT management on the operational level, is crucial. De Haes and Van Grembergen (2009) introduced and validated an operationalisation of the construct of *IT governance* as varying in *maturity* and being a combination of structures, processes and relational mechanisms as defined by Peterson’s (2003).

3.2 IT business value from a resource based view

Being hard to define, *IT business value* (ITBV) was one of the most discussed topics within IS literature in the last two decades. One major perspective for the analysis of ITBV is the *resource based view* of the firm (RBV), which regards the firm as a bundle of resources including assets, humans, knowledge and processes. The RBV is based on the fundamental assertion that resources can be heterogeneously distributed among competitors, and that some of these resources are imperfectly mobile and thus can provide sustainable competitive advantage (Mata et al. 1995).

The growth of the firm is both facilitated and limited by the search for the best usage of available resources (Rivard et al. 2006). This activity can generally be equated with the act of good governance. The eventual goal of ITG, in line with Weill’s (2004) definition, is the best possible application (usage) of IT, which in turn is defined by Mata et al. (1995) as a resource of the firm. The RBV can therefore be regarded as the appropriate theoretical lens and basic frame for a research endeavour on

ITG and its impact on business performance. Melville et al. (2004) provide a thorough RBV-based analysis of the ITBV and conclude that the value creation occurs through the enhancement of business processes and is dependent on several factors like complementary organisational resources.

3.3 Synergy, relatedness and the theory of complementarities

The concept of *synergy* is divided in terms of *super-additive value* and *sub-additive cost*. The former is defined if the joint value of two business units is greater than the sum of their individual values (Davis and Thomas 1993), whilst the latter arises if the use of common factors of production reduces joint production costs (Teece 1982). It is a key proposition in strategic management that synergies among businesses increase the overall performance of the firm (Goold and Luchs 1993). However, the examination of the link between synergy and performance becomes problematic, as the latter itself is often defined in terms of super-additive value or sub-additive costs. Consequently, a tautology arises: if synergies are feasible, they must be observable in terms of super-additive value or sub-additive cost, which in turn is the definition of synergy (Tanriverdi and Venkatraman 2005). Focusing on sources of synergy instead of synergy per se, provides a solution (Davis and Thomas 1993).

The central source of synergy is regarded to be *resource relatedness*, which refers to the presence of shared resources and similar activities across business units of the firm (Davis and Thomas 1993). Building on the RBV, it is argued that the sharing of strategic resources across business units creates synergies, which in turn improve the overall business performance (Robins and Wiersema 1995). While the sharing of mutually independent resources supports firms in achieving sub-additive costs, it is not sufficient to achieve super-additive values. According to the *theory of complementarities* (TOC) (Milgrom and Roberts 1995), the generation of super-additive value requires the combination of resources which are complementary. Resources are defined as *complementary*, if the increase of one resource increases the return of the other (Harrison et al. 2001; Milgrom and Roberts 1995).

To sum up, the relatedness of complementary resources helps multi-business firms to achieve sub-additive costs and super-additive value. Sub-additive costs coming from relatedness are imitable, and can only lead to temporary competitive advantage. Super-additive values from a complementary set of resources with high relatedness, however, are imperfectly mobile and hence not easily imitable; therefore, they are a potential source of sustainable competitive advantage. In this dissertation project, the construct *business performance* is used as shown by Sabherwal and Chan (2001), and its increase is reasoned in line with Tanriverdi (2006) with the generation of *sustainable competitive advantage*.

3.4 IT relatedness

Tanriverdi (2006) derives the concept of *IT relatedness* which he defines as “*the extent to which a multi-business firm uses common IT resources and common IT management processes across its business units*”. Examining the relation between IT relatedness and corporate performance, Tanriverdi (2006) showed that relatedness of single IT resources leads to sub-additive costs, while relatedness of complementary IT resources generates super-additive values and thus increases business performance.

4 DEVELOPMENT OF A THEORETICAL FRAMEWORK

Based on the literature research and the case studies, a theoretical framework has been developed that aims at explaining how ITG and business performance are related and how this relationship is moderated between the two constructs. The framework is depicted in Figure 1 and discussed subsequently. Table 2 provides definitions for the key constructs of the framework.

4.1 The impact of IT governance

As a common theme throughout all analysed companies, the consolidation of the IT infrastructure and application landscape has been found to be one of the primary goals, after initiating activities of the

implementation of ITG. GAMMA, with low ITG maturity (ITGM) and LAMBDA (medium ITGM) have pointed out that before implementing ITG, there was no informed or responsible body for company-wide decisions concerning IT, hence no mutual actions were possible. This impression is further illustrated by the cases of DELTA (low ITGM), which started its ITG implementation two years ago and is currently setting up ITG processes and structures. Its CIO explained that a common IT infrastructure is the basis for all strategic considerations concerning IT. Consequently, the harmonisation of desktop solutions, WANs and data centres will be pursued over the next years. The next step will focus on applications and IT management practices. ZETA, still without mature ITG, substantiated the impression of a link between ITG and consolidation of IT, given that the IT landscape was absolutely dismembered and the CIO drew its primary information about systems in use from the bills and orders he had to sign-off. Partly during the process of the consolidation of infrastructure, the harmonisation of the application landscape and the IT management processes was regarded as the natural next step in the regarded case companies. Empirical examples have been provided by KAPPA and LAMBDA (both with medium ITGM) that are in the process of application consolidation. Both companies described how they see potential for value provision provided by a harmonised application landscape. THETA (medium ITGM) added that harmonisation is not only about cost saving, but that a harmonised application landscape provides new opportunities, for example seamless services for the customers.

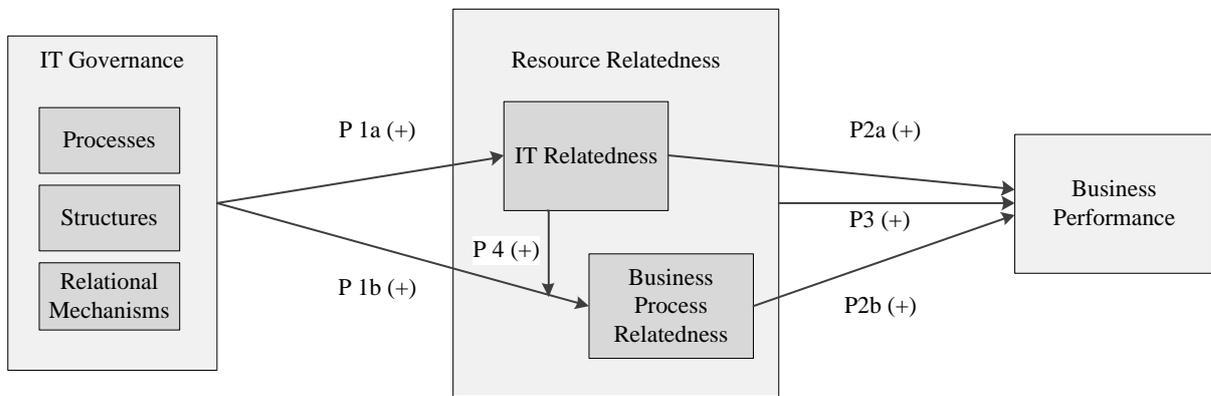


Figure 1. Theoretical framework

Construct	Definition	Sources
Business Performance	Combination of (1) reputation among major customer segments, (2) frequency of new product or service introduction, (3) return on investment, (4) net profits, (5) technological developments and/or other innovations in business operations, (6) product quality, (7) market share gains and (8) revenue growth.	(Sabherwal & Chan, 2001), (Venkatraman, 1989), (Chan et al., 1997), (Venkatraman & Ramanujam, 1986), (Dess & Robinson, 1984)
IT Governance	Framework for decision rights and accountabilities to encourage desirable behaviour in the use of IT. Viewed from a top-level perspective and regarded as a combination of processes, structures and relational mechanisms.	Based on (Weill, 2004), (ITGI, 2003), (Peterson, 2003), (De Haes & Van Grembergen, 2009).
ITG Processes	Formalisation and institutionalization of strategic IT decision making or IT monitoring procedures.	(Peterson, 2003), (De Haes & Van Grembergen, 2009)
ITG Structures	Structural (formal) devices and mechanisms for connecting and enabling horizontal, or liaison, contacts between business and IT management (decision-making) functions.	(Peterson, 2003), (De Haes & Van Grembergen, 2009)
ITG Relational Mechanisms	Active participation of, and collaborative relationship among, corporate executives, IT management, and business management.	(Peterson, 2003), (De Haes & Van Grembergen, 2009)
Resource Relatedness	The use of common resources (i.e., common factors of production) across business units.	(Davis & Thomas, 1993)
IT Relatedness	Usage of common IT resources and common IT management processes across business units.	(Tanriverdi, 2006), (Tanriverdi & Venkatraman, 2005), (Campbell and Goold, 1998), (Milgrom & Roberts, 1995)
Business Process Relatedness	Usage of common business processes across business units.	Based on (Davis & Thomas, 1993), (Tanriverdi, 2006), (Campbell and Goold, 1998).

Table 2. Definitions of constructs employed

An explanation of these empirical observations can be found in the RBV. The implementation of ITG provides many companies for the first time a platform for company-wide information aggregation, analysis and discussion, which in turn allows for mutual and sensible decision making. Since IT is one

of the fundamental resources of the firm, management will utilize the available information and related control structures in order to fully exploit it and achieve the maximum output that can be generated by that particular resource (Barney 1991). Since resource relatedness is a major source of synergies in multi-business firms, it will be pursued by management with zeal. Consequently, to sum up, the more mature ITG is, the more capabilities are available for company-wide information gathering and decision making concerning the resource IT. This includes the possibility to raise IT relatedness and thus achieve synergies and as a consequence higher profits.

Proposition 1a: The higher the maturity of IT governance processes, structures and relational mechanisms, the higher the IT relatedness.

The three case companies ALPHA, BETA and EPSILON were operating on a high level of ITGM and reported coherently high IT relatedness. ALPHA, which reported that ITG has been a topic of interest since the beginning of the nineties, explicated that its data centres and infrastructure are consolidated in a way that it takes less than three hours to update more than 200,000 PCs world-wide. BETA explained that they achieved such a high relatedness of IT, that they only need less than four to six months to fully integrate a major competitor after an acquisition.

All three top performing case companies referred to business processes and the harmonisation of these as the primary concern of ITG. The CIO of ALPHA stated: *“If you start off with harmonising IT, that’s fine, you will achieve synergies, but you get the really big synergies if you look at business processes.”* ALPHA explained that after almost 20 years of controlled ITG campaigns, they came to a point where the further optimisation of the IT support for the company has been only possible in interdependence with the reengineering of the supported business processes. The IT slogan of ALPHA, *“one solution for one problem”* was actively advocated to the business. BETA reported very similar experiences: *“Within the HR, for example, we are trying to align the processes Europe-wide and explain that if Spain, Italy and Germany keep running their own processes, not only the development of the HR application is a problem, but we constantly get overlapping and clashing change requests. The system becomes extremely complex and problematic to maintain.”* As a result, the top-performing CIO departments stated that for a better IT support of the firm as whole, the next step must be a harmonisation of the supported processes itself.

Since business processes are regarded as resource arrangements of a company (Barney 1991), the study ties in with the previous line of argumentation, which is based on the resource based view, the notion of synergies and the relatedness of resources as a source of these. It can therefore be argued that business process harmonisation in general will be pursued by management, as it leads to better performance. Therefore this study proposes in the following, based on the previous argumentation that ITG not only drives the consolidation of the IT landscape and IT management procedures. In a second step, mature ITG provides a leveraging tool to the management to further harmonise IT-supported business processes themselves. To model this relationship, the construct *business process relatedness* is defined based on the concept of resource relatedness (Davis and Thomas 1993; Tanriverdi 2006) as *the extent to which a multi-business firm uses common business processes across its business units.*

Proposition 1b: The higher the maturity of IT governance processes, structures and relational mechanisms, the higher the business process relatedness.

Since a common IT landscape was continuously described in the collected data as a basis for ITG-driven business process harmonisation, this study further proposes:

Proposition 4: The higher the IT relatedness, the stronger the proposed positive effect between IT governance and business process relatedness.

4.2 Performance effects of resource relatedness

Tanriverdi (2006) showed that IT relatedness is positively correlated to business performance, which he argues to be a result of the generation of sustainable competitive advantages. He also confirmed the assumptions of the RBV, namely that the relatedness of single IT dimensions leads to sub-additive

costs only, while only a complementary set of related IT-resources leads to super-additive values and hence sustainable competitive advantage, thus to higher business performance.

Proposition 2a: Super-additive value synergies arising from a complementary set of common IT resources and common IT management processes have a positive impact on the business performance of a multi-business firm.

While previous research has shown that business process harmonisation in general is desirable and leads to better performance (Wüllenweber et al. 2008), it was focused on sub-additive costs, which does not lead to sustainable competitive advantage. But by combining these insights with the RBV and the theory of complementarities, it can be argued that higher business process relatedness can lead to sustainable competitive advantage and thus, to higher business performance. As described in detail in the theoretical foundation section, relatedness of resources can only create sustainable value if the resources are strategic or in a complementary relationship to each other (Robins and Wiersema 1995). Even though some business processes might be strategic, many others, like payroll or HR processes, are likely to be not. However, they can be complementary to each other. Even if values provided by such complementary resources are recognised competitors, it might be necessary to change the whole architecture of a firm in order to imitate them. This may be inadequate, as it might affect own unique value provisioning processes (Milgrom and Roberts 1995). It was possible to identify such complementary, IT-supported business processes e.g. at THETA, which grew mostly inorganically. The increase of the cross-unit relatedness of the business processes *procurement*, *catering*, and *in-flight-HR* is already valuable in isolation as it provides sub-additive cost synergies. But these processes are highly interrelated and their commonality is mutually reinforcing, hence complementary. If THETA achieves commonality in one of these processes, it becomes more valuable to do so in the others as well. The use of the same sets of meals across the different THETA brands increases the purchase quantity of similar ingredients and thus the negotiation power of the procurement department. Simultaneously, it simplifies the harmonisation of the in-flight service, and consequently the pooling and sharing of the in-flight staff. Likewise does the weak relatedness of one process diminish values of the relatedness of the others. E.g., if different meals are served and prepared for each THETA, a harmonised procurement might even be a financial disadvantage.

Proposition 2b: Super-additive value synergies arising from a complementary set of common business processes have a positive impact on the business performance of a multi-business firm.

As the collection of a firm's IT resources and IT management practises as well as the collection of a firm's business processes can be regarded as resources of the firm (Barney 1991), this study proposes that the previous RBV- and TOC-based line of argumentation is fully valid on a higher level, namely for the interaction of IT and business processes as a whole. These two sets of resources are highly interrelated and mutually reinforcing. Their relatedness is thus complementary. When a firm achieves commonality in IT resources and IT management practices, it becomes more valuable for a firm to achieve commonality in business processes and vice versa. These complementarity based super-additive value synergies can be sources of sustainable competitive advantage. The empirical first evidence fully supports this notion:

ALPHA's "one solution for one problem"-initiative concerning business processes was boosted by the fact that it was possible to map the harmonised business processes onto an already consolidated IT infrastructure and application-landscape, whose value was in turn elevated through the use by multiple departments. The same holds true for BETA's supply-chain initiative. Although more infrequent, a reinforcing effect can be observed vice versa as well. After regulation enforced consistent and compliant business processes in many areas within the case companies in the financial sector, it was common sense to use shared and consistent IT to support these processes, which in turn became easier to handle and control, due to one point of technical access.

Proposition 3: Super-additive value synergies arising from a complementary set of common IT resources and common IT management processes on one hand, and common business processes on the other, have a positive impact on the business performance of a multi-business firm.

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