

NEAR EAST UNIVERSITY GRADUATE SCHOOL OF SOCIAL SCIENCES BANKING AND FINANCE PROGRAM

THE IMPACT OF FINANCIAL BUSINESS INTELLIGENCE ON ORGANIZATIONAL PERFORMANCE IN JORDANIAN BANKS

ABDEL RAHMAN NIDAL MUSTAFA HASHISH

MASTER'S THESIS

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THESIS SUPERVISOR ASSOC. PROF. DR. TURGUT TÜRSOY

> NICOSIA 2020

ACCEPTANCE/APPROVAL

We as the jury members certify the 'The Impact Of Financial Business Intelligence On Organizational Performance In Jordanian Banks' Prepared by Abdel Rahman Nidal Mustafa Hashish defended on/.... has been found satisfactory for the award of degree of Master of Banking and Finance

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DECLARATION

I, Abdel Rahman Nidal Mustafa Hashish, hereby declare that this dissertation entitled 'The Impact Of Financial Business Intelligence On Organizational Performance In Jordanian Banks' has been prepared myself under the guidance and supervision of Assoc. Prof. Dr. Turgut Türsoy in partial fulfillment of the Near East University, Graduate School of Social Sciences regulations and does not to the best of my knowledge breach and Law of Copyrights and has been tested for plagiarism and a copy of the result can be found in the Thesis.

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DEDICATION

I Dedicate this Thesis to my father who passed away because of cancer and it was his wish for me to have a master degree one day and now I did it. Also, to my mom for nursing me with affections and love and their dedicated partnership for success in life.

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Thank God for the spirit that gave me health and wellness, and thank myself for my honesty with myself and with the other two.

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ABSTRACT

THE IMPACT OF FINANCIAL BUSINESS INTELLIGENCE ON ORGANIZATIONAL PERFORMANCE IN JORDANIAN BANKS

The accounting field is going through a major shift that affects ways accountants are performing their tasks, this change relates to technological advancements. In particular, business intelligence has recently entered organizational lexicon as organizations are racing to benefits from these new technologies in today's hyper competition markets. Dataset was compiled through primary data collection conducted in Jordanian banking institutions, where 270 responses have been used to analyze this data using structure equation modeling. This thesis envisions the role played accounting systems business intelligence on Jordanian banks performance. This was done through studying functionality, self-service and infrastructure integration of these systems. While functionality did not show any significant association with performance, both self-service and infrastructure integration have shown significant and positive associations with banks performance. Additionally, strategic alignment of these systems has been probed as moderating force on these three relations that shown interaction effects on both self-service and infrastructure integration.

Keywords: Accounting Systems, Business Intelligence, Jordanian Banks, Self-Service, Infrastructure Integration, Functionality, Strategic Alignment.

THE IMPACT OF FINANCIAL BUSINESS INTELLIGENCE ON ORGANIZATIONAL PERFORMANCE IN JORDANIAN BANKS

Muhasebe alanında muhasebeciler görevlerini yerine getiriyor yolları etkileyen büyük bir değişim geçiyor, bu değişiklik teknolojik gelişmeler ile ilgilidir. Özellikle, günümüz hiper rekabet pazarlarında organizasyonlar bu yeni teknolojilerden yararlanmak için yarışırken, iş zekası son zamanlarda örgütsel sözlüğe girmiştir. Dataset, yapı denklemi modellemesi kullanılarak bu verileri analiz etmek için 270 yanıtın kullanıldığı Ürdün bankacılık kurumlarında gerçekleştirilen birincil veri toplama yoluyla derlenmiştir. Bu tez, Ürdün bankalarının performansı nda muhasebe sistemleri iş zekasının oynadığı rolü öngörmektedir. Bu, bu sistemlerin işlevselliği, self servis ve altyapı entegrasyonu nun incelenmesi yoluyla yapılmıştır. İşlevsellik performansla önemli bir ilişki göstermemekle birlikte, hem self servis hem de altyapı entegrasyonu bankaların performansıyla önemli ve olumlu ilişkiler göstermiştir. Buna ek olarak, bu sistemlerin stratejik uyumu, hem self servis hem de altyapı entegrasyonu üzerinde etkileşim etkileri gösteren bu üç ilişki üzerinde ılımlı bir güç olarak incelenmiştir.

Anahtar Kelimeler: Muhasebe Sistemleri, Iş Zekası, Ürdün Bankaları, Self Servis, Altyapı Entegrasyonu, Işlevsellik, Stratejik Uyum.

ABBREVIATIONS

- AAA American Accounting Association
- AACSB Advance Collegiate Schools of Business International
- **CPAs** Certified Public Accountant
- **CMV** Current Market Value

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INTRODUCTION

Business intelligence and analytics have been put to forefront of the accounting profession recently, as the American Accounting Association (AAA) has hosted specialized conferences in this area that repeatedly called for increasing collaboration between theoretical and practical accounting professionals to examine the increasing reliance on such technologies within the profession (Sledgianowski, Gomaa, & Tan, 2017). These calls have made resounding impact on highlighting a crucial and understudied challenge for accounting and finance which was understood by the Advance Collegiate Schools of Business International (AACSB). Accordingly, the AACSB have updated their accreditation procedures for accounting courses to include developing learning goals regarding the use of accounting technologies (of which, business intelligence and analytics is a key part) as a requisite form their members (Sledgianowski, et al. 2017).

The above two calls are based on the understanding that business intelligence activities (among other accounting and financial technologies) has penetrated all business sectors in recent years. Financial services sector is no exception; however, there are few scholarly examinations that shed light on the business intelligence aspect of this accounting and financial development. This work attempts to build a theoretical model that links business intelligence capabilities with performance in Jordanian banks.

The use of financial information systems has been steadily gaining foothold in major organizations accounting and finance units for the past three decades. Consequently, researchers have tried to make sense of these developments through multiple investigative lenses. For instance, Grabski et al (2011) advocates a view on the accounting use of information systems that has underlines critical success factors,

performance and economic impact. This view has repercussions for accounting, auditing, and management control systems. Later researchers (Pincus, M., Tian, F., Wellmeyer, P., & Xu, S. X, 2017) have found that using accounting and finance information systems as provided by Enterprise Resource Planning systems do lead to reductions in the number of

restatements, reductions in filling delays, and reductions in fees for accounting auditors. Benefits of using such systems might go beyond direct financial gains or lower costs as shown by Nicolaou, (2008), who claims that auditing accounting in accounting information systems environments do provide better management and control over inter-organizational relationships. The related literature does indicate that the use of financial information systems does lead to organizational gains both financial and nonfinancial ones; however, this thesis does investigate business intelligence systems use in accounting and finance as explained in the research problem below.

RESEARCH PROBLEM

Based on the accounting literature regarding the use of technological advancements, this research investigates the scarcely studied use of business intelligence in accounting and finance. In particular, how using these accounting business intelligence capabilities affect banks' performance through supporting business processes while considering technology-business alignment as a contributing factor in such situations. "Many people in accounting, such as CPAs, are seeing automation and artificial intelligence take over auditing and control tasks. Automation only appears a few times in the articles, as does artificial intelligence." Research gap.

RESEARCH QUESTION

How does accounting use of business intelligence impact banks' performance?

This question represents the overriding motivation of investigation presented here. However, a more detailed presentation is offered below.

Question One: How does business intelligence infrastructure for accountants lead to positive effect on banks' performance?

Question Two: What effect does the usability of business intelligence functionality in the accounting processes have on banks' performance?

Question Three: what effect does the usefulness of business intelligence selfservice for accounting and financial processes have on banks' performance?

Question Four: Does aligning accounting systems with banks goals moderate the relationships between accounting systems Business Intelligence and banks performance?

RESEARCH MODEL



RESEARCH HYPOTHESES

H1: the availability of business intelligence infrastructure for accountants leads to positive effect on banks' performance.

H2: the usability of business intelligence functionality in the accounting processes leads to increased banks' performance.

H3: the usefulness of business intelligence self-service for accounting and financial processes correlates positively with banks' performance.

H4: Aligning accounting systems with banks goals does moderate the relationships between accounting systems Business Intelligence and banks performance.

RESEARCH DESIGN

This research uses self-administered questionnaires to collect data from Jordanian banks employees. Random sampling is adopted in order to reduce sampling bias. The questionnaire is treated in accordance with ethical procedures as accepted by the university. The researcher tool all measures to protect participants' identities through guaranteeing anonymity.

As this research uses primary data to study an economic phenomenon, the student uses relevant statistical tools for analysis. These tools include SPSS and Analysis of Moments Structure software as means to develop structure equation modeling.

STUDY MOTIVATION

This study is motivated by the lack of scholarly understanding of the impact of financial business intelligence on organizational performance. This stems from the fact that researchers have focused more on the study of the development and adoption of business intelligence (Owusu, 2017). To this end, the student has decided to engage in a scientific inquiry to uncover the role played by financial business intelligence in relation to banks' performance.

This Study represents the first attempt to understand how Jordanian banks use of business intelligence techniques and tools does affect banks reported performance. Also, this study represents the a unique endeavor that seeks to understand using business intelligence information systems, whereas most scholarly activities on the topic tended to cast a wide net that covers business intelligence use in organizations and its impact on performance. Hence, these two dimensions of the study seem to be groundbreaking research into uncharted field of scientific examinations.

LIMITATIONS OF THE STUDY

This study is based on self-administered survey, as such the results are prone for biased responses. To overcome this limitation the author has decided employ procedural methods that would minimize. These methods include negative questions that are embodied in the survey, also the researcher has employed statistical CMV measures to put out the common variances.

THESIS OUTLINE

Ch1: introducing this thesis research overview that includes aims and the underlying value for economists and banking professionals.

Ch2: constructing a justifiable appraisal of the knowledge found in the related literature. Then using this to propose a theoretical framework which enables the researcher to suggest extending our theoretical understanding. In this case, the theoretical framework will reason that including the moderating variable enhances our understanding of the effect of artificial intelligence on banks performance.

Ch3: unfolding the philosophy of science background that enables using this research approach for this thesis. This means that this positivist and deductive approach, which uses empirical survey research design is the most suitable scientific approach to study such a phenomenon within the field of economics and accounting.

Ch4: presenting the statistical analysis conducted beginning with descriptive analysis going through testing the model and presenting a hypotheses appraisals. Ch5: summarizing the research conducted while presenting main takeaways from this research and proposing future studies and limitation of the research.

CHAPTER 1

LITERATURE REVIEW

1.1. INTRODUCTION

This chapter produces a literature scan that assess the current state of academic knowledge available for researchers interested in understanding the current state of using accounting business intelligence. Researchers have been investigating issues related to the field of this thesis for the last four decades, through discovering theoretical explanations and proposing new theories. The sequence of evolving theories around the student's area of interest varies from different academic areas, such as: economics, accounting, management, and information systems.

This chapter provides a background understanding of business intelligence for financial analysis use. This leads developing hypotheses that are combined together in the theoretical framework introduced previously in chapter one.

1.2. RESEARCH BACKGROUND

Central to any country economic prosperity is the question of businesses' impact. As successful economic entities contribute collectively to a higher levels of economic development and productivity. This is a reflection of decision makers' abilities to make decisions based on the availability of information to them. Accounting and financial information counts as an integral part of related information the decision makers do seek. Financial and accounting reporting is understood to represent a humanity discipline of studies that seeks, at certain time-points, to portray ideas by relying on some acceptable conventions, using a tool kit of reliable techniques through varying actual practices (Boyns and Edwards, 1997).

As accounting hold the honorary privilege of reporting the most important figures in businesses' daily operations, it often referred to as the "language of business" (Bloomfield, J. (2008). Accounting as a field of human activity has been recorded for four millennia when ancient Romans, Egyptians, Indians started recording commercial transactions. These civilizations developed ways to record such dealings to suit the needs of the merchant class and serve governing purposes of the ruling dynasties (Alexander, J. 2002). As a result, Anandarajan, M., Anandarajan, A., & Srinivasan, C. . (2012, p.2) argue that:

"The earliest 'intelligence techniques' in accounting were characterized by recorded transactions in clay and papyrus and systems of checks and balances to ensure that the records were accurate and could be verified. Early records indicate that ancient Romans developed their own elaborate system of checks and balances to account for receipt and payment of money"

However, this study focus on business intelligence to enhance performance is engrained in today's fabric of life. As Business intelligence has been gaining attention and importance due to the increasing awareness of "big data" analysis as popularized in the recent political events of Russian meddling in the American election (Riley, M. & Robertson, J., 2017), and the Brexit vote (Way, L. A., & Casey, A. E., 2019) and the ensuing Cambridge Analytica scandal. Thus, bringing to the fore a cultural backlash movement that threatens the very fabric of international economic and political realities and norms (Norris, P., & Inglehart, R., 2019).

Even before these seismic global events researchers in organizational economics have warned of the potential impact of these technologies as powered by machine learning and big data (Agarwal, R., & Dhar, V., 2014).

Thus, the interest in understanding the scope and impact of business intelligence has already been established (Shollo, A., & Kautz, K., 2010).

Business intelligence systems are part of today's financial settings which enable decision makers to take informed choices to create value for firms' shareholders. Nevertheless, to help business intelligence reach its maximum effect, both academia and praxis need to have solid understanding of how do firms benefit from implementing business intelligence systems.

Business intelligence entered our lexicon quite recently. It was first coined by Hans Peter Luhn in the 1950s. Business intelligence were thought of as "automatic method to provide current awareness services to scientists and engineers" (Luhn 1958). This conceptualization was prompted by the need to deal with the exponential growth of avaible knowledge for scientists as this was his primary concern at the time. It took some time for technological advancement to catch up to provide meaningful ways to sort through his conceived problems automatically.

The time where business intelligence has been used widely was in the 1990s, when ways to use information through technological systems capabilities at the firms' disposal to benefit organizational aims has been developed Dekkers, J.V., Johan; and Batenburg, R. (2007). However, it was only in the 1990s that the term was widely used, after BI was used by Dresner, a Gartner analyst (Dekkers et al. 2007), to convey the idea that the information in IT systems could be exploited by the business itself.

According to a recent BBC report, a new YouTube series featuring Robert Downey Jr does attempt to demystify artificial intelligence (BBC, 2019). The aims of the series is use star attraction to communicate the benefits of artificial intelligence and reduce the fear of the unknown among viewers. This view resonates with the author who attempts to model to examine the benefits of using machine intelligence for organizational settings.

1.3. BUSINESS INTELLIGENCE INFRASTRUCTURE INTEGRATION

In his recent literature review, Kocsis, D. (2019) stresses the importance of integration to accounting information systems within firms. Researchers have examined integrating information technologies such enterprise encompassing software packages which do integrate within an organizational setting through using shared databases like ones needed to run business intelligence queries (Chapman & Kihn, 2009; Newell, Huang, Galliers, & Pan, 2003; Quattrone & Hopper, 2005).

Through utilizing an integrated architecture business intelligence tend foster a technical environment that utilizes interoperability among a variety of systems which falls beyond the scope of "stand-alone" information systems tasks that are normally supported. Furthermore, such a feature does equip business intelligence systems to maintain standard levels of process automation, but more crucially the functionality of disseminating related information with high accuracy in a timely manner. As a result, improved managerial and employee decision making is a reported advantage in the literature of using integrated infrastructure (Hitt,Wu, & Zhou, 2002)..

Despite the fact that integrated business intelligence being implemented and designed through "non-accountants", these software developments are carefully attached to functions needed by accountants Chapman (2005). Information systems do occupy a central role in today's business operations, in particular with regards to accounting processes (Efendi, Mulig, & Smith, 2006). Using these advancements in information technologies has helped change the practice of accounting. To this extent, Sadagopan (2003) argued that even the otherwise mundane accounting tasks have been transformed. Maiga (2014) agrees and goes on to a few of these tasks that are supported through such systems, such as: "general ledger, accounts receivable, accounts payable, financial control, asset management, funds flow, cost centers, profit centers, profitability analysis, order and project accounting, product cost accounting, and performance analysis."

What stems from this understanding developed in the literature is that using an integrated infrastructure for business intelligence systems have ramifications for accountants' tasks (Sutton, 2006; Hunton, 2002). So the justification of employing these integrated solutions is reducing mundane jobs and tasks (Arnold & Sutton, 2007; Drury, 2008), which leads to transforming the role of accountants from gathering information oriented to analyzing gathered information oriented (Hunton, 2002), in other words from back office support to a leading role in decision making (Holtzman, 2004).

Based on the understanding developed in this section the role of having an integrated infrastructure business intelligence system in the Jordanian banks is theorized to affect banks performance as in hypothesis below:

H1: business intelligence infrastructure integration does have an impact on the performance of Jordanian banks.

1.4. BUSINESS INTELLIGENCE FUNCTIONALITY

BI functionality refers to capacity provided by user interface to process performance measurement data (Peters, Wieder, Sutton, & Wakefield, 2016). The functionality provided through Business Intelligence depends on the system's ability to pool data across varying organizational databases sources for manipulation and processing. This means that business intelligence systems mirror the old accounting cliché of "garbage in, garbage out", whereby high quality data availability for these systems makes them capable of producing timely and relevant business intelligence reports.

Business intelligence functionality refers to point of usability that results from data interactions and modeling through using multidimensional data hierarchy.

BI functionality is the usability level for modeling and interacting with multidimensional data hierarchies (Rikhardsson & Yigitbasioglu, 2018). Build on the work done by Ariav (1992), Peters et al. (2016) sketched features of usability and data multi-dimensionality to help operationalize business intelligence systems. According to Peters, Wieder, & Sutton, (2018) usability involves fused user access and user-manipulation that is done on present, past and future data cubes. These cubes encapsulate objects, attributes and time. Moreover, multi-dimensionality relates to the degree of objects, attributes and temporality. Furthermore, in this data oriented functionality structure, Peters et al. (2018) the following specifications to be me in order to support business intelligence as follow:

- "Objects include responsibility center arrays (e.g., profit center, revenue center, and cost center)"
- "Responsibility center aggregation patterns (e.g., manager, regional, national), and plan versions (e.g., actual results, budget, forecast, latest forecast)."
- "Attributes refer to calculative elements (e.g., amounts, stock keeping units, employees).
- "Temporal dimensionality refers to time periods (e.g., day, month, quarter, or year)."

Base on the literature review conducted here and the results obtained by Peters et al. (2016), who established a positive relationship between BI functionality and performance, the author theorize that Business Intelligence does impact performance as in H2 below.

H2: the use business intelligence systems' functionality does have an impact on the performance of Jordanian banks.

1.5. BUSINESS INTELLIGENCE SELF-SERVICE

Self-Service in the Business Intelligence context can be explained to represent "the facilities within the BI environment that enables BI users to become more self-reliant and less dependent on the IT organization" (Schlesinger & Rahman, 2016). Under this clarification an environment whereby business intelligence systems utilize self-service are thought to give accountant the capability to retrieve sought after data whenever need emerges, without being dependent on Information and Communication Technology department staff for such tasks. Consequently, accountants who are capable of accessing business intelligence capabilities do take a short cut without Information and Communication Technology staff support to develop that sort of reports or dashboard wanted, as they can use business intelligence systems on their own to produce needed reports.

Nevertheless, deploying self-service requires making business intelligence systems user friendly for the needs of accountants. To enable accessing data and develop information, accountants must; therefore, grasp the availability of information delivery in a business intelligence system. As such, explaining to financial staff the systems' potential to reach a business-like agreement on what to expect and who to operate information to get the required output.

Based on such understanding developed in this section, the author theorize that Business intelligence self-service will have an impact on performance. As stated in h3 below.

H3: self-service business intelligence does affect performance in Jordanian banks.

1.6. ALIGNMENT OF BUSINESS INTELLIGENCE

In the context of Information System alignment is referred to as "the extent of fit between information technology and business strategy" (Tallon and Pinsonneault, 2011). Theorists have speculated that alignment was key factor in clarifying variations regarding financial investments returns on firms expenditure in Information and communication technology resources (Venkatraman & Henderson, 1999). Which is supported by others findings regarding aligning processes that facilitate achieving higher levels pf return on investment (Tallon, Kraemer, and Gurbaxani, 2000). Employment of alignment between business need and technology deliverables do affect the organizational competitive position within its market which has implications for profitability and returns (Ferrier, 2010).

Literature surrounding Alignment of technological based resources tells a story of positive links with profitability, market growth, intangible benefits (Chan & Reich, 2007; Preston & Karahanna, 2009). Consequently, the author theorize that aligning business intelligence with the banks strategies will positively affect performance of Jordanian banks as postulated in the hypothesis below:

H4: the alignment of business intelligence with the banks strategies will positively affect performance of Jordanian banks.

1.7. CONCLUSION

The second chapter of this thesis has undertaken job of offering the theoretical research model that was developed by the researcher to investigate the accounting systems business intelligence impact in Jordanian banks. To this end three direct effect that theorized the relations between accounting systems business intelligence and banks performance along with three interaction hypotheses are pout forward to be statistically testes in the chapter four of this thesis.

CHAPTER 2

METHODOLOGY

2.1. INTRODUCTION

This chapter aims at offering a detailed reflection of the scientific knowledge research. Which is done through explaining related research philosophy, research design and methodological employments used to gather data for answering the research question. Also, this chapter presents the pilot study and procedures adopted to collect data. As such, this chapter makes the case that the methods used are the best suited for the purpose of this thesis, and are grounded in the scholarly tradition of choosing robust methodologies in order to produce reliable scientific knowledge. In parallel, the methodologies used here represent the best fit possible with the research questions proposed in this study.

Methods applied in this thesis are quantitative in nature that the researcher will present in the coming sections as a justifiable choice of method relying on the motivation of this thesis research. For analysis of the data gathered here, the researcher examines the possibilities of using simultaneous equations to estimate the regression weights of the proposed relationships. For this purpose, this research advocates using structural equation modeling techniques as an appropriate statistical analysis tool. Additionally, the third chapter provide information about the population of Jordanian banks employees of this study that dictated the sample size used in this research to produce generalizable results. Moreover, this chapter makes it clear how the variables adopted here were operationalized for the thesis and measured relying on the construct measurements that are used in the literature. Finally, chapter three provides evidence supporting the ethical grounds used in this research that the student abided by throughout this thesis research.

2.2. RESEARCH PHILOSOPHY

Philosophy in the context of scientific knowledge advancement has a rather unique value attached to it, as opposed to the colloquial usage of the word. In this sense, philosophy refers to a structured pattern followed by researchers to attain knowledge and truth, which is done through a systematic process of academic research (Thornhill, A., Saunders, M., & Lewis, P., 2009). An acceptable thesis for high level academic programs should make an explicit claim to the philosophical underpinning of the scientific work conducted to meet the objectives of the research and answer the research questions. Relying on rigorous philosophical basis that represent a good fit between the research and the methods used does indeed offer potential advantages for the produced academic work (Saunders, M., Lewis, P., & Thornhill, A., 2012).

Four philosophical assumptions represent the general understanding of how all of the scientific work is carried out. These paradigms are Pragmatism, Positivism, Realism, and Interpretivism. A pragmatist " recognize that there are many different ways of interpreting the world and undertaking research, that no single point of view can ever give the entire picture and that there may be multiple realities" (Saunders et al., 2012). Which is in contrast to what a positivist would believe about reality being independent of research conducted. Leading positivists to argue that research objective should be to discover theories that are based on the empirical evidence through observing and experimenting.

In line with Saunders et al (2012) realism can further divided into direct and critical. Direct realism which is thought of as "you get what you see", while critical realism is described as "sensations and images of the real world can be deceptive and they usually do not portray the real world" (Novikov & Novikov, 2013).

Finally, interpretivism philosophical paradigm argues for understanding the socially constructed context of reality that is bound to affect our understanding of what reality is consisted of (Creswell, 2009).

Table 2.1.

Research Paradigms Adapted

	Pragmatism	Positivism	Realism	Interpretivism
	Mixed or	Highly	Methods	Small samples,
_ /	multiple	structured,	chosen	in-depth
Popular	method	large samples,	must fit the	investigations,
data	designs,	measurement,	subject	qualitative
collection method(s)	quantitative	quantitative,	matter,	
	and	but can use	quantitative	
	qualitative	qualitative	or	
			qualitative	

(Source: Saunders et al. 2012)

The differences among the philosophical paradigms in social science research are depicted in table one above. This thesis relies on using positivist philosophical stance. That assumes using reported perceptions and experiences of Jordanian banks' employees represents a valid form of truth to understand the reality of accounting business intelligence systems as they are used in the financial industry.

2.3. RESEARCH APPROACH

Three main approaches are identified from the literature for conducting research, these are: inductive, abductive, and deductive (Wilson, 2014). Deductive research approaches cater towards explaining the relationships among variables hypothesized in the research which is often done through relying on quantitative data analysis. Such relationships might be causal or

recursive. Thus, researchers using this approach tend to rely on the use of prior knowledge gathered from literature to posit ideas which are testable through empirical results analyses (Wilson, 2014, Saunders et al., 2012).

Variables used in this approaches rely on conceptualization effort on behalf of the research to explicitly state phenomena being studied. This in turn, does lead to understanding how these variables are measured quantitatively for the research purposes. Going down this pathway does have an inclination to use large samples that are more likely to produce results which are statistically generalizable. This approach can be related to ideas discussed in section 2.1 above. As such, deductive approaches are likely to be built upon a positivist philosophical stance for the research that test theories based on (more likely than not) employing quantitative data analyses.

The second approach is the inductive approach. Researchers utilizing this approach tend to tackle knowledge gaps through studying small sample sizes. Whereby, theory starts to emerge throughout the data analysis stage of the scientific investigation. Such an approach is exploratory in nature that varies considerably from the explanatory nature of the deductive approach to research that complements work done within the interpretivist paradigm (Creswell, 2009).

From these understandings, it becomes clear that this thesis qualifies to be based on a deductive approach. This position on research approach justifies the use of quantitative analysis of large sample size to answer the research question regarding the impact of financial business intelligence in the Jordanian banking sector.

At this stage, it becomes clear that there is a link to be established between adopting a certain research philosophical stance with research choice for the approach which later guides the methodological choice and the consequent data analysis. Such an overview of the research was visualized by Saunders et al (2012) through the research onion as in figure 2.1 below. The research onion is a visual depiction of the choices that range from epistemological stance on constitutes valid knowledge or truth all the way to conducting and analyzing research results.



Figure 2.1: Research Onion (Source: Saunders et al, 2012)

2.4. RESEARCH METHODOLOGICAL CHOICE

Research methods refer to the processes of gathering and analyzing data to provide an answer for a research question (Sekaran, U & Bougie, R, 2016). Three main choices are thought to be available for researchers conducting research in accounting and finance. These approaches are: quantitative, qualitative, and mixed methods (Creswell, 2013). This research adopts quantitative methods to check whether relationships do in fact exist between financial business intelligence usage and performance gains in Jordanian banks. Furthermore, predicting the strength and the directions of these relationships lend themselves using explorative research as supported by statistical analysis tools (Creswell, 2013).

Qualitative research, on the other hand, does not aim to gather data of quantitative nature that can be used in statistical test and analyses. Qualitative data gathering relies on the researcher's best judgment as to what and where to collect it. This leads researchers to observe research participants as organizational anthropologists would do. Alternatively, researcher would run focus groups to gather data from multiple participants at the same time. Another method relies on interviewing the research participants that enables a rich understanding of their personal experiences and perceptions of the phenomena under study Bryman (2012).

Furthermore, mixed methods approaches in research are utilized when both quantitative and qualitative do not provide suitable knowledge to investigate the phenomenon understudy (Goddard & Melville, 2004).

The arguments provided in thesis conjecture to propose a suitable methodology. This thesis employs primary data collection through surveys as a quantitative method that represent the best fit possible for the nature and scope of this research. Different advantages are gained through using this method. First, it has a structured design that enables collecting data from a large sample size. Second, employing a pilot study does offer value through pretesting the research instrument before engaging in the more time consuming efforts of data collection and analysis. Third, analyzing data of quantitative nature takes less time to while offering rigorous results that are generalizable to a bigger population.

The choice of this thesis method corresponds to calls made in the literature to emphasize the behavioral nature of research in finance and economics. For instance, the economics noble prize winner Richard Thaler observes that "I think that many economists began to take behavioral approaches to finance more seriously" (Thaler, R., 2005).

2.5. SURVEY DEVELOPMENT AND CONSTRUCT MEASUREMENT:

This research has adopted primary data collection method through distributing questionnaires for the accounting departments in the Jordanian

banks. The survey used 5 piont Likert scale with answers ranging from 1 to 5. Constructs measured in this thesis research has relied on measurements that have been previously validated in the existing literature to probe business intelligence in the Jordanian banks accounting systems as it perceived by employees working there. In this section the author introduces the variables measurement as it was adapted from literature. First, accounting systems business intelligence infrastructure was measured using four items adopted from Peters et al (2016), these items are:

- "Accounting business intelligence systems are (1) purely spreadsheet based vs (5) have a fully integrated IT systems architecture"
- "Accounting business intelligence systems (1) consist solely of isolated and individualized spreadsheets Vs (5) are integrated by a common, shared online platform and database"
- "Accounting business intelligence systems (1) use highly manual processes to extract data from transactional systems vs. (5) have fully automated integration with all relevant transactional systems"
- "Accounting business intelligence systems (1) are based on data from disparate spreadsheets vs. (5) source all data from a single data warehouse."

Second, accounting systems business intelligence functionality was measured using four items adopted from Peters et al (2016), these items are:

- "Accounting business intelligence systems have rapid response and refresh times"
- Accounting business intelligence systems have highly interactive reporting features"
- "Accounting business intelligence systems are very easy to use and navigate by all users."
- "Accounting business intelligence systems have sophisticated formats and presentation features."

Third, accounting business intelligence systems self-service was measured using four items adopted from Peters et al (2016), these items are:

- "Accounting business intelligence systems have (1) dedicated analysts provide all the information to middle managers to (5) middle managers access and interact with the system(s) very frequently"
- "Accounting business intelligence systems have (1) dedicated analysts provide all the information to senior managers to (5) senior managers access and interact with the system(s) very frequently"
- "Accounting systems business intelligence self-service has (1) dedicated analysts provide all the information to middle managers to (5) middle managers' access and interact with the system(s) very frequently."
- "Accounting systems business intelligence self-service has (1) dedicated analysts provide all the information to senior managers to (5) senior managers access and interact with the system(s) very frequently"

Fourth, accounting business intelligence systems strategic alignment of accounting business intelligence systems was measured using four items adopted from Tai et al (2018), these items are:

- "Accounting business intelligence information systems support detailed analyses of major business decisions."
- "Accounting business intelligence information systems facilitate strategic business planning."
- "Accounting business intelligence information systems help the users in modeling possible courses of action."
2.6. RESEARCH SAMPLING PROCEDURE:

The logic underlying conducting this thesis research is to understand how employees with managing roles in the Jordanian banking sector appreciate the role played by accounting business intelligence systems. Therefore, targeted population for the purpose of this thesis is managers employed in Jordanian banks. The Central Bank of Jordan states the existence of thirteen local banks that employee more than 2500 personnel in a variety of managing roles, such as heads of departments, executives, deputies or mangers. To get an estimate of a representative sample, survey monkey sampling tool was used. The formula used by this tools is outlined here:



Sample Size =

"Where; Population Size = N | Margin of error = e | z-score = z."

Margin of error is set to 5% for the employees' population in Jordanian banking sector. The resulting sample size was 243 which was calculated at margin error 5% and confidence level 90%. This meant our results had merely 5% likelihood to not accurately mirror overall views held within the population of the study at 90% confidence level.

This thesis has used literature that has been reported in English to test phenomena in an Arabic speaking culture. Hence, Perrewe et al (2002) approach was applied. This has meant that translating the questionnaire from English to Arabic was performed by a translator, followed by another translator doing the opposite translation for the first translator job. Then a comparison of the two English versions was conducted to checks for irregularities and changing meanings. Such a way of managing translating research questions has been thought to reduce the losing the original meaning in the language that the operationalization was developed in. Additionally, the researcher has carried out a limited pre-testing through going to some banks to conduct a pilot study. In total, 15 questionnaires were collected and reliability of the measurement instrument was established by getting Cronbach Alpha values of higher than 0.7 for the thesis constructs.

This was followed by arranging visits to banks headquarters with Human resource management departments to apply for research participation at these banks. An overawing synopsis of the research importance and hoped for value through this study was explained, along with the academic purpose of this research. Participating banks have agreed to distribute research envelops that included an ethical statement explaining the ethical standards of this type research and a consent form along with the survey for participants to fill out on non-obligatory terms.

2.7. CONCLUSION

The third chapter has given away the philosophical assumptions for carrying out this research. As such, this thesis is grounded the scientific tradition of positivist research. This was done through collecting primary data through distributing questionnaires to managers working in Jordanian banks to get a representative sample of managers' views on the use of business intelligence systems in accounting in these banks.

CHAPTER 3

RESULTS

3.1. INTRODUCTION

The fourth chapter of this dissertation exhibits gathered dataset analysis by utilizing covariance-based approach for structured equation modelling. This is done through different stages shown as this chapter progresses in the following order: first, data descriptive analyses displays ratios of research participants across gender, monthly income, level of education, marital-status and respondents' age. Second, an exploratory-factor-analysis was calculated to reveal underlying associations in structure with regards to this data. Third, confirmatory factor analysis was considered to look at how survey items of collected variables are structured as latent variables. Fourth, a covariance-based structure equation modelling method is taken to test theorized hypotheses after achieving acceptable levels with regards to goodness of fit indices for the calculated model. Fifth, the moderation analysis exposed the magnitude by which systems alignment with the business interacted with the main three postulated relations of our research model.

3.2. DATASET DESCRIPTIVE VIEW

To guard against a biased sample for this research, and examine managers' involvement in this study. Descriptive data section offers deeper look at the respondents' profile. 1200 questionnaires were distributed to 13 Jordanian banks, the number of returned questionnaires was 303. After eliminating responses with missing data or responses that showed unengaged

participation the number has dropped to 270. This number satisfies and exceeds 245 required responses as calculated in chapter three above.

Firstly, the gender profile of research participants is shown in table 3.1 below. 222 males' research participants representing 82.2% of the sample was complemented by 48 female research participants representing 17.8% of this sample have been included here. This represents a normal distribution of gender as most Jordanian banks employees in managing positions seem to be males.

Table 3.1.

PERSONAL I	PERSONAL INFORMATION		PERCENTAGE
Gender	Male	222	82.2%
	Female	48	17.8%
Marital status	Single	121	44.8%
	Married	133	49.3%
	Divorced	16	5.9%
Age	Less than 25	87	32.2%
	26-39	141	52.2%
	Above 40	42	15.6%
Educational level	Bachelors degree	164	60.7%
	Master Degree	69	25.6%
	Phd Degree	33	12.2%
	Other degrees	4	1.5%
Income	Less than 400 JD	9	3.3%
	400-599	36	13.3%
	600-799	87	32.2%
	800-999	74	27.6%

Descriptive View of Collected Dataset

Secondly, marital status profile of research participants is shown table 3.1 above. Research participants who reported being single was 121 representing 44.8% of the sample. Married research participants were counted to be 133 employees representing 49.3%, and research participants who stated being divorced was 16 representing 5.9% of the sample size. These figures are charted in table 3.1 above.

Thirdly, the age profile of research participants is shown in table 3.1 above. This shows research participants who were less than 25 years ole were 87 representing 32.2% of the sample. Research participants who were aged between 26 and 40 were 141 representing 52.2% of the sample, and research participants who were aged above 40 years old to be 42 observations representing 15.6% of the sample. This show that most of the bank employees in supervisory or managing positions are aged between 26 and 40 years old.

Fourthly, the education background profile of research participants is shown table 3.1 above. This shows 164 employees had a Bachelor's degree representing 60.7%, 69 employees had a Master's degree representing 25.6%, 33 employees had a doctoral degree representing 12.2%, while 4 have reported other degrees. The education background analysis revealed that most employees in supervisory or managing roles had a Bachelor's degree.

Fifthly, the monthly salary profile of research participants is shown table 3.1 above. This revealed 9 observations below 400 JD representing 3.3%, 36 observations were between 400JD-599JD representing 13.3%, 87 representing observations were between 600JD-799JD 32.2%, 74 observations were between 800JD-999JD representing 27.4%, and 64 observations were above 1000JD representing 23.6%. This means that around 84% of the observations were above 600JD which represents a sensible monthly salary for Jordanian standards of living.

3.3. EXPLORATORY FACTOR ANALYSIS

After considering descriptivist view of dataset, the research takes aim at exploratory factor analysis (EFA) which was prepared for three major contributions it adds for research:

First, "factor analysis reduces a large number of variables into a smaller set of variables (also referred to as factors)". Second, "it establishes underlying dimensions between measured variables and latent constructs, thereby allowing the formation and refinement of theory". Finally, "it provides construct validity evidence of self-reporting scales" (Williams, Onsman, & Brown, 2010, P., 2).

The following route was adopted in examining EFA. This began by eyeballing measurement appropriateness through descriptive analysis before calculating EFA. Specifically, two descriptive statistics were underscored for this procedure: standard deviation and mean. The student has embraced the view presented by Kim (2011), who argues that items with extremely high or low observations to be marked for possible elimination, this meant items approaching 1 or 5 are elimination candidates. Figure 3.1 represents a sample of this check though charting the answers, standard deviation and mean of observations for this item. The Logic underlying such a way to eliminate items is to stay away from negative impact on validity and reliability of research data. Hence, the measurement reported here is for gathered data on all items apart from SERV4 as it demonstrated low factor loading and cross loading with other factors in the preparation runs of EFA.



Figure 3.1: Scree Plot for SERV3 Observations Descriptive Analysis

The first effort to understand factor structure of dataset is shown in figure 3.2 scree plot below. Five factors were calculated to have Eigenvalues higher than one. This matches our theorized model that the researcher aims to investigate 5 variables in this study.

The Eigenvalues drop below 1 after the fifth factor indicating that the data probably would house a sixth visible factor within its structure. As evidenced by figure 3.2 below.



Figure 3.2: Scree Plot For Factors Numbers And Eigenvalues

Table 3.2.

	Total Variance Explained						
Factor	Initial Eigenvalues Extraction Sums of Squared Loadings				Rotation		
							Sums of
							Squared
							Loadings ^a
	Total	% of	Cumulative	Total	% of	Cumulative	Total
		Variance	%		Variance	%	
1	3.668	20.380	20.380	3.009	16.714	20	2.573
2	2.625	14.585	34.965	2.411	14	30.111	2.692
3	2.512	13.957	48.921	1.696	10	39.535	2.540
4	2.075	11.529	60.450	1.751	10	49.263	2.104
5	1.839	10.217	70.667	1.968	10	60.2	1.544
Extraction	Extraction Method: Maximum Likelihood.						
a. When	factors are cor	related, sums of	f squared loading	gs cannot be a	dded to obtain a	total variance.	

Total Variances Explained

With reference to produced variances as evidenced in table 3.2 below. The researcher determined the following:

Factor one (Accounting systems business intelligence infrastructure) explained 20% of the variance, as factor two (performance) explains 14% of variance, as factor three (Accounting systems business intelligence self-service) explained 10% of variance, and factor four (Accounting systems business intelligence functionality) explained 10% of and factor five (Accounting systems business intelligence alignment) explained 10% from variance in outcome from model. The research model is analyzed after eliminating SERV4 item, has the predictor power to explain 60.2% cumulatively of calculated variance.

According to suggestions given through (Hair, Black, Babin, & Anderson, 2010; Kaiser, 1974; Tabachnick & Fidell, 2007) the data analysis procedure did initial screening of observed variables (i.e. research items of the

variables) to kick off exploratory factor analysis. Specifically, the following assumptions proved to be essential during this process.

- Looking for satisfactory number of correlationswhich represent statistical significance in the produced rotation matrix.
- Using Kaiser- Meyer- Olkin (KMO) as an indicator for sampling adequacy, which is based on the endorsed threshold to be higher than 60% to match the gathered data.
- conducting Bartlett's test of sphericity and producing results that are higher than one
- through relying on the work of (Tabachnick & Fidell, 2007), the research adopted the recommendation which specifies loadings should be higher than 0.4. This should be done simultaneously while guarding against cross loadings with other factors. Such cross loadings do signify potential multicollinearity issues.
- Finally, Eigenvalues are supposed to be more than one.

Using these assumptions for exploratory factor analysis, item SERV4 was dropped. Consequently, the exploratory factor analysis produced is shown in table 3.3 below.

That calculation has used maximum likelihood estimator, and promax with kaiser normalization to produce these results. The logic for using maximum likelihood is that it matches the estimator used algorithm in AMOS which will be used in the following sections.

Pattern Matrix					
	Factor				
	1	2	3	4	5
INFRA1	.748				
INFRA2	.803				
INFRA3	.862				
INFRA4	.703				
PERF1		.802			
PERF2		.812			
PERF3		.770			
PERF4		.728			
SERV1			.869		
SERV2			.922		
SERV3			.854		
FUNC1				.711	
FUNC2				.751	
FUNC3				.808	
FUNC4				.585	
ALING1					.913
ALIGN2					.513
ALIGN3					.631
Extraction Method: Maximum Likelihood.					
Rotation M	Rotation Method: Promax with Kaiser Normalization.				
a. Rotation	converged in	5 iterations.			

EXPLORATORY FACTOR ANALYSIS

3.4. CONFIRMATORY FACTOR ANALYSIS

This research has then moved to performing a confirmatory factor analysis that aimed to establish the measurement model as reliable tool for the purpose of this research.

Three statistical tests were applied to evaluate reliability. "Cronbach's alpha, composite reliability, an average variance extracted (AVE)". both AVE and Cronbach's Alpha values are thought to represent evidence for reliability when they exceed 0.70 according to Nunnally and Bernstein (1978). Which seems to be received with widespread application and appreciation among scholars in various fields of science.

On the other hand, validity of the measurement model was established through goodness of fit indices that indicated the overall research model represent a well fitted model. As shown in table 3.4 and table 3.5 these measures include: "chi-square (x^2), normed chi-square (x^2 /df), goodness of fit index (GFI), comparative fit index (CFI), Normed fit index (NFI) and the root mean square error of approximation (RMSEA), Standardized Root Mean Square Residual (SRMR)"

Moreover, convergent validity is judged by scrutinizing "observed variables" correlations among themselves in reference to one latent variable. It was concluded that these correlations are higher than correlations with other latent variables. On the other hand discriminant validity was established because latent variables shared more variance with corresponding observed variables than with other latent variables.

After conducting some covariance modifications, the researcher was satisfied with measurement model shown in figure 3.3 to proceed with analysis.



Figure 3.3: CFA Before Modification



Figure 3.4: CFA After Modification

Table 3.4.

Measure	Estimate	Threshold	Interpretation
CMIN	162.491		
DF	125.000		
CMIN/DF	1.300	Between 1 and 3	Excellent
CFI	0.980	>0.95	Excellent
SRMR	0.042	<0.08	Excellent
RMSEA	0.033	<0.06	Excellent
PClose	0.979	>0.05	Excellent

Goodness of fit before modification

Table 3.5.

Goodness of it after modification

Measure	Estimate	Threshold	Interpretation
CMIN	140.318		
DF	123.000		
CMIN/DF	1.141	Between 1 and 3	Excellent
CFI	0.990	>0.95	Excellent
SRMR	0.040	<0.08	Excellent
RMSEA	0.023	<0.06	Excellent
PClose	0.999	>0.05	Excellent

3.5. STRUCTURAL EQUATION MODEL

The structural equation model inspection implemented within this current study has achieved good level of acceptance with regard to fitness parameters, that is evidenced by the accompanying goodness of it indices below in table 3.7.



Figure 3.5: Structural Model Before Covariance Modifications



Figure 3.6: Structural Model After Covariance Modifications

Table 3.6.

Measure	Estimate	Threshold	Interpretation
CMIN	114.327		
DF	84.000		
CMIN/DF	1.361	Between 1 and 3	Excellent
CFI	0.980	>0.95	Excellent
SRMR	0.038	< 0.08	Excellent
RMSEA	0.037	<0.06	Excellent
PClose	0.913	>0.05	Excellent

Fit Indices Before Modifications

Table 3.7

Measure	Estimate	Threshold	Interpretation
CMIN	92.185		
DF	82.000		
CMIN/DF	1.124	Between 1 and 3	Excellent
CFI	0.990	>0.95	Excellent
SRMR	0.035	<0.08	Excellent
RMSEA	0.021	<0.06	Excellent
PClose	0.994	>0.05	Excellent

Fit Indices After Modifications

3.5.1. Direct Hypotheses testing

The following table represents results achieved from the above developed structure equation modeling:

Table 3.8.

Independent variables	Dependent variable	Std Beta	Р	
Infrastructure	Performance	.18	**	
Self-service	Performance	.23	***	
Functionality	Performance	.02	ns	
*** <i>p</i> <.01, ** <i>p</i> <.05, <i>ns</i> = not significant				

Direct Hypotheses Testing

H1 was found to be statistically significant and was accepted. This means that accounting systems business intelligence infrastructure integration has a positive impact on banks performance.($\beta = 0.18$, p<**).

H2 was found to be statistically significant and was accepted. This means that accounting systems business intelligence self-service has a positive impact on banks performance.($\beta = 0.23$, p<***)

H3 was found to be statistically insignificant and was rejected. This means that accounting systems business intelligence functionality does not have any measureable association with banks performance

3.6. MODERATION ANALYSIS



Figure 3.7: Interaction Effect Structural Model

Table 3.9

Exogenous Variables	Endogenous Variables	Estimate	S.E.	CR	Р
Alignment	Performance	05	.09	78	***
Infrastructure	Performance	.21	.04	3.78	***
Self-service	Performance	.25	.06	4.48	***
Functionality	Performance	.03	.04	12.26	.59
functionality_x_alignment	Performance	01	.06	17	0.87
Self-service_x_alignment	Performance	.11	.05	1.91	.06 †
infrastructre_x_alignment	Performance	18	.05	-3.18	**
S.E.= Standard Error; **	*p <.01, **p<.05,	† p < 0.100			

Table 3.9 above exhibits the results of two interaction testing of the theorized hypotheses, these results indicate that:

H4a: was statistically insignificant and thus rejected. Which means that alignment was not significant in moderating the relation between accounting system business intelligence functionality and performance.

H4b: was statistically significant and thus accepted. This means that alignment has a significant moderating role in the relationship between accounting system business intelligence infrastructure integration and performance. This effect was negative which indicate that the moderation effect does decrease effect of accounting system business intelligence infrastructure integration on performance when alignment is at a high level. This relationship is shown in figure 3.8 below

H4c: was statistically significant and thus accepted. This means that alignment has a significant moderating role in the relationship between accounting system business intelligence self-service and performance. This effect was positive which indicate that the moderation effect does increase effect of accounting system business intelligence self-service on performance when alignment is at a high level. This relationship is shown in figure 3.9 below.



Figure 3.8: Alignment Interaction Effect on Self-Service And Performance

Alignment strengthens the positive relationship between Self-service and Performance.





Alignment dampens the positive relationship between Infrastructure and Performance.

3.7. CONCLUSION

This chapter has been given the central role of presenting the empirical evidence after adequate statistical analysis. The analysis procedures undergone here have been revolving around structure equation modeling techniques. First, the exploratory factor analysis is shown to reflect that this dataset has five factors as theorized in the literature chapter. Second, confirmatory factor analysis is calculated to confirm these factors and examine discriminant and convergent validity. Third, structural model is constructed to measure the direct effect hypotheses. Fourth and final section has exhibited moderation effect of strategic alignment of business intelligence on the direct relationships measured above.

CONCLUSION

Introduction

This chapter deals with summarizing how this thesis advanced a theoretical position. This is argued to provide value that is academically appreciated, while having further implications for decision makers in the industry that are interested in applying accounting systems business intelligence within financial institutions. Likewise, the dataset provided empirical evidence on perceptions about business intelligence and effects of such systems for Jordanian banking industry that are understood to be an antecedent for performance. Similarly, this work give away a basis to undermine arguments that are based on skeptic views regarding the efficiency of business intelligence systems. These skeptic arguments would be undermined by offering a tangible evidence to support investing in these technologies at a time when financial institutions are overburdened with costs and expenses. As these investments are proposed to yield welcomed effect on performance.

Theoretical Implications

Previous researchers have demonstrated that accounting information systems have helpful impact with regards to refining organizations' competitive positions in various sectors (Budiarto, Ak, & Prabowo, 2019; Komala, 2012; Sajady, Dastgir,& Nejad, 2012: Peters, Wieder, Sutton, & Wakefield, 2016). However, few researchers have examined how integrating business intelligence within these systems does contribute to performance gains. As such, this work builds on this niche field on academic inquiry.

This is done through proposing that applying business intelligence concepts in accounting systems we expect find higher performance as both infrastructure integration and self-service did exhibit positive effects. However, functionality did not show enough evidence to support performance gains. The research conducted above has revealed an interesting points considering literature most recent knowledge on the topic. For instance, business intelligences capabilities have been noted for their effect on performance when applied in marketing activities (Germann, Lilien, & Rangaswamy, 2013). While using business intelligence analytics for websites provides valuable information for organizations (Saura, Palos-Sánchez, & Cerdá Suárez, 2017). Our results represent a general understanding that accounting systems business intelligence does in fact exhibit a positive relation with performance, as general research regarding business intelligence would have predicted (Ramakrishnan, Jones, & Sidorova, 2012).

Also, strategic alignment of business intelligence with banks goal seemed to have positive effect on enhancing the relation between business intelligence self- service and performance. Which is probably due to employees in managing positions being able to use accounting business intelligence systems to hasten achieving their targets that are already derived from bank wide goal to achieve higher performance levels.

This is contrasted to the alignment role observed effect on the relation between infrastructure integration and performance. Which had a dampening impact. This role might be due to the fact that this research measured strategic alignment, other forms of alignment can be studied by future researchers to give a complete picture on the role of alignment as a moderator on these relationships.

Alignment between accounting systems business intelligence and the organizational goals does have performance gains according to literature (Hu & Huang, 2006). This is seems a logical extension to the observed role reported for alignment of information technologies in general and performance (Reich & Benbasat, 2000). However, as noted by Yayla & Hu (2012) the extent of scholarly understanding of the effect is in its infancy due to insufficient understanding of the boundary conditions effect of alignment. As such our study fills this gaps by investigating alignment as a boundary condition moderating the relationship between accounting systems business intelligence and performance. The reported findings here do provide an extra

dimensions to understand role played by aligning business intelligence with organizational wider goals and visions.

Limitations

A number of limitations has to be noted: first, this thesis used a dataset based on cross-sectional data gathering. As such, results provided here reflect a one-time answers that might lack accuracy when compared to a multi-longitudinal studies. So, the author hopes that future researchers will use different time frames to collect data to consolidate results obtained here (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Second, understanding the true impact of bias attributed to non-respondents was extremely difficult to eliminate. This resulted from the nature of data gathering design of this research. The research has agreed with the banks to give concealed envelops to HR departments who later distributed and collected filled responses. So the researcher could not tell difference between the first batch of respondents and the last. However, as this research had acceptable levels of statistical validity and reliability, the researcher hopes that the effects of such bias are minimal (Hair, Black, Babin, Anderson, & Tatham, 1998).

Future Research

This research represented the first attempt to study accounting systems business intelligence impact on performance in Jordanian banks. This research has shown an intriguing result indicating that accounting systems business intelligence functionality does not have any significant effect on performance. As such, future researchers are invited to study other aspects of functionality that might lead to measurable impact on performance.

Conclusion

This chapter has given concluding remarks about undertaken thesis research reported in the previous four chapters. This is done by describing the theoretical implications for conducting the research. Also, as robust scientific inquiries dictate potential limitations are reported to enhance the research transparency and quality. While paving the way for future researchers to benefit from results described through identifying possible paths for upcoming scientific endeavors in this field.

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APPENDIX 1: Questionnaire Survey

Gender:	Male	F	emale
Marital Status:	Single	Married	Divorced
Age: Le	ss than 25 🛛 2	26-39	Above 40 🔲
Education Level:	Bachelors degree	MSC 🗌 F	PhD Other
Monthly Income:	Under 400	400 to 599 🔲	600 to 799
	800 to 1000	Above	1,000

I would like to describe the Accounting systems business intelligence infrastructure status in the bank I work at as follows:

 Our planning, budgeting, and forecasting accounting business intelligence systems are (1) purely spreadsheet based vs (5) have a fully integrated IT systems architecture purely spreadsheet based to some extent closer to number 1 above to moderate extent represent a mix of both to some extent closer to number 5 below have a fully integrated IT systems architecture

 Our planning, budgeting, and forecasting accounting business intelligence systems (1) consist solely of isolated and individualized spreadsheets Vs (5) are integrated by a common, shared online platform and database consist solely of isolated and individualized spreadsheets to some extent closer to number 1 above to moderate extent represent a mix of both to some extent closer to number 5 below

are integrated by a common, shared online platform and database

•Our planning, budgeting, and forecasting business intelligence systems (1) use highly manual processes to extract data from transactional systems vs. (5) have fully automated integration with all relevant transactional systems

use highly manual processes to extract data from transactional systems

to some extent closer to number 1 above

to moderate extent represent a mix of both

to some extent closer to number 5 below

have fully automated integration with all relevant transactional systems

• Our planning, budgeting, and forecasting business intelligence systems (1) are based on data from disparate spreadsheets vs. (5) source all data from a single data warehouse.

are based on data from disparate spreadsheets

to some extent closer to number 1 above

to moderate extent represent a mix of both

to some extent closer to number 5 below

source all data from a single data warehouse

- Our planning, budgeting, and forecasting accounting business intelligence systems have rapid response and refresh times
- o not at all
- o to some extent
- o to moderate extent
- o to large extent
- o to very large extent

- o not at all
- o to some extent
- o to moderate extent
- o to large extent
- o to very large extent
 - Our planning, budgeting, and forecasting accounting business intelligence systems are very easy to use and navigate by all users.
- o not at all
- o to some extent
- o to moderate extent
- o to large extent
- o to very large extent
- I would like to describe our accounting business intelligence systems selfservice:
- Our planning, budgeting, and forecasting business intelligence systems have (1) dedicated analysts provide all the information to middle managers to (5) middle managers access and interact with the system(s) very frequently
- Dedicated analysts provide all the information to middle managers
- o to some extent closer to number 1 above
- o to moderate extent represent a mix of both
- o to some extent closer to number 5 below
- o to middle managers access and interact with the system(s) very frequently
- Our planning, budgeting, and forecasting business intelligence systems have (1) dedicated analysts provide all the information to senior managers to (5) senior managers access and interact with the system(s) very frequently
- Dedicated analysts provide all the information to senior managers
- to some extent closer to number 1 above
- o to moderate extent represent a mix of both
- to some extent closer to number 5 below to senior managers access and interact with the system(s) very frequently

• For our management reporting and analysis accounting systems business intelligence self-service has (1) dedicated analysts provide all the information to middle managers to (5) middle managers access and interact with the system(s) very frequently

- o Dedicated analysts provide all the information to middle managers
- o to some extent closer to number 1 above
- o to moderate extent represent a mix of both
- o to some extent closer to number 5 below

o to middle managers access and interact with the system(s) very frequently

• For our management reporting and analysis accounting systems business intelligence self-service has (1) dedicated analysts provide all the information to senior managers to (5) senior managers access and interact with the system(s) very frequently

- o Dedicated analysts provide all the information to senior managers
- $\circ~$ to some extent closer to number 1 above
- \circ to moderate extent represent a mix of both
- o to some extent closer to number 5 below
- to senior managers access and interact with the system(s) very frequently

I would like to describe the strategic alignment of accounting business intelligence systems status in the bank I work at as follows:

- Our accounting business intelligence information systems support detailed analyses of major business decisions:
- o not at all
- o to some extent
- o to moderate extent
- o to large extent
- o to very large extent
- o Not to all

I would like to describe the Organizational performance status in the bank I work at as follows:

My bank exhibited improved service delivery cycle time

- \circ Worst in the industry
- Worse than industry
- Equal to the industry
- Better than industry
- Best in the industry

My bank shows achieves increased sales of existing products

- o Worst in the industry
- Worse than direct competitors
- Equal to the industry
- Better than direct competitors
- Best in the industry

APPENDIX 2: A LETTER TO THE RESPONDENT

Dear Sir/ Madam,

RE: KINDLY REQUESTIONG FOR YOUR PARTICIPATION TO ANSWER MY RESEARCH STUDY QUESTIONS THAT WILL HELP IN THE END FIND OUT THE IMPACT OF FINANCIAL BUSINESS INTELLIGENCE ON ORGANIZATIONAL PERFORMANCE IN JORDANIAN BANKS.

Dear Sir/ Madam:

The survey in your hands looks at how Accounting business intelligence in your banking institution is appreciated. The researcher appreciates your participation as this study would not be possible without your valuable contributions. The author hereby declares that all information collected from this survey will be kept confidential and will not be shared with your employer or any other party, and shall be only used for the purpose completing the researcher's master's thesis in finance.

In this survey there are no right or wrong answers, the questions are aimed at understanding your own personal opinion and experience regarding the status of accounting information systems within the bank you are currently working at.

This survey will take about 10 minutes to finish, and I would like to thank you in advance for investing that amount of time to participate in this study

Thank you in advance for your kind assistance,

Participant's name	Date	Signature
Researcher	Date	Signature
PLAGIARISM REPORT

THE IMPACT OF FINANCIAL BUSINESS INTELLIGENCE ON ORGANIZATIONAL PERFORMANCE IN JORDANIAN BANKS ABDEL RAHMAN NIDAL MUSTAFA HASHISH

ORIGINALITY REPORT

2 SIMILA	0% ARITY INDEX	16% INTERNET SOURCES	15% PUBLICATIONS	20% STUDENT P	APERS
PRIMAR	Y SOURCES				
1	Submitted to Girne American University Student Paper				2%
2	aisel.aisnet.org				2%
3	Submitted to Tshwane University of Technology Student Paper				1%
4	Matt D. Peters, Bernhard Wieder, Steve G. Sutton. "Organizational improvisation and the reduced usefulness of performance measurement BI functionalities", International Journal of Accounting Information Systems, 2018 Publication				1 %
5	www.igi-global.com				1%



11.02.2020

Dear Abdel Rahman Nidal Mustafa Hashish

Your application titled **"The Impact of financial business intelligence on organizational performance in Jordanian banks"** with the application number YDÜ/SB/2020/592 has been evaluated by the Scientific Research Ethics Committee and granted approval. You can start your research on the condition that you will abide by the information provided in your application form.

Assoc. Prof. Dr. Direnç Kanol

Rapporteur of the Scientific Research Ethics Committee

Direnc Kanol

Note: If you need to provide an official letter to an institution with the signature of the Head of NEU Scientific Research Ethics Committee, please apply to the secretariat of the ethics committee by showing this document.