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Rules Of Efficiency Or Legitimacy? Antecedents Of It-Outsourcing - A Longitudinal Approach

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RULES OF EFFICIENCY OR LEGITIMACY? ANTECEDENTS OF IT-OUTSOURCING – A LONGITUDINAL APPROACH

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Abstract

It still remains unclear whether the decision to outsource IT is governed by rule of efficiency or from institutional constraints imposed by the state and the professions in order to gain legitimacy through institutional isomorphism. Our analysis is based on a unique data set that contains all first-time decisions of publicly listed German firms to engage in large-scale IT outsourcing between 1990 and 2008. We find that both motives play a role for IT outsourcing decisions. Firms are more likely to make a first-time decision for IT outsourcing when they have a considerable low cost efficiency, a low ratio of cash to liabilities, and low earnings per share. Also a firm is more likely to sign an IT outsourcing contract if successful and large peers have already made the same decision. We find that firms with a low cost efficiency are likely to choose IT outsourcing contracts with duration of more than five years while firm with low earnings per share tend to engage in short-term contracts. Consequently, economic reasons as well as institutional factors have to be kept in mind when analyzing large-scale IT outsourcing decisions. Studies that focus only on one of these motives without acknowledging the other may omit important factors.

Keywords: IT Outsourcing, Efficiency, Institutional Isomorphism, Legitimacy

1 Introduction

Over the past two decades, many authors looked into the reasons that compel businesses to change their structure through IT outsourcing (Grimshaw and Miozzo,2006), Hall and Liedtka,2005). In spite of these numerous analyses, it still remains unclear whether the decision to outsource IT is governed by rule of efficiency or from institutional constraints imposed by the state and the professions in order to gain legitimacy through institutional isomorphism (DiMaggio and Powell,1983). Efficiency variables such as a low net income or a heightened cash demand of the outsourcing firm as well as institutional factors such as mimetic or normative pressure can be in a conflicting as well as a congruent relationship regarding the question of IT outsourcing.

Up until now, only four articles study efficiency and legitimacy oriented influence factors in their combined effect on IT outsourcing decisions (Ang and Cummings,1997, Barthélemy and Geyer,2004, Vitharana and Dharwadkar, 2007). These articles conclude that both factors are important for decision making and reveal that the exclusive observation of economic factors without recognizing institutional effects is insufficient and vice-versa.

However, these studies are restricted to a comparison of organizational fields such as the comparison of two countries (Germany and Great-Britain for instance) or the distinction of political vs. private economic environment. An integrated observation of economic and institutional influence factors so far mostly relied on the comparison of institutional contexts; at best, it identified moderating factors between an economical and an institutional entity. In former works the effects of the independent variable on the dependent variable was determined mostly through the pair wise comparison with the mean value of a control group. The added value of the following article therefore lies in the equal value attributed to efficiency and legitimacy without determining a priori a main effect and a secondary effect. Against this background, this paper contributes to the integration of the economic and institutional perspective.

The goal of the paper is to determine whether economic and legitimacy-oriented behaviour can be reconciled or whether these factors are mutually exclusive. We examine this question with a unique data set that contains all first-time decisions of publicly listed German firms to engage in large-scale IT outsourcing between 1990 and 2008. As IT outsourcing was hardly known among German firms prior to 1990, our sample provides a quasi-natural experiment that helps us to identify the type and strength of economic and legitimacy-oriented pressures on IT outsourcing decisions.

2 Theory

2.1 Efficiency oriented influence factors on IT outsourcing decisions

2.1.1 Cost efficiency

A first factor identified as a significant reason for IT outsourcing by senior management is the cost cutting potential (Lacity and Wilcocks, 1995). This is often reflected in the company goals at the time of the contract conclusion. Smith et al. (1998), for instance, determine in their study that 26 of 29 outsourcing companies were following a company-wide cost cutting program mentioned in their annual report at the time of the contract conclusion.

Performance problems are seen as an important incentive to change the status quo and initiate organizational change (Millar and Chen, 1994). Firms which show a low cost efficiency in comparison to other companies and take this as an incentive to force a change therefore seem predestined for IT outsourcing (Smith et al., 1998). This is in accordance with the assessment of Strassmann (1995), that outsourcing is a “game for losers“ in which mainly unprofitable companies participate. From this results the following hypothesis:

(H1) Companies with a low cost efficiency show a tendency towards IT outsourcing.

2.1.2 Cash demand and liabilities

Next to the effect on cost efficiency, outsourcing of IT operations to an external service provider also has an effect on the cash balance. The customer can expect a short term "cash infusion" at the beginning of the contract duration (Barthélemy and Geyer, 2004). During the take-over of operations by the service provider, the customer sells PCs, servers, and network equipment, while in return the cash supply rises. This exchange leads to a reduction of assets, i.e. working capital and a simultaneous increase in cash. Often, even higher sums than the residual book value of the transferred assets are being paid (Juma'h and Wood, 1999), especially when personnel are being transferred, so that an added payment instrument materializes for the customer (Hall and Liedtka, 2005). The rules of accounting allow for these profits to be shown as operating income, as they do not have to be declared as a result from "discontinued operations". Therefore, a short term cost effect can arise at the beginning of the contractual period next to the cash effect, so that from the point of view of investors, the customer's company performance is enhanced (Hall and Liedtka, 2005). Next to this, a short term cash effect is achieved for the customer if the IT service provider grants generous payment terms when invoicing for services.

Companies with low cash reserves have a clear motive to close deals which generate a high inflow of cash short term (Juma'h and Wood, 1999). These findings lead to the following hypothesis:

(H2a) Companies with need for cash show a tendency towards IT outsourcing.

As shown, customers exchange assets for cash. This can be used to reduce liabilities (Smith et al., 1998). However, some authors are of the opinion that the connected intent to reduce future payback obligations is idealistic, as service providers get a reimbursement through leasing rates and service fees in exchange (Hall and Liedtka, 2005). The underlying construct hereby resembles a "sale and lease back" or rental agreement (Juma'h and Wood, 1999). Taking a closer look at the financial construct, these concerns cannot be shared. Service providers usually receive favourable financing conditions for leasing compared to the credit conditions of their customers, as the lessor applies the solvency of the IT service provider. If a financially strong IT service provider is chosen, the IT provider will have lower interest terms through better credit ratings. Therefore cost savings can be achieved in addition to the positive cash effect through financing instead of investment. This cost effect might appear marginal. However, considering the balance sheet, the difference between financing through loan versus leasing is significant. While loans are appear as a liability on the balance sheet, this is generally not the case for leasing obligations that are integral part of service fees. Applying this leasing construct, neither are the respective fixed assets shown on the balance sheet nor does their financing appear as a liability, so that IT outsourcing is sometimes considered an "off balance sheet"-financing (Juma'h and Wood, 1999). Summing up, the financial expenditures and liabilities are considerably and sustainably reduced for the customer. Logically consistent, debt reduction was named as motive for IT outsourcing in about 50 % of annual financial statements of outsourcing companies (Smith et al., 1998). Companies with a high debt ratio can benefit greatly this way, as the reduction of liabilities makes them appear less risky and thus a better credit rating reduces the financing costs for their loans (Hall and Liedtka, 2005). Hence,

(H2b) Companies with a high degree of debt show a tendency towards IT outsourcing

2.1.3 Shareholder expectations

The factors we pictured so far, i.e. cost efficiency, cash requirements and debt show an internal perspective on performance. This reflects the shareholder's point of view only partially. The shareholders of a corporation mostly act as investors and therefore take the position of the market – a perspective more external to the company. They analyse business progress discerning, as they have a legitimate interest in its positive development. When shareholders are unhappy with a company's performance, they put pressure on the managers, who in turn try to portray their company in a better light. Managers hereby show a tendency to take decisions with short term effects to fulfil their investors' expectations and maximise their profit.

IT outsourcing projects usually lead to an increase in the company value. Similarly, former studies have shown that the markets have a predominantly positive reaction to outsourcing agreements (Hayes et al., 2000). Moreover, IT outsourcing improves financial performance in the view of external stakeholders, as already pointed out above. Therefore companies that are forced to enhance their shareholders' performance can use outsourcing as an effective mean to achieve just that. These findings lead to the following hypothesis:

(H3) Companies which do not fulfill their shareholder's expectation show a tendency towards IT outsourcing.

2.2 Legitimacy of IT outsourcing decisions

Mimetic pressures (imitation) play a role particularly with environmental insecurities or the complexity of a decisive situation (Loh and Venkatraman, 1992b). Decision takers are geared to known, trustworthy models for imitation. These are mostly companies which are highly visible and appear modern or successful – the company that seems best or most efficient in the perception of the copying company. Intermediaries for the necessary information to imitate another company can be employees who switched companies and brought knowledge about another company, but also consulting firms active in several companies of a sector (DiMaggio and Powell, 1983). Moreover, company networks which are created for instance through membership in sector-specific associations, committees or unions can function as sources for mimetic behaviour (Ang and Cummings, 1997). The more broadly a company is positioned, the more possibilities it has to learn from others, to imitate and copy them (DiMaggio and Powell, 1983).

In summary, companies that have not practiced IT outsourcing until now and are uncertain in their decision making process rely on the first-hand accounts of the management of other companies and follow their path. The basis for an imitation of IT outsourcing behaviour can also be a similarity to other companies of the same sector with similar suppliers and clients or large and successful companies (Vitharana and Dharwadkar, 2007).

Normative pressure is the logical consequence of „structuring" forces which result in homogenous or isomorphic behaviour and thereby influence the behaviour of companies (Heugens and Lander, 2009). The development of normative pressure originates in cognitive processes resulting from habits taken for granted (Vitharana and Dharwadkar, 2007). With the increasing forming of the company environment norms and standards take on definite forms which limits the organizational activity.

In their decision making process, managers consider norms and standards which are considered mandatory in their business or field. The business practices in their environment are subject to a routine or are held as accepted solution for certain problems. Therefore some management decisions appear obvious or self-evident from the start. A search for possible alternative solutions is dispensed with.

This can also concern an IT outsourcing decision, for instance when the outsourcing of IT operations has asserted itself in a sector with certain standards and counts as up to date, without being critically scrutinized anymore. If a company observes that competitors outsource their IT department and that IT outsourcing asserts itself in its environment, it will show a similar outsourcing behaviour to gain legitimacy with their clients and business partner (Vitharana and Dharwadkar, 2007). In doing so, transaction costs can be saved by calling on service providers that are already established as well as adapting prevalent contract standards, monitoring techniques and sanction mechanisms. Hence,

(H4a) „Mimetic pressures" lead to the imitation of large and successful companies and

(H4b) the existence of „normative pressures" leads to the imitation of companies in the same industry.

2.3 Choice of contract duration

2.3.1 Contract duration and efficiency

The economic criteria cost efficiency, cash requirements and debt as well as dividend yield are influenced – as shown – short term as well as long term through IT outsourcing. A closer look however allows a distinction on the basis of the above-mentioned arguments between the influence of the efficiency criteria on short term and on long term contract duration.

Generally, the consequences of cost efficiency are more long term in nature. If a contract runs five years on average this corresponds roughly to 15% of the outsourced IT budget for a year. On top of this, in the first year there are expenditures for the transfer of the IT operation to the service provider, so that in spite of the attractive remuneration models described above, the reduction of the cost of IT operations arrives for the employer with a delay. Similarly, cost savings from process ameliorations and automation can hardly be realized short term, as they become effective only after completion of the transformation by the service provider. This leads to the following hypothesis:

(H5a) Companies with a low cost efficiency decide for IT outsourcing with long contract duration.

The prospect of a fast inflow of cash through the sale of fixed assets in the beginning of the contract duration constitutes an important part of the outsourcing decision for the employer. Simultaneously, granted credit periods take effect on the cash flow at the beginning of the contract period. Moreover the IT outsourcing has a long term influence on the cash and debt situation, as investment – and therefore the financing of the fixed assets – in the IT sector are carried out for the whole of the contract run by the IT service provider. And the reduced costs of the IT operations have a lasting positive influence on the cash resources. This leads to the following thesis:

(H5b) Companies with cash demand and high debt do not have fixed contract durations for their IT outsourcing projects. They choose short as well as long contract periods.

Reports on contractually arranged outsourcing projects are received mostly positively by market participants (Hayes et al., 2000). They heighten the company value short term. The often necessary restructuring of the company on the grounds of IT outsourcing however has more negative long term effects on the company value. The shareholders' expectations can therefore be fulfilled through short term contract periods while simultaneously reducing the risk of becoming dependant on IT providers that would accompany a long term contractual obligation. Therefore there is no motive for the employer to accept long term contract periods when concluding IT outsourcing agreement in response to pressure form the shareholders. Moreover, contract with shorter duration can be negotiated faster as they have to take fewer precautions to provide for unforeseen situations, for instance with regards to technological change, price development in the IT sector, fluctuating demand or unclear requests from the employer. In this way, the requirements of the shareholders can be taken up faster, so that they prefer shorter periods as well. This leads to the following hypothesis:

(H5c) IT outsourcing contracts which were concluded because of weak performance from the perspective of shareholders have shorter contract duration.

2.3.2 Contract duration and legitimacy

The outsourcing of the data processing does not only have positive consequences, but also risks and insecurities, for instance with regard to the price development for IT services or technological change (Lacity and Willcocks, 1995). Companies which see high risks in the outsourcing decision will have a tendency not to obligate themselves for a long time and to therefore choose a short contract period. Employers act carefully and try to conclude contracts as detailed and complete as possible or to find arrangements which will keep the hurdles to a reversal of the outsourcing minimal. They therefore use contractual means and configuration possibilities to reduce the „locked-in".

The uncertainty is particularly strong when companies outsource for the first time. Employers in these situations will try to compensate their uncertainty by emulating large and successful companies or adapting established practices in their sector to legitimize their decision. Hence,

(H6) Institutional factors influence IT outsourcing decision independently of the chosen contract duration.

3 Data and Methods

3.1 Variables

Dependent variable

We examined the first-time decisions of publicly listed German firms to engage in large-scale IT outsourcing between 1990 and 2008. To get a complete sample of firms, we searched for respective outsourcing announcements in the Lexis Nexis data base as well as in relevant IT journals using search terms like „IT", „DP", „data processing", „data center" etc. The announcements were compared with two databases that comprise all IT outsourcing contracts with a volume over € 1 Mio (PAC Deal Tracker) and over € 10 Mio (Sourcing Monitor). In addition, we asked a number of experienced IT sales managers and IT consultants to assess whether we had captured all relevant IT outsourcing projects and to point out potential missing data. This exhaustive data collection effort resulted in a sample of 1.041 IT outsourcing contracts with a volume over € 1 Mio for 19 year time-window between 1990 and 2008. To verify our data, we checked for IT outsourcing decisions in the years prior to 1990 and did not find any relevant announcements. As IT outsourcing was very uncommon among German firms before 1990, we are confident to have a complete data set of first-time IT outsourcing decisions. In addition, we avoid problems with left-censoring.

The question whether a strategic choice – like IT outsourcing – aims at increasing efficiency or legitimacy is especially relevant when the firm has no prior experience with that decision and faces high uncertainty (DiMaggio and Powell, 1983). Therefore, we focused on a firm's first-time decision to engage in large-scale IT outsourcing. We treated an IT outsourcing decision as a first-time decision if the firm had not chosen to engage in IT outsourcing with a volume over € 1 Mio before. In case of a holding company, a first-time outsourcing decision refers to the first-time large-scale IT outsourcing contract of any of the firm's subsidiaries. After one of the subsidiaries had decided to engage in IT outsourcing, later contracts of other subsidiaries were not included in the study. This resulted in a sample of 627 first-time IT outsourcing contracts.

To match our data on IT outsourcing with reliable information on various measures of firm performance, we had to narrow down our sample to publicly listed firms. These firms represent a broad spectrum of the German economy, with the largest firm equivalent to a firm in the top 5 of the Fortune 500 and the smallest firm falling in the range of smaller mid-cap firms in the U.S., allowing us to observe a great deal of variance in firm size within the sample. Our final data set consists of 227 first-time IT outsourcing decisions of publicly listed firms in Germany for a 19 year time-window between 1990 and 2008. Consequently, our dependent variable, $IT\ outsourcing_{jt}$, is coded as 1 if firm j became party to an IT outsourcing contract over € 1 Mio in year t.

Independent variables

We use a number of independent variables to capture whether an IT outsourcing decision was driven by a firm's quest for efficiency or for legitimacy. All independent variables are lagged by one year.

Our first independent variable, *cost efficiency*, is measured as the relation of net income and total assets. Cost efficiency serves as indicator for a firm's productivity and accounts for taxes that accrue when parts of the firm's assets are sold to an IT service provider and for potential balance sheet contractions (Hall and Liedtka, 2005). Additional indicators for a firm's efficiency are its cash demand and debt. Both measures are affected by IT outsourcing in the same way. As a firm outsources large parts of its IT, it exchanges investments in IT assets against monthly service fees to the outsourcing provider, thus reducing the amount of tied capital. Furthermore, a sale of current IT assets to an outsourcing provider results in a cash infusion. As a consequence, the outsourcing firm can meet a higher cash demand and reduce its debt. Prior studies often use both measures separately without accounting for their correlation. Analyzing H2a and H2b, we aim at integrating the effects of IT outsourcing on meeting cash demand and reducing debt by using a combined variable, i.e. the relation of *cash to liabilities*.

A firm's quest for an increase in efficiency may not only be driven by an internal performance perspective but also by shareholders' expectations. To capture the effect that IT outsourcing may be driven by a firm's wish to better meet these expectations, we use *earnings per share*. Extant literature has shown that this measure has an influence on IT outsourcing decisions.

Many studies that analyze mimetic behavior measure in how far a firm's specific choice or action is affected by similar decisions of other organizations in their sample (e.g. Katz and Shapiro, 1985; Haunschild and Miner, 1997). This set-up, however, makes it difficult to distinguish between mimetic behavior and a general diffusion of strategic choices and actions. To get a more fine-grained measure for legitimacy-oriented behavior, we analyze the firm's propensity to imitate IT outsourcing decisions of large and successful firms. As these firms are especially visible and prominent, they may be seen as role models by their smaller and less successful peers (Burnes and Wholey, 1993; Haveman, 1993). Our indicator for size is the firm's log number of employees while success is measured as the relation of net income and total assets. Firms in the top quartile of the respective indicator are identified as especially large and/or successful. The impact of these firms' IT outsourcing decisions on our sample firms are captured by two variables labeled *size imitation* and *success imitation*. The variable *industry imitation* captures the number of firms within an industry in our sample that have already chosen to engage in large-scale IT outsourcing. The industries are defined according to the classification provided by Datastream. To be able to compare coefficients across models we standardized the variables for size imitation, success imitation, and industry imitation.

Moderator

A measure for contract duration serves as moderating variable. Contract duration is a dichotomous variable that helps us to distinguish between IT outsourcing contracts that last up to 4 year on the one hand and longer than 5 years on the other hand.

Control variables

In all models we control for *firm size*, measured as the log of employees. To control for unobserved *industry* effects, we create dummy variables for five of the six broad industry categories represented in our study. Finally, we control for the duration of the IT outsourcing contract (*contract duration*), except in those models that analyze the moderating effect of this variable.

3.2 Analysis

To analyze the effects of our independent variables on IT outsourcing decisions we estimate a piece-wise logistic regression model which is a simple extension of a discrete-time logit specification with piecewise constant hazard rates. The advantage of a piece-wise regression model

is that it does not make strict assumptions about the effect of time on the likelihood of IT outsourcing. Rather, a constant baseline hazard rate is assumed for each time period that is allowed to vary between the „time pieces“ (Petersen, 1995). We chose five year periods as respective cutpoints or „time pieces“ (i.e. 1990-1994; 1995-1999; 2000-2004; 2005-2008).

Each year (beginning in 1990) represents a spell in which firms may potentially become party to an IT outsourcing contract. If a firm did not engage in IT outsourcing throughout the observation period, the spell was right censored by the end of 2008. Spells were updated at the end of each year to accommodate the annual time-varying covariates. Once a firm had opted for a large-scale IT outsourcing contract, the next year's risk set was diminished by the respective firm. This yielded a total of 2.730 firm-year spells. We accounted for the correlation between decisions about IT outsourcing by the same firm across different years by using a robust variance estimator (Lin & Wei, 1989).

4 Results

Table 1 presents descriptive statistics and correlations. Please note the considerably strong correlation between the three variables that capture the impact of imitation on IT outsourcing decisions (i.e. size imitation, success imitation, and industry imitation). These correlations could be an indicator of problems with multicollinearity. Since multicollinearity inflates standard errors, the respective correlations would work against our predictions. To address this issue, we entered the respective variables in separate models.

		Mean	Std	1	2	3	4	5	6	7	8	9	10	11	12	13
1	IT Outsourcing	.847	.963													
2	Firm size	9.953	1.762	0.065												
3	Contract duration	.841	.365	0.102	0.036											
4	Industry 1	.132	.339	0.014	0.111	0.027										
5	Industry 2	.273	.446	0,090	0,082	0,104	-0,239									
6	Industry 3	.220	.414	-0,039	0,025	-0,089	-0,207	-0,326								
7	Industry 4	.110	.313	-0,036	-0,064	-0,078	-0,137	-0,216	-0,187							
8	Industry 5	.114	.318	-0,034	-0,059	0,043	-0,140	-0,221	-0,191	-0,127						
9	Cost efficiency	.028	.119	-0,022	0,114	-0,039	0,076	-0,053	0,111	-0,038	-0,044					
10	Cash / Liability	.140	.337	-0,029	-0,211	-0,067	-0,062	-0,057	0,011	0,026	0,204	-0,019				
11	Earnings per Share	.057	.178	0,060	0,077	-0,071	0,010	0,001	0,033	-0,052	-0,002	0,038	-0,026			
12	Success imitation	.784	1.495	0,665	0,031	0,000	0,000	0,000	0,000	0,000	0,000	-0,020	0,032	0,119		
13	Size Imitation	.669	1.280	0,666	0,028	0,000	0,000	0,000	0,000	0,000	0,000	-0,032	0,037	0,107	0,973	
14	Industry Imitation	.760	1.407	0,684	0,054	0,017	0,022	0,133	-0,058	-0,053	-0,050	-0,025	0,015	0,108	0,971	0,968

Table 1. Descriptive Statistics

Table 2 provides the results of our main analyses. Consistent with the logistic transformation of the dependent variable, the coefficients represent the effect of each variable on the log-odds of IT outsourcing. Model 1 reports the findings for the control variables. The dummies for the time pieces are significant and reveal that the likelihood of IT outsourcing increases over time. Firm size and contract duration have a positive and significant influence on IT outsourcing. The dummies for the broad industry categories are insignificant with the exception of the category „construction, manufacturing system engineering, and electrical industry“ (i.e. Industry 2 in Model 1).

	Model 1 b (se)	Model 2 b (se)	Model 3a b (se)	Model 3b b (se)	Model 3c b (se)
Time piece 1 (1990-1994)	-4,480 *** (0,430)	-4,659 *** (0,626)	-4,146 *** (0,655)	-4,233 *** (0,686)	-4,185 *** (0,662)
Time piece 2 (1995-1999)	-3,593 *** (0,416)	-3,879 *** (0,623)	-3,810 *** (0,634)	-3,897 *** (0,636)	-3,877 *** (0,642)
Time piece 3 (2000-2004)	-2,928 *** (0,397)	-3,300 *** (0,606)	-4,066 *** (0,638)	-3,955 *** (0,681)	-3,792 *** (0,668)
Time piece 4 (2005-2009)	-1,802 *** (0,378)	-2,087 *** (0,570)	-3,703 *** (0,698)	-3,301 *** (0,773)	-3,126 *** (0,738)
Firm Size	0,057 * (0,035)	0,085 * (0,050)	0,093 * (0,051)	0,090 * (0,051)	0,090 * (0,052)
Contract duration	0,307 * (0,142)	0,185 (0,173)	0,138 (0,179)	0,173 (0,178)	0,161 (0,176)
Industry 1	0,044 (0,209)	0,284 (0,280)	0,243 (0,284)	0,269 (0,285)	0,176 (0,283)
Industry 2	0,342 * (0,170)	0,687 ** (0,252)	0,698 ** (0,253)	0,704 ** (0,256)	0,470 * (0,266)
Industry 3	-0,060 (0,177)	0,334 (0,261)	0,283 (0,265)	0,317 (0,266)	0,345 + (0,264)
Industry 4	0,234 (0,238)	0,321 (0,344)	0,256 (0,342)	0,302 (0,350)	0,357 (0,347)
Industry 5	-0,020 (0,195)	0,296 (0,287)	0,238 (0,301)	0,281 (0,296)	0,314 (0,300)
Cost Efficiency		-2,303 *** (0,644)	-2,407 *** (0,686)	-2,254 *** (0,651)	-2,242 *** (0,664)
Cash / Liabilities		-0,843 * (0,450)	-0,848 * (0,460)	-0,851 * (0,459)	-0,835 * (0,457)
Earnings per Share		-0,354 * (0,204)	-0,485 * (0,243)	-0,394 * (0,226)	-0,453 * (0,241)
Success Imitation			0,644 *** (0,150)		
Size Imitation				0,519 * (0,234)	
Industry Imitation					0,457 ** (0,181)
N	2.178	1.519	1.519	1.519	1.519
Wald χ^2	1.391,26 ***	1.165,27 ***	1.007,68 ***	1.078,79 ***	1.100,41 ***
+ p < 10% * p < 5% ** p <1% *** p < 0,1% (two-tailed tests)					

Table 2. Impact of Efficiency and legitimacy rationales on IT outsourcing Piece-wise logistic regression; robust standard errors in parenthesis

In Model 2 we include the three variables that capture efficiency as trigger for IT outsourcing decisions. Our measures for cost efficiency, cash/liabilities, and earnings per share show a significant and negative influence on IT outsourcing. Put differently, firms are more likely to make a first-time decision for IT outsourcing when they have a considerable low cost efficiency, a low ratio of cash to liabilities, and low earnings per share. Thus, we find support for Hypotheses 1, 2a/b, and 3.

We tested Hypotheses 4a and 4b by assessing the impact of prior IT outsourcing decisions of successful and large peers on the focal firm's decision to follow suit. As Model 3a and 3b in Table 2 reveal, both variables show a strong and significant positive influence on the focal firm's IT outsourcing decision. Consequently, a firm is more likely to close an IT outsourcing contract if successful and large peers have already made the same decision. Model 3c reveals the results for

the influence of prior IT outsourcing decisions of peers within the industry on the focal firm. In line with Hypothesis 4c, we find a significant and positive result.

So far, our results for Hypotheses 1 through 4 show that IT outsourcing decisions may be triggered by a quest for efficiency and/or legitimacy. This also confirms our baseline assumption that both motives play a role for IT outsourcing decisions.

	Model 4a	Model 4b	Model 4c	Model 5a	Model 5b	Model 5c
	Short-term contract			Long-term contract		
	b (se)	b (se)	b (se)	b (se)	b (se)	b (se)
Time piece 1 (1990-1994)	-18,067*** (1,621)	-17,409*** (1,675)	-16,623*** (1,683)	-3,984*** (0,697)	-4,089*** (0,726)	-4,016*** (0,704) *
Time piece 2 (1995-1999)	-1,898 (1,611)	-1,903 (1,644)	-1,225 (1,624)	-3,609*** (0,690)	-3,660*** (0,691)	-3,650*** (0,705)
Time piece 3 (2000-2004)	-1,520 (1,545)	-1,632 (1,567)	-0,918 (1,491)	-3,966*** (0,699)	-3,754*** (0,765)	-3,675*** (0,742)
Time piece 4 (2005-2009)	-1,530 (1,735)	-1,534 (1,711)	-1,308 (1,650)	-3,517*** (0,782)	-2,966*** (0,896)	-2,920*** (0,825)
Firm Size	-0,056 (0,133)	-0,059 (0,133)	-0,106 (0,131)	0,084+ (0,058)	0,081+ (0,058)	0,081+ (0,059)
Industry 1	-1,868* (0,819)	-1,890** (0,731)	-2,681*** (0,814)	0,407+ (0,300)	0,426+ (0,299)	0,347 (0,299)
Industry 2	-0,555 (0,811)	-0,811 (0,845)	-2,159* (0,948)	0,791** (0,263)	0,795** (0,264)	0,600* (0,279)
Industry 3	-0,973** (0,415)	-1,228** (0,500)	-1,214** (0,409)	0,356 (0,285)	0,396+ (0,282)	0,413+ (0,280)
Industry 4	-1,960*** (0,497)	-2,091*** (0,475)	-2,269*** (0,531)	0,638+ (0,401)	0,692* (0,415)	0,725* (0,408)
Industry 5	-2,548*** (0,497)	-2,557*** (0,547)	-3,022*** (0,487)	0,419+ (0,306)	0,451+ (0,302)	0,483+ (0,306)
Cost Efficiency	-3,322 (3,166)	-1,990 (3,044)	-3,455 (3,038)	-2,379*** (0,721)	-2,294*** (0,694)	-2,243*** (0,700)
Cash / Liabilities	-0,234 (0,467)	-0,235 (0,497)	-0,218 (0,442)	-0,791+ (0,508)	-0,809+ (0,511)	-0,779+ (0,509)
Earnings per Share	-1.190* (0.588)	-0.908+ (0.602)	-1.237* (0.573)	-0.430 (0.416)	-0.387 (0.384)	-0.422 (0.410)
Success Imitation	1.261*** (0.277)			0.586*** (0.179)		
Size Imitation		1.393*** (0.366)			0.408+ (0.279)	
Industry Imitation			1.793*** (0.385)			0.394* (0.202)
N	294	294	294	1.225	1.225	1.225
Wald χ^2	8.370,80***	8.139,55***	6.142,77***	918,28***	962,54***	976,95***
+ p < 10% * p < 5% ** p <1% *** p < 0,1% (two-tailed tests)						

Table 3. Efficiency and legitimacy rationales under varying levels of contract duration Piece-wise logistic regression; robust standard errors in parenthesis

Table 3 reveals the results for the moderating influence of contract duration on the impact of an efficiency rationale and institutional factors on IT outsourcing. As scholars have recently shown, conventional interactions may lead to inappropriate conclusions in non-linear models, like those reported here, because the coefficient of an interaction term does not always represent the correct sign or magnitude (Ai and Norton, 2003). Consequently, we tested the interaction hypotheses using the procedure suggested by Shaver (2007). Specifically, we split the sample into firms with IT

outsourcing contract duration below four years (Model 4a – 4c) and above five years (Model 5a – 5c) and compared the effects across subsamples through a test of significance. Please recall that we expect different moderating effects for the duration of the IT outsourcing contract depending on the motive that triggered the outsourcing decision. In H5a, we expect that firms with a low cost efficiency profit most from long-term IT outsourcing contracts. In line with this prediction we find that firms with a low cost efficiency are likely to choose IT outsourcing contracts with a duration of more than five years while we find no significant result for short-term contracts. A Wald test confirms this result.

H5b predicted that firms in need of cash or with high debt are likely to engage in short-term as well as in long-term IT outsourcing. In contrast to our assumptions, the ratio for cash to liabilities shows no significant impact on short-term IT outsourcing contracts and is only marginally significant for contracts with a duration over 5 years. In line with H5c, Models 4a to 5c reveal that firms with low earnings per share have a strong propensity to enter short-term IT outsourcing contracts while they are considerably less interested in respective long-term IT outsourcing.

With respect to the influence of institutional factors on IT outsourcing we expected to find a positive impact of prior outsourcing decisions by successful and large peers as well as by competitors within the focal firm's industry. As Models 4a – 5c show, the direction and significance of the coefficients for the variables success imitation, size imitation, and industry imitation are as expected. As confirmed by Wald tests, however, the effects were stronger for short-term IT outsourcing contracts than for long-term contracts.

5 Discussion

The results of this study reveal that IT outsourcing decisions may be triggered by economic and institutional factors alike. As assumed in our baseline proposition, key strategic decision makers seek both, an increase in efficiency and in legitimacy, as they opt to close an IT outsourcing contract. Consequently, economic reasons as well as institutional factors have to be kept in mind when analyzing large-scale IT outsourcing decisions. Studies that focus only on one of these motives without acknowledging its alternative may omit important factors.

Especially firms that seek to increase their cost efficiency have a higher probability to close long-term IT outsourcing contracts. As the positive cost effects of IT outsourcing are rather long-term in nature, firms with a low cost efficiency profit more from engaging in respective long-term contracts. In contrast, firms with a weak capital market performance are more likely to engage in short-term IT outsourcing. These firms seem to be more interested in providing a positive signal to their shareholders than to realize long-term cost-effects from a respective IT outsourcing contract.

For both types of contracts we find intra-industry imitation as well as an imitation of large and successful peers. However, the effect is much stronger for the split-sample with short-term contracts than for the split-sample with long-term contracts. This result is surprising, as long-term outsourcing contracts are deemed as especially risky and should, thus, make imitation especially likely. A possible explanation for this finding is provided by our control for the four "time-pieces". While all "time-pieces" are significant in the split-sample comprising short-term contracts, all "time-pieces" are significant for the split-sample addressing long-term contracts. This indicates, that short-term contracts were especially likely in early years (1990-1994) in which the uncertainty surrounding the outsourcing decision was especially high.

As every empirical study, our paper has some limitations which mostly refer to our data set. Although we were careful about how to design our sample and invested time in an exhaustive data collection effort, our sample suffers from the omission of data. First, as we needed to match our data with firms' financial information, we had to focus on publicly listed firms. Second, it may well be that press announcements regarding IT outsourcing decisions are biased towards large and more visible firms. Therefore, our results may not be generalizable to privately-owned and smaller firms.

A further limitation of this study is the fact that other than economic and institutional factors may drive IT outsourcing decisions. For instance, these decisions could be driven by firm-specific needs that also influence the performance variables under study. We tried to control for that by lagging all

independent and control variables but cannot rule out that we may have omitted relevant influence factors. Future research may try to provide a more fine-grained picture of the IT-outsourcing decision by including additional factors.

References

Ai, C. and Norton, E. C. (2003). Interaction terms in logit and probit models. Economics Letters, 80 (1), 123-129.

Ang, S. and Cummings, L. (1997). Strategic Response to Institutional Influences on Information Systems Outsourcing. Organizational Science, 8 (3), 235-256.

Barthélemy, J. and Geyer, D. (2004). The Determinants of Total IT Outsourcing. The Journal of Computer Information Systems, 44 (3), 91-97.

Burns, L. R. and Wholey, D. R. (1993). Adoption and abandonment of matrix management programs. Academy of Management Journal, 36, 106-138.

DiMaggio, P. J. and Powell, W. W. (1983). The Iron Cage Revisited. American Sociological Review, 48 (2), 147-160.

Grimshaw, D., and Miozzo, M. (2006). Institutional effects on the IT outsourcing market. Organization Studies, 27 (9), 1229-1259.

Hall, J. A. and Liedtka, S. L. (2005). Financial performance, CEO compensation, and large-scale information technology outsourcing. Journal of Management Information Systems, 22, 193-221.

Haunschild, P. R. and Miner, A. S. (1997). Modes of interorganizational imitation: The effects of outcome salience and uncertainty. Administrative Science Quarterly, 42 (3), 472-500.

Haveman, H. A. (1993). Follow the leader: Mimetic isomorphism and entry into new markets. Administrative Science Quarterly, 38, 593-627.

Hayes, D. C., Hunton, J. E., and Reck, J. L. (2000). Information systems outsourcing announcements. Journal of Information Systems, 14 (2), 109-125.

Heugens, P. P. M. A. R., and Lander, M. W. (2009). Structure! Agency! (And other quarrels). Academy of Management Journal, 52 (1), 61-85.

Juma'h, A. H., and Wood, D. (1999). Outsourcing implications for accounting practices. Managerial Auditing Journal, 14 (8), 387-395.

Katz, M. L. and Shapiro, C. (1985). Network externalities, competition, and compatibility. American Economic Review, 75 (3), 424-440.

Lacity, M. C., and Willcocks, L. P. (1995). Interpreting information technology sourcing decisions from a transaction cost perspective. Accounting, Management and Information Technology, 5, 203-244.

Lin, D. Y. and Wei, L. J. (1989). The robust inference for the Cox proportional hazards model. Journal of the American Statistical Association, 1074-1078.

Loh, L., and Venkatraman, N. (1992a). Determinants of information technology outsourcing. Journal of Management Information Systems, 9 (1), 7-24.

Loh, L., and Venkatraman, N. (1992b). Diffusion of information technology outsourcing. Information Systems Research, 3 (4), 334-358.

Meyer, J. W. and Rowan, B. (1977). Institutional organizations: formal structure as myth and ceremony. American Journal of Sociology, 83, 340-363.

Millar, D., and Chen, M.-J. (1994). Sources and consequences of competive inertia: A study of the U.S. airline industry. Administrative Science Quarterly, 39 (1), 1-23.

Petersen, T. (1995). Analysis of event histories. Handbook of Statistical Modeling for the Social and Behavioral Sciences. Arminger, G.; Clogg C.C., Sobel, M.E. (eds). Plenum Press, 453-515.

Shaver, J. M. (2007). Interpreting Empirical Results in Strategy and Management Research. Research Methodology in Strategy and Management, 4, 273-93.

Smith, M. A., Mitra, S., and Narasimhan, S. (1998). Information systems outsourcing: A study of pre-event firm characteristics. Journal of Management Information Systems, 1 (2), 61-93.

Staw, B. M. and Epstein, L. D. (2000). What bandwagons bring. Administrative Science Quarterly, 45, 523-556.

Strassmann, P. A. (1995). Outsourcing: A game for losers. Computerworld, 29 (34), 75-76.

Vitharana, P., and Dharwadkar, R. (2007). Information systems outsourcing: Linking transaction cost and institutional theories. Communications of the Association for Information Systems, 20 (1), 346-370.