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Keywords: IT Governance, Business Performance, Resource Relatedness, Absorptive Capacity, Resource Based View, Theory of Complementarities, Knowledge Based View

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How mature IT Governance affects Business Performance

Abstract

This paper presents a theory-based model that proposes and explains the positive impact of IT governance on business performance of the firm. The study takes a resource based perspective and integrates the economic theory of complementarities, the concept of resource relatedness as well as the knowledge based view of the firm. The proposed increase of business performance is grounded in the generation of sustainable competitive advantage through super-additive value synergies, which are hard to imitate by competitors. The theoretical model is developed and substantiated in two stages. During the first stage, eleven exploratory case studies of multinational corporations were used for theory building. During the second stage, eight case studies with comparable companies were conducted for theory refinement and substantiation. The results suggest that IT governance is positively associated with business performance through two mediators: IT relatedness and business process relatedness. It is argued that these mediators are complementary in the sense that they do not solely increase business performance independently, but add extra value if they impact concurrently. The results furthermore imply that the absorptive capacity of the IT department has a significant moderating effect.

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Introduction and motivation

The fundamental importance of information technology (IT) in today's business operations can hardly be refuted. 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). In a consequence, IT spending is constantly rising, with IT costs in average representing more than 4% of revenue within corporations, which is a significant fraction of the total expenditures (Gartner, 2011b). 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).

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). Today, IT governance (ITG) is a key enabler and success factor for business performance (De Haes and Van Grembergen, 2009). Weill (2004) even argues that IT governance can account for a 20% increase in profits.

Boosted by the passage of the Sarbanes-Oxley Act in 2002, many organisations started establishing deliberated IT governance frameworks, but academic research within this area is still in its early stages. While ITG best practices and descriptive frameworks have been available since years, theoretical models explaining the impact of ITG on business performance are missing (De Haes and Van Grembergen, 2009). In other words, the available literature claims that ITG provides value and even offers guidelines how to design ITG in order to achieve value gains, but the mechanisms between ITG and an enhancement of business performance

remain unexplored. In face of this significant lack of research, this study aims at opening the black box of the relationship between IT governance and business performance, which leads to the following research question (RQ):

How are IT governance and business performance related?

In order to answer that question, this research endeavour looks in detail at the literature and includes qualitative data from two subsequent field studies. Within the first empirical stage, 11 exploratory case studies of major multinational corporations were used for theory building. During the second stage, eight case studies with comparable companies were conducted for theory refinement and substantiation.

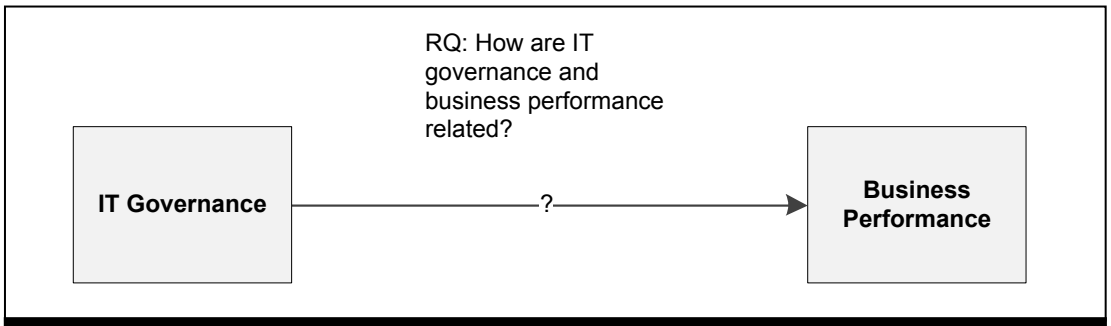

Figure 1: Research framework

Previous research on IT governance

IT governance, which we regard in line with Weill (2004, p.2) as *"the framework for decision rights and accountabilities to encourage desirable behavior in the use of IT"*, has become an important topic in practice and research in recent years (De Haes and Van Grembergen, 2009). IT governance deals with physical and human IT resources which are among the major resources of the firm (Mata et al., 1995). Penrose (1959), who developed the basic ideas of the resources based view (RBV), postulates that 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 associated with the act of good governance and highlights the significance of the topic of this study.

Van Grembergen et al. (2003) describe ITG as being embedded within several layers of the firm, from board level to operational IT, but following Peterson (2003) a clear distinction between ITG, which is based on top-management level, and IT management, which is concerned with decisions on the operational level, is crucial. This is very much in line with Weill's view that: *"IT governance is not about what specific decisions are made. That is management. […] Good IT governance draws on corporate governance principles to manage and use IT to achieve corporate performance goals"* (Weill, 2004, pp.2,3), and the definition of the ITGI (2003) which regards ITG as *"the responsibility of executives and the board of directors".* Based on the latter fundamental definitions, a thorough review of literature and a Delphi study, 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 (2003).

Brown and Grant (2005) as well as Webb et al. (2006) provide a thorough analysis of the existing literature on ITG, illustrating the advancements in this field of research and prevailing definitions of the term ITG. They point out the diversity of topics that are collected under the umbrella term ITG, such as 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 and conceptualisations are in use. Research on what is now called ITG has focused mainly on the locus of control and governance structures,

contingency analysis and eventually the combination of these two streams (Brown and Grant, 2005). Table 1 provides an overview of different research streams.

Despite the great practical value of the literature presented in these first three streams of ITG, the outcomes and models developed within these research endeavours often are descriptive and, surprisingly, prescriptive, since they lack a solid a theoretical foundation. Explanatory models explicitly dealing with ITG and its value creation are scarcely available (De Haes and Van Grembergen, 2009).

Recent exceptions, which represent a new stream regarding the *impact analysis of ITG*, consider ITG mainly in relation to business/IT alignment (BITA), which in turn is understood in relation to business performance (Sabherwal and Chan, 2001). Examples are De Haes and Van Grembergen (2009), Silva and Chaix (2008), Csaszar and Clemons (2006), Luftman et al. (2008) or Liang et al. (2011). We argue that this is still unsatisfying for various reasons. Looking at one of the most cited BITA models (Luftman et al., 2008), ITG is only one out of six major input factors of BITA, while BITA is not the only desired effect of ITG. But more significantly, the five additional formative indicators of BITA (Luftman et al., 2008) are in parts overlapping with several aspects regarded as indicators of mature IT governance (De Haes and Van Grembergen, 2009), hence the relationship between ITG and BITA could be classified as tautological. In addition, the notion of BITA is still vague and representing various different concepts, despite being discussed for more than two decades in over 150 publications (Chan and Reich, 2007). These facts limit the theoretical and managerial implications of BITA-related ITG models thoroughly.

To sum up, despite a large body of literature on ITG, a theoretically grounded explanation of the positive relation between ITG and business performance is still missing and should be analysed independent of the confounded concept of BITA.

Table 1: Primary sources and key ideas (based on Brown and Grant, 2005)		
Stream one - IT governance forms		
Basic locus of IT decision making	Thompson, 1957, Jelinek, 1977, Burlingame, 1961, Golub, 1975, Olson and Chervany, 1980, Keen, 1981, Jenkins and Santos, 1982, Wetherbe, 1988, Von Simson, 1990	Research on traditional IT organisational structures
Expanded IT decision making structures	Ein-Dor and Segev, 1978, Rockart et al., 1978, King, 1983, Zmud et al., 1986, Boynton and Zmud, 1987	Research on vertical and horizontal expansion of the traditional IT organizational structures
Stream two - IT governance contingency analysis		
Individual and multiple contingencies for uniform governance frameworks	Olson and Chervany, 1980, Ein-Dor and Segev, 1982, Tavakolian, 1987, Dixon and John, 1989, Ahituv et al., 1989, Allen and Boynton, 1991, Boynton et al., 1992, Henderson and Venkatraman, 1992, Clark, 1992, Venkatraman, 1997	Research on the individual and multiple contingencies affecting traditional IT organizational structure decisions
Complex analysis for non-uniform governance frameworks	Brown, 1997, Brown and Magill, 1998, Brown, 1999, Sambamurthy and Zmud, 1999	Research on the individual and multiple contingencies affecting expanded (vertically and horizontally) IT organizational structure decisions
Stream three - Contemporary frameworks of IT governance		
Combination of governance forms and contingency analyses	Brown and Grant, 2005, Weill, 2004, Willcocks et al., 2006	Convergence and aggregation of the first two streams, after those reached saturation
Stream four - Impact analysis of IT governance		
Theory based analysis of IT governance impact	De Haes and Van Grembergen, 2009, Silva and Chaix, 2008, Csaszar and Clemons, 2006, Luftman et al., 2008, Liang et al., 2011, Lazic et al., 2011	Analysis of mediating and moderating constructs between ITG maturity and business performance

Theoretical foundations

IT business value from the perspective of the resource based view

Although hard to measure, *IT business value* (ITBV) was one of the most discussed topics within the IS literature in the last two decades. The value of IT, or in other

words, the contribution of IT to business performance, was studied by academics mainly from two perspectives (Rivard et al., 2006). Within the first paradigm and based on Porter's (1980) competitive strategy framework, Porter and Miller (1985) describe IT as a means of altering the competitive forces that collectively determine industry profitability, by either lowering cost or enhancing differentiation. The second perspective, the *resource based view* of the firm (RBV), 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 lead to a sustainable competitive advantage (Mata et al., 1995).

The aim of this study is to analyse the impact of the governance of IT on the business performance of the firm. In this context, IT is considered as a major resource of the firm. The nature of the analysis has an intraorganisational focus. More specifically, the objective of this research endeavour is an explanation of the influence of complex social relationships within the boundaries of a firm on different outcome levels of success with regard to the exploitation of information systems and the surrounding IT infrastructure of the firm. The resource based view clearly addresses this kind of internal linkages as possible causes of performance variations, while the market-based perspective is not focused on, but neglects those linkages as a possible source of improved business performance and, hence, competitive advantage. As a consequence, it seems reasonable to choose the RBV as an appropriate theoretical basis for analysing the impact of ITG on business performance as it provides a suitable framework for investigation. The enhancement of (business) performance is defined as an increase in *effectiveness* or *efficiency* (Melville et al., 2004). This is very close to the notion of *value* in the RBV, as

valuable resources provide the firm with the possibility to implement strategies which improve the organisation's effectiveness or efficiency (Barney, 1991, Mata et al., 1995). In this study, we apply the construct *business performance* as shown by Sabherwal and Chan (2001) and analyse the sustainability of the achieved competitive advantage using the RBV.

One of the most influential discussions on ITBV from a resource based point of view is the work by Melville et al. (2004) who conclude that IT does add value to the firm, but not directly. They state that the value creation occurs through the enhancement or improvement of business processes and that the extent and dimensions of the value added are dependent on several factors, such as complementary organisational resources and the environment of the firm. Consequently, an analysis of the impacts of ITG should focus on these dimensions and mechanisms.

The knowledge based view, knowledge specificity and absorptive capacity

Regarding the fact that IT governance is dealing not only with tangible assets but with highly intangible and knowledge-centric social structures, the knowledge based view (KBV) (Cole, 1988, Nonaka, 1994, Nonaka and Takeuchi, 1995, Spender, 1996a, Spender, 1996b) offers a valuable extension of the RBV in the context of this study.

Within the KBV, services rendered by tangible resources are seen as dependent on the way of their combination and application, which in turn is a function of the firm's know-how (Alavi and Leidner, 2001). This know-how, or in other words, this knowledge, is embedded and carried within tangible and intangible entities of an organisation. Those can be for example individuals, documents, policies, working

routines, systems or the organisational culture (Grant, 1996a, Grant, 1996b, Nelson and Winter, 1982, Spender, 1996a, Spender, 1996b). Due to the complex nature of knowledge, especially if embedded within a social and organisational setting, knowledge based resources are regarded as difficult to imitate. The KBV postulates, based on the insights of the RBV, that knowledge-assets are unequally distributed among competitors and may produce long-term sustainable competitive advantage (Grant, 1996a, Grant, 1996b).

Knowledge is divided across professionals in a firm in the same way as labour is, therefore, knowledge-assets are distributed across the firm as well. A chemist in the R&D department has specialized knowledge that a mathematician in the finance department does neither have nor need and vice versa. Jensen and Heckling (1995, p.21) define such specific or idiosyncratic knowledge as “knowledge of the particular circumstances of time and place”. This specificity of knowledge can be divided into two domains: context-specific knowledge and technology-specific knowledge (Choudhury and Sampler, 1997, Hayek, 1945, Jensen and Heckling, 1995). It can generally be argued that with regard to IT and IS, Business Units (BUs) hold primarily context-specific knowledge, while IT-departments possess primarily technology-specific knowledge. For a successful application and governance of IT, it is necessary to intertwine these two assets of knowledge. Even though the BUs need to understand the potentials and limitations of technology, it is in particular the IT-department that recurrently has to combine the context- and technology-specific knowledge of a firm. Consequently, the IT-department consistently has to acquire context-specific knowledge from the BUs.

Following the KBV, not only knowledge-assets themselves are unequally distributed among corporations, but as well the capabilities to absorb and use knowledge. The

latter is referred to as *absorptive capacity* and defined as "the ability to utilize outside knowledge" (Cohen and Levinthal, 1990, p.128). From the view of a companies' IT department, we refer with the notion *outside knowledge* to any knowledge that is not originally resident within the IT department, like detailed knowledge of the companies' business process. The fact that the absorptive capacity of an IT department is even less tangible and deeper rooted in the social and organisational setting than the knowledge assets themselves makes it even less mobile, and hence, following the KBV, more valuable and apt to generate sustainable competitive advantage.

Synergy, relatedness and the theory of complementarities

Lazic et al. (2011) indicated that the achievement of synergies is one of the major drivers of IT governance. The concept of *synergy* is divided in the strategy and economics literature in terms of *super-additive value* synergies and *sub-additive cost* synergies. 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 of the singular business units (Teece, 1982). It is a key proposition in strategic management of multi-business firms, 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 itself provides a possible solution for circumventing this tautology (Davis and Thomas, 1993).

The central source of synergies in multi-business firms 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 cross-business 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 mostly 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 towards each other. The increase of one resource increases the return of the other (Harrison et al., 2001).

To sum up, the relatedness of complementary resources helps multi-business firms to achieve sub-additive costs and super-additive value. Sub-additive costs which stem from the concept of relatedness are imitable and lead, thus, 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.

IT relatedness

Tanriverdi (2006, p.59) adapts the concept of *relatedness* to information technology, which is central to this study. He defines *IT relatedness* 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) is able to show that relatedness of single IT resources leads to sub-additive costs, while relatedness of complementary IT resources in addition generates super-additive values and thus increases business performance. These findings are in line with previous research on resource relatedness and complementarities (Milgrom and Roberts, 1995).

Research design

In an effort to close the previously identified gap in the existing research, this study has two empirical phases of which the first is exploratory in nature and aims on theory building, while the second phase is focused on empirical substantiation and refinement of the developed theory. The epistemological stance of this endeavour is positivist, based on the assumption that reality exists independently of human consciousness and cognition (Orlikowski and Baroudi, 1991) and that we can create knowledge through observations of that reality (Chalmers, 1999). The object of analysis is determined as the organization that applies and redefines ITG frameworks. Due to the fact, that previous literature hardly provides theoretical models on ITG, the theory has to be developed in wide parts from scratch. Thus, a qualitative research design is considered to be appropriate. Qualitative case study research is deemed promising in order to answer the question of *how* ITG and business performance are related (Yin, 2009).

The research endeavour started with a thorough review of IS as well as non-IS literature. Thereafter, within the first empirical stage, 11 exploratory case studies of major multi-business corporations were conducted for theory building. Diversified multi-business firms operating in several industries still represent the rule rather than

the exception in the modern economy (Caves, 1964, Teece, 1982). Consequently, these firms were chosen as the subject of interest for this study. CIOs of the 100 largest firms in Germany were approached via email, which yielded 11 interviews in total. The data was gathered from various industries, assuring that the observations were not industry specific. The perspective taken was that of the top management; only top-level decision makers were interviewed. 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).

Table 2: First round case study participants

#	Case Company	Sector	Core Business	Turnover 2009	Bal. Sheet 2009	Interview Partner(s)
1	ALPHA	INDUSTRY	High-Tech manufacturing	> € 30 bn		CIO
2	BETA	INDUSTRY	Chemical industry	> € 30 bn		CIO, head of controlling, head of IT servies
3	GAMMA	INDUSTRY	Chemical industry	> € 30 bn		Head of CIO office
4	DELTA	INDUSTRY	Heavy industry	> € 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

In line with Eisenhardt (1989), the insights gained from the exploratory case studies were then compared with the relevant literature in order to develop a theoretical model which outlines and explains the relation between ITG and business performance. This approach helps to build a model that is based on empirical data as much as on a rigorous theoretical background.

In order to substantiate the findings and refine the theoretical model, a second empirical endeavour was undertaken. A new dataset was chosen, in order to avoid a selection bias. The constructs and propositions employed in the developed model served as basis for the design of a more structured second interview guideline in order to meet the requirements of the corroborating nature of the second data collection. In this step, eight case studies with comparable companies and interview partners were conducted; the second dataset is introduced in the chapter *Empirical substantiation and theory refinement*.

All expert interviews from the two rounds of data collection were transcribed and analyzed in-depth through coding relevant text passages and making sense of the emerging concepts (Miles and Huberman, 1994). The first round of collected data was initially coded in an open manner in order to find patterns by *coder A*, and then re-coded by a second person, *coder B* using pre-determined codes. The emerged constructs were used by *coder A* and third person, *coder C,* for developing the questionnaire for the second data collection. The second data collection was then carried out and analysed by *coder C*. In order to increase the internal validity of the case studies in both rounds, provided internal documentation like quality manuals, organisational charts or ITG guidelines, as well as publicly available data found in annual reports or the companies' websites were analysed and employed for data triangulation in order to complement the expert interviews. The gathered information resulted in more than 130,000 words of qualitative data.

Empirical exploration and theory building

Based on the literature research and the case studies from the first round, a theoretical model was developed that aims at explaining how ITG and business

performance are related and how this relationship is moderated. The model is depicted in Figure 2 and discussed subsequently. Table 3 provides definitions for the constructs employed in the model.

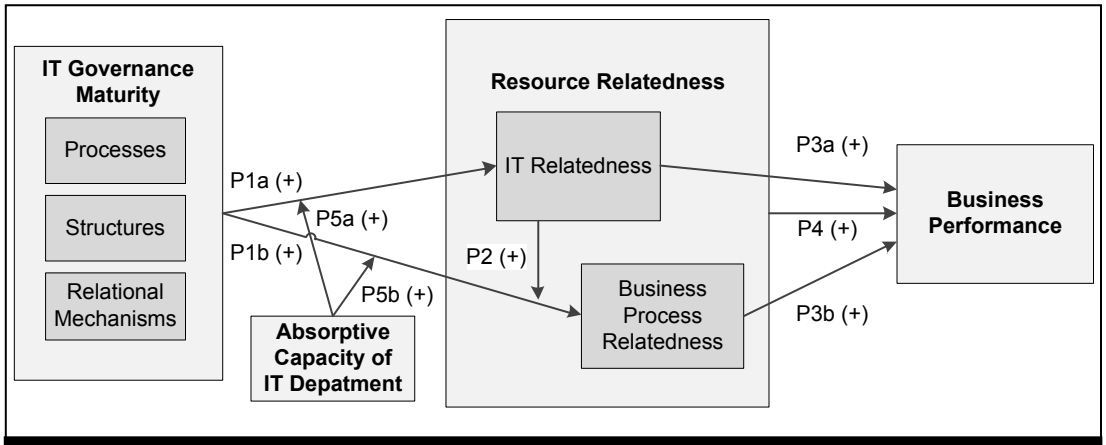

Figure 2: Preliminary theoretical model

Table 3: Definitions of the constructs employed

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	(Sabherwal & Chan, 2001), (Venkatraman, 1989), (Chan et al., 1997), (Venkatraman & Ramanujam, 1986), (Dess & Robinson, 1984)
IT Governance Maturity	Maturity of the framework for decision rights and accountabilities to encourage desirable bahaviour in the use of IT. 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 (Tanriverdi, 2006), (Tanriverdi & Venkatraman, 2005), (Campbell and Goold, 1998), (Milgrom & Roberts, 1995)
Absorptive Capacity of the IT Department	The ability of the IT department to consistently gain and utilize context-specific knowledge situated within business units.	(Cohen and Levinthal, 1990)

The impact of IT governance

As a common theme throughout all analysed companies, the consolidation of the IT infrastructure and information systems landscape has been found to be one of the primary goals after initiating activities of an active revision of ITG. The construct of

ITG-Maturity, developed and validated by De Haes and Van Grembergen (2009), proved to be well applicable in the context of this study and was thus adopted.

GAMMA, with low ITG maturity (ITGM) and LAMBDA (medium ITGM) have pointed out that before redesigning their ITG, there was no informed or responsible body for company-wide decisions concerning IT, hence no coordinated actions across different departments were possible. This evidence is further illustrated by the case of DELTA (low ITGM), which started its ITG change 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 information systems landscape and the IT management processes was regarded as the natural next step in the respective 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.

An explanation of these empirical observations can be found in the RBV:

The deliberated redesign of ITG structures, processes and relational mechanisms offers many companies for the first time a platform for company-wide aggregation, analysis and discussion of IT functions, 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, decision making and the enforcing of these decisions concerning the resource IT. This includes the possibility to increase IT relatedness and, thus, achieve synergies, which lead to 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 the IT infrastructure and IS landscape of 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. For this reason, 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 addition, 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 in analogy to 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 our dataset as a basis for ITG-driven business process harmonisation, we further propose:

Proposition 2: *The higher the IT relatedness, the stronger the proposed positive effect between IT governance maturity and business process relatedness.*

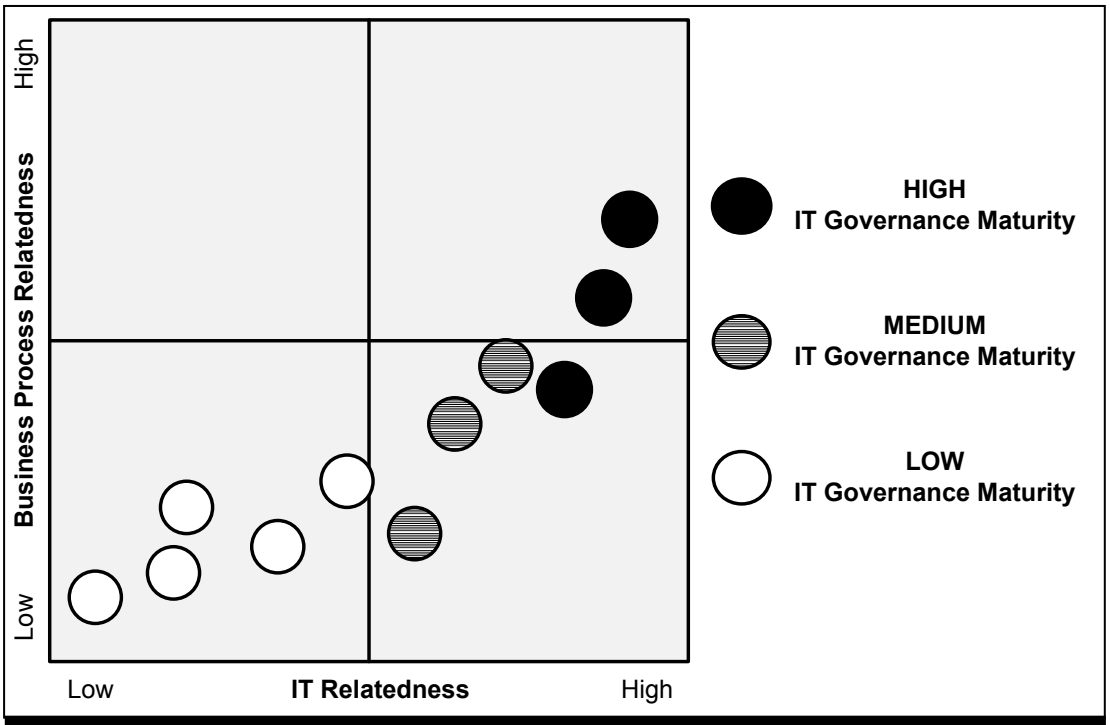

Figure 3: Qualitative assessment of the case companies in the first round

TABLE 4: Qualitative assessment of the ITG-Maturity of the case companies		
LOW	MEDIUM	HIGH
GAMMA	LAMBDA	ALPHA
DELTA	KAPPA	BETA
ZETA	THETA	EPSILON
ETA		
IOTA		

Our qualitative assessment concerning the relatedness of IT and business processes in relation to the ITG maturity of the eleven case companies (Table 4) is depicted in Figure 3. Due to the exploratory nature of the first round of data collection, there were no pre-determined measures of the maturity of the companies. The assessment in the first round was being based on a comparison of the IT governance frameworks among the analysed case companies and the companies own perception of where they are and where they want to be with the (re)design of their ITG framework. For easier comprehension, the single independent variable is shown in the chart while the two dependent variables are placed on the axes.

Performance effects of relatedness

Tanriverdi (2006) has shown that IT relatedness is positively related 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 and, thus, to higher business performance. Proposition 3a is adopted from Tanriverdi (2006) and further developed, including business processes, towards Propositions 3b and 4, as shown in the following.

Proposition 3a: *High IT relatedness has 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 focused on sub-additive costs, which does not lead to sustainable competitive advantage. But by combining these insights with the RBV, the theory of complementarities and Tanriverdi's (2006) insights, 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 is only likely to 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 not. However, they can be complementary to each other. Even if values provided by such complementary resources are recognised by 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).

We analysed the collected data looking for indicators of increased business performance as shown in Table 3, and then applied the RBV and TOC to analyse if the performance increase leads to competitive parity or if it yields a sustainable advantage.

It was possible to identify 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 catering and in-flight service, and consequently the pooling and sharing of catering and in-flight staff.

Likewise does the weak relatedness of one process diminish values of the relatedness of the others. E.g., if different, region-specific meals are served and prepared for each brand, a harmonised and centralised procurement of the ingredients might lead to financial disadvantages.

Proposition 3b: *High business processes relatedness has 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 the firm to achieve commonality in business processes and vice versa. In other words, while IT relatedness and business process relatedness independently lead to increased performance (P3a and P3b), the simultaneous availability of both types of relatedness enables additional value through interaction-

effects. 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 4: *Super-additive value synergies arising from the interaction of a complementary set of high IT relatedness and high business process relatedness have a positive impact on the business performance of a multi-business firm.*

The moderating effect of the absorptive capacity of the IT department

A major requirement for the successful execution of ITG-triggered harmonisation initiatives within the case companies was observed to be a high absorptive capacity of the IT departments. E.g. ALPHA and BETA both reported that before relatedness was enforced from the IT side, the IT department did not feel compelled to actively aggregate business-specific knowledge. Since IT acted primarily as a pure service provider for the business, it was adequate to understand and implement the requirements of the business, without digging deep into the business logic itself. The

CIO of ALPHA stated: *"after the first harmonisation projects, we had problems going on, because whenever we wanted to change something, the business said 'You can't take that away, I can't do my business without that tool'. And this was during a project where we enforced the consistent usage of one single email client. We know that one email client is fine for everyone, but it's different with highly specific business processes. Here you need to have people in the IT which understand the process as good as the business does. If you want to discuss with them, if you even want to change the way they work every day, you need to be able to talk with them at eye level"*. Consequently, the more the ITG departments were stimulating relatedness-projects, the more the IT had to actively gather and accumulate business-specific knowledge to be able to successfully pursue the projects. But not less important, the knowledge was crucially needed to be able to invalidate the ever recurring argument of the business side 'without my specific solution, I will go out of business', and moderate the dialogue between different business units towards a unified solution for similar problems. GAMMA stated *"To make a difference, I need people in my IT that are able to understand the highly specific chemical processes we run in our factories".*

Proposition 5a: *The higher the absorptive capacity of the IT department, the stronger is the proposed positive effect between IT governance maturity and IT relatedness.*

Proposition 5b: *The higher the absorptive capacity of the IT department, the stronger is the proposed positive effect between IT governance maturity and business process relatedness.*

These propositions, which suggest that the absorptive capacity is critical for the achievement of relatedness, and hence competitive advantage, are not only in line

with our data sample, but as well strongly in line with the implications of the KBV as introduced in the theoretical background and discussed by Alavi and Leidner (2001). They demonstrate that the basic assumption of the KBV, that knowledge-assets are unequally distributed among competitors (Grant, 1996a, Grant, 1996b) and hence a crucial basis for the achievement of competitive advantage, is in particular true for a firm's ability to effectively apply existing knowledge in order to take action that forms competitive advantage.

Empirical substantiation and theory refinement

While the aim of the first empirical stage was theory building based on exploratory case studies, the goal of the second empirical stage was the substantiation of the findings and a refinement of the initial theoretical model.

Data selection and analysis

In order to avoid a selection bias and allow for analytical generalisation, making the developed model applicable for explaining and predicting the value generation of IT governance, it was inevitable to conduct the substantiation and refinement of the model independent of the original data set. To do so, a second collection of firms was approached, which resulted in eight case studies. In order to ensure comparability, large multi-business firms from various industries were analysed. Through careful selection of interview partners, a top-level view was ensured and, like throughout the first empirical phase, additional data was collected for triangulation. Table 5 provides an overview of the participating companies.

In order to meet the requirements of the corroborating nature of the second data collection, the constructs and propositions employed in the developed model served

as basis for the design of a more structured second interview guideline. Like during the building of the theoretical model, where existing and validated constructs were employed wherever possible, available and validated indicators were utilized for the development of the second questionnaire. Table 6 shows some exemplary indicators for each of the employed constructs.

Table 5: Second round case study participants

#	Case Company	Sector	Core Business	Turnover 2009	Bal. Sheet 2009	Interview Partner(s)
I	Rho	INDUSTRY	Engineering	> € 2 bn		Head of services
II	Sigma	INDUSTRY	Engineering	> € 4 bn		Head of IT
III	Tau	INDUSTRY	Engineering	> € 4 bn		Head of CIO office
IV	Upsilon	INDUSTRY	Engineering	> € 3 bn		CIO
V	Phi	INDUSTRY	Automotive	> € 30 bn		Division CIO
VI	Chi	SERVICE/INDUSTRY	Energy & utility	> € 30 bn		Head of ITG
VII	Psi	SERVICE/INDUSTRY	Energy & utility	> € 20 bn		Head of IT
VIII	Omega	FINANCE	Services & Banking		> € 1 bn	Head of IT strategy

Table 6: Exemplary indicators

Construct	Exemplary Indicators
Business Performance	Cost savings, customer satisfaction, development of new business fields / products, time to market, agility in economic turmoil
ITG Processes	Availability of portfolio management, charge-back arrangements, SLAs, ITG frameworks, IT budget management, IT budget control & reporting
ITG Structures	Availability of IT strategy committee, IT architecture steering committee, IT project steering committee, established reporting structures
ITG Relational Mechanisms	Availability of informal meetings between business and IT, established business IT partnerships, business-IT account managers
IT Governance Maturity	Degree of availability of ITG processes, ITG structures and ITG relational mechanisms
IT Relatedness	Usage of common hardware / infrastructure / applications / IT management processes across different business units
Business Process Relatedness	Usage of common HR / logistics / customer support / procurement / production processes across business units
Resource Relatedness	Degree of the concurrent availability of IT Relatedness and Business Process Relatedness
Absorptive Capacity of IT Department	Perceived and actual acquisition & application of context-specific knowledge, like e.g. procurement processes, engineering procedures or regulatory requirements

First, each case was analysed and described in separate case stories. These stories enabled an assessment of the relative significance of each theoretical dimension within the context of each corporation. Doing so, it was possible to examine each proposition in detail with numerous examples. This was important to deepen the

understanding of the impact of the singular dimensions of IT governance, but especially in order to have a close look at the value generation based on IT relatedness, business process relatedness, and in particular the effects of complementary between these two constructs. Eventually a cross-case analysis was conducted with the goal to scrutinize if the developed model is able to explain disparities and commonalities among the cases. In doing so, an analytical generalization of the theoretical model was pursued.

Results of the single and cross-case analysis

Due to space restrictions, we refrain from presenting direct citations and combine the presentation of the single and cross case analysis in the following. The chapter is structured according to the theoretical model as shown in Figure 2.

The impact of IT governance

Based on De Haes and Van Grembergen (2009), it was possible to classify the case companies along three maturity levels of IT governance, as shown in Table 7. Appendix 1 provides a more detailed overview of the assessment process.

Table 7: IT governance maturity levels

Case Company	ITG Structures	ITG Processes	ITG Relational Mechanisms	ITG Maturity
RHO	Medium	High	Low	Medium
SIGMA	Low	Low	Low	Low
TAU	High	High	High	High
UPSILON	Low	High	High	Medium
PHI	Medium	Low	Low	Low
CHI	High	Medium	High	Medium
PSI	High	Medium	High	Medium
OMEGA	High	High	High	High

The degree of the IT relatedness (ITRel) and business process relatedness (BPRel) of each company was assessed with indicators, as shown exemplary in Table 6.

The case studies of the second data collection confirmed a strong relation between IT governance maturity and resource relatedness, as shown in the pattern depicted in Figure 4.

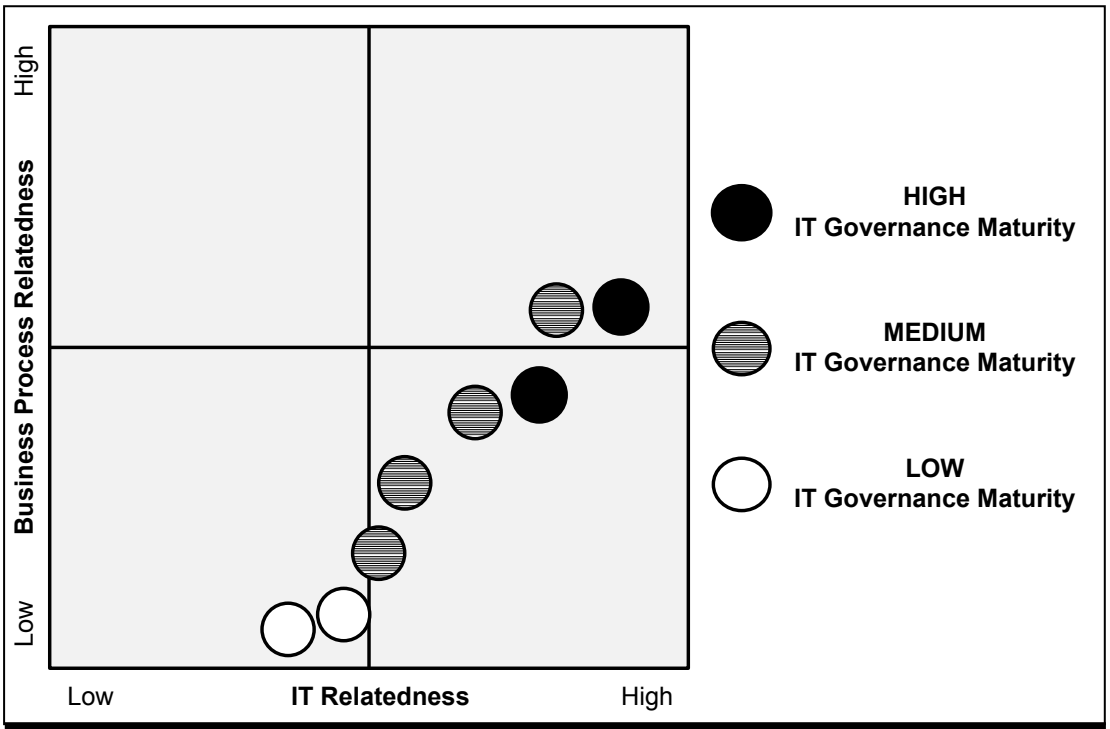

Figure 4: Qualitative assessment of the case companies in the second round

In addition to the observed pattern which clearly suggests a link between ITG maturity and IT relatedness, the qualitative data allows a close look at this relationship in almost all regarded companies:

Within UPSILON, ITG initiatives were followed by the successful consolidation of the application landscape towards SAP and Microsoft products, encompassing ERP, SRM or CRM. Inside RHO, IT infrastructure and process consolidation was brought forward after ITG was installed. After introducing SAP /R3 in 1999, CHI was able to enforce a single-vendor strategy with good ITG, allowing them to replace legacy

solutions company-wide with standard SAP modules, such as ‘Enterprise Portal’, ‘CRM’ or ‘SAP Process Integration’ between 2000 and 2008.

Even though business process relatedness was generally rated lower than IT relatedness throughout all companies, the qualitative assessment as shown in Figure 4 supports the suggested relationship between IT governance maturity and relatedness as well. A few examples are provided in the following, elucidating the proposition.

UPSIOLON established an ITG Process, which ensures that business processes which are to be supported by IT, are developed based on best practices only once in a pilot region and, thereafter, consistently rolled out to Europe and thereafter worldwide. The central IT department of TAU was the first department in TAU to really go global with consistent work-practices and processes; these were ensured and enforced with ITG initiatives. Due to its great success, this project is now used as a reference model for consolidating IT-supported structures and process, especially within HR, controlling and R&D. RHO, with a medium mature ITG, took the first step towards ITG-driven increase of BPRel with the establishment of a unified sales and service template, which has to be employed globally. Even though the singular subsidiaries are free to align their sales and service process according to their local needs, the uniform data template guarantees that the data and back-office processes remain globally consistent.

To sum up, the aggregated cross and single case analysis of the case companies in the second data collection substantiate Proposition 1a and 1b, as developed and theoretically grounded in the empirical exploration.

Moreover, a thorough analysis of the collected information in the second empirical round substantiates Proposition 2 as well. A common technological platform was not

only found to be an absolutely crucial basis for BPRel enhancement, but proved to be even a driver or reference model in the observed case-companies.

Performance effects of relatedness

Assessing the effects of relatedness based on a comparison of the absolute performance of the eight case companies is not suitable in this study. The dataset is, especially with regard to the different industries the observed firms are active in, too small. A singular longitudinal assessment of the performance in relation to the resource relatedness was due to missing data in the case companies not possible.

As a consequence, we chose to analyse the case data in a way, that we were assessing the singular performance indicators, as presented in Figure 4, and thereafter relating them to the specific IT- or business-projects that caused them.

We see this as a valid way to substantiate the propositions, especially regarding the fact that the positive impact of IT relatedness (ITRel) on business performance – *Proposition 3a* - was quantitatively shown by Tanriverdi (2006) with the positive impact of business process relatedness (BPRel) – *Proposition 3b* – as well as the positive impact of the interplay between BPRel and ITRel – *Proposition 4*, being further developments of his assumptions and based on the same theoretical reasoning, as presented in detail in the empirical exploration.

In other words, we were assessing the case data looking for evidence of the proposed effects of IT relatedness and business process relatedness. That these singular effects increase business performance can be reasoned by looking at the literature, as shown in the theoretical foundations.

Even though the case studies provide strong support for Proposition 3a, we want to move on directly to Proposition 3b due to the space restrictions and the fact that Proposition 3a originates from the literature and needs no further substantiation.

Due to the nature of Proposition 3b, it is not trivial to collect information from the IT side, with the proposition-specific data and business cases being in the hands of business units. Never the less, data from TAU, OMEGA and UPSILION, the three top performing concerning BPRel, indicates support for Proposition 3b. OMEGA measured the satisfaction and value-rating of the first company-wide harmonised processes and was surprised that even strongly independent subsidiaries fully acknowledged the value-added provided through the increase of BPRel. However, OMEGA admits that there is still a long way to go in order to exploit BPRel and cross-divisional synergies. TAU, where the harmonization of IT processes was a big success, applies, as described earlier, the IT governance principles now as a reference for corporate governance, with the goal to globally harmonise business processes. The company not only aims at cost-savings through synergies, but expects to strengthen its position in the market once higher BPRel and closer collaboration, e.g. in logistics and R&D, is achieved. Eventually UPSILON was able to provide data from management surveys, trying to measure the general value add of IT. While the surveys indicate that much value was created through the provision of cross-business process harmonisation, and thus support Proposition 3b, they as well highlight weaknesses and suggest that the IT-department has to acquire more process-specific knowledge, to better support operational units cross-divisionally.

Assessing the interactive effects between ITRel and BPRel, the conducted case studies of the second round clearly substantiate Proposition 4 and provide great

evidence of the proposed super additive value synergies that can be generated if ITRel and BPRel are available in combination.

RHO reported that with the introduction of a unified CRM and a harmonization of support-processes across business units, they were able to redevelop in-field service and provide the service staff with a custom-developed mobile device. The field-workers now have completely new possibilities to work customer-oriented and provide support for products which were produced by different units of RHO. The technicians can check on-site every past support-process and provide assistance for different divisions much quicker and more efficiently. In addition to the improved customer satisfaction, the sales department can now extract data centrally from all support departments, see weaknesses of the customer's production facilities and improve goal-oriented cross-selling.

UPSILON reported of an even more expressive case, where concurrently increased BPRel and ITRel enabled a completely new line of business. UPSILON manufactures gears for assembly lines and production facilities. Due to the high number of product-variations, customers who are running up to 1000 UPSILON-products in different production plants had to deal with various UPSILON divisions for service and support. When the IT unit of UPSILON started merging all databases across divisions and eventually installed a unified CRM, they realized that they possess data precisely showing which customer runs which product in which plant. Using all that information and unifying the support process across all divisions, UPSILON can now offer a completely new service to their clients. Today UPSILON is able to remotely monitor all devices at the customers' plants, not only ensuring an immediate replacement of the correct device in the case of failure (one assembly line can be driven by dozens of devices), but even providing accurate estimations on

how long a certain device can run before it will break down. Doing so, downtimes of production facilities can be reduced immensely. It is not only that customer satisfaction and device sales went up, with UPSILON saving money by streamlining and accelerating support processes. In addition, the combined increase of BPRel and ITRel facilitated a entirely new service-product, providing on-top sales and a unique market position.

The described cases do not only provide support for Proposition 4 but are as well fully in line with the theoretical grounding of the proposition as described in the empirical exploration and theory building. The increase of BPRel and ITRel is complementary to each other in the sense that the increase of BPRel makes an increase of ITRel more valuable and vice versa. Consequently, concurrently increased BPRel and ITRel can provide super-additive value synergies which are not only hard to copy, but even hard to observe, as they are deeply rooted in the corporations' technical, organisational and cultural architectures. Exploiting these synergies, companies can achieve sustainable competitive advantage.

The moderating effect of absorptive capacity

The absorptive capacity of the case companies was assessed with indicators as shown in Table 6. Closely analysing the second round of case studies, neither objective patterns nor qualitative data is to be found that supports Proposition 5a. The deviation from the assessment of the first case studies can be explained due to the exploratory nature of the first empirical round. The data was not rich enough to allow a clear perimeter of the moderating impact of absorptive capacity on relatedness-projects. Consequently, a moderating effect for the ITG-driven increase in IT relatedness (P5a) and business process relatedness (P5b) was proposed.

The data of the second round is based on a more detailed and structured interview guideline which focused on the substantiation of the model. Consequently, a more detailed inquiry of the effect of absorptive capacity and an isolation of its impact, which proved to be omnipresent for ITG-driven BPRel-projects, yielded strong support for Proposition 5b:

A good example for the moderating effect of absorptive capacity is provided with UPSILON. Despite a medium ITG maturity, this firm is top scoring in business process relatedness. The CIO reported that with a high absorptive capacity of the IT staff, UPSILON was able to align business processes in a very short period of time. The past projects and partnerships between business and IT were so successful, that the business side, which is still the process owner, occasionally chooses to hand over certain business process ownerships to the IT. Within RHO, the IT was not involved in the design of business processes in the last years, but started optimizing those on a daily basis. IT realised that this is only possible to a certain extent without decent knowledge of the business processes themselves. Therefore, the acquisition of context-specific knowledge by IT is now actively promoted by the management, supporting Proposition 5b. TAU experienced similar issues and reported that employees with a broad context-specific knowledge are, even in the business units, very rare. Thus, a process was put in place that ensures job rotations from IT into business functions in order to improve the absorptive capacity of the IT department, which is regarded as basis for the IT-enabled redesign of business processes.

Summing up, while Proposition 5a was remained unproved, Proposition 5b was substantiated in the second data collection.

Summary of the empirical substantiation and theory refinement

In an effort to substantiate and refine the theoretical model which is explaining the positive impact of IT governance on business performance and which was developed using 11 exploratory case studies, a second dataset was collected in order to avoid a selection bias. Analysing eight case studies in detail, each construct and proposition was closely assessed. It was possible to strongly substantiate the original propositions 1a, 1b, 2, 3a, 4 and 5b. It was not possible to fully substantiate Proposition 3b due to the fact that the case studies were conducted with the IT side of the corporations, while the necessary data is likely to be found in the singular business units. Never the less, the case studies indicate support for proposition 3b.

The original Proposition 5a could not be confirmed and is consequently dropped from the theoretical model. Therefore, the original Proposition 5b is renamed to Proposition 5 in the substantiated and refined theoretical model as shown in Figure 5. All other propositions and constructs remain unmodified as introduced and defined in the empirical exploration and theory building.

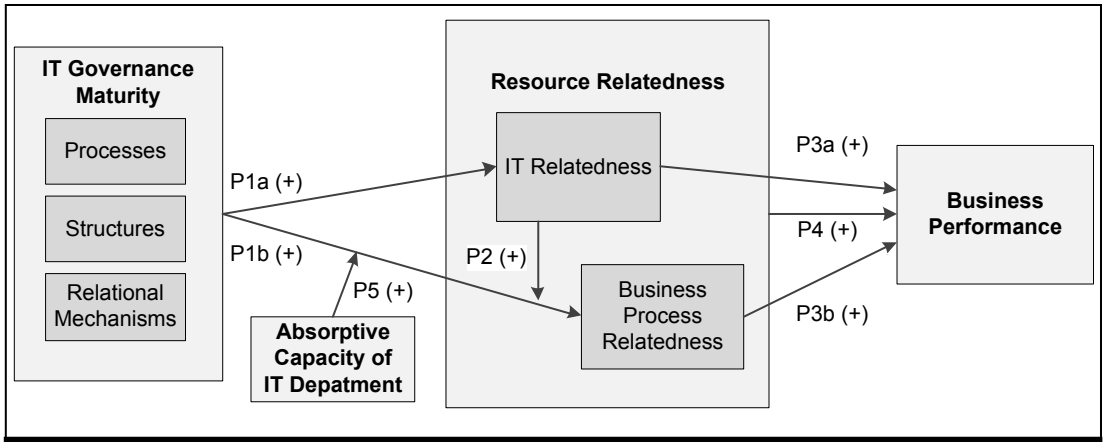

Figure 5: Substantiated and refined theoretical model of IT governance impact

Discussion and conclusion

Summary of results

Our research showed that ITG is positively related to the business performance of a firm. The study further revealed *how* the creation of value through ITG is occurring, namely through the increase of IT relatedness and business process relatedness. These can create sustainable competitive advantage induced by super-additive values, which are rooted in effects of complementarity. The increase of business process relatedness is moderated by the absorptive capacity of the IT-department. The study further demonstrated that IT relatedness and business process relatedness do not only create value independently, but that they rather are interdependent and mutually reinforcing, therefore creating additional value if pursued concurrently.

Contribution to theory and practice

We perceive this work contributing to theory within two domains. On one hand, it adds to the body of knowledge on ITG and, on the other hand, it enhances the resource based perspective on IT business value creation.

While previous literature on ITG is primarily focused on best practices, a theoretical assessment of the value creation process itself was not available to date. Therefore, the paper at hand provides a theoretical contribution to the area of ITG with a model that is the first to analyse and explain the relationship between ITG and business performance in detail.

By drawing on profound theories from reference disciplines, this model provides 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. The theoretical model, which is fully falsifiable, is made amenable for quantitative theory testing. All constructs are precisely defined with indicators being developed; a translation into variables and hypotheses is at hand.

Melville et al. (2004) propose that the ITBV generation is closely connected to the enhancement of business processes and that the IT value-added is dependent on the complementarity of organisational resources (Rivard et al., 2006).

First, this study fully confirms these propositions. Second, being the major contribution in this domain, this paper shows and explains in detail how IT and ITG are interlinked with the enhancement of business processes and what the role and mechanisms of the complementary effects within the value generation exactly are. Furthermore, being a third contribution in the area of the RBV, the paper at hand provides a new construct, *business process relatedness,* and proposes how it creates value separately on one hand and through a complementary interplay with *IT relatedness* on the other. 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), we propose that this mechanism can be found in a the application of ITG. Closing this research gap is a fourth theoretical contribution to the resource based perspective.

Furthermore, by showing what ITG can generally achieve, and what is to be considered within every ITG redesign, the outcomes of this study can serve as a basic frame for planning and establishing ITG in practice. Today, the latter happens based on best practices and intuition, as no substantial explanatory model of ITG value creation is available.

Limitations and future research

The presented model originates from an exploratory study with eleven companies and was substantiated with a second set of eight case studies only. In order to increase the validity of our results, we need to increase the number of case studies in the substantiation phase significantly. In order confirm the theory on a larger scale, a quantitative test of the model on the basis of a large dataset is considered to be useful.

Another limitation is that we primarily interrogated IT departments in our study. Consequently, the model could be complemented with dyadic interviews from both, the IT and the business side to obtain a more comprehensive picture of reality. A quantitative test of the model should use paired questionnaires for IT and the business.

Moreover, IT governance is concerned with both, generation and preservation of value. Both objectives can lead to higher business performance. This research analyses the effects of the value generating aspect of IT governance only. Further analysis on value preserving practices are yet to be conducted.

We limited ourselves to corporations from Europe for our initial research, enabling us to reduce complexity. The same holds true for the size of the companies analysed, and the fact that all of them were multi-business firms. The model, therefore, needs to be further generalised in regard to the cultural dimension and the size of the corporations.

Appendix

Appendix 1: Assessment of maturity levels of the second data collection

ITP Practice	Case company							
	RHO	SIGMA	TAU	UPSILON	PHI	CHI	PSI	OMEGA
Structures								
IT strategy committee			1			1		1
IT steering committee	1		1		1		1	1
IT architecture committee						1	1	1
IT project steering committee	1	1	1	1	1	1	1	
Sum	**2**	**1**	**3**	**1**	**2**	**3**	**3**	**3**
	MEDIUM	**LOW**	**HIGH**	**LOW**	**MEDIUM**	**HIGH**	**HIGH**	**HIGH**
Processes								
Charge back arrangements	1	1	1	1		1	1	1
SLA			1				1	1
Portfolio management	1			1	1	1	1	
Performance measurement			1	1				
Frameworks (ISO, COBIT)				1				1
ITIL	1		1					1
Project governance	1		1	1	1	1	1	1
IT budget control	1	1	1	1	1	1	1	1
IT reporting	1		1	1				
Sum	**6**	**2**	**7**	**7**	**3**	**4**	**5**	**6**
	HIGH	**LOW**	**HIGH**	**HIGH**	**LOW**	**MEDIUM**	**MEDIUM**	**HIGH**
Relational mechanisms								
Informal meetings		1	1	1		1	1	1
IT leadership	1	1	1	1	1	1	1	1
KM (Job rotation, KMS)				1		1		
BITA account management			1				1	1
Corporate internal communication	1		1	1	1	1	1	1
Sum	**2**	**2**	**4**	**4**	**2**	**4**	**4**	**4**
	LOW	**LOW**	**HIGH**	**HIGH**	**LOW**	**HIGH**	**HIGH**	**HIGH**
Overall Assessment	**MEDIUM**	**LOW**	**HIGH**	**MEDIUM**	**LOW**	**MEDIUM**	**MEDIUM**	**HIGH**

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