International Journal of Business and Economic Sciences Applied Research

VOLUME 12, ISSUE 1

EASTERN MACEDONIA & THRACE INSTITUTE OF TECHNOLOGY PRESS

International Journal of Business and Economic Sciences Applied Research

A: Agios Loukas, PC 65404, Kavala, Greece
E: http://ijbesar.teiemt.gr/

Contents

Honorary Editorial Board

Editorial Board of IJBESAR

AIM AND SCOPE

The ***International Journal of Business and Economic Sciences Applied Research*** (IJBESAR) is a blind peer-reviewed, scholarly journal devoted to publishing high-quality papers and sharing original business and economics research worldwide.The Journal considers only manuscripts that have not been published (or submitted simultaneously), at any language, elsewhere. Contributions are in English. The Journal is published by the Eastern Macedonia & Thrace Institute of Technology. Copyright is by the publisher and the authors. The Journal is issued both in electronic form (for free) and in printed form as annual volume (free for the authors). The Journal accepts 9 types of articles defined as follows:

1. **Research Articles**: A research article is a regular article which aims to present new findings.
2. **Letters to the Editor**: A letter to the editor is a short article which aims to present new findings that require fast publication procedures.
3. **Notes**: A note is an article (regular or short) which aims to present rather new findings.
4. **Comments**: A comment is a short article that makes comments on another article already published by this journal or replies to a comment;
5. **Review Articles**: A review article is an article which aims to present comprehensively already existing findings.
6. **Lecture Notes:** A lecture note is a short review article.
7. **Monographs:** A monograph is a thesis of one or more authors on a unique subject; apart form the standard reviewing procedures, a monograph must also be accepted from a committee of specialists appointed by the Editor.
8. **Innovations**: An innovation is an article which aims to present new procedures or devices.
9. **Selected conference articles**: Upon an agreement with a conference committee, selected papers may be published by the Journal in a special section. In this case the editor will appoint in collaboration with the conference committee guest editors.

ETHICAL NOTES

An author is a person who has a substantial contribution to the article; all other contributions should be mentioned as acknowledments. Authors should cite only the articles which have contributed to their work; unnecessary citations should not be listed. Authors should present their work as objectively as possible. Arguments that discriminate people by race, sex, origin, religion, etc are not accepted. Bogus results must not be given. Reviewers should not take advantages from the manuscript; instead, they should help the authors to improve their work. Reviewers should not criticize in public the manuscripts. The Editor guarantees the anonymity of the reviewers.

IJBESAR

International Journal of Business and Economic Sciences Applied Research

Factors Affecting the Acceptance of Electronic Books by the Readers

Efstathios Dimitriadis, Dimitrios Chatzoudes, Marta Jordan, François Cudel, Evmorfia Bourdouni, Antonios Mandilas, Miriam Lutz, Raffael Reisl, Pauline Hego, Théo Mailly

Volume 12, Issue 1

Eastern Macedonia & Thrace Institute Of Technology Press

International Journal of Business and Economic Sciences Applied Research

IJBESAR
ijbesar.teiemt.gr

Factors Affecting the Acceptance of Electronic Books by the Readers

Efstathios Dimitriadis[1], Dimitrios Chatzoudes[2], Marta Jordan[3], François Cudel[4], Evmorfia Bourdouni[5], Antonios Mandilas[1], Miriam Lutz[3], Raffael Reisl[3], Pauline Hego[4], Théo Mailly[4]

[1] International Hellenic University, Department of Management Science and Technology, Greece
[2] Democritus University of Thrace, Department of Production and Management Engineering, Greece
[3] FH Joanneum - University of Applied Sciences, Austria
[4] University of Lille 1, France
[5] International Hellenic University, Department of Accounting and Finance, Greece

ARTICLE INFO
Article History
Received 1st April 2019
Accepted 20th April 2019

JEL Classifications
L63; L81; M15; O33

Keywords:
e-books, e-book adoption, (Enhanced) Technology Acceptance Model (TAM), Intention to use, Empirical study, Structural Equation Modeling (SEM).

ABSTRACT

Purpose

One of the main questions about the future of print and electronic books is whether the second will replace the first. Although the electronic book was first introduced to the public in 1971, the trend of reading e-books did not gain popularity until the previous decade. The recent introduction of e-book devices has drastically changed the way people access and use the reading content. Therefore, in the present study, the electronic book is examined not only as an innovative technological product, but also as a cultural commodity. More specifically, the present study aims to develop and empirically test a conceptual framework (research model) that sheds fresh light on the factors that affect e-book adoption by the readers.

Design/methodology/approach

The examination of the proposed conceptual framework was made with the use of a newly-developed structured questionnaire that was distributed to book readers residing in three EU countries. In particular, the participants of the survey were citizens from Austria, France and Greece. The study includes nine research factors. Some of them are dependent (e.g., "perceived usefulness", "perceived ease of use", "perceived trust"), while the two main dependent factors of this study are "attitude towards use" and "behavioural intention". The empirical data were analysed using the "Structural Equation Modelling" (SEM) technique.

Findings

Empirical results revealed that the factors that have the most significant impact on e-book acceptance, both directly and/or indirectly, are three: "compatibility with the preferred way of reading", "ease of use" and "attitude towards use". Also, the results highlighted interesting differences between the three countries of the sample.

Research limitations

A limitation stemming from the implemented methodology is the use of self-reported scales in order to measure the constructs of the proposed model. Also, the paper lacks a longitudinal approach, since it provides a static picture of e-book acceptance (first quarter of 2019).

Originality/value

It is of great significance that everyone who has a stake in the adoption of e-books by the readers, understands which factors are the most significant. In that way, the publishing houses, the e-reader manufacturers and the software developers, will be able to approach their consumers more effectively. The present study offers guidelines to these organisations, thus enhancing their understanding about the perceptions of their customers. Moreover, the present study is conducted on a European level (sample from three EU countries), something that has never been attempted before in the relevant literature.

1. Introduction

Books are one of the very few things we have been working on since the beginning of our lives. Having been extensively used in order to teach children, everyone has at least some reading experience from a printed book (Chartier, 2004). But the same cannot be said for e-books. Since the first e-book, in 1971, as the

[1]Corresponding Author: Efstathios Dimitriadis
E: edimit@teiemt.gr
DOI: 10.25103/ijbesar.121.01

product of Project Gutenberg, the first digital library till today, e-books have gone through many stages. Nowadays books are going through their most challenging stage, since they are about to be the main way of reading literature and essays (Anton *et al*., 2013; Lebert, 2009).

Although, the digital transformation of our society is happening, the e-book has not been established in our everyday life, such as the use of mobile and computer. This may have been partially due to consumer's unwillingness to give up the tactile reading experience associated with traditional books (Armstrong, 2008; Torres *et al*., 2014).

The present paper will try to take a step towards a more differentiated view on e-book acceptance. The main theories on the acceptance of e-books are the Technology Acceptance Model (TAM) and Innovation Diffusion Theory (IDT) (Lai and Chang, 2010; Chang *et al*., 2012). These models suggest variables that are related to acceptance. Based on these two models, many researchers have attempted to identify which variables affect acceptance and what kind of effect they have. The main factors examined are: Perceived Utility, Ease of Use, Perceived Discontent, Brand Trust, Behavioral Intention and Attitude of Use.

By examining the term "acceptance", it is concluded that it is quite a general concept and, therefore, an attempt has been made to make it concrete, so that it can be investigated. The most popular, commonly used models are the Technology Acceptance Model and Innovation Diffusion Theory (Chang *et al*., 2012; Lyytinen and Damsgaard, 2001; Sheppard *et al*., 1988). TAM, proposed by Davis (1989) argues that acceptance of new technology is influenced by Perceived Utility and Easy of Usability (Davis, 1989). Considering that e-books introduce a new technology, this model can effectively examine their acceptance. According to Diffusion Theory of Innovation, there are specific factors that can influence one's attitude before adopting and innovation. These factors are the relative advantage, compatibility, complexity, testability and observability (Rogers, 2003).

In the international literature, the main factors related to acceptance are: Perceived Utility, Ease of use, Perceptible Discontent, Trust Brand, which are usually considered as independent variables and Behavioral Intent and Attitude in Usage, which are usually considered as dependent ones.

Perceived usefulness can be defined as "the consumer's perception of the degree of utility in the use of e-book" (Tsai, 2012). Ease of use is often defined as "the consumer believes reading e-books is easy and does not require effort" (Gerlach and Buxmann, 2013). Perceived discontent in the case of e-books is defined as "the perceived discontent experienced by a person because an object has a different feel to the one he is accustomed to" (Gerlach and Buxmann, 2011). It has been observed, for example, that prolonged reading of e-books tire readers, resulting in increased dissatisfaction (Borchert *et al*., 2009).

Brand trust not only refers to the brand of the reader (the device), but also to the overall e-book package, that is, the reputation of the book's purchasing website, the service and the security that the consumer feels when buying. It has been observed to directly and positively affect the market intent (Tsai, 2012).

Behavioral Intention is defined as "the degree of willingness to adopt new technology". It is considered the last and most representative variable to measure acceptance (Tsai, 2012). The attitude expresses "positive or negative emotions or assessment when someone uses a new information technology (IT)". The attitude successfully measures the intention and has been observed to depend on factors such as ease of use and perceived utility (Tsai, 2012).

Although, many studies have been written on e-books and the possible upcoming replacement of printed books, the scientific investigation on their acceptance by the readership remains incomplete (Park *et al*., 2013). The reasons for this are two: Firstly, surveys usually focus on university libraries and student experiences, so the results are difficult to generalize in the general population, which differs substantially in terms of how and why e-books are used. Secondly, many researches approach the subject from a purely technological base, studying factors such as utility, ignoring that the book is a cultural asset (Lee *et al*., 2002; Gerlach and Buxmann, 2013).

In summary, this paper is one of the most comprehensive reviews of e-book acceptance, because it does not only recognize the factors that affect the acceptance of e-books, but is also conducted on a European level. The countries that participated in our survey are: Austria, France and Greece. This research could contribute to many European organisations (publishers, reader manufacturers and developers of e-books), because if these companies understand what factors are the most important for European readers, they will be able to reach and satisfy them more effectively.

2. Literature Review

Books are an everlasting medium for more than 500 years, but since the last century there is a lot of competition. The generation of today has no time for conscious reading. They get their daily information over the internet, check their mails several times daily, watch their favourite series over their streaming service and either shop over the internet. The electronic book offers nearly the same possibility as the internet: quite adequate space for various sorts of texts (Tellioglu, 2018; Vasileiou *et al*., 2008).

By definition, e-book means a "digital book publication", which is available on a digital or mobile device or a personal computer (Lee, 2012; Shin, 2011).

If you add some links to your device it is called an enhanced or enriched e-book, which describes the extraordinary aspect that you can read an electronic book accompanied by visuals like audios and videos. For this purpose, e-books offer a great opportunity to learn new languages (Siegel, 2009). Digital books are identified with their ISBN (International Standard Book Number) - same as traditional books.

When thinking of an e-book, at first it seems simple to tell what makes it what it is: Just a regular book or text in a digital format, which can be read on any electronic device with a screen. Nevertheless, there are two very important characteristics that have to be fulfilled in order to be a real e-book:

Editability: An e-book should not be editable. If you think

of an actual paperback book, it is the same thing. You cannot just take one and change any content, the format, the layout or the sequence of the chapters. Exactly the same is valid for an e-book. Furthermore, this would possibly be against the author's permission and due to this fact not legal. To ensure that an e-book cannot be edited, some especially suitable formats were introduced (Weber and Cavanaugh, 2006; Gibson and Gibb, 2011; Anton *et al*., 2013).

Flowability: Another important property in order to qualify as an e-book is to be reflowable. This means that the text always adjusts perfectly to the screen you are reading on, no matter which size it has. The flowability includes the general format of the text, the line breaks and the chapters and also the size and position of images, all proportions have to be proper at every time (MacFadyen, 2011; Lee, 2012).

2.1 Previous studies

The empirical studies presented in the following paragraphs, evolve around the acceptance of e-books and are conducted in various different countries. The presentation of each study includes the research objectives, the main theories that were used by the researchers, the location and time period of the research, the numerous variables (factors) that were used, the methodology that was followed, as well as the main empirical results. More specifically, we reviewed studies that have similar characteristics with the present study. The results of these previous studies reveal different opinions about the acceptance of e-books.

Chu (2003) analytically researched the viewpoints of e-book readers. A questionnaire survey was distributed among 27 students at a library and information science school in the USA, to find out what users and potential users think about e-book in a transition period, when the US economy has experienced downtime, and the e-book world failed to see profitability, as predicted. Among the 27 survey participants, a third of them have used e-books in the past, mostly reading computer-based e-books, without special readers. Those who have never used e-books mainly think that e-books are "hard to read and browse" or "need special equipment". However, about half of the non-users of e-books plan to examine some e-book titles in the future.

Carreiro (2010) examined how new technologies are changing the face of the publishing industry. This paper explored the topic of electronic books (e-books) and the impact that these devices and other new technologies has on the publishing industry. Modern society often claims that the publishing industry is dying and that the innovation of the e-book will eventually sentence the printed book to death. But this study showed that such is not the case.

The empirical study of Richardson and Mahmood (2012) examined user satisfaction from e-books. Their study was based on a survey of 81 information studies graduate students, who responded about their ownership of specific e-readers, their likes and dislikes, as well as perceived problems. Additionally, respondents were asked to volunteer for an ethnographic journaling study, which allowed eight book readers to use one of the five available eBook readers for a weekend, or longer. The authors found that the Kindle is the most popular, but regardless of reader, the respondents disliked the poor navigation and inability to add titles in their collection. In addition, the respondents liked the portability of the readers, as well as the ability to have multiple books on one single reader. However, they also identified a major issue, notably, the licensing of titles versus outright ownership.

In 2012, Tsai studied the acceptance of e-books, using the variables: ease of use, perceived utility, brand / service confidence, attitude and actual intention to use. The questionnaire was based on the TAM and consisted of several modules. Four-item Likert scales were used. Initially, test questionnaires were distributed (80) and then, after a reliability analysis, the final questionnaires were also collected. Using random sampling techniques, emails were sent to book readers. 298 questionnaires were, finally, collected, while only 213 were valid.

The KMO and Bartlett's test, variance analysis and three different models were tested. The results showed that consumer attitudes are positively influenced by trust and usefulness, and there is no significant relationship between ease of use and attitude. Last but not least, the researchers believe that their study will motivate businesses into targeting existing consumers and improving their websites and security (Tsai, 2012).

Particularly interesting is the research of Camarero *et al.* (2013), as it approaches acceptance by introducing the concepts of morality, piracy and pricing, for which little research has been done in the past. Their research model drew data from the TAM, the theory of self-efficacy, and the general theory of marketing ethics, using a variety of factors (variables) from these theories. Finally, the factors were divided into three distinct categories: technological factors, reader characteristics and moral factors. The final questionnaire, distributed to a sample of 227 users of e-readers and tablets in Spain, contained questions that combined the Likert scale, the equilateral scale, and Nominated/ Mutually Excluded Questions. The results were analyzed using the SEM technique and revealed that there is a negative correlation between price acceptance and piracy, namely that the less money one is willing to spend, the more likely it is to turn to the illegal downloading.

Letchumanan and Muniandy (2013) investigated the impact of TAM's elements on user attitude towards e-books, but also examined the relationship between the factors of TAM. Quantitative research was conducted on 119 undergraduate students at the University of Malaysia. The questionnaire focused on the relationship between the following variables: perceived utility, ease of use, attitude, and intention to use. Initially, a pilot study was conducted, in order to avoid any ambiguity, and then the students completed the questionnaires. They returned 119 valid questionnaires, out of the 300 that were shared. A reliability analysis and a least square regression analysis were performed. The results showed that perceived utility has a positive effect on ease of use, ease of use and perceived utility have a positive effect on attitude and utility does not affect intention to use. The authors suggested that seminars should be held by e-books providers to familiarize non-users with e-books.

In order to fully understand the factors influencing the acceptance of e-books, Gerlach and Buxmann (2013) explored the factors that determine the acceptance of e-books at the individual level. Their research was based on the TAM and DIT models. "Perceived ease of use",

"perceived utility", "behavioral intention", "value", "previous experience", and "preferred mode of reading" were studied. The two authors conducted their research at several public locations in a central European city and provided the sample with an electronic reader, so they can get acquainted with the device. Then, they distributed 180 questionnaires with questions about the experience of the users. The data were tested for their validity with various measures (e.g., Cronbach Alpha, etc.). The most interesting conclusions were the confirmation of the positive relationship between the compatibility of the preferred mode of reading and the perceived usefulness and the rejection of the hypothesis that past technological experiences can push readers to prefer e-books. The contribution of this research lies in linking the acceptance of a cultural asset with the acceptance of a technology (Gerlach and Buxmann, 2013).

Another empirical survey conducted by the two same researchers (Gerlach and Buxmann, 2011), revealed that there is a close correlation between the tactile features of books as objects, but also as a means of an overall reading experience (weight, size, page break, etc.) and perceived dissatisfaction with the e-books. In particular, Gerlach and Buxmann (2011) examined "perceived dissatisfaction" as a variable of acceptance of e-books and divided conceptual constructions into two sub-categories: (a) tactile factors and (b) disagreement factors. They conducted a qualitative research at a German bookstore and conducted 30 open interviews. It was noticed that experienced book readers are most likely to feel uncomfortable using e-books, because of cognitive dissonance between old habits and new experiences, and therefore reject them. The researchers consider that the results of their research can be used to better understand resistance to innovation when touch-characteristics play an important role (Gerlach and Buxmann, 2011).

In 2014, Jin used an enriched TAM, together with DIT, TPB and TRA, for his own research on accepting e-books. The peculiarity of the proposed model lies in the separation of internal and external factors. Specifically, these variables were: compatibility, relative advantage, self-efficacy, subjective standards (external), perceived utility, perceived ease of use, e-book satisfaction and intent to continue using e-book (Jin, 2014).

The sample of the research consisted of undergraduate economics and management students of two South Korean universities. At the beginning of the semester, they had been distributed e-readers for their learning needs. Data collection was conducted at the end of the semester, using the questionnaire method. 1030 of these were collected and analytically tested for their reliability and validity. Subsequently, the case study was followed. The empirical results confirmed TAM's key role in e-book acceptance research, as well as that external variables (apart from the relative advantage) positively affect PEOU and PU. The findings, according to Jin (2014), will assist in enhancing and designing marketing strategies, by providing more complete products, as well as consolidating e-books on the market (Jin, 2014).

Park *et al.* (2015) reviewed reader's experiences during an e-book reading and the complications that they may have in accepting them. In particular, based on a highly complex model, they analysed the components of TAM and tested the relationship between the various TAM factors, while they also examined their relationship with other variables, such as the "locus of control" and "ease of reading the text". Initial qualitative and quantitative research was carried out in 219 university students, with an average age of 22,8 years. At the beginning, the participants were familiarised with reading devices and were asked questions about their past experiences on reading e-books. In the second part of the survey, questionnaires were distributed. In total, questionnaires consisted of 9 factors, measured on a 7-point Likert scale. The results verified the proposed model, and revealed that "portability" and "viewing experience" positively affect "ease of use". These empirical results are important, according to the researchers, for the development of marketing strategies and, in particular, for the promotion by e-book readers.

In conclusion, the results of these previous empirical studies reveal different opinions and findings about the acceptance of e-book. Therefore, since research consensus has not yet been reached, conducting a study that empirically examines e-book acceptance seems quite interesting.

3. The proposed conceptual framework

3.1 Development of the conceptual framework

The main objective of this paper is the development of a conceptual framework which investigates the factors that affect the acceptance of e-books by the readers and their behaviour towards them.

The extensive review of the contemporary international literature that was conducted prior to the empirical research, revealed that numerous factors have been used in order to predict the acceptance of e-books. The present study adopted nine of these factors.

3.2 Factor Definition

The factors used in the present study come from an extended literature review. Through the study of previous researches, a conceptual framework (research model) that consists of 9 factors was developed. These nine factors are (Ajzen and Fishbein, 1977; Ajzen, 1991; Camarero *et al.*, 2013; Davis, 1986; Davis, 1989; Fishbein and Ajzen, 1975; Gerlach and Buxmann, 2013; Mangin *et al.*, 2013; Tsai, 2012; Venkatesh and Davis, 2000):

Perceived Usefulness: The perceived usefulness is "the degree to which a person believes that using a particular electronic reading device will enhance the effectiveness of reading".

Perceived Ease of Use: The perceived ease of use is "the degree to which a person believes that using a new electronic reading technology is free from effort".

Trust: The perception of a user regarding the safety and validity of electronic transaction procedures.

Perceived Dissatisfaction: The frustration an individual may experience while using new technologies.

Compatibility with the Preferred way of reading: The degree to which the usage of new electronic reading technologies fits the personal preferences of a user.

Compatibility with past Experiences: The degree that indicates how familiar a user is with new e-reading technologies.

Price: The perception of an individual regarding the value of an electronic reading device compared to the fee

he has to pay for its purchase.
Attitude towards use: The positive or negative feelings or evaluations generated when an individual uses new information technologies.
Behavioural Intention: The degree of a person's willingness to use electronic reading technologies in the future.

3.3 Hypotheses

The objective of the Technology Acceptance Model (TAM), which was formulated by Davis (1986), is to explain and predict user acceptance of technology innovations or Information Systems (Montano and Kasprzyk, 2008; Masrom, 2007). According to Davis (1986), perceived usefulness (PU) and perceived ease of use (PEOU) are the two main predictors of technology acceptance. PU is the belief that the usage of a particular technological innovation can enhance the users' job efficiency and performance; whereas PEOU captures the belief that users make less effort in order to use that technological product. Besides these two constructs, TAM also consists of factors such as attitude towards use, intention to use (ITU), actual use and other related external variables (Davis, 1986; Venkatesh and Davis, 2000). Perceived usefulness is often positively affected by perceived ease of use. If a technology is easy to use, the user can spend more cognitive effort on the actual task, increasing his or her net gains (Gerlach and Buxmann, 2013). Even if a technology is perceived as useful, it will only be used if it is perceived as easy to use, that is, benefits of usage outweigh the effort of using the system (Bradley, 2009). The perceived usefulness is based on the observation that "people tend to use or not use the application to the extent they believe it will help them perform their job better" (Fishbein and Ajzen, 1975; Davis, 1989). Based upon previous research, the following hypotheses are proposed:

H1: *Perceived Ease of Use has a substantial positive impact on Perceived Usefulness.*
H2: *Perceived Ease of Use has a substantial positive impact on Attitude Towards Use.*
H3: *Perceived Usefulness has a substantial positive impact on Attitude Towards Use.*

Agarwal and Prasad (1999) found a positive relationship between an individual's prior compatible experiences and the acceptance of the new technology. If an individual is accustomed to reading from screens, he or she might be less sceptical toward reading e-books (Gerlach and Buxmann, 2013). In case a user feels frustration using an electronic reading device, it is less possible for him or her to adopt it as the preferred way of reading. A reader's desires regarding his or her preferred reading style are essential to the decision whether to use electronic reading technology or not. If a reader thinks that using e-book technology will fit his or her personal preferences, he or she will be more likely to adopt that technology (Gerlach and Buxmann, 2013). Thus, the following hypotheses are being proposed:

H4: *Perceived Dissatisfaction has a substantial negative impact on Attitude Towards Use.*
H5: *Compatibility with the preferred way of reading has a substantial negative impact on Perceived Dissatisfaction.*
H6: *Compatibility with the preferred way of reading has a substantial positive impact on Attitude Towards Use.*
H7: *Compatibility with past Experiences has a substantial positive impact on Perceived Dissatisfaction.*

Based on the trust model suggested by Mayer *et al.* (1995), perceived trust is an essential component, especially when uncertainty is "present". Trust refers to the perception of the users regarding the overall safety of electronic transaction procedures. If an individual believes that transaction systems for e-books are safe, he or she will be more likely to adopt them. The basic assumption is that perceived trust will have a positive effect on an individual's intentions to engage in using e-books. In a consumer context, price is also an important factor, as consumers have to bear the financial costs associated with the purchase of devices and services. The price value is positive when the benefits of using a technology are perceived to be greater than the monetary cost. Such a price value has a positive impact on intention (Liao *et al.*, 2008; Venkatesh *et al.*, 2012; Mangin *et al.*, 2013). Thus, the following hypotheses are proposed:

H8: *Trust has a substantial positive impact on Attitude Towards Use.*
H9: *Price has a substantial positive impact on Perceived Usefulness.*
H10: *Price has a substantial positive impact on Behavioural Intention.*

Previous studies of the technology acceptance domain have discovered a relationship between the attitude towards using a system and the actual intention to use it (e.g., Davis, 1989; Ajzen and Fishbein, 1977; Ajzen, 1991). Davis (1989) hypothesized that the attitude of a user toward a system was a significant determinant of whether the user will actually use or reject the system. Thus, it is hypothesised:

H11: *Attitude Towards Use has a substantial positive impact on Behavioural Intention.*

The synthesis of the hypotheses presented above constitutes the proposed conceptual framework (research model) of the present empirical study (Figure 1). It should be underlined that, according to the best of the researcher's knowledge, such a conceptual framework (combination of research factors) has never been previously examined in the international literature.

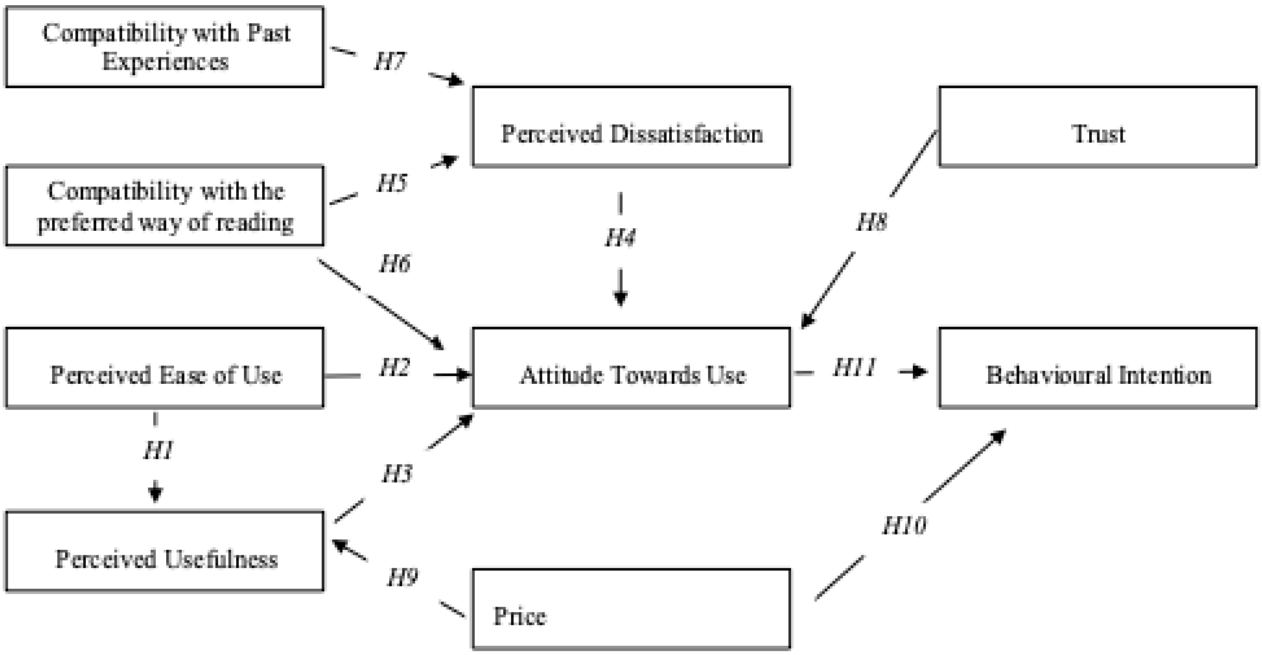


Figure 1. The proposed conceptual framework of the study

4. Methodology

4.1 Methodological approach

In order to sufficiently answer the main research questions of this study, a systematic review of the existing literature was conducted. As a result, the proposed conceptual framework of the study was developed. Then, the conceptual framework was tested (hypothesis testing) using primary data, collected from three different countries (Greece, Austria, France).

The present study is empirical (primary data collection), explanatory (examines cause-and-effect relationships between nine research factors), deductive (tests research hypotheses) and quantitative (analyses quantitative data collected with the use of a structured questionnaire).

4.2 Measurement

A newly developed questionnaire was used for the examination of the proposed framework. The questionnaire was based on items that have been used by various previous researchers. The five-point Likert scale was used for the measurement of all research factors (1 = strongly disagree, 5 = strongly agree).

The questions were translated to Greek, German and French. In total, the questionnaire measures 9 factors using 33 items. Besides the measurement of the factors, the questionnaire contained one more section, which included demographic information about the respondent. The questionnaire items were reviewed and (slightly) modified by two academics, who are considered as experts in this field.

The following Table (Table 1) demonstrates the nine (9) factors measured in the research, the items used for their measurement and the studies from which they were adapted.

Table 1. Factor measurement.

Factors	Number of Items	Adapted from:
A. Perceived Usefulness	5	Gerlach and Buxmann (2013)
B. Perceived Ease of Use	4	Gerlach and Buxmann (2013)
C. Perceived Trust	3	Tsai (2012)
D. Perceived Dissatisfaction	4	Gerlach and Buxmann (2013)
E. Compatibility with the preferred way of reading	3	Gerlach and Buxmann (2013)
F. Compatibility with past experiences	3	Gerlach and Buxmann (2013)
G. Price	4	Mangin *et al.* (2013)
H. Attitude towards use	3	Tsai (2012)
I. Behavioral Intention	4	Gerlach and Buxmann (2013)

Table 2. Validity and reliability.

Factors	Kaiser-Mayer-Olkin	% of Variance	Cronbach Alpha	Normed X^2	C.R.	V.E.	RMSEA	CFI / GFI
	Explanatory Factor Analysis			Confirmatory Factor Analysis				
A. Perceived Usefulness	0,814	73,451	0,845	2,19	0,79	64,4%	0,045	0,97 / 0,91

B. Perceived Ease of Use	0,790	65,544	0,844	2,51	0,79	75,3%	0,064	0,97 / 0,91
C. Perceived Trust	0,811	66,411	0,842	3,11	0,86	78,2%	0,066	0,97 / 0,91
D. Perceived Dissatisfaction	0,891	77,910	0,856	3,13	0,89	74,6%	0,078	0,97 / 0,91
E. Compatibility with the preferred way of reading	0,791	73,271	0,762	3,45	0,81	77,8%	0,072	0,97 / 0,91
F. Compatibility with past experiences	0,850	65,156	0,891	2,49	0,81	75,4%	0,036	0,97 / 0,91
G. Price	0,845	71,850	0,756	3,77	0,79	71,3%	0,055	0,97 / 0,91
H. Attitude towards use	0,781	69,780	0,775	3,41	0,84	66,2%	0,074	0,97 / 0,91
I. Behavioral Intention	0,812	75,502	0,814	3,33	0,80	66,5%	0,071	0,97 / 0,91

4.3 Sample and data collection

The population of this study consists of citizens of three European countries, namely France, Austria and Greece. Citizens who cannot read, people that are digitally illiterate and finally those who are not familiar with the subject of this research were excluded from the final sample. Therefore, the sample of this study consists of citizens who read books and are conversant with technology (Daniel, 2012).

The questionnaire was uploaded online, via Google Forms, and was promoted to French, Austrian and Greek book blogs and other social media platforms, that were randomly selected (Fielding *et al.*, 2017). This procedure took place over the course of 4 weeks (February 2019) and resulted in the collection of 120, 154 and 167 questionnaires from each country, respectively.

4.4 Validity and reliability

During the validity test, each of the nine factors was evaluated (a) for its unidimensionality and reliability, (b) for its goodness of fit to the proposed model (see Table 2).

(a) The examination of the unidimensionality was conducted with the use of Explanatory Factor Analysis. The following measures were examined (Fabrigar and Wegener, 2011): (a1) 'Bartlett's test of Sphericity', (a2) the statistical test of 'Kaiser-Mayer-Olkin' (KMO), (a3) the criterion of 'eigenvalue', (a4) the factor loadings, (a5) the statistical measure 'Cronbach Alpha' (for estimating the reliability of every factor).

(b) Moreover, the evaluation of the goodness of fit of all factors was conducted with the use of Confirmatory Factor Analysis. More specifically, the following measures were examined (Brown, 2014): (b1) Normed X^2, (b2) Composite Reliability (C.R.), (b3) Average Variance Extracted (A.V.E.), (b4) RMSEA (Root Mean Square Error of Approximation), (b5) CFI (Comparative Fit Index), (b6) GFI (Goodness of Fit Index).

All appropriate tests (presented in Table 2) concluded that the scales that were used for the measurement of all the research factors of this study are valid and reliable.

5. Empirical results

5.1 Demographics

The first section of the questionnaire contained questions asking the demographic characteristics of the individuals who participated in the research. The citizenship of those individuals was determined by the number of questionnaires collected by each participating team. In total, 441 questionnaires were collected, 27,2% of which were submitted by French citizens, while the rest were almost equally filled out by Austrian and Greek citizens (34,9% and 37,9% respectively) (Table 3).

The age group that appears more often in the questionnaires is 18-25 (42%), while an adequate percentage comes from people who are over 56 years old (7,3%), as Table 4 demonstrates.

5.2 Mean scores

The mean score of seven (7) out of the 9 (nine) factors was over the value of 3,0 (on a five point Likert- scale). There are only two factors with a mean score below 3,0 ("compatibility with the preferred way of reading", "compatibility with past experiences"). This means that the sample tends to disagree on the items which measure these factors (Table 5) (the items are presented in the Appendix of this study).

5.3 Comparison of means

The comparison of means can lead to the establishment of relationships between the demographic data and the factors that affect the acceptance of electronic books by the readers. First, the analysis of variance (ANOVA) tested the relationship between the factors and the citizenship of the participants. Table 6 shows the factors with the biggest differences between the three countries.

Table 3. Participating countries.

	Frequency	Percent	Valid Percent	Cumulative Percent
France	120	27,2%	27,2%	27,2%
Austria	154	34,9%	34,9%	62,1%
Greece	167	37,9%	37,9%	100,0%
Total	441	100,0%	100,0%	

Table 4. Age groups.

	Frequency	Percent	Valid Percent	Cumulative Percent
18-25	185	42,0	42,0	42,0
26-35	82	18,6	18,6	60,5
36-45	77	17,5	17,5	78,0
46-55	65	14,7	14,7	92,7
56+	32	7,3	7,3	100,0
Total	441	100,0	100,0	

Table 5. Mean scores – Factors.

	Mean	Std. Deviation
A. Perceived Usefulness	3,2810	0,99984
B. Perceived Ease of Use	3,8107	0,94200
C. Perceived Trust	3,3873	0,87642
D. Perceived Dissatisfaction	3,4121	0,99868
E. Compatibility with the preferred way of reading	2,7831	1,07834
F. Compatibility with past experiences	2,9986	1,05112
G. Price	3,5298	0,79666
H. Attitude towards use	3,2300	1,04145
I. Behavioral Intention	3,1723	1,10990

Table 6. Comparison of means (Research factors).

		N	Mean	Std. Deviation	p
A. Perceived Usefulness	France	120	3,0992	1,09746	0,002
	Austria	154	3,5000	0,99048	
	Greece	167	3,2096	0,89921	
	Total	441	3,2810	0,99984	
F. Compatibility with past experiences	France	120	3,2803	1,11565	0,000
	Austria	154	2,6129	1,09178	
	Greece	167	3,1519	0,84768	
	Total	441	2,9986	1,05112	
H. Attitude towards use	France	120	3,1735	1,12764	0,028
	Austria	154	3,4068	1,08708	
	Greece	167	3,1076	0,90981	
	Total	441	3,2300	1,04145	
I. Behavioural Intention	France	120	3,0292	1,22953	0,001
	Austria	154	3,4416	1,17253	
	Greece	167	3,0269	0,90056	
	Total	441	3,1723	1,10990	

Table 7. Comparison of means (Age groups).

		N	Mean	Std. Deviation	p
B. Perceived Ease of Use	18-25	185	4,0581	0,81281	0,002
	26-35	82	4,0152	0,82901	
	36-45	77	3,8669	0,71817	
	46-55	65	3,3500	0,88034	
	56+	32	2,6563	1,30716	
	Total	441	3,8107	0,94200	
D. Perceived Dissatisfaction	18-25	185	3,3608	0,95350	0,001
	26-35	82	3,2683	0,97956	
	36-45	77	3,3571	1,03032	
	46-55	65	3,4654	0,91949	
	56+	32	4,1016	1,15329	
	Total	441	3,4121	0,99868	
E. Compatibility with the preferred way of reading	18-25	185	2,8741	0,99889	0,00
	26-35	82	3,0160	1,11729	
	36-45	77	2,7836	1,14203	
	46-55	65	2,5948	0,90848	
	56+	32	2,0409	1,25829	
	Total	441	2,7831	1,07834	

G. Price	18-25	185	3,6063	0,79077	0,001
	26-35	82	3,6829	0,82031	
	36-45	77	3,5649	0,68394	
	46-55	65	3,2731	0,70118	
	56+	32	3,1328	0,98780	
	Total	441	3,5298	0,79666	

As seen above (Table 6), people from Austria tend to believe that e-books are useful, while they seem to be familiar with electronic reading devices, unlike the citizens of the other two countries. In addition, the Austrians are more likely to read e-books in the future.
The age group, in which a person belongs, has a substantial impact on Perceived Ease of Use. Young people think that reading e-books is easy. The older someone gets, the harder he finds the use of an electronic device. This attitude towards electronic books has to do partly with their perception regarding books in general. Having been used to paperback, older people feel awkward using an e-book.
Finally, all the age groups believe that the price of e-books is acceptable and the value of an e-book responds to the fee they have to pay.

5.4 Hypotheses testing

The examination of the proposed conceptual framework (test of eleven research hypotheses) was conducted using the Structural Equation Modelling technique (SEM). More specifically, the Maximum Likelihood Estimation method was employed. Also, the Covariance Matrix was used as the table of entry and the "Standardized Completely Solution" was requested (Hair *et al.*, 1995; Kelloway, 1998).
In more detail, the (modified) structural model fitted the data well, while the factors that were included can explain 69% of the variance of the main dependent factor "behavioural intention" and 72% of the dependent factor "attitude towards use". It must be stressed that new paths were added to the model, based on modification indexes of IBM AMOS 23. This resulted in a structural model with improved fit and explanatory (predictive) power.
More analytically, to evaluate the fit of the overall model the chi-square value (X^2 = 81,012 with 19 degrees of freedom) and the p-value (p = 0,000) were estimated. These values indicate a good fit of the data to the overall model. However, the sensitivity of the X^2 statistic to the sample size forces towards the adoption of other supplementary measures for evaluating the overall model (Harrison and Rainer, 1996), such as the "Normed-X2" index (4,26), the RSMEA index (0,086), the RMR index (0,054), the CFI (0,972), the GFI (0,960) and the NFI (0,963), that all indicate a very good fit.
Figure 2 demonstrates the final structural model (research model) (after all the necessary modifications), along with the path coefficients (r) and the adjusted R^2 scores. Table 8 shows the overall findings concerning the original hypotheses and the new proposed causal relationships.
In synopsis, results offer support to nine research hypotheses (H1, H3, H4, H5, H6, H7, H8, H9, H11), whilst two hypotheses are not verified by the empirical data (H2, H10). Moreover, eight new causal paths were added to the initially proposed conceptual framework.

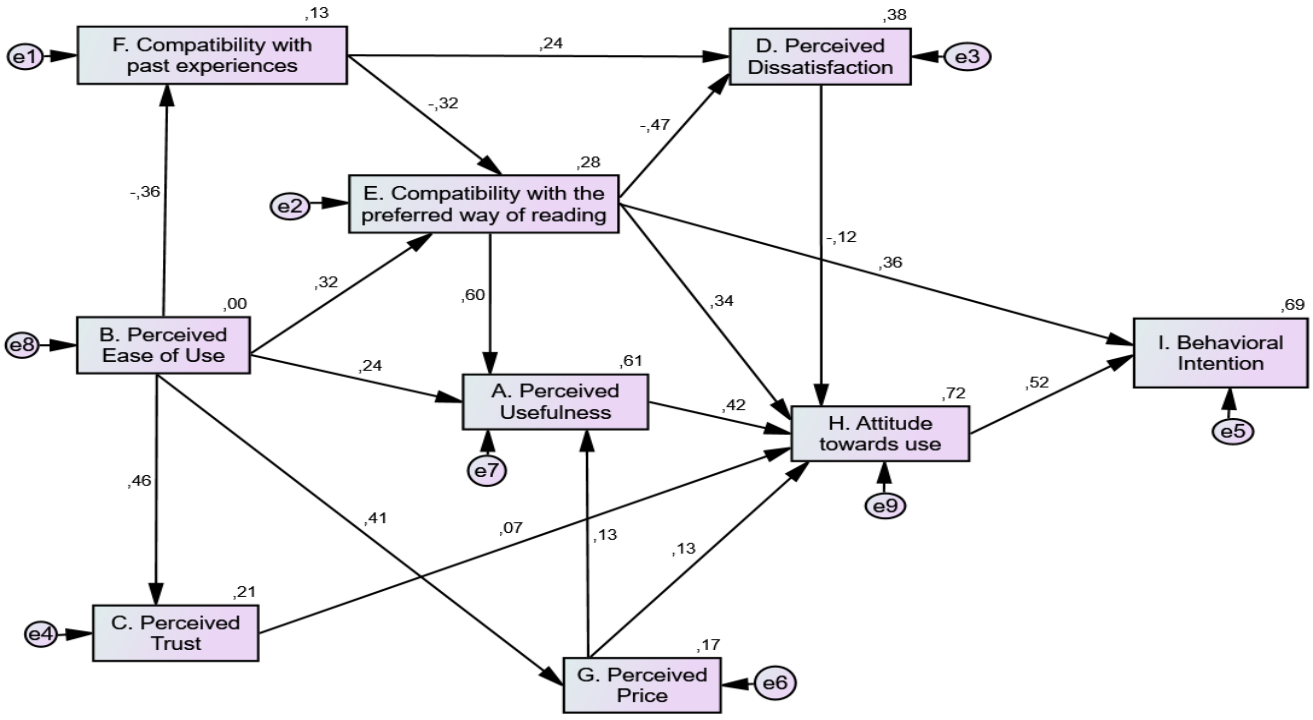


Figure 2. The (modified) conceptual framework *(all paths are statistically significant)*

Table 8. Hypotheses testing results.

Hypothesis	Path	Path coefficient	Remarks
H1	Perceived Ease of Use → Perceived Usefulness	0,23*	Accepted
H2	Perceived Ease of Use → Attitude Towards Use	-	*Rejected*
H3	Perceived Usefulness → Attitude Towards Use	0,42*	Accepted
H4	Perceived Dissatisfaction → Attitude Towards Use	-0,11*	Accepted
H5	Compatibility with the preferred way of reading → Perceived Dissatisfaction	-0,47*	Accepted
H6	Compatibility with the preferred way of reading → Attitude Towards Use	0,34*	Accepted
H7	Compatibility with Past Experiences → Perceived Dissatisfaction	0,24*	Accepted
H8	Trust → Attitude Towards Use	0,72*	Accepted
H9	Price → Perceived Usefulness	0,13*	Accepted
H10	Price → Behavioural Intention	-	*Rejected*
H11	Attitude Towards Use → Behavioral Intention	0,52*	Accepted
	Proposed causal relationships		
	Perceived Ease of Use → Compatibility with Past Experiences	-0,36*	*New path*
	Perceived Ease of Use → Compatibility with the preferred way of reading	0,31*	*New path*
	Perceived Ease of Use → Price	0,41*	*New path*
	Perceived Ease of Use → Trust	0,46*	*New path*
	Compatibility with Past Experiences → Compatibility with the preferred way of reading	-0,32*	*New path*
	Compatibility with the preferred way of reading → Perceived Usefulness	0,59*	*New path*
	Compatibility with the preferred way of reading → Behavioral Intention	0,36*	*New path*
	Price → Attitude Towards Use	0,13*	*New path*

** $p < 0,01$*

In more detail, the two factors that have a significant impact to "behavioral intention", are "attitude towards use" (r=0,52) and the "compatibility with the preferred way of reading" (r=0,36). The factor "compatibility with the preferred way of reading", examines whether the reading style of readers matches with e-books, while the factor "attitude towards use" examines whether each reader has a positive or negative attitude towards the use of e-books. The factor "compatibility with the preferred way of reading" seems to be a particularly significant factor (r=0,36), because it directly affects "behavioral intention", while at the same time receiving a positive influence from the factor "perceived ease of use" (r=0,32) and a negative influence from the factor "compatibility with past experiences" (r=-0,32). Respectively, the influence of "attitude towards use" is equally important, because it greatly affects the main dependent factor of this study, namely "behavioral intention" (r=0,52). This is the case because "attitude towards use" receives significant influences from other five factors: "perceived dissatisfaction" (r=0,38), "compatibility with the preferred way of reading" (r=0,34), "perceived trust" (r=0,41), "perceived usefulness" (r=0,42), "perceived price" (r=0,17).

In the initial set of research hypotheses, the factors "ease of use" and "perceived price" were hypothesised to directly affect "behavioral intention". Nevertheless, the two corresponding hypotheses were rejected by the empirical data. Despite that, "ease of use" is highlighted as a significant factor of the conceptual framework, because it significantly affects five other factors: "compatibility with past experiences" (r=-0,36), "compatibility with the preferred way of reading" (r=0,32), "perceived price" (r=0,42), "perceived usefulness" (r=0,24) and "perceived trust" (r=0,46). On the other hand, such results were not found for the factor "perceived price". Although "perceived price" has an indirect impact on "behavioral intention" (through the factor "attitude towards use"), this impact is not considerable (it is quite week).

6. Conclusions

The present study was motivated by gaps that were recognised in the relevant literature of the field. In order to cover these research gaps, we conducted an extensive literature review and we developed an original conceptual framework (research model) that investigated the antecedents of e-book adoption. This conceptual framework has never been used before in the international literature. Additionally, this framework was tested with the use of a newly-developed structured questionnaire (collection of quantitative data) on a

sample of Greek, French and Austrian book readers. Future empirical studies can adopt the same methodological approach, further highlighting the relationship between critical factors for e-book adoption.

E-books are a special, complex and extremely interesting field of research for academics, entrepreneurs, but also for every booklover in general. This empirical study tried to highlight the barely mapped world of e-books on a European level. While the acceptance models that were used in the past have yielded interesting results, this paper added some additional elements (factors), thus extending the current stream of research.

The main objective of the present study was to investigate the factors that affect the acceptance of e-books by the readers. In particular, the empirical data were collected from three countries, namely France, Austria and Greece. The results indicate that Austrian citizens are more familiar with electronic reading devices. In addition, they seem more positive towards the use of electronic books, compared to French and Greek readers. Thus, it is more likely that Austrians will read more e-books in the future. Regarding the acceptance of electronic books among the different age groups of the sample, it is observed that there is a remarkable (statistically significant) difference between younger and older people. Young people seem to believe that electronic books are easy to use, while older people encounter difficulties while using e-books. In summary, young people are positive towards using e-books. On the contrary, reading from electronic reading devices does not match with the way older people prefer reading books.

The examination of the conceptual framework (research model) of this study assisted in answering its main research question (which factors are important for the acceptance of e-books). Empirical results revealed that the factors that have the most significant impact on e-book acceptance, both directly and/or indirectly, are three: "compatibility with the preferred way of reading", "ease of use" and "attitude towards use".

Therefore, these findings can be used by publishing houses, e-reader manufacturers and software developers, in order to introduce products and adopt policies that will enhance their ability to better reach their target audiences. In more detail, the results of this study suggest that additional research should be conducted on how readers prefer to read (thus understanding the compatibility with their preferred way of reading). In that direction, companies should collect more primary data, using questionnaires in universities, libraries and other alternative research settings. In that way, they will be able to make e-books more "friendly" to their readers.

Another proposal is to offer e-books in different file types. Although PDF is the most common e-book file type, companies should offer files in multiple different file types, so customers can choose the format they actually prefer (thus enhancing their ease of use). In order to make readers more familiar with the use of e-books, companies could also provide free e-books to schools, universities, libraries, etc. In that way, the opportunity will be given to young children and seniors to get in line with the digital era and experience e-books.

Moreover, in order to enhance the reader's positive attitude towards e-books, publishing houses, e-reader manufacturers and software developers should design targeted marketing campaigns and advertisements for e-books, highlighting their ecological nature. In that way, more citizens will be able to fully understand that reading an e-book helps the preservation of nature. After all, the use of an electronic book is not just a technological achievement, but also a sign that an individual respects the environment. Another way a company can use in order to introduce e-books to the consumers is by conducting webinars. These can help people understand how to use e-books and what value they can offer them.

References

Agarwal, R., & Prasad, J. (1999), "Are individual differences germane to the acceptance of new information technologies?", *Decision sciences*, **30** (2), pp. 361-391.

Ajzen, I. (1991), "The Theory of Planned Behavior", *Organizational Behavior and Human Decision Processes*, **50** (2), pp. 179-211.

Anton, C., Camarero, C., & Rodriguez, J. (2013), "Usefulness, Enjoyment, and Self-Image Congruence: The Adoption of e-Book Readers", *Psychology and Marketing*, **30** (4), pp. 372-384.

Armstrong, C. (2008), "Books in a virtual world: The evolution of the e-book and its lexicon", *Journal of Librarianship and Information Science*, **40** (3), pp. 193-206.

Borchert, M., Hunter, A., Macdonald, D. and Tittel, C. (2009), "A study on student and staff awareness, acceptance and usage of e-books at two Queensland universities", *14th ALIA Information Online Conference & Exhibition*, 20-22 January, Darling Harbour Exhibition and Convention Centre, Sydney.

Brown, T. A. (2014), *Confirmatory factor analysis for applied research*, New York, Guilford Publications.

Camarero, C., Antón C. & Rodriguez, J. (2013), "Technological and ethical antecedents of e- book piracy and price acceptance Evidence from the Spanish case", *The Electronic Library*, **32** (4), pp. 542-566.

Carreiro, E. (2010), "Electronic books: how digital devices and supplementary new technologies are changing the face of the publishing industry", *Publishing Research Quarterly*, **26** (4), pp. 219-235.

Chang, C. C., Yan, C. F., & Tseng, J. S. (2012), "Perceived convenience in an extended technology acceptance model: Mobile technology and English learning for college students", *Australasian Journal of Educational Technology*, **28** (5), pp. 809-826.

Chartier, R. (2004), "Languages, books, and reading from the printed word to the digital text", *Critical Inquiry*, **31** (1), pp. 133-152.

Chu, H. (2003), "Electronic books: viewpoints from users and potential users". *Library Hi Tech*, **21** (3), pp. 340-346.

Daniel, J. (2012), *Sampling Essentials: Practical Guidelines for Making Sampling Choices*, Thousand Oaks, SAGE.

Davis, F. D. (1989), "Perceived Usefulness, Perceived

Ease of Use, and User Acceptance of Information Technology", *MIS Quarterly*, **13** (3), pp. 319-340.

Fabrigar, L. R., & Wegener, D. T. (2011), *Exploratory Factor Analysis (Understanding Statistics)*, New York, Oxford University Press.

Fielding, N. G, Lee, R. M., & Blank, G. (2017), *The SAGE Handbook of Online Research Methods*, Thousand Oaks, SAGE.

Fishbein, M. A., & Ajzen, I. (1975), *Belief, attitude, intention and behaviour: An introduction to theory and research*, Reading, Addison-Wesley.

Fishbein, M., & Ajzen, I. (1975), *Belief, attitude, intention, and behavior: an introduction to theory and research*, Reading, Mass, Addison-Wesley Publishing Company.

Gerlach, J., & Buxmann P. (2011), "Investigating the Acceptance of Electronic Books - The Impact of Haptic Dissonance on Innovation Adoption", *ECIS 2011 Proceedings*, 9-11 June, Helsinki, Finland.

Gerlach, J., & Buxmann P. (2013), "Analyzing Electronic Book Acceptance: A Compatibility Perspective", *46th Hawaii International Conference on System Sciences*, 7-10 January, pp. 2813-2822, Institute of Electrical and Electronics Engineers, Hawaii, USA.

Gibson, C., & Gibb, F. (2011), "An evaluation of second-generation ebook readers". *The Electronic Library*, **29** (3), pp. 303-319.

Hair J., Anderson R., & Tatham R. (1995), *Multivariate data analysis with readings*, USA, Macmillan Publishing Company.

Harrison, A. W., & Rainer Jr, R. K. (1996), "A general measure of user computing satisfaction", *Computers in Human Behavior*, **12** (1), pp. 79-92.

Jin, C. H. (2014), "Adoption of e-book among college students: The perspective of an integrated TAM", *Computers in Human Behavior*, **47**, pp. 471-477.

Kelloway, E. K. (1998), *Using LISREL for Structural Equation Modeling: A researcher's guide*. USA, SAGE.

Lai, J.Y., & Chang, C.Y. (2010), "User attitudes toward dedicated e-book readers for reading: The effects of convenience, compatibility and media richness", *Online Information Review*, **35** (4), pp. 558-580.

Lebert, M. (2009), *A Short History of eBooks*, Toronto, Project Gutenberg.

Lee K.H., Guttenberg, N., & McCrary, V. (2002), "Standardization aspects of eBook content formats", *Computer Standards & Interfaces*, **24** (3), pp. 227–239.

Lee, S. (2012), "An integrated adoption model for e-books in a mobile environment: Evidence from South Korea", *Telematics and Informatics*, **30** (2) pp. 165-176.

Letchumanan, M., & Muniandy, B. (2013), "Migrating to e-book: a study on perceived usefulness and ease of use", *Library Hi Tech News*, **30** (**7**), pp. 10-16.

Liao, C.H., Tsou, C.W., & Shu, Y.C. (2008), "The Roles of Perceived Enjoyment and Price Perception in Determining Acceptance of Multimedia-on-Demand", *International Journal of Business and Information*, **3** (1), pp. 27-52.

Lyytinen, K., & Damsgaard, J. (2001), "What's Wrong with the diffusion of innovation theory? The case of a complex and networked technology", *Fourth Working Conference on Diffusing Software Products and Process Innovations*, pp. 173-190.

MacFadyen, H. (2011), "The reader's devices: The affordances of e-book readers", *Dalhousie Journal of Interdisciplinary Management*, **7**, pp. 1-15.

Mangin, J., Guerrero, M. M., Bourgault, N., & Egea, J. (2013), "Exploring the Influence of Price and Convenience on Perceived Usefulness of On-line Banking within the TAM Framework: A Cross National (Canada and Spain) Decision Model", *Journal of Business Theory and Practice*, **1** (2), pp. 342-362.

Marshall, M. N. (1996), "Sampling for qualitative research", *Family Practice*, **13** (6), pp. 522-525.

Masrom, M. (2007), "Technology Acceptance Model and E-learning", *12th International Conference on Education*, 21-24 May, Sultan Hassanal Bolkiah Institute of Education, Universiti Brunei Darussalam.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995), "An integrative model of organizational trust", *Academy of Management Review*, **20** (3), pp. 709-34.

Montano, D. E., & Kasprzyk, D. (2008), "Theory of reasoned action, theory of planned behavior, and the integrated behavior model", *Health Behavior and Health Education: Theory, Research, and Practice, 4th edition*, San Francisco, CA: Jossey-Bass, pp. 67-96.

Park, E., Sung, J., & Cho, K. (2015), "Reading experiences influencing the acceptance of e- book devices", *The Electronic Library*, **33** (1) pp. 120-135.

Richardson Jr, J. V., & Mahmood, K. (2012), "eBook readers: user satisfaction and usability issues". *Library Hi Tech*, **30** (1), pp. 170-185.

Roca, J. C., Garcia, J. J., & de la Vega, J. J. (2009), "The importance of perceived trust, security and privacy in online trading systems", *Information Management & Computer Security*, **17** (2), pp. 96-113.

Rogers, E. M. (2003), *Diffusion of Innovations*, 5th Edition, The Free Press, New York.

Sheppard, B. H., Hartwick J., & Warshaw P. R. (1988), "The Theory of Reasoned Action: A Meta-Analysis of Past Research with Recommendations for Modifications and Future Research", *Journal of Consumer Research*, **15** (3), pp. 325-343.

Shin, D.H. (2011), "Understanding e-book users: Uses and gratification expectancy model", *New Media & Society*, **13** (2), pp. 260-278.

Siegel, L. (2009), "Should we switch to reading books online?", *The Observer Magazine*, 30 August.

Tellioglu, H. (2018), "A Model-Based Approach to Guide Digital Transformation", *Proceedings of the 13th International Conference on Digital Information Management (ICDIM 2018)*, September 24-26, Berlin, Germany, IEEE, pp.196-203.

Torres, R., Johnson, V., & Imhonde, B. (2014), "The impact of content type and availability on e-book reader adoption". *Journal of Computer Information Systems*, **54** (4), pp. 42-51.

Tsai, W. C. (2012), "A study of consumer behavioral intention to use e-books: The Technology Acceptance Model perspective", *Innovative Marketing*, **8** (4), pp. 55-66.

Vasileiou, M., Hartley, R., & Rowley, J. (2008), "An overview of the e-book marketplace", *Online Information Review*, **33** (1) pp. 173-192.

Venkatesh, V., & Davis, F. D. (2000), "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies", *Management Science*, **46** (2), pp. 186-204.

Venkatesh, V., Thong, J. Y., & Xu, X. (2012), "Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology", *MIS quarterly*, **36** (1), pp. 157-178.

Weber, C. L., & Cavanaugh, T. W. (2006), "Promoting Reading: Using eBooks with Gifted and Advanced Readers", *Gifted Child Today Magazine*, ***29*** (4), pp. 56-63.

APPENDIX (QUESTIONNAIRE)

Perceived Usefulness
PU1. I believe that e-books can make reading more effective.
PU2. E-books match my personal needs.
PU3. Having books in e-books form is useful.
PU4. For my personal needs, I consider the potential that e-books are useful.
PU5. For my personal needs, I consider e-books practical.

Perceived Ease of Use
PEOU1. I think that e-books are easy to use.
PEOU2. Learning to use an e-book is easy for me.
PEOU3. I do not encounter difficulties while using e-books.
PEOU4. I think that reading e-books is easy.

Perceived Trust
PT1. I believe that electronic transaction procedures and their outcome are valid.
PT2. I believe that transaction systems for e-books are safe.
PT3. I believe that my personal data are safe during and after the transaction.

Perceived Dissatisfaction
PDIS1. Having been used to paperback, it feels awkward using an e-book.
PDIS2. Not having the feel of a paperback in my hands bothers me.
PDIS3. I believe that e-books are impersonal.
PDIS4. While holding the device, I cannot see the progress I have done so far.

Compatibility with the preferred way of reading
COMPREAD1. Reading e-books match with the way I like reading books.
COMPREAD2. E-books allow me to read in the way I want.
COMPREAD3. E-books match with my chosen way of reading.

Compatibility with past experiences
COMPEXP1. E-books are a new experience for me.
COMPEXP2. Reading e-books is a new reading experience for me.
COMPEXP3. Reading e-books is awkward for me.

Perceived Price
PR1. Buying paperback via bookstores is more expensive than buying e-books via internet.
PR2. Buying e-books allows me saving money.
PR3. Buying e-books is great value.
PR4. I think that the price of e-books is acceptable.

Attitude towards use
ATT1. I like using e-books.
ATT2. Using e-books is a good idea.
ATT3. I am positive towards using e-books.

Behavioral Intention
BEHINT1. I believe that I will read e-books in the future.
BEHINT2. I am planning to read e-books in the future.
BEHINT3. I would like to read e-books.
BEHINT4. I predict that I will read e-book in the future.

IJBESAR

International Journal of Business and Economic Sciences Applied Research

Influence of Strategic Physical Resources on Performance of Small and Medium Manufacturing Enterprises in Kenya

Muturi Moses Murimi, Beatrice Ombaka and Joseph Muchiri

pp. 20-27

Volume 12, Issue 1

Eastern Macedonia & Thrace Institute Of Technology Press

International Journal of Business and Economic Sciences Applied Research

IJBESAR
ijbesar.teiemt.gr

Influence of Strategic Physical Resources on Performance of Small and Medium Manufacturing Enterprises in Kenya

Muturi Moses Murimi[1], Beatrice Ombaka[2] and Joseph Muchiri[1]

[1]Department of Business and Economics- Karatina University
[2]Department of Human Resources - Karatina University

ARTICLE INFO
Article History
Received 1st April 2019
Accepted 13th May 2019

JEL Classifications
L60; M11; M13

Keywords:
Performance; Resources; Strategy; Strategic Physical Resources; Small and Medium Manufacturing Enterprises

ABSTRACT

Purpose
This study sought to determine the influence of strategic physical resources on performance of small and medium manufacturing enterprises in Kenya. Anchored on the Resource Based View (RBV) theory the study adopted positivism research philosophy descriptive and causal-effect research designs.

Design/methodology/approach
The population for the study comprised of the management staff of the 350 small and medium manufacturing enterprises registered by the Kenya Association of Manufacturers (KAM) where a sample of 183 participants was chosen using stratified sampling method. The study tested for content validity as well as reliability using internal consistency of the questionnaire using Cronbach alpha coefficient. Data analysis was conducted using descriptive statistics and regression analysis to conclude that physical resources have a significant influence on performance of small and medium manufacturing enterprises in Kenya.

Findings
Consequently the study recommended that the management of SMEs should ensure that they invest significantly in these resources so as to maximise on the performance of these firms. However the conclusions reached in this paper were based on data collected from small and medium manufacturing enterprises in Kenya. For this reason, the results of the study suffer from generalizability since they may not be inferred on other firms other than manufacturing firms in the sector with similar characteristics.

Originality/value
The findings of this study significantly contribute to the existing pool of knowledge regarding the concept of intellectual capital and its implications on organizational performance. Scholars and other researchers would find the outcomes of this study relevant as reference material to advance in their research.

1. Introduction

Organisations rely on the resources at their disposal to produce goods and services in their quest to generate more revenue and maximise their performance. As opined by Ombaka, Machuki and Mahasi (2015), firm's resources are essential in determining a firm's success. It follows that for organisations to perform better they need more and more resources. However, as noted by Hatch and Howland (2015) resources are not an adequate condition to generate superior performance. Instead, for the resources to generate superior performance they must be strategic in the sense that they must be rare, valuable, non-substitutable and inimitable. Rareness in this sense means that the resources are scarce and only accessed by a few making them unique to the firm. This is why a resource needs to be rare if it is to give the organisation a competitive advantage. Further, Kim and Mauborgne (2014) note that resources are not valuable in themselves but they give organisations the capabilities to operate in a way that they can have sustainable and competitive business. If the organisation wants to have a competitive edge over its rivals, it has to have resources that are more than immobile and heterogeneous.

Additionally, if a resource is to be a source of a sustainable competitive advantage, the heterogeneity in it must not be a onetime thing but should continue in the long term since the resources used to create a competitive advantage are not mobile for different organisations. Barney (1991) points out that an organisation's strategic resources consist of the human,

†Corresponding Author: Muturi Moses Murimi
E: mosesm.murimi@gmail.com
DOI: 10.25103/ijbesar.121.02

physical, intellectual capital and financial resources. The organisation uses these resources to produce goods and services that are unique and that cater for the customer's needs. Physical resources include the resources that are visible such as the firm buildings, manufacturing facilities and physical assets. According to Gakenia (2014), the performance of an organisation is dependent on the effective and efficient use of the resources under the organisations disposal. It is therefore necessary for managers of SMEs in the manufacturing sector to pinpoint the resources at their disposal and use them strategically to build a competitive and sustainable business. Further, Zarutskie (2010) noted that physical resources in the likes of furniture, equipment, materials, and machines offer a vital service to production process. Further, Barney (2014) was of the view that human and physical resources are some of the most essential organisation's resources.

Porter (1986) is said to be the person behind the concept of competitive advantage (CA). According to Porter (1985) CA comes as a result of the long-time use of unique strategies that result to value. These strategies are not only unique but rare. Based on Porter's view, organisations that want to compete successfully in a dynamic business environment should come up with generic strategies and use them to achieve sustainable and profitable business (Yadav, Han & Kim, 2017). Generic strategies do not only make an organisation's operations competitive but sustainable in the long run. This advantage is achieved due to the use of the available company resources (Hatch and Howland, 2015). If these resources are used optimally they can give the firm a competitive advantage based on price or one based on differentiation leading to sustainable and efficient business. The efficiency that comes from such operations leads to minimal operational costs or allows the product to be unique in terms of better quality, higher awareness of the brand or enhanced availability (Wagner & Hollenbeck, 2014). Small businesses are often found in a saturated market where competition is intense and can be the biggest gainers of competitive advantage.

According to Koontz and Thomas (2012), an organisation is only successful if it is able to give its shareholders profits and if it can maintain this profitability in the long term. Performance in manufacturing SME's is paramount as it is what determines the firm's prosperity, survival and expansion. As noted by Musah (2008) there are different means of measuring performance. The type of measure to be used is dependent on the industry, the products the firm offers and the structure of the firm. For instance, Saleem and Khurshid (2014) states that performance is the total results of a firm activities and the output the firm gives to the shareholders. This outcome is measured in terms of loyalty, commitment, efficiency, effectiveness, effort, participation, decision-making, innovativeness and profitability. Further, Nzitunga (2015) noted that SME's are an important part of any economy since they help in the achievement of economic goals through job creation for the country's population.

In Kenya, Small and Medium Enterprises make a significant contribution to the Kenyan economy, accounting for 20 percent of Kenya's GDP and contribute to 88 percent of jobs created annually (RoK, 2015). Further, women owned businesses account for over 48 percent of all SMEs in Kenya. The sector is a source of customer products, it is a source of innovation, competition and good organisation culture which are important in enhancing the development of the private sector and improved industrialization (Bowen, Morara & Mureithi, 2009). However, these SMEs are constantly faced by threat of failure and most of them close down shortly after their establishment and never grow into large businesses. This may be partly attributed to lack of management skills on the part of the proprietors coupled with shortage of resources that are strategic in nature. This study aimed at establishing the influence of strategic physical resources on performance of Kenyan manufacturing SMEs.

2. Literature Review

The study is based on the Resource Based View (RBV) theory attributed to the works of Penrose (1959) who showed that organisational performance is directly related to the resources owned and controlled by the firm. The theory postulates that firm performance is dependent on how a firm controls its resources (Wernerfelt, 1984). Consequently, the emphasis of the theory is on acquisition of strategic resources from which a firm can gained competitive advantage and the combination of such heterogeneous resources in a manner that guarantees greater performance and sustainability (Kraaijenbrink, Spender & Groen, 2010). Additionally, this theory is fit for this study as it allows organisation leaders to determine if they have resources that can give the firm a competitive and sustainable edge. They are also able to use market imperfections to their advantage. This means that firm leaders can use t a combination of resources available to them to compete effectively against their rivals. The R BV theory highlights ways that organisations can achieve superior performance by use of resources at their disposal. However, the emphasis here is that an organisation can only build a competitive and sustainable enterprise if it uses resources that are non-substitutable, inimitable, rare and valuable.

The study found that there exists a lot of literature on physical resources and firm performance. For instance Grant (1991) and Barney (2014) concluded that in order to gain a sustainable competitive edge, firms must be in a position to gain access and control resources such as physical resources and deploy then in a coherent manner. It was also noted that over the years, firms have mainly focused on how to employ or use their existing physical resources which in turn results in providing partial explanation on the emergence of heterogeneous resource positions. Barney (1991) argued that lasting competitive position requires synergic coordination and configuration of resources and capabilities to positively influence firm performance.

Moreover, Benjamin and Orodho (2014), physical facilities represent one of the most important components of organizational resources that stimulate production and superior performance. Studies have shown that manufacturing organisations success depend

on the available resources at the firms disposal and the way in which these resources are used. Although it is important for managers to study and determine the resources available, Myeda and Pitt (2014) emphasized on the responsibility of FM in encouraging organizational performance, and in provision of competitive advantage. At the same time, examining the relationship between facility management, customer satisfaction and service relationship in the health care facilities located in Bangkok, Pitt, Chotipanich, Issarasak, Mulholland, and Panupattanapong (2016) indicated that a favourable association does exist between the study variables.

Moreover, Angila (2008) looked at the impact availability and use of physical resources has on the performance of students at Kimathi Primary School. The results showed a favourable relationship between the study variables. Further, assessing the impact of management of physical resources on KCSE performance in Kisii central based public secondary schools, Mong'are (2012) found that the lack of funding led to inadequate learning and teaching resources, congestion and un-conducive learning environment. At the same time, Obinga (2014) looked at the association between physical resources and internal efficiency of public secondary schools in Tana river County, Kenya. The findings showed that the availability of physical resources in these schools had a favourable impact on their internal efficiency. Finally, Ndungu (2014) did a study to determine the availability, use and effective utilisation of leaning materials, equipment, teaching materials and physical educational resources in Starehe Nairobi primary schools. The outcome showed that many of these schools did not make the provision of adequate physical resources, development and use of these resources part of their budget.

3 Methodology

The research philosophy adopted in this study was positivism philosophy whose ontology states that reality is real and encourages the collection of data to provide the results of a research. The positivism philosophy also encourages the use of real facts, measuring the data, being objective, neutral and validation of the data (Saunders, 2011). Additionally, the epistemology of this philosophy makes an assumption that the research will not be biased since the researcher will not be part of the researched participants and will do the study with no bias. In this study the researcher observed objectivity as outlined in this philosophy. Moreover statistical tests of hypothesis were conducted to make conclusions in this study. Based on these observations the philosophy applicable in the study. The research designs adopted in the study were descriptive research design as well as causal-effect research design. The target population in this case consisted of the management staff of the 350 small and medium manufacturing enterprises registered by the Kenya Association of Manufacturers (KAM). A sample size of 183 respondents (one respondent per firm) was chosen with the help of stratified sampling method.

The research tool used to collect primary data was a semi-structured, self-administered questionnaire. The instrument was tested for validity through content validity. As explained by Sekaran (2011) testing for content validity of a research tool is important since it determines the extent to which the tool content is in line with the content related to the phenomenon under study. Reliability was tested using internal consistency via Cronbach alpha coefficient. A coefficient of 0.7 and above as advised by Field (2009) was considered adequate. The questionnaire contained two sections, the first section covered the demographic characteristics of the respondents while the second section consisted of the research questions on the dependent variable (firm performance) and independent variable (physical resources). In this study, the dependent variable (performance) was measured in terms of profitability, sales volume, market share and number of customers as advised by Kaplan and Norton (2007) in their concept of balanced score card which allows companies to track financial results while monitoring progress in building capabilities needed for growth. On the other hand, physical resources were operationalized in terms of production facility, ICT infrastructure, natural resources and marketing infrastructure as recommended by Zarutskie (2010) who observed that physical resources also include machines, equipment, furniture and materials, which offer a vital service to production process. The respondent were required to respond to the research items on the extent to which they agree with the statements on the aspects of study variables in a 5-point Likert scale where 5- was very large extent and 1 represented no extent.

Descriptive statistics including standard deviation and mean helped analyse the data. Inferential analysis with the use of regression analysis was also done. The independent variable (physical resources) was measured through production facility, ICT infrastructure, natural resources and marketing infrastructure while performance was measured through profitability, sales volume, market share and number of customers. To test the significance of the regression model the study conducted an F-test while the significance of the study coefficients was tested using the P-value at 0.05 significance level. The study findings were presented inform of tables.

4. Results and Discussions

This study used descriptive statistics to establish the relationship that exists between physical resources and performance. The descriptive statistics provides a summary on the characteristics of the study variables through measures of central tendency: specifically, the mean and the standard deviation. In this section, the respondents were required to express the extent to which they agreed to statements on each of the study variable in a 5-point Likert scale where 1 represented no extent while 5 represented very large extent. Each variable is discussed separately and presented in separate tables. The descriptive results for physical resources are as shown in Table 1 below

The results shown in table 1 indicated that the aggregate mean score for physical resources was found to be 3.52 which showed that majority of small and

medium manufacturing enterprises in Kenya utilized physical resources to a great extent in influencing their firm performance. However, the study noted that there was high disparity in the utilization of the physical resources as shown by a standard deviation of 1.08. Results further showed that majority of small and medium manufacturing enterprises in Kenya were connected to the internet as shown by a mean score of 3.85. This meant that the respondents to a great extent agreed that their university was connected to the internet.

Table 1: Descriptive Statistics for Physical Resources

	N	Mean	Std. Deviation	Coefficient of Variation	t-statistic	Sig. (2-tailed)
ICT infrastructure						
This organization is connected to the internet	131	3.85	1.106	0.287	39.824	.000
Use of ICT in our organization has improved our efficiency	131	3.75	1.166	0.311	36.797	.000
All departments in this organization are connected through an internal network	131	3.64	1.222	0.336	34.104	.000
Processes in this organization have been automated	131	3.44	1.124	0.327	34.984	.000
This firm has adequately invested in information communication technology.	131	3.41	1.129	0.331	34.588	.000
This firm encourage sharing of databases with our customers to monitor their stock levels	131	3.31	1.164	0.352	32.573	.000
Production facility						
The layout of our factory is designed to improve efficiency.	131	3.76	1.006	0.268	42.801	.000
The production facility available is adequate to meet our customers' demands.	131	3.60	.943	0.262	43.647	.000
The organization has invested in adequate production facility.	131	3.57	.953	0.267	41.523	.000
There is adequate space in the production section.	131	3.56	1.054	0.296	38.642	.000
Marketing infrastructure						
Our marketing team is adequately empowered to carry on their functions	131	3.57	.985	0.276	42.907	.000
This company has a strong marketing infrastructure	131	3.45	1.104	0.320	35.773	.000
The company has adequate distribution channel for our products	131	3.59	.927	0.258	44.292	.000
Natural resources						
There is free flow of raw materials and finished goods on the production floor.	131	3.48	1.105	0.318	36.059	.000
We have adequate access to natural resources	131	3.23	1.092	0.338	33.832	.000
Most of our raw materials are natural resources	131	3.11	1.125	0.362	31.611	.000
Aggregate Score	**131**	**3.52**	**1.08**			

Source: Survey Data (2018)

These results signified the relevance of connectivity to the internet on firm performance. Pitt, et al. (2016) showed that connectivity to the internet may boost firm performance by improving access to market information, by facilitating more effective coordination of firms' production and delivery chains and by creating new business opportunities. Accordingly, small and medium manufacturing enterprises in Kenya tap into the internet so as to increase performance levels.

The statement with the highest absolute deviation as measured through the standard deviation was that all departments in this organization were connected

through an internal network with a standard deviation of 1.222. These results showed that some organisations had all their departments connected through an internal network while in other originations though connected to the internet did not have an intranet connecting all the departments in the organisation. It was shown by Paunov and Rollo (2016) that internet and intranet adoption positively affects a firms' labour productivity and also improves firms' efficiency in Africa, Eastern Europe, Central Asia, the Middle East as well as Latin America and the Caribbean.

Table 2: Descriptive Statistics for Performance

	N	Mean	Std. Deviation	Coefficient of Variation	t-statistic	Sig. (2-tailed)
Profitability						
Gross profit margin has been on the rise	131	3.79	.950	0.251	45.687	.000
We have observed a steady increase in profit before tax	131	3.66	1.058	0.289	39.553	.000
This company has over the years experienced gradual growth in profit after tax	131	3.63	1.083	0.298	38.409	.000
Sales volume						
Our firm has been experiencing growing sales volume	131	3.85	1.016	0.264	43.419	.000
Our customers have been gradually increasing their order volumes	130	3.62	1.109	0.306	37.157	.000
Market Share						
Our main products occupy the bigger portion of market share	131	3.63	1.018	0.280	40.775	.000
We pride as the manufacturing firm with the highest market share	131	3.52	1.126	0.320	35.784	.000
Number of Customers						
The quality of our products has helped us increase the number of customers	131	3.95	1.152	0.292	39.199	.000
The number of customers in this firm has been gradually increasing	131	3.89	1.010	0.260	44.136	.000
Aggregate Score	**131**	**3.727**	**1.058**			

Source: Survey Data (2018)

The overall mean score for the firm performance was 3.727 indicating that majority of respondents agreed that the performance of their firms had increased to a great extent. Additionally, the overall standard deviation was 1.058 which shows that there was a high dispersion in performance among the small and medium manufacturing enterprises in Kenya. Based on the magnitude, it was found that majority of small and medium manufacturing enterprises in Kenya relied on the quality of their products to increase the number of customers as shown by a mean score of 3.95 and a standard deviation of 1.152. The high value of the standard deviation depict that there was high variability on the pursuit of quality products among the small and medium manufacturing enterprises.

The respondents also believed to a great extent that their manufacturing firm had the highest market share with a mean score of 3.52 and a standard deviation of 1.126. Although, this is the statement that received the least mean score, the results showed that majority of the respondents believed that their firm held a significant proportion of the market in the regions that they operate. Hatch and Howland (2015) had earlier concluded that for firms to effectively compete in the complex and highly competitive environment, companies must constantly improve the quality of their products, reducing costs, and differentiating their products and services. The results therefore show that small and medium manufacturing enterprises in Kenya had adopted this strategy to a great extent though with a significant level of variability as shown by the standard deviation.

5.1 Reliability Of The Research Instruments

Reliability of the research instrument in this study was tested using internal consistency test. The internal consistency was measured using Cronbach's alpha coefficient (α). The coefficient indicates how well the items in a set are positively correlated to one another (Benjamin & Orodho, 2014). The Alpha ranges from zero, indicating no internal consistency, to one, showing complete internal consistency. The higher the coefficient, the more reliable the measurement scale. As rule of the thumb, reliability value of 0.6 and above is acceptable. Reliability of research instruments was conducted and the results are as shown in Table 3 below

Table 3: Variable Reliability Statistics

Variable	Cronbach's Alpha		
	Pilot	Main Study	Remarks
Physical resources	.872	.883	Reliable
Performance	.904	.904	Reliable

Source: Survey Data (2018)

From the result shown in Table 3, it is found Cronbach alpha coefficient for physical resources was 0.883 while performance had a coefficient of 0.904. Based on these observations, the study noted that the coefficients for all the constructs were greater than 0.7 and it was therefore concluded that the questionnaire was reliable.

The study further conducted inferential analysis through regression analysis was conducted and the results are as shown in Table 4

Table 4: Regressing performance and physical resources

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.668[a]	.446	.442	.592

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.44	1	36.44	103.884	0.002[b]
	Residual	45.25	129	0.351		
	Total	81.69	130			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.602	.375		6.934	.000
	Physical Resources	.325	.105	.263	3.094	.002

a. Dependent Variable: Performance

b. Predictors: (Constant), Physical Resources

Source: Survey Data (2019)

The results in Table 4 above show that the R square (R^2) for the model was 0.446 meaning that physical resources accounted for 44.6 percent of the changes in performance of manufacturing SMEs in Kenya. The results also imply that 55.4 percent of the changes in performance of manufacturing SMEs in Kenya is explained by other factors other than physical resources. The Analysis of Variance (ANOVA) results indicated that the F-statistic for the model was 103.884 which was greater than the F-critical value of 3.9146 and therefore the model was found to be fit for predicting performance of manufacturing SMEs in Kenya. The results also show that the P-value for the F-statistic was 0.002 which was lowered compared to the significance level of 0.05. Therefore, it was concluded that the model was a good fit for performance prediction.

The results also indicate that the unstandardized coefficient for the constant was 2.602 while that of physical resources was 0.325. The results imply that holding physical resources constant at zero (0) performance of manufacturing SMEs in Kenya would be 2.602. It is also found that with all things constant, increasing physical resources by a unit would lead to a 0.325 increase in performance of manufacturing SMEs in Kenya. The study noted that the P-Value for the regression coefficient (Physical Resources) was 0.002 which was less than the significance level of 0.05. The null hypothesis was not accepted and the conclusion was that resources have a significant influence on performance of manufacturing SMEs in Kenya.

The regression results were thus summarised as follows;

$$FP = 2.602 + 0.325PHR + e$$

The results tallied with regression coefficient which showed that increasing physical resources by one unit increases performance of small and medium manufacturing enterprises in Kenya by 32.5 percent showing the great significance of the variable in performance. While the study sought the influence of production facility, ICT infrastructure, natural resources and marketing infrastructure on performance of manufacturing SMEs in Kenya, the descriptive results showed that manufacturing SMEs relied more on the ICT infrastructure by connecting all the departments with intranet and internet to improve efficiency. The study also found that most small and medium manufacturing enterprises relied on production facility and marketing infrastructure to a great extent to improve performance. However, natural resources only had moderate influence of performance.

Theoretically, the variable was based on the RBV theory which stresses the essence of resources to achieve better performance (Wernerfelt, 1984). While physical resources might not be non-substitutable, inimitable, rare or valuable for it to be strategic, the study found that the existence of these resources in form of production facility, ICT infrastructure and marketing infrastructure increases performance of these firms by improving efficiency and increasing market share for the firms. The study therefore found support for the postulates of the RBV theory. Empirically, the study findings showed support to conclusions reached by Benjamin and Orodho (2014) who claimed that physical facilities represent one of the most important components of organizational resources that stimulate production and superior performance. Further, Barney (2014) concluded that physical resources alongside other

resources are some of the most essential when it comes to product firms since they play an important role in the production process. Moreover, Myeda and Pitt (2014) emphasized on the role of facilities management in encouraging organizational performance, and in giving competitive advantage. Angila (2008) investigating the impact availability and use of physical resources on the performance of students concluded that there exists a favourable relationship between the two.

Earlier studies by Angila (2008), Obinga (2014) and Pitt, et al, (2016) had shown that gaps exist in literature where scholars had not conceptualised the measurement of the variable while other studies failed to show the association that exist between physical resources and performance. It was also found that researchers had shied away from measuring performance in manufacturing SMEs in Kenya. This study thus filled this gap by showing that a positive relationship exist between physical resources and performance of small and medium manufacturing enterprises in Kenya. The study further contributes to the body of Knowledge by showing that physical resources significantly influence performance of manufacturing SMEs in Kenya.

5.2 Correlation Analysis

The objective of correlation analysis was to establish the nature and strength of the relationship that exist between the study variables. To achieve this objective, Pearson's product moment correlation was used. The decision on the strength of the relationship was based on Dancey and Reidy (2004) recommendations who indicated that a correlation coefficient of 1 indicates that there is a perfect correlation between the variables, a correlation coefficient of 0.7 to 0.9 shows a strong correlation, a coefficient of, 0.4 to 0.6 indicates a moderate correlation, a coefficient of 0.1 to 0.3 shows a weak correlation while a coefficient of 0 shows absence of correlation. The results of the correlation analysis were as summarised in Table *5*

Table *5*: Correlations Analysis Results

		Performance	**Physical Resources**
Performance	Pearson Correlation	1	.668
	Sig. (2-tailed)		.002
	N	131	131
Physical Resources	Pearson Correlation	.668	1
	Sig. (2-tailed)	.002	
	N	131	131

Source: Survey Data (2018)

Based on the results shown in table *5*, it is found the correlation coefficient between performance and physical resources was 0.668 with a significance level of 0.002. These results show that there was a strong positive correlation between performance of small and medium manufacturing enterprises and physical resources. In general, the results showed that there was a positive correlation between performance of small and medium manufacturing enterprises and all physical resources implying that an increase in strategic resources lead to an increase in performance of small and medium manufacturing enterprises in Kenya.

6. Conclusion

The findings of the research show that small and medium manufacturing enterprises in Kenya adopted production facility, ICT infrastructure to a great extent, and marketing infrastructure to a moderate extent while natural resources were used to a low extent. Overall, physical resources affected performance to a great extent and the study therefore concluded that physical resources have a significant influence on performance of manufacturing SMEs in Kenya. The study established that production facility and marketing infrastructure significantly predicted performance while ICT infrastructure and natural resources failed to significantly predict performance of manufacturing SMEs in Kenya. Further, the results showed that physical resources were significant in predicting profitability and market share but insignificant in predicting sales volume and number of customers.

Recommendations of the Study

The study concluded that that physical resources have a significant influence on performance of manufacturing SMEs in Kenya. In particular the study found that ICT infrastructure, production facility and marketing infrastructure had the greatest influence on performance. The research recommendation is that the management of small and medium manufacturing enterprises in Kenya should ensure that they invest significantly in these resources so as to maximise the performance of these firms. Since natural resources only had a moderate influence of performance of the firm, the study recommends that the management should economically justify investment in acquisition of natural resources.

References

Angila, G. A. (2008). Effective utilization of physical resources in relation to academic performance. A case study on Kimathi Primary School.

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of management*, *17*(1), 99-120.

Barney, J. B. (2014). How marketing scholars might help address issues in resource-based theory. *Journal of the Academy of Marketing Science*, *42*(1), 24-26.

Benjamin, B. A., & Orodho, J. A. (2014). Teaching and learning resource availability and teachers' effective classroom management and content delivery in secondary schools in Huye District, Rwanda. *Journal of Education and Practice*, *5*(9), 502-523.

Bowen, M., Morara, M., & Mureithi, M. (2009). Management of business challenges among small and micro enterprises in Nairobi-Kenya. *KCA journal of business management*, *2*(1), 957-983.

Dancey, C. P., & Reidy, J. (2004). Statistics without Maths for Psychology (Harlow.

Gakenian. N. J. (2014). *Effects of organizational resources, competitive advantage on firm's performance of mobile phone industry in Kenya* (Unpublished Doctoral dissertation), Kenyatta University, Kenya.

Grant, R. M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation. *California management review*, *33*(3), 114-135.

Hatch, N. W., & Howland, C. (2015). When Does Competitive Advantage Improve Customer Welfare? In *Academy of Management Proceedings* (Vol. 2015, No. 1, p. 18091). Academy of Management.

Kaplan, R. S., & Norton, D. P. (2007). Using the balanced scorecard as a strategic management system. *Harvard business review*, *85*(7-8), 150-+.

Kim, W. C., & Mauborgne, R. A. (2014). *Blue ocean strategy, expanded edition: How to create uncontested market space and make the competition irrelevant*. Massachusetts, Harvard business Press.

Koontz, T. M., & Thomas, C. W. (2012). Measuring the performance of public-private partnerships: A systematic method for distinguishing outputs from outcomes. *Public Performance & Management Review*, *35*(4), 769-786.

Kraaijenbrink, J., Spender, J. C., & Groen, A. J. (2010). The resource-based view: A review and assessment of its critiques. *Journal of management*, *36*(1), 349-372.

Mong'are, E. (2012). *Management of Physical resources and its impact on KCSE performance in public secondary schools in Kisii Central District, Kenya.* (Unpublished doctoral dissertation), Kenyatta University, Kenya.

Musah, S. (2008). Evaluating the extent to which people and performance AMO model has contributed to the strategic human resource debate. *Journal of Management*, *15*(1), 67-79.

Myeda, E. N., & Pitt, M. (2014). Facilities management in Malaysia: Understanding the development and practice. *Facilities*, *32*(9/10), 490-508.

Ndungu, J. M. (2014). *Physical Education Resources and Implementation of Physical Education in Urban Primary Schools of Starehe District, Nairobi County,Kenya.* (Unpublished doctoral dissertation Kenyatta University, Kenya.

Nzitunga, J. B. (2015). Strategic Development for Manufacturing Small & Medium Enterprises (SMEs) in Namibia. *Management*, *5*(4), 117-131.

Obinga, P. O. (2014). *Relationship between physical resources and internal efficiency of public secondary schools in Tana River County, Kenya.* (Unpublished doctoral dissertation Kenyatta University, Kenya.

Ombaka, B., Machuki, V. N., & Mahasi, J. (2015). Organizational Resources, External Environment, Innovation and Firm Performance: A Critical Review of Literature. *DBA Africa Management Review*, *5*(1), 407-429.

Paunov, C., & Rollo, V. (2016). Has the internet fostered inclusive innovation in the developing world?. *World Development*, *78*, 587-609.

Penrose, E.T. (1959). *The Growth of the Firm.* NewYork, Wiley.

Pitt, M., Chotipanich, S., Issarasak, S., Mulholland, K., & Panupattanapong, P. (2016). An examination of facility management, customer satisfaction and service relationship in the Bangkok healthcare system. *Indoor and Built Environment*, *25*(3), 442-458.

Porter, M. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance.* New York: Free Press.

Porter, M.E. (1986). *Competitive Advantage: Creating and Sustaining Superior Performance*, Washington, Free Press.

RoK, (2015). *The National Micro and Small Enterprise Baseline Survey in Kenya.* Nairobi, Government Printer.

Saleem, I., & Khurshid, A. (2014). Do human resource practices affect employee performance? *Journal of Science and Management*, *13*(5), 16-28.

Saunders, M. N. (2011). *Research methods for business students*, 5thE. Delhi, Pearson Education.

Sekaran, U. (2011). Research methods: A skill building approach. Hoboken, New Jersey: John Wiley & Sons.

Wagner III, J. A., & Hollenbeck, J. R. (2014). *Organizational behaviour: Securing competitive advantage.* Abingdon, United Kingdom: Routledge.

Wernerfelt, B. (1984). A Resource-based View of the Firm. *Strategic Management Journal*, Vol. 5(2), pp. 171-180.

Yadav, P. L., Han, S. H., & Kim, H. (2017). Sustaining Competitive Advantage through Corporate Environmental Performance. *Business Strategy and the Environment*, *26*(3), 345-357.

Zarutskie, R. (2010). The role of top management team human capital in venture capital markets: Evidence from first-time funds. *Journal of Business Venturing*, *25*(1), 155-172.

IJBESAR

International Journal of Business and Economic Sciences Applied Research

Capital Management Risk and Value of the Firm: Perspectives from Private Equity Financial Firms in Kenya

Florence Waitherero Kariuki, Dr. Stephen Muchina and Dr. Stephen Macharia

pp. 28-33

Volume 12, Issue 1

Eastern Macedonia & Thrace Institute Of Technology Press

International Journal of Business and Economic Sciences Applied Research

IJBESAR
ijbesar.teiemt.gr

Capital Management Risk and Value of the Firm: Perspectives from Private Equity Financial Firms in Kenya

Florence Waitherero Kariuki, Dr. Stephen Muchina and Dr. Stephen Macharia

Department of Business and Economics, Karatina university

ARTICLE INFO
Article History
Received 30th April 2019
Accepted 13th may 2019

JEL Classifications
G32, G39, G23, G29

Keywords:
Capital Adequacy Ratio, Capital management risk, Firm value and SACCO

ABSTRACT

Purpose
This study sought to explore the effect of capital management risk on value of the firm among private equity financial firms in Kenya.

Design/methodology/approach
Anchored on the agency theory and guided by positivism research philosophy, descriptive research design as well as causal research design, the study surveyed 115 savings and credit societies regulated by Sacco Societies Regulatory Authority. A panel regression model detailing the interaction between capital risk management and firm's value was set.

Findings
The study found that capital management risk significantly affects value of SACCOs in Kenya such that a unit change in capital adequacy ratio increases value of SACCO.

Originality/value
The results of the study supported the propositions of agency theory which postulates that goal incongruence and asymmetric information may generate agency problems forcing the owners of the firm to incur agency costs which reduce the cash flows available for investment leading to sub-optimization and thus reducing the value of the firm. We recommend management of SACCOs in Kenya to seek to improve their capital adequacy ratio by increasing their tier one and tier two capital so as to increase their overall core capital.

1. Introduction

The existence of Savings and Credit Cooperative Societies (SACCOS) in the financial sector has over the years brought tremendous improvement in financial deepening and economic growth in the world (Sadgrove, 2016), This is mainly because they offer credit to individuals and small and medium enterprises, who would otherwise have difficulties accessing credit facilities in commercial banks, at competitive interest rates (Christoffersen, 2012). However, they are exposed to a number of risks resulting from their operations such as financial risk, market risk, credit/default risk, interest rate risk and political risk. Since the institutions are in the financial sector, their dominant risk according to Greuning and Bratanovic (2009) is financial risks. Additionally, Hutson and Stevenson, (2010) observed that financial risk is one of the main risks facing SACCOs, and include liquidity risk, interest rate risk, credit risk foreign exchange risk, and capital management risk. Thus, their survival is largely determined by how well they manage their financial risks. SACCOs must therefore, aim at achieving an acceptable equilibrium between risk and return while minimizing possible unacceptable outcomes on their performance.

In managing their capital risk, (Bessis, 2011) noted that business organisations must start by setting objectives, identifying risk, assessing risk, establishing control activities, monitoring and communicating risk exposures on time to reduce and eliminate the exposures to loss by the institution. Askari, Iqbal and Mirakhor (2011) also noted that a robust capital risk management framework could enhance financial performance of organizations by helping them reduce their exposure to risks. In concurrence, McNeil, Frey and Embrechts (2015) concluded that capital risk management help companies to reduce costs, increase profits, widen their client base and finally, to make the cost structure produce maximum results.

SACCOs in Kenya form an integral part of the financial sector. Ayieko (2016) observed that there are over 16,000 Co-operative societies with more than 14 million members making it the largest Sacco movement in Africa (World Bank, 2016). Additionally, of the total savings mobilised and loans advanced by SACCOS in Africa, the subsector in Kenya contributes nearly 62% of the savings and 65% of the loans thus making it the

†Corresponding Author: Florence Waitherero Kariuki
E: kariukiflorence@gmail.com
DOI: 10.25103/ijbesar.121.03

most influential Sacco movement in Africa. Currently, over 30 million Kenyans constituting 67% of the entire population, depend on the co-operative related activities, directly or indirectly, for their livelihoods. Furthermore, SACCOs control slightly over 30% of Kenya's GDP and accounts for 80% of the total accumulated savings. In addition, the co-operative movement in Kenya has been regarded as a key pillar in achievement of Vision 2030 through mobilization of savings and developing demand driven financial products, which encourage members to save additional resources (ROK, 2008).

The agency theory developed by Jensen and Meckling (1976) describes agency relationship between the shareholders and the management as a major concern for management and investors. According to the theorist firm owners who are the principal employ managers to act as their agents and perform some functions on their behalf. However, manager's interests sometimes differ from that of their bosses bringing about a conflict of interest (Mustapha & Che Ahmad, 2011). Although SACCOS are not listed in the Nairobi Security Exchange (NSE) members of the SACCO who contribute their capital towards the SACCO have no direct control over the management of their business. This forces the shareholders to incur agency costs such as monitoring costs, contracting costs and residual loss to monitor the activities of the and deter the management from engaging in activities hindering achievement of their wealth maximization goal (Hutson &Stevenson Heracleous, 2010). These costs tend to reduce profitability of the firm which in turn reduces the ability of the firm to maximise wealth and value.

Additionally, since the value of the firm is determined by the market value of equity and market value of the debt, Gill, Biger and Mathur (2010) notes that the debt holders will seek to supervise the implementation of the funds supplied to the firm. When the value of the firm increases the risk exposure of debt holders is reduced as a result of increased equity base. On the contrary, should the management mis-appropriate the finances, Hoffmann (2011) conclude that capital management risk will increase and creditors will be forced to intervene which may adversely affect the performance of the firm.

Existing financial discourse has mainly revolved around what contributes to the value of the firm (Fama & French, 2002; Christoffersen, 2012). Hutson and Stevenson (2010) found that there are practical problems experienced in determining the value of the firm associated with uncertainty and the instability of factors that influence equity holders' income, a factor highly attributed to the value of the firm. Saunders and Allen (2010), also noted that firm value is influenced by a number of complex and differentiated factors including firm levered level, operational efficiency, liquidity level and growth capacity (Fama & French, 2002; Minnis, 2011). Literature also shows a non-linear relationship between gearing and the value of the firm. Chen, Chung, Hsu and Wu (2010) concluded that the value of the firm is influenced by leverage and that the tax shield from debt represents a significant proportion of total value for many companies, projects, and transactions. The study thus explored the effect of capital management risk on value of the firm among SACCOs in Kenya. To achieve this objective the study tested the hypothesis that:

HO: Capital risk has no significant effect on value of the firm among SACCOs in Kenya

2.Research Methodology

The study was guided by positivism epistemological research philosophy which is characterized by the belief that knowledge should be based on facts and no abstractions (Neuman, 2010). In line with philosophical foundations in the study, both descriptive research design and causal research design were used. Descriptive research design was used because the study sought to describe characteristics of the SACCOS and the variables being studied. Causal research design was employed to determine the extent and nature of cause-and-effect relationship existing between capital management risk and value of SACCOs in Kenya. The target population for this study consisted of all the 164 Savings and Credit Co-operative Societies licensed by Sacco Societies Regulatory Authority (SASRA) to operate in Kenya as at 31st January 2017. The population was stratified into eight clusters as categorised by SASRA. A sample size of 115 respondents was randomly selected from the target population of 164. The sample size was calculated using the Cochran (1977) formula.

Table1: The Sampling Matrix

ADMINISTRATIVE REGIONS	TOTAL NO.	Ratio	Sample Size
Central Region	24	0.70	17
Coast Region	10	0.70	7
Eastern Region	29	0.70	20
Nairobi Region	41	0.70	29
North Eastern Region	1	0.70	1
Nyanza Region	11	0.70	8
Rift Valley Region	36	0.70	25
Western Region	11	0.70	8
Total	**164**		**115**

Source: Author (2019)

Data was analysed using descriptive statistics and inferential data analysis via Pearson correlation coefficient and panel regression model involving cross-sectional data collected from selected SACCOs for a period of eight years. In testing the fitness of the model, the coefficient of determination R^2 was used to measure

the extent to which the variation in firm value is explained by the variations in capital management risk. F-statistic was also computed at 5% significance level to test whether there is any significant relationship between capital risk management and value of SACCOs in Kenya. This analysis was done using STATA software and the findings presented in form of a research report. In testing the hypothesis, the student's (t) test and the corresponding p-value at 0.05 significance level were used. The adopted regression model was as follows:

$$Fv_{it} = \beta_0 + \beta_1 Cmr_{it} + \epsilon_{it}$$

The study also sought to determine the controlling effect of firm size on the value of the firm. To test the control effect of firm size, the study used the same regression model as specified above. Agnew (2017) argued that a control variable is a factor that is assumed to remain constant or unchanged throughout the course of analysis. In this study the firm size as measured through total assets was evaluated as a control variable. Firm size was introduced in the model and value of the firm regressed on capital management risk as specified in the following model;

$$Fv_{it} = \beta_0 + \beta_1 Cmr_{it} + \beta_2 Fs_{it} + \epsilon_{it}$$

Where: - Fv = Firm Value, β_0, β_1, = Constants, Fs_{it} = Firm Size and ϵ= Error Term

3. Results and Discussions

The study relied on descriptive statistics as well as inferential statistics to make the conclusions. Table 2 shows the analysis of variable characteristics.

Table 2: Variable Characteristics

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
Capital Management Risk	410	7.617226	25.52715	.000759	281.6402	0.600	2.877
Value of the Firm	410	1.517546	3.517641	-11.6478	33.85699	0.768	3.1059

Source; Research data (2018)

The descriptive results in Table 2 above revealed that capital management risk as measured through Capital Adequacy Ratio (CAR) had a mean score of 7.617226 and a standard deviation of 25.52715. These results shows that on average, the SACCOs financial strength to cushion depositors' funds and absorbing a reasonable amount of losses before they become insolvent using their capital and assets were lower than the current minimum ratio of capital to risk-weighted assets of 8% under Basel II and 10.5% under Basel III. The standard deviation was also noted to be very high which shows that there was a high variation among SACCOs in the ability to absorb losses. This is evidenced by the wide range in the observations with a minimum of .0007592 and a maximum of 281.6402. Capital management risk had a skewness value of 0.600 and a Kurtosis value of 2.877. Since the variable had skewness values of less than one and Kurtosis values averaging three the study concluded that the data was normally distributed.

Firm value showed a mean of 1.517546 billion shillings and a standard deviation of 3.517641 billion shillings. On the basis of these results it may be deduced that there was high variation in the value of the SACCOs in Kenya with some reporting negative values and others reporting positive values. This is evidenced by the values ranging from a minimum of -11.64775 billion shillings to a maximum of 33.85699 billion shillings. This variation may be explained by the various elements that influenced the factors of firm value such as interest rate risk, credit risk, capital management risk and liquidity risk. In this study capital expenditure was measured through investment in fixed assets. However, SACCOs are required by regulations 13 (2) of the SACCO societies regulations 2010, to maintain 15% of their savings deposits in liquid assets. Since capital expenditure was an integral part of value of the firm, some SACCOs had negative values for their firm value. Similarly, the study relied on earnings before interest and taxes (EBIT) and non-cash working capital in measuring the value of the firm which significantly affected the value of the firm. The variable had a skewness value of 0.768 and a Kurtosis value of 3.1059. The study thus concluded that the data on the variable was normally distributed.

Table 3: Regressing Capital Management Risk on firm value

Source	SS	Df	MS	Number of obs	= 410
				F (1, 408)	= 1782.36
Model	4118.18897	1	4118.18897	Prob > F	= 0.0008
Residual	942.6948	408	2.31053	R-squared	= 0.8137
				Adj R-squared	= 0.8132
Total	5060.88378	409	12.373799	Root MSE	= 3.5118

value of the firm	**Coef.**	**Std. Err.**	**t**	**P>t**	**[95% Conf.**	**Interval]**
Capital	0.104639	0.006802	15.383	0.000	-0.0029083	0.023836

Management Risk						
_cons	1.43784	0.1810093	7.94	0.000	1.082013	1.793667

Source; Research data (2018)

To test the effect of capital management risk on the value of the firm, the study tested the null hypothesis that capital management risk has no significant effect on value of the firm among SACCOs in Kenya. To achieve this value of the firm was regressed on capital management risk and the results in Table 3 were obtained.

The results are summarised as follows:

$$Fv_{it} = 1.43784 + 0.104\ Cmr_{it}$$

The results in Table 3 revealed that capital management risk had a positive coefficient of 0.104639 meaning that, holding all other factors constant, increasing CAR by one unit would result in a 0.104639 increase in the value of the SACCO. The results also show that the coefficient for the constant was 1.43784 implying that if capital management risk was held constant at zero, value of the SACCO would be equal to 1.43784. The results also showed that the coefficient of capital management risk had a t-statistic value of 15.383. This t-value was found to be less than the t-critical of 2.776. Thus, based on the t-value, the study rejected the null hypothesis and conclude that capital management risk has a significant effect on value of the firm among SACCOs in Kenya. The study further found that capital management risk coefficient had a P-value of 0.000 P-value of 0.000 which was less than the significance level of 0.05. Based on the P-value, the study also rejected the null hypothesis and concluded that capital management risk has a significant effect on value of the firm among SACCOs in Kenya.

The results shown in Table 2 showed that the adjusted R^2 was 0.8132 meaning that the Model could predict 81.32% of the variations in value of the firm. The results also showed that the F-statistic for the model was 1782.36 which was greater than the F-critical of 3.8644. The study therefore found that the model was fit to predict value of the firm. Based on P-value, the study found that the P-value for the model was 0.0008 which was less than the significance level of 0.05. The study therefore concluded that the model was fit to predict firm value.

When, firm size was introduced in to the model, the results were as shown in Table 4.

Table 4: Regressing Capital Risk Management on Firm Value Controlling for Size

Source	**SS**	**Df**	**MS**	**Number of obs**	=	**410**
				F(2, 407)	=	727.709
Model	54.9135619	2	1977.4568	Prob > F	=	0.001
Residual	5005.97022	407	2.7174	R-squared	=	0.7815
				Adj R-squared	=	0.7804
Total	5060.88378	409	12.373799	Root MSE	=	3.5071

Value of the firm	**Coef.**	**Std. Err.**	**t**	**P>t**	**[95% Conf.**	**Interval]**
Capital Management Risk	0.0744	0.0071	10.472	0.000	-.0065284	.214142
Firm size	.4616023	.3191397	1.45	0.009	1.08897	.1657657
_cons	5.674121	2.934426	1.93	0.054	-.0944035	11.44264

Source; Research data (2018)

The results were summarised as follows:

$$Fv_{it} = 5.674121 + 0.0744Cmr_{it} + 0.4616Fs_{it}$$

It was noted from the table that the capital management risk had a coefficient of 0.0744 meaning that holding firm size constant, a unit increase in CAR which measured capital risk management would lead to a 0.0744 increase in risk. At the same time, firm size had a coefficient of 0.4616 implying that if capital risk management was held constant, a unit increase in total assets would lead to 46.16% increase in the value of the firm. The two variables were significant in predicting firm value since their P-values were less than the 0.05 significance level. The results shown in Table 3 above also indicated that the value of adjusted R squared was 0.7804 implying that both capital management risk and firm size predicted 78.04 % of all the variations in the value of the firm. The results further indicated that 21.06 of all the variations in the value of the firm were caused by other factors other than capital management risk and firm size. To test the fitness of the model, the study used the F-statistic (2, 407= 727.709) which was found to be greater than F-critical value of 3.0179 at the same time the P-Value for the model was also less than the 0.05 significance level. The study thus concluded that the model was fit in predicting firm value. Based on the results shown in Table 3 and Table 4 the study found that the value of adjusted R squared reduced by 0.0328 from 0.8132 to 0.7804 a difference that may be attributed to the controlling effect of firm size. At the same time the coefficient of firm size was significant indicating that it had a significant controlling effect.

In summary, the study results on the variable showed that capital management risk as measured by capital adequacy ratio as the ratio of core capital to risk weighted assets of the firm showed the SACCOs had financial strength of cushioning depositors' funds and absorbing a reasonable amount of losses before they become insolvent using their capital and assets were lower than the current minimum ratio of capital to risk-weighted assets of 8% percent under Basel II and 10.5% percent under Basel III. Regression results showed that an increase in capital adequacy would lead to an increase in value of the firm. Hypothesis test results showed that capital management risk had a significant effect on value of the firm among SACCOs in Kenya. Similarly, the study established that firm size had a significant controlling effect on firm value.

These results were consistent with the findings of Hoffmann (2011) who showed a negative impact of money on the profitability of the banks implying that when a company has a higher capital ratio, it is likely to suffer lower profitability. Since profitability is directly related to value of the firm it means that these results agree with the current study. In addition, the results agreed with the findings of Karkrah and Ameyaw (2010) who revealed that the equity ratio which is the measure of the capital strength of the banks displayed a positive relation with the banks ROA. This implies that a decrease in equity ratio exposes the firm to capital risk which are the findings of the study. Further, Gill, Biger and Mathur (2010) found a significant relationship between the cash conversion cycle and profitability and firm value which agreed with the current study. Finally, the findings were in congruence with the findings of Mugwang'a (2014) who showed that there was no existence of a significant relationship between capital adequacy and the following and liquidity risk, credit risk, interest rate risk, return on assets ratio, return on equity ratio and revenue power ratio. Further the results were in agreement with the findings of Murkomen (2016) who found that operating efficiency is positively related to capital adequacy. This is because operational efficiency may lead to better performance and increased firm value. However, the results were inconsistent with the findings of Havrylchyk and Jurzyk (2011) who indicated that there is a positive influence of capital management risk on profitability.

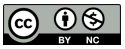
4. Conclusions and Recommendations

Following the results obtained, the study concluded that capital management risk significantly affects value of SACCOs in Kenya. The study also concluded that a unit change in capital adequacy ratio increases value of SACCOs in Kenya. Further the study concluded that firm size had a significant controlling effect on firm value. Based on the theoretical foundation, the study found that the findings of this study were consistent with the propositions of agency theory credited to Jensen and Meckling (1976) who postulated that goal incongruence and asymmetry information may give rise for agency problems including adverse selection and moral hazard problems leading to sub optimisation of wealth maximisation as envisaged by the owners of the firm. When this happens, the owners of the firm would incur agency costs to deter the management to engage in activities hindering achievement of their wealth maximization. These costs would reduce the cash flows available for investment and thus reducing the value of the firm.

The findings of this study contribute to the body of knowledge by supporting the provisions of agency theory that misappropriation of capital reduces creditors' confidence which adversely affect firm value. Moreover, the study added to the body of knowledge empirically by showing the relationship that exist between capital management and value of SACCOs in Kenya. The study results showed that there is a significant direct interaction between capital management risk and value of SACCOs in Kenya.

Based on the conclusions reached in this study it is recommended that the management of SACCOs in Kenya should seek to improve their capital adequacy ratio by increasing their tier one capital and tier to capital so as to increase their overall core capital. This may be achieved by recruiting more members in to their SACCOSs so as to increase share capital which form a significant part of the core capital. Further, the study recommends that the management should reduce the proportion of their risky assets so as to improve their capital adequacy ratio.

However, this study was conducted among SACCOs regulated by Sacco Societies Regulatory Authority. This means that the finding of this study was only applicable to such SACCOs in Kenya which are registered by SASRA and other financial institutions with similar characteristics and the findings cannot therefore be inferred on all SACCOs. The results therefore suffer from generalizability since they may not be applicable to other financial institutions such as commercial bank and other public equity firms. Therefore, the study suggests that other studies be conducted among SACCOs not regulated by SASRA to establish if the findings in this study would concur. In addition, since these results were based on SACCOs, the study recommends that another study be conducted among other financial institutions such as Micro Finance Institution and commercial banks in Kenya to determine if similar results would be obtained.



References

Askari, H., Iqbal, Z., & Mirakhor, A. (2011). *New Issues in Islamic Finance and Economics: Progress and Challenges* (Vol. 753). New Jersey, United States, John Wiley & Sons.

Ayieko B. (2016). SACCOs Could Play a Bigger Role in Shaping Kenya's Financial Sector. *An International Review*, *18*(3), 234-249.

Bessis, J. (2011). *Risk management in banking*. New Jersey, United States, John Wiley & Sons.

Chen, W. P., Chung, H., Hsu, T. L., & Wu, S. (2010). External financing needs, corporate governance, and firm value. *Corporate Governance: An International Review*, *18*(3), 234-249.

Christoffersen, P. F. (2012). *Elements of financial risk management*. Academic Press.

Cochran, W. G. (1977). Sampling techniques (3rd ed.). New York: John Wiley & Sons.

Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *The review of financial studies*, *15*(1), 1-33.

Gill, A., Biger, N., &Mathur, N. (2010). The relationship between working capital management and profitability: Evidence from the United States. *Business and Economics Journal*, *10*(1), 1-9.

Greuning, H., & Bratanovic, S. (2009). *Analyzing banking risk: a framework for assessing corporate governance and risk management*. World Bank Publications.

Havrylchyk, O., &Jurzyk, E. (2011). Profitability of foreign banks in Central and Eastern Europe. *Economics of Transition*, *19*(3), 443-472.

Hoffmann, P. S. (2011). Determinants of the Profitability of the US Banking Industry. *International Journal of Business and Social Science*, *2*(22).

Hutson, E., & Stevenson, S. (2010). Openness, hedging incentives and foreign exchange exposure: A firm-level multi-country study. *Journal of International Business Studies*, *41*(1), 105-122.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, *3*(4), 305-360.

Karkrah, C., & Ameyaw, S. (2010). *Valuation Issues and Operational Risk in Hedge Funds*. Capco Research and Working Paper.

McNeil, A. J., Frey, R., & Embrechts, P. (2015). *Quantitative risk management: Concepts, techniques and tools*. Princeton university press.

Minnis, M. (2011). The value of financial statement verification in debt financing: Evidence from private US firms. *Journal of Accounting Research*, *49*(2), 457-506.

Mugwang'a, F. A. (2014). *Determinants of capital adequacy of commercial banks in Kenya* (Doctoral dissertation), University of Nairobi.

Murkomen, R. J. (2016). *The Effects of Capital Requirements on Operating Efficiency of Commercial Banks in Kenya* (Doctoral dissertation), University of Nairobi.

Mustapha, M., &Che Ahmad, A. (2011). Agency theory and managerial ownership: evidence from Malaysia. *Managerial Auditing Journal*, *26*(5), 419-436.

Neuman, W. L. (2010). Social research methods: Quantitative and qualitative methods. *Anthrop Educ Q*,*3*.

Neuman, W. L., & Robson, K. (2014). *Basics of social research*. Canada: Pearson.

Sadgrove, K. (2016). *The complete guide to business risk management*. Routledge.

Saunders, A., & Allen, L. (2010).*Credit risk management in and out of the financial crisis: new approaches to value at risk and other paradigms* (Vol. 528). John Wiley & Sons.

World Bank (2016). *World Development Report (2016)* World Bank Documents & Reports.

IJBESAR

International Journal of Business and Economic Sciences Applied Research

The Model of Forming Employee Commitment in General Hospital Tgk Chik Ditiro in Pidie

T. Roli Ilhamsyah Putra

pp. 34-38

Volume 12, Issue 1

Eastern Macedonia & Thrace Institute Of Technology Press

International Journal of Business and Economic Sciences Applied Research

IJBESAR
ijbesar.teiemt.gr

The Model of Forming Employee Commitment In General Hospital Tgk Chik Ditiro in Pidie

T. Roli Ilhamsyah Putra

Department of Management, Syiah Kuala University, Banda Aceh, 23111, Indonesia

ARTICLE INFO

Article History
Received 16th December 2018
Accepted 28th January 2019

JEL Classifications
D80; D81; G31; G32

Keywords:
competence, organizational culture and commitment

ABSTRACT

Purpose
This study aims to examine the factors that form the commitment
Design/methodology/approach
The sampling technique used is proportionate stratified random sampling, with 100 respondents and the data collection happens in 2018. Methods of data analysis in this study uses multiple linear regression, with the number of respondents as many as 100 employees.
Findings
The result shows that the competence and organizational culture significantly influence the commitment. This implies to the manager that the increase of employee competence and the suitable organization culture are very important in strengthening their employee commitment.
Research limitations/implications
The limitation of this research is in the amount of variables that are only three, and only focus in one object.
Originality/value
The findings of this research are the new ones, by developing the previous theory, using a new place and time.

1. Introduction

The General Hospital Tgk Chik Ditiro is an integral part of a social and health organization with the purpose of providing comprehensive, curative and preventive services to the people of the Pidie District and also serves as a training center for health workers and medical research center employees.

This hospital's mission is to provide quality health services in the Pidie District, that are affordable to the district's citizens, in order to improve their health. The onus on the hospital's staff is to fulfil this mission via a harmonious, efficient and effective health service that prioritizes healing and recovery, is aligned with improvement and prevention of ill-health, and implementation of referral efforts of patients admitted to other hospitals or by other doctors.

In improving the service for the community, management is often faced with problems, including low employee work commitment. This is in line with preliminary results, which have found that high commitment employees are still limited in number, due to the existence of employees not dedicated to achieve the goals of the hospital. According to Daft (2010), individuals with low organizational commitment tend to disrupt organizational performance via tardiness in work, complaining, strikes and low turnover. According to Streers (1991), low commitment employees impact turnover, high attendance, poor quality of work, increased job lag, lack of desire to remain in the organization's employ, and lack of loyalty to the organization. Meanwhile, Meyer et al. (1993) describes three dimensions used to measure the commitment of employees to the organization, namely: 1) affective commitment; 2) continuance commitment; 3) normative commitment.

Furthermore, the preliminary assessment of the hospital's staff competency needs attention, particularly those employees that display bad working habits, such as procrastinating the work; these characteristics have been found even in employees that are considered by peers to be knowledgeable, skilful and talented. This attitude can generally be attributed to a lack of employee understanding on the importance of group co-operation, group coordination and discussion, misperceptions about individual performance assessment and excessive egos. Although not all employees display such bad habits, the effect impedes the overall improvement in performance.

†Corresponding Author: T. Roli Ilhamsyah Putra
E: teuku.roli@gmail.com
DOI: 10.25103/ijbesar.121. 04

This condition indicates the importance of increasing competence, especially knowledge/understanding of employee behaviour and work ethics in a team culture. According to Zaim et al. (2013), low competence prevents employees from mastering the job and leads to performance degradation. Conversely, greater employee competence results in higher organizational commitment that also affects employee performance (Martin et al., 2013). Spencer and Spencer (1993) noted competency indicators consisting of: 1) character / traits / traits innate; 2) motive; 3) self-concept; 4) knowledge; 5) skills.

Organizational culture has also been found to be central to achieving a maximum work commitment. Initial assessment results found that the organizational culture in General Hospital Tgk Chik Ditiro is still not quite fit for purpose. There are three factors that affect performance, one of which is attitude. Good and bad employee attitude is influenced by organizational culture because the values and norms contained in it can be used to direct employee attitude and behaviour. A good organizational culture enhances the ownership and commitment of organizational members to their organization and working groups (Robbins and Judge, 2011). According to Robbins and Judge (2012), the indicator of organizational culture involves four dimensions; these are: 1) individual initiative; 2) briefing; 3) integration; and 4) control.

Based on the above discussion, the research hypothesis can be formulated as follows:

H1: competence affects Employee commitment

H2: organizational culture affects employee commitment

2. Method

In this research, the following three variables were measured along with the relevant indicators:

1) commitment: 1) Affective Commitment: a1) I would love to spend the rest of my career in this organization; a2) I really feel as if the problem in this organization is my problem; 2) Continuance Commitment: a3) Now staying in the employ of an organization is a necessary thing, as I see fit; a4) It is very hard for me to leave this organization; 3) Normative Commitment: a5) I feel no obligation to leave my current boss; a6) I feel it's not right to leave my organization right now, even if it's profitable;
2) competency indicators consisting of: B1) Character / traits / traits innate; b2) Motive; b3) Self Concept; b4) Knowledge; b5) Skills;
3) organizational culture, that are: 1) Individual Initiative: c1) Freedom of opinion and c2) Ideas; 2) Briefing: c3) Orientation; c4) Integration Commands; 3) Integration: c5) Integration of objectives; c6) Integration of activities; 4) Control: c7) Preliminary supervision, and c8) Working supervision.

The type of research used is that of verification research using multiple linear regression analysis, by SPSS software. This research was conducted in General Hospital Tgk Chik Ditiro located in Pidie District, and the hospital's employees constitute the research population. The proportionate stratified random sampling technique was chosen because it can represent heterogeneous and subpopulations levels. In stratified proportional random sampling, the sample is taken by considering the levels in the population. The random lottery method was used for selection; employee names were noted and selected randomly according to the desired sample. In this heterogeneous population, the sample was taken proportionately to obtain the number of samples capable of representing each subpopulation (Sekaran and Bougie, 2009).

The selected one hundred (considered as a large sample in line with Roscoe's (1975) guidelines as it is larger than 30 and less than 500) respondents from the hospital's staff were asked to consider questions related to the influence of competence and organizational culture.

Based on the results in table 1, it is found that all variables, measuring instruments or instruments used in the study have a value of correlation coefficient greater than the critical value r, $\alpha = 5\%$ of 0.195. This means that all research instruments have significant internal consistency validity in measuring the measured aspect. All obtained data is therefore valid and can be used for this research.

3. Results

Table 1. Validity Test Result

Questionnaire Item	Variable	Correlation Coefficient	Critical Value (N=100)	Remark
a1	Y = Commitment	0.678	0.195	Valid
a2		0.728	0.195	Valid
a3		0.628	0.195	Valid
a4		0.675	0.195	Valid
a5		0.657	0.195	Valid
a6		0.532	0.195	Valid
b1	X1 = Competence	0.719	0.195	Valid
b2		0.726	0.195	Valid
b3		0.688	0.195	Valid
b4		0.772	0.195	Valid
b5		0.704	0.195	Valid
c1	X2 = Organizational Culture	0.724	0.195	Valid
c2		0.678	0.195	Valid
c3		0.742	0.195	Valid

c4		0.718	0.195	Valid
c5		0.706	0.195	Valid
c6		0.534	0.195	Valid
c7		0.568	0.195	Valid
c8		0.502	0.195	Valid

Source: primary data, 2018 (processed)

Table 2. Reliability Test Result

No.	Variable	Mean	Number of Indicator	Cronbach Alpha	Remark
1.	Commitment (Y)	3.9133	6	0.723	Reliable
2.	Competence (X1)	3.9060	5	0.778	Reliable
3.	Organizational Culture (X2)	4.1075	8	0.812	Reliable

Source: Primary Data, 2018 (processed).

Based on the results in table 2, the reliability of each variable used in this study can be explained; for the variable of commitment (Y), the value of Cronbach alpha is 72.3%, the competence variable (X1) is 77.3%, and the organizational culture variable (X2) is 81.2%.

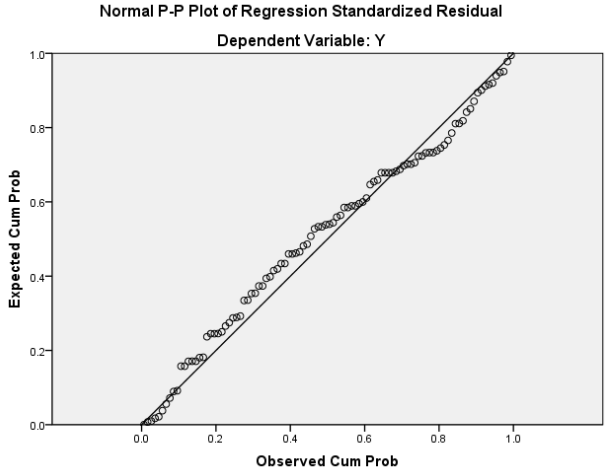


Figure 1. Normality Test

Based on the normality test, figure 1 above shows the standardized residual distribution in the range of the diagonal line. The spread of existing data to all parts of the curve can also be seen, so it can be concluded that the data has a normal distribution.

Table 3. Multicollinearity Test

Independent Variable	Collinearity Statistics		Remark
	Tolerance	VIF	
Competence	0,802	1,248	No multicollinearity
Organizational Culture	0,802	1,248	No multicollinearity

Source: Primary Data, 2018 (processed).

The results of the multicollinearity test presented in table 3 shows that all independent variables VIF < 10 and tolerance > 0.10. It can therefore be concluded that the independent variables consisting of competence and organizational culture are free from multicollinearity issues.

Table 4 reveals that for the competence variable, the t_{count} of 4.854 is greater than t_{table} of 1.984, with the significant value at 0.000, smaller than the level of confidence of 0.05. Thus, the t test results state that H_0 is rejected and Ha is accepted. This means that the partial competence variables significantly influence commitment.

The results are in line with Lotunani et al. (2014), which found that competence has a significant influence on civil servant commitment (Study on Designing Work Plans in Kendari City Government, Southeast Sulawesi). According to Faruya et al. (2007), human resource policies in the company affect the repositioning of employees globally, where the influence of skills/personal transferred skills will affect the commitment in the division of labour.

Table 4. Regression Result

Variable	Unstandardized Coefficient B	Standardized Coefficient Beta	Standard of Error	T_{count}	t_{table}	Sig.
Constant	0.996	-	0.335	2.663	1.984	0.002
Competence	0.498	0.502	0.066	4.854	1.984	0.000
Organizational Culture	0.623	0.641	0.079	7.898	1.984	0.000
Correlation Coefficient (R) = 0.798 (a)			a. Predictor variable: competency on organization culture			
Determination Coefficient (R^2) = 0.588						
Adjusted (R^2) = 0.577			b. Dependent Variable: Commitment			

Source: Primary Data, 2018 (processed).

This also agrees with Syahrum, Brahmasari and Nugroho's (2016) study of significant test results, indicating that competence significantly affects organizational commitment, which means that an increase in employee competence will have a real effect on the increase within the scope of commitment of the Makassar Government. The results of research conducted showed that competence has a positive and significant influence on the scope of organizational commitment to Makassar City Government.

For the organizational culture variable, it's observable that with t_{count} = 7.898 and t_{table} = 1.984, $t_{count} > t_{table}$, while the significant value of 0.000 is less than the 0.05 confidence level. Thus, the t test results state that H_0 is rejected and is Ha accepted. This means that the

organizational culture variables partially effects commitment.

These results are in line with findings of Patulak et al. (2013); that organizational culture has a positive and significant effect on organizational commitment (Study on Irrigation Area Management in Southeast Sulawesi). Then, also in line with Syahrum, Brahmasari and Nugroho (2016), organizational culture has a positive (significant) effect on organizational commitment within the scope of Makassar City Government.

The results also agree with McKinnon et al.'s (2003) research, and the findings of Patulak et al. (2013), extending the strong positive relationship between organizational culture (i.e. respect for others, innovation, stability and aggressiveness) with employee response (i.e. organizational commitment, job satisfaction, tendency to remain within the organization and share information). This shows the importance of the influence of organizational culture on the condition of the employee (outcome).

Based on the regression results table obtained by data processing using the SPSS 18.0 software as shown in the table above, the multiple regression equation is:

$$\mathbf{Y = 0.502\ X_1 + 0.641\ X_2 + e}$$

From this equation several things can be concluded:

1. The regression coefficient effect of 0.502 competence (X1) means that any gains in competence variable (X1) by 1 unit will raise the commitment (Y) about 0.502 or 50.2% assuming all other independent variables are constant. This suggests a positive or unidirectional relationship between the competence and the commitment variables.
2. The regression coefficient influence of organizational culture (X2) is 0.641, which means that any gains in organizational culture variable by 1 unit raises the commitment (Y) about 0.641 or 64.1%. Thus, there is a positive or unidirectional relationship between the organizational culture and the commitment variables.

The table also shows the correlation coefficient (R) is about 0.798, and an obtained determination coefficient (R^2) of 0.588. The adjusted R^2 value is 0.577 with the standard error of estimate of 0.31136. It means that the independent variables have influenced the dependent variable as much as 79.8%. The remaining 20.2% can be influenced by other variables that are not in this research.

Table 5. ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.956	2	4.478	46.191	.000[a]
	Residual	9.404	97	.097		
	Total	18.360	99			

a. Predictors: (Constant), X2, X1

b. Dependent Variable: Y

From the ANOVA in the table 5, the obtained F_{count} = 46.191 value is greater than the F_{table} = 3.23 value, while the obtained significant value of 0.000 is smaller than the level of confidence of 0.05. This means that the competence and organizational culture variables simultaneously affect commitment.

4. Conclusion

The result shows that H1 and H2 are accepted, so competence and organizational culture significantly influences commitment, both partially and simultaneously in the General Hospital Tgk Chik Ditiro. This academic finding strengthens previous theories, indeed upgrades those under new premise, based on a new object and time. The study's limitation arises from it use of only three variables and focuses only on one object. In light of further research actions, this can be expanded to the larger area, undertaken on another object, and/or add other variables to build a new research model. For practical application, this study's findings informs management that addressing improvement of employee competence and organizational culture can increase employee commitment to work.

References

Daft, Richard L.2010. New Era of Management. Canada: South-Western Cengage Learning.

Furuya, Norihito. Michael J. Stevens, Gary Oddou, Allan Birdand and Mark E. Mendenhall (2007), The Effects of HR Policies and Repatriate Self-Adjustment on Global Competency Transfer. Asia Pacific Journal of Human Resources Vol.45(1).

A. Lotunani, M.S. Idrus, E. Afnan, and M Setiawan. (2014), The Effect of Competence on Commitment, Performance and Satisfaction with Reward as a Moderating Variable (A Study on Designing Work plans in Kendari City Government, Southeast Sulawesi). International Journal of Business and Management Invention ISSN (Online): 2319 – 8028, ISSN (Print): 2319 – 801X www.ijbmi.org Volume 3 Issue 2‖ February. 2014‖ PP.18-25.

Mahmudah, Enny, Widyaningrum (2011), Influence of Motivation and Culture on Organizational

Commitment And Performance Employee of Medical Services. Academic Research International.

Martin, Effendi Patulak; Armanu Thoyib; Surachman; dan Margono Setiawan (2013), The Role of Organizational Commitment as Mediator of Organizational Culture and Employees' Competencies on Employees' Performances: A Study on Irrigation Area Management in Southeast Sulawesi. Journal of Economics and Sustainable Development, Vol.4, No.5, 166-175.

M. E. Patulak, A. Thoyib, Surachman, M. Setiawan (2013), The Role of Organizational Commitment as Mediator of Organizational Culture and Employees' Competencies on Employees' Performances (A Study on Irrigation Area Management in Southeast Sulawesi). Journal of Economics and Sustainable Development www.iiste.org ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online) Vol.4, No.5.

Robbins, Stephen P. and A. Judge, Timothy (2011), Organizational Behavior. Fourteenth Edition. Pearson education. New Jersey 07458. 77-89*.

Roscoe, J. T., (1975), Fundamental Research Statistics for the Behavioral Sciences. New York: Holt, Rinehart and Winston, Inc. hal.189-197.

Sekaran, Uma dan Roger Bougie (2009), Research Methods for Business: A Skill Building Approach 5th ed. United Kingdom: John Wiley and Sons.

Steers, R.M and Porter, L.W (1991), Motivation and Work Behavior. New. York: McGraw Hill Book Co.

Syahrum, Andi, Brahmasari, Ida, Aju dan Nugroho, Riyadi (2016), Effect of Competence, Organizational Culture and Climate of Organization to the Organizational Commitment, Job Satisfaction and the Performance of Employees in the Scope of Makassar City Government. International Journal of Business and Management Invention ISSN (Online): 2319 – 8028, ISSN (Print): 2319 – 801X. www.ijbmi.org || Volume 5 Issue 4 || April. 2016 || PP—52-64.

Zaim, H., M. F. Yaşar, O. F. Unal (2013), Analyzing the Effects of Individual Competencies On Performance: A Field Study In Services Industries In Turkey. Journal of Global Strategic Management, Vol. 1. No. 14. Page. 67-77.

IJBESAR

International Journal of Business and Economic Sciences Applied Research

Financially Constrained Firms: The Impact Of Managerial Optimism And Corporate Investment – The Case Of Greece

Dimitrios Maditinos, Alexandra Tsinani, Željko Šević and Jelena Stankevičienė

pp. 39-49

Volume 12, Issue 1

Eastern Macedonia & Thrace Institute Of Technology Press

International Journal of Business and Economic Sciences Applied Research

IJBESAR
ijbesar.teiemt.gr

Financially Constrained Firms: The Impact Of Managerial Optimism And Corporate Investment – The Case Of Greece

Dimitrios Maditinos[1], Alexandra Tsinani[1], Željko Šević[2] and Jelena Stankevičienė[2]

[1]International Hellenic University, Department of Management Science and Technology, Kavala, Greece
[2] Vilnius Gediminas Technical University, Department of Finance Engineering, Faculty of Business Management, Lithuania

ARTICLE INFO
Article History
Received 5th May 2019
Accepted 20th May 2019

JEL Classifications
D80; D81; G31; G32

ABSTRACT

Purpose

The purpose of this paper is to examine the impact of managerial optimism on corporate investment regarding the financially constrained firms for the case of Greece. Taking as a fact that managers principally are optimistic and often overconfident an effort is made to highlight the effect of this psychological bias on managerial investment decision – making.

Design/methodology/approach

The research methodology is based on the approach that the investment-cash flow sensitivity of firms with optimistic managers is more pronounced in financially constrained (equity dependent) firms. Data is gathered from the stock market as well as from balance sheets and cash flow statements for all firms of the sample. Focus is placed on every firm's annual report in order to gather all necessary data for the methodology. Additionally, stock prices are classified on an everyday basis for all firms for the years from 2007 to 2012. Fixed effects panel regression of capital expenditures on several control variables is used among all stocks of the sample's 184 non-financial firms with the highest financial constraints in order to examine the impact of the behaviour of optimistic managers to firm financial constraints.

Findings

Constrained firms exhibit a lower profitability, a lower pay-out ratio, a lower excess value, and are more likely to be financially distressed. The empirical findings clearly show that the investment-cash flow sensitivity of firms with optimistic managers is more pronounced in financially constrained (equity dependent) firms. The difference between unconstrained firms and constrained firms is that on one hand unconstrained firms, with more cash flow, tend to use debt in order to increase both their investment as well as their dividend payment, and on the other hand, constrained firms have to choose whether to apportion their cash flow to investment or dividend payments.

Research limitations/implications

In this study the regressions that were run were for the whole of the 6-year period of 2007 to 2012. However, testing each year individually could provide researchers with the ability to compare different results, to find out whether there was anything special statistically for each specific year and maybe test the period after the year 2010 when the Greek crisis had started to come up on the horizon. Additionally, supplementary research is proposed regarding the impact of managerial optimism in order to examine its impact on the whole range of decisions that managers have to make

Originality/value

As part of the literature which links psychological and economic variables to test behavioural finance models, this paper is the first to investigate managerial optimism and its impact on corporate investment in Greece. The importance of this study lie in finding how managerial decision making works within a firm, how biased a manager is when he has to make extremely important decisions regarding the firm's future performance and success, and how managerial optimism affects corporate investment decision-making especially in financially constrained firms.

Keywords:
Managerial optimism, investment, financial constraints

1. Introduction

Financing investment may not be a problem for large, well-known firms. However, many analysts believe that smaller, less well-known firms sometimes find it difficult to finance worthy projects. Banks and outside investors may be reluctant to fund unfamiliar firms, forcing these

†Corresponding Author: Dimitrios Maditinos
E: dmadi@teiemt.gr
DOI: 10.25103/ijbesar.121.05

firms to finance their investment internally. As such, these firms can be defined as financially constrained. The implications for the economy are serious if firms are financially constrained. By forcing firms to finance their own investment, financial constraints can make the economy less stable.

A growing body of evidence suggests many firms in the economy are financially constrained. Financial constraints affect both the stability and growth of the economy. By making investment spending more volatile, financial constraints make the economy more volatile. And by slowing investment spending on plant and machinery, financial constraints slow the economy's long-term growth. By making firms dependent on the availability of internal funds, financial constraints make business investment spending more volatile. Aggregate investment spending in the economy fluctuates much more than any other major component of national spending. One of the most significant predictions of the literature is that the link between managerial optimism and corporate investment is most usually encountered in financially constrained or equity-dependent firms.

Heaton (2002) find that optimistic managers prefer internal financing to external financing because they believe market investors underestimate the value of their firm and thus hesitate to raise funds from the financial markets. Several empirical studies, such as Lin et al. (2008) and Hackbarth (2008), confirm this theoretical prediction by Heaton (2002) and show that managerial optimism can explain pecking order preferences in financial decisions. Barros and Silveira (2009) further show that firms with optimistic managers will choose a more aggressive financing policy, resulting in firms that have higher leverage ratios, affecting their capital structure.

Managerial behaviour tendencies may not only affect a firm's financing decisions but also impact its investment decisions. Jensen (1986), using the concept of agency cost of free cash flow, predicts that managers may invest in negative NPV projects due to self-interest. This agency cost between managers and shareholders may thus cause overinvestment, resulting in investment distortions. Malmendier and Tate (2005a) is the first study to consider managerial optimism in corporate investment decisions. They measure the timing of CEO's stock option exercise as the proxy for CEO optimism and find that overoptimistic CEOs are significantly more responsible for the firm's cash flow. By hand-collecting data on how the press portrays each CEO as the measure of managerial optimism, Malmendier and Tate (2005b) reconfirm their findings that managerial overoptimism accounts for corporate investment distortions. Using a unique database of German companies to proxy for managerial optimism, Glaser et al. (2008) show that the investment-cash flow sensitivity is higher for firms with optimistic managers, which again supports the findings of Malmendier and Tate (2005a, b).

2. Theoretical Background

Overconfidence and optimism

The notion that specific managers may be overconfident regarding their own abilities to manage, the selection of upper investment projects and the precision of their knowledge are encouraged by psychological studies of judgement. The most significant finding in this area of study is the phenomenon of overconfidence (Tversky and Kahneman, 1986). They simply argue that overconfidence consists of factors such as the illusion of control, insensitivity to predictive accuracy, self-enhancement tendencies and finally misunderstanding of chance processes. All the above mentioned causes of overconfidence apply to the managerial decision making of mergers. Griffin and Brenner (2004) argue that all concepts that characterise overconfidence are linked.

Weinstein (1980) provides evidence that individuals are especially overconfident regarding projects to which they are highly committed. Malmendier and Tate (2005a, 2005b) argue about the potential of control and commitment concerning managers' internal investment decisions. Optimistic managers tend to invest more. However, the possible case of over-investment due to overconfidence and managerial optimism may be a source of long –run underperformance (Glaser and Weber, 2007). In his seminal paper regarding optimism Roll's (1986) *hubris hypothesis* suggests that managers share an overly optimistic opinion of their competence to create value. Hubris usually is developed after a person has lived through a period of success. Hubris refers to the extravagant confidence of people who strongly believe that their opinion is always the right one. Consequently, hubris feelings can lead to harmful and unfavourable behaviour. Especially for a manager who is seriously affected by hubris, may become a burden for their firms. As a result, these managers often trigger their own downfall. Therefore, hubris as a psychological characteristic may induce disastrous outcomes for the manager and his firm.

Generally, the *hubris hypothesis* (Roll, 1986) serves as an alternative explanation of corporate mergers and acquisitions. Hubris when referring to individual decision makers regarding bidding firms, can give an explanation on why bids are made even when there exists a positive valuation error. Therefore, bidding firms which are affected by hubris tend to pay too much for their mergers and acquisitions investment targets. According to Roll (1986) psychologists offer explanations on the fact that individuals do not always make rational decisions, under risk and uncertainty. In a series of studies (Oskamp, 1965; Tversky and Kahneman, 1981; Kahneman, Slovic and Tversky, 1982) it is observed that economists have a reputation of arrogance due to the fact that they constantly ignore the psychologists' evidence that individuals do not always act rationally. However, Roll (1986) suggests that corporate takeovers usually reflect individual decision making.

The psychology and behavioural economic literature underline self-attribution bias as the most common source of overconfidence. According to Malmendier and Tate (2005a) overconfidence is equal to over-optimism. Over-optimist managers overestimate the returns of their investment decisions and regard external funds excessively costly. Optimistic managers are at higher risk because they use to overestimate the future cash flows of their decisions.

Specifically, overconfident managers tend to consider that future outcome of mergers are under their control, especially regarding outcomes of mergers that they are

highly committed (Weinstein, 1980; Weinstein and Klein, 2002). A manager who is deceived regarding his power of control is likely to be extremely optimistic about the future prospects of a merger (Langer, 1975; Langer and Roth, 1975; and March and Shapira, 1987).

Weinstein (1980) provides evidence that individuals are especially overconfident regarding projects to which they are highly committed. Malmendier and Tate (2005a; 2005b) argue about the potential of control and commitment concerning managers' internal investment decisions. Optimistic managers tend to invest more. However, the possible case of over-investment due to overconfidence and managerial optimism may be a source of long –run underperformance (Glaser and Weber, 2007). In his seminal paper regarding optimism Roll's (1986) *hubris hypothesis* suggests that managers share an overly optimistic opinion of their competence to create value. Hubris usually is developed after a person has lived through a period of success. Hubris refers to the extravagant confidence of people who strongly believe that their opinion is always the right one. Consequently, hubris feelings can lead to harmful and unfavourable behaviour. Especially for a manager who is seriously affected by hubris, may become a burden for their firms. Therefore, hubris as a psychological characteristic may induce disastrous outcomes for the manager and his firm.

Especially regarding mergers, the bidding firms which are affected by hubris, usually pay large amounts of money for their targets (Hietala, Kaplan and Robinson, 2003). Consistent with Roll (1986) the managers who are overcome with hubris act in a way which they believe as the most proper for the best interests of their shareholders. Moreover, it is also possible that managers also gain from mergers and acquisitions which do not favour their shareholders. Therefore, private benefits tend to decrease when a manager owns a larger share of a firm's equity (Hietala *et al.*, 2003).

Another interesting point in literature is self-attribution bias as reinforcement to individual overconfidence (Langer and Roth, 1975; Miller and Ross, 1975). According to Svenson (1981) this bias is similar to the "better than average effect" which suggests that individuals believe they have above-average abilities to make the correct decisions. Since self-attribution bias amplifies overconfidence, those managers who suffer from this bias are more likely to be highly overconfident regarding their judgement and overestimate or underestimate the positive or respectively negative outcomes of a possible merger. In corporate finance, irrational agents are less likely to learn from bad experience because important corporate decisions regarding capital structure or investment policy in general, are not that frequent like trading decisions are. Russo and Schoemaker (1992; 2002) argue that managers tend to make the mistake of equating experience with learning and knowledge. Hayward (2002) argues that learning is related mostly to the quality and not the quantity of a firm's experience.

According to Doukas and Petmezas (2007) the overconfidence hypothesis states that managers are overconfident and over-invest. They also feel that are superior regarding others and more competent. Specifically, overconfident managers strongly believe that future merger outcomes are mainly under their control. A Chief Executive Officer (CEO) who suffers from delusion of control is more likely to be heavily optimistic about the future outcome of a merger. Malmendier and Tate (2005a, 2008) also try to demonstrate that overconfidence helps explain merger decisions. Positive CEO beliefs based on overconfidence and risk-seeking decisions emerge as the most well-defined ways to integrate private investment and corporate merger decisions.

Regarding firm investment and optimistic managers, Glaser et al. (2008) underline the fact that managerial optimism gives an explanation for corporate investment even when other variables are controlled for. This is mainly driven by managers' optimism regarding capital expenditures. The effects of managerial optimism on capital expenditures are stronger in small firms as well as for stocks with a low percentage of closely held shares. Still regarding acquisitions there is a difference between the fact that all managers decide together as a group and an individual manager deciding alone. Optimism of all managers significantly increases the probability of an acquisition whereas single manager's optimism alone does not.

Beber and Fabbri (2012) find that specific managerial characteristics as CEO age and education are correlated with speculation in the FX market. This finding is also consistent with Bertrand and Schoar (2003) who showed that managerial style, which is likely to be affected by managerial characteristics and significantly affects corporate financial policy. Additionally, Huang and Kisgen (2013) find that male executives make riskier financial and investment decisions than female executives. According to Kaplan et al. (2012) general CEO ability and execution skills play a significant role in buyout and venture capital transactions. Adam et al. (2014) have also addressed the concern that their optimism measure it is probably correlated with CEO characteristics that also affect risk-taking such as CEO age, tenure, gender, and education. In addition to personal managerial characteristics, executive compensation plans are likely to also affect risk-taking behavior. Older CEOs are not that likely to issue new debt that contain performance-pricing provisions in comparison to younger CEOs.

Finally, Banerjee et al. (2015) examine the fact that the promotion of overconfident executives to CEOs is a prejudiced decision firms make. The reason that firms select optimistic or overconfident CEOs is because overconfidence is indissolubly connected with policies, such as innovation and greater investments more vulnerable to risk. The motive is the belief that they will improve the firm's value, given its current situation. Additionally, consistent with prior literature they propose that overconfident CEOs might be better innovators. Banerjee et al. (2015) find support for their hypothesis that firms that are more likely to appoint optimistic and overconfident CEOs are those that are larger and are associated with lower risk.

Finance Constraint Theories

Managers no longer cope with a strict finance constraint. Even though managers often have to pay for their purchases with cash, they have the capacity to

borrow in case of lower liquidity. Due to the introduction of other assets too, the finance constraint becomes more clear and conclusive. Since money is the only asset that is involved in this model, holding of money is a very complicated procedure and usually mixed up with saving. Therefore, money-holding behaviour cannot be easily separated from money-saving behaviour.

According to Kohn (1981a) there exists a finance constraint on aggregate spending despite the fact that asset markets relieve the finance constraint on the individual. The total money available an individual has may be redistributed in order to be spent between individuals by the process of trading assets. The individual behaviour, therefore, will be consistent with the lack of the necessity to be aware of this aggregate finance constraint. The strange attributes of finance constraint models arise from the difference in the set of constraints in these models as well as the straightforward present-value inter-temporal budget constraint that managers cope with in a model implying complete financial markets.

The first attribute is a wedge which exists between purchase prices and sales prices. According to Wilson (1979) and Kohn (1984) if managers display time preference, or even when the value of money changes, the time wedge between purchase and sale will capture a price wedge too. The existence of this time wedge between purchases and sales is underlying in finance constraint models. In the case that purchases and sales would occur at the same time, finance constraints would vanish. Thus, money's only role in the formal model would be its function as a medium of exchange.

The second attribute of finance constraint models refers to the fact that agents cope with a sequence of constraints only when finance constraints are binding (Kohn, 1988). In this specific case, multiple effects are caused because of the circular flow of payments between agents. Additional attention must be made regarding financial constraint models in order for the circular flow of payments to be consistent with the notion that the spending of one agent that affects the constraints of others must be received by another. This phenomenon may constitute a specific problem for representative agent models (Fried, 1973; Stockman, 1980; Feenstra, 1985). A finance constraint model seriously involves heterogeneity of agents in order for the money outflow to be fit in with the inflow of another agent. Heterogeneity as the main substance of various distribution effects which cannot be observed in a representative agent model, usually ends up offering some very useful and important results (Kohn, 1988; Barsky *et al.*, 1997).

The question of how important finance constraints are for firms was empirically first presented in the seminal work of Fazzari, Hubbard, and Petersen (1987). Empirical models of business investment are based generally on the hypothesis of a "representative firm" which is correlated to prices set in centralised securities markets. Actually, with the assumption that all firms have the same access to capital markets, firms' reply to alterations in the cost of capital or investment motives based on tax, is different only due to changes in investment demand. External funds offer a perfect substitute for internal capital. Thus, a firm's financial structure is not relevant. Generally, a firm's investment decision making is not dependent on its financial condition, given the fact that capital markets function in a perfect way (Glaser, Lopez-de Silanes, and Sautner, 2013).

An alternative theory, however, is proposed by Fazzari, Hubbard, and Petersen (1988) who base their work on the view that internal and external capital are not perfect substitutes. Based on this point of view, investment may possibly depend on financial factors, like the availability of internal finance, the procedure of issuing new debt or equity, or the function of specific credit markets. Early investment research focused on the significance of financial considerations in business investment (Meyer and Kuh, 1957). Financial effects, actually, have drawn major attention during the early post-war period (Modigliani and Miller, 1958) regarding all areas of economic activity. The vast majority of literature, however, has secluded real firm decision making from pure financial factors.

Modigliani and Miller (1958) were the first to provide the theoretical grounds for that approach, by displaying the fact that financial structure and financial policy are irrelevant regarding investment under certain conditions. They argue that in perfect capital markets the financial structure of a firm will not affect its market value. Therefore, if their assumptions are proven, real firm decision making, with the hypothesis of the maximisation of shareholders' wealth, is not dependent on financial factors like debt leverage, dividend payments, and internal liquidity.

Hall and Jorgenson (1967) develop the neoclassical theory of investment. According to this theory, a firm's inter-temporal optimisation problem could be confronted without the need of financial factors. Firms which were assumed to cope with a cost of capital it were proved to have solved their problems without dependence on the firm's specific financial structure.

The broader and most precise definition of financial constraints, classifies firms as financially constrained when they are forced to cope with a wedge between the internal and external cost of funds (Kaplan and Zingales, 1997). With the use of this definition, however, all firms should be classified as financially constrained. Only a small transaction cost which will occur when raising external funds would be enough to classify a firm as financially constrained. However, this definition provides an important and useful pattern in order to differentiate firms based on the degree they are financially constrained. As the wedge between internal and external cost of funds increases, a firm increases its financial constraints. The classification pattern of Kaplan and Zingales (1997) therefore, is designed to isolate the differences in the degree to which firms are financially constrained. Generally, more constrained and less constrained firms are the firms which present relatively large and small amounts of liquid assets and net worth.

Kaplan and Zingales (1997) are not interested whether the wedge between internal and external cost of funds is caused by hidden information problems or agency problems (Jensen and Meckling, 1976; Myers and Majluf, 1984; Greenwald, Stiglitz, and Weiss, 1984; Hart and Moore, 1995). The purpose of their analysis is, therefore, to understand the effects of capital market imperfections on investment. Thus, they are agnostic on

identifying the source of the capital market imperfections (Blanchard, Lopez-de-Silanes and Shleifer, 1994).

3. Methodology

Research question

Research Question: The investment-cash flow sensitivity of firms with optimistic managers is more pronounced in financially constrained (equity dependent) firms. The following approach is chosen in order to test the second research question. The Kaplan-Zingales-index (Kaplan and Zingales, 1997) is used which was mainly used in past studies too. This index is meant to capture firms with high need for funds. Another index that is used is the Whited-Wu-index (Whited and Wu, 2006) which basically captures firms with high costs of external funds. Finally, we incorporate the Cleary-index (Cleary, 1999) which separates the sample into three categories of firms' dividend payment policies, as well as an index of Glaser et al. (2008) who make an addition to Cleary-index (Cleary, 1999) by adding firm size.

Sample and data

The unique sample of Greek non-financial firms listed in the ASE was tested in order to produce useful results. These results may be extremely important for managers of Greek companies in order to overcome the difficulties they face. The narrow bounds for investment and rising of firms, the general financial crisis of public as well as private sectors, make the role of Greek managers much more difficult. Therefore, the firm sample is multi-faceted. It consists of firms from 11 different industries and sectors in order to incorporate the whole substance of optimism. The process is to exclude financial firms due to the differences in the way they compile their annual reports. Thus, the 184 non-financial sample firms will be the starting point for the research, in order to produce significant results and add to the existing knowledge on this subject.

Data is gathered from the stock market as well as from balance sheets and cash flow statements for all firms of the sample. Focus is placed on every firm's annual report in order to gather all necessary data for the methodology. The next step is to classify stock prices on an everyday basis for all firms for the years from 2007 to 2012. Data is accessed from the ASE and is accumulated for every sample firm. Balance sheet data is necessary in order to formulate the basic variables that will be used in regression analysis. Balance sheet data is gathered from the web pages of all firms and is accumulated on an annual basis.

Basic regressions are run from 2005 to 2012 in order to have an analysis of the effects of managerial optimism on subsequent corporate investment, aiming to see if there is something special about the period of interest in terms of investing conditions. The main data source for stock price data is the ASE. ASE is the primary data source of studies that analyse corporate decisions in Greece.

Directors' dealings data is obtained from Directors Deals – Global Data & Analysis, a specialised global data market company which analyses and monitors all share transactions made by directors in the shares of their own company. Therefore, this work uses all the available data regarding the Greek case for the period of 6 years (2007 to 2012). During this period a total of 18,575 directors' dealings are reported. Due to the fact that this study focuses on the transaction behaviour of individuals, all transactions that were executed by legal entities are excluded. The procedure is to maintain only the transactions that are described as buys or sells and exclude awards, contract buys, transfer ins and outs, transfers, div re, exercise, sale-post exercise, given away and subscribe.

Financial constraints measures

One of the most significant predictions of the literature is that the link between optimism and corporate investment is most usually encountered in financially constrained or equity-dependent firms. The most used index and consequently the most used methodology on financial constraints is of Kaplan and Zingales (1997). Their index is mainly designed for identifying firms with high need for funds However, there are other indices too that have emerged in relative literature such as the Cleary-index (Cleary, 1999) and the Whited-Wu-index (Whited and Wu, 2006). Both indices are supposed to capture firms with high costs of external funds.

This study opts to choose the following approach. As in Glaser *et al.* (2008) the Kaplan-Zingales-index (Kaplan and Zingales, 1997) is used as well as the Whited-Wu-index (Whited and Wu, 2006) in order to capture the differences in their approaches regarding financial constraints; the high need of funds as well as the high costs of external funds respectively. These indices have been constructed for the US stocks only. However, there are several studies in literature which incorporate these indices for firms in Europe. Bris, Koskinen and Nilsson (2006) focus on the identification of financially constrained firms in Germany and the rest of Europe with the use of Kaplan-Zingales-index (Kaplan and Zingales, 1997). These indices are displayed below, as they were presented in Glaser *et al.* (2008):

$$\text{Kaplan-Zingales-index} = -1.001909 * \frac{\text{cash flow}}{\text{total capital}} + 0.2826389 * \text{Tobin's Q} + 3.139193 * \text{Leverage} - 39.3678 * \frac{\text{dividend}}{\text{total capital}} - 1.314759 * \frac{\text{cash}}{\text{total capital}} \quad (1)$$

Kaplan and Zingales (1997) measure investment or capital expenditures using COMPUSTAT item 128. They also measure cash flow as the sum of earnings before extraordinary items and depreciation. They deflate investment and cash flow by capital, measured as net property, plant, and equipment at the beginning of the fiscal year. Finally, they measure Tobin's Q as the market value of assets divided by the book value of assets where the market value of assets equals the book value of assets plus the market value of common equity minus the sum of the book value of common equity and balance sheet deferred taxes.

$$\text{Whited-Wu-index} = -0.091 * \frac{\text{cash flow}}{\text{total assets}} - 0.062 * \text{dummy (positive dividend)} + 0.021 * \frac{\text{long term debt}}{\text{total assets}} - 0.044 * \ln(\text{total assets}) + 0.102 * \text{industry sales growth} - 0.035 * \text{sales growth} \quad (2)$$

As an additional financial constraint measure the Cleary-index (Cleary, 1999) is used. The method of Cleary (1999) suggests that the sample of US firms is divided into three subsamples according to the dividend payment policy which is being followed be each sample firm. The first group consists of firms which increase dividends and are likely not financially constrained. The second group consists of firms which cut dividends and are likely financially constrained, while the third group consists of firms which do not change their dividend payment policy. His basic tool is a discriminant analysis he performs in order to discover firm characteristics that are related with the categorisation of firms into the above mentioned three groups.

To calculate Cleary-index (Cleary, 1999) with Greek coefficients is needed a "dummy" variable is needed as the dependent variable. This "dummy" variable takes the value of 1 if a firm increases dividends and takes the value of 0 if a firms decreases dividends. This variable is controlled for current ratio, fixed charge coverage, financial slack divided by lagged capital, net income margin, sales growth, and the debt ratio. To create the index all coefficients of variables that are significant at the 5 per cent level are used.

Consistent with Glaser *et al.* (2008) it is expected that this fourth index will best rank Greek firms in analysing the link between managerial optimism and corporate investment for financially constrained firms due to the fact that it is calibrated for a European country (Germany) and thus may serve as a better proxy for the Greek case too. Moreover, it includes the natural logarithm of assets to incorporate firm size to capture one significant case of financial constraints, the high costs of external funds.

Financial constraints scores with the calculation of Cleary-index (Cleary, 1999)

A Probit regression is run in order to calculate the Cleary-index (Cleary, 1999). The choice is this type of regression, due to the fact that the dependent variable is dichotomous and can only take two values. The dependent variable is a "dummy" variable that takes the value 1 if the firm increases dividends, and takes the value 0 if the firm cuts dividends. Our dependent variable is regressed across several independent variables. Current ratio, fixed charge coverage, financial slack divided by lagged capital, net income margin, sales growth, long term debt divided by total assets, and the natural logarithm of total assets.

The regression equation that arises with the use of the Probit regression is presented below. It has a similar form with the linear regression equation with the difference that the dependent variable Y takes the form of $\Phi^{-1}(\pi)$ because Y cannot be observed; only the consequences of Y can be observed. If Y is below a certain level, one is able to observe a success. Otherwise, we are forced to observe a failure. The regression of the dependent variable Y on several independent variables X_1, X_2, ..., X_7, displays how the boundaries between success and failure change with the incorporation of the independent variables X. The area under the normal curve below the values of the dependent variable Y, is the probability of a success for the controlling independent variables X. As the values of X change, the boundary values of Y_x change, having as a result the change of the probability of success. Formally, the area under the curve less than Y (the standard normal cumulative function) is denoted as:

$$\Phi(y) = \int_{-\infty}^{Y} \frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}} dx \quad (3)$$

Thus, the Probit linear regression model can be written as:

$$\pi = \Phi(b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7) \quad (4)$$

This equation gives the model the form of the inverse link. One can, therefore, write the Probit model in terms of the link function as follows:

$$\text{Probit}(\pi) = \Phi^{-1}(\pi) = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + \varepsilon \quad (5)$$

$\Phi^{-1}(\pi)$ = the value of the dependent variable ("dummy" variable)

X_1, X_2, ..., X_7 = the values of the independent variables (current ratio, fixed charge coverage, financial slack/lagged capital, net income margin, sales growth, long term debt/total assets, and the natural logarithm of total assets)

b_0 = constant

b_1, b_2,..., b_7 = coefficients

ε = the error term

Optimism and financial constraints

Fixed effects panel regression of capital expenditures on several control variables is used for the one third of all stocks with the highest financial constraints as identified by the indices of Kaplan and Zingales (1997), Whited and Wu (2006), Cleary (1999), and Glaser *et al.* (2008) in order to examine the impact of the behaviour of optimistic managers to firm financial constraints. The methodology followed is the one of Glaser *et al.* (2008) and, thus, the firms are separated according to how financially constrained they are. It states that the investment-cash flow sensitivity of firms with optimistic managers is more pronounced in financially constrained (equity dependent) firms. The classification of managers into optimistic and not optimistic is done by the use of the managerial "dummy" variable. The "dummy" variable is equal to 1 when members of the Executive Board and the Supervisory Board (ALL), only the Executive Board (EB), or only CEO are classified as optimistic in a given year.

The next step is to assess the constraint scores on all three groups of managers of the study (ALL, EB, and CEO) and run several regressions with dependent variable the capital expenditures divided by lagged assets. The choice is to use as independent variables cash flow divided by lagged assets, lagged Tobin's Q, managerial optimism, as well as the optimism × (cash flow/lagged assets) based on the methodology of Malmendier and Tate (2005a). This new independent variable is constructed to test, due to the fact that Glaser and Hirn (2007) showed that firms which display the

highest financial constraints normally do not display the highest investment-cash flow sensitivity, and therefore it is not possible to split the sample in optimistic managers and not optimistic managers. All regressions include firm and year fixed effects and the time period tested is 2007 to 2012.

Therefore, for the dependent variable CAPEX/lagged assets (dependent or criterion) and the independent variables (independent or predictors) cash flow/lagged assets, lagged Tobin's Q, managerial optimism, and optimism × (cash flow/lagged assets) the regression equation that arises with the use of the least square methods has the next form:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \varepsilon \quad (6)$$

Y = the values of the dependent variable (CAPEX/lagged assets)

X_1, X_2,...,X_4 = the values of the independent variables [cash flow/lagged assets, lagged Tobin's Q, managerial optimism, and optimism × (cash flow/lagged assets)]

b_0 = constant

b_1, b_2,...,b_4 = coefficients

ε = the error term

4. Empirical Findings

Descriptive statistics of financial constraints

Table 1 presents descriptive statistics of different firm characteristics for constraint terciles (low, middle and high levels of constrained firms) that are based on all four indices that were analysed above. The results confirm the results of Glaser and Hirn (2007) and Glaser et al. (2008). Constrained firms exhibit a lower profitability, a lower pay-out ratio, a lower excess value (natural logarithm of the ratio of a firm's actual value to its imputed value), and are more likely to be financially distressed.

The results based on Kaplan-Zingales-index (Kaplan and Zingales, 1997) show a difference in values of Tobin's Q. Firms with high financial constraint values exhibit lower values of Tobin's Q when compared to firms belonging to groups with low and middle financial constraint scores. Moreover, the ratio of capital expenditures divided by lagged assets also displays a downward trend for financially constrained firms. This can be interpreted in the way that financially constrained firms usually cope with a wedge between the internal and external cost of funds. When the wedge between the internal and external cost of funds increases, a firm is considered to be more financially constrained.

Sales growth is another variable that must be analysed since it depicts the progress of a firm regarding its sales as well as its general performance. Sales growth is an indicator which is considered positive for a firm's profitability as well as survival, since it may result in higher stock prices, or increased dividend payments for shareholders. Measured for all three groups of financial constraints (low, middle, and high degree) with the Kaplan-Zingales-index (Kaplan and Zingales, 1997) it can be seen that sales growth of financially constrained firms is importantly lower than sales growth of firms which are not financially constrained.

It seems that financial constraints exhibit a significant power to resist to the profitability of firms, to their growth of sales and excess value. Even firm size does not play an important role in this analysis for financially constrained firms using the Cleary-index (Cleary, 1999). To summarise, descriptive statistics provide us with some very useful results. Consistent with prior literature of Glaser and Hirn (2007) and Glaser et al. (2008) this work finds that financially constrained firms display a lower profitability, a lower pay-out ratio, and are more likely to become financially distressed than firms with middle or low levels of financial constraints. This is unambiguous since being financially constrained a firm has to cope with a significant wedge between the internal and external cost of funds. When this wedge between the internal and external cost of funds increases, a firm is considered to be more financially constrained.

According to Kaplan and Zingales (1997) higher investment-cash flow sensitivities are considered as evidence of higher financing constraints. On one hand it is easy to show that constrained firms are sensitive to internal cash flow. On the other hand, it is not that obvious that the extend of the sensitivity increases in the degree of financing constraints. However, one should underline the fact that investment is sensitive to cash flow for most of the firms analysed in this sample. This can be interpreted in the way that external funds cost more than internal funds for all firms with the necessary condition of the involvement of transactions costs.

Financial constraints and the effects of managerial optimism

Cash flow is generally highly correlated with investment opportunities. Constrained firms when there are favourable investing opportunities, also tend to invest more and consequently issue additional debt to finance these opportunities. Additionally, Tobin's Q as well as managerial optimism as independent variables also display lower coefficient statistic values when compared to the whole sample firms. This result is consistent with Kaplan and Zingales (1997), Cleary (1999, 2006) and Glaser and Hirn (2007).

However, the regression specification does not take into account the effect of debt financing. As a consequence, the investment-cash flow sensitivity of unconstrained firms is enlarged. The difference between unconstrained firms and constrained firms is that on one hand unconstrained firms, with more cash flow, tend to use debt in order to increase both their investment as well as their dividend payment, and on the other hand, constrained firms have to choose whether to apportion their cash flow to investment or dividend payments. Therefore, the link between investment and cash flow sensitivity is weaker for constrained firms (Moyen, 2004).

The focus is on the newly added control variable of *optimism* × (cash flow divided by lagged assets) that was previously introduced. The constraint scores that are of particular interest are the ones based on the index of Glaser *et al.* (2008). As thoroughly analysed in the previous chapter, the most appropriate index to examine the financial constraints of the sample firms is the Glaser-Schafers-Weber-index (Glaser *et al.*, 2008). It contains the natural logarithm of total assets in order to

capture the essence of firm size in the results. It has already been tested for German firms and as Glaser *et al.* (2008) state, this index is the most suitable to be used for European firm samples. For this reason, the focus is placed on the results of the last three regressions (10 to 12).

Table 1: Characteristics of financial constraints scores

Method of constraints calculation		Kaplan Zingales			Whited Wu			Cleary			Own		
Constraints		Low	Middle	High	Low	Middle	High	Low	Middle	High	Low	Middle	High
Lagged Tobin's Q	Mean	1.655	1.474	1.406	1.414	1.679	1.408	1.399	1.408	1.396	1.457	1.543	1.432
	Median	1.580	1.430	1.400	1.430	1.630	1.420	1.410	1.410	1.390	1.425	1.412	1.395
Total asset (thousand Euro)	Mean	125,580	106,300	77,500	109,220	132,770	108,980	106,960	108,010	105,650	135,630	135,430	132,900
	Median	129,500	110,460	108,060	109,750	134,720	109,420	106,820	73,430	104,710	106,220	130,110	125,400
Cash flow/lagged assets	Mean	1.981	1.582	1.566	0.439	0.685	0.455	1.070	0.593	0.455	1.342	1.314	1.298
	Median	0.670	0.480	0.440	0.420	0.680	0.460	0.135	0.600	0.450	0.245	0.298	0.266
CAPEX/lagged assets	Mean	0.078	0.046	0.046	0.047	0.077	0.047	0.047	0.047	0.046	0.055	0.232	0.049
	Median	0.070	0.050	0.050	0.050	0.070	0.050	0.050	0.050	0.050	0.051	0.046	0.056
EBIT/lagged assets	Mean	-0.070	-0.063	-0.002	-0.070	-0.007	-0.070	-0.072	-0.066	-0.074	-0.063	-0.053	-0.065
	Median	-0.074	-0.065	-0.003	-0.076	-0.010	-0.078	-0.074	-0.066	-0.076	-0.058	-0.053	-0.064
Firm age	Mean	15.463	15.449	15.534	15.520	15.548	15.542	15.420	15.160	15.632	14.898	14.685	14.885
	Median	15.673	16.675	15.895	15.233	16.548	16.473	15.432	15.549	16.562	15.865	14.755	14.765
Sales growth	Mean	0.270	0.210	0.150	0.230	0.260	0.190	0.440	0.280	0.190	0.430	0.180	0.120
	Median	0.142	0.147	0.152	0.166	0.174	0.167	0.160	0.146	0.129	0.157	0.157	0.153
Cash/lagged assets	Mean	0.128	0.091	0.080	0.124	0.118	0.089	0.146	0.145	0.124	0.119	0.149	0.112
	Median	0.110	0.080	0.170	0.140	0.080	0.170	0.120	0.050	0.170	0.160	0.120	0.120
Pay-out ratio (dividend payment/assets)	Mean	0.015	0.023	0.014	0.018	0.029	0.016	0.021	0.008	0.005	0.028	0.029	0.006
	Median	0.017	0.016	0.000	0.015	0.019	0.000	0.004	0.008	0.000	0.006	0.017	0.000
Excess value	Mean	0.170	0.140	-0.170	0.050	0.070	-0.250	-0.180	-0.250	-0.140	0.020	0.050	-0.230
	Median	0.166	0.145	0.000	0.057	0.081	0.000	-0.169	-0.241	0.000	-0.018	-0.039	0.000
Pay-out ratio in (dividend payment/earnings)	Mean	13.760	15.000	4.150	3.590	9.110	2.220	12.190	11.790	3.330	10.780	9.350	9.340
	Median	0.700	0.570	0.630	0.660	0.750	0.620	0.620	0.660	0.500	0.720	0.500	0.700
Leverage ratio	Mean	0.620	0.580	0.530	0.690	0.690	0.490	0.660	0.590	0.520	0.710	0.640	0.570
	Median	-0.070	-0.002	-0.063	-0.070	-0.007	-0.070	-0.066	-0.074	-0.072	-0.065	-0.053	-0.063

This table shows several characteristics of constraints terciles as indentified by the Kaplan-Zingales-index, the Whited-Wu-index, the Cleary-index (with own coefficients) and Glaser-Schafers-Weber-index. All variables are winsorised at the 1 per cent level.

The next step is to test the new optimism control variable that was introduced in the regression model (Table 1). One can observe that for the Glaser-Schafers-Weber-index (Glaser *et al.*, 2008) the optimism × (cash flow divided by lagged assets) variable is significant in all regressions for all three groups of managers (All, Executive Board, and CEO). This control variable is significant in ALL regressions for the Kaplan-Zingales-index (Kaplan and Zingales, 1997) as well as for the Whited-Wu-index (Whited and Wu, 2006), and in CEO regression for the Cleary-index (Cleary, 1999). The results are similar when lagged constrained measures are incorporated. It is not surprising, though, due to the fact that there is some persistence of the ranking of firms over time (Glaser and Hirn, 2007).

However, not consistent with Glaser *et al.* (2008) is the fact that there is no strong evidence regarding optimism and CEO transactions. The stronger results of Glaser *et al.* (2008) are found for the regressions when optimism is based on CEO transactions. This work's findings, therefore, do not consolidate the fact that CEOs play a key-determinant role in firm performance and corporate outcomes (Bertrand and Schoar, 2003; Bennedsen, Perez-Gonzalez and Wolfenzon, 2006).

Interestingly, as already mentioned above in regressions using the Glaser-Schafers-Weber-index (Glaser *et al.*, 2008) all *optimism* × *cash flow* variables are significantly related with capital expenditures (regressions 10 to 12). This work, therefore, is able to state that the investment-cash flow sensitivity of firms with optimistic managers is more pronounced in financially constrained (equity dependent) firms, and thus confirm research question of this study.

Table 2: Empirical results: Optimism and financial constraints

Constraints score Optimism based on	Kaplan-Zingales			Whited-Wu			Cleary			Glaser-Schafers-Weber		
	All	EB	CEO	All	EB	CEO	All	EB	CEO	All	EB	CEO
	1	2	3	4	5	6	7	8	9	10	11	12
Cash flow/lagged Assets	0.008	0.010	0.014	0.010	-0.008	0.012	0.012	0.012	0.016	0.011	0.012	0.010
	(0.009***	(0.008***	(0.007***	(0.030**	(0.028**	(0.006***	(0.000***	(0.000***	(0.000***	(0.000***	(0.000***	(0.000***
Lagged Tobin's Q	0.070	0.023	0.010	0.067	0.019	0.010	0.036	0.037	0.035	0.039	0.036	0.043
	(0.007***	(0.004***	(0.007***	(0.008***	(0.005***	(0.010***	(0.000***	(0.000***	(0.000***	(0.000***	(0.000***	(0.000***
Managerial Optimism	-0.088	-0.012	-0.006	-0.022	0.011	-0.005	0.001	-0.001	0.003	0.004	0.005	0.002
	(0.005***	(0.005***	(0.007***	(0.009***	(0.005***	(0.005***	0.495	0.741	0.309	0.234	0.297	0.559
Optimism * (cash flow/lagged assets)	-0.090	0.003	0.110	-0.020	0.012	0.005	0.003	0.134	0.200	0.212	0.122	0.220
	(0.030**	0.857	0.118	(0.050**	0.129	0.435	0.524	0.170	(0.060*	(0.070*	(0.100*	(0.070*
Constant	0.046	0.044	0.049	0.047	0.044	0.050	-0.015	-0.016	-0.014	-0.023	-0.019	-0.027
	(0.000***	(0.000***	(0.000***	(0.000***	(0.000***	(0.000***	(0.000***	(0.000***	(0.019**	(0.000***	(0.076*	(0.000***
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Cases	1202	588	614	1202	699	503	1187	663	524	1175	754	421
Firms	61	61	61	61	61	61	61	61	61	61	61	61
Adjusted R-squared	0.393	0.189	0.261	0.347	0.280	0.238	0.181	0.351	0.181	0.273	0.196	0.447

This table shows fixed effects panel regression results of capital expenditures on several control variables for the one third of all firms with the highest financial constraints as identified by the Kaplan-Zingales-index, the Whited-Wu-index, the Cleary-index (with own coefficients), and Glaser-Schafers-Weber-index. The dependent variable is capital expenditures divided by lagged assets. In all regressions, we analyse cash flow divided by lagged assets and lagged Tobin's Q as control variables. Furthermore, we also include an optimism "dummy" variable and Optimism * (cash flow divided by lagged assets) as explanatory variables. The "dummy" variable is equal to 1 when members of the EB and SB (ALL), only the EB, or only CEOs are classified as optimistic in given year. All regressions include firm and year fixed effects. Time period is 2007-2012. All variables are winsorised at the 1 per cent level. Robust p-values are in parentheses. *** indicates significance at 1 per cent, ** indicates significance at 5 per cent and * indicates significance at 10 per cent.

5. Conclusions

Research in the field of Behavioural Finance and optimism as a cognitive, personal characteristic, is a rapidly developing field. Usually, optimism is correlated with positive outcomes for the independent director (Ravina and Sapienza, 2010) as well as for his firm too. However, the extensive use of optimism in all aspects of everyday life can prove disastrous since over-optimism may often be associated with negative outcomes too. Yet, it should be underlined that being moderately optimistic regarding a future event may induce great personal profits.

It is widely accepted by researchers that managers principally are optimistic. They display optimism in every single aspect of their career. Often, optimism slips into overconfidence and arrogance inducing unfavourable outcomes for the manager and his firm. If the term "hubris" is used for every action of a manager which incorporates overconfidence, one is easily able to see that this "hubris" may often lead the manager to face his personal downfall, not only his firm's decline.

The investment-cash flow sensitivity has also been examined in this thesis regarding the impact of financial constraints on investment. The general assumption that exists is based on the statement that the sensitivity of investment to cash flow should be higher for financially constrained (equity dependent) firms. These firms are forced to cope with the monotonicity hypothesis which implies that there is a wedge between the internal and external costs of funds. The use of investment-cash flow sensitivity, therefore, has become something of a standard in recent years as far as corporate finance literature is concerned (Shin and Stulz, 1998; Malmendier and Tate, 2005a; Almeida and Campello, 2007; Glaser *et al.*, 2008).

This study added to the existing literature on the field of managerial optimism, by examining its impact on corporate investment for the case of Greece. As part of the literature which links psychological and economic variables to test behavioural finance models, this study is the first to investigate managerial optimism and its impact on corporate investment in Greece. The importance of this study lied in finding how managerial decision making works within a firm, how biased a manager is when he has to make extremely important decisions regarding the firm's future performance and success, and how managerial optimism affects corporate investment decision making.

Additionally, this work confirmed the Research Question too. Financially constrained firms compared to the whole sample of firms did not display high investment-cash flow sensitivities. Constrained firms when there are favourable investing opportunities, have the tendency to invest more. They tend to issue more debt in order to be able to finance these advantageous investing opportunities. Moreover, there was no strong evidence regarding optimism and CEOs' transactions. This work's findings did not justify the fact that a CEO plays

a significant role in corporate firm performance. Therefore, in financially constrained firms, the investment-cash flow sensitivity with optimistic managers was more noticeable. The fact that a firm is financially constrained implies that optimistic managers affect cash flow of investment at a higher level than managers who are not optimistic. Again, optimism as a managerial cognitive characteristic played an important role in corporate investment decision making.

References

Adam, T. R., V. Burg, T. Scgeinert and D. Streitz (2014), Managerial Optimism and Debt Contract Design: The Case of Syndicated Loans, *Discussion Paper Series of SFB/TR 15 Governance and the Efficiency of Economic Systems from Free University of Berlin, Humboldt University of Berlin, University of Bonn, University of Mannheim, University of Munich.*

Almeida, H. and M. Campello (2007), Financial constraints, asset tangibility, and corporate investment, *Review of Financial Studies*, **20**(5), 1429-1460.

Baccar, A. B. M. Ezzeddine and A. Bouri (2013), Managerial Optimism, Overconfidence and Board Characteristics: Toward a New Role of Corporate Governance, *Australian Journal of Basic and Applied Sciences*, **7**(7), 287-301.

Barros, L. A. B. and A. Silveira (2009), Overconfidence, managerial optimism and the determinants of capital structure, *Brazilian Review of Finance*, **6**(3), 293-335.

Beber, A. and D. Fabbri (2012), Who times the foreign exchange market? Corporate speculation and CEO characteristics, *Journal of Corporate Finance*, **18**(5), 1065 – 1087.

Bennedsen, M., F. Perez-Gonzalez and D. Wolfenzon (2006), *Do CEOs matter?*, Working Paper No FIN-06-032, New York: New York University.

Berger, P. G. and E. Ofek (1995), Diversification's effect on firm value, *Journal of Financial Economics*, **37**(1), 39-65.

Bertrand, M. and A. Schoar (2003), Managing With Style: The Effect of Managers on Firm Policies, *Quarterly Journal of Economics*, **118**(4), 1169-1208.

Bris, A., Y. Koskinen and M. Nilsson (2006), The Real Effects of the Euro: Evidence from Corporate Investments, *Review of Finance*, **10**(1), 1-37.

Chandler, A. D., (1977), *The Visible Hand*, Cambridge: Belknap Press.

Cleary, S. (1999), The Relationship between Firm Investment and Financial Status, *Journal of Finance*, **54**(2), 673-692.

Doukas, J. A. and D. Petmezas (2007), Acquisitions, Overconfident Managers and Self-attribution Bias, *European Financial Management*, **13**(3), 531-577.

Fazzari, S., R. G. Hubbard and B. C. Petersen (1988), Financing constraints and corporate investment, *Brookings Papers on Economic Activity*, **0**(1), 141-195.

Glaser, M. and C. Hirn (2007), *The Measurement of Corporate Financial Constraints*, Working Paper, Mannheim: University of Mannheim.

Glaser, M. and M. Weber (2007), Overconfidence and Trading Volume, *Geneva Risk and Insurance Review*, **32**(1), 1-36.

Glaser, M. and S. Muller (2010), Is the Diversification Discount Caused by the Book Value Bias of Debt?, *Journal of Banking and Finance*, **34**(10), 2307-2317.

Glaser, M., P. Schafers and M. Weber (2008), Managerial optimism and corporate investment: Is the CEO alone responsible for the relation?, AFA 2008 New Orleans Meetings Paper.

Griffin, D. and L. Brenner (2004), Perspectives on probability judgment calibration, in: D. J. Koehler and N. Harvey, eds. *Blackwell Handbook of Judgment and Decision Making*, Oxford: Blackwell, 177-199.

Hackbarth, D. (2008), Managerial traits and capital structure decisions, *Journal of Financial and Quantitative Analysis*, **43**(4), 843-882.

Heaton, J. B. (2002), Managerial Optimism and Corporate Finance, *Financial Management*, **31**(2), 33-46.

Huang, J. and D. J. Kisgen (2013). Gender and corporate finance: Are male executives overconfident relative to female executives? *Journal of Financial Economics*, **108**, 822–839.

Jensen, M. (1986), Agency costs of free cash flow, corporate finance, and takeovers, *American Economic Review*, **76**(2), 323-329.

Kahneman, D., P. Slovic and A. Tversky (1982), *Judgement under Uncertainty: Heuristics and Biases*, Cambridge: Cambridge University Press.

Kaplan, S. N. and L. Zingales (1997), Do Investment-cash flow Sensitivities Provide Useful Measures of Financing Constraints, Quarterly Journal of Economics, 112(1), 169-215.

Kaplan, S. N., M. M. Klebanov, and M. Sorensen (2012), Which CEO characteristics and abilities matter? Journal of Finance 67, 973–1007.

Lang, L. H. P. and R. E. Stulz (1994), Tobin's q, corporate diversification and firm performance, *Journal of Political Economy*, **102**(6), 1248-1280.

Lin, Y., S. Hu and M. Chen (2008), Testing pecking order prediction from the viewpoint of managerial optimism: Some empirical evidence from Taiwan, *Pacific-Basin Finance Journal*, **16**(1-2), 160-181.

Malmendier, U. and G. Tate (2005a), CEO Overconfidence and Corporate Investment, *Journal of Finance*, **60**(6), 2661-2700.

Malmendier, U. and G. Tate (2005b), Does overconfidence affect corporate investment? CEO overconfidence measures revisited, *European Financial Management*, **11**(5), 649-659.

Malmendier, U. and G. Tate (2008), Who makes acquisitions? CEO overconfidence and the market's reaction, *Journal of Financial Economics*, **89**(1), 20-43.

Moyen, N. (2004), Investment-cash flow Sensitivities: Constrained versus Unconstrained Firms, *Journal of Finance*, **59**(5), 2061-2092.

Myers, S. C. (1977), The determinants of corporate borrowing, *Journal of Financial Economics*, **5**(2), 147-175.

Oskamp, S. (1965), Overconfidence in case study judgements, The *Journal of Consulting Psychology*, **29**(3), 261-265.

Ravina, E. and P. Sapienza (2010), What do independent directors know? Evidence from their trading, *The Review of Financial Studies*, **23**(3), 962-1003.

Roll, R. (1986), The hubris hypothesis of corporate takeovers, *The Journal of Business*, **59**(2), 197-216.

Shin, H. and R. Stulz (1998), Are internal capital markets efficient?, *Quarterly Journal of Economics*, **113**(2), 531-552.

Stulz, R. M. (1990), Managerial discretion and optimal financing policies, *The Journal of Financial Economics*, **26**(1), 3-27.

Tversky, A. and D. Kahneman (1981), The framing of decisions and the psychology of choice, *Science*, **211**(4481), 453-458.

Tversky, A. and D. Kahneman (1986), Rational choice and the framing of decisions, *The Journal of Business*, **59**(4), 251-278.

Villalonga, B. (2004a), Diversification discount or premium? New evidence from the business information tracking series, *The Journal of Finance*, **59**(2), 475-502.

Villalonga, B. (2004b), Does diversification cause the 'diversification discount'?, *Financial Management*, **33**(2), 5-27.

Weinstein, N. D. (1980), Unrealistic optimism about future life events, *The Journal of Personality and Social Psychology*, **39**(5), 806-820.

Weston, J. F. (1970), The nature and significance of conglomerate firms, *St John's Law Review*, **0**(44), 66-80.

Whited, T. M. and G. Wu (2006), Financial Constraints Risk, *Review of Financial Studies*, **19**(2), 531-559.

IJBESAR

International Journal of Business and Economic Sciences Applied Research

Public Spending and Economic Growth in Latin America Countries: A Panel Fixed Effect Analysis

Yobouet Thierry Bienvenu Gnangoin1, Akadje Jean-Roland Edjoukou and Diby François Kassi pp. 50-63

Volume 12, Issue 1

Eastern Macedonia & Thrace Institute Of Technology Press

International Journal of Business and Economic Sciences Applied Research

IJBESAR
ijbesar.teiemt.gr

Public Spending and Economic Growth in Latin America Countries: A Panel Fixed Effect Analysis

Yobouet Thierry Bienvenu Gnangoin[1], Akadje Jean-Roland Edjoukou[2]and Diby François Kassi[3]

[1]School of Economics, Dongbei University of Finance and Economics, Dalian (116025), China

[2]School of Accounting, Dongbei University of Finance and Economics, Dalian (116025), China

[3]School of Finance, Dongbei University of Finance and Economics, Dalian (116025), China

ARTICLE INFO

Article History

Received 27th April 2019

Accepted 13th May 2019

JEL Classifications

H52, H54, O47, O54

Keywords:

Public spending, Panel fixed effect, Panel causality test

ABSTRACT

Purpose

This article studies the effects of public expenditure on economic growth in Latin America countries (LAC), especially the role played by foreign aid and public and private investment

Design/methodology/approach

Granger causality approach and Fixed effect method.

Findings

There is bidirectional causality between investment climate improvement, domestic investment and economic growth. Also, private investment, population growth rate, investment climate improvement and corruption reduction lead these countries economic growth.

Research limitations/implications

In these countries, to manage economic growth governments have to pay attention on population growth rate , level of corruption, domestic and private investment

Originality/value

There are numerous studies regarding the impact of public spending on economic growth, but this study focus on developing countries especially on one area which is Latin America Countries. Also, it shows that ,additionally to private investment ,domestic investment, population growth rate and corruption are economic growth determinants in this area

1. Introduction

Public expenditure refers to expenditure incurred by the government, social security administrations, local authorities and the administrations and bodies attached to them. It acts as an economic lever. It can be classified into three categories: operating expenditure, which is used to improve the running of public services without any improvement (current expenditure on personnel and maintenance); transfer costs, mainly the provision of public services such as hospitalization or free education; or in cash (e.g business subsidies, pensions, family allowances, minimum social benefits, etc.).

Taxation (government revenue) and government expenditure are the two tools of public policy. Neither of excess is good for the society, it has to be balanced to achieve maximum social benefit. (*Dalton, 1992)* called

[1]Corresponding Author: Yobouet Thierry Bienvenu Gnangoin[1]

E: thierrybienvenu2010@yahoo.f

DOI: 10.25103/ijbesar.121.06

this principle as "Maximum Social Advantage" and (*Pigou, 1912)* termed it as "Maximum Aggregate Welfare". According to its theory, determination of public expenditure and taxation will happen on the basis of public preferences. The cost of supplying a good is then taken up by the people. So, government has to be careful because this expenditure can have some effects on economic growth and population human development. In fact, the conventional wisdom is that a large government spending is a source of economic instability or stagnation.

Empirical research, however, does not conclusively support the conventional wisdom because many analyses about the effect of public expenditure on economic growth gave different answers. Some studies reported positive and significant relation between government spending and economic growth while several others found significant negative or even no relation between an increase in government spending and economic growth in real output. In our case, we use an adapted production function based on the neoclassical growth theory developed in the 19th century. This theory states that economic growth rate can be accomplished with the proper amounts of the three driving forces: labor, capital and technology. The neoclassical growth theory is based on the understanding that the accumulation of capital within an economy, and the ways in which people use that capital, is important for economic growth.

The production function of neoclassical growth theory is generally depicted as:

$Y = AF(K, L)$ or $Y = F(K, AL)$.

"Y" denotes an economy's gross domestic product *(GDP)*; "K" represents its share of capital; "L" describes the amount of unskilled labor in an economy; and "A" represents a determinant level of technology.

The adapted model is quite different because in this model, variables have been modified to reach our objectives which are to determine the nature and the direction of the relationship between public expenditure and economic growth rate in Latin America Countries.

So, in our case variables are: annual growth rate in real gross domestic product *(GDPGR)*, private investment as percent of gross domestic product *(PI)*, annual percentage change in population *(PGR)*, human capital *(HUM)*, government expenditure for domestic investment improvement as percent of GDP *(GI)*, government expenditure for infrastructures *(INF)*, government expenditure for institutional quality *(INS)*, government expenditure for investment climate improvement *(INV)*, government expenditure for corruption reduction *(CORR)*, government expenditure for governance quality *(GOV)*, net official development assistance from all donors as percent of recipient GDP *(ODA)*, annual percentage change in the ratio of the sum of export and imports to GDP, a proxy for trade-openness *(TO)*.

In this study, the analysis is conducted in two steps: The first step consists in analyzing the evolution trend ofthe main variables while the second step, by using an econometric method, examines the effects of private and public spending on economic growth.

The interests of the study are firstly to investigate the effect of each type of spending separately, secondly to emphasize the role of these spending on economic growth. Similar characteristics of the sample countries are expected to make the inferences derived from the empirical results more valid. We hope that this study will contribute, at a minimum, to the methodology of cross section analysis as it is applied to the economies of developing countries in this area of research.

Growth refers to a positive change in size, and/or maturation, often over a period of time. Growth can occur as a stage of maturation or a process toward fullness or fulfillment. It can also perpetuate endlessly, for example, as detailed by some theories of the ultimate fate of the universe.

In the *Barro model (1990)*, growth increases with taxes and spending at low levels and then falls as the distortionary effects outweigh the beneficial effects of public goods. Public spending and growth are positively related when public spending is below their optimal amount. *Keynes (1936)* showed theoretically that the use of the budget could influence the demand of economic agents and therefore be used in the context of a policy of regulating the economic situation in two ways: expansionist when states seek to support or promote economic activity (a situation where unemployment is high) or in a restrictive sense when they seek to reduce the demand for economic agents (inflationary situations or large external deficits). According to *Adolph Wagner*

(1892) "The more civilized society is, the more expensive the state is," it means that the more developed is the society, the more important will be the needs and the demand in infrastructure (roads, railways, water and sanitation network, airports electric services and 4G networks), that will therefore lead to an increase of public expenditures to meet this demand. Empirical growth studies have been broadly perceived as being too aggregated: most are done at the level of several countries, using aggregate variables such as average per capita gross domestic product *(GDP)*, total factor productivity *(TFP)* average, average savings rate, average measures of financial development, or indicators of average education. An effective education system will have a positive effect on long-term productivity growth, both by increasing the efficiency of innovation and investment technologies (both highly knowledge intensive), and by reducing the cost of skilled labor, thereby increasing profits and promoting innovators.

Benhabib and Spiegel (1994), as well as *Krueger and Lindhal (2001)*, showed that a larger stock of human capital increases a country's ability both to innovate and to imitate the most advanced technologies. In endogenous growth models, the growth rate of the economy depends largely on the initial conditions of the economies. While some countries have levels of human capital or initial physical capital below a certain threshold, external effects are not sufficient to sustain growth. Thus, human capital is complementary to other factors, especially physical capital. A stock of human capital must be "absorbed" by a production system that uses all the capacities of individuals.

Hénin and Ralle (1993) argued from the same perspective that human capital generates strong positive externalities when it is possible to communicate and interact with other people with the same level of knowledge; this is what we call the network externalities. Using an endogenous growth model of the U.S. economy in which government purchases directly affect both the utility of consumers and the productivity of firms, *Knoop (1999)* found that reducing the size of government reduces economic growth and welfare.

Devarajan, et al. (1996) examined the relation between the share of total government expenditure in GDP and the growth in per capita real GDP and found negative and significant relationship between the two variables.

Ghura (1995) tested the relation between government consumption as a percent of GDP and economic growth using data from developing countries. He found significantly negative relationship between government consumption and the growth in per capita real GDP.

Lindauer and Velenchik (1992) concluded that there is no significant direct relationship between government expenditure and economic growth. However, they argued that government spending may positively affect economic growth indirectly through its influence on the efficiency of the private sector allocation of inputs. *Khan and Reinhart (1990)* developed a growth model that examines separately the effects of public sector and private sector investments. Using cross-section data from a sample of 24 developing countries, they found that public investment has no direct effect on economic growth.

Aschauer (1990) reported positive and significant relation between government spending and the level of output .In a similar study, Aschauer specifies real output as a function of employment, stock of capital, productivity, and government expenditure. He concluded that the additions to nonmilitary structures increase the overall economic productivity.

Conte and Darrat (1988) examined the effect of government spending on output using one-sided Granger-causality analysis.Their findings are mixed but indicated no significant relationship between government spending and growth in output for most of the countries. *Ram (1986)* derived the empirical model from a production function that explicitly includes both private and public sectors. He reported that public investment is more productive than private investment in both studies. *Saunders (1985)* tested the effect of government expenditure on the economy by making a regression of the percentage change in real GDP on the share of the total government spending in GDP. Using data from OECD countries, he found negative relation between average economic growth and average share of total government expenditure in GDP.

Landau (1983) reported a negative relation between growth in government spending and the growth rate in real per capita GDP. In another paper, he defined government consumption as a ratio of GDP and the real output as an average rate of growth in real per capita GDP, and tests the model using cross-section data from

developed and developing countries for several sub-periods. His results showed that an increase in government consumption significantly reduces the growth rate in real per capita GDP. The empirical evidence regarding the effect of government spending on economic growth is clearly mixed. Furthermore, the literature review indicates that the empirical results are specification-dependent. In other words, the results seem to depend on how the government spending is specified in the empirical model. Based on the empirical review, it can be concluded that the relationship between government spending and economic growth is generally negative if the government spending is expressed as percent of GDP and is generally positive if it is expressed as an annual percentage change in the estimating equation.

2. Materials and methods

2.1 Materials

To make this analysis, we use Latin America countries data from 2002 to 2014. These data come from *World Development Indicators (WDI)* and *World Governance Indicators (WGI)*.

2.2 Methods

2.2.1 Model

The neoclassical production function is used as the basis for specifying the empirical model for this study.

Ignoring the level of technology (A), the standard aggregate production function is written as:

$$Y = F\left(K, L\right) \tag{1}$$

Where, Y is the level of output, K is the stock of domestic physical capital, and L is labor. As in *Feder (1982)* and *Ram (1985)* the standard aggregate production function can be modified to include the total government expenditure for capital formation (G) as an independent input and rewritten as:

$$Y = f\left(K, L, G\right) \tag{2}$$

For analytical purpose, the government expenditure is divided into domestic component (G^D) and foreign component (G^F), which represents the official inflow for development assistance. And labor is divided in labor force (L) and human capital (H). Government expenditure for domestic issues (G^D) is expressed as government expenditure for infrastructure (G^{INF}), institutional quality (G^{INS}), investment climate improvement (G^{INV}), corruption reduction (G^{CORR}), governance quality (G^{GOV}), and domestic investment improvement (G^K)

Disaggregating the government expenditure into its domestic and foreign components as in *Khan and Reinhart (1990)* and introducing a measure of openness (Z), the aggregate production function used in this analysis is specified as:

$$Y = g\left(K, L, H, G^{INF}, G^{INS}, G^{INV}, G^{CORR}, G^{GOV}, G^K, G^F, Z\right) \tag{3}$$

Taking total derivatives of equation (3) and normalizing the results by the gross domestic product (Y), except the labor force, yields to:

$$\begin{aligned} dY/Y = &\left(\partial Y/\partial K\right) dK/Y + \left(\partial Y/\partial L\right) dL/Y + \\ &+\left(\partial Y/\partial H\right) dH/Y + \left(\partial Y/\partial G^{INF}\right) dG^{INF}/Y + \\ &+\left(\partial Y/\partial G^{INS}\right) dG^{INS}/Y + \left(\partial Y/\partial G^{INV}\right) dG^{INV}/Y \\ &+\left(\partial Y/\partial G^{CORR}\right) dG^{CORR}/Y + \\ &+\left(\partial Y/\partial G^{GOV}\right) dG^{GOV}/Y + \left(\partial Y/\partial G^K\right) dG^K/Y + \\ &+\left(\partial Y/\partial G^F\right) dG^F/Y + \left(\partial Y/\partial Z\right) dZ/Y \end{aligned} \tag{4}$$

Where, ($\partial Y/\partial K$) is the marginal product of capital, ($\partial Y/\partial L$) is the marginal product of labor force, ($\partial Y/\partial H$) is the marginal product of human capital.

Similarly, $\left(\partial Y/\partial G^{INF}\right)$ is the marginal product of government expenditure for infrastructure, $\left(\partial Y/\partial G^{INS}\right)$ is the marginal product of government expenditure for institutional quality, $\left(\partial Y/\partial G^{INV}\right)$ is the marginal product of government expenditure for investment climate improvement, $\left(\partial Y/\partial G^{CORR}\right)$ is the marginal product of government expenditure for corruption reduction, $\left(\partial Y/\partial G^{GOV}\right)$ is the marginal product of government expenditure for governance quality, $\left(\partial Y/\partial G^{K}\right)$ marginal product of government expenditure for domestic investment improvement , $\left(\partial Y/\partial G^{F}\right)$ marginal product of official assistance received , and $\left(\partial Y/\partial Z\right)$ as the marginal product of trade openness.

The signs of all partial derivatives with respect to output are assumed to be positive. This means that private investment, labor force, human capital, government spending for infrastructure, institutional quality, investment climate improvement, corruption reduction, governance quality, domestic investment, and trade-openness are all expected to have positive and significant effect on economic growth. Trade-openness is expected to have a positive and significant effect on economic growth because open economies can have more access to foreign resources and markets. Thus, a more open economy is expected to have a higher growth rate than a closed economy.

For empirical analysis, $\partial Y/\partial K=\alpha_1, \partial Y/\partial L=\alpha_2, \partial Y/\partial H=\alpha_3, \partial Y/\partial G^{INF}=\alpha_4, \partial Y/\partial G^{INS}=\alpha_5, \partial Y/\partial G^{INV}=\alpha_6,$

$\partial Y/\partial G^{CORR}=\alpha_7, \partial Y/\partial G^{GOV}=\alpha_8, \partial Y/\partial G^{F}=\alpha_9, \partial Y/\partial G^{K}=\alpha_{10},$

and $\partial Y/\partial Z=\alpha_{11}$.

The variables are also expressed in more explicit notation as:

$dY/Y = GDPGR =$ annual growth rate in real gross domestic product (economic growth),

$dK/L = I/Y = PI =$ private investment as percent of gross domestic product,

$dL/L = PGR =$ annual percentage change in population, a proxy for the labor force

$dH/L = HUM =$ human capital as percent of gross domestic product,

$dG^{INF}/Y = G^{INF}/Y = INF =$ government expenditure for infrastructures ,

$dG^{INS}/Y = G^{INS}/Y = INS =$ government expenditure for institution quality,

$dG^{INV}/Y = G^{INV}/Y = INV =$ government expenditure for investment climate improvement

$dG^{CORR}/Y = G^{CORR}/Y = CORR =$ government expenditure for corruption reduction ,

$dG^{GOV}/Y = G^{GOV}/Y = GOV =$ government expenditure for governance quality, $dG^{K}/Y = G^{K}/Y = GI =$ government expenditure for investment climate improvement as percent of GDP, $dG^{F}/Y = ODA =$ net official development assistance from all donors as percent of recipient GDP, $dZ/Y = TOP =$ annual percentage change in the ratio of the sum of export and imports to GDP, a proxy for trade-openness. After making these adjustments in definitions and notations, the estimating equation is written as:

$$GDPGR_{it} = \alpha_0 + \alpha_1 PI_{it} + \alpha_2 PGR_{it} + \alpha_3 HUM_{it} + \alpha_4 INF_{it} + \alpha_5 INS_{it} + \alpha_6 INV_{it} + \alpha_7 CORR_{it} + \alpha_8 GOV_{it} + \alpha_9 GI_{it} + \alpha_{10} ODA_{it} + \alpha_{11} TOP_{it} + \varepsilon_{it} \quad (5)$$

Where, i=1,……., 22

t=1,……..,12

α_0 =the constant term,

ε_{it} = the error term

The model specified in equation (5) examines the independent effects of private investment and public investment on economic growth. The other variables in the model serve as control variables.

The study uses panel data from 22 countries of Latin America region. The data cover 2002-2014 period for the variables expressed in annual changes for a total of 286 observations. The data in level form were reported in U.S. dollars for all countries. All data were transformed to three year moving averages. The moving average process was applied to correct any autocorrelation problem.

2.2.2 Descriptive statistics

In this part, we want to show the evolution of foreign aid, economic growth and public spending in the analysis period, the relationship between these variables and their correlation.

a. Graphs

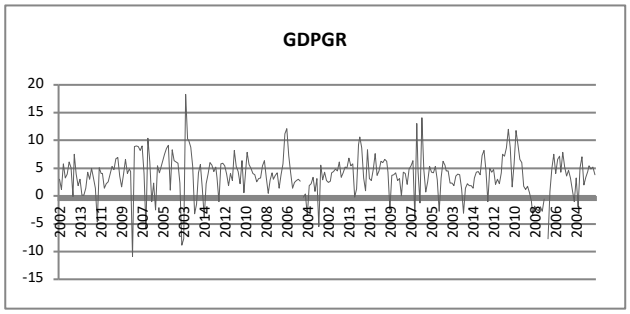


Figure 1: Latin America countries growth evolution

Source: Authors

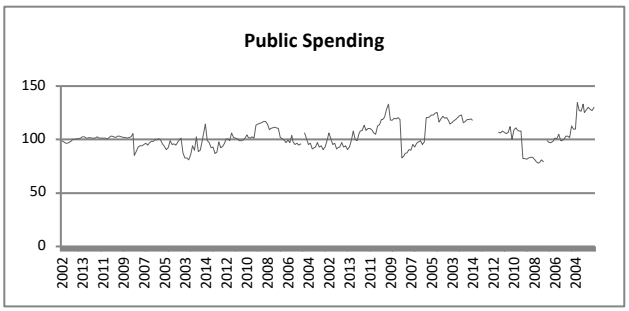


Figure 2: Latin America countries public spending evolution

Source: Authors

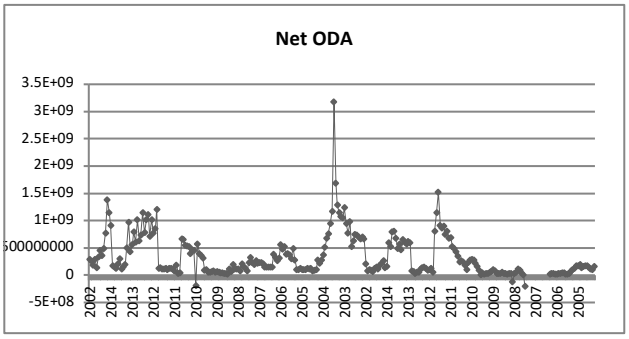


Figure 3: Latin America countries foreign aid received evolution

Source: Authors

The representation of GDP growth, public spending and foreign aid show mainly that these different variables are not constant on time, and they have known different level in their evolution. However, these graphics do not give clearly information about growth evolution and these different levels of investment. So we will analyze more precisely this relation by using econometric approach.

b. Correlation analysis

Table 1: Correlation matrix

	GDPGR	PI	PGR	HUM	INF	INS	INV	CORR	GOV	GI	ODA	T.O
GDPGR	1.0000	0.2074	0.3120	0.1725	-0.0539	-0.0486	-0.0810	0.0235	-0.0201	0.0650	-0.0549	0.0688
PI	0.2074	1.0000	0.2924	-0.1823	-0.0252	-0.2237	0.0070	-0.3267	-0.1954	0.4283	0.0407	0.0883
PGR	0.3120	0.2924	1.0000	-0.1027	0.0013	-0.4544	-0.2210	-0.5716	-0.4434	0.0581	0.3023	0.1731
HUM	0.1725	-0.1823	-0.1027	1.0000	0.2494	0.2488	0.1593	0.2208	0.3717	-0.1005	-0.2858	-0.0194
INF	-0.0539	-0.0252	0.0013	0.2494	1.0000	0.0932	0.0795	0.0139	0.2097	0.0266	0.0536	-0.0845

INS	-0.0486	-0.2237	-0.4544	0.2488	0.0932	1.0000	0.8434	0.8107	0.9074	-0.3682	-0.3421	-0.1632
INV	-0.0810	0.0070	-0.2210	0.1593	0.0795	0.8434	1.0000	0.5822	0.8028	-0.2057	-0.1654	-0.2328
CORR	0.0235	-0.3267	-0.5716	0.2208	0.0139	0.8107	0.5822	1.0000	0.8054	-0.2003	-0.4265	-0.1532
GOV	-0.0201	-0.1954	-0.4434	0.3717	0.2097	0.9074	0.8028	0.8054	1.0000	-0.2561	-0.4221	-0.1626
GI	0.0650	0.4283	0.0581	-0.1005	0.0266	-0.3682	-0.2057	-0.2003	-0.2561	1.0000	0.2400	0.0408
ODA	-0.0549	0.0407	0.3023	-0.2858	0.0536	-0.3421	-0.1654	-0.4265	-0.4221	0.2400	1.0000	-0.0757
T.O	0.0688	0.0883	0.1731	-0.0194	-0.0845	-0.1632	-0.2328	-0.1532	-0.1626	0.0408	-0.0757	1.0000

Source: Authors

The table shows positive correlation between *GDPGR* with all variables except *ODA*, *GOV*, *INF*, *INS*, and *INV*. It means that foreign aid, government expenditure for institution quality; government expenditure for infrastructure and institution quality have some negative influence on *GDP growth* evolution in these countries. On contrary, *PI* and *GI* have positive impact on *GDP growth rate*.

The table also shows that there is autocorrelation between *INS*, *INV*, *CORR* and *GOV*. To solve this autocorrelation problem, we remove in our analysis the variables *INS* and *GOV*.

3. Results

The model was estimated using two alternative estimation methods: *fixed effects* and *random effects* methods. And the reported results will be those of *random effect* method cause to *Hausman test* results. The data were also formally tested for heteroskedasticity by using the *Breusch Pagan test* and for multicollinearity by using the variance inflation factor analysis *(VIF)*.

3.1 Fixed effects method

Fixed effects explore the relationship between dependent *(GDPGR)* and independent variables within an entity, in this case within Latin America countries (Table 2). By using fixed effects methods, we assume that something within the individual may impact or bias dependent or independent variables and we need to control for this. Fixed effects remove the effect of time-invariant characteristics so we can assess the net effect of the independent on the dependent variable. Another important assumption of the fixed effects model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics.

Table 2: Fixed effect regression

GDPGR	**Coefficient**	**t**	**P** $\succ \lvert t \rvert$
PI	0.1579699	3.89	0.000
PGR	1.813498	2.46	0.014
HUM	0.0012811	0.96	0.340
INF	-0.0000118	-0.42	0.673
INV	-1.921206	-2.53	0.012
CORR	4.081731	5.01	0.000
GI	0.0005315	0.03	0.975
ODA	$1.18e-10$	0.16	0.870
T.O	2.323471	0.41	0.685
Constant	-0.2067915	-0.06	0.951

Source: Authors

In this case, *PI*, *PGR*, *INV*, *CORR* has a significant influence on dependent variable *GDP growth rate* (p-value is lower than 0.01 and 0.05).

Private investment (PI) has positive influence on economic growth, and when private investment increases by one unit, *GDP growth* increases by *0.1579699 unit.*

Population growth rate (PGR) has positive influence on economic growth, and when population growth rate increases by one unit, *GDP growth increases by 1.813498 unit.*

Climate investment improvement (INV) has negative influence on economic growth, and when government spending for climate investment improvement increases by one unit, *GDP growth* decreases by *1.921206 unit.*

Corruption reduction (CORR) has positive influence on economic growth, and when government expenditure

for corruption reduction increases by one unit, *GDP growth increases by 4.081731 unit.*

Like expected, without INV, the others variables coefficients are positive.

3.2 Econometrics tests

3.2.1 Hausman test

Prob>chi2= 0.0399

Hausman test shows that p-value is lower than 0.05, it means that it is better to choose fixed effect model to make this analysis.

3.2.2 Breusch Pagan test

Breusch Pagan test is used to know if there is heteroskedasticity problem in regression results or not.The test results indicate no heteroskedasticity problem:

Chi2 (1): 3.03

Prob>chi2: 0.0816

In fact, according to Breusch Pagan test, if p-value (Prob>chi2) is lower than 0.05, we reject hypothesis of homoscedasticity Ho. In this case p-value is higher than 0.05, hence we accept Ho. And we may say that there is no heteroskedasticity problem in this model.

3.2.3 Variance inflation factor (VIF) test

Table 3: VIF table

Variable	VIF	1/VIF
CORR	2.81	0.355564
INV	1.92	0.521536
PI	1.72	0.582888
PGR	1.61	0.619284
ODA	1.55	0.645722
GI	1.48	0.677736
HUM	1.23	0.811617
T.O	1.11	0.899400
INF	1.09	0.917730
Mean VIF	1.61	

Source: Authors

A variance inflation factor (VIF) less than 10 is generally viewed as evidence of absence of problematic multicollinearity among regressors.

3.2.4 Panel unit root tests

The first step, before analyzed the causality relationship between variables, is to determine whether all the variables are integrated of the same order. A number of panel unit root tests have been developed to determine the order of integration of panel variables.

We performed the panel unit root tests proposed by *Levin et al. (2002)* and *Im et al. (2003)* and panel unit root tests Fisher-ADF and Fisher-PP proposed by *Maddala and Wu (1999)*, and by *Choi (2001). Levin, Lin, and Chu (LLC) (2002)* test assumes that there is a common unit root process so that ρ_i is identical across cross-sections. The test employs a null hypothesis of a unit root. LLC test consider the following basic ADF specification:

$$\Delta y_{it} = \alpha y_{it-1} + \sum_{j\ 1}^{P_i} \beta_{ij} \Delta y_{it-j} + X_{it}^{'} \delta + \varepsilon_{it} \qquad (6)$$

Where we assume a common $\alpha = \rho - 1$, but allow the lag order for the difference terms, p_i to vary across cross-sections. The H_0 is $\alpha = 1$ (there is a unit root) and the alternative H_1 is $\alpha \prec 0$ (there is no unit root). *Im, Pesaran,* and *Shin (2003)* test allows for individual unit root processes so that ρ_i may vary across cross-sections. The test begins by specifying a separate ADF regression for each cross section (on the model of Eq(6)).

The null hypothesis may be written as $H_0 : \alpha_i = 0$, for all *i*, while the alternative hypothesis is given by:

$$\begin{cases} \alpha_i \prec 0, i = 1,2,...,N_1 \\ \alpha_i = 0, i = N+1, N+2,...,N \end{cases}$$

(where the *i* may be reordered as necessary) which may be interpreted as a non-zero fraction of the individual processes is stationary. Rejection of the null hypothesis does not necessarily imply that the unit root null is rejected for all *i*.

Maddala and Wu (1999), and *Choi (2001)* proposed an idea to derive tests that combine the p-values from individual unit root tests using *Fisher's (1932)* results.

The Fisher-ADF and PP tests allow for individual unit root processes so that ρ_i may vary across cross-sections. The tests are all characterized by the combining of individual unit root tests to derive a panel-specific result. The tests have null hypothesis of unit root, whereas the alternative hypothesis of some cross-sections do not contain a unit root.

Table 4: Test results for panel unit roots

Variables		Method			
		Levin, Lin and Chu t*	Im, Pesaran and Shin W-stat	ADF-Fisher Chi-square	PP- Fisher Chi-square
Levels	**GDPGR**				
	Statistic	-10.1900	-6.88663	127.131	63.1934
	Prob.	0.0000	0.0000	0.0000	0.0303
	PI				
	Statistic	-9.80878	-6.28592	96.1020	89.6549
	Prob.	0.0000	0.0000	0.0000	0.0000
	PGR				
	Statistic	-10.4226	-7.25473	158.288	118.539
	Prob.	0.0000	0.0000	0.0000	0.0000
	HUM				
	Statistic	-8.26198	-7.98049	99.8549	109.705
	Prob.	0.0000	0.0000	0.0000	0.0000
	INF				
	Statistic	-9.02654	-7.85417	68.9270	68.9259
	Prob.	0.0000	0.0000	0.0000	0.0000
	INV				
	Statistic	-15.7917	-11.9887	187.912	149.295
	Prob.	0.0000	0.0000	0.0000	0.0000
	CORR				
	Statistic	-12.5801	-12.6074	199.967	189.620
	Prob.	0.0000	0.0000	0.0000	0.0000
	GI				
	Statistic	-17.3734	-11.7246	99.1275	111.685
	Prob.	0.0000	0.0000	0.0000	0.0000
	ODA				
	Statistic	-1.08487	-2.89600	72.8288	83.8544
	Prob.	0.1390	0.0019	0.0022	0.0001
	T.O				
	Statistic	-5.33731	-4.24934	91.8662	109.137
	Prob.	0.0000	0.0000	0.0000	0.0000
First differences	**GDPGR**				

	Statistic	-13.2343	-8.30095	145.324	96.6033
	Prob.	0.0000	0.0000	0.0000	0.0000
	PI				
	Statistic	-12.5010	-9.39270	129.437	149.260
	Prob.	0.0000	0.0000	0.0000	0.0000
	PGR				
	Statistic	-57.3521	-31.9223	200.518	277.541
	Prob.	0.0000	0.0000	0.0000	0.0000
	HUM				
	Statistic	-18.9632	-10.9568	144.930	179.973
	Prob.	0.0000	0.0000	0.0000	0.0000
	INF				
	Statistic	-29.7285	-13.0266	70.4903	67.6553
	Prob.	0.0000	0.0000	0.0000	0.0000
	INV				
	Statistic	-13.6866	-10.1037	169.484	231.548
	Prob.	0.0000	0.0000	0.0000	0.0000
	CORR				
	Statistic	-20.3247	-11.2901	156.292	212.824
	Prob.	0.0000	0.0000	0.0000	0.0000
	GI				
	Statistic	-211.864	-60.4207	167.732	201.698
	Prob.	0.0000	0.0000	0.0000	0.0000
	ODA				
	Statistic	-8.58061	-8.74373	144.810	168.041
	Prob.	0.0000	0.0000	0.0000	0.0000
	T.O				
	Statistic	-26.4078	-14.1522	178.955	201.317
	Prob.	0.0000	0.0000	0.0000	0.0000

Source: Authors

We performed ten different statistics described above. The results of the LLC, IPS, Fisher-ADF and Fisher-PP panel unit root tests for each of the variable are shown in Table 4. We perform each test for the level and first difference of variables. In case of the level of variables the null hypothesis that variables assume common and individual unit root process cannot be rejected. However, after applying the first difference, all of the variables meet the requirements of the study. So, we can acknowledge their stationarity for the 95% confidence interval.

3.2.5 Granger causality test

In this step, we determine the direction of the causality between the variables in this panel framework; to achieve this goal, we apply the panel Granger causality test based on the model developed by *Dumitrescu and Hurlin (2012)*. This model allows for heterogeneity across the cross sections, while the conventional Granger-causality test (*Granger, 1969*) ignores this property.

The Dumitrescu-Hurlin panel Granger causality test is based on the individual Wald statistics of Granger non causality averaged across the cross-section units. This test uses the following model to test for Granger causality:

$$y_{i,t} - \alpha_i + \sum_{k\ 1}^{K} \gamma_i^{(k)} y_{i,t-k} + \sum_{k\ 1}^{K} \beta_i^{(k)} x_{i,t-k} + \varepsilon_{i,t}$$

Where α_i denotes the individual effects, K represents lag orders which is identical for all cross-sectional units of the panel, and $\gamma_i^{(k)}$ and $\beta_i^{(k)}$ are group-specific parameters. The null hypothesis assumes no causality exists in any cross-section, while the alternative hypothesis suggests that there is causality at least for some cross-sections. The null and alternative hypotheses are defined as:

$$H_0 : \beta_i^k = 0 \qquad \forall\ i = 1,\ldots..N$$

$$H_1 : \begin{cases} \beta_i = 0, i = 1,2,.....N \\ \beta_i^k \neq 0, i = N+1,.....N \end{cases}$$

Table 5: The *Dumitrescu and Hurlin (2012)* panel causality test

Null hypothesis	Zbar-Stat	Prob
GDPGR does not granger-cause PGR	2.7417	0.0061***
PGR does not granger cause GDPGR	0.8488	0.3960
GDPGR does not granger cause HUM	2.2152	0.0267**
HUM does not granger cause GDPGR	1.3392	0.1805
GDPGR does not granger cause INV	3.9731	0.0001***
INV does not granger cause GDPGR	4.7159	0.0000***
GDPGR does not granger cause CORR	3.6264	0.0003***
CORR does not granger cause GDPGR	-1.0973	0.2725
GDPGR does not granger cause GI	2.6667	0.0077***
GI does not granger cause GDPGR	9.3113	0.0000***
GDPGR does not granger cause ODA	1.6142	0.1065
GDPGR does not granger cause TO	2.4951	0.0126**

Source: Authors

Note: ***, **,* denote the rejection of the null hypothesis at the 1%, 5% and 10% significance levels, respectively.

We use the first difference of the data series as the test requires the variables to be stationary. Table 5 presents the results of the *Dumitrescu and Hurlin (2012)* heterogeneous panel causality test.

They indicate that there is a bidirectional causal relationship between economic growth and investment climate improvement. The result suggests that a good climate investment leads to an improvement in economic growth and vice versa in Latin American countries.

The findings also show evidence of a feedback relationship between GDPGR (economic growth) and GI (government expenditure for domestic investment improvement). This implies that both economic growth and domestic investment are driving each other , underlying the importance of domestic investment in Latin American countries.

However, no evidence of a significant causality is found between GDPGR (economic growth) and ODA (foreign aid), which may reflects that foreign aid has no effect on these countries economic growth and vice versa.

In sum, the causality test main results indicate that investment climate improvement and domestic investment have significant influence on economic growth.

4. Discussion

This paper has mainly examined the effects of public and private spendings on economic growth using panel data from 22 Latin America countries for the 2002-2014 periods. The model was estimated in its full and restricted versions by *fixed-effects* and *random-effects* techniques. The results produced by fixed-effects estimation has been used according to *Hausman test*

results.

The results from fixed effect method show that the *trade-openness* and *human capital* are not significant, so it has no effects on these countries economic growth. These results seem to imply that in these countries, *private investment*, *population growth rate*, *corruption reduction* create favorable economic environment for economic growth. In addition, the implication of government in *climate investment* has a negative impact on economic growth. The results also point out that the impact of *foreign aid* is not significant. Additionally, the causality test indicates that *investment climate improvement* and *domestic investment* have significant influence on economic growth.

The results of this study have policy implications; they are useful in the sense that they show that in these countries *foreign aid* is not necessary for economic growth. Moreover they encourage *public spending for corruption reduction*, *private and domestic investment*. In addition, the results show that the government action for the improvement of *investment climate* is not good for economic growth in these countries. Some of these analyses are necessary but, not sufficient because they only rely on the environment of spending. Analyses have also to pay attention of legal environment of investment and public spending. Recent works on the economy of institutions (*La Porta and al.*,2008, *Hall and Jones, 1999; Acemoglu et al.,2004*) showed that the ability of better protection of property rights promotes growth. Moreover, according to *Williamson (1999)*, in developing countries it is clear that it is not necessarily a matter of reducing or increasing the size of spending, but of spending better. So, the research must also pay attention of process of using public spending

END NOTES

1. Following some previous studies, both the domestic government spending for capital formation and the official development assistance have been expressed as percentages of domestic GDP rather than annual percentage changes.

2.In this study four countries (Guadeloupe, Martinique, Saint Barthelemy, St Martin) were dropped due to the lack of availability of complete data for the period under consideration.The countries in the sample are: Brazil, Mexico, Colombia, Argentina, Peru, Venezuela, Chile, Ecuador, Guatemala, Cuba, Haiti, Bolivia, Dominican Republic, Honduras, Paraguay, Nicaragua, El Savador, Costa Rica, Panama, Puerto Rico, Uruguay, French Guyana,. The main sources of data are *World Development Indicators 2016* and *World Governance Indicators 2016* published by the World Bank.

References

Acemoglu, Johnson and Robinson (2004), "Institutions as the Fundamental Cause of Long-Run Growth," Handbook of Economic Growth

Aschauer D.A., (1990), Is government spending simulative? *Contemporary Economic Policy*, Vol.8, issue 4, p. 30-46

Barro, R. (1990), "Government Spending in a Simple Model of Endogenous Growth", *Journal of Political Economy*, vol. 98, n° 5, p. 103-125.

Benhabib and Spiegel (1994), the role of human capital in economic development evidence from aggregate cross-country data, *Journal of Monetary Economics*, vol. 34, issue 2, 143-173

Choi, (2001). Unit root tests for panel data. *Journal of International Money and Finance*, 2001, vol. 20, issue 2, 249-272

Conte, Darrat M.A and Darrat A.F (1988), "Economic Growth and the Expanding Public Sector: A Re-examination, "*Review of Economics and Statistics*, pp. 322-30

Dalton, H. (1992), Principles of public finance, Routledge Library Editions-Economics.

Devarajan, S., Swaroop V. and Zou H. (1996), "The composition of Public Expenditure and Economic Growth," *Journal of Monetary Economics*, Vol.37, pp. 313-344.

Dumitrescu, and Hurlin, C, (2012) .Testing for granger non-causality in heterogeneous panels. *Economic Modelling*, 29(4), 1450–1460.

Feder, G., (1982). "On exports and economic growth". *Journal of Development Economics*. Vol. 12, Issue no. 1-2, pp. 59-73.

Fisher, R. A. (1932).Statistical methods for research workers (5th ed.). Oliver and Boyd: Edinburgh

Ghura, D., (1995). "Macro Policies, External Forces, and Economic Growth in Sub-Saharan Africa, "Economic Development and Cultural Change, pp.759-78.

Granger, C.W.J., (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica* 37 (3), 424–438

Hall and Jones (1999), "Why Do Some Countries Produce So Much More Output per Worker than Others? "*Quarterly Journal of Economics*, 83-116.

Hénin and Ralle, (1993). "Les nouvelles théories de la croissance : quelques apports pour la politique économique," Revue Économique, Programme National Persée, vol. 44, issue 1, pp 75-100.

Im KS, Pesaran MH, Shin Y. (2003) Testing for unit roots in heterogeneous panels. *JEconom.* 2003; 115:53–74.

Khan, Reinhart M.S. and Reinhart C.M. (1990), "Private Investment and Economic Growth in Developing Countries," *World Development*, Vol. 18, pp. 19-27.

Keynes, J.M. (1936), The General Theory of Employment, Interest and Money,Palgrave Macmillan

Knoop, T.A. (1999), Growth, Welfare and the Size of Government, *Economic Inquiry*, Vol.37, issue 1, 103-119.

Krueger and Lindahl (2001): Education for Growth Journal of Economic Literature, Vol.34, pp. 1101–1136

Landau (1983), 'Government expenditure and economic growth: a cross-country study, *Southern economic journal*, Vol.49, n3, pp.783-792

La Porta R, Lopez-de-Silanes F, Shleifer A. (2008), The Economic Consequences of Legal Origins, *Journal of Economic Literature*, Vol. 46, n2, pp.285– 332

Levin A, Lin CF, Chu C. (2002) Unit root tests in panel data: asymptotic and finite-sample properties. *J Econom* 2002; 108:1–24

Lindauer, D.L. and Velenchik A.D. (1992), "Government Spending in Developing Countries: Trends, Causes, and Consequences, "World Bank Observer 7, pp. 59-78.

Maddala G S, Shaowen Wu. (1999). A comparative study of unit root tests with panel data and a new simple test. Oxford Bull Econ Stat 1999; 61:631–52.

Pigou A. C. (1912), Wealth and Welfare. Macmillan and Company. pp, xxxi, 493.

Ram, R. (1985), Exports and Economic Growth: Some Additional Evidence, Economic Development and Cultural Change, vol. 33, issue 2, 415-25

Ram, Rati (1986), Government Size and Economics Growth: A new framework and some Evidence from Cross-Section and Time-Series Data, The American Economic Review, pp. 191-203.

Saunders, P. (1985), "Public Expenditure and Economic Performance in OECD Countries," *Journal of Public Policy*, pp. 1-21.

Wagner, A. (1892). Grundlegung der politischen Ökonomie. Part 1, vol. 1. 3rd edn. Leipzig: Winter

Williamson, J. (1990). Latin American Adjustment: How Much Has Happened? Washington: Institute for International Economics

Appendix

	VARIABLE	Proxy/measurement
1	Dependent variable: GDPGR (Economic growth)	Annual growth rate in real gross domestic product
2	Independent Variable: PI (Private Investment)	Private investment as percent of gross domestic product,
3	Independent variable: PGR (Population Growth Rate)	Annual percentage change in population, a proxy for the labor force
4	Independent variable:	Human capital as percent of gross domestic product,

	HUM (Human capital)	
5	Independent variable: INF(Infrastructures)	Government expenditure for infrastructures as percent of gross domestic product,
6	Independent variable: INS(Institution quality)	Government expenditure for institution quality
7	Independent variable: INV(Investment climate)	Government expenditure for investment climate improvement
8	Independent variable: CORR(Corruption)	Government expenditure for corruption reduction
9	Independent variable: GI (Domestic investment)	government expenditure for domestic investment improvement as percent of GDP,
10	Independent variable: ODA (Official development assistance)	Net official development assistance from all donors as percent of recipient GDP,
11	Independent variable: TOP (Trade openness)	Annual percentage change in the ratio of the sum of export and imports to GDP, a proxy for trade-openness.
12	Independent variable: GOV (Governance)	Government expenditure for governance quality

IJBESAR

International Journal of Business and Economic Sciences Applied Research

The Effect of Public and Private Health Expenditures on Life Expectancy in Different Countries: Using Panel Data Model

Tayyebe Azodi, Seyed Mohammad Javad Razmi, Ali Akbar Naji Meidani and Mohammad Ali Falahi pp. 64-69

Volume 12, Issue 1

Eastern Macedonia & Thrace Institute Of Technology Press

International Journal of Business and Economic Sciences Applied Research

IJBESAR
ijbesar.teiemt.gr

The Effect of Public and Private Health Expenditures on Life Expectancy in Different Countries: Using Panel Data Model

Tayyebe Azodi, Seyed Mohammad Javad Razmi, Ali Akbar Naji Meidani and Mohammad Ali Falahi

Ferdowsi University of Mashhad, Iran

ARTICLE INFO
Article History
Received 9th April 2019
Accepted 28th May 2019

JEL Classifications
C23, E01, H75

Keywords:
Public Health Expenditure, Private Health Expenditure, Income Levels, Panel Data

ABSTRACT

Purpose
International research shows that improving health by increasing health expenditures can vary in different countries. In the present study, the effect of public and private health expenditures of GDP was examined using life expectancy as a health indicator.

Design/methodology/approach
The study evaluated 142 countries with different income levels using panel data from the period 1996-2014. For this purpose, the World Bank classification was used to identify Low, Lower-Middle, Upper-Middle and High-income countries. This study were the panel data method and estimated using Eviews9 and Stata12 software.

Findings
The results show that public expenditure in high-income countries has no significant effect on life expectancy, but private expenditure has a significant and positive effect. The effect of public and private expenditures is significant in the middle and low-income groups, but in the upper middle-income group, the effect of public expenditure is greater than private expenditure; whereas in lower middle and low-income groups, the effect of public expenditure on life expectancy is lower than private expenditure.

Research limitations/implications
The limitation of this research is in the amount of variables.

Originality/value
The findings of this study can assistance allocate resources, control expenditure and provide economic solutions in the health segment.

1. Introduction

Everyone has the right to have a healthy, productive and high-quality life with an acceptable lifetime without illness and disability. In addition to the individual, governments are also responsible for this and it is considered as one of the preconditions for sustainable development; but health systems are the most complex systems in all countries as health is affected by social, environmental, political, governmental factors, as well as economic policies, etc [1]. In addition to these cases, health is also affected by the access to health expenditure, which requires the use of national resources by both the private and public sector, whose limited resources and facilities have always been mentioned in the past and will be imposed more severely on the socio-economic conditions. On the other hand, health expenditure is associated with great uncertainty, as many diseases are randomly created because of unforeseen expenditures imposed on people so that sometimes their decision is related to life and death; thus the proper use of facilities and available resources and the promotion of their efficiency is a crucial issue to respond to the needs of communities. Given that health is considered as the center of sustainable economic, social, political and cultural development of societies and a worthy means and goal, which is important in the infrastructure of different parts of society, economists and policy-makers have paid lots of attention to find an optimal way for community health promotion [2].

Health issue was forgotten at the international level until after World War I, when the Statute of the League of Nations was prepared. Health expenditure as a criterion indicates the amount of resources allocated to the health sector, and statistics related to it are always of interest to theorists, policy-makers and practitioners in the health sector. Government and policy-makers tend to measure the relationship between health expenditure and health status as international comparisons of health expenditure can provide accurate information for health policy-makers to attract support for policy changes [3]. Actually, the key element is the distinction between public health expenditure and private health expenditure. Whereas public expenditure is basically a political decision, private expenditure reflects the way individuals distribute their available income depending on their preferences. [4].

For the first time, it was Newhouse (1977) that in his study, referred to the dual nature of health services in industrialized countries compared to other countries. He believes that in developed societies, the nature of health expenditure is not usually to escape from epidemiological diseases and premature deaths due to infectious diseases, faced by most of the people in less

†Corresponding Author: Tayyebe Azodi
E: azodi2015@gmail.com *DOI:* 10.25103/ijbesar.121.07

developed societies, but that in these countries, people spend on health in order to postpone death, obtain more peace against the anxieties of life, and for better and more accurate diagnosis of diseases, etc [5].

Socio-economic factors such as lifestyle, law and order, education and income level employment, urbanization etc. are the most important factors that affect health indicators [6, 7], for example the global effect of income on health status has been confirmed through various channels such as better nutrition, housing, better sanitation, etc. as well as Employment rate has a positive effect on life expectancy, as unemployment leads to social exclusion, anxiety and health-threatening behaviors such as suicide and on the other hand, employment reduces deprivation and anxiety and leads to better earning to obtain better facilities, nutrition and education and improved living conditions and as a result increased health of individuals [8]. Urbanization also has a positive effect on health as with the increase in urban population, especially in developing countries, the countries generally enjoy more advanced facilities and care, higher education and better socioeconomic conditions, all of which have a positive effect on human health [9, 10, 11, 12, 13, 14]. In addition to these factors, public and private resources allocated to the health sector also help to improve health, but the effect of these two variables is not the same on different health indicators in different regions [15].

Given that the concept of health expenditure may vary from country to country, Poullier et al. (2002)[16], presented a general classification of health expenditure. In figure (1), the total health expenditures are considered as total public and private expenditures on all goods and services related to health. In this figure, the total health expenditures are divided into two categories: public and private health expenditures and the way of financing the expenditures is identified in the branches at the end of the figure.

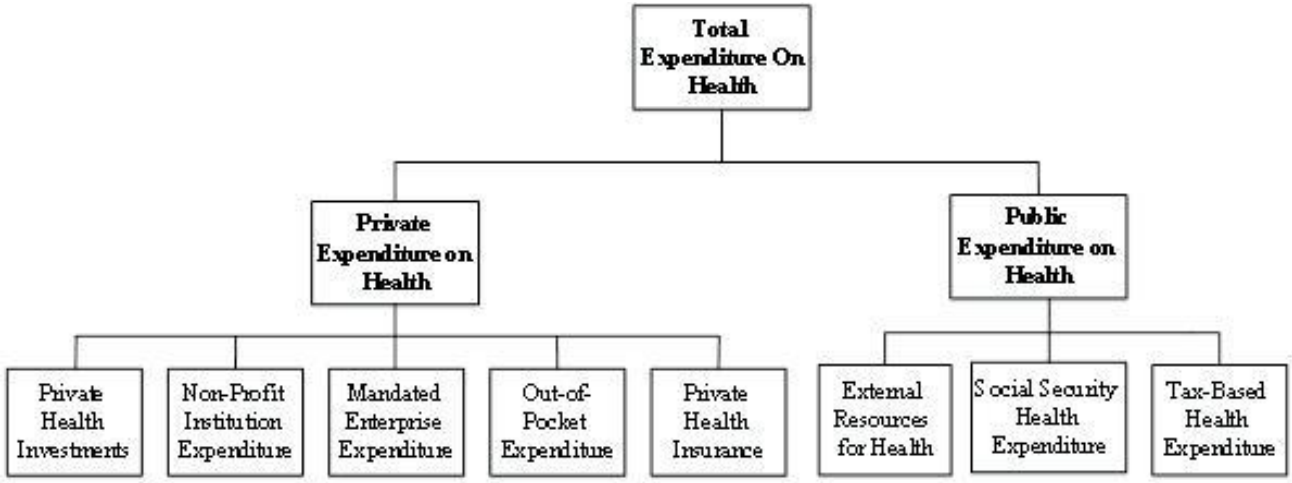


Figure 1. Classification of health expenditure. Poullier et al. (2002).

On the relationship between public health expenditure and health status, two points should be considered: First, there is a large gap between the apparent potential of public health expenditure and their actual performance to improve health [17].

Reviews of the cost effectiveness of preventive and primary curative interventions suggest that a significant fraction of below five deaths could be avoided for as little as $10, and in many cases, under $1000 per death averted. However, in practice, cross-national differences in public spending on health, account for essentially none (one seventh of 1%) of the differences in health status. This extremely small actual association estimated from the cross-national data, implies that the typical public spending on health per child death averted in developing countries is $50,000 to 100,000. This is a striking discrepancy between the apparent potential and actual performance. Secondly, differences in infant mortality and children are well explained by socioeconomic factors, while public expenditure has a very little explanatory power [18].

2. Literature review

In the following, some of the studies on the relationship between health spending and health indicators will be referred to. (Sadeghi & Mohammadi Khanghani, 2014 [19]) believed that private health expenditure has a greater effect on life expectancy than public expenditure, while public expenditure compared to private expenditure is more effective in reducing mortality and infant mortality in countries with average income. (Farag, 2009 [20]), also states that one percent increase in health expenditure will reduce infant mortality by 0.1 percent. (Bokhari, Gai & Gottret, 2007 [21]) believed that although economic growth is certainly an important factor for health, public expenditure is equally important. The results of the study of (Gottret & Schieber, 2006 [22]) which was conducted by the data from 81 countries, mostly low- and middle-income countries, showed that public health expenditure compared to income has a more effect on children's mortality but has less effect on maternal mortality. On the other hand, (Self & Grabowski, 2003 [23]) believed that in countries where the public sector is very large, public health expenditure does not help much in improving health. Generally, the effect of public expenditure is more in countries where there is a balanced relationship between public and private sectors. Thus, it seems that their efficacy in countries with larger private sector also needs the development of health

public sector.

Examining the relationship between health expenditure and the health status in Iran, (Asgari & Badpa, 2011 [24]) concluded that although total health expenditure is a crucial component in improving the health status in Iran, public health expenditure is relatively more effective on health status in Iran. (Mohammad Zade, Nafisi Moghadam & Heydari ,2014 [25]) also suggest that three variables including GDP per capita, the ratio of public health expenditure to GDP and the ratio of private expenditure to GDP have a negative and significant effect on the mortality rate for children under seven years of age as an indicator of health. The increase in public health expenditure can dramatically improve health indicator in countries with low human development. (Rajkumar & Swaroop, 2008 [26]) believe that public health expenditure further reduces children's mortality rates in countries that have good governance. In general, public expenditure, in fact, has little effect on health and education in countries that are governed poorly. These findings have important outcomes for increasing the efficiency of public expenditure and are also an experience especially for developing countries where public health expenditure is relatively low, coupled with poor governance.

3. Methodology

The econometrics model was developed as:

$$LEB_{it} = \alpha_i + \beta_1 HPU_{it} + \beta_2 HPR_{it} + \beta_3 GDP_{it} + \beta_4 EMP_{it} + \beta_5 URB_{it} + U_{it} \quad (1\text{-}2)$$

In the equation(1-2) i = 1, 2,..., N and t = 1, 2,..., T; that denote number of countries (i = 1, 2,…, 142 (N)) and time period (t =1996, 1997,…., 2014 (T)), respectively. α are constants and $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, $\beta 5$ are coefficients. U is the error term that are normally distributed with zero mean and homoscedastic variance. All the variables in Eq. are in logarithmic form. The health status proxy dependent variables in equations are LEB; It is the average years of life that will be lived by a newborn in a given year if living conditions and the pattern of mortality stay the same throughout its life. independent variables consisting of two main variables: public expenditure (HPU) and private expenditure (HPR) as a percentage of GDP and per capita GDP variables in terms of purchasing power (GDP), employment to population ratio in 15-year old people and older to the total population (estimated by ILO) (EMP), the proportion of urban population to the total population (URB), as control variables and U_{it} is also confounding element. Statistics and information about the variables needed were collected from the database of the World Bank and World Health Organization [27, 28].

3.1. The Descriptive Statistics

In this section, the average of public and private health expenditure for each income group is given in a table below:

Table1. Descriptive statistics of variables

Low income levels				
Variables	Average	Standard deviation	Minimum	Maximum
LEB	53.98	6.02	35.65	69.6
HPU	2.3	1.8	44	6.93
HPR	3.42	1.73	1.4	10.9
GDP	1212.7	4.3	454.8	3421.2
EMP	71.8	9.53	46.3	87.8
URB	27.6	11.17	7.41	59
Lower middle income levels				
LEB	63.84	8.06	42.02	75.62
HPU	2.49	1.4	0.55	9.08
HPR	2.82	1.28	0.51	7.92
GDP	4271	2133	1040.25	10748
EMP	58.1	10.5	32.9	82.4
URB	41.2	14.95	12.9	69.5
Upper Middle income levels				
LEB	69.21	6.08	42.5	79.4
HPU	3.22	1.32	0.79	147.14
HPR	2.5	1.32	0.44	8.46
GDP	11420	5387	2774.4	42957.3
EMP	54.67	11.06	29.6	81.9
URB	59.54	14.35	29.57	87.6
High income levels				
LEB	77.23	3.38	68.4	83.58
HPU	5.1	2.1	0.88	10
HPR	2.22	1.32	0.16	8.98

GDP	36280.3	183374	8431.7	110135
EMP	57.27	7.78	38.7	81.9
URB	75.3	16.35	8.55	98

As seen, the differences among different income groups are very impressive , for low income and lower - middle countries the difference between the average ratio of public and private health expenditures is low and in most low - income and lower - middle income countries the average public expenditure is more than private expenditure. As seen in upper Middle income countries the average share of public health expenditure is more than private health expenditure. Information related to health expenditure in high - income countries, shows that most health expenditure is funded by the public sector and a huge difference is observed in the average public and private health expenditures.

3-2. Chow test results

In this study we estimate the model by using panel data method. For using panel data model particular test method are used which will be discussed in this section. Before discussion about estimation and model analysis, it is necessary that why this study try to use the panel data method. In other words, are the countries -which are going to be studied- homogeneous or not? If the countries are homogeneous Pool Data method can be easily used by ordinary least squares otherwise, the necessity of using panel data is required. In other words, based on statistical concept we have:

$Y_i = Z_i\delta_i + U_i$ Conditional Model

$Y_i = Z_i\delta_i + U_i$ Non-Conditional Model

$i = 1, 2 \ldots, N$

The statistics for testing the hypothesis is as follows:

$$F_{(N-1,NT-N-K)} = \frac{(R^2_{UR} - R^2_R)/(N-1)}{(1-R^2_{UR})/(NT-N-K)}$$

Which N represents the number of country, K the number of explanatory variables, T the number of observations over the time. In this test (which is called as significance effects of group test) when null hypothesis rejected, using of panel data is required. For decision about using of Fixed Effects method or Random Effects method, it must be considered that fixed effect method is usually used when total population is considered and if samples selected from big population, random effect method will be better method [29, 30].

Table 2. Chow test results

Group countries	Statistics	P-value	Result
Low income	225.8	0	H_0 is rejected
Lower-middle income	387.9	0	H_0 is rejected
Upper-middle income	342.7	0	H_0 is rejected
High income	88.86	0	H_0 is rejected

3-3. Hausman Test

Hausman Test is used for determining the method of estimation in panel data approach which its statistic is (H) with χ^2 distribution with K degree freedom (number of explanatory variables). If the null hypothesis rejected in the first test, the second test (Hausman Test) for the method of estimation in panel data methods will be used. In the Fixed Effects method, time aspect is not considered and only the effects which belong to each section of the time will be consider as individual effects. In the Random Effects method, time aspect is considered and the effects which belong to each section of the time will be consider as individual effects in the model. Hausman test statistic is as follows:

$$H = \frac{\beta_{FE} - \beta_{RE(GLS)}}{VAR(\beta_{FE}) - VAR(\beta_{RE(GLS)})}$$

This test is hypothesis testing of uncorrelated individual effects and the explanatory variables which based on this test the generalized least squares estimation (GLS) under the H_0 hypothesis is consistent and under H_1 hypothesis is inconsistent. These hypothesis are as follows:

$H_0 : E(u_{it} / x_{it}) = 0$

$H_0 : E(u_{it} / x_{it}) \neq 0$

The rejection of the null hypothesis implies that the test method is fixed effects.

Table 3. Hausman test results

Income groups	Statistics	P-value	Result
Low income	18.27	5	H_0 is rejected
Lower-middle income	4.11	0.5	H_0 is no rejected
Upper-middle income	6.1	0.2	H_0 is no rejected
High income	205.4	0	H_0 is rejected

3-4.The results of model for different income groups

Table 4. Model results of the regression model for different income groups

	Low Income	**Lower Middle Income**	**Upper Middle Income**	**High Income**				
Variables	Coefficient	Statistics	Coefficient	Statistics	Coefficient	Statistics	Coefficient	Statistics
LHPU	0.02*** (0.000)	5.37	0.009** (0.03)	2.11	0.02*** (0.000)	5.24	0.00001 (0.5)	2
LHPR	0.03*** (0.000)	4.27	0.01** (0.04)	2.3	0.01*** (0.000)	3.93	0.003*** (0.000)	3.49
LGDP	0.14* (0.000)	9.94	0.08*** (0.000)	15.40	0.05*** (0.000)	12.95	0.01*** (0.000)	6.7
LEMP	0.18*** (0.007)	2.71	0.12*** (0.000)	5.11	0.1*** (0.000)	5.17	0.01*** (0.01)	2.56
LURB	0.34*** (0.000)	14.35	0.15*** (0.000)	9.76	0.12*** (0.000)	7.62	0.06*** (0.000)	5.86
C	1	3.79	2.35	21.5	2.7	26.27	3.9	0.06
R^2	0.76	0.56	0.48	0.48				
F	253.9 (0.000)	858.3 (0.000)	652.2 (0.000)	652.2 (0.000)				

Explanation: The dependent variable is the log of life expectancy (LEB)

As seen in Table 4, Coefficients related to health expenditure Low income groups show, assuming that other factors are constant, 10 percent increase of public health expenditure increases life expectancy by 0.02% and also 10 percent increase of private health expenditure increases life expectancy by 0.03% in low-income countries. Coefficients related to health expenditure in Lower middle income show, assuming that other factors are constant, 10 percent increase of public health expenditure increases life expectancy by 0.009% and also 10 percent increase of private health expenditure increases life expectancy by 0.01% in low-income countries. As well as Coefficients related to public and private health expenditure in Upper Middle income show, assuming that other factors are constant, 10 percent increase of public and private health expenditure increases life expectancy by 0.02% and by 0.01%, respectively, in this income group. The coefficient related to private health expenditure in the high income countries show, assuming that other factors are constant, 10 percent increase of private health expenditure increases life expectancy by 0.003%. As seen, public expenditure in high -income countries has not a significant effect on life expectancy that the possible reason for this can be due the fact that in high income groups a high percentage of GDP is included, thus the law of diminishing returns begins and continues until the effect of public expenditure has no significant effect on life expectancy. In addition, there are many other factors that affect life expectancy, in high-income groups the effect of other factors may be to the extent that public expenditure has not significant effect on life expectancy.

4. Results and Discussion

This study aimed to evaluate the effect of public and private expenditures on life expectancy in different income groups using panel data model. For this purpose, the World Bank classification was used in which countries are divided into high, (lower and upper) low and medium income groups and given that data were not available, the period of review was limited to 1996-2014. The findings show that health expenditure, regardless of the financing source, improves life expectancy at birth, but the effect on the target indicator is not the same in different countries.

In addition, health expenditure in all income groups improves life expectancy at birth, except high -income groups, but the effect on the target indicator is not the same in different groups. It was expected that private and public expenditures have significant and positive effect on life expectancy at birth in all groups; while unexpectedly according to the results obtained in the study period, coefficients related to public expenditure in lower and upper low and middle income groups are significant and positive, but they have not a significant effect on health in high-income countries that the result was contrary to expectation, but according to the law of diminishing returns it is consistent with theoretical foundations as well as previous studies; as according to Self and Grabowski rich countries enjoy more health, but more health expenditure, especially public health expenditure in these countries has little effect on health, and the reason of this average improvement is their better economic and educational status; but it justifies government intervention in middle-income countries and less developed countries in which the participation rate of public sector is relatively smaller and explains that this type of expenditure in these countries is more effective on health; thus regardless the economic status, the more intervention of public sector in health reduces the efficiency of health sector; therefore, in these countries diminishing returns begin with the expansion of public sector in health area. In addition, private health expenditure in all income groups has a significant and positive effect on life expectancy at birth.

Health area is so that on the one hand, is affected by many factors and on the other hand many sectors are affected by it, this area is very critical, yet it has its specific complexity. In addition, each community has different socio-economic, environmental and governance

conditions, etc. that all of these factors affect health. There are also many input indicators in the health sector that considering each of these indicators as the dependent variable, different results may be obtained, thus, given the complexities, accurate and comprehensive results cannot be obtained and given the specific circumstances of each country or group the results cannot be generalized to other groups.

References

1. Lu C, Schneider M.T, Gubbins P, Leach- Kemon, K, Jamison D, Murray C.J. Public financing of health in developing countries: a cross-national systematic analysis. The Lancet 2012; *375*(9723): 1375-1387.
2. Deluna JR. Peralta, T. F. Public Health Expenditures, Income and Health Outcomes in the Philippines. University of Southeastern Philippines, School of Applied Economics 2014.
3. Moreno-Serra R, Smith P.C. Does progress towards universal health coverage improve population health?. The Lancet 2012; 380(9845): 917-923.
4. Aísa R, Clemente J, & Pueyo F. The influence of health expenditure on longevity: a reconsideration. International Journal of Public Health 2014.
5. Newhouse J.P. Medical-care expenditure: a cross-national survey. The Journal of Human Resources 1977; 12(1): 115-125.
6. Çevik S, Taşar M.O. Public spending on health care and health outcomes: cross-country comparison. Journal of Business Economics and Finance 2013; 2(4): 82-100.
7. Thornton J. Estimating a health production function for the US: some new evidence. Applied Economics 2002; 34(1): 59-62.
8. Mikkonen J, Raphael D. Social Determinants of Health: the canadian facts York University, School of Health Policy and Management 2010.
9. Preston S.H. The changing relation between mortality and level of economic development. Population studies 1975; 29(2): 231-248.
10. Wilkinson R.G. Income distribution and life expectancy. BMJ: British Medical Journal 1992; 304(6820): 165.
11. Winegarden C.R. A simultaneous-equations model of population growth and income distribution. Applied Economics 1978; 10(4): 319-330.
12. Winegarden C.R. Income redistribution versus accelerated economic growth: A comparison of demographic effects. Oxford Bulletin of Economics and Statistics 1984; 46(3): 255-271.
13. Saunders, P. Income distribution, poverty and health in Australia. In présenté au colloque du Centre d'étude de marché du travail, Université d'Aarhus 1996: 21.
14. Kawachi I. Kennedy B.P. The relationship of income inequality to mortality: does the choice of indicator matter? Social science & medicine 1997; 45(7): 1121-1127.
15. Novignon J, Olakojo S.A, Nonvignon J. The effects of public and private health care expenditure on health status in sub-Saharan Africa: new evidence from panel data analysis. Health economics review 2012; 2(1): 22.
16. Poullier J.P, Hernandez P. Kawabata K. Savedoff W.D. Patterns of global health expenditures: results for 191 countries. Geneva: World Health Organization 2002.
17. Jamison D.T, Mosley W.H. Disease control priorities in developing countries: health policy responses to epidemiological change. American journal of public health 1991; 81(1): 15-22.
18. Filmer D, Pritchett L.The impact of public spending on health: does money matter? Social science & medicine 1999; 49(10): 1309-1323.
19. Sadeghi S K, Mohammadi e khanghani R. The impact of health care expenditure on health indicators: an empirical analysis in middle income countries. Journal of Payesh 2014; 4(1): 7-14.
20. Farag M. Health Financing and Health Outcomes in the Eastern Mediterranean Region. Brandeis University 2009; 10-20.
21. Bokhari F.A, Gai Y, Gottret P. Government health expenditures and health outcomes. Health Economics 2007; 16(3): 257-273.
22. Gottret P.E, Schieber G. Health financing revisited: a practitioner's guide. World Bank Publications 2006.
23. Self S, Grabowski R. How effective is public health expenditure in improving overall health? A cross–country analysis. Applied Economics 2003; 35(7): 835-845.
24. Asgari H, Badpa P. The effects of public and private health expenditure on health status of individuals in Iran. Journal of Medical Sciences 2015; 23(5).
25. Mohammad Zade p, Nafisi Moghadam M, Heydari H. The effects of public and private health care expenditures on health in selected countries, with panel data approach. First International Conference on Emerging Trends in business management. Tabriz University, Tabriz and Industrial Management Institute 2014.
26. Rajkumar A.S, Swaroop V. Public spending and outcomes: Does governance matter? Journal of development economics 2008; 86(1): 96-111.
27. http://databank.worldbank.org
28. http://www.who.int/en/
29. Baltagi B. H. Econometric Analysis if Panel Data, Third Edition. John Wiley and Sons. 2005.
30. Baltagi B. Econometric analysis of panel data. Fourth edition. John Wiley & Sons. 2008.