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IT GOVERNANCE ADOPTION IN BANKING AND INSURANCE SECTOR: LONGITUDINAL CASE STUDY OF COBIT USE

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Abstract: For achieving business success and sustainability, companies should increase their focus on aligning business strategy with information technology (IT) governance. Consequently, there has been an increase of interest in IT governance adoption and the usage of COBIT framework. In order to investigate the reasons, ways and differences of COBIT framework implementation in financial sector companies, we have conducted a longitudinal research in form of case studies within two banks and two insurance companies. The results reveal an increase in COBIT maturity levels for all observed companies during the five year period, but with significant differences in the level and speed of its adoption. This research indicate the importance of true strategic IT and business alignment for increasing IT governance maturity and opportunities for business model innovation, which makes the practical contribution of the paper.

Keywords: COBIT, IT governance, case study, longitudinal research, financial sector

1. Introduction

In the last few decades, information technology (IT) is becoming to have a pivotal role for business success and sustainability in growing number of companies (Soriano et al., 2013; Lunardi et al., 2014; Prasad et al., 2012). In accordance to that, there have been an increasing interest in the way companies could and should manage their IT, which generated a growing body of research focused on IT governance (De Haes et al., 2013). IT governance is the way companies align their business and IT strategy, while taking into consideration

stakeholders' interests (Schwartz, 2007). Therefore, numerous companies use IT governance as the leverage for creating coordination between IT projects and business goals (Van Grembergen & De Haes, 2012; Ali et al., 2015). Due to importance of IT governance for the improving business performance, the interest in its adoption is also increasing (e.g. Tuttle & Vandervelde, 2007).

Two decades ago, ‘Information Systems Audit and Control Association’ (‘ISACA’) created a framework for IT governance adoption called ‘Control Objectives for Information and Related Technology’ (‘COBIT’) which provides a common language for business executives to communicate with each other about IT goals, objectives and results (ISACA, 2016a). The

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main COBIT goal is enabling the development of clear policy and good practice for organizational IT control (Lainhart IV, 2000).

The research focusing to IT governance adoption using COBIT framework is mainly oriented to the case study approach. Several case studies have been conducted in non-profit organizations, mainly universities (e.g. Ko & Fink, 2010; Idlbek, 2011; Sadikin et al., 2014) and health care organizations (Wilkin & Riddett, 2009). Some of them were observing governmental organizations (e.g. Gerke & Ridley, 2009; Wilkin et al., 2012), most of them were based on profit organizations (e.g. Hardy, 2006; Bowen et al., 2007; Willson & Pollard, 2009), but we found only few COBIT based case studies focused to financial institutions (e.g. Damiandes, 2005; Robb & Parent, 2009; Spremic, 2012; Herz et al., 2013), although companies that operate in these industries invest a large portion of their turnover to IT. Also, only few of observed COBIT case studies specify the research period, mainly ranging from 2 months to 2 years. Furthermore, most of the case studies were based on a single organization, while only few investigated multiple organizations, in majority of cases 2 or 4 of them (e.g. Zolper et al., 2013; Cram et al., 2014).

Several authors focused their research on IT governance practice in the financial industry. In a single case study, Damiandes (2005) present an IT governance framework for providing accurate, visible and timely information while ensuring secure information assets in financial institutions in USA. Robb and Parent (2009) conducted a case study research regarding IT governance in two financial institutions in Australia and Canada. They studied IT governance choices and emphasize contextual differences between Australia and Canada regarding regulations. Herz et al. (2013) conducted interviews in a period of 2 months in German financial service company. Zopler et al. (2013) conducted a 2-year case study based on four organizations using interviews

and questionnaires (among them one is bank and other insurance company), focusing to the interaction structures between business and IT. While some previous researches (Spremic, 2012) have been focusing on investigating how and to what extent the prescribed regulatory provisions have affected IT governance in banking sector, namely in IT security domain, in this paper we have expanded our research reach to different industries and groups, and we focus to the broader area of IT governance adoption.

Taking into account the gaps of previous research (lack of focus to financial organizations, namely banks and insurance companies; single-case study approach; focus only to IT security domain, and shorter time period of analysis), in this paper we set the first research question:

RQ1: What are the reasons and dynamics of IT governance adoption in the financial sector (banks and insurance companies) using COBIT framework over 5 year time period?

Since previous research revealed that there are substantial differences in behavior of subsidiary and domestic companies in numerous aspects of business (e.g. Mata & Portugal, 2004), we raise the second research question as:

RQ2: What are specific mechanisms which affect IT governance adoption using COBIT framework in different groups of companies (banking vs. insurance & domestic vs. subsidiary companies)?

In order to provide answers to these research questions we have combined desk and case study research. First, we have analyzed 25 case studies of IT governance activities using COBIT framework from 2005 until 2015 cited in Web of Science and Scopus database in order to get insight into current literature on COBIT use in IT governance adoption. Second, the multiple longitudinal case study on COBIT use in IT governance adoption research was performed, using the sample of two banks and two insurance

companies, that are of different ownership type (domestic vs. subsidiary).

Our research provides several contributions. First, based on the analysis of 25 case studies we identify gaps in IT governance adoption research using COBIT (2005-2015). Second, we analyze IT governance adoption issues (reasons, mechanisms, dynamics) using COBIT framework during longer period of time (five years) within financial companies in Croatia using developed qualitative case study methodology. Third, we compare IT governance practice in banking and insurance companies as well as practices of domestic and subsidiary companies, in order to conclude if industry and/or ownership impact speed and depth of IT governance adoption using COBIT.

The paper is organized as following. After introduction, a literature review on IT governance and COBIT framework is presented with summary of relevant case studies. Research methodology is presented in third part of the paper. The overview of results from observed banking and insurance case studies are given in fourth and discussed in fifth section. At the end, conclusion highlights the most important findings and contributions of this paper.

2. Literature review

IT governance and COBIT framework

'IT governance is a relatively new concept introduced in the late 1990s, which has gained importance in the 21st century due to well-known collapses (Enron Inc., WorldCom, Parmalat, etc.) and the need for a better reporting and financial disclosure system' (Spremic, 2012). According to Gartner, IT governance is a set of processes which ensure that the usage of IT is effective and efficient and therefore enables companies to achieve their goals (Gartner, 2016). As suggested by the ITGI (ITGI, 2003), IT governance activities should be implemented around these two areas: (1) how IT can deliver value to the business and

(2) how IT risks should be managed and mitigated. ITGI (ITGI, 2003) concluded 'that approach leads to the five main focus areas of the IT governance, all driven by stakeholder value' and together with their partner institution ISACA, propose (ITGI, 2003; ISACA, 2012) 'that IT governance should consist of five different components, with the first two being drivers, the second two outcomes and the last one referring to IT resource issues':

- 1) **Business/IT strategic alignment** – relates to IT governance procedures which should result in aligning IT activities with strategic business objectives, namely through sound IT business value propositions and efficient IT operational excellence.
- 2) **Performance measurement in IT** – activities by which the implementation of IT strategy need to be monitored, IT programs and projects governed, process monitored and IT services delivered in accordance with the strategic objectives.
- 3) **IT value creation and delivery** – methodologies and frameworks which help in implementing value added IT initiatives.
- 4) **IT risk management and/or value preservation** – continuous use of sound and efficient IT risk management system, especially by making senior executives aware of cyber risks and IT threats, defining appropriate IT risk level ('corporate's IT risk appetite') and assigning responsibilities for governing them.
- 5) **IT resource management** – clear procedures and proven methodologies in managing IT investments and efficient management of all IT resources, including software, data, employees and their competencies, technology and associated processes.

Many researches stressed the importance of IT governance mainly due to its potential impact on value added IT investments and alignment with strategic objectives. While Weill and Ross (2004) revealed that 'companies with better than average IT governance gain 20% higher returns on assets', other researchers tried to investigate what particular mechanisms work best as practical implications for proper corporate governance of IT. Two focus areas and five different components, as a sound IT governance construct, might make IT governance implementation easy, but some researchers revealed this is not so straightforward process. Wilson & Polard (2009) pointed at strong CEO-CIO relationship, structural changes regarding IT-business alignment and shared vision between business executives and techs professionals as a key drivers of IT governance. Van Grembergen and De Haes (2015) investigated what IT governance mechanisms are crucial for effective and successful implementation and identified 'seven key minimum baseline IT governance practices: IT steering committee, IT budget control and reporting, portfolio management, IT leadership, CIO-CEO-COO relations and project issues' and argue about their possible use. Their research was focused on short time period. Therefore, in this paper we would like to explore in more details and in longer period of time (5 years) what are specific factors which affect successful IT governance adoption using COBIT framework.

Even it is understandable that many researchers and practitioners are very interested in finding 'perfect' mechanisms to implement IT governance, the truth is that there is no unique formula how IT governance should look like or 'one-size-fits-all' IT governance model. A one-size-fits-all approach to any technology (digital technology, IT) almost never works, especially for business organizations competing at different markets or implementing different business models. IT

governance adoption is arguably very important issue in improving business performance, but despite a number of researches, it is not still clear what precise mechanisms are crucial. We would like to close this research gap by exploring subtle and specific mechanisms of IT governance adoption over longer period of time.

On the other hand, a range of IT governance standards and frameworks has been introduced (Larsen et al., 2006), mainly to assist companies in delivering and improving IT governance. ISO/IEC 38500 helps to clarify IT governance with top-down approach demonstrating to all stakeholders (including regulatory bodies), providing effective means of assigning accountability for IT activities in six major areas: responsibility, strategy, acquisition and implementation, performance, conformance and human behavior. ITIL is globally recognized as an useful IT service delivery framework, but might also be used for delivering IT governance. Developed and released by ISACA in 1996 in order to define and align business goals with IT processes, COBIT is so called 'umbrella' framework for delivering and improving IT governance. Since then, there have been several iterations of the COBIT framework to the current version of COBIT 5, released in 2012 (ISACA, 2012, 2016a).

As ISACA reported (ISACA, 2012) 'the focus on financial reporting has driven a significant corresponding focus on the importance of IT-related controls and the use of good practices such as COBIT has been mandated in some countries and industries'. This means that in many countries national IT governance regulation are based on COBIT framework (mainly in banking and insurance industry) which make a sound basis for our research. Also, ITGI (ITGI, 2003) identified 'the primary focus of COBIT is the responsibility of the board of directors and executive management to control formulation and the implementation of IS strategy, to ensure the alignment of IS and business, to identify metrics for

measuring business value of IS and to manage IS related risks in an effective way'. As suggested by the ITGI (ITGI, 2003), COBIT acts as a worldwide professional framework for delivering and improving IT governance activities. Mostly due to its comprehensive approach, COBIT is one of the most known frameworks for developing and evaluating technology intensive information systems, widely used by practitioners (Simonsson & Johnson, 2006; Tuttle & Vandervelde, 2007).

In the Republic of Croatia regulatory framework for IT governance is prescribed in banking and insurance industry, with regulatory provisions mainly following COBIT 5 framework (mandating in total 18 areas for overall IT governance compliance which are equal for large, medium and small companies). If not mandated by a separate regulation, companies which operate in other sectors mainly use COBIT as an umbrella IT governance framework. We have selected our sample following specific research interest to investigate are there any differences between IT governance practices in different groups of companies (industry, ownership structure, various initial IT governance maturity and other organisational factors which might affect IT governance adoption using COBIT framework). In our work we have focused to banks and insurance companies, due to the fact that COBIT based IT governance framework is in strict use for a long time (over a decade), so we might expect satisfactory maturity levels of IT governance.

IT governance implementation case studies using COBIT framework

First contribution of this paper is to investigate depth and breadth of IT governance implementation case studies using COBIT. In our review we have exclusively focused to appropriate case studies published as peer-reviewed papers, from 2005 until 2015, which is taking into account that COBIT was first released in 1996 (ITGI, 2003).

Literature gathering was conducted in the following steps. First, Web of science research platform was used for searching SCI-EXPANDED and SSCI databases in order to identify appropriate papers. The Boolean keyword combination was used for searching relevant work (COBIT AND "case study"). Second, the same approach for finding IT governance implementation case studies using COBIT framework was used to search Scopus database. The results were limited only to articles published in peer-reviewed journals and book chapters, while conferences proceedings were excluded from the analysis.

Searching the Web of science resulted in 8 articles. Searching the Scopus database resulted with 55 papers, which were narrowed to 25 articles and book chapters published in peer-reviewed journals. After careful abstract and full-text reviewing, papers which do not refer to implementation of COBIT were removed from the analysis, resulting with the final list of 25 articles from Scopus and Web of science, among which 3 papers are cited in both databases. The final list for further analysis consisted of 25 published in 22 journals.

Appendix presents descriptive analysis of IT governance implementation case studies using COBIT, based on the research presented in Table 1. Majority of case studies reflect to private companies (64%) and are based on a single case (72%). Moreover, 76% of the analyzed case studies do not specify the research period, so we may conclude they are single time case studies. Only 14% of the selected case studies are based on observing financial institutions and most of the case studies are based on observing companies from other industries (42%).

We may conclude that longitudinal multiple case studies are rare, which give us a solid basis for a research construct. Also, as financial industry heavy invest in IT (Sassi et al., 2013) we found this research gap and area very interesting to investigate.

Table 1. Presents analysis of IT governance implementation case studies using COBIT framework according to industry, country, observed time period and number of sampled companies. (Source: Author work, based on the search of Web of science and Scopus)

Author, year	Title of the paper	Industry / Organization type	Case study	Observed period	Country
Sadikin et al., (2014)	IT governance self assessment in higher education Based on COBIT case study: University of Mercu Buana	University/ private	Single	N/A	Indonesia
Al Qassimi & Rusu, (2005)	IT Governance in a Public Organization in a Developing Country: A Case Study of a Governmental Organization	Governmental organization/ public	Single	N/A	Developing countries
Willson & Pollard, (2009)	Exploring IT governance in theory and practice in a large multi-national organisation in Australia	Large corporate multi-national organisation/ private	Single	6 months	Australia
Wilkin & Riddett, (2009)	IT governance challenges in a large not-for-profit healthcare organization: The role of intranets	Healthcare organization/ non-profit	Single	N/A (longitudinal)	Australia
Robb & Parent, (2009)	Understanding IT governance: A case of two financial mutuals	Financial mutual/ private	Multiple (2)	N/A	Australia & Canada
Bowen et al., (2007)	Enhancing IT governance practices: A model and case study of an organization's efforts	Large multi-divisional organization/ private	Single	6 months	Australia & New Zeland
Gerke & Ridley, (2009)	Tailoring CobiT for Public Sector IT Audit: An Australian Case Study	State organization/ public	Single	N/A	Australia
Ko & Fink, (2010)	Information technology governance: an evaluation of the theory-practice gap	University/N.A.	Multiple (4)	N/A	Australia
Damianides, (2005)	Sarbanes-Oxley and IT governance: New guidance on IT control and compliance	Financial institution/ private	Single	N/A	USA
Lucio-Nieto et al., (2012)	Implementing an IT service information management framework: The case of COTEMAR	Construction and maintenance company/ private	Single	N/A	Mexico
Hardy, (2006)	Using IT governance and COBIT to deliver value with IT and respond to legal, regulatory and compliance challenges	IT solutions company/ private	Single	3 years (2002-2004)	Taiwan
Park et al., (2010)	Is the perceived IT governance maturity level enough? A case study of a Korean enterprise	Company/ private	Single	N/A	Korea
Huang et al., (2011)	Building the evaluation model of the IT general control for CPAs under enterprise risk management	Company/ private	Single	N/A	Taiwan

Idlbek, (2011)	Using COBIT to increase performance: A case study of a higher education institution	Higher education institution/ non-profit	Single	N/A	Croatia
Azedine et al., (2012)	Deploying holistic meta-modeling for strategic information system alignment	Telecommunication company/ private	Single	N/A	Morocco
Wilkin et al., (2012)	Co-Creating Value from IT in a Contracted Public Sector Service Environment: Perspectives on COBIT and Val IT	Service company/ public	Single	18 months	Australia
Herz et al., (2013)	Toward a model of effective monitoring of IT application development and maintenance suppliers in multisourced environments	Financial service company/ private	Single	2 months (8-10/2010)	Germany
Zolper et al., (2013)	When the river leaves its bed: analyzing deviations between planned and actual interaction structures in IT change processes	Company: Bank, Insurance, Manufacturing/ private	Multiple (4)	2 years (2010-2011)	Germany
Cram et al., (2014)	Addressing the control challenges of the enterprise architecture process	Company/ private	Multiple (2)	N/A	USA
Kurniati & Atastina, (2015)	Implementing process mining to improve COBIT 5 assessment program or managing operations (Case study: A university blog)	University/ private	Single	N/A	Indonesia
Ferriyan & Istiyanto, (2015)	Data Center Governance Information Security Compliance Assessment Based on the Cobit Framework	Company/ private	Single	N/A	Indonesia
Luciano & Testa, (2011)	Controls of information technology management for business processes outsourcing based on COBIT	N/A	N/A	N/A	Brasil
An et al., (2010)	The Impact of The Maturity of IT Management Standard Processes on IT Outsourcing Performance: A Field Case Study	N/A	N/A	N/A	Korea
Oh & Cho, (2010)	A Study on IT Service Management Based on ITIL with Consideration of IT Governance Structures : Focused on A Case Study of Manufacturing Company	N/A	N/A	N/A	
Seo, (2008)	A Study on Implementing Integrated IT Management Model: A Case Study of K Company	Company/ private	Single	N/A	USA

With the aim of providing an insight into the longitudinal aspect of IT governance implementation case studies using COBIT in developing country, in our paper we present case study based on exploring four companies from financial sector operating in Croatia over five year time period, from 2009 to 2013. Sample consists of four companies (2 banks and 2 insurance companies, which are also domestic and subsidiary companies).

Several issues are relevant regarding the Croatia as the country where case studies are placed and the examined period (from 2009 to 2013). Croatia is a placed in the Southeast Europe, with 4.3 million of inhabitants, according to the population census in 2012. Croatia joined European Union in 2011. The general trends in the economy during 2009 to 2014 were the following: while in the 2003 - 2007 period Croatian economy recorded average real GDP growth of about 4.8% per year (which is at a level close to the one achieved by Poland and Slovenia as the ninth and tenth ranked economy of the EU), in 2008 Croatia recorded a growth rate of only 2.1%, followed by a strong real GDP decline by 7.4% in 2009. Prolonged period of recession lasted from 2009 to 2014, during which GDP stagnated. The Croatian economy recovered in 2015, after the observed period. These negative trends generated a deterioration of a range of other macroeconomics variables: growth of unemployment, increase in budget deficit and public debt, growth of external debt, a significant drop in real estate prices. Therefore, growth of risk premium built into interest rates were also recorded, which influenced lower level of investments in the observed period.

The observed negative trends in the economy in general had significant impact to banking and insurance sectors are the focus of our analysis. The deterioration of profitability ratios were recorded in almost all sectors including banking system, with big savings, reduced investments and changes in business policy. Problems in the

economy real sector (enterprises bankruptcies, debt repayment messiness, etc.) reflected on problems in banking and insurance sectors. For example, banking profitability decreased. Return on average assets (ROAA) of the banking system in Croatia in 2009 was 1.8%, while it decreased to as little as 0.5% in 2014. These trends had a strong impact to structure of banking sector in general. At the end of 2008 there were 34 banks operating in Croatia, while at the end of 2014 28 of them remained. The same trends of decreased profitability and number of companies in insurance sector were observed. At the beginning of 2008, there were 27 insurance and reinsurance companies operating on Croatian insurance market, with gross written premium of 1.3 billion EUR. At the end of 2014 there were 26 companies on the insurance market with lower gross premium (1.1 billion EUR).

3. Methodology

In our work we use a case study methodology in order to provide insight for the purpose of our research questions. We follow the work of Wynn et al. (2012, p.787), proposing 'a set of methodological principles for conducting and evaluating critical realism-based explanatory case study research within the information systems field'. Wynn et al. (2012) present the example of Bygstad (2010), who 'explained how the emergent higher level structures affect lower level entities and vice versa in identifying the innovation reinforcement and service reinforcement mechanisms', and we use Retroduction approach in order to identify and elaborate on predispositions in examined companies that may have interrelated together in order to impact IT governance adoption using COBIT.

This section presents methodology used for developing this paper, structured in three stages. First, we selected companies for research, then we developed a research instrument, and finally we collected and analyzed case studies.

Stage 1: Company selection

In our work, we use purposeful sampling procedure, following the criterion based selection. As highlighted by Patton (2005, p.46), ‘purposeful sampling focuses on selecting information-rich cases whose study will illuminate the questions of the research’, with the goal to choose cases. Number of similar IS case studies follow the same approach, analyzing mainly up to four companies (e.g. Bradford et al., 2014; Bosilj Vuksic at al., 2013).

First, the case selection was limited to banks and insurance companies operating in Croatia in 2009, with different type of ownership (domestic vs. subsidiary). In 2008 there were 34 banks operating in Croatia, of which 16 were in majority foreign private ownership, 2 banks in state ownership and 16 in the majority domestic private ownership. Also, at the same time in 2008 there were 27 insurance and reinsurance companies, out of which 18 companies were majority owned directly or indirectly by non-residents. Therefore, we used the list of banks and insurance companies in 2008 (one year before the beginning of the study), that we split into four groups: (i) domestic banks – 16 banks, (ii) subsidiary banks – 16 banks; (iii) domestic insurance companies - 19 companies; (iv) subsidiary insurance companies - 18 companies.

Second, among these companies we focused on companies that in 2008 were between 1-‘initial/ad hoc’ and 2-‘repeatable but intuitive’ levels of IT governance adoption according to COBIT framework (ISACA, 2016b). This allowed us to compare the companies with the similar level of IT governance adoption during the longer period of time, and to investigate how they will progress regarding the further IT governance adoption based on COBIT during the examined period. Banks and insurance companies from the four groups according to their ownership type, who already use COBIT, were contacted with the request to participate in research. The initial

response was satisfactory, with 11 institutions willing to participate. Among them, the initial prescreening of the level of IT governance adoption was conducted, and four companies were selected with the 1-‘initial/ad hoc’ and 2-‘repeatable but intuitive’ levels of COBIT assessment.

Since our study observes the same companies during the five year period (from 2009 to 2013), according to the criteria of Klein et al. (1999) it is categorized as a longitudinal study. The presented approach allowed us to conduct the analysis needed to provide answers to RQ1 and RQ2.

Four companies were selected: (i) Company A - Banking (Domestic); (ii) Company B - Banking (Subsidiary); (iii) Company C - Insurance (Domestic), and (iv) Company D - Insurance (Subsidiary). The selected companies will be presented briefly:

- Company A - Banking (Domestic) is a medium-sized bank entirely owned by private investors. During the observed period bank was stagnating in terms of assets. However, despite the crisis, the bank expanded business network with opening of new branches, offering standard services of superior quality and introducing novel services (e.g. mobile banking).
- Company B - Banking (Subsidiary) is a medium-sized bank, a member of the international group. As well as the bank A, it was stagnating in terms of assets during the observed period. However, it invested less to the business network compared to bank A.
- Company C - Insurance (Domestic) is a medium-sized insurance company, entirely owned by private investors. During the observed period, the company maintained stable, regardless of the national GDP decrease. It records a

continuous development in the offering of new services.

- Company D - Insurance (Subsidiary) is a large insurance company, a member of the international group. As well as the company C, it maintained stable during the observed period. However, company devoted special attention to the introduction of new technological solutions, improving business processes and quality and prompt claims payment.

Stage 2: Developing research instrument

We have created research instrument for evaluating adoption of IT governance components and mechanisms during the longer period of time and to relate them to COBIT maturity levels. In order to provide a qualitative measure of IT governance adoption in selected companies over 5-year time period, we have created a subtle IT governance mechanisms and measurement scale for each IT governance components, as presented in Table 2. The mechanisms and scale construct were defined according to previous researches and COBIT framework (ITGI, 2003; ISACA, 2012), using the following procedure in order to attain the construct validity (Bagozzi et al., 1991; MacKenzie et al., 2011).

First, five components of IT governance were used to design questions that were the basis for in-depth, semi-structured interviews: Business / IT strategic alignment; IT value creation and delivery; IT risk management and value preservation; IT resource management; and Performance measurement in IT were used to construct questions which will reveal subtle IT governance mechanisms and measure its adoption according to COBIT, as presented in table 2 (ITGI, 2003; ISACA, 2012). For example, Business/IT strategic alignment was transferred to question: What is the level of alignment between business and IT strategy in your company/bank? The other four questions were formed in the same way.

Second, specific mechanisms and measurement levels for IT governance adoption were developed, again based on COBIT suggestions (ITGI, 2003; ISACA, 2012). For example, mechanisms and measurement levels as the possible answers to second research questions were defined ranging from 'No clear alignment' (the lowest level) to 'True alignment' (the highest level). However, key informants from companies did not choose mechanisms by themselves, but semi-structured interview was conducted for each IT governance component. Based on semi-structured interviews, two senior researchers independently selected measurement level for IT governance component in the particular company.

Third, pilot research was conducted in order to increase construct validity. In creation of possible measurement levels we used the approach proposed by Yin (1994). Also we invited key informants from participating organizations to review interview transcripts and to check measurement levels selected by two independent researchers.

In addition to evaluation of IT governance adoption level, a COBIT maturity stage for each of the selected companies was graded for every year during the observing period (2009-2013) by one of researchers, an ISACA registered expert, following COBIT methodology (ITGI, 2003), according to the six COBIT maturity levels, being: (i) 0-'non-existent', (ii) 1-'initial/ad hoc', (iii) 2-'repeatable but intuitive', (iv) 3-'defined processes', (v) 4-'managed and measurable' and (vi) 5-'optimized' (ISACA, 2016b). The detailed procedure for evaluation of COBIT maturity stage could not be disclosed in this paper, since it is classified information, although companies agreed that the average grades of COBIT maturity can be published. Therefore, we included the average grades of COBIT maturity in the result section of the paper, since they provide additional information that is relevant to RQ1 and RQ2.

Table 2. Research instrument for the IT governance adoption using COBIT and mechanisms around five IT governance components

IT governance component	Mechanisms and measurement levels for the IT governance component adoption based on COBIT
What is the level of alignment between business and IT strategy in your company/bank?	No clear alignment; Weak alignment; Moderate alignment, trying to align IT to real business needs; Strong alignment, IT closely involved in strategic planning; True alignment
To what manner IT contributes to the value creation and delivery in your company/bank?	No value or weak business value from IT initiatives; IT supports cost cutting; KPIs for IT initiatives; Understanding between CIO and business units; Trust between CIO and business units
What is the level of IT risk management and value preservation in your company/bank?	Ad-hoc, individual efforts; In preparation; IT risk management policy defined; Acceptable IT risk management defined; IT risk management is a crucial part of overall risk management process
What is the level of efficiency of IT resource management in your company/bank?	Ad-hoc, individually oriented, initial; Routine, reactive, technology driven; Efficient IT services; Proactive, business objectives driven; Proactive, strategic IT connectors
How is performance measurement in IT conducted in your company/bank?	No, not a business priority or no metrics for IT performance; Routine (technology based) IT metrics; KPIs defined for IT infrastructure processes; KPIs defined for IT support to key business process; Qualitative and business oriented KPIs for strategic IT initiatives

Source: Author work, based on COBIT methodology

Stage 3: Data collection and analysis

After selection process, data for our case study research were collected. In order to increase reliability of the research, we followed a semi-structured case study protocol (Yin, 1994).

First, semi-structured interviews with the CIOs (Chief Information Officers) and top management members (CxOs) have been conducted in each year. In every company two interviews were conducted per year, resulting in total number of 40 interviews. Second, for every company, the interviews conducted with the CIOs and CxOs were analyzed in order to detect possible discrepancies, and if needed additional data was collected in order to gain in-depth understanding of crucial processes and IT practices. Third, based on the semi-structured interviews, two independent researchers estimated adoption level of each of IT governance components, which additionally supported reliability of research

(Boudreau et al., 2001). Again, in case of discrepancies, additional data was collected. Fourth, average grades of COBIT maturity obtained as the result of COBIT assessment were included in analysis in order to provide summarized outlook to IT governance adoption.

4. Results

4.1. IT governance adoption level at the participating companies

In the following section adoption of IT governance 5 components framework (ITGI, 2003) has been presented, namely: (1) 'Business and IT strategic alignment', (2) 'IT value creation and delivery', (3) 'IT risk management and value preservation', (4) 'IT resource management' and (5) 'Performance measurement in IT'. The changes have been monitored and each company specific practice is discussed during 5 year time

period.

Business and IT strategic alignment

Table 3 presents range and depth of changes and evolution of business and IT strategic alignment in observed companies in 2009–2013 period. Domestic bank and subsidiary insurance company had the same paths of progress from no clear business and IT alignment to true alignment which included the fact that business objectives were the result of strategic IT initiatives. Subsidiary

bank and domestic insurance company were close, but not as successful as the other two companies. They started with no alignment at all, and their top management found IT as a technology enabler. However, they both ended with IT being strongly involved in strategic planning, and in case of subsidiary bank, IT impact on business was still not strong enough but it had regular alignment mechanisms and sessions.

Table 3. Mechanisms and measurement level for Business / IT strategic alignment

Industry vs. Ownership	Banking								Insurance											
	A (Domestic)				B (Subsidiary)				C (Domestic)				D (Subsidiary)							
Years (2009- 2013)	I	I	II	I	V	I	I	II	I	V	I	I	II	I	V	I	I	II	I	V
No clear alignment	✓				✓					✓				✓				✓		
Weak alignment	✓				c				✓				✓	✓				✓		
	a																			
Moderate alignment, trying to align IT to real business needs		✓				✓	✓							✓					✓	
	b					b	b												b	
Strong alignment, IT closely involved in strategic planning			✓								✓				✓			✓	✓	
			d																	
True alignment				✓															✓	

a week alignment, but CIO regularly reports to CFO

b confirmed at executive level, CIO reports directly to CEO

c no alignment, top management finds ICT as a technology enabler

d regular alignment mechanisms and sessions, still weak impact on business, CIO reports to CEO

Note: I-2009; II-2010; III-2011; IV; 2012; V-2013

Source: Authors' work

IT value creation and delivery

Table 4 presents depth and dynamics of IT value creation and delivery in observed companies. In first year all four companies achieved weak business value from IT initiatives or no business value at all. In the next four years subsidiary bank and domestic insurance company stagnated in IT value and creation component for first three years (using IT to support cost cutting, with no interest of business units to be involved in IT

initiatives) and ended in the last year with defined KPIs for IT initiatives (still generally technologically based). At the same time domestic bank and subsidiary insurance company achieved higher level of IT value creation and delivery mainly due to gaining understanding and trust between CIO and business units. In the third observed year in subsidiary insurance company IT investment committee was set up.

Table 4. Mechanisms and measurement level for IT value creation and delivery

Industry vs. Ownership	Banking								Insurance											
	A (Domestic)				B (Subsidiary)				C (Domestic)				D (Subsidiary)							
Years (2009- 2013)	I	I	II	I	V	I	I	II	I	V	I	I	II	I	V	I	I	II	I	V
	I	I	V		I	I	I	V		I	I	I	V		I	I	I	V		
No value or weak business value from IT initiatives	✓				✓				✓					✓	✓			d		
IT supports cost cutting	✓					✓	✓	✓			✓	✓	✓				b	b		
KPIs for IT initiatives		✓							✓					✓		✓		e		
Understanding between CIO and business units			✓						a			c			f					
Trust between CIO and business units				✓											✓			g		

a KPIs for ICT initiatives defined, mainly technologically based

b No interest of business units to be involved in ICT initiatives

c Technologically oriented KPIs for ICT initiatives

d Business process owners still not aware of ICT value creation potential, awareness sessions, education programs, change of ICT audit scope towards more business oriented

e IT value creation mechanisms defined (KPIs for crucial activities), ICT investment committee set up

f CIO involved in strategic planning, empowering business units to decide on IT investments

g CIO responsible for delivering value for business out of strategic ICT initiatives, specific KPIs defined

Note: I-2009; II-2010; III-2011; IV; 2012; V-2013

Source: Authors' work

IT risk management and value preservation

Table 5 presents improvements of IT risk management and value preservation in selected companies. Again, all companies started their journey towards understanding IT risk management as an essential part of overall risk governance process from ad-hoc level with only individual efforts. The least successful was domestic insurance company who defined IT risks management policy but only through standardized framework covering crucial IT infrastructure processes, while subsidiary bank was slightly more successful by defining acceptable risk management. At the beginning of our research, subsidiary insurance company had been using some procedures for calculating

IT risks on limited business processes and progressed to the level where initiatives arise from IT and partly from regulation with accepted IT risk level defined for key business processes. The most successful companies in this part were domestic bank and subsidiary insurance company who managed to implement IT risk management as a vital part of risk management process at the end of the observed period.

IT resource management

Table 6 explains that changes in IT resource management were similar for both groups, ranging from ad-hoc, technologically driven initiatives at the beginning to proactive, business objectives' driven as IT governance evolved over time.

Table 5. Mechanisms and measurement level for IT risk management and value preservation

Industry vs. Ownership	Banking								Insurance											
	A (Domestic)				B (Subsidiary)				C (Domestic)				D (Subsidiary)							
Years (2009- 2013)	I	I	II	I	V	I	I	II	I	V	I	I	II	I	V	I	I	II	I	V
Ad-hoc, individual efforts	✓					✓	✓				✓	✓				✓				
In preparation		✓						✓				✓				✓	✓		c	
IT risk management policy defined		✓							✓				✓	✓			b			
Acceptable IT risk management defined			✓							✓								✓	d	
IT risk management is a crucial part of overall risk management process				✓															✓	

a ICT risk management policy prescribed mainly due to regulatory provisions, employees still not truly aware of risk

b Standardized framework covering crucial ICT infrastructure processes

c Some procedures for calculating ICT risks used, but on limited business processes

d initiatives arises from ICT and partly from regulation, accepted ICT risk level defined for key business processes

Note: I-2009; II-2010; III-2011; IV; 2012; V-2013

Source: Authors' work

Table 6. Mechanisms and measurement levels for IT resource management

Industry vs. Ownership	Banking								Insurance											
	A (Domestic)				B (Subsidiary)				C (Domestic)				D (Subsidiary)							
Years (2009- 2013)	I	I	II	I	V	I	I	II	I	V	I	I	II	I	V	I	I	II	I	V
Ad-hoc, individually oriented, initial	✓					✓	✓				✓	✓				✓				
Routine, reactive, technology driven		✓						✓				✓				✓				
Efficient IT services			✓						✓	✓			✓	✓				✓		
Proactive, business objectives driven				✓															✓	
Proactive, strategic IT connectors					✓															✓

Source: Authors' work

Performance measurement in IT

Table 7 presents evolution of performance measurement in IT in observed companies. At the beginning of our research we found out that there were no metrics for IT performance in the observed companies, mainly due to the fact that this IT governance component was not a business priority. The only exception was the domestic bank which had positive result of awareness program and almost whole company prepared and engaged in Business Impact Analysis for IT project. That gave

them a quicker start of detecting routine technology based IT metrics, while the others took two years for that. At the end of the observed period domestic insurance company had defined quantitative KPIs mainly for IT infrastructure. Subsidiary bank went further on and had defined KPIs for IT support to key business processes, while domestic bank and subsidiary insurance company had defined qualitative and business oriented KPIs for strategic IT initiatives.

Table 7. Mechanisms and measurement levels for Performance measurement in IT

Industry vs. Ownership	Banking								Insurance											
	A (Domestic)				B (Subsidiary)				C (Domestic)				D (Subsidiary)							
Years (2009- 2013)	I	I	II	I	V	I	I	II	I	V	I	I	II	I	V	I	I	II	I	V
No, not a business priority or no metrics for IT performance	✓				✓	✓			✓	✓			✓	✓						
Routine (technology based) IT metrics		✓					✓				✓				✓				✓	
KPIs defined for IT infrastructure processes			✓					✓				✓	✓		b					
KPIs defined for IT support to key business process				✓					✓								✓			
Qualitative and business oriented KPIs for strategic IT initiatives					✓													✓		

a positive result of awareness program, preparation for Business Impact Analysis (BIA) for ICT, almost whole company engaged in BIA project (CEO sponsor)

b Quantitative KPIs, mainly for ICT infrastructure

Note: I-2009; II-2010; III-2011; IV; 2012; V-2013

Source: Authors' work

4.2. COBIT maturity level of the observed companies

Table 8 presents the evaluation of IT governance adoption based on COBIT maturity level. All investigated companies improved their IT governance mechanisms

which resulted in increased COBIT maturity level. The most successful in progress was domestic bank, followed by the subsidiary insurance company. The least successful company was the domestic insurance company.

Table 8. IT governance adoption according to COBIT maturity level

Industry vs. Ownership	Year					Increase
	2009	2010	2011	2012	2013	
A - Banking (Domestic)	2,10	2,56	2,78	3,32	3,45	1,35
B - Banking (Subsidiary)	1,95	2,07	2,34	2,67	2,75	0,80
C - Insurance (Domestic)	1,87	2,10	2,27	2,34	2,59	0,72
D - Insurance (Subsidiary)	2,34	2,65	3,12	3,24	3,38	1,04

Source: Authors' work

Figure 1 presents how the selected companies improve their IT governance over time (2009-2013 period) and show their transition over the COBIT maturity levels. Two companies started at the level 1 (Initial / Ad hoc) and two companies at level 2 (Repeatable, but intuitive). In the last

observed year, the two companies that were ahead in the first year (at the level 2) also transitioned to the level 3 (Defined process). On the other hand, the two companies that were lagging behind in the first year (at the level 1), transitioned to the level 2 (Repeatable, but intuitive).

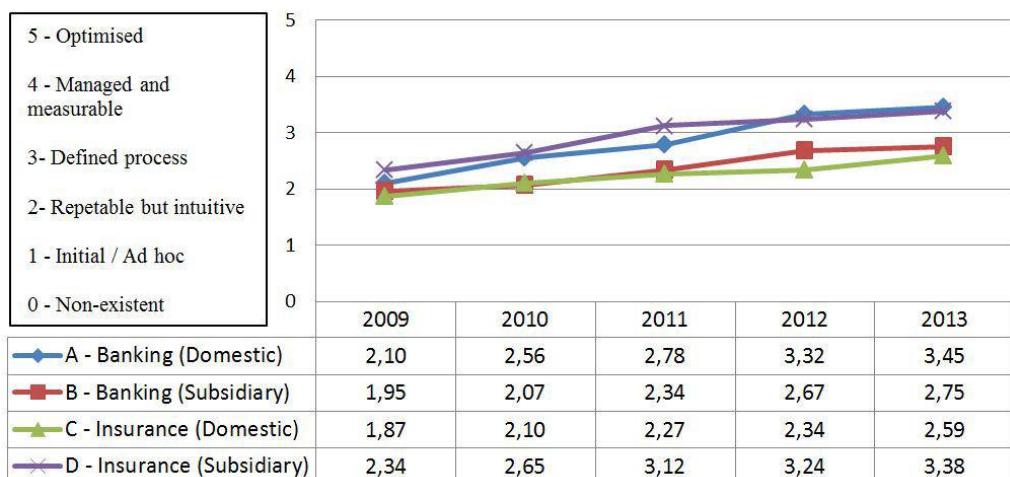


Figure 1. Improvements in IT governance adoption over time measured by COBIT maturity levels

5. Discussion

In the discussion section we analyzed case study findings and relate them to research questions.

RQ1: What are the reasons and dynamics of IT governance adoption in the financial sector (banks and insurance companies) using COBIT framework over 5 year time period?

First research question (RQ1) aims at investigating what motivated selected banks and insurance companies to engage in IT governance and how quick they managed to adopt succinct IT governance activities over time. Our longitudinal case study analysis revealed that companies with domestic ownership structure and subsidiaries had different motivations for improving IT governance.

Company D-Insurance (Subsidiary) started with the regulatory provisions alongside with subsidiary requirements. It appeared that subsidiary requirements were more rigorous than regulatory provisions at that time, but strong CIO commitment to add value to business with IT support resulted in achieving full compliance with both subsidiary and regulatory provisions. The company even extends subsidiary requirements and become regional excellence center in IT governance, fully compliant to regulations and adding significant value to business, particularly creating services that impacts the innovativeness of the business model. On the other hand, company C-Insurance (Domestic) lacks involvement of executive management on crucial IT principles, which resulted in barely satisfying minimum regulatory requirements. The necessity to be compliant to regulatory provisions and strong recommendations which arises from external IT auditing practice resulted in improvements and meeting industry best practices, namely in IT infrastructure, but with no initiatives to use IT support to add value to the business and significantly change business model.

Companies with predominant domestic ownership structure took the different path in adopting IT governance. In the case of company A-Banking (Domestic) the improvements in IT support were highly motivated to align it with the business objective and earn executive management commitment in IT decisions with the regulatory compliance as a consequence and confirmation of good practice, not the principal trigger for improvements. So, being almost compliant to regulations, company started to exploit IT opportunities for adding value, while being fully compliant, the main objective of IT support was to significantly add value to business.

On the other hand, company C (Insurance – Domestic) was very slowly becoming aware of the necessity for improving the way IT supports business, mainly due to lack of top

management involvement in strategic IT initiatives, non-flexible IT infrastructure and pure technology competencies of IT staff. The necessity to be compliant to regulatory provisions resulted in improvements towards achieving regulatory compliance and industry best practices, but with no initiatives to use IT support to add value to the business and significantly change business model.

We may conclude that during the period from 2009 to 2013, all observed companies improved their IT governance and COBIT maturity levels. They have done so not just using different reasons and pace of change, but also relying on different approaches, which brings us to the second research question arguing about specific mechanisms for IT governance adoption using COBIT framework.

RQ2: What are specific mechanisms which affect IT governance adoption using COBIT framework in different groups of companies (banking vs. insurance & domestic vs. subsidiary companies)?

Company D (subsidiary insurance company) started with the highest level of IT governance adoption among all observed companies, being between 2-repeatable but intuitive and 3-defined processes measured by COBIT maturity levels. On the other hand, company C (domestic insurance company) was at the lowest point of IT governance adoption measured by COBIT maturity levels in 2009, followed by the company B (subsidiary bank). Although all four companies started from the similar points, company A (domestic bank) and company D (subsidiary insurance company) have managed to improve their IT governance and reach much higher COBIT maturity levels than company B (subsidiary bank) and company C (domestic insurance company). Among observed companies, company A (domestic bank) has made the greatest progress, ending with the COBIT maturity level grade 3.45, which is an increase of 1.35 points.

This summary has generated three sub questions about the progress of the observed companies: (i) How company A - Banking (Domestic) manage to generate the fastest progress in IT governance adoption? What IT governance mechanisms were crucial there?; (ii) Why did company D-Insurance (Subsidiary) generate slower progress compared to company A, especially having in mind the fact that it started from the higher IT governance adoption level measured by COBIT?, and (iii) Why B-Banking (Subsidiary) and C-Insurance (Domestic) companies generated the slowest progress in IT governance adoption, while their starting positions were not substantially lower comparing to other two companies? The forthcoming detailed discussion will summarize crucial mechanisms affecting all these subtle IT governance adoption issues, all arising from our research methodology (in-depth interviews, dedicated surveys, regular meetings over 5 year period with CIOs and CxOs).

Mechanisms affecting IT governance adoption in company A (banking-domestic)
Company A-Banking (Domestic) was the one that generated the fastest progress in IT governance adoption. This company has tried “*to differentiate its business by offering innovative services in the market and in this sense has changed the role of IT in business (from supporting routine business processes to fostering business model innovations)*” (CEO Interview, 2013). This change did not happen quickly, but over five years of the study (as visible form tables presented in the fourth part of the paper) the management team has been systematically raising business competencies of IT staff, especially the CIO, to change focus of IT investment (from investments in technology infrastructure to projects that create new value). In this way, the CIO in the company A is not only Chief Information Officer, but is increasingly becoming Chief Innovation Officer, one of the most important persons in the company responsible for innovation, not only for business processes innovation, but

the innovation of the entire business model and creation of the scenarios of the sustainable competitiveness of the company (Table 3). The crucial facts in the changing the role of IT in business in the case of company A were: CEO-CIO relationship (top management from the beginning haven’t been using IT just as a technological support, rather than trying to ‘pull’ the more value to the business of IT investments), and CIO and IT executives are not only looking at IT as a technological tool, rather than trying to create opportunities for business change (Table 4). The early accomplished CEO-CIO confidence developed many effective IT governance principles and mechanisms which provided successful shift in role of IT in business. Regular IT audits (initially imposed as a regulatory obligation) have helped the management to realize the desired role of IT in business (Table 5). The integration of most developed COBIT practice with intrinsic motivation of the CEO-CIO team to develop strategic business-IT alignment was the probable crucial reason for the fastest progress in IT governance adoption of the Company A.

Mechanisms affecting IT governance adoption in company D (insurance-subsidiary)

Company D-Insurance (Subsidiary) generated slower progress compared to company A, despite the fact it started from higher IT governance maturity level. Company D has gone through similar path as company A, with the difference that its starting position was better because, as a subsidiary of the international corporation, it was obliged to implement subsidiary based IT audit and follow certain corporate IT governance rules, which contributed to a more mature IT governance. To the word of the CIO (2012 Interview): “*Commitment from top management to be compliant to, firstly, subsidiary regulations and then mandatory national regulation of the insurance industry, made IT governance principles and mechanisms more and more matured and aligned with business*

objectives". In this sense, especially important is the role of so called 'value added IT audit' which helped top management to understand that IT can or should be used only as a technology enabler. Company quickly met all regulatory requirements (fully compliant to regulations) and within the corporation has become a regional center of excellence in IT governance, adding significant value to business (Table 4). CIO is not a member of the Board, but still "*reports directly to the CFO, numerous mechanisms of IT governance have improved and become more mature, e.g. true IT / business alignment with strategic business goals coming out from IT initiatives*" (CIO 2012 Interview, Table 3). The decision to focus on the fulfilling subsidiary IT regulations and mandatory national IT governance regulations, rather than opting to more close IT / business alignment was the probable cause of the slower progress of the company D.

Mechanisms affecting IT governance adoption in company B and C

Companies B-Banking (Subsidiary) and C-Insurance (Domestic) generated slowest progress, while their starting positions were not substantially lower comparing to other two companies. Even as a subsidiary of the international corporation operating in banking sector, main trigger for improving IT support for company B was national IT governance regulatory provisions. Main objective of IT use in the business was to provide reliable efficient support to existing business processes at lowest cost. Top management had a reactive attitude towards innovative application of IT, focusing on the company to meet the demands of regulators and that it can operate smoothly. National IT governance regulatory requirements provided a clear path for improvements in IT processes showing what need to be done in order to be compliant, which finally resulted in certain improvements in IT operations. Reactive attitude of management towards use of IT has resulted in less mature IT

governance mechanisms (not sufficient IT/business alignment, deficient business competencies of IT staff, low CxO involvement in strategic IT initiatives, heavy IT outsourcing, IT budget mainly in infrastructure area and slower development of IT support).

Very similar considerations were observed in case of company C. In this case as well, the main motive of improving IT functions in the business was the need for harmonization with national IT governance legislation, rather than management's strategic thinking to create new value from the use of IT (Table 4). Reactive attitude of management towards the application of IT in business and the inability of IT to participate in strategic planning meant that company uses IT to support a reliable, quick and efficient implementation of current business processes, without the need to change business processes or overall business model. The main focus to fulfill mandatory IT governance national regulation, as well as the reactive attitude of the management team were the probable cause of the slowest progress of the companies B and C.

Reasons for this kind of different paths between companies in our case study in IT governance adoption using COBIT could also be found in already mentioned political and economic situation in Croatia in the observed period. We can assume that this progress could be faster if the situation on the market had been more stable and if market conditions had been more favorable. Moreover, in the observed period in Croatia there were many new regulations and adjustments with the EU legislation which caused significant problems for some companies, so that could also be the reason for differences between progress speeds of the observed companies.

6. Discussion

While many researches (e.g. Weill and Ross (2004)) pointed out the importance of IT

governance, some of them investigated what are the specific mechanisms for successful implementation. Wilson & Polard (2009) revealed a strong CEO-CIO relationship, structural changes regarding IT-business alignment and shared vision between business executives and techs professionals to be crucial mechanisms for IT governance adoption. De Haes and Van Grembergen (2015) identified 'seven key minimum baseline IT governance practices working best for companies in financial industry: IT steering committee, IT budget control and reporting, portfolio management, IT leadership, CIO-CEO-COO relations and project issues'.

In this paper we used a three stages methodology to conduct a longitudinal research in form of multi-case studies based on four selected companies from financial sector, to reveal what mechanisms are affecting IT governance adoption. Two of them were banks, and the remaining two insurance companies. In each group, one of the selected companies was a domestic company, while the other one was a subsidiary. First, we did an extensive literature review to analyze the current state of IT governance adoption using COBIT framework from 2005 till 2015. We have concluded that most of the case studies are focused on only one organization in a shorter period of time, indicating the need for the longitudinal multi-case studies. Furthermore, we have conducted a number of well-structured and detailed interviews with relevant professionals (CIOs and CxOs) and analyzed the IT governance adoption measured by COBIT maturity levels in selected companies operating in Croatia in a period from 2009 to 2013. Case studies showed differences in progression paths of selected companies in terms of different starting points in relation to progress speed and the ending points.

Research with most similarities to our study is the one done by Zolper et al. (2013) who did a case study based on four organizations using interviews and questionnaires (among

them one is bank and other insurance company). This study lasted 2 years and explained why 'actual interaction structures between business and IT differ from planned ones which helped managers with IT governance decisions'. Compared to Zolper et al. (2013), our work contributes in the identification of the reasons and especially mechanisms for fast or slow IT governance adoption using COBIT.

Our longitudinal case study analysis revealed that companies with domestic ownership structure and subsidiaries had different motivations for improving IT governance (RQ1). While in the case of company A-Banking (Domestic) the main reason for improvements in IT governance were high motivation of IT team to align IT with the business objectives and earn executive management commitment in IT decisions with the regulatory compliance as a consequence and confirmation of good practice, not the principal trigger for improvements, company C (Insurance – Domestic) was very slowly becoming aware of the necessity for improvements in IT governance, mainly due to lack of top management involvement in strategic IT initiatives, non-flexible IT infrastructure and pure technology competencies of IT staff. The necessity to be compliant to regulatory provisions resulted in improvements towards achieving regulatory compliance and industry best practices, but with no initiatives to use IT support to add value to the business and significantly change business model.

On the other hand, both international subsidiary companies started improving IT governance using national regulatory provisions alongside with subsidiary requirements. It appeared that subsidiary requirements were more rigorous than national (industry) regulatory provisions at that time, but strong CIO commitment to add value to business with IT support resulted in achieving full compliance with both subsidiary and regulatory provisions. Company C even extends subsidiary

requirements and become regional excellence center in IT governance, fully compliant to regulations and adding significant value to business, particularly creating services that impacts the innovativeness of the business model.

We may conclude that even so national or industry regulatory provisions (imposed for banking and insurance in our cases) or strong subsidiary requirements surely serve as a necessary trigger and a good starting point for IT governance improvements, it is not the ownership structure that dictates evolution in IT governance maturity, but subtle IT governance mechanisms such as strong top management involvement in IT strategic initiatives, combined with clear CIO commitment to add value to the business with IT support.

While confirming some of the previous findings (Wilson and Polard, 2009; De Haes and Van Gremberen, 2015) our longitudinal research revealed that main reason for fastest progress in IT governance adoption (company A - banking, domestic) was the use of these subtle IT governance mechanisms (RQ2):

- systematically raising business competencies of whole IT staff (especially CIO) by executive management team,
- change of focus in IT investment (from investments in technology infrastructure to projects that create new value),
- CIO acting not only as Chief Information Officer, but increasingly becoming Chief Innovation Officer, being one of the most important persons in the company responsible for innovation of the entire business model,
- early accomplished CEO-CIO trust developed many effective IT governance principles and mechanisms which enabled successful shift in role of IT in the business (from IT being a sound

- technological support to IT as an agent for change),
- flexible and modular IT infrastructure and
- promoting CIO to highest executive positions.

On the other hand, even so main trigger for improving IT support was national (industry) regulatory provisions and their starting positions were not substantially lower comparing to other two companies, slower progress in IT governance adoption in Company B and C were due to the following reasons:

- IT used as a tool for automation and efficient support to the existing business processes, with no initiative to change its role to add significant value to business,
- top management had a reactive attitude towards the innovative application of IT (just focusing on how to fulfill the imposed regulatory requirements), which has resulted in less mature IT governance mechanisms and procedures (not sufficient IT/business alignment, deficient business competencies of the IT staff, low CxO involvement in strategic IT initiatives, heavy IT outsourcing, IT budget mainly in infrastructure area and slower development of IT support),
- top management not involved in strategic IT initiatives,
- non-flexible IT infrastructure and pure technology competencies of IT staff.

Furthermore, in short future we expect one of these companies (slower progress) will succeed to improve IT governance if they kept on using following specific IT governance mechanisms introduced in last year of our thorough research: CIO went through MBA program and became a Board member, improvements in IT/business alignment, KPIs defined for key IT processes

that give an indication of the changing role of IT in business - from reactive to proactive.

Finally, we may conclude that regulatory provisions (at national – industry or subsidiary level) in many cases are useful trigger for IT governance initiation, while specific and subtle mechanisms for IT governance adoption are making difference in its evolution. Our research suggest that there is no a 'perfect' formula to implement IT governance or 'one-size-fits-all' IT governance model, but faster progress in IT governance adoption and clear shift in its evolution (from IT acting as a pure technological support to business to IT as an enabler of entire business model innovation) can be made relying on following IT governance mechanisms:

- strong executive management commitment to IT issues, truly IT / business alignment with the objective of exploiting IT innovation potential,
- mutually respectful CEO-CIO relationship, especially strong CEO's trust that CIO should act as a business model innovator more than technology provider,
- CEOs should be technologically savvy and CIOs should have a business-related competencies,
- promoting CIO as a peer to executive management, introducing IT steering committee,
- fostering IT investments that add value to the business,
- CIOs (Chief Information Officers) acting more as a Chief Innovation Officer with the clear vision how to exploit the IT business value,
- using modular and flexible IT infrastructure, and
- conducting regular external IT audits (namely, value-added IT

audits which focus on strategic objectives).

Results of our study also generate the practical implications that could be useful for companies implementing COBIT framework in order to improve IT governance. Integration of the most developed COBIT practice with the intrinsic motivation of CEO-CIO team to develop strategic business-IT alignment were the probable crucial reasons for the fastest progress in the IT governance adoption. Practical implication of this research arises from the fact that when sound strategic IT/business alignment is in place, IT governance is more matured and opportunities for business model innovation are growing, which may create incentives for further IT investments. Also, the important point of our research is that improvements in IT governance adoption are more likely if evaluated by regular IT audits. We noticed that playing on an innovative nature of IT adds more value to business compared to 'traditional' or default approach imposed by national IT governance regulations.

Although this study extends the existing body of knowledge, there are limitations of this research, which could be also used as the guidelines for future research. Since we focused only on financial sector, the results of the study could not be generalized for other industries. However, future research could include other industries as well, especially those with no regulatory requirements, since it would be interesting to compare the results between the industries. This way, the ability of drawing conclusions regarding IT governance could be strengthened. Moreover, similar case studies in greater number of companies could be conducted and therefore increase the reliability of the research results.

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Appendix:

Appendix 1. IT governance case studies using COBIT framework (2005-2015): analysis by characteristics of observed organizations

Characteristics of organization	Type of organization	% (n=25)
Ownership type	Private	64%
	Public	20%
	Not available	16%
Time period	Up to one year	12%
	Between 1 and 3 years	12%
	Not available	76%
Number of organizations included in the case study	Single case study (one organization)	72%
	Multiple case study (2-4 organizations)	16%
	Not available	12%
Organization type	University/Higer education	16%
	Governmental organization	12%
	Healthcare organization	4%
	Financial organization	14%
	Company (other)	42%
	Not available	12%

Source: Authors' analysis

Appendix 2. IT governance case studies using COBIT framework (2005-2015): analysis by continents and countries

Continent	% (n=25)	Country	% (n=25)
Australia and Oceania	26%	Australia	24%
		New Zealand	2%
North America	14%	USA	12%
		Canada	2%
Asia	28%	Indonesia	12%
		Taiwan	8%
		Korea	8%
Europe	12%	Croatia	4%
		Germany	8%
Africa	4%	Morocco	4%
South America	8%	Mexico	4%
		Brazil	4%
Other	8%	Developing countries	4%
		Not available	4%

Source: Authors' analysis