

**CORPORATE
OWNERSHIP & CONTROL**

Postal Address:

Postal Box 136
Sumy 40000
Ukraine

Tel: +380-542-610360
e-mail: info@virtusinterpress.org
www.virtusinterpress.org

Journal Corporate Ownership & Control is published four times a year, in September-November, December-February, March-May and June-August, by Publishing House "Virtus Interpress", Gagarina Str. 9, office 311, Sumy, 40000, Ukraine.

Information for subscribers: New orders requests should be addressed to the Editor by e-mail. See the section "Subscription details".

Back issues: Single issues are available from the Editor. Details, including prices, are available upon request.

Advertising: For details, please, contact the Editor of the journal.

Copyright: All rights reserved. No part of this publication may be reproduced, stored or transmitted in any form or by any means without the prior permission in writing of the Publisher.

Corporate Ownership & Control

ISSN 1727-9232 (printed version)
1810-0368 (CD version)
1810-3057 (online version)

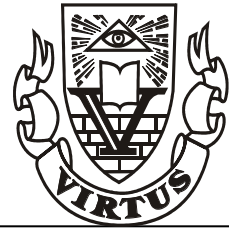
Certificate № 7881

Virtus Interpress. All rights reserved.

CORPORATE OWNERSHIP & CONTROL

VOLUME 13, ISSUE 3, SPRING 2016, CONTINUED - 2

CONTENTS



VALUE, GOVERNANCE AND FOREIGN SHAREHOLDING IN BRAZILIAN COMPANIES	275
<i>Natalia Simoes, Andre Carvalho</i>	
POLITICAL CONNECTIONS, STATE OWNED ENTERPRISES AND TAX AVOIDANCE : AN EVIDENCE FROM INDONESIA	279
<i>Yudha Aryo Sudibyo, Sun Jianfu</i>	
FINANCING STRUCTURE AND OUTREACH OF SELECTED SADC MICROFINANCE INSTITUTIONS (MFIS)	284
<i>Innocent Bayai, Sylvanus Ikhide</i>	
DO INVESTORS VALUE FIRM EFFICIENCY IMPROVEMENT? EVIDENCE FROM THE AUSTRALIAN CONTEXT	293
<i>Hai Yen Pham, Richard Chung, Eduardo Roca, Ben-Hsien Bao</i>	
INEFFECTIVE CORPORATE GOVERNANCE: BUSYNESS OF INTERNAL BOARD MONITORING COMMITTEES	309
<i>Khamis H. Al-Yahyaee, Ahmed Al-Hadi</i>	
CREDIT RISK: FROM A SYSTEMATIC LITERATURE REVIEW TO FUTURE DIRECTIONS	326
<i>Flavio Barboza, Herbert Kimura, Vinicius A. Sobreiro, Leonardo F. C. Basso</i>	
“INTEGRATED” PUBLIC GROUPS: INSIGHTS ON BOUNDARIES AND DIVESTMENT OPPORTUNITIES	347
<i>Vincenzo Zarone, Alessia Patuelli, Simone Lazzini</i>	
BOARD GOVERNANCE, OWNERSHIP STRUCTURE AND FINANCING DECISIONS IN EMERGING MARKET	355
<i>Md Safiullah</i>	
THE FINANCING METHODS FOR SMALL AND MEDIUM COMPANIES: COMPARISON BETWEEN ITALY AND GERMANY	366
<i>Rossi Matteo, Giacosa Elisa, Mazzoleni Alberto</i>	
DISPOSITION EFFECT AND INVESTOR UNDERREACTION TO INFORMATION	378
<i>Mondher Bouattour, Ramzi Benkraiem, Anthony Miloudi</i>	
FINANCIAL INNOVATION IN RETAIL BANKING IN SOUTH AFRICA	393
<i>B. Smit, F J Mostert, J H Mostert</i>	
BUSINESS GROWTH AND SOCIAL MEDIA: AN ORGANISATIONAL ISSUE	402
<i>Claudette Rabie, Michael C. Cant, Ricardo Machado</i>	

VALUE, GOVERNANCE AND FOREIGN SHAREHOLDING IN BRAZILIAN COMPANIES

Natalia Simoes * Andre Carvalho**

* Getulio Vargas Foundation

** Federal University of Rio de Janeiro, The second author would like to acknowledge and thank support from CNPq and FAPERJ.

Abstract

This study aims to identify the characteristics of Brazilian listed companies that have foreign investors. The purpose is to examine whether such companies have higher performance and valuation and better corporate governance. We study 215 listed companies from 2001 to 2012, and find that there is a significant relationship between the presence of foreign investors and higher firm valuation, higher profitability and better corporate governance.

Keywords: Foreign Investors, Corporate Governance, Firm Value And Performance

1. INTRODUCTION

The relationship between corporate governance, value and performance of the firms is the subject of numerous studies, which in general conclude that there is a positive correlation between governance and higher firm value and profitability. In the finance literature there are also studies on the relationship between the presence of foreigners in the capital of a firm and valuation, profitability and corporate governance practices. Foreign capital can encourage and finance economic growth in emerging countries and allow developed countries to diversify their investments better.

Berle and Means (1932), analyzing the ownership structure of companies in the US, find the prevalence of public companies with dispersed ownership among several small minority shareholders. There are few countries that have companies with diffuse ownership and, in general, this structure occurs in large corporations of Anglo-Saxon legal tradition of countries.

La Porta et al. (1998) show a strong negative correlation between the concentration of ownership and quality of legal protection to investors in a given country. In countries where the law does not adequately protect investors, they must have stakes large enough to carry out the monitoring of the company's management. Brazil, which belongs to the tradition of French law, offers less protection to investors and so it is expected high concentration of capital in the companies, especially as regards the voting capital (La Porta et al, 1998).

Pohl, Claessens and Djankov (1997) conclude that, in the Czech Republic, the higher the ownership concentration the greater the profitability and valuation of companies, since there is greater incentive to monitor companies and implement the necessary changes and improvements. The authors also show that the presence of foreign investors is positively related to profitability and negatively related to Tobin Q.

Kim and Kang (2008) argue that multinationals have specific advantages (superior management skills, improved production technology and more solid financial position) compared to domestic firms, and it should be expected that foreign investors take more active role in corporate governance. On the

other hand, if foreign investors have less information on domestic companies, and since there is a cost disadvantage associated with this information (cost of obtaining information, travel costs, etc.), the incentives to engage in governance activities are lower than domestic investors.

A factor that can limit the presence of foreign investors is the distance between them and the target company. Several studies show that, in the United States, investors that are located near the investee company have information advantage, possibly due to easier access to the company's valuable information (Coval and Moskowitz (1999)). King and Kang (2008) show that, in the United States, foreign investors located in the same state of investee companies are more likely to engage in corporate governance activities than investors in other states.

Grinblatt and Keloharju (2001) analyze Finnish companies and suggest that the preference for investments in domestic companies is due to greater familiarity, which can be divided into three aspects: the spoken language, culture and distance of the investor to the investee company. The study shows that Finnish investors whose mother tongue is Swedish are more likely to buy shares of companies whose President speak Swedish. Since the difference in the spoken language can create major barrier in the communication process, the study suggests that the mother tongue is a major source of asymmetries in foreign purchases. Another conclusion is that companies domiciled in Finland who publish their annual reports in Finnish and Swedish have a considerably larger shareholder base.

Chan, Covrig and Ng (2005) show that capital controls, accounting standards, regional laws, rating and GDP growth are factors that influence the decision to invest abroad. Caramico, War and Gasparelo (2011) study the behavior of stock markets in countries that get investment grade, and show that, in the 20 months prior to obtaining investment grade, there is a strong inflow of funds.

Gillian and Starks (2003) find that an important factor in the development of corporate governance in some countries is the presence of foreign institutional investors as shareholders of the companies. On the one hand, firms may be motivated to improve their governance practices to

attract foreign capital, but on the other, the increase in investment from foreign institutions can provide power to these institutions to enforce the changes in governance.

Since the 1990's, the Brazilian market has been gradually allowing the entry of foreign funds. The size of foreign investment in Brazil increased a lot in the last two decades, especially after receiving investment grade status by Standard & Poor's in 2008, followed by Fitch and Moody's.

The favorable environment, combined with a lower risk perception in the Brazilian economy, generated a greater flow of capital to the markets and companies in various industries. From 1995 to 2006, foreign direct investment (FDI) in Brazil grew 14.1% per annum, and, after obtaining the investment grade, the growth rate rose to 19.3% per annum from 2007 to 2013. According to data from Central Bank of Brazil, the share of FDI in Brazil's external liabilities increased from 37% in 2002 to 69% in 2013. The stock of FDI in Brazil in relation to total world increased from 1.6% in 2000 to 3.3% in 2011.

In Brazil, Silveira, Barros and Fama (2004) concluded that the identity of the controlling shareholder does not appear to have an impact on the level of corporate governance and reinforced the idea that corporate governance is probably determined endogenously from observable characteristics of the company.

This paper studies the characteristics of companies that have foreign shareholders in its capital, and analyzes the relationship between the presence of foreign shareholders, firm performance, valuation and governance practices. We estimate panel regressions to examine whether the financial

and market indicators of foreign-controlled companies are better than those of companies in which the largest shareholder is Brazilian. Our results indicate that companies with foreign shareholders have higher performance, valuation and better governance practices when compared to domestic companies.

2. DATA AND METHODOLOGY

Our sample is comprised of 215 listed firms listed from 2001 to 2012. The ownership and governance data come from the Brazilian Securities and Exchange Commission's website, and the financial and accounting data come from Economatica and Bloomberg databases.

First, we collect the information on the largest shareholder with voting rights in each company and classify him as Brazilian or foreigner. Then we split our sample into two groups according to the presence of foreign shareholders or not. We perform statistical tests to analyze if firm characteristics are significantly different between the two groups of companies.

To assess whether companies with foreign shareholders have higher value, we estimate panel regressions using the price-to-book and Tobin's Q as dependent variables. Our variable of interest is the presence of foreign controlling shareholders, so we create a dummy variable to identify them. As control variables we use various financial and governance data identified as determinants of firm value in previous studies. The estimated models are as follows:

$$P/B_{i,t} = \beta_1 + \beta_2 For_{i,t} + \beta_3 ForVOT_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 ROE_{i,t} + \beta_7 NM_{i,t} + \beta_8 Vot_{i,t} + \epsilon_{i,t} \quad (1)$$

$$Q_{i,t} = \beta_1 + \beta_2 For_{i,t} + \beta_3 ForVOT_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 ROE_{i,t} + \beta_7 NM_{i,t} + \beta_8 Vot_{i,t} + \epsilon_{i,t} \quad (2)$$

where P/B is the price-to-book (ratio of market value to capital stock value), Q is the Tobin's Q (ratio of market value of assets to book value of assets), ROE is the return on equity (net income/shareholder's equity), NM is a dummy variable equal to 1 when a firm is listed on New Market, For is a dummy variable equal to 1 when a firm has foreign controlling shareholders, $ForVot$ is the voting capital of the foreign shareholder, Vot is the voting capital of the largest shareholder, $Size$ is firm size (log of total assets), and Lev is leverage (liabilities/total assets).

3. RESULTS

Table 1 shows the descriptive statistics of the variables used in the study from 2001 to 2012. Around 11% of listed companies have foreign shareholders in their capital. On average, companies have price-to-book of 2.06, Tobin's Q of 1.70, ROE of 5.77%, and leverage of 60%. The largest shareholder owns on average 55.1% of the voting capital, and 21% of the companies are listed on New Market.

Table 1. Descriptive Statistics

Descriptive statistics of all variables used in the study from 2001 to 2012. The definition of variables is reported in section 3.

Variable	Mean	Median	Std Dev	Min	Max
P/B	2.06	1.52	9.99	-331.42	57.26
Q	1.70	1.25	2.17	0.22	70.72
FOR	0.11	0.00	0.31	0.00	1.00
ROE	5.77	12.17	77.66	-151.29	988.99
NM	0.21	0.00	0.41	0.00	1.00
VOT	55.08	53.10	26.31	0.00	100.00
SIZE	7.51	7.56	2.23	-7.82	13.96
LEV	60.23	61.80	23.14	0.00	99.90

Table 2 shows the correlation matrix between the variables. There is a positive correlation between foreign shareholder, P/B, Tobin's Q, ROE, firm size and NM. Moreover, there is a negative correlation between foreign shareholder, leverage

and ownership concentration. These results indicate that companies with foreign investors are bigger, less leveraged, have higher valuation, profitability and better governance practices.

Table 2. Correlation Matrix

Matrix of correlation of all variables used in the study from 2001 to 2012. The definition of variables is reported in section 3.

	<i>P/B</i>	<i>Q</i>	<i>FOR</i>	<i>ROE</i>	<i>SIZE</i>	<i>LEV</i>	<i>NM</i>	<i>VOT</i>
<i>P/B</i>	1.00							
<i>Q</i>	-0.57	1.00						
<i>FOR</i>	0.02	0.05	1.00					
<i>ROE</i>	0.12	0.08	0.03	1.00				
<i>SIZE</i>	0.08	-0.18	0.06	0.13	1.00			
<i>LEV</i>	0.29	-0.06	-0.04	0.01	0.13	1.00		
<i>NM</i>	0.09	0.09	0.16	0.08	0.04	-0.04	1.00	
<i>VOT</i>	-0.01	-0.03	-0.13	-0.04	-0.06	-0.01	-0.38	1.00

Table 3 shows the mean and the median of financial and governance variables of the companies divided into 2 groups: companies with Brazilian and foreign shareholders. The table also shows the p-values of the tests of differences in mean and median to analyze if there are significant differences between both groups of firms.

The results indicate that foreign-controlled firms are larger and have higher profitability, value, and better governance practices. The average ROE of foreign companies is 14.87% versus 4.56% of

Brazilian companies. Foreign companies have Tobin's Q and price-to-book (1.98 and 2.49, respectively) higher than those of Brazilian companies (1.66 and 1.99, respectively). The proportion of foreign companies in the New Market (30%) is higher than that of Brazilian companies (20%). The largest shareholder has less voting capital in foreign companies when compared to Brazilian firms (51.46% and 55.53%, respectively). Most of the differences are statistically significant at the 1% or 5% levels.

Table 3. Firm Characteristics by Foreign or Brazilian Shareholding

The sample was divided in two groups: companies with Brazilian and foreign shareholders. The mean and median (in parenthesis) of each variable are reported. The definition of the variables is reported in section 3. We performed a test of differences in mean and median to analyze the existence of a significant difference between the two groups, and the p-value of the test is reported. ***, **, and * indicate statistical difference at 1%, 5% and 10%, respectively

<i>Variables</i>	<i>Foreign-Owned</i>	<i>Brazil-Owned</i>	<i>P-value of test of differences</i>
<i>P/B</i>	2.49 (1.76)	1.99 (1.51)	0.33 (0.02**)
<i>Q</i>	1.98 (1.52)	1.66 (1.24)	0.34 (0.00***)
<i>ROE</i>	14.87 (15.31)	4.56 (11.71)	0.02** (0.00***)
<i>SIZE</i>	8.02 (8.13)	7.44 (7.45)	0.00*** (0.00***)
<i>LEV</i>	57.60 (56.50)	58.48 (56.00)	0.54 (0.81)
<i>NM</i>	0.30 (0.00)	0.20 (0.00)	0.00*** (0.00***)
<i>VOT</i>	51.46 (51.70)	55.53 (53.10)	0.03** (0.07*)

Table 4 shows the results of panel regressions for price-to-book and Tobin's Q as dependent variables. The dummy variable for foreign shareholding is positive and statistically significant for Tobin's Q. For the price-to-book, the dummy

variable for foreign shareholding has the expected sign (positive), but the result is not statistically significant. These results indicate that there is a significant relationship between the presence of foreign investors and higher firm valuation.

Table 4. Firm Value and Foreign Shareholding

Fixed-effects panel regressions where the dependent variables are the price-to-book (*P/B*) and Tobin's Q (*Q*) from 2001 to 2012. The definition of variables is reported in section 3. The p-values adjusted by autocorrelation and heteroscedasticity are reported in parenthesis. ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

<i>Independent Variable</i>	<i>Dependent Variable</i>	
	<i>P/B</i>	<i>Q</i>
<i>FOR</i>	0.21 (0.54)	0.22** (0.05)
<i>ROE</i>	0.01 (0.16)	0.01 (0.12)
<i>SIZE</i>	-0.02 (0.95)	-0.57*** (0.00)
<i>LEV</i>	0.30*** (0.00)	-0.01 (0.44)
<i>NM</i>	0.39 (0.45)	0.44*** (0.01)
R ² adj	0.58	0.36

5. CONCLUSION

The objective of this study is to investigate the relation between firm value, governance and presence of foreign shareholders in the capital of Brazilian companies. We analyzed 215 listed companies from 2001 to 2012, and find a significant relationship between the presence of foreign investors and higher firm valuation, higher profitability and better corporate governance.

REFERENCES

1. Barontini, R.; Bozzi, S. Board compensation and ownership structure: empirical evidence for Italian listed companies. *Journal of Management & Governance*, v.15, n. 1, p. 59-89, 2011.
2. Berle, A.; Means, G. *The modern corporation and private property*. New York: MacMillan, 1932.
3. Chan, K.; Covrig, V.; e NG, L. (2005). What determines the domestic bias and foreign bias? Evidence from mutual fund equity allocations worldwide. *Journal of Finance*, v. 60, p 1495 - 1534, Jun. 2005.
4. Claessens, S., Djankov, S., Pohl, G. *Ownership and Corporate Governance: Evidence from the Czech Republic*. World Bank Seminar, 1997.
5. Gillan, S., Starks, L. *Corporate Governance, Corporate Ownership, and the Role of Institutional Investors: A Global perspective*. *Journal of Applied Finance*, p.4-22, Fall/Winter 2003.
6. Grinblstt, M., Keloharju, M. How Distance, Language and Culture Influence Stockholdings and Trades. *The Journal of Finance*, v. 56, n. 3, p. 1053-1083, 2001.
7. Guerra, K., Caramico, A., Gasparelo, L. O Efeito do Investment Grade nos países emergentes. VII Congresso Virtual Brasileiro de Administração, 2011.
8. Kim, J., Kang, J. Do Foreign Investors Exhibit a Corporate Governance Disadvantage? An Information Assymmetry Perspective. *Journal of International Business Studies*, v. 41, p. 1415-1438, 2010.
9. La Porta, R. et al. Law and finance. *Journal of Political Economy*, v. 106, p. 1113-1155, 1998.
10. Leal, R. P. C.; Carvalho Da Silva A. L. Controle Compartilhado e o valor das empresas brasileiras, RAC Electronica, Curitiba, v.2, n.2, p. 296-310, Mai-Ago 2008.
11. Moskowitz, T., Coval, J. The Geography of Investment: Informed Trading and Asset Prices. *Journal of Political Economy*, v. 109, n. 4, p. 811-841, 2010.
12. Silveira, A., Barros, L., Famá, R. Determinantes do Nível de Governança Corporativa das Companhias Abertas Brasileiras. VII SEMEAD - Pesquisa Quantitativa Finanças, 2004.

POLITICAL CONNECTIONS, STATE OWNED ENTERPRISES AND TAX AVOIDANCE : AN EVIDENCE FROM INDONESIA

Yudha Aryo Sudibyo*, Sun Jianfu**

* Faculty of Economics and Business, Jenderal Soedirman University, Indonesia

** College of Management, Hebei University, P.R China

Abstract

This study investigated the relationship between political connections and tax avoidance behaviour in Indonesian listed-firms in 2007-2013 year period. Some firms created links to government for obtaining benefits in various variables such import licensing, taxes, and supply-funds. We have manually managed to identify politically connected-firms from the annual reports and measure tax avoidance by using Cash Effective Tax Rate (CETR) as the proxy. Our observation indicated that politically connected-firms paid lower corporate income tax than non-politically connected-firms. Our study also examined how the status of State Owned Enterprise (SOE) correlates to tax avoidance. Firms hiring politically connected independent commissioners (INDCOM) in this study were more likely to show tax avoidance behavior. However, we have no strong evidence to prove our proposition regarding the type of political connections.

Keywords: Political Connections; State Owned Enterprises; Tax Avoidance; Corporate Income Tax; Cash Effective Tax Rate.

Acknowledgment

This work was supported by Ministry of Research, Technology and Higher Education of Indonesia.

1. INTRODUCTION

Corporate income tax is one of the primary concerns of both firms and the government. Firms are always trying to manage tax efficiently to reduce their expenses. On the other side, the government is responsible to optimize state revenues from tax. A study showed that one-fourth of US listed firms are able to maintain long-run cash effective tax rates below 20 percent (Dyreg et.al, 2008). Some other empirical researches have showed how firms were able to efficiently manage their tax (Siegfried, 1974; Porcano, 1986; Rego, 2003; Slemrod, 2004; Crocker and Slemrod, 2005; Dyreg et.al, 2008).

This paper studies tax avoidance, one of the most significant aspects in tax management, which is also the focus in the area of accounting. See Sticney & Mc Gee, 1982; Zimmerman, 1983; Gupta & Newberry, 1997; Shackelford and Shevlin, 2001; Desai and Dharmapala, 2006 ;Chen et.al, 2010; Mc Guire et.al, 2014.

How political connections and tax avoidance are related is the focus of this study; the outcome of this study will be a significant contribution to tax literature. Faccio (2010) believes that politically connected-firms have higher leverage, pay lower taxes, and have stronger market power than non-politically connected-firms. The study of Wu et.al (2012) showed how hiring politically connected manager is a convenient and effective channel for private firms to create links to the government.

When they hire such manager, it will be beneficial to the firms in terms of lower taxes and private taxes information.

We here focus on Indonesia, a country where the institutional environment is weak (Leuz & Gee, 2006; Sudibyo et.al, 2013). Corruption is a serious issue in Indonesia (as well as other Asian Countries, according to the survey held by Transparency International, 2013). Despite its corruption issue, Indonesia's economic growth is considerably high. World Bank (2011) has named Indonesia as 10 of 12 countries with the largest economic growth as indicated by Gross Domestic Product (GDP). This shows that tax is one of the potentials to improve state revenue; thus, it must be significantly optimized. This year, Indonesian Tax Authority has established their tax ratio, aiming the increase from 12% to 14% (Directorate General of Taxes, 2015).

We here provided empirical evidence on tax avoidance behavior from firms listed at Indonesian Stock Exchange from 2007-2013 periods. The purpose of our study is to examine the effect of politically connected-firms toward tax avoidance behavior. The recent coordinating Minister on Economy of Indonesia argued that the position of board of directors or commissioners at state-owned enterprise (SOE) for politicians or former of politicians is a tradition in Indonesia (Kompas, 2015). This is supported by some literatures on political connections in Indonesia (Fisman, 2001; Leuz & Gee, 2006; Mobarak & Purbasari, 2006; Nys et.al, 2015).

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Political Connections

Stigler (1971) argued that public resources and powers could be used to improve the economic status of economic groups (such as industries and occupations), which he referred as the demand for regulation. Supply of regulation was characterized by political processes which allow relatively small groups to obtain such regulation. Theory of economic regulation here, is central to determine who will receive the benefits or burdens of regulation, what regulation is in effect, and the effects of the regulation upon the allocation of the resources. Here, bureaucrats tend to use their position by providing rights to businessman for product licensing (Krueger, 1974), or tax benefit (Quinn & Shapiro, 1991; Williams & Collins, 1997; Young et.al, 2001; Richter et.al, 2009).

Some literatures on political connections in Indonesia has shown the significant role of the connection to the economy (Fisman, 2001), the relationship to global financing (Leuz & Gee, 2006), the effect on import licenses decisions (Mobarak & Purbasari, 2006), the indirect costs of financial distress (Wijantini, 2007) and the ability to collect formal deposit insurance (Nys et.al, 2015).

2.2. Tax Avoidance

Tax literatures define tax avoidance in many different way; we here take the definitions broadly that it is the reduction of explicit taxes (Dyregang et. Al, 2008; Hanlon and Heitzman, 2010). Most literatures on tax avoidance emphasize on the determinants of tax avoidance, such as firm value (Chen et.al, 2014), firm size (Zimmerman, 1983; Porcano, 1986; Gupta & Newberry, 1997), firms ownership (Shackelford & Shevlin, 2001; Chen, et.al, 2010), foreign-operations firm (Stickney & McGee,

1982; Rego, 2003; Atwood et.al, 2012), and leverage (Gupta & Newberry, 1997).

However, studies with empirical evidence on relationship between political connections and tax avoidance are still scarce (Adhikari, 2006; Faccio, 2010; Wu et.al, 2012). Therefore, our study aims to examine the effect of political connections toward tax avoidance. We believe political connections will be beneficial to the firms in terms of gaining more information about tax regulation and favorable tax treatment. We will prove this hypothesis in our paper.

Firms which have political connections are divided into private firms and state-owned enterprise (SOE). That state-owned enterprise have more stable connections with tax authorities positively correlates to tax managing skills; much better than private firms. Therefore we present the following hypothesis:

H 1: Politically connected pay lower taxes than non politically connected-firms.

H 2: SOE able to manage taxes better than private politically connected-firms.

3. RESEARCH METHOD

3.1. Data

To minimize bias caused by different tax regulations on each sectors, our study here focuses on manufacturing firms listed at Indonesian Stock Exchange from 2007 to 2013 periods. We retrieved our data from OSIRIS Database for pre-tax income, and then we manually collected cash tax paid data from financial statement, and categorized the politically connected firms from their annual reports.

We eliminated several firms which do not comply to the following criteria: no business activities/ missing data, net operating loss (NOL) carry-forward, negative cash tax paid and cash ETR more than one. Finally, our sample consists of 52 manufactured firms, with 364 firm-year observation (Table 1).

Table 1. Sample selection

<i>All manufacturing firms listed in Indonesian Stock Exchange</i>	171
<i>Less :</i>	
<i>Firms missing data for one or two years</i>	(32)
<i>Firms with net operating loss carry-forward</i>	(82)
<i>Firms with negative cash tax paid</i>	(45)
<i>Firms with cash ETR more than one</i>	(12)
<i>Final sample (number of firms)</i>	52
<i>Final sample (firm years)</i>	364

3.2. Measure of Political Connections (POL)

A company is defined as politically connected firm when at least one of its shareholders (anyone controlling at least 10% of voting shares), and one of its top officers (board of commissioners/ directors) is a political party member, a parliament member, a government official (including military officer), a former of parliament member and/or a former of government official (military officer). We also define state-owned enterprises as politically connected firms.

The procedure of the categorization is as follow: first, we collected the name of

commissioners, directors and owners from firms' financial statements. Second, we determine their political backgrounds by investigating individuals' biographies from firms' annual reports. Finally, we collected additional data from various websites to check the information established at the second step.

POL is a dummy variable that equals one when a firm has political connections, and zero when otherwise. In this study, we classified 26 firms as politically connected-firms, and 25 firms with no political connections (NONPOL). NONPOL is also a dummy variable which equals one when it is non

politically-connected firm, and zero when it is otherwise.

For politically connected-firms, we follow Nys et.al (2015), where the categorization falls into three different categories based on what is politically connected. The classification is as follow: firms, which at least one of their directors or at least one

of their controlling shareholders is politically connected (DIR); firms, which at least one of their commissioners is politically connected (COM); and firms, which at least one of their independent commissioners is politically connected (INDCOM).

To investigate impact of SOE to tax avoidance behavior, we also examine the model below:

$$CETR_{i,t} = \alpha_0 + \alpha_1 SOE_{i,t} + \alpha_2 DIR_{i,t} + \alpha_3 COM_{i,t} + \alpha_4 INDCOM_{i,t} + \varepsilon_{i,t} \quad (1)$$

3.3. Measure of Tax Avoidance

Tax avoidance is measured by using Cash Effective Tax Rate (Cash ETR). We calculated a firm's total cash taxes paid over a five-year period and divided that by the sum of its total pretax income over the same five-year period (Dyrenge et.al, 2008). Cash tax paid by the firms can be obtained in the financial statements at the statement of cash flows. The benefit of using cash tax is to avoid tax accrual effects present in the current tax expense.

We divided our observation periods into 3 groups (2007-2009 periods, 2010-2013 periods, and 2007-2013) since the government decreased the tariff of corporate income taxes to 25 % at 2010¹. For robustness check, we examined the impact of political connections toward tax avoidance in those periods.

4. RESULTS

We here examined the influence of political connections to tax avoidance behavior. The mean of cash effective tax rate (CETR) between politically

connected-firms (POL) and non politically connected firms (NONPOL) were compared. Table 2 describes mean comparison of cash effective tax rate. During overall period, non politically connected-firms (NONPOL) has higher mean than politically connected-firms (POL), at 0.3493 and 0.2872, respectively. It indicates that politically connected-firms pay lower taxes than non-politically connected-firms.

The comparison of cash effective tax rate (CETR) on separate periods yields consistent results. For robustness check, we compare cash effective tax rate in 2007-2009 periods (CETR3) and 2010-2013 periods (CETR7). The results show that politically connected-firms have lower CETR in both periods than non politically connected-firms (Table 2). That there is no influence of difference of corporate income tax tariff is evidential in our study.

From table 2, we investigate the average of cash effective tax rate (CETR) which are paid by politically connected-firms is 28,72%. On the other side, non politically connected-firms pay higher at 34,93%. The average of CETR3 is higher than CETR 7 as the tariff was different at of the two periods.

Table 2. T-test results

	POL (n=26)		NONPOL (n=25)		t-Test
	Mean	Median	Mean	Median	
CETR3	0.3135	0.3086	0.4077	0.3157	0.000***
CETR7	0.2675	0.2603	0.3054	0.2667	0.000***
CETR	0.2872	0.2746	0.3493	0.2782	0.000***

POL is political connected-firms. NONPOL is non politically connected-firms. CETR is cash effective tax rates. CETR3, CETR7, CETR are calculated by summing cash tax paid over 2007-2009 periods, 2010-2013 periods, and total periods, respectively, and dividing by pretax income summed over 2007-2009 periods, 2010-2013 periods, and total periods, respectively. *, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively.

To examine the impact of state owned enterprise to tax avoidance behaviour, we conducted ordinary least square (OLS) regression for testing our model (Table 3). The results show that the status of state owned enterprise (SOE) affect their cash tax paid in overall periods at 10% level of significance. It denotes that state-owned enterprises have the ability to manage their tax better than private firms.

Table 3. OLS Regression results

	POLCETR3	POLCETR7	POLCETR
SOE	1.983 (0.051)*	0.548 (0.585)	1.859 (0.065)*
DIR	-0.598 (0.552)	-0.220 (0.827)	-0.791 (0.430)
COM	-1.398 (0.166)	0.562 (0.575)	-0.594 (0.553)
INDCOM	-1.254 (0.214)	1.463 (0.147)	0.076 (0.940)
Observations	78 firm-years	104 firm-years	182 firm-years

This table reports the OLS regression results of cash effective tax rates on political connected-firms. POLCETR3 is cash effective tax rates of politically

connected-firms in 2007-2009 periods. POLCETR7 is cash effective tax rates of political connected-firms in 2010-2013 periods. POLCETR is cash effective tax

rates of political connected-firms in 2007-2013 periods. SOE is the dummy variable for firms which equal 1 if a firm belong to government, and zero otherwise. DIR is the dummy for directors which equal 1 if politically connected, and zero otherwise. COM is the dummy variable for members of board of commissioners which equal 1 if politically

connected, and zero otherwise. INDCOM is the dummy variable for independent commissioners which equal 1 if politically connected, and zero otherwise. The values in parentheses are *p*-values. **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 4. Correlation matrix

	<i>POLCETR</i>	<i>SOE</i>	<i>DIR</i>	<i>COM</i>	<i>INDCOM</i>
<i>POLCETR</i>	1				
<i>SOE</i>	0.06	1			
<i>DIR</i>	0.069	0.083	1		
<i>COM</i>	0.046	-0.093	-0.210***	1	
<i>INDCOM</i>	-0.050	0.397***	-0.397	-0.490***	1

The table reports Pearson correlation matrix of the variables. *POLCETR* is cash effective tax rates of political connected-firms. *SOE* is the dummy variable for state-owned enterprises. *DIR* is the dummy for firms with political connected-director. *COM* is the dummy for political connected-commissioners. *INDCOM* is the dummy for political connected-independent commissioners. **, and *** indicate significance at the 10%, 5% and 1% levels.

However, in this study, we have no strong evidence to support our proposition regarding the type of political connections. The observation of firms where the directors are politically connected-directors (*DIR*), and firms where the directors have political connections on their commissioners (*COM*), seem to show negative impact upon their ability to manage tax.

Firms hiring politically connected-independent commissioners (*INDCOM*) are more likely to perform tax avoidance. Table 3 reports the regression results of *INDCOM*; it shows positive impact of *INDCOM* to *CETR*, but the relationship is weak with *p*-values at 0.076. We also presented the correlation analysis of each variable at table 4.

5. CONCLUSION

Our study has provided empirical evidence on tax avoidance behaviour in Indonesia. Under the framework of previous studies concerning political connections in Indonesia (Fisman, 2001; Leuz & McGee, 2006; Mobarak & Purbasari, 2006; Wijantini, 2007; Nys et.al, 2015), we have managed to expose the effect of political connections regarding tax avoidance behaviour in Indonesia.

Our findings are consistent to tax avoidance definition by Dyreng et.al (2008) and conceptual terms proposed by Hanlon & Heitzman (2010), as the reduction of explicit taxes. Consequently, firms which are indicated to avoid taxes in this study might be defined by different means. The avoidance might be driven by their tax managing skills, tax planning, tax aggressiveness, tax evasion and tax sheltering.

Our study has described that tax avoidance behavior by politically connected-firms during 2007-2013 periods in Indonesia. Previous literatures described that political connection gives more benefits regarding import licensing (Mobarak & Purbasari, 2006), supply of funds and inviting deposits (Nys et.al, 2015). In this study, we have provided another evidence on the correlation

between political connections and tax avoidance behavior.

Politically connected-firms tend to pay lower taxes as compared to non politically connected-firms during observation periods. This supports prior works on political connections and tax literatures (Adhikari, 2006; Faccio, 2010). In this study, political connections play an important role on cash tax paid by firms. It suggests that the economy of developing countries tend to be relationship-based rather than market-based (Adhikari, 2006).

For Indonesian Directorate General of Taxes, this study is a valuable contribution to tax collecting activities by describing how politically connected-firms enjoy tax benefit in Indonesia as compared to others. Proper policies designed by these findings might optimize state revenues from corporate income tax in upcoming years, and in turn, help the directorate in achieving its target.

Control variables and other determinants of tax avoidance are details to improve in further study. Firm size and firm performance are some of the variables to consider, as well as other tax avoidance determinants such as family-ownership shareholder, foreign-operation, high-leverage and dual-listings firms.

1. Tariff of corporate income tax at Indonesia was 28% until 2009, and then it changed to 25% in 2010.

REFERENCES

1. Adhikari, A., Derashid, C., & Zhang, H. (2006). Public Policy, Political Connections, and Effective Tax Rates : Longitudinal Data from Malaysia. *Journal of Accounting and Public Policy*, 25, 574-595.
2. Atwood, T.J., Drake, M.S., Myers, J.N., & Myers, L.A. (2012). Home Country Tax System Characteristics and Corporate Tax Avoidance : International Evidence. *The Accounting Review*, 87(6), 1831-1860.
3. Chen, Shuping., Chen, Xia., Cheng, Qiang., & Shevlin, Terry. (2010). Are Family Firms more Tax Aggressive than Non-Family Firms. *Journal of Financial Economics*, 95, 41-61.
4. Chen, X., Hu, N., & Wang, X. (2014). Tax Avoidance and Firm Value : evidence from China. *Nankai Business Review International*, 5(1), 25-42.
5. Crocker, Keith.J & Slemrod, Joel. (2005). Corporate Tax Evasion with Agency Costs. *Journal of Public Economics*, 89, 1593-1610.

6. Desai, M., & Dharmapala, D. (2006). Corporate Tax Avoidance and High Powered Incentives. *Journal of Financial Economics*, 79(1), 145-179.
7. Directorate General of Taxes. (2015). Ditjen Pajak Optimis Mencapai Target Penerimaan Rp.1.296 Trilyun. Retrieved from <http://www.pajak.go.id>. (in Indonesian language).
8. Dyreng, Scott D., Hanlon, Michelle., & Mayden, Edward L. (2008). Long-Run Corporate Tax Avoidance. *The Accounting Review*, 83(1), 61-82.
9. Faccio, Mara. (2010). Differences between Politically Connected and Non connected Firms : A Cross Country Analysis. *Financial Management*, Autumn, 905-927.
10. Fisman, R. (2001). Estimating The Value of Political Connections. *The American Economic Review*, 91(4), 1095-1102.
11. Gupta, Sanjay & Newberry, Kaye. (1997). Determinants of the Variability in Corporate Effective Tax Rates : Evidence from Longitudinal Data. *Journal of Accounting and Public Policy*, 16, 1-34.
12. Hanlon, Michelle & Heitzman, Shane. (2010). A Review of Tax Research. *Journal of Accounting and Economics*, 50, 127-178.
13. Kompas. (2015). Tim Sukses dan Orang Parpol di BUMN. Retrieved from <http://www.kompas.com>. (in Indonesian language).
14. Krueger, A.O. (1974). The Political Economy of the Rent-seeking Society. *The American Economic Review*, 64(3), 291-303.
15. Leuz, C & Obelholzer-Gee, F. (2006). Political Relationships, Global Financing, and Corporate Transparency : evidence from Indonesia. *Journal of Financial Economics*, 81, 411-439.
16. Mc Guire, Sean T., Wang, Dechun., & Wilson, Ryan J. (2014). Dual Class Ownership and Tax Avoidance. *The Accounting Review*, 89(4), 1487-1516.
17. Mobarak, A.M., & Purbasari, D.P. (2006). *Corrupt Protection for Sale to Firms : Evidence from Indonesia*. Unpublished manuscript. University of Colorado at Boulder, Colorado.
18. Nys, E., Tarazi, A., & Trinugroho, I. (2015). Political Connections, bank deposits, and formal deposit insurance. *Journal of Financial Stability*, <http://dx.doi.org/10.1016/j.jfs.2015.01.004>.
19. Porcano, Thomas M. (1986). Corporate Tax Rates : Progressive, Proportional and Regressive. *The Journal of The American Taxation Association*, 7(1), 17-31.
20. Quinn, D.P., & Shapiro, R.Y. (1991). Business Political Power : The Case of Taxation. *The American Political Science Review*, 85(3), 851-874.
21. Rego, Sonja O. (2003). Tax-Avoidance Activities of U.S.Multinational Corporations. *Contemporary Accounting Research*, 20(4), 805-33.
22. Richter, B.K., Samphantharak, K., & Timmons, J.F. (2009). Lobbying and Taxes. *American Journal of Political Science*, 53(4), 893-909.
23. Shackelford, D.A., & Shevlin, T. (2001). Empirical Tax Research in Accounting. *Journal of Accounting and Economics*, 31, 321-387.
24. Siegfried, John. J. (1974). Effective Average U.S.Corporation Income Tax Rates. *National Tax Journal*, 27(2), 245-259.
25. Slemrod, Joel. (2004). The Economics of Corporate Tax Selfishness. *National Tax Journal*, 57(4), 877.
26. Stickney, C., & Mc Gee, V. (1982). Effective Corporate Tax Rate : The Effect of Size, Capital Intensity, Leverage and Other Factors. *Journal of Accounting and Public Policy*, 1(2), 125-52.
27. Stigler, G.J. (1971). The Theory of Economic Regulation. *The Bell Journal of Economics and Management Science*, 2(1), 3-21.
28. Sudibyo, Y.A., Jianfu, S., & Bawono, I.R. (2013). Institutional Theory and Corruption : Empirical Study on Public Sector Organizations in China and Indonesia. *Indonesia Accounting National Conference XVII Proceeding*. (in Indonesian language).
29. Transparency International. (2013). Corruption Perceptions Index. Retrieved from <http://www.transparency.org>.
30. Wijantini. (2007). A Test of The Relationship between Political Connection and Indirect costs of Financial Distress in Indonesia. *Asian Academy of Management Journal of Accounting and Finance*, 3(2), 61-87.
31. Williams, J.T., & Collins, B.K. (1997). The Political Economy of Corporate Taxation. *American Journal of Political Science*, 41, 208-44.
32. World Bank. (2011). The International Comparison Program. Retrieved from <http://icp.worldbank.org>.
33. Wu, Wenfeng., Wu, Chongfeng., Zhou, Chunyang., & Wu, Jun. (2012). Political Connections, Tax Benefit and Firm Performance : Evicence from China. *Journal of Accounting and Public Policy*, 31, 277-300.
34. Young, M., Reksulak, M., & Shughart, W.F. (2001). The Political Economy of The IRS. *Economics and Politics*, 13(2), 201-219.
35. Zimmerman, Jerold L. (1983). Taxes and Firm Size. *Journal of Accounting and Economics*, 5, 119-149

FINANCING STRUCTURE AND OUTREACH OF SELECTED SADC MICROFINANCE INSTITUTIONS (MFIS)

Innocent Bayai*, Sylvanus Ikhide*

* University of Stellenbosch Business School, South Africa

Abstract

This paper probes the link between financing structure and outreach noting the commercialization trend for selected Southern Africa Development Community (SADC) MFIs. Assuming MIX panel data on 60 MFIs, this study tackles outreach depth and breadth - a diversion from an outreach depth-centered study which employed Planet Rating data on 74 Sub-Saharan African MFIs. Robust panel methods show that, both outreach depth and breadth are affected by the same variables, though in a different way. Equity, deposits and 'new' MFIs significantly further depth whilst borrowings limit depth. Breadth is constrained by borrowings, equity and 'new' MFIs while deposits expand the breadth. We suggest that, permitting MFIs to collect deposits go a long way in spurring outreach depth and breadth.

Keywords: Financing Structure, Outreach, Microfinance, Mfis, SADC

JEL Classification: G21, I32

1. INTRODUCTION

Hermes & Lensink, (2007: F1) noted that, 'Lack of access to credit is generally seen as one of the main reasons why people in developing economies remain poor.' Soaring financial exclusion is attributed to the lack of strong financial intermediation backed by sound MFI financing (Kapper 2007). Though microfinance has proven its mettle by enhancing access to financial services and products to the poor (Iezza & La Cour 2010; Khawari 2004; Ayayi & Sene 2010), MFIs' capital constraints in developing countries limit access to financial services by the larger proportion of the population (Kumar 2012). Demand for microfinance thus remains un-quenched as stated by Paul (2010) that, 'Demand for microfinance currently outstrips supply by \$300 billion and in order to reach those without access, MFIs need to expand.'

The quest to meet the ballooning demand for microfinance has seen MFIs embracing commercial financing options to broaden their financing options - a phenomenon known as commercialization. Commercialization has been applauded for ensuring financial sustainability (FS) and opening up broader financing opportunities for MFIs (Sekabira 2013). In this respect, the manner MFIs are financed (financing structure) has greatly changed. Hoque et al., (2011) noted the marked transition of NGOs and non-bank MFIs into regulated microfinance banks capable of attracting deposits as the search for adequate financing sources. Quayes (2012) giving the instance of Latin American MFIs acknowledged the significant strides made by NGOs in deviating from subsidy dependency into profitable institutions. Deposit attraction plus debt usage has been increasing, evidencing the evolution of MFI financing structure (Hoque et al. 2011). According to

Lafourcade et al. (2006: 123), 'The future of microfinance as a commercial industry has become the dominant strand of thought behind several international development organizations.' This has seen a growing trend towards commercial microfinance in respect of financing and pricing of products. This paradigm is linked to the institutionalists' camp which posit that, express fight against poverty require permanent institutions (F.S) which are large and stable, exploit massive outreach and are innovative hence operate at low cost (Rhyne, 1998; Robinson 2001; Brau & Woller 2004; Von Pischke 1996). Murdoch (2000: 620) restated that:

....financially sustainable programs can make the greatest dent in poverty. Third, that financial sustainability will give programs access to commercial financial markets. Fourth, that since they come at no cost to donors, financially sustainable programs are superior weapons for fighting poverty. Fifth, that subsidized programs are inefficient and thus bound to fail. Sixth, that subsidized credit most often ends up in the hands of the non-poor. Seventh, that successful microfinance programs must be nongovernment programs. And, eighth, that subsidizing credit undermines savings mobilization.

However, commercialization has brought fears of mission drift - igniting debate on whether FS deepen outreach or spark mission drift. Welfarists content that, commercial microfinance disregards the poor thus the future of microfinance has to be funded by donations, subsidies or grants (Brau & Woller 2004). Increased lending rates on loans are thought to deter the poor from accessing loans and other services. Institutionalists argue that, given the limited resources availed by donors (Johnson 2015), inconsistency of donors in funding development

(Ayayi & Sene 2010) on the back of unchecked abuse of donations, outreach is limited. Also, considering that donors and governments are now weaning off MFIs, commercial financing methods are being instituted (Hoque et. al, 2011). They wrote that, '...commercialisation is the only way to attract money needed to expand the outreach and to liberate the system from dependency on foundations and other charitable donors.'

Evidence on the trade-off between FS and outreach has remained inconclusive. There is evidence aligned to FS being a hindrance to outreach depth (see Cull et. al. 2006; Cull et al. 2009; Hermes et al. 2011; Hartarska & Nadolnyak 2007). Other writings hail the compatibility of FS and outreach (Quayes 2012; Manos & Yaron 2009). Conversely, Hermes & Lensink (2007: 8) argued that,

...most of the evidence on the depth of outreach on microfinance institutions suffers from being anecdotal and case study driven. The existing studies do not systematically explain differences in depth of outreach of microfinance institutions, nor do they explicitly explore whether there is a trade-off between the depth of outreach versus the strife for financial sustainability.

Whereas prior inquiry queried the link between FS and outreach and recently, the link between financing structure and FS (see Sekabira 2013; Bogan 2012) - a direct relationship between financing structure and outreach remain one of the virgin research areas in microfinance as sparse facts exist. The relationship remains implied in studies meant to interrogate either outreach or MFI efficiency (see Kumar 2012; Cull et al. 2011; Hermes & Lensink 2011; Quayes 2012; Zerai & Rani 2012). Whilst Johnson (2015) delved on capital structure and outreach depth considering 74 Sub Saharan Africa MFIs, his study did not address the integrity of outreach, i.e depth and breadth. It remains a duty to understand the relationship between the financing structure and outreach depth and breadth as well as identifying institutional characteristics that have an impact on outreach considering selected SADC MFIs. Cull et al. (2009: 19) noted that, 'the exact nature of trade-offs in microfinance differ across regions, but meaningful trade-offs need to be recognized and weighed everywhere.' In this realm, refocusing on how commercialized MFI financing relates to both depth and breadth of outreach in SADC with the intent of informing MFI financing is a worthy cause.

The SADC region is of interest given the deplorable poverty levels which call for informed MFI financing methods for sustainable poverty alleviation. The International Council of Social Welfare stated that more than half of the SADC population lives on less than a dollar per day (ICSW 2014). Still, gloomy microfinance outreach in SADC (Karim et. al. 2011) explains financial exclusion and the poverty in the region thereby calling for apt MFI financing structures which confer the best outreach, hence control poverty. The financing structure of MFIs in the region mimics that of commercial banks - implying that commercialization has taken its toll in the region (Karim et. al 2011). In this realm, it remains worthy to question how commercial financing relates to outreach in the region.

The study is structured as follows: section II covers the literature review; section III describes the data and the methodology; empirical results and the

conclusions are captured in sections IV and V respectively.

2. LITERATURE REVIEW

2.1. Microfinance Outreach

The provision of microfinance products and services (loans, deposits, insurance, consultancy etc) to a broad clientele base define outreach (Conning 1999). Schreiner (1999) noted the variation in the meaning of 'outreach' mentioning the poverty (welfarists) and the financial systems approach (institutionalists) in what has been popularized as the microfinance schism (Morduch 2000). The poverty and the financial systems approaches are synonymous to the welfarist and institutionalist paradigms accordingly (Brau & Woller 2004). Microfinance outreach according to welfarists is meant to reach the poorest whilst institutionalists target less poor client niche in order to limit outreach related costs.

Schreiner (1999) suggested various ways of evaluating the net benefits of microfinance to the community as indicated by: scope and clients' worth, affordability to clients, depth, breadth and length. Yaron (1992) proposed: the value of outstanding loan portfolio and the average value of loans extended, the amount of savings and average value of savings accounts, the variety of financial services offered, the number of branches and village posts, percentage of the total rural population served, the annual growth of MFI assets in real terms and women participation. However, outreach depth and breadth are popular in microfinance literature hence are discussed hereunder.

2.2. Breadth of Outreach

The total number of the clients served by an MFI defines the breadth of outreach (Hishigsurem 2004; Rosenberg 2009). In this regard, the total number of clients doing micro-saving, borrowers, those accessing micro insurance, consultancy etc delineates outreach breadth (Ganka 2010; Mersland & Strom 2010; Hermes et al., 2008). This definition goes well with institutionalists who believe in serving large numbers of the poor hence make a noticeable impact in poverty alleviation. Thus the shallow outreach depth is covered up by large number of clients served (Navajas et al. 2000). The more the clients served, the greater the impact of microfinance on poverty levels. In line with the financial systems approach, financially-sustainable MFIs widen outreach breadth thus reach as many of the poor as poverty-oriented organizations with narrow breadth (Rosenberg, 1996). For example, some self-sustainability-oriented credit unions in Colombia had more poor clients than some poverty-oriented village banks in Costa Rica and Guatemala (Paxton and Cuevas, 1998). Impliedly, the clients served are not necessarily the poorest.

2.3. Depth of Outreach

Outreach depth is synonymous with the poverty camp and it defines the extent microfinance reach and serves the poor. Schreiner (1999: 7),

Depth of outreach is the value that society attaches to the net gain of a given client. In welfare theory, depth is the weight of a client in the social-welfare function. If society has a preference for the poor, then poverty is a good proxy for depth. For example, society likely prefers that a street child or a widow get a given net gain than that a richer person get the same net gain.

The gist is if MFIs fail to serve the poor, then they operate purely as banks. The number of purely-poor clients served better defines an MFI's outreach depth as it meets the social mission of microfinance.

Cull et.al. (2007) acknowledging Ledgerwood (199) wrote that, 'number of clients as a measure of outreach considers only the total number of clients served from various products of an MFI without their relative level of poverty. Microfinance's average loan size has been used as a proxy of the depth of outreach using relative level of poverty. Smaller loans indicate poorer customers'. Other measures of outreach depth include percentage of women borrowers, rural clients served, minorities reached and the illiterate clients (Schreiner 1999). Outreach depth thus is more pronounced where the less privileged are accorded chance to access financial services.

3. MFI FUNDING

Though the traditional M&M¹ capital structure theory sets the tone on corporate funding issues; it remains irrelevant in explaining funding of microfinance given the uniqueness of the microfinance industry. The conventional corporate assumed by the M&M theory does not dovetail with the double bottom lines prioritized in microfinance (Cohen 2003). The life cycle theory (LCT) and the profit incentive theory (PIT) remain the preferred basis for explaining microfinance funding.

3.1. Funding Theories

The LCT acknowledges funding transition evident in MFIs as they develop into financially sustainable institutions. The LCT connotes that funding transition depends on the initial charter assumed by an MFI (Kapper 2007). The Industry Perspective (Campion & White 1999) details the motive to transform by NGOs (donor financed) through shedding off donations and adopting commercial funding means as they seek financial sustainability. The Institutional Perspective (Campion & White 1999) further state that, MFIs would capitalize on cost efficient Information Technology (IT) as they transform. Whilst commercial MFIs use commercial funding from the onset, such meager sources are tight and cannot edify outreach and sustainability. Improved financial performance would further open more commercial funding sources, access capital markets and use of financial instruments.

On the other hand, the PIT emphasizes that commercial funding raises MFI cost consciousness hence advance MFI efficiency and sustainability (Kapper 2007, Bogan 2012, Sekabira 2013). Essentially, MFIs keen on remaining operational for a

long time need not use concessionary priced capital. The PIT upholds that, commercial MFIs seek to maximise revenue and limit operational costs hence accumulate surpluses that cover expenses. The surpluses are then used to further outreach, thus making development to pay for itself (Brau & Woller 2004). Donor funded MFIs do not respond to profit maximisation and cost minimisation pressures thus deliberately opt to choose outreach depth over efficiency by serving the poorest and rural clients which naturally have extra lending costs thereby limiting outreach efforts (see Bogan, 2012; Armanderitz de Aghion & Morduch, 2005).

3.2. MFI funding options and sources

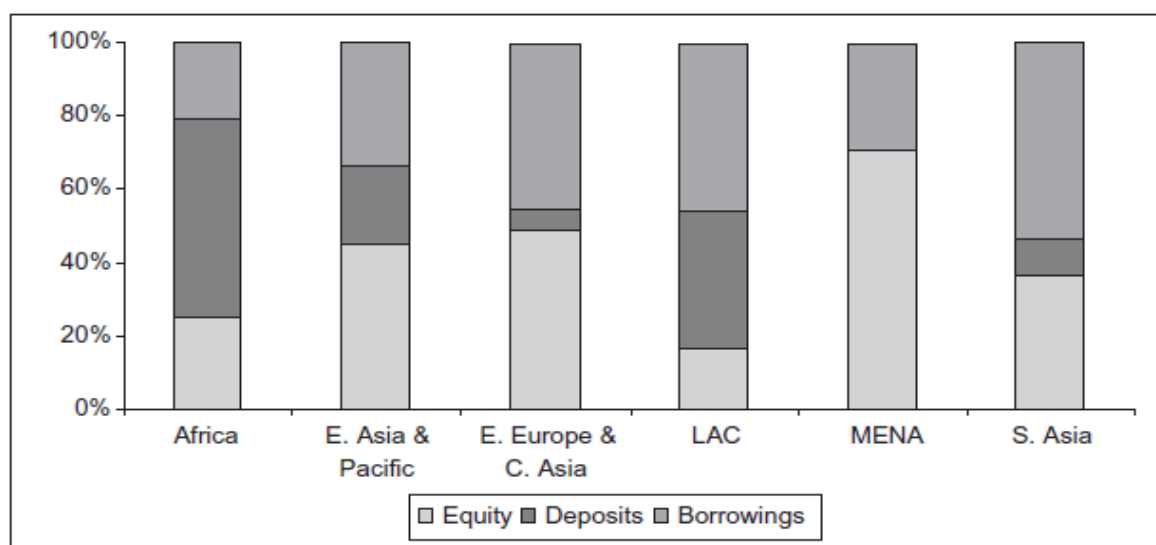
A lot has been written on donations signaling their popularity as a funding option for MFIs. Donations finance capital losses in the poverty camp and fund innovation and establishment costs under the financial systems approach. Once operations are viable, donations are relegated out of the financing structure of sustainability-seeking MFIs (Brau & Woller 2004). However, donations are slammed for harboring in-efficiency, corruption and limiting the attraction of savings. Morduch (2000) stated that, microfinance programs may evade the attraction of savings especially when it is costly to maintain them and when lending programs are not profitable. Rather they choose cheap donor funding leading to a subsidy trap² for MFIs. Governments, international donors, philanthropists and corporates are the major sources of donations (Buss 1999; Kapper 2007).

Savings occupy a significant role in the financing of MFIs in Africa (Lafourcade et al. 2006) as shown in fig 1.0 below. However, attraction of deposits requires observing regulatory and licensing provisions as set by supervisory authorities. Amongst other important issues is the hiring of experts in the handling of deposits as well as the necessary technology for secure record keeping, effecting payments and settlements (Tehulu 2013; Cull et al. 2011). Despite these costs, deposits are a stabilizing form of funding (Kapper 2007; Bredbeg & Ek 2011). Whilst the conventional accounting for financial institutions record deposits as liabilities, their distinguishing feature from debt is that they are attracted from clients at a lower rate (deposit rate) and used to churn-out loans at a higher rate (lending rate).

Where regulation limits MFIs to access deposits, then the most common commercial financing option besides equity is debt. Such can be from commercial banks and international financing organizations (Kapper 2007). Governments and individuals invest in MFIs through Microfinance Investment Vehicles (MIVs). MIVs are institutions designed to provide capital to MFIs by way of investing in microfinance on commercial basis (Isern & Porteous, 2006). They act as conduits of both public and private capital meant for microfinance programmes.

¹ The groundbreaking capital structure theory of the 1950s by Modigliani and Miller glued on the proposition that that firm value is independent of the manner it is capitalized.

² Failure to exist once subsidies stop to be availed

Figure 1. Global Distribution of MFI funding options

Source: Lafourcade et al. (2006)

Popular MIV investors include public funds in the name of International Finance Institutions (IFIs), institutional investors (pension funds) as well as foundations bent on social values, NGOs and philanthropic individuals. Unlike equity capital, debt capital has obligatory repayments meant to service the debt making it more expensive (Kinde 2012). In demonstrating the popularity of commercial funding for microfinance, Hermes & Lensink (2011) highlighted that private investment funds (MIVs) held portfolios constituting MFIs valued at \$2.3 billion.

However, where equity financing require issuing shares on stock markets, floatation costs raise the cost of equity. All the same, equity financing remain an inexpensive financing source for MFIs. Retained earnings are the cheapest since there is no cost of raising such since they are internally generated cash flows reserved for future investment. National and international non-profit organizations, private individuals, governments and banks are popular equity holders in MFIs (Hoque & Chishty 2011).

Table 1. Summary of mfi funding options and funding sources

Funding option	Source of funding
Donations/Subsidies/ Grants	Governments, International Donors, Philanthropists, Corporates (Buss 1999; Kapper 2007)
Debt/Borrowings/Leverage	Private Investors, Banks - Local & International, Multilateral Organizations, Governments (MIVs) (Isern & Porteous, 2005)
Equity	National & International non Profit Organizations; Private Individuals - IPOs, Governments, Banks (Isern & Porteous 2005; Hoque & Chishty 2011)
Savings/Deposits	Micro-savers

Source: Author Compilation

3.3. Commercialization

Lensink (2011) underscored that, commercialisation of microfinance, competition, technology, financial liberalisation and regulation explain the change in financing structure of MFIs. In line with the industry perspective, there is a widespread belief that transformation commercializes microfinance and brings better returns (Campion & White 1999; Meehan 2004; Kapper 2007). This transformation is akin to institutionalists who adhere to the altering of '...management structure, operational efficiency, and sources of financing to resemble those more like a for-profit institution' (Johnson 2015: 122). The gist of commercialization is to make microfinance self-financing, being able to cover both operational and financial costs hence can survive without exterior support (de Sousa-Shields & Frankiewicz 2004). Commercialization is a reality we cannot afford to ignore since international donor agencies are now

embracing commercialization in all programs they fund (Hoque & Chishty 2011).

4. TRADE-OFF BETWEEN FINANCING STRUCTURE AND OUTREACH OF MICROFINANCE

Demystifying the tradeoff between MFI financing and outreach remain an epic task as limited evidence exist. This is because few studies focused on this area. Most of the evidence presented hereunder was implied in studies which pursued either outreach or sustainability.

Kumar (2012) explored the impact of capital structure on MFI performance noting the agency theory. GMM and IV inference on MIX panel data of 782 MFIs in 92 countries concluded that debt had a significant negative impact on outreach. Debt-servicing costs make the granting of loans to the poor more expensive. Outreach depth in this study was measured through average loan size, average loan size adjusted for GDP per capita as well as the

percentage for female clients served by an MFI. Chief amongst the findings was the fact that capital structure had no impact on either the breadth or depth of outreach.

Debate on microfinance trade-offs by Hartarska & Nadolnyak (2007) noted that deposit taking institutions attain broader outreach. The suspicion was that regulation (which allow MFIs to attract deposits) could be having an un-observed effect on outreach. However, an OLS empirical analysis by Cull et al. (2011) on whether regulation curtail profitability and outreach noted that supervision is connected to large average loan sizes and reduced lending to women - implying mission drift. Notable in the paper is that, cost linked to deposit attraction may limit outreach depth despite the fact that savings are a cheap financing option. Hermes et al. (2011) on outreach and efficiency of MFIs underscored the importance of commercial funds in expanding outreach to the poor for protracted periods. On the other hand, commercial funding invites competition amongst MFIs thereby leading to lower costs and interest rates - benefiting the poor.

By mere inference, financial sustainability by definition upholds commercial funding and disregard subsidies. Instinctively, where financial sustainability is linked to outreach, its almost like linking commercial funding and outreach. Assuming this manner of thinking, Quayes (2012) recorded a complimentary alliance between financial sustainability and depth of outreach. This position is explained by innovation in lending by MFIs which pursue financial sustainability. Conversely, Zerai & Rani (2012) showed that there is no link between financial sustainability and outreach. A weak relationship was identified between outreach depth and F.S whilst a strong positive correlation was observed between F.S and outreach breadth. Deductively, commercial funding optimises outreach breadth and limits outreach depth. This position is supported by Wagenaar (2012) and Millson (2013) whose studies concluded that commercial MFIs extent lumpier loans and have a limited proportion of female clients. These results thus portray the inconclusiveness of the perceived relationship between MFI funding and outreach.

5. STYLIZED FACTS ON MFI FUNDING AND OUTREACH IN SADC

This rundown notes funding challenges as well as low outreach chronicling the un-abated poverty in the region. An earlier survey on the state of outreach

in Africa by Lafourcade et al. (2006) spotted that, outreach in Southern Africa was spurred by Teba Bank (South Africa) whose gross loan portfolio accounted for 24% of the outstanding micro loans in Africa and 83% of the total Southern African micro loans. The outreach of the Southern African region is upped by the inclusion of micro-lending aligned commercial banks. As noted by Karim et. al., (2011) outreach in the region remains low hence poverty is unchallenged. Failure of MFIs including the curatorship of the biggest microfinance bank in region (African Bank) in 2014 explains the ailing outreach.

Capitalization of MFIs in SADC is via deposits, equity and retained earnings as well as wholesale priced funds from wholesale markets (Karim et al. 2011). These funding mixes imitate the ones assumed by commercial banks. Donations are provided by international donor societies, public institutions and philanthropic individuals. Regulatory provisions sanctioning the collection of deposits (to protect the public) have allowed MFIs to attract deposits. Lack of adequate financing for MFIs in the region raised the need of structuring financial rescue packages as a way of meeting outreach demands (Karim et. al., 2011).

6. METHODOLOGY

6.1. Data

The study uses Microfinance Information Exchange (MIX (Information is accessible on www.mixmarket.org)) data. Though marred with reporting inconsistencies and self selection bias, MIX data, according to Kumar (2012: 331) '*.....is the most detailed publicly available data on financial, portfolio and outreach performance of MFIs on a global scale.*' Commercialization informed the sample assumed in this study. Accordingly, commercial-oriented MFIs and NGOs in the process of evolving into full-commercial institutions are considered. Traces of commercial funding in the financing structure of NGOs pointed to funding transition.

MFIs with missing details required for the study were relegated. A sample of 60 MFIs was selected for the period 2005 - 2010 and is summarized in table 1.0 below. Unbalanced panel with a minimum of 4 and a maximum of 6 observations is assumed. Key MFI characteristics such as age, number of active borrowers, and number of outstanding loans, profit and regulation status, financing structure details and average loan sizes were provided in the data accessed.

Table 2. Sample description

Characteristic	Number of MFIs	% of the Sample
NGOs	21	35%
Banks	10	17%
Cooperatives	11	18%
NBFIs	17	28%
Rural Bank	1	2%
New	8	13.3%
Young	15	25%
Mature	37	61.7%
Regulated	46	77%
Collect Deposits	51	85%
Profit Motivated	23	38%

Source: Author's compilation

Reflecting on the theoretical underpinnings of commercialization, the sample comprise a blend of MFI charters (NGOs, banks, NBFIs and cooperatives) which naturally assume diverse financing structures good for the investigation being instituted. Notable is that, non-profit MFIs (NGOs) had commercial debt as well as savings in their funding structure. Interestingly, most MFIs (85%), regardless of charter attract deposits in line with findings by Lafourcade et al. (2006).

6.2. Model Specification

The study employs univariate multiple linear regression under panel framework. Panel methods were handy in broadening data points and degrees of freedom hence permit for novel data analysis

$$Out_{it} = C + \beta_1 Fin_{it} + \beta_2 MSC_{it} + \alpha MEF_{it} + u_i + \varepsilon_{it} \quad (1)$$

Where Out_{it} stands for outreach measures, C is a constant, Fin_{it} are financing methods per MFI per time period, MSC_{it} represents MFI specific characteristics whilst MEF_{it} captures macro-economic fundamentals obtaining in the host country of an MFI. Unobserved effects are represented by u_i with the error term captured in ε_{it} .

Financing variables include: borrowings (BA), equity (EA), retained earnings (REA), donations (DA) and deposits (DTA). All these are scaled against assets as a way of smoothening results. MFI specific variables comprise MFI age (MFIs whose age range between 0 - 4 are classified as 'new'; age from 4 - 8 is classified as 'young' whilst age in excess of 8 is referred to as 'mature'. See Bogan 2012.), legal status (regulated or unregulated), profit status and whether an MFI attract deposits or not. Real yields (RY) control for macro economic factors since they are adjusted for inflation.

Using panel data require that an appropriate model is selected between fixed and random effect.

$$AvLoan = \alpha_1 + \beta_1 mature + \beta_2 new + \beta_3 EA + \beta_4 DA + \beta_5 BA + \beta_6 DTA + \beta_7 For_profit + \beta_8 Bank + \beta_9 regulated + \beta_{10} RY + \varepsilon_{it} \quad (2)$$

$$NOAB = \alpha_1 + \beta_1 mature + \beta_2 new + \beta_3 EA + \beta_4 DA + \beta_5 BA + \beta_6 DTA + \beta_7 For_profit + \beta_8 Bank + \beta_9 regulated + \beta_{10} RY + \varepsilon_{it} \quad (3)$$

7. EMPIRICAL RESULTS

7.1. Outreach Depth

Hausman test approved random effects model over the fixed effects model. The Breusch Pagan LM test for random effects accredited the random effects model over OLS. Treating the model to account for cluster effects and robust standard errors exempt of heteroskedasticity and autocorrelation gave results shown in table 3. below.

7.2. Outreach Depth

Equity, borrowings and deposits are the only significant funding options that have an effect on outreach depth. Equity being shareholder-provided comes at a low cost hence can further outreach depth thus explaining the significant positive link with outreach depth. Banerjee et. al. (2011) emphasized that, equity consolidates depth of

techniques to be assumed (Greene 2003; Greene 2002). Gujarati (2004: 637) noted that,

'By combining time series of cross-section observations, panel data give more informative data, more variability, less collinearity among variables, more degrees of freedom and more efficiency.'

Panel data captures time variant (random) and time invariant (fixed) effects making it superior to either cross section or time series data. These methods can capture unobserved effects in the data which cannot be detected by either time series or cross-sectional data individually. Multiple observations per MFI confer the heterogeneity which enriches results. In line with Hartarska & Nadolnyak (2007) and Kumar (2012) MFI specific characteristics, funding and macro-economic fundamentals are included in the general estimation equation 1 below.

Whilst fixed effects fail to account for the ever changing MFI business environment, random effects models might still be inferior to pooled OLS model in some instances. Lucky enough all this can be verified through Hausman and the Breusch-Pagan Lagrange Multiplier (LM) tests (Gujarati 2004). Though the study uses a micro-panel, contemporaneous correlation between panels is tested too. In-built STATA (A data analysis software package popular in economics) (vce options) commands which address panel weaknesses such as autocorrelation and heteroskedasticity are resorted to in making the selected model robust.

Noting the 'schism' in defining outreach, the study embraces both outreach depth and breadth as per welfarists and institutionalists positions. Siding with welfarists, the dependant variable in equation 2 is the average loan size. Literature labeled it as a good measure of outreach depth. Equation 3 is based on institutionalism, i.e. outreach is defined by number of active borrowers - NOAB).

outreach thus has a restricted impact on breadth. Also, equity remains a scarce resource to most MFIs given that in SADC, few if any MFIs have gone public. Borrowings recorded a significant negative relationship with outreach depth, cementing findings by Johnson (2015) and Kar (2012). Kinde (2012) noted that debt in Africa is costly thus in this case, it cannot be used to fund costly small loans required by the poor. Since MFIs place a margin on top of the cost of debt when lending in order to gunner for sustainability, costly debt make loans too expensive to the poor. Additional huge administrative costs attached to small loans meant for the poor imply that debt limits outreach depth.

Deposits too, being cheap sources of commercial financing present an opportunity for deepening outreach. Savings are then used to extent loans to the poor as written by Lafourcade et al. (2006) that, *'Southern Africa appears to be reaching lower-income clients when average savings and loan balances are compared with GNI per capita.'* Though

insignificant, donations showed their receding influence on depth of outreach owing to a barrage of weaknesses such as corruption, inefficiency and the dwindling flows of such during the period (2005 -

2010 characterized the global financial crisis and donations globally went plummeted) under study. Recent studies by Bogan (2012) verify this finding.

Table 3. Summary of regression results (depth and breadth)

Variables	Outreach Depth	Robust Standard Errors	Outreach Breadth	Robust Standard Errors
Donations	-.0000346	.000027	-.1860664	.1303978
Equity	.0000206*	.000000085	-.0288971*	.0050474
Borrowings	-.0000356*	.000017	-.1262593*	.0597128
Deposits	.000104*	.0000000375	.0020244*	.0000877
Mature	.0000399	.0000432	.2167651	.1184506
New	.0001982*	.000089	-.9150059*	.1406789
Bank	-.0000972	.0000875	-.3373289	.6191932
For profit	-.0000552	.0000611	-.3811054	.4177677
Regulated	-.0000493	.0000611	-.5036514	.4590551
Real Yields	.00015	.0002408	.0001712	.001028
constant	-.0003381	.0001212	.64665	.4536836

5% significance *, 10% significance **

New MFIs showed a significant positive relationship with outreach depth as they are mostly engrossed with the social mission given the limited financing which curtail their affinity to expand (Banerjee et. al (2011). Noting the life cycle theory, most MFIs are established on donor funding thus the inclination is to serve the poor (outreach depth). Outreach at this stage is limited mainly because of various operational challenges and competition from established MFIs and microfinance-oriented commercial banks.

7.3. Outreach Breadth

Random effects model proved its superiority over fixed effects and OLS models by way of running Hausman test and Breusch Pagan LM test for random effects. Results adjusted for robust standard errors and allowing for cluster effects are shown in table 2.

The same financing structure variables that affect the depth of outreach do affect the breadth of outreach but in a different manner. Only deposits have a positive effect on the breadth of outreach whilst equity and borrowings do negatively relate to outreach breadth. Hartaska & Nadolnyak (2011) found out that, deposit taking MFIs recorded extended breadth of outreach in line the current study. The explanation is linked to the volume of deposits attracted at low costs translating into huge outreach breadth (Lafourcade et. al. 2006). Debt being costly as testified by Kinde (2012) would make loans churned out to be costly thus clients are naturally deterred from accessing loans. Whilst the expectation was that, borrowings would further the breadth of outreach, the period under study (2000 - 2010) was characterized with the global financial crisis hence the cost of borrowings was prohibitive thereby affecting the breadth of outreach.

Equity for MFIs is a limited resource which cannot be stretched to fund broad outreach. In SADC, very few if any MFIs have gone public hence cannot maximise on equity financing in churning out loans to loans (Banerjee et. al. 2011). This explains the negative association between equity and outreach breadth. Also, equity in most MFIs is owned by NGOs who normally are aligned to the social mission. The only MFI characteristic with a significant influence on the breadth of outreach is the dummy for new MFIs. According to the LCT

(Bogan 2012; Sekabira 2013) and institutional metamorphosis of Campion & White (1999), new MFIs are usually unsustainable, have blunt business models and struggle with capitalization and competition. This holds back outreach breadth.

8. CONCLUSIONS

The study investigated the relationship between MFI financing structure and outreach for selected SADC MFIs in view of the commercialization trend. Unbalanced panel methods under fixed and random effects framework confirmed that, both outreach depth and breadth are affected by the same financing variables though in a different fashion. Deposits, equity and the dummy for new MFIs further outreach depth whilst borrowings have a damaging effect on outreach depth. Since outreach depth is affected by huge administration costs linked to small loans, cheap commercial funding sources further outreach depth (equity and savings). This substantiates why costly commercial funding sources, i.e. debt hinder outreach depth and breadth. Equity being a limited resource cannot exploit broad outreach compared deposits which significantly expand the breadth of outreach. In-adequate funding, competition, operational challenges and dull business models for 'new' MFIs limit outreach breadth. Cull et al, (2009) wrote that, 'Meaningful interventions in microfinance will require making deliberate choices—and thus embracing and weighing tradeoffs carefully.' Noting these trade-offs, the quest to reach poor and to exploit maximum outreach can be achieved by allowing MFIs to attract deposits. Regulatory authorities in the region must come up with a framework that provision deposit attraction if maximum poverty is to be arrested.

REFERENCES

1. Armanderitz de Aghion, B. & Morduch, J., 2005, *The economics of microfinance*, MIT Press, London.
2. Ayayi, A. G. & Sene, M. 2010, 'What drives microfinance's financial sustainability,' *The Journal of Developing Areas*, Vol 44, No. 1, pp 303-324,
3. Banerjee, A. V.; Duflo, E. & Munshi, K., 2003, 'The (Mis)allocation of capital,' *Journal of the European*

- Economic Association*, 1(3), pp. 484-494.
4. Bogan, L. V., 2012 'Capital Structure and Sustainability: An Empirical Study of Microfinance Institutions,' *The Review of Microfinance and Statistics*, 94(4), pp. 1045-1058.
 5. Brau, C. J. & Woller, G. M., 2004, 'Microfinance: A Comprehensive Review of Existing Literature,' *Journal of Entrepreneurial Finance and Finance Ventures*, 9(1), pp. 1-26.
 6. Bredberg, S. & Ek, S., 2011, *How to apply microfinance activities in the developed world - A field study in New York City*. A Master's Thesis, Stockholm.
 7. Buss, F. T., 1999, 'Microenterprise in International Perspective: An overview of issues,' *International Journal of economic Development*, 1(1), pp. 1-28.
 8. Campion, A. & White, W. 1999, *Institutional metamorphosis: Transformation of microfinance NGOs into regulated financial institutions*. Occasional Paper No. 3, Microfinance Network, Washington D.C.
 9. Cohen, R. D. 2003. The optimal capital structure of depository institutions. *WILMOTT Magazine*, pp. 38-49
 10. Conning, J. 1999, 'Outreach , Sustainability and leverage in monitored and peers-monitored lending,' *Journal of Development Economics*, Volume 60, pp. 51-77.
 11. Cull, R., Demirguc-Kunt, A. & Morduch, J., 2011, 'The effect of regulation on MFI profitability and outreach,' *World Development*, 39(6), pp. 949-965.
 12. Cull, R., Demirgüç-Kunt, A. & Morduch, J., 2009, 'Microfinance Meets the Market,' *Journal of Economic Perspectives*, 23(1), pp.167-192.
 13. Cull, R., Demirguc-Kunt, A. & Morduch, J., 2007, 'Financial performance and outreach: a global analysis of leading microbanks,' *Economic Journal*, Volume 117, pp. 107-133.
 14. Cull, R., Demirgüç-kunt, A. & Morduch, J., 2006, *Financial Performance and Outreach: A Global Analysis of Leading Microbanks*. World Bank Policy Research Working Paper 3827, Washington, World Bank.
 15. De Aghion, A., B. & Morduch, J. 2005, *The economics of microfinance*, The MIT Press, London.
 16. de Sousa-Shields, M. & Frankiewicz, C., 2004, *Financing Microfinance Institutions: The Context for Transition to Private Capital*. Micro Report No. 32 - Accelerated Microfinance Advancement Project - USAID.
 17. Ganka, D. 2010, *Financial sustainability of rural microfinance institutions in Tanzania*. PhD thesis, University of Greenwich, Australia
 18. Greene, W., 2002, *The bias of the fixed effects estimator in nonlinear models*. Available at: <http://people.stern.nyu.edu/wgreene/nonlinearfixedeffects.pdf>.
 19. Greene, W., H. 2003, *Econometric Analysis*, Prentice Hall. Available at: <http://pubs.amstat.org/doi/abs/10.1198/jasa.2002.s458>.
 20. Gujarati, D., 2004. *Basic Econometrics* 4th Ed., McGraw-Hill Companies.
 21. Hoque, M., Hallway, R. & Chishty, M., 2011, 'Commercialisation and Changes in Capital Structure in Microfinance Institutions: An Innovation or a Wrong Turn?' *Managerial Finance*, 37(5), pp. 414-425.
 22. Hartaska, V. & Nadolnyak, D., 2007, 'Do regulated microfinance institutions achieve better sustainability and outreach? Cross country evidence,' *Applied Economics*, 39(10), pp. 1207-1222.
 23. Hermes, N., Lensink, R. & Meesters, A., 2011, 'Outreach and Efficiency of Microfinance Institutions,' *World Development*, 39(6), pp.938-948.
 24. Hermes, N. & Lensick, R., 2011, 'Microfinance: Its Impact, Outreach, and Sustainability,' *World Development*, 39(6), p. 875-881.
 25. Hermes, N. & Lensink, R., 2007, 'The empirics of microfinance: What do we know?' *The Economic Journal*, 117(1).
 26. Hermes. N., Lensink, R. & Meesters, A. 2008, 'Outreach and Efficiency of Microfinance Institutions.' Available at SSRN: <http://ssrn.com/abstract=1143925> or <http://dx.doi.org/10.2139/ssrn.1143925>
 27. Hishigsuren, G. & Fehr, D. 2004, *Raising capital for microfinance: Sources of funding and opportunities for equity financing*, Southern New Hampshire University, Working paper 2004-01
 28. Iezza, P. & La Cour, L., 2010. *Financial sustainability of microfinance*. A Master's Thesis, Copenhagen Business School.
 29. International Council of Social Welfare (ICSW) 2014, accessible on: <http://www.sadc.int/themes/poverty-eradication-policy-dialogue/>
 30. Isern, J. & Portus, D. 2006, *Commercial Banks and Microfinance: Evolving models of success*. CGAP Focus Note No. 28
 31. Johnson, C. 2015, 'The impacts of capital structure on outreach depth in Sub-Sahara Africa,' *Critique: A worldwide journal of student politics*, Spring 2015.
 32. Kapper, A., 2007, *Commercialisation of microfinance institutions*. Paris Graduate School of Business, Paris.
 33. Karim, S., Hanouch, M., Ketley, R. & Sibanda, X., 2011, *SADC Microfinance Study: Landscape, regulatory environment. level of monitoring and support*, SADC - Johannesburg, South Africa.
 34. Khawari, A. 2004, *Microfinance; Does it hold its promises? A survey of recent literature*. HWWA Discussion Paper No. 276.
 35. Kumar, K. A., 2012, 'Does capital and financing structure have any relevance to the performance of microfinance institutions,' *International Review of Applied Economics*, 26(3), pp. 329-348.
 36. Lafourcade, A. et al., 2006, *Overview of the Outreach and Financial Performance of Microfinance Institutions in Africa*. Microbanking Bulletin, April 2011. Available at: [http://www.themix.org/sites/default/files/MBB12-OutreachandFinancialPerformance of African MFIs.pdf](http://www.themix.org/sites/default/files/MBB12-OutreachandFinancialPerformance%20of%20AfricanMFIs.pdf).
 37. Manos, R. & Yaron, J. 2009, 'Key issues in assessing performance of microfinance institutions,' *Canadian Journal of Development studies*, Volume 29, pp 101-22
 38. Mersland, R. & Strom, R. O., 2010, 'Microfinance and Mission Drift,' *World Development*, 38(1), pp. 28-36.
 39. Mersland, R. & Strom, R. O., 2009, 'Performance and governance in microfinance institutions,' *Journal of Banking and Finance*, Vol. 33, pp 662-9
 40. Meehan, J. 2004, *Tapping financial markets for microfinance*. Grameen Foundation USA Publication Series 4.
 41. Millson, H.F., 2013, *The Trade-Off Between Sustainability And Outreach: The Experience Of Commercial Microfinance Institutions*. Department of Economics Advisor: Shannon Mudd.
 42. Morduch, J., 1999, 'The Microfinance Promise,' *Journal of Economic Literature*, Volume 37, pp. 1569-1614.

43. Modurch, J. 2000, 'Microfinance Schism,' *World Development*, Volume 28, No. 4, pp. 617-629.
44. Navajas, S.; Schreiner, M.; Meyer, R. L.; Gonzalez-Vega, C. & Rodriguez-Meza, J. 2000, 'Microcredit and the poorest of the poor: theory and evidence from Bolivia,' *World Development* 28, 333-346
45. Paul, M. S., 2010, 'Bridging the Gap to the Microfinance Promise: A Proposal for a Tax-Exempt Microfinance Hybrid Entity,' *International Law and Politics*, Volume 42, pp. 1383-1426.
46. Paxton, J. & Cuevas, C. 1998, *Outreach and sustainability of member based of rural financial intermediaries in latin America: A comparative analysis*. Sustainable Banking for the Poor, Washington DC.
47. Quayes, S., 2012, 'Depth of outreach and sustainability of microfinance institutions,' *Applied Economics*, Volume 44, p. 3421-3433.
48. Rhyne, E., 1998, *The Yin and Yang of Microfinance; Reaching the poor and sustainability*. Microfinance Bulletin, July.
49. Robinson, M., 2001, *The Microfinance Revolution: Sustainable finance for the poor*. The World Bank, Washington D.C.
50. Rosenberg, R. 2009, *Measuring results of microfinance institutions: Minimum indicators donors and investors should track*. CGAP Technical Guide, Washington, USA.
51. Rosenberg, R. 1996, *Microcredit interest rates*. Occasional paper No. 1, August 1996, CGAP, Washington D.C. available on: <http://www.unCDF.org/mfdl/readings/CGAPoccl.pdf>
52. Schreiner, M., 1999, *Aspects of Outreach: A Framework for Discussion of the Social Benefits of Microfinance* Aspects of Outreach: A Framework for Discussion of the Social Benefits of Microfinance.
53. Sekabira, H., 2013, 'Capital Structure and its role on performamnce of microfinance institutions: The Ugandan Case,' *Sustainable Agricultural Research*, Vol. 2, No. 3, pp 86-100
54. Tehulu, T., 2013, 'Determinants of Financial Sustainability of Microfinance Institutions in East Africa,' *European Journal of Business and Management*, 5(17), pp.152-159. Available at: <http://www.iiste.org/Journals/index.php/EJBM/article/view/6636>.
55. VonPischke, J. D., 1996, 'Measuring the trade-off between outreach and sustainability of microenterprise lenders', *Journal of International Development*, 8(2), pp. 225-239.
56. Kinde, B.A., 2012, 'Financial Sustainability of Microfinance Institutions (MFIs) in Ethiopia" *European Journal of business and Management*, 4(15), pp.1-11.
57. Wagenaar, K., 2012, *Institutional transformation and mission drift in microfinance*. Centre of Development Studies, University of Cambridge.
58. Yaron, J. 1992, *Succssful rural finance institutions*. World Bank Discussion Paper No. 150, The World Bank, Washington D.C.
59. Zerai, B. & Rani, L., 2012, 'Is There a Tradeoff between Outreach and Sustainability of Micro finance institutions? Evidence from Indian Microfinance Institutions (MFIs)', *Research Journal of Finance and Accounting*, 2(11), pp.32-42. Available at: <http://iiste.org/Journals/index.php/RJFA/article/view/1291>.

DO INVESTORS VALUE FIRM EFFICIENCY IMPROVEMENT? EVIDENCE FROM THE AUSTRALIAN CONTEXT

Hai Yen Pham*, Richard Chung*, Eduardo Roca*, Ben-Hsien Bao**

*Griffith University, Australia

**The Hong Kong Polytechnic University, Hong Kong SAR, China

Abstract

Do investors value improvement in efficiency? This paper investigates the relation between the firm's technical efficiency change and subsequent stock returns. We employ a stochastic frontier analysis to evaluate a firm's efficiency for a large panel of non-financial companies in Australia from January 1990 to October 2012. The results show that over the sample period, the estimated mean improvement in firm's efficiency is 3% per year. We find that an equally-weighted (value-weighted) portfolio of stocks with the top tertile level change in efficiency outperforms an equally-weighted (value-weighted) portfolio of stocks with the bottom tertile level change in efficiency, by an average of 11% (7%) per annum during the sample period. We also find a significant efficiency change effect on a cross-section of stock returns after controlling for other risk factors such as size, book-to-market, market liquidity, industry concentration, and seasonality effect.

Keywords: Efficiency change · Stock returns · Stochastic frontier analysis

JEL classification: G11, G12

1. INTRODUCTION

The productivity or efficiency of an organization is its ability to transform inputs such as labor and capital into outputs such as goods and services (Australian Bureau of Statistics, 2012). At the macro-economic level, productivity refers to the efficiency with which an economy employs resources to produce economic output. For a given set of inputs, the higher the productive efficiency, the higher the output that can be produced. Therefore, growth in productivity is viewed as the key driver of growth in per capita income and living standards in the long run (D'Arcy and Gustafsson, 2013). Productivity growth is also important to the firm so it can meet its obligations to workers, shareholders and governments and still remain competitive or even improve its competitiveness in the marketplace (Parham and Economics, 2013). When discussing the importance of productivity growth, Nobel Prize-winning economist Paul Krugman said: "Productivity isn't everything, but in the long run, it is almost everything".

One good indicator of productivity is multifactor productivity, which is the quantity of value added obtained from a 'unit bundle' of both labor and capital (Australia's Productivity Performance, 2009). Multifactor productivity growth can be decomposed into two growth factors: technological progress in the long term, which represents improvements in ways of doing things, and technical efficiency growth in the short term, which reflects unexplained factors such as cyclical variations in labor and capital utilization, economies of scale and others (Australian Bureau of Statistics, 2012). In this paper, we focus on the relation between short-term change in technical efficiency and future stock returns.

Over the last four decades, the growth in multifactor productivity accounted for over one-third of the growth in Australia's real incomes (Australia's Productivity Performance, 2009). Recently, however, as indicated in the Australian government's reports, Australia's productivity growth has fallen from 0.7% per year in the period 1998-2004 to a negative number of -0.8% per year in the period 2005-2008 (Australian Bureau of Statistics, 2012). Thanks to the commodity boom and terms of trade boost in recent years, that performance has been masked; however, there is the likelihood that Australia's terms of trade will decrease as the commodity price cycle runs its course (Green, Toner and Agarwal, 2012). In addition, given its aging population, the participation of the population in the labor force will decrease in the future. Hence, the need to improve Australia's productivity performance is undoubtedly in the national interest. However, do investors value improvement in firm efficiency? This question motivated us to study productivity or efficiency; in particular, we investigate how the change or growth in a firm's technical efficiency contributes to the growth of investors' future wealth in the context of Australia.

Classical finance theory argues that there is a trade-off between risk exposures and asset return. Riskier assets have more uncertain outcomes, and when investors are risk averse, they will demand a premium for holding such assets (Frijns, Margaritis and Psillaki, 2012). The Capital Asset Pricing Model (CAPM), which was introduced by Sharpe (1964), Lintner (1965) and Black (1972), states that there is a linear relation between beta (systematic risk) and expected stock returns and that beta is sufficient to explain the variation in expected returns. However, the empirical evidence suggests the existence of other factors not captured by beta that can explain the variation in future stock returns such as size and

book-to-market (Fama and French, 1992), momentums (Jegadeesh and Titman, 1997), excess cash holding (Dittmar and Marhrt-Smith, 2007), liquidity (Chan and Faff, 2003; Mahipala, Chan and Faff, 2009), default risk (Garlappi, Shu and Yan, 2008), industry concentration (Hou and Robinson, 2006) and corporate governance (Gompers, Ishii and Metrick, 2003).

Firm technical efficiency refers to how much output (i.e., sales and firm value) can be obtained given a set of inputs such as a firm's labor, plants, properties, equipment, managerial strengths and investment choices (Nguyen and Swanson, 2009), which may play an important role in asset pricing (Frijns et al., 2012). Many prior studies that rely on alternative performance measures emphasize that efficient frontier approaches seem to be superior to traditional financial ratios (Berger and Humphrey, 1997; Gaganis, Hasan and Pasiouras, 2013) and are more likely to be incrementally informative than those mandated by regulation (Kothari, 2001). However, these studies' findings on the relation between firm efficiency level and stock returns are far from a consensus: some have documented that firm efficiency is negatively related to stock returns (Nguyen and Swanson, 2009), whereas others have found a positive relation between them (Alam and Sickles, 1998; Frijns et al., 2012).

Similar to Amess and Girma (2009), we suggest that a firm's shareholders are more concerned with the change in firm efficiency than the firm efficiency level itself. Shareholders value organizational improvements and the adoption of better management practices that lead to better resource utilization rather than the level of efficiency (Amess and Girma, 2009). In addition, compared to the efficiency level, the change in firm efficiency not only provides information regarding firms' abilities to remain or improve their profits relative to their peers but also offers information about the trend of firms' future performance.

More practically, in the context of the urgent call within Australia for improving the efficiency and productivity of its industries and businesses, does improvement in efficiency lead to higher stock returns? Of course, the results of this study would also be very useful to financial market participants such as firm's shareholders, investors, fund managers, financial advisors, and others because compared to traditional financial indicators, the efficiency measurement approach appears to be superior, offering more information regarding firms' competitiveness (Berger and Humphrey, 1997; Kothari, 2001; Gaganis et al., 2013).

Academically, our study contributes to the existing literature in a number of ways. First, there are now a large number of studies examining the effect of a change in firm efficiency on stock returns in the US; however, this issue remains relatively unexplored in Australia. There are some studies on the issue of efficiency related to banking and insurance in Australia (see Kirkwood and Nahm, 2006; Shamsuddin and Xiang, 2012), but these studies do not investigate the impact of efficiency change on future stock returns and none of them address non-financial firms. Therefore, our study attempts to fill this gap. Second, this research uses a large sample consisting of most listed non-financial companies during the period from January 1990 to October 2012. The sample is representative of all non-financial industry sectors in the Australian Securities Exchange (ASX), thus, the findings are

generalizable to the population of listed non-financial companies. Finally, our study provides a more comprehensive analysis, as it investigates the relation between firm efficiency change and stock returns over time and across industries. The seasonality effect in Australia is taken into account as well.

The research proceeds as follows. In the first stage, we estimate firm efficiency level and its change. In the second stage, we examine the impact of changes in firm efficiency on subsequent stock returns. Following Habib and Ljungqvist (2005), efficiency is estimated by comparing a benchmark Tobin's Q of a hypothetical value-maximizing firm to the firm's actual Tobin's Q using the stochastic frontier analysis. Efficiency change is measured as level change or percentage change in efficiency in the current year compared to that in the previous year. The results indicate that the estimated efficiency score of the average firm is approximately 61.5% and that this score has improved 3% per annum over the sample period³. The relation between efficiency improvement and returns is examined in both time-series and cross-sectional settings. First, we sort stocks based on efficiency change to construct tertile portfolios and apply the Carhart (1997) 4-factor model of stock returns on those portfolios. Second, we perform the Fama-MacBeth (1973) regression model to determine whether efficiency improvement plays a role in explaining the variance in the cross-section of stock returns. Furthermore, regressions are run by industry to determine the impact of efficiency improvement on future stock returns across industries.

We find that an equally-weighted (value-weighted) portfolio of stocks with a high efficiency change outperforms an equally-weighted (value-weighted) portfolio of stocks with a low efficiency change by an average of 11% (7%) per year. In cross-sectional analysis, the efficiency change helps explain variation in the cross-section of stock returns, even after controlling for known risk factors such as size, book-to-market, market liquidity and industry concentration. Furthermore, the cross-sectional regression results by industry reveal that the efficiency change has power in explaining stock returns in several industries such as materials (mining), industrials, consumer discretionary, consumer staples, health care and utilities.

The remainder of the paper is organized as follows: A brief relevant literature review is presented in section 2, while section 3 describes the methodology. The data are presented in section 4. Section 5 discusses empirical results and the robustness test. Section 6 concludes the paper.

2. LITERATURE REVIEW AND HYPOTHESIS

2.1. Literature review

One of the first studies in this area is that of Alam and Sickles (1998). Data Envelopment Analysis (DEA) was employed on the data of 11 US airlines observed quarterly during the period 1970-1990 to analyze the association between stock market returns and

³ Similar to the trend in productivity growth in Australia, the percentage change in efficiency of firms in the sample has increased by an average of 5.27% pa during the period 1998-2004, but it has declined by an average of 4.54% pa during the period 2005-2008 and then has improved again by an average of 10.24% pa from 2009 to 2011.

relative technical efficiency. They found a positive relation between efficiency news in a quarter and stock market performance during the following two months. Similarly, Frijin et al. (2012) apply the same technique, namely DEA, on various input/output combinations, focusing on sales and market value as output measures in constructing the frontier technologies for the publicly listed companies in the US during the period 1988-2003. They document that firm efficiency plays an important role in asset pricing and that efficient firms significantly outperform inefficient firms even after controlling for known risk factors.

In contrast, Nguyen and Swanson (2009)—using a stochastic frontier approach to evaluate the firm efficiency of publicly listed firms in the US from 1988 to 2002—report that the portfolio composed of highly efficient firms significantly underperforms the portfolio composed of inefficient firms, even after adjusting for firm characteristics and risk factors, which suggests that investors require a premium for the inefficient firms. Furthermore, they find that the difference in performance between the two portfolios remains for at least five years after the portfolio formation year. In addition, firm efficiency exhibits significant explanatory power for equity returns in a cross-sectional analysis.

With respect to efficiency change, Kirkwood and Nahm (2006), using DEA to evaluate the cost and profit efficiency of Australian banks from 1995-2002, have documented that change in profit efficiency is positively related to contemporaneous stock returns. Amess and Girma (2009) employed both DEA and SFA approaches for a sample of an unbalanced panel of 706 public limited companies observed over the period 1996-2002 in the US. They find a positive relationship between efficiency and the market value of manufacturing sector firms, controlling for traditional accounting measures of performance such as earnings per share and return on capital employed. By contrast, they find no evidence for such a relation in the service sector firms. Gaganis et al. (2013), using a sample of 399 listed insurance firms in 52 countries during the period 2002-2008, find a positive and statistically significant relation between profit efficiency change and market-adjusted stock returns. Hence, given the mixed evidence in the literature, our study examines the relation between improvement in efficiency and future stock returns for Australian non-financial companies.

2.2. Theoretical framework and hypothesis

The notion that a firm's value should be maximized through efficient operation is central for corporate managers. Yet, the empirical evidence suggests that most firms are operated inefficiently for various reasons such as agency cost or financial distress (Chung, Fung and Hung, 2012). Jensen and Meckling (1976) argue that the agency cost is generated by the separation between ownership and control. They postulate that agency cost prevents firms from operating efficiently and from maximizing values due to a firm's management's perquisite consumption, shirking behavior and investing in sub-optimal projects that are not in the best interest of shareholders. Similar to Gompers et al. (2003), we suggest that a decrease (an increase) in a firm's efficiency would cause higher (lower) agency costs in the subsequent year. If investors underestimate (overestimate) these costs and risk, then the firm's

operating performance would be worse (better) than expected. This also implies that the firm's value at the beginning of the period would be too high (low) or that the firm is overvalued (undervalued). Consequently, when stock price moves to its intrinsic value, subsequent stock prices and future returns should be lower (higher) than expected.

An alternative explanation regarding the relation between change in efficiency and stock returns comes from Q-theory (Lovell, 1993; Zhang, 2006; Amess and Girma, 2009; Hirshleifer, Hsu and Li, 2013). This theory posits that all other things being equal, firms with higher profitability will have higher stock returns. By taking actions such as providing managers with the appropriate set of incentives, employing better managerial and organizational practices, adopting an efficient monitoring system and so forth, firms improve their efficiency. This improvement in efficiency means firms better utilize their resources—with a given set of inputs, they can produce more outputs or use lower input costs to produce a given set of outputs compared to their peers—and will thus generate better future financial results. Hence, the improvement in efficiency should lead to a better operating performance, higher market valuation and, thus, higher stock returns. Given the above discussion, we therefore hypothesize that there is a positive relation between efficiency change and subsequent stock returns.

3. METHODOLOGY

3.1. Frontier construction

Firm technical efficiency is referred to as the ability to transform inputs to outputs or how much output can be obtained from a given set of inputs. The two most popular methods to estimate firm efficiency are the following: 1) stochastic frontier analysis (SFA), which is parametric; and 2) data envelopment analysis (DEA), which is non-parametric. These two methods have been chosen fairly often by academics, professionals and practitioners, and each method has its own advantages and disadvantages.

DEA is a non-parametric method that is based on mathematical programming. The main advantage of DEA is that it is quite simple, as only input and output information is required. In addition, it does not require any assumption to be made about the distribution of inefficiency or a particular functional form of the data in establishing the most efficient firms (Gaganis et al., 2013). However, when constructing the production frontier line, DEA does not take into account stochastic noise in data representing effects that cannot be controlled by firms such as changes in regulations, worker conflicts, bad weather and measurement errors (Hjalmarsson, Kumbhakar and Heshmati, 1996). Efficiency is measured relative to the highest observed performance rather than an average (Hjalmarsson and Veiderpass, 1992), so its analysis is sensitive to outliers. Additionally, it assumes that data are free of measurement error (Gaganis et al., 2013).

In contrast, SFA's main weaknesses are that it requires an explicit imposition of a particular parametric functional form representing the underlying technology and an explicit distributional assumption for the inefficiency terms (Hjalmarsson et al., 1996). The strength of SFA is that it considers stochastic noise in data and controls for firm

characteristics and growth opportunities, and thus, a firm's hypothetical maximum value is estimated from its own characteristics. DEA estimates a true upper bound, whereas SFA is based on a conditional mean rather than enveloping it so outliers do not cause estimation bias. Given their strengths and weaknesses, the choice between the different methods must be based on a trade-off concerning technology characteristics, type of data, quality of data and other factors. As the SFA model offers a richer specification and allows for a formal statistical testing of hypotheses (Hjalmarsson et al., 1996), we therefore choose to use this approach in this study.

Tobin's Q, which is defined as the ratio of the market value of debt and equity to the replacement cost of the firm's assets in place, is used as the output measure in the frontier model. Habib and

Ljungqvist (2005) argue that Tobin's Q can be used as a proxy for firm value because if a firm operates and invests in assets that are expected to create added value, then its Q will be greater than 1; the more value created, the higher is the Q. Factors representing firm characteristics and growth opportunities are selected based on prior empirical research on firm efficiency.

Following Habib and Ljungqvist (2005) (In the Habib and Ljungqvist (2005) model, the square of $\ln(\text{sales})$ and the square of PPE/Sales are included, but in our model, they are highly correlated to $\ln(\text{sales})$ and PPE/Sales , respectively, so we leave them out. The correlation matrix and results of the frontier model using the square of $\ln(\text{sales})$ and the square of PPE/sales are available from the authors.), using Tobin's Q as the dependent variable, the stochastic frontier function is estimated as follows:

$$Q_{it} = \alpha_0 + \beta_1 * \ln(\text{sales}_{it}) + \beta_2 * \frac{\text{R\&D}_{it}}{\text{PPE}_{it}} + \beta_3 * \frac{\text{CAPEX}_{it}}{\text{PPE}_{it}} + \beta_4 * \frac{\text{INC}_{it}}{\text{sales}_{it}} + \beta_5 * \frac{\text{PPE}_{it}}{\text{sales}_{it}} + \beta_6 * \text{LEV} + \beta_7 * \text{FOLL} + v_{it} - u_{it} \quad (1)$$

- Where Q is Tobin's Q of the firm, measured as the ratio of market value of equity plus book value of total debts to book value of total assets.

- $\ln(\text{sales})$ is the natural logarithm of gross sales. Diminishing returns suggest that the average Q will decrease as firms become larger. $\ln(\text{sales})$ is therefore expected to be negatively related to Q.

- $\text{R\&D}/\text{PPE}$ is the ratio of research and development expenditures to net of property, plant, and equipment (PPE), referred to as "soft" spending. Capex/PPE is the ratio of capital expenditures to PPE, referred to as "hard" spending. Both of them proxy for firm growth opportunities and are expected to be positively related to the firm's Tobin's Q.

- The operating margin INC/sales is a measure of the firm's profitability and is computed as the ratio of operating income before depreciation and amortization to gross sales. It is expected to be positively related to the firm's Tobin's Q.

- PPE/sales is the ratio of PPE divided by gross sales. According to Habib and Ljungqvist (2005), it can be positively or negatively related to the firm's value.

- LEV is the firm leverage, measured as the ratio of book value of long-term debt to the sum of market value of equity and book value of long-term debt. The effect of Lev on Q is ambiguous.

- FOLL is a dummy variable that proxies for analyst following and takes the value of unity if the firm is followed by an analyst(s) and 0 otherwise. Financial analysts, by acting as significant information intermediaries between managers, can potentially improve capital markets' information quality. Therefore, we expect that analyst following has a positive effect on Tobin's Q.

- u_i is a one-sided error term greater than or equal to 0. For the firm that lies on the frontier line, $u_i=0$. In contrast, $u_i>0$ implies that the firm lies below the frontier line and operates inefficiently. We assume that $\text{cov}(u_i, v_i) = 0$ to assure that the two error terms are independent and uncorrelated; v_i is a two-sided error term in the conventional ordinary least square (OLS) with a normal distribution, including zero-mean, symmetric, independent, and identically distributed error (Chung et al., 2012).

The equation below specifies the normalization procedure to calculate firm efficiency:

$$\text{Efficiency}_i = 1 - \frac{u}{Q^*} = \frac{Q}{Q^*} \quad (2)$$

where Q^* is the hypothetically best-performing value and Q is the actual value for the firm. The shortfall from the frontier, $u=Q^* - Q$, is a measure of inefficiency (Habib and Ljungqvist, 2005). The efficiency score is a normalized measure between 0 and 1. For instance, a score of 0.70 implies that the firm is valued at a 70% level in comparison with its best-performing peers, ceteris paribus. Similar to Nguyen and Swanson (2009), assuming that investors make investment decisions based on the current efficiency level (current information), we compute our efficiency score across firms in each year. In this study, we use both level change and percentage change in firm efficiency. They are defined as follows:

Level change:

$$\text{CH} = \text{Efficiency}_t - \text{Efficiency}_{t-1} \quad (3)$$

Percentage change:

$$\% \text{CH} = (\text{Efficiency}_t - \text{Efficiency}_{t-1}) / \text{Efficiency}_{t-1} \quad (4)$$

where Efficiency_t is the firm's efficiency in year t.

3.2. Return models

First, we examine the relation between efficiency change and stock returns over time by constructing portfolios based on efficiency change (CH-sorted or %CH-sorted portfolios). Then, we use the Carhart (1997) 4-factor model to test whether there is an abnormal return after controlling for some known risk factors such as systematic risk, size, value and momentum. Second, in terms of the cross-section of returns, we apply the Fama-Macbeth (1973) approach in cross-sectional analysis to test whether efficiency change can help explain the variation in the cross-section of stock returns.

3.2.1. Portfolio construction

In December of each year, t, from 1990 to 2012, we rank all stocks in the sample by the efficiency change in ascending order. We then assign stocks into tertile portfolios. The first portfolio (Low) consists of firms with low change in efficiency, the second is Middle, and the last portfolio (High)

consists of firms with high change in efficiency. All portfolios are rebalanced at the end of each year.

The Carhart (1997) model, also known as the 4-factor model, is an extension of the Fama and French (1993) 3-factor model (Nguyen and Swanson,

2009). According to the model, in the absence of abnormal performance (i.e., Jensen's alpha is zero), the excess return of a portfolio is attributable to factor-risk premiums. The model can be estimated as follows:

$$\text{Excess}_{i,t} = \alpha + \beta_1 * \text{MRP}_t + \beta_2 * \text{SMB}_t + \beta_3 * \text{HML}_t + \beta_4 * \text{MOM}_t + \varepsilon_{i,t} \quad (5)$$

where EXCESS is the excess return on portfolio, computed by subtracting the risk-free rate from the return on portfolio. The risk-free rate is measured as the 10-year government bond yield. MRP is the monthly market risk premium, measured by subtracting the risk-free rate from the market return. SMB is a size factor, measured as the difference between the returns on a portfolio of small cap stocks and on a portfolio of large cap stocks. HML is a value factor, measured as the difference between the returns on a portfolio of high book-to-market stocks and on a portfolio of low book-to-market stocks. MOM is a momentum factor, measured as the difference between the returns on a portfolio of winner stocks and on a portfolio of loser

stocks (Please see the details of MRP, SMB and MOM construction in Appendix B.). The 4-factor model will generate Jensen's alpha while controlling for the covariance of portfolio returns with market return, size, B/M, and momentum factors.

3.2.2. Cross-sectional regression of stock returns

We examine the relation between the efficiency change and the cross-section of stock returns using the cross-sectional regression analysis of monthly returns on individual stocks. The augmented Fama-MacBeth (1973) model is estimated as follows:

$$R_{i,t+1} = \alpha + \beta_1 * \text{Change}_{i,t} + \beta_2 * \text{Size}_{i,t} + \beta_3 * \text{B/M} + \beta_4 * \text{Turnover}_{i,t} + \beta_5 * \text{HHI}_{i,t} + \varepsilon_{i,t} \quad (6)$$

where R is the monthly return on an individual stock in year t+1. Change is the level change in efficiency, CH, or percentage change in efficiency, %CH. SIZE is the natural logarithm of market capitalization, measured at December of year t. B/M is the natural logarithm of book value to market value, measured at the fiscal year end of year t. Similar to Fama and French (1992), we use SIZE and B/M to capture firm size effect and value effect, respectively.

Prior research found that liquidity plays a role in explaining the stock returns, even after controlling for size, book-to-market and beta in the US market (see Amihud and Mendelson, 1986; Chordia, Subrahmanyam and Anshuman, 2001) and in the Australian market (see Chan and Faff, 2003). Thus, we expect that market liquidity is one explanatory variable in our model. We use TURNOVER, calculated as the ratio of trading volume to shares outstanding over a year, as a proxy for market liquidity and expect it to be negatively associated with return as the higher liquidity, the lower ask-bid gap, the lower return and vice versa.

With respect to product market, in highly concentrated or regulated industries such as telecommunication and utilities industries, barriers to entry are high; thus, firms are likely to be insulated from distress risk, suggesting that the risk of poor operating decisions leading to distress is much lower (Hou and Robinson, 2006). This situation implies that firms operating in a highly concentrated industry would have lower risk than firms operating in a highly competitive industry, and hence, they would have lower return. On the other hand, firms operating in a monopolistic or oligopolistic market tend to have higher profitability and would thus have higher stock returns. Therefore, the expected sign of industry concentration on future stock returns is ambiguous. Following Hou and Robinson (2006), we use the Herfindahl index (HHI) as a proxy for industry concentration. An industry's HHI is computed by first calculating the sum of squared sales-based market shares of all firms in that industry during a given year and then averaging it over the past 3 years.

4. DATA AND DESCRIPTIVE STATISTICS

Our sample consists of 14,857 firm-year observations or 137,174 firm-month observations of listed companies across nine industry sectors in the ASX from January 1990 to October 2012. Consistent with prior studies, we also exclude firms in the financial industry⁴ (e.g., banks, financial services, insurance) and firms with a negative book value of equity. The sample covers most firms in the ASX200 and the majority of the All Ordinary index composite over 22 years. The information on firms such as total assets, debts, sales, capital expenditure, stock price, daily trading volume and share outstanding is sourced from COMPUSTAT Global, while analyst forecasts are from I/B/E/S. The market index is obtained from DATASTREAM, and the risk-free rate is measured as the 10-year government bond yield sourced from the Reserve Bank of Australia⁵. Firms were classified into nine industries based on Standard and Poor's Global Industrial Classification Standard (GICS) sectors: energy (10), materials or mining (15), industrials (20), consumer discretionary (25), consumer staples (30), health care (35), information technology (45), telecommunication (50), and utilities (55)⁶. Chan, Lakonishok and Swaminathan (2007) argue that the use of GICS codes is an effective mean of characterizing industry, citing widespread use of the GICS code by investment portfolio managers and analysts (Docherty, Chan and Easton, 2011). All of our analyses use data available at time t to forecast stock performance at time t + 1, so there is no look-ahead bias induced by our statistical procedures.

⁴ Financial firms often have high leverage, which does not necessarily mean that those firms are in financial distress, as it does with non-financial firms.

⁵ Some prior studies on the Australian market, such as Chai, Faff and Gharghori (2013) and Braisford, Gaunt and O'Brien (2012), used the monthly return on the 13-week Treasury note as a proxy for the risk-free rate. However, these data have not been available for the Reserve Bank of Australia since 2006.

⁶ The number within parentheses is the code for each industry sector.

Table 1. Descriptive statistics of variables in the frontier model and estimated efficiency score

Panel A of Table 1 presents descriptive statistics for the frontier model on the full sample and by industry. The average (median) firm has a Tobin's Q of 3.15 (1.65) and gross sales of \$489.48 million (\$10.75 million)⁷. The median firm report has a R&D/PPE of 0%, a CAPEX/PPE of 22% and an operating margin of 4%. On average, the leverage of the Australian firms is low, with an average leverage of just 8%, and analysts cover approximately one-third of firms in the market.

Panel A: Descriptive statistics of variables in the frontier model													
	Full sample				Median by industry								
	<i>Obvs</i>	<i>Mean</i>	<i>Std</i>	<i>Median</i>	<i>Energy</i>	<i>Materials</i>	<i>Industrials</i>	<i>Consumer discretionary</i>	<i>Consumer staples</i>	<i>Health care</i>	<i>Information technology</i>	<i>Telecom munication</i>	<i>Utilities</i>
Tobin's Q	14,857	3.15	4.36	1.65	2.10	1.92	1.24	1.43	1.27	2.40	1.58	1.67	1.39
Market value of equity (\$M)	14,857	1,143.12	8,174.85	47.55	37.38	29.46	116.37	113.43	222.44	40.47	28.37	51.56	125.24
Sales (\$M)	14,857	489.48	2,580.27	10.75	0.98	0.36	150.49	103.17	237.66	3.01	16.32	23.65	24.27
R&D/PPE	14,608	0.70	3.71	0.00	0	0	0	0	0	0.40	0	0	0
CAPEX/PPE	14,608	0.54	1.63	0.22	0.26	0.23	0.20	0.20	0.13	0.26	0.36	0.30	0.13
INC/Sales	13,105	-3.48	10.22	0.04	-0.67	-0.90	0.08	0.10	0.07	-0.69	0.03	0.05	0.20
PPE/Sales	13,127	5.49	13.96	0.41	2.69	1.71	0.18	0.15	0.33	0.22	0.06	0.21	3.03
LEV	14,857	0.08	0.14	0.00	0	0	0.08	0.06	0.12	0	0.00	0.01	0.08
FOLL	14,857	0.29	0.46	0.00	0	0	0	0	0	0	0	0	0
Panel B: Estimated efficiency score and its change in the period 1990-2011													
	Full sample				Median by industry								
	<i>Obvs</i>	<i>Mean</i>	<i>Std</i>	<i>Median</i>	<i>Energy</i>	<i>Materials</i>	<i>Industrials</i>	<i>Consumer discretionary</i>	<i>Consumer staples</i>	<i>Health care</i>	<i>Information technology</i>	<i>Telecom munication</i>	<i>Utilities</i>
EFFICIENCY	11,906	0.615	0.180	0.614	0.675	0.649	0.550	0.586	0.557	0.699	0.606	0.615	0.578
CH	10,098	-0.003	0.145	0.000	0.000	0.000	0.002	0.002	0.005	-0.006	-0.008	-0.012	0.010
%CH	10,098	0.031	0.294	0.000	0.000	0.000	0.004	0.004	0.007	-0.008	-0.014	-0.015	0.017

Tobin's Q is defined as the ratio of market value of equity plus book value of total debts to book value of total assets. The market value of equity equals to the product of price of stock at December of year *t* and share outstanding (in \$million). Total assets and gross sales are values at the end of the fiscal year *t*, in \$million. R&D/PPE is the ratio of R&D expenditure to net of property, plant and equipment. CAPEX/PPE is the ratio of capital expenditure to net of property, plant and equipment. INC/Sales is the ratio of operating income before depreciations and amortizations to gross sales. PPE/Sales is the ratio of net of property, plant and equipment to gross sales. LEV is the ratio of book value of long-term debts to sum of book value of long-term debt and market value of equity. FOLL is analyst following, takes value of unity if the firm is followed by analyst(s) and zero otherwise. EFFICIENCY is estimated efficiency score, measured as Q/Q^* . CH is level change in efficiency, computed as difference between efficiency score of year *t* and that of year *t-1*. %CH is percentage change in efficiency, computed as level change in efficiency divided by efficiency score of year *t-1*. All variables are winsorized at the 1% and 99% levels.

⁷ In this study, \$ denotes Australian dollar AUD

5. EMPIRICAL RESULTS

5.1. Efficiency of Australian Firms and Industries

Panel B of Table 1 exhibits the estimated efficiency score of firms and its change from 1990-2011 in nine industries. The average firm has an estimated efficiency of 61.5%, implying an inefficiency of 38.5%, which is shortfall from the frontier line. Compared to an inefficiency of 16% for industrial firms reported by Habib and Ljungqvist (2005) and 30% reported by Nguyen and Swanson (2009),

Australian companies during the period 1990-2011 tend to operate less efficiently than companies in the US. On average, health care and energy industries tend to operate above the average level of the broad market, whereas industrials, consumer discretionary, consumer staples, telecommunication and utilities tend to operate under it. Overall, in terms of level change, firm efficiency has remained almost unchanged. However, in terms of percentage change, firm efficiency tends to increase as the average firm has improved 3% per annum during the sample period.

Table 2. Mean parameter sensitivities from the frontier model

	<i>Expected sign</i>	<i>Mean of coefficient</i>	<i>t-value</i>
<i>Ln(sales)</i>	-	-0.20***	-5.46
<i>R&D/PPE</i>	+	0.31	1.66
<i>CAPEX/PPE</i>	+	0.18**	2.56
<i>INC/Sales</i>	+	-0.05	-1.61
<i>PPE/Sales</i>	+/-	0.004	0.24
<i>LEV</i>	+/-	-4.34***	-12.44
<i>FOLL</i>	+	0.46***	4.64
<i>Constant</i>		6.01***	7.93

Note: This table reports the average of parameter sensitivities for stochastic frontier analysis for equation (1) using the sample of 14,857 firm-observations of listed companies in the Australian Securities Exchange (ASX) from January 1990 to October 2012. Dependent variable is Tobin's Q, measured as the ratio of the market value of equity plus book value of total debts to book value of total assets. The market value of equity equals to the product of price of stock at December of year t and share outstanding (in \$million). Ln(sales) is the natural logarithm of gross sales. Book value of total assets, book value of total debts and gross sales are values at the end of financial year (in \$million). R&D/PPE is the ratio of R&D expenditure to net of property, plant and equipment. CAPEX/PPE is the ratio of capital expenditure to net of property, plant and equipment. INC/Sales is the ratio of operating income before depreciations and amortizations to gross sales. PPE/Sales is the ratio of net of property, plant and equipment to gross sales. LEV is the ratio of book value long-term debts to sum of book value of long-term debt and market value of equity. FOLL is analyst following, takes value of unity if firm is followed by analyst(s) and zero otherwise. All ratios are winsorized at the 1% and 99% levels. The frontier model using SFA regresses with truncated-normal, running annually then following Fama and MacBeth (1973) we calculate the mean of time-series coefficients and their t-statistics by dividing mean by time-series standard deviation. ***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively.

At the end of each year, t, from January 1990 to December 2011, we estimate equation (1) using the stochastic frontier approach. Table 2 reports the mean parameter sensitivities from the frontier regression results. Following Fama and MacBeth (1973), we calculate the mean of time-series coefficients and their t-statistics based on 22 annual observations. The results are in line with the finding in Habib and Ljungqvist (2005). For instance, the average coefficient of ln(sales) is -0.20, which is

close to the value of -0.31 reported in Habib and Ljungqvist (2005), suggesting that the average Q will fall as firms grow larger. The variables that proxy for soft-spending (R&D/PPE) and operating margin INC/sales are insignificant. Capital intensity or hard-spending (CAPEX/PPE), which proxies for growth opportunities, is positively related to Tobin's Q. Leverage (LEV) has a negative impact on firm value, whereas analyst following helps improve it.

Table 3. The large firms with the lowest percentage change in efficiency (%CH) in 2011

#	<i>Company</i>	<i>Industry</i>	<i>Market Capitalization (\$M)</i>	<i>%CH</i>	<i>Return</i>
1	Billabong Int'l Ltd.	Consumer discretionary	675	-42.30%	-71.66%
2	Linc Energy Ltd.	Energy	587	-41.22%	-60.88%
3	Bathurst Resources Ltd	Materials	515	-41.01%	-40.19%
4	Arrium Ltd	Materials	1,564	-39.05%	-8.91%
5	Independence Group NL	Materials	1,088	-38.39%	-2.27%
6	Paladin Energy Ltd	Energy	1,309	-35.76%	-24.81%
7	Bluescope Steel Ltd	Materials	2,032	-33.27%	0.21%
8	Jetset Travelworld Ltd	Consumer discretionary	452	-32.64%	-47.00%
9	Energy Resources of Australia	Energy	2,892	-31.61%	3.20%
10	Mount Gibson Iron Ltd	Materials	1,246	-30.57%	-40.55%

Note: This table shows stock returns on the large firms (the top 200 firms in terms of market capitalization at the end of 2011) with the lowest percentage change in efficiency (%CH). Return is the compounded return from January 2012-October 2012.

Table 3 shows 10 large firms (in the top 200 in terms of market capitalization at the end of 2011) with the lowest percentage change in firm efficiency (%CH) in 2011. Intuitively, there is a positive relation between the change in firm efficiency in 2011 and subsequent stock returns in 2012; the greater the decrease in efficiency, the more significant is the plunge in stock price in the following year. Take

Billabong Int'l Ltd, a retail company, for example. The company had extended⁸ its business by investing and opening many shops in foreign countries but failed to compete with domestic shops

⁸ Billabong Int'l's acquisitions in 2010-2011 were \$368 million, approximately 4.5 times higher than the \$82 million in 2009-2010 (see the company's financial report, ended 30 June 2011).

and online stores in those markets. Consequently, many shops were closed, earnings dropped and the company's estimated efficiency fell from 60% in

2010 to just 34.5% in 2011. As a result, Billabong's price had declined considerably, losing almost 72% of its value from January 2012 to October 2012.

Table 4. Descriptive statistics of variables in the Fama-MacBeth model and correlation table

Panel A: Descriptive statistics of variables using in the Fama-MacBeth model						
	<i>Obvs</i>	<i>Mean</i>	<i>Std</i>	<i>Median</i>	<i>Min</i>	<i>Max</i>
<i>R</i>	137,174	-1.71%	17.46%	-1.28%	-61.68%	61.55%
<i>CH</i>	10,098	-0.003	0.145	0	-0.445	0.443
<i>%CH</i>	10,098	0.031	0.294	0	-0.603	1.392
<i>SIZE</i>	11,906	18.25	2.13	17.97	14.2	23.81
<i>B/M</i>	11,906	-0.87	0.95	-0.82	-3.65	1.35
<i>TURNOVER</i>	11,906	0.49	0.54	0.32	0	3.16
<i>HHI</i>	11,704	0.15	0.13	0.12	0.03	1
Panel B: Pearson cross-correlation coefficients table.						
	<i>CH</i>	<i>%CH</i>	<i>SIZE</i>	<i>B/M</i>	<i>TURNOVER</i>	<i>HHI</i>
<i>CH</i>						
<i>%CH</i>	0.930***					
<i>SIZE</i>	0.111***	0.033***				
<i>B/M</i>	-0.088***	-0.035***	-0.313***			
<i>TUNROVER</i>	0.064***	0.069***	0.205***	-0.145***		
<i>HHI</i>	-0.005	0.012	0.016*	-0.008	0.068***	

R is monthly return on individual stock, calculated as the compounded daily return. Efficiency is estimated efficiency score. *CH* is change in efficiency score, computed as efficiency score of year *t* minus that of year *t-1*. *%CH* is percentage change in efficiency, computed as level change in efficiency divided by efficiency score of year *t-1*. *SIZE* is the natural logarithm of market value of equity, measured in December of year *t*. *B/M* is the natural logarithm of the ratio of book value to market value of equity, measured at the fiscal year end of year *t*. *TURNOVER* is calculated as the ratio of daily trading volume to shares outstanding over year *t*. An industry's Herfindahl index (*HHI*) is measured by first calculating the sum of squared sales-based market shares of all firms in that industry in a given year and then averaging over the past 3 years. Our sample of Australia is from COMPUSTAT Global in the period from Jan 1990 to Oct 2012. *MRP* is monthly risk premium, calculated as the market return less the risk-free rate. The risk-free rate is proxied by the 10-year government bond yield, sourced from the Reserve Bank of Australia. ***, **, * indicates significance at 1%, 5%, and 10% levels, respectively, for the correlation coefficients.

Panel A of Table 4 shows the descriptive statistics of the full sample. Monthly market return is the value-weighted return on the broad market portfolio, sourced from DATASTREAM. The risk-free rate (*Rf*) is proxied by the 10-year government bond yield, sourced from the Reserve Bank of Australia. Monthly return (*R*) on individual stock is the compounded daily return within the month, sourced from COMPUSTAT Global. Return for the average firm (median) is -1.71% (-1.28%) per month. Those negative numbers are possibly attributable to the adverse effect of several financial crises that happened during the sample period such as the dot-com bubble crisis in the early 2000s and the global financial crisis (GFC) in 2008. *TURNOVER* is calculated as the ratio of the daily trading volume to shares outstanding over a year, and the average firm has a value of 49% per annum. An industry's Herfindahl index (*HHI*) is used to proxy for industry concentration; the higher the *HHI*, the more monopolistic is the market, whereas the lower the *HHI*, the more competition exists in the product market. An industry's *HHI* is computed by first calculating the sum of squared sales-based market shares of all firms in that industry during a given year and then averaging that value over the past 3 years. This approach is to ensure that the Herfindahl measure is not unduly influenced by potential data errors (Hou and Robinson, 2006).

Panel B of Table 4 shows correlation coefficients between our variables. There is a high correlation between *CH* and *%CH* (0.93), but the

other correlation coefficients are quite low, implying that the multicollinearity is not a significant issue in our regressions.

5.2. Returns and change in the efficiency-sorted portfolio

Table 5 reports the mean returns on *CH*-sorted and *%CH*-sorted portfolios. Panel A presents the performance of portfolios during the period from January 1990 to October 2012, whereas Panels B and C present the results for the sub-period of the 1990s and 2000s, respectively. They exhibit the same pattern, as returns on portfolios tend to increase moving from the Low portfolio to the High portfolio. The statistics on the spreads show that the mean of return on the equally-weighted (value-weighted mean) spread *CH*-sorted portfolio over the full sample is 0.9% (0.6%) per month and statistically significant. This result implies that the High *CH*-sorted portfolio outperforms the Low *CH*-sorted portfolio by approximately 11% and 7%, respectively, on a compounded annual basis in terms of equally- and value-weighted returns. Notably, as observed in Panels B and C, most mean returns on portfolios during the 2000s tend to be lower than those during the 1990s. However, the spread of mean returns between the High and Low portfolios over the two sub-periods are similar to that in the full sample period.

Table 5. Mean monthly returns on CH-sorted and %CH-sorted portfolios

Portfolio	CH-sorted portfolio		% CH-sorted portfolio	
	Equally-weighted	Value-weighted	Equally-weighted	Value-weighted
Panel A: Full sample, Jan 1990-Oct 2012				
Low	-1.54%	-0.38%	-1.49%	-0.40%
Middle	-0.54%	0.35%	-0.58%	0.34%
High	-0.59%	0.27%	-0.60%	0.24%
Spread (High-Low)	0.9%***	0.6%***	0.8%***	0.6%***
Panel B: Subsample, Jan 1990- Dec 1999				
Low	-0.47%	-0.41%	-0.43%	-0.35%
Middle	0.13%	0.43%	0.13%	0.40%
High	0.46%	0.40%	0.42%	0.41%
Spread (High-Low)	0.9%***	0.8%**	0.8%**	0.7%**
Panel C: Subsample, Jan 2000-Oct 2012				
Low	-2.33%	-0.41%	-2.25%	-0.42%
Middle	-1.02%	0.29%	-1.12%	0.26%
High	-1.35%	0.24%	-1.33%	0.18%
Spread (High-Low)	1%***	0.6%*	0.9%***	0.6%*

Note: This table displays equally and value-weighted monthly return on CH-sorted portfolios and %CH-sorted portfolios. In December of each year t , we rank all the stocks in the sample by efficiency change in ascending order. We then assign the sample into three tertile portfolios. The first portfolio is Low that consists of firms with low improvement in efficiency, the second is Middle and the last portfolio is High that consists of firms with high improvement in efficiency. All portfolios are held in 1 year from January to December of year $t+1$ and are rebalanced at the end of each year. The SPREAD portfolio is a zero-cost portfolio that has a long position in the High portfolio and short position in the Low portfolio. The return series for the SPREAD portfolio is the difference between the High portfolio return and the Low portfolio return. ***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively.

To obtain more insight about the behavior of the High and Low portfolios, we draw graphs for the annual performance of the equally- and value-weighted CH-sorted portfolios in Figs. 1a and 1b. This method is repeated for the %CH-sorted

portfolios, and we have Figs. 2a and 2b. As observed from the four figures, the outperformance of the High portfolio over the Low portfolio is not time period-specific but is present over most years in the sample period.

Figure 1a. Performance of the High vs Low equally-weighted CH-sorted portfolio

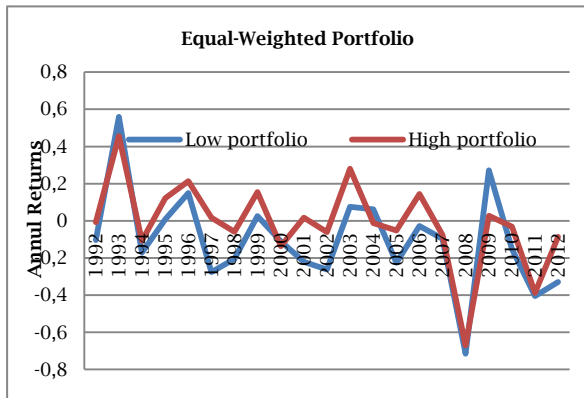


Figure 1b. Performance of the High vs Low value-weighted CH-sorted portfolio

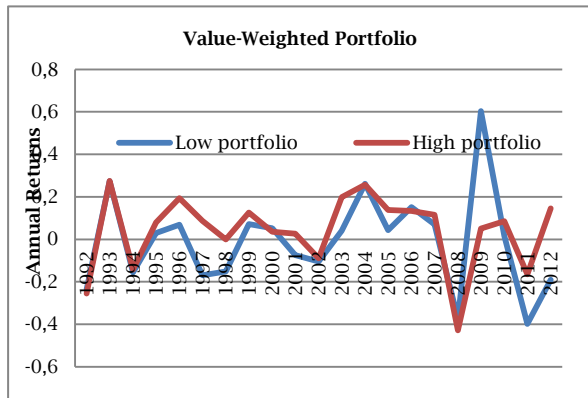


Figure 2a. Performance of the High vs Low equally-weighted %CH-sorted portfolio

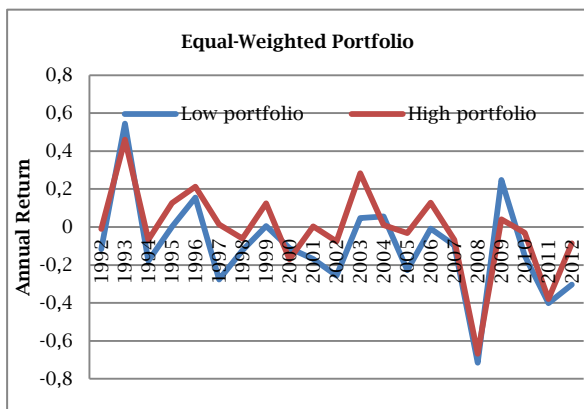
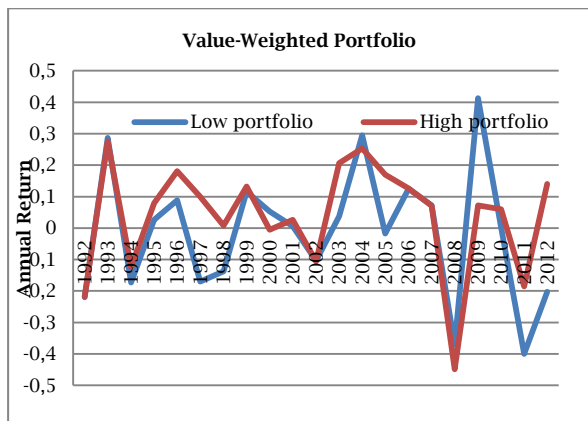


Figure 2b. Performance of the High vs Low value-weighted %CH-sorted portfolio



5.3. Effect of Efficiency Improvement on Stock Returns

5.3.1. The Carhart 4-factor models

To investigate the effect of efficiency change on returns over time, we will run the Carhart 4-factor model on the excess portfolio returns. In this model, MRP proxies for portfolio systematic risk, SMB proxies for firm size effect, HML proxies for book-to-market or value effect and MOM proxies for momentum effect. If Jensen's alpha is positive and significant, after adjusting for other risk-loading factors (i.e., beta, size, value and momentum effects), then the abnormal returns may be attributable to the efficiency change.

We follow Fama and French (1993) to calculate SMB and HML factors and follow Carhart (1997) to calculate the MOM factor during the period from January 1990 to October 2012. The mean magnitude of small-minus-big, SMB, is -2.08% pm. However, Brailsford, Gaunt and O'Brien (2012) report a mean SMB of -0.22% pm during the period 1982-2006⁹. The mean of HML is 1.17% pm, consistent with the finding in Halliwell, Heaney and Sawicki (1999), who document a premium of approximately 1.2% pm during 1981-1991, and with Gharghori, Chan and Faff (2006), who report a premium of 1.18% pm during 1990-2003. The mean of MOM is 14.97% pm, similar to the finding in O'Brien, Brailsford and Gaunt (2010)¹⁰.

The regression results on CH- and %CH-sorted portfolios are displayed in Panel A and Panel B of Table 6, respectively. The coefficient values of the four different factors provide us with useful information regarding the different portfolios. In both Panels A and B, the parameter MRP is positive and significant for all portfolios, implying that there is an important role of systematic risk in explaining the variation of returns on portfolios. Furthermore, we observe that the market betas are highest for the Low portfolio in most cases, indicating that the Low portfolio tends to have higher levels of market risk than the High portfolio.

Turning to the SMB factor, it is worth noting that the magnitude of the SMB slope coefficient is the largest for the Low portfolio compared to other portfolios. This result indicates that there is a concentration of small-cap stocks in the low change in efficiency portfolio. Additionally, the Low portfolio seems to hold value stocks, as the slope coefficient of the HML factor is the highest. Taken together, the Low portfolio tends to consist of small-cap and value stocks. This finding is in line with Fama and French (1993), as smaller firms are more likely to be financially distressed. Financially

distressed firms are more apt to suffer from inefficiency, as without access to external capital, firms may be forced to forgo investments with good growth opportunities, thus, firm value is not maximized (Chung et al., 2012). The loading on MOM is almost insignificant, suggesting that the momentum factor has limited power to explain the variation in stock returns over the sample period. This finding is similar to Kassimatis (2008), who finds that the momentum factor is statistically significant in explaining variation in returns for only 3 of 25 portfolios in his study.

Compared with other portfolios, Jensen's alpha on the equally- and value-weighted Low CH-sorted (%CH-sorted) portfolio is the lowest at -1.1% and -2.5% (-1.2% and 2.5%) per month, respectively, and significant in most cases. This result indicates that the Low portfolio tends to be overvalued. Taking the finding above that the Low portfolio is likely to consist of small-cap and value stocks, we can conclude that misevaluation is common among small-cap and value firms with a large decrease in firm efficiency. Jensen's alpha is 1.9% and 2.0% (1.9% and 2.1%) per month and significant at the 5% level for the equally- and value-weighted CH-sorted (%CH-sorted) spread portfolio, respectively. Notably, the magnitude of Jensen's alpha for the High portfolio is smaller than for the Low portfolio, suggesting that the abnormal return from the strategy of buying the High portfolio and short selling the Low portfolio is mainly driven by short positions.

We observe similar results to the 4-factor model on %CH-sorted portfolios in Panel B of Table 6. The Low portfolio also tends to have higher systematic risk, concentrate small-cap and value stocks and underperform the High portfolio. In sum, the results of our performance regressions show that efficiency change has a clear impact on subsequent stock price performance. This finding is present in both CH-sorted and %CH-sorted portfolios. Hence, these results are not model specific. The presence of an abnormal return after controlling for known risk factors (i.e., systematic risk, size effect, value effect and momentum effect) therefore would be attributable to the efficiency change.

5.3.2. The Fama-MacBeth (1973) model

The performance of the regressions above shows that a change in firm efficiency plays a role in explaining stock price performance over time. In this section, we assess whether firm efficiency change also plays a role in explaining the cross-section of stock returns.

Table 7 exhibits the results of the Fama-MacBeth (1973) regression analysis of the cross-section of stock returns on firm efficiency changes and other controlling variables for the full sample and by industry. Panel A exhibits the results of the regressions of monthly return on level change CH, whereas Panel B presents the results for percentage change %CH. The parameters estimated are the average of time-series coefficients and their standard deviations. The average slopes provide the standard Fama-MacBeth (1973) test for determining which explanatory variables on average have non-zero expected premiums (Fama and French, 1992) during the period from January 1990 to October 2012.

⁹ There is one possible explanation for a negative number of the mean of SMB, which is that our sample period covers several financial crises such as the dot-com bubble that occurred in the early 2000s and the GFC in 2008. During those hard times, the returns for many firms, particularly small firms, declined significantly; as a result, the mean of SMB during the period 1990-2012 may be lower than that during other periods.

¹⁰ For instance, O'Brien et al. (2010) report that the mean of returns for the large-cap value winners is 48.02%, and for the large-cap value losers, it is -33.21%, suggesting that the difference between large-cap value winners and losers is 81.23% per semi-annum or 13.54% pm; the mean of returns on the mid-cap growth winners is 60.52%, and on the mid-cap growth losers, it is -41.62%, suggesting that the difference between mid-cap growth winners and losers is 102.12% per semi-annum or 17.02% pm during the period 1981-2005.

Table 6. The Carhart 4-factor model

	Equally-weighted return				Value-weighted return			
	Low	Middle	High	Spread (High-Low)	Low	Middle	High	Spread (High-Low)
Panel A: CH-sorted portfolios								
Alpha	-0.011	-0.005	0.008	0.019**	-0.025***	0.001	-0.005	0.020**
	(0.007)	(0.005)	(0.006)	(0.008)	(0.008)	(0.005)	(0.007)	(0.009)
MRP	1.091***	0.951***	1.031***	-0.060	1.048***	1.058***	0.938***	-0.110*
	(0.045)	(0.034)	(0.042)	(0.053)	(0.050)	(0.032)	(0.043)	(0.058)
SMB	0.758***	0.484***	0.641***	-0.117**	0.138***	-0.067**	-0.047	-0.185***
	(0.042)	(0.032)	(0.040)	(0.051)	(0.047)	(0.031)	(0.041)	(0.055)
HML	0.381***	0.354***	0.255***	-0.126*	0.264***	0.057	0.016	-0.248***
	(0.064)	(0.048)	(0.060)	(0.076)	(0.071)	(0.046)	(0.062)	(0.082)
MOM	0.023	0.013	-0.055	-0.078	0.127**	-0.025	0.016	-0.111*
	(0.049)	(0.037)	(0.046)	(0.058)	(0.055)	(0.035)	(0.047)	(0.063)
Adj_Rsq	0.796	0.814	0.789	0.018	0.649	0.812	0.655	0.064
N	250	250	250	250	250	250	250	250
Panel B: %CH-sorted portfolios								
Alpha	-0.012*	-0.004	0.007	0.019**	-0.025***	0.001	-0.004	0.021**
	(0.007)	(0.005)	(0.006)	(0.008)	(0.008)	(0.005)	(0.007)	(0.010)
MRP	1.086***	0.971***	1.014***	-0.072	1.105***	1.017***	0.992***	-0.113*
	(0.043)	(0.034)	(0.042)	(0.052)	(0.050)	(0.033)	(0.048)	(0.063)
SMB	0.752***	0.475***	0.656***	-0.096*	0.174***	-0.082***	-0.006	-0.179***
	(0.041)	(0.032)	(0.040)	(0.049)	(0.048)	(0.031)	(0.045)	(0.060)
HML	0.389***	0.332***	0.271***	-0.117	0.338***	0.038	0.056	-0.282***
	(0.062)	(0.048)	(0.060)	(0.074)	(0.072)	(0.047)	(0.068)	(0.090)
MOM	0.031	-0.003	-0.047	-0.079	0.126**	-0.032	0.010	-0.117*
	(0.047)	(0.037)	(0.046)	(0.057)	(0.055)	(0.036)	(0.052)	(0.069)
Adj_Rsq	0.805	0.818	0.783	0.016	0.672	0.796	0.633	0.056
N	250	250	250	250	250	250	250	250

Dependent variable is monthly excess return on portfolios. The model is estimated as follows:

$$\text{Excess}_{i,t} = \alpha + \beta_1 * \text{MRP}_t + \beta_2 * \text{SMB}_t + \beta_3 * \text{HML}_t + \beta_4 * \text{MOM}_t + \varepsilon_t$$

Where Excess is the monthly excess return on portfolio, computed by subtracting the risk free rate from the return on portfolio. The risk free rate is measured as the 10-year government bond yield. MRP is monthly market risk premium, measured by subtracting the risk free rate from the monthly value-weighted market return. SMB is the size factor, measured the difference between returns on a portfolio of stocks with small cap and on a portfolio of stocks with large cap. HML is the value factor, measured as the difference between returns on a portfolio of stocks with high book-to-market and on a portfolio of stocks with low book-to-market. MOM is the momentum factor, measured as the difference between returns on a portfolio of winner stocks and on a portfolio of loser stocks. Standard errors are in parentheses. ***, **, * indicates significance at 1%, 5%, and 10% levels, respectively.

The average slope coefficient on CH for the full sample is 3.4% and statistically significant at 1%, implying that improvement in firm efficiency can help explain the variation in the cross-section of stock returns after controlling for size effect, value effect, market liquidity and industry concentration. On average, a one standard deviation increase in efficiency change would lead to a 3.4% standard deviation increase in the cross-section of stock returns during the next year.

Interestingly, as observed in Panel A, the effect of efficiency change on stock returns varies across industries. Overall, a level change in efficiency (CH) helps explain the cross-section of stock returns in six out of nine industries including mining, industrials, consumer discretionary, consumer staples, health care and utilities. It is worth noting that the six mentioned industries are highly competitive¹¹. With the average of HHI being 0.05, the consumer discretionary industry is the most competitive industry in the Australian market. Take retail companies, for example. Traditional retailers face keen competition from online stores and thus, they are forced to introduce an online shopping option to compete for survival.

Although the 0.37 average of the utilities industry's HHI is not as low as in highly competitive industries, the utilities industry is seen as a risky industry due to its characteristics and the risks it has faced. For instance, because electricity

generators are long lived (usually in excess of 40 years) and have capital-intensive assets, they tend to bear the inflation risk inherent with long-lived assets (Investment Reference Group Report, 2011). Moreover, investment in the utilities sector is also posed to other risks such as policy risks (i.e., retail price regulation, commitment to long-term emissions reduction trajectories) and market risks (i.e., uncertainty of future fuel prices, currency fluctuation). In addition, one of the outcomes of pricing carbon¹² that is difficult to predict is the demand response by customers to the higher prices resulting from a carbon price (Investment Reference Group Report, 2011).

Habib and Ljungqvist (2005) and Nguyen and Swanson (2009), among others, have documented that inefficient firms are forced to improve their performance to compete and survive in a competitive market. Therefore, efficiency improvement is essential to survive in a competitive market, which in turn becomes an important factor in the asset pricing models.

Compared to CH, Panel B shows that %CH tends to have weaker explanatory power, as the change in efficiency effect remains in just two out of nine industries (i.e., the consumer discretionary and utilities industries). This result is consistent with our finding above that efficiency improvement is crucial for a firm in a highly competitive or risky market, which in turn becomes an important factor in the firm's market valuation.

¹¹ The HHI of the consumer discretionary, industrials, mining, health care, consumer staples and utilities industries are 0.05, 0.06, 0.15, 0.15, 0.19 and 0.37, respectively.

¹² A carbon tax came into effect on July 1, 2013.

Table 7. The Fama-MacBeth (1973) cross-sectional regression of monthly stock returns on efficiency change

		By industry								
	Full sample	Energy	Materials	Industrials	Consumer discretionary	Consumer staples	Health care	Information technology	Telecom munication	Utilities
Panel A: level change in efficiency (CH)										
CH	0.034*** (0.154)	-0.002 (0.513)	0.033*** (0.224)	0.032* (0.272)	0.100*** (0.334)	0.050* (0.417)	0.165* (1.368)	-0.043 (3.478)	0.538 (5.651)	0.280** (1.507)
SIZE	0.005*** (0.010)	0.005*** (0.020)	0.005*** (0.014)	0.005*** (0.014)	0.004*** (0.019)	0.004*** (0.018)	0.008*** (0.035)	0.008*** (0.040)	0.005 (0.169)	0.013 (0.193)
B/M	0.008*** (0.008)	0.007** (0.055)	0.007*** (0.026)	0.008*** (0.038)	0.002 (0.029)	0.003 (0.048)	0.0006 (0.139)	0.011*** (0.067)	0.070 (0.663)	0.027 (0.496)
TURNOVER	-0.014*** (0.042)	0.0008 (0.087)	-0.014*** (0.051)	-0.009*** (0.093)	-0.019*** (0.096)	-0.016*** (0.092)	-0.054*** (0.286)	0.004 (0.145)	-0.037** (0.239)	-0.015 (0.487)
HHI	-0.009* (0.079)									
Constant	-0.092*** (0.217)	-0.086** (0.418)	-0.096*** (0.291)	-0.086*** (0.270)	-0.062** (0.381)	-0.078*** (0.340)	-0.162*** (0.816)	-0.148*** (0.891)	0.089 (5.618)	-0.244 (3.878)
N	238	250	250	250	250	250	250	250	166	178
Panel B: percentage change in efficiency (%CH)										
%CH	0.012** (0.077)	0.001 (0.223)	0.010 (0.120)	0.010 (0.137)	0.039*** (0.175)	0.023 (0.227)	0.027 (0.649)	-0.036 (2.342)	0.054 (2.635)	0.126*** (0.575)
SIZE	0.005*** (0.011)	0.005*** (0.020)	0.005*** (0.014)	0.005*** (0.014)	0.003*** (0.019)	0.004*** (0.019)	0.006*** (0.037)	0.007*** (0.043)	0.016** (0.091)	0.008 (0.103)
B/M	0.007*** (0.015)	0.007** (0.054)	0.006*** (0.026)	0.007*** (0.039)	0.002 (0.028)	0.002 (0.047)	0.005 (0.111)	0.010** (0.070)	0.017 (0.352)	0.015 (0.260)
TURNOVER	-0.014*** (0.042)	0.0002 (0.085)	-0.013*** (0.051)	-0.010* (0.086)	-0.020*** (0.096)	-0.017*** (0.093)	-0.056*** (0.299)	0.004 (0.152)	-0.035* (0.236)	-0.024 (0.299)
HHI	-0.010** (0.079)									
Constant	-0.095*** (0.219)	-0.088*** (0.413)	-0.097*** (0.291)	-0.089*** (0.269)	-0.066*** (0.370)	-0.081*** (0.344)	-0.123** (0.801)	-0.147** (0.898)	-0.320 (2.880)	-0.141 (2.088)
N	238	250	250	250	250	250	250	250	166	178

This table reports monthly Fama-MacBeth (1973) cross-sectional regressions of monthly stock returns (R) in year $t+1$ on efficiency changes and other variables in year t , the model is estimated as follows:

$$R_{i,t+1} = \alpha + \beta_1 * Change_{i,t} + \beta_2 * SIZE_{i,t} + \beta_3 * B/M + \beta_4 * TURNOVER_{i,t} + \beta_5 * HHI_{i,t} + \varepsilon_{i,t}$$

Where R is monthly return on individual stock in year $t+1$. $Change$ is CH or $\%CH$ where CH is level change in efficiency year t compared to year $t-1$ and $\%CH$ is percentage change in efficiency year t compared to that of year $t-1$. $SIZE$ is the natural logarithm of market value of equity, measured in December of year t . B/M is the natural logarithm of the ratio of book value to market value of equity, measured at the accounting balance date of year t . $TURNOVER$ is calculated as the ratio of daily trading volume to shares outstanding over year t . An industry's HHI is measured by first calculating the sum of squared sales-based market shares of all firms in that industry in a given year and then averaging it over the past 3 years. R , $TURNOVER$ and HHI are sourced from COMPUSTAT Global. Following Fama and MacBeth (1973) we calculate the average slope as the time-series average of the monthly regression slopes for January 1990 to December 2011. To avoid biased results caused by outliers, all variables are winsorized at the 1% and 99% levels. Standard deviations are in parentheses. ***, **, * indicates significance at 1%, 5%, and 10% levels, respectively.

The slope coefficient on SIZE is significantly positive and quite stable across industries. This is not surprising, as prior studies of the Australian market report mixed results for the size effect. For instance, Docherty, Chan and Easton (2013) document that the size premium is nonlinear and driven by microcaps, whereas Faff (2001) finds evidence of large-firm indices outperforming small-firm indices. Liew and Vassarou (2000) have argued that small firms are riskier than large firms, making them a very risky investment in bad times because they have less chance of survival. Rational investors will hold small firms during good times, raising their prices, and will avoid them during bad times, pushing their returns down (Kassimatis, 2008). In addition, institutional investors tend to invest in larger firms and push up their stock prices (Gompers and Metrick, 2001). Taken together, with the dot-com bubble that occurred in the early 2000s and the GFC in 2008, returns on small firms would decline greatly during the 2000s. This might explain why large firms tended to outperform small firms in the Australian market during the 2000s.

Consistent with findings in prior studies (see Fama and French, 1992; Brailsford, Gaunt and O'Brien, 2012; Gharghori, Strykowski and Veeraraghavan, 2013; Docherty et al., 2013), we also find that book-to-market ratio is positively associated with stock return, implying that the required rate of return will be higher to compensate for firms in financial distress. The slope coefficient on share turnover is negative and significant in most industries, suggesting that investors require higher returns to compensate for illiquidity risk. The loading on HHI of -0.009 (-0.01) in Panel A (Panel B) is significant, revealing that the more competitive a market is in which firms operate, the higher the expected returns on firms' stocks.

A possible explanation for the correlation between efficiency change and subsequent stock return is that mispricing tends to be common among small-value firms, which have a large drop in firm efficiency. If a decrease in firm efficiency would cause additional agency costs in a subsequent year and if investors underestimate these additional costs, then a firm's performance should be worse than expected (Gompers et al., 2003). This situation implies that the firm's value at the beginning of the period would be too high or that the firm is overvalued. The stock price would move back to its intrinsic value, which is lower than the initial expectation. As a result, the subsequent stock return would be lower than expected. Alternatively, firms with a greater change in firm efficiency would better utilize their resources and would thus be more profitable and have higher subsequent stock returns.

However, due to the endogeneity issue for the firm efficiency change variable, agency cost proxies and firm performance proxies, further study is needed to tease out the exact cause of the relation we document.

5.4. Robustness test

According to the tax-loss selling hypothesis, because investors can use their investment losses to offset gains to reduce their tax, stocks that have declined in value tend to be sold at the end of the financial year. Consequently, as the supply of such stocks

drops in the following month, their prices would increase and they would tend to perform well. Because Australia has a July-June taxation cycle, we also expect that a seasonality effect exists in July. Prior research also finds that the January effect exists in the Australian market, as there is a high integration between the Australian market and the US market (see Brown, Keim, Kleidon and Marsh, 1983; Brailsford and Easton, 1993). To avoid the effect brought by seasonality, we remove January and July firm observations.

The Carhart 4-factor model and the cross-sectional Fama-MacBeth model are re-run without January or July observations. We find that the results without those months' observations are consistent with the full sample results¹³, implying that the efficiency change effect remains regardless of the seasonality effect.

We also run the CAPM, Fama-French 3-factor models for the full sample and the sub-sample without January or July observations and find that the unreported results are in line with those from the Carhart 4-factor model with the same conclusion.

6. CONCLUSION

This paper investigates whether investors in the Australian context value firm efficiency improvement at all. In particular, it examines how contemporaneous change in firm efficiency can be used to predict future stock performance in non-financial industries in Australia.

We employ a stochastic frontier analysis to estimate firm efficiency for a large panel of Australian listed companies from January 1990 to October 2012 and then examine the relation between the firm efficiency change and subsequent stock returns. Firm efficiency is estimated by comparing a benchmark Tobin's Q of a hypothetical value-maximizing firm to the firm's actual Tobin's Q. The change in efficiency is measured as level change and percentage change in firm efficiency in the current year compared to that in the previous year.

We find that an equally-weighted (value-weighted) portfolio of stocks with a high change in efficiency outperforms an equally-weighted (value-weighted) portfolio of stocks with a low change in efficiency by an average of 11% (7%) per annum. In cross-sectional analysis, efficiency improvement helps explain the variation in the cross-section of stock returns, even after controlling for known risk factors such as size, book-to-market, market liquidity and industry concentration. Furthermore, the cross-sectional regression results by industry reveal that firm efficiency improvement helps explain the cross-section of stock returns in six out of nine industries: materials, industrials, consumer discretionary, consumer staples, health care and utilities. It is worth noting that these industries are highly competitive. Therefore, this result is consistent with the notion that efficiency improvement is essential to compete and survive in a competitive market, which in turn becomes an important factor in the asset pricing model.

¹³ Results for the Carhart 4-factor and cross-sectional Fama-MacBeth models without January or July observations have not been reported for the sake of brevity but are available from the authors on request.

Our findings confirm the importance of improvements in firm efficiency; the higher the improvement in efficiency is, the higher the subsequent stock returns. The results indicate the alignment between firm efficiency improvement and maximization of shareholders' wealth. Thus, our findings indicate that investors in the Australian stock market value improvement in firm efficiency. This finding therefore provides further impetus for the drive within Australia to improve the productivity and efficiency of the country, particularly in its industries and firms. It is comforting to know that the capital market also supports this, as it rewards firms that improve efficiency through higher stock returns. These findings also provide a signal to investors such as fund managers in their search for assets that can yield high returns. Finally, these results have implications for asset pricing theories: efficiency change, at least in the Australian context, is a factor that can explain changes in future returns.

REFERENCES

- Alam I and Sickles R (1998) The relationship between stock market returns and technical efficiency innovations: evidence from the US airline industry. *Journal of Productivity Analysis* 9: 35-51.
- Amess K and Girma S (2009) Do stock markets value efficiency? *Scottish Journal of Political Economy* 56: 321-331.
- Amihud Y and Mendelson H (1986) Asset pricing and the bid-ask spread. *Journal of Financial Economics* 17: 223-249.
- Australia's Productivity Performance (2009) available at http://www.pc.gov.au/_data/assets/pdf_file/0005/91382/productivity-growth.pdf
- Australian Bureau of Statistics report (2012) available at <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1370.0.55.001~2012~Main%20Features~Productivity~20>
- Berger A and Humphrey D (1997) Efficiency of financial institutions: international survey and directions for future research. *European Journal of Operational Research* 98: 175-212.
- Black F (1972) Capital market equilibrium with restricted borrowing. *The Journal of Business* 45: 444-455.
- Brailsford T, Gaunt C and O'Brien MA (2012) Size and book-to-market factors in Australia. *Australian Journal of Management* 37: 261-281.
- Brailsford TJ and Easton SA (1993) New evidence on the impact of tax-loss selling on the turn of the year effect. *Journal of Banking and Finance* 17: 131-144.
- Brown P, Keim DB, Kleidon AW and Marsh TA (1983) Stock return seasonality and the tax-loss selling hypothesis. *Journal of Financial Economics* 12: 105-127.
- Carhart M (1997) On persistence in mutual fund performance. *Journal of Finance* 52: 57-82.
- Chan HW and Faff RW (2003) An investigation into the role of liquidity in asset pricing: Australian evidence. *Pacific-Basin Finance Journal* 11: 555-572.
- Chan LKC, Lakonishok J and Swaminathan B (2007) Industry classifications and return comovement. *Financial Analysts Journal* 63: 56-70.
- Chordia T, Subrahmanyam A and Anshuman V (2001) Trading activity and expected stock returns. *Journal of Financial Economics* 59: 3-32
- Chung R, Fung S and Hung SK (2012) Institutional investors and firm efficiency of real estate investment trusts. *The Journal of Real Estate Finance Economics* 45: 171-211.
- Dittmar A and Maht-Smith J (2007) Corporate governance and the value of cash holdings. *Journal of Financial Economics* 83: 599-634.
- Docherty P, Chan H and Easton S (2011) Asset tangibility, industry representation and the cross section of equity returns. *Australian Journal of Management* 36: 75-87.
- Docherty P, Chan H and Easton S (2013) Australian evidence on the implementation of the size and value premia. *Accounting and Finance* 53: 367-391.
- D'Arcy P and Gustafsson L (2013) Australia's productivity performance and real income. Available at <http://www.rba.gov.au/publications/bulletin/2012/jun/bu-0612-3a.html>
- Engle R (2001) GARCH 101: The use of ARCH/GARCH models in applied econometrics. *Journal of Economic Perspectives* 15: 157-168.
- Fama E and MacBeth J (1973) Risk return and equilibrium: empirical tests. *Journal of Political Economy* 81: 607-636.
- Fama E and French K (1992) The cross-section of expected stock returns. *Journal of Finance* 47: 427-465.
- Fama E and French K (1993) Common risk factors in the returns of stocks and bonds. *Journal of Financial Economics* 33: 3-56.
- Frijns B, Margaritis D and Psillaki M (2012) Firm efficiency and stock returns. *Journal of Productivity Analysis* 37: 295-306.
- Gaganis C, Hasan I and Pasiouras F (2013) Efficiency and stock returns: evidence from the insurance industry. *Journal of Productivity Analysis* 40: 429-442
- Garlappi L, Shu T and Yan H (2008) Default risk, shareholder advantage, and stock returns. *The Review of Financial Studies* 21: 2743-2778.
- Gharghori P, Chan H and Faff RW (2006) Factors or characteristics? That is the question. *Pacific Accounting Review* 18: 21-46.
- Gharghori P, Strykowski S and Veeraraghavan M (2013) Value versus growth: Australian evidence. *Accounting and Finance* 53: 393-417.
- Green R, Toner P and Agarwal R (2012) Understanding productivity Australian's choice, available at <http://mckellinstitute.org.au/understanding-productivity-australias-choice>
- Gompers PA and Metrick A (2001) Institutional investors and equity. *The Quarterly Journal of Economics* 116: 229-259.
- Gompers P A, Ishii J and Metrick A (2003) Corporate governance and equity prices. *Quarterly Journal of Economics* 118: 107-155.
- Habib M and Ljungqvist A (2005) Firm value and managerial incentives: A stochastic frontier approach. *Journal of Business* 78: 2053-2093.
- Halliwel J, Heaney R and Sawicki J (1999) Size and book-to-market effects in Australian share markets: a time series analysis. *Accounting Research Journal* 12: 122-137.
- Hirshleifer D, Hsu P and Li D (2013) Innovative efficiency and stock returns. *Journal of Financial Economics* 107: 632-654.

35. Hjalmarsson L, Kumbhakar SC and Heshmati A (1996) DEA, DFA and SFA: A comparison. *The Journal of Productivity Analysis* 7: 303-327.
36. Hjalmarsson L and Veiderpass A (1992) Productivity in Swedish electricity retail distribution. *The Scandinavian journal of economics* 94: 193-205.
37. Hou K and Robinson D (2006) Industry concentration and average stock returns. *Journal of Finance* 61: 1927-1956.
38. Investment reference group report (2011). A report to the Commonwealth Minister for Resources and Energy, available at <http://www.ret.gov.au/energy/Documents/Energy-Security/IRG-report.pdf>
39. Jegadeesh N and Titman S (1993) Returns to buying winners and selling losers: implications for stock market efficiency. *Journal of Finance* 48: 65-91.
40. Jensen MC and Meckling WH (1976) Theory of the firm: managerial behavior, agency cost and ownership structure. *Journal of Financial Economics* 3: 305-360.
41. Kassimatis K (2008) Size, book to market and momentum effects in the Australian stock market. *Australian Journal of Management* 33: 145-159, 161-168.
42. Kirkwood J and Nahm D (2006) Australian banking efficiency and its relation to stock returns. *Economic Record* 82. 258: 253-267.
43. Kothari SP (2001) Capital markets research in accounting. *Journal of Accounting Economics* 21: 105-231.
44. Liew J and Vassorou M (2000) Can book-to-market, size and momentum be risk factors that predict economic growth? *Journal of Financial Economics* 57: 221-245.
45. Lintner J (1965) The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *The Review of Economics and Statistics* 47: 13-37.
46. Lovell CAK (1993) Production frontiers and productive efficiency. in Fried HO and SS Schmidt (eds.). *The Measurement of Productive Efficiency*. Oxford University Press, Oxford, 3-67.
47. Mahipala T, Chan H and Faff R (2009) Trading volume and information asymmetry: routine versus nonroutine earnings announcements in Australia. *Applied Financial Economics* 19: 1737-1752.
48. Nguyen G and Swanson P (2009) Firm characteristics, relative efficiency, and equity returns. *Journal of Financial and Quantitative Analysis* 44: 213-236.
49. O'Brien MA, Brailsford T and Gaunt C (2010) Interaction of size, book-to-market and momentum effects in Australia. *Accounting and Finance* 50: 197-219.
50. Parham and Economics (2013) available at <http://economics.adelaide.edu.au/downloads/services-workshop/Definition-Importance-And-Determinants-Of-Productivity.pdf>
51. Shamsuddin A and Xiang D (2012) Does bank efficiency matter? Market value relevance of bank efficiency in Australia. *Applied Economics* 44: 3563-3572.
52. Sharpe W (1964) Capital asset prices: a theory of market equilibrium under conditions of risk. *Journal of Finance* 19: 425-442.
53. Zhang XF (2006) Information uncertainty and stock returns. *Journal of Finance* 61: 105-137.

Appendix A: Variable definitions

<i>Variables</i>	<i>Definitions</i>
Frontier model	
Tobin's Q	Tobin's Q is defined as the ratio of market value of equity plus book value of total debts to book value of total assets
ln(sales)	The natural logarithm of gross sales
R&D/PPE	The ratio of research and development expenditures (R&D) to the stock of property, plant, and equipment (PPE); R&D is set to zero if missing
CAPEX/PPE	The ratio of capital expenditure to PPE
INC/Sales	Operating margin is measured as the ratio of operating income before depreciations and amortizations to gross sales
PPE/Sales	The ratio of PPE to gross sales
Lev	The ratio of book value of long-term debt to the sum of book value of long-term debt and market value of equity
Foll	Analyst following equals unity if the firm is followed by analyst(s) or 0 otherwise
Stock returns regressions	
R	Monthly return on individual stock in year t+1
Rf	Risk-free rate; proxied by the government 10-year bond yield in year t+1
Efficiency	Firm efficiency; the ratio of the firm's actual value to the hypothetically best-performing value of the firm as Q/Q*
CH	Level change in efficiency; the difference in efficiency between the current year and the previous year
%CH	Percentage change in efficiency; change in efficiency divided by the previous year's firm efficiency
SIZE	Natural logarithm of market value of equity; measured at December year t
B/M	Natural logarithm of ratio of book value to market value of firm equity at the accounting balance date of year t
Turnover	Calculated as ratio of daily trading volume to shares outstanding over year t
HHI	Industry concentration; calculated as the average of HHI over the past 3 years: $HHI = \sum_{i=1}^I \left(\frac{\text{Sales of firm } i}{\text{total industry sales}} \right)^2$
Excessew	Excess equally-weighted monthly return on portfolio; calculated by subtracting the risk-free rate from the equally-weighted monthly return on the portfolio
Excessvw	Excess value-weighted monthly return on portfolio; calculated by subtracting the risk-free rate from the value-weighted monthly return on the portfolio
MRP	Market risk premium; calculated by subtracting the risk-free rate from the market return
SMB	Return on the mimicking size portfolio; measured as the difference between the returns on a portfolio with small cap and on a portfolio with large cap
HML	Return on the mimicking book-to-market portfolio; measured as the difference between the returns on a portfolio with high book-to-market and on a portfolio with low book-to-market
MOM	Return on the mimicking momentum portfolio; measured as the difference between the returns on a portfolio of winner and on a portfolio of loser

Appendix B: SMB, HML and MOM construction

For the SMB and HML factors, following Fama and French (1993), we form six portfolios from the intersections of two size and three book-to-market portfolios. At the end of December of year t-1, we first rank stocks according to their market capitalization, and the median market capitalization is used to split stocks into two groups—small and big. Similar to Braisford et al. (2012), the top 200 firms by market capitalization are ranked by their book-to-market ratios and separated based on the breakpoints for the bottom 30% (low), middle 40% (medium), and top 30% (high). These book-to-market breakpoints are recorded and used to assign all other firms outside the top 200 into the three book-to-market portfolios.

Monthly value-weighted returns on the six portfolios are calculated from January to December of each year. The portfolios are reformed at the end of each December. SMB (Small Minus Big) is the average return on the three small-size portfolios minus the average return on the three big-size portfolios. HML (High Minus Low) is the average return on the two high book-to-market portfolios minus the average return on the two low book-to-market portfolios.

Following Carhart (1997), we construct the momentum factor (MOM) as the equally-weighted average of firms with the highest 30% six-month returns, lagged one month, minus the equal-weight average of firms with the lowest 30% six-month returns, lagged one month. These momentum portfolios are rebalanced on a monthly basis.

INEFFECTIVE CORPORATE GOVERNANCE: BUSYNESS OF INTERNAL BOARD MONITORING COMMITTEES

Khamis H. Al-Yahyaee^{*}, Ahmed Al-Hadi^{**}

^{*}Department of Economics and Finance, College of Economics and Political Science, Sultan Qaboos University, Sultanate of Oman

^{**}School of Accounting, Curtin Business School, Curtin University

Abstract

We examine whether the voluntary formation of a Risk Committee (RC) compromises the effectiveness of other monitoring duties carried out by the board members. We argue that adding more monitoring committees increases the board's internal busyness, which reduces the effectiveness of monitoring by the Audit Committee (AC). Using a sample of financial firms over the period 2007 to 2011 from the Gulf Cooperation Countries (GCC), we find that voluntarily adopting a risk committee impairs the effectiveness of the audit committee, which in turn reduces financial reporting quality. Our findings suggest that multiple layers of monitoring capacity viz-a-viz the existence of both an audit and risk committee may weaken the quality of monitoring provided by the audit committee.

Keywords: Internal Busyness; Board; Effectiveness; Monitoring; Risk Committee

JEL: G34, D71, G32

1. INTRODUCTION

The board of directors exists as one of the strongest corporate governance mechanisms, put in place to ensure that, the interests of shareholders of the company are protected. Traditionally, the literature concerning the role of the board of directors has concentrated on multiple outside directorships. For instance, Ferris, Jagannathan, and Pritchard (2003) contend with the fact that directors with multiple outside directorships may be sufficiently busy, such that, they do not function as effective monitors. Consistent with this argument, Core, Holthausen and Larcker (1999) find that outside multiple directorships lower the effectiveness of outside directors as corporate monitors because they become overcommitted and might shirk their responsibilities as monitors. Similarly, Fich and Shivdasani (2006) demonstrate that outside multiple directorship weakens board monitoring. However, there is little evidence on the effect of internal board busyness on monitoring. In this paper, we argue that internal board busyness also has a similar adverse effect on monitoring. Specifically, we argue that incrementing more monitoring committees increases the board's internal busyness resulting in less work effort from the members to monitor management. Hence, we test how the voluntary formation of an additional board monitoring committee such as the RC, reduces the effectiveness of monitoring by the audit committee.

Corporate governance, effective board monitoring and managerial accountability have been placed under scrutiny since the recent Global Financial Crisis. A frequently suggested solution to financial crises is that increasing the monitoring quality of the board of directors, could improve the board's effectiveness (Field et al. 2013). Globally

(e.g., GCC region¹⁴ and USA), regulators require firms to have three mandatory monitoring board sub-committees (audit, compensation and nominating) for publicly listed firms. Whilst voluntarily adding more monitoring committees to the board increases their monitoring duties, directors' oversight may be somewhat impaired because directors are generally busier and potentially equipped with less resources to deal with the hard issues requiring attention. Allen (1992) suggests that the monitoring function is more powerful when directors have more commitment to time and better resources.

Ferris et al. (2003) and Jiraporn et al. (2009) provide evidence on how external directors' busyness affect the firm's performance. On the one hand, Ferris et al. (2003) find that multiple external directorship (outside board seats) does not diminish directors' abilities to serve multiple internal board committees' memberships. On the other hand, Jiraporn et al. (2009) find that a greater number of external directorships reduces the ability of internal members of board monitoring committees to perform effectively. Hence, they suggest that external directorship plays a significant role in determining AC membership. Given this competing views on the role of multiple board membership, we are motivated to investigate the effects of the internal board members' busyness on the AC monitoring effectiveness.¹⁵

Faleye et al. (2011) examine how the intensity and busyness of internal board monitoring committees can influence the directors'

¹⁴ GCC is Gulf Co-operation Council established in 1981 comprising of Oman, Bahrain, Kuwait, Qatar, Saudi Arabia (KSA), and United Arab Emirates (UAE).

¹⁵ We consider the internal board monitoring busyness by board internal committees. The outside directorship is not a popular phenomenon in the GCC (TNI 2008 survey).

effectiveness in performing their role in the advisory committee. They find that busy directors sitting on internal board monitoring committees (audit committee, remuneration, compensation and corporate governance), limit their ability to perform in board strategic and planning committees. Specifically, they argue that independent directors are assigned multiple oversight tasks; hence, they are overcommitted in an advisory role. In this study, we extend this line of argument by suggesting that the voluntary formation of an additional monitoring committee such as the RC will increase the internal board's oversight workload and thereby, limit directors' abilities in effectively discharging their duties in monitoring committees. While Jiraporn et al. (2009) suggest that board members external directorship significantly explains the AC assignments, they also conclude that the relationship between the number of external directorship and audit committee assignments are non-linearly related.

In this paper, we investigate how an internal directorship's busyness affects audit committee assignments. Based on board signalling theory (prestigious board) and busyness hypothesis, we examine how more internal directorships of the board will have an adverse impact particularly, in regards to the monitoring of the AC. We argue that this could occur through compromising the AC's composition quality, thus, reducing its effectiveness in improving the firm's Financial Reporting Quality (FRQ).¹⁶

Several reasons motivate us to use the voluntary formation of RC as a benchmark for a firm's internal board busyness as an effective factor, to reduce the relationship between AC and FRQ. First, in the GCC listed firms, audit, remuneration and compensation committees are mandatory, while the RC is not, hence, we assume that firms that form an additional monitoring board committee will increase their monitoring workload for directors compared to firms that do not. Second, duties and responsibilities of the RC in all code of corporate governance in GCC are assigned under the responsibility and oversight of the AC, hence, the overlapping responsibilities between both committees can create conflict. This suggests that "voluntarily" adopting an RC leads the board to nominate a director who used to or still serves in the AC to be a member of the RC compared to directors who serve on other internal committees because of the director's prior experiences and background in risk management issues. Third, the RC is considered a monitoring committee, thus, adopting an RC will increase monitoring duties and oversight of the board.

Using data from six GCC countries financial firms' annual reports, we provide evidence that the internal monitoring busyness (through formation of RC) reduces the quality of AC composition which then reduces its monitoring effectiveness. First, we find that the quality of AC's composition reduces significantly when the firm "voluntarily" adopts RC. Specifically, we find that the mean difference of AC quality is significant when the firm "voluntarily" adopts RC. Second, we find consistent results which

indicate that, in the presence of RC, the association between AC and FRQ proxies is reduced. This result might be due to time-series problem; hence, we have repeated our analysis by considering if the firm "voluntarily" adopted RC in the current year (t), and yet did not adopt RC in the previous year ($t-1$). After re-running the regressions, we find consistent results that show that adopting RC reduces the relationship between AC and FRQ. The results suggest that the formation of RC reduces the quality of AC composition which in turn lowers the financial reporting quality. This result is generally consistent with the recent findings of Tani and Smith (2015), who demonstrate that the busyness of the audit committee chairman and financial expert weakens the monitoring and oversight role that audit committees play in the financial reporting process. Third, self-selection bias can be a case in our regression. Neglecting self-selection for firms having only RC and selecting financial firms may result in bias and an inconsistent estimator. Hence, we replicate our analysis using Heckman's (1979) two-stage self-selection bias model. We find that our results are in line with baseline regressions, suggesting that estimates based on self-selection bias cannot explain or justify the reason for the negative association between AC and FRQ in the presence of RC.

This study enrich corporate governance literature in four important ways. First, this study contributes to the limited, albeit, growing literature on internal busyness by providing empirical evidence to show that the internal busyness of the board has a significant impact on the effectiveness of board monitoring. While prior research (e.g., Vafeas 2005) extensively documents that the quality of AC's monitoring has a positive impact in improving the board's effectiveness (e.g., FRQ), no study has till date examined whether introducing voluntary monitoring RC deteriorates or improves the board's effectiveness.

Second, this study is one of the first to theoretically introduce an interaction between signalling and busyness theories, in order to explain how the voluntary creation of an additional monitoring committee (e.g., RC) can influence the board's effectiveness, by testing the conditional effects between the FRQ and the monitoring quality of AC in the presence of RC. Third, given the recent emphasis on regulatory bodies to strengthen risk management and board monitoring, an empirical study on the association between voluntary formations of RC as well as board monitoring busyness and effectiveness is of great importance. Our study responds to this call by investigating this relationship, suggesting that even internal busyness of the board's monitoring sub-committee can harm the shareholders' interests by increasing the oversight time of monitoring directors on the board. Fourth, we contribute to the literature on audit committees by demonstrating that when the quality of the AC composition is reduced through the formation of additional monitoring committees, such as RC, the financial reporting quality will be adversely affected.

In summary, our findings suggest that multiple layers of monitoring capacity viz-a-viz the existence of both an audit and risk committee may impair the quality of monitoring provided by the audit

¹⁶ Quality of AC composition is measured based on 4 characteristics that have been used in prior literature namely: majority independent director, qualification, size, and independence of the AC chairman.

committee. In other words, the internal busyness of the board weakens the monitoring and oversight role that audit committee plays in the quality of the financial reporting. The implication is that, regulators need to consider directors' commitments and busyness when making rules for mandatory establishment of risk committee. This study has international implications for regulators who have rules governing the existence and composition of committees.

The remainder of the paper is organized as follows: Section 2 reviews the GCC setting and relevant prior studies, and develops the testable hypotheses. Section 3 focuses on the research design, data sources and sample selection. Section 4 contains the empirical results, while Section 5 states our main conclusions.

2. GCC SETTING, BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1. GCC Setting and Background

The Gulf Corporation Council was established in 1981, to strengthen the economic co-operation and development of six countries comprising of, Oman, Bahrain, Kuwait, Qatar, Saudi Arabia (KSA) and United Arab Emirates (UAE). The GCC countries collectively constituted one of the fastest growing developing economies, and the GCC stock markets, represent emerging but equally rapidly growing markets (Al-Shammari et al. 2008). All corporate codes in GCC countries recommend and encourage firms to form different types of board sub-committees, including AC, remuneration committee, and corporate governance committee. However, these codes do not mandate the establishment of RC (Risk Committee). Hence, the creation of RC is primarily voluntary. Risk management policy, accountability, and risk disclosure, are currently under AC's supervision and responsibility in all corporate governance codes in the GCC region. Although, none of the GCC corporate governance codes require firms to establish a separate RC (except in Kuwait- from 2016), about 39% of our sample of GCC financial firms shows the existence of a separate RC.

Two opposing views exist in the literature in relation to the voluntary formation of RC. Proponents argue that, since RC is charged with monitoring and managing business risks, therefore, the directors (members) of RC will objectively act to safeguard the interests of shareholders. On the other hand, the opponents argue that, directors having multiple board membership will have limited time to concentrate on various aspects of corporate risk, so RC will unlikely be effective in protecting shareholders' interests.

Jiraporn et al. (2009) and Bradbury (1990) suggest that board size, composition, and ownership structure play a significant role in voluntarily adopting the internal board monitoring committee. The GCC region provides an ideal setting to test our hypotheses. The GCC political institutions are built systematically favouring specific classes (Amenta 2000), who have controls over many big government banks and financial listed firms. Furthermore, a small number of government representatives who are mainly from ruling families and rich merchant

families in the board of directors, regulate and control the state and economy rather than vice versa (Boron 1995; Hertog 2012; Ozel 2003). In addition, it is "Socially" accepted that the "Sheik"¹⁷ directors in the GCC expect absolute obedience and are not willing to be questioned (Sidani and Al Ariss 2013).

Ruling families and family directors are largely dominant in the GCC region. For instance, the TNI (2008) survey found that in Qatar, the directors from ruling families and top 9 families are represented by 24% and 25% directors in listed firms, respectively. Hence, the high influence of the ruling families in the board composition may have consequences on the firm's financial reporting quality (Chaney et al. 2011), which may subsequently increase the board's internal busyness. Moreover, the board's internal busyness is worthy of study in the GCC as the external board directorship has been widely investigated in prior survey and has been found to be the least popular in all GCC's publicly listed firms (TNI Survey 2008). For example, in Bahrain, the 2, 3, 4, 5 and 6 boards seat are only represented by about 5.8%, 2.9%, 0.3%, 0.9%, 0.3% of the total sample respectively.¹⁸

2.2. Literature review and hypothesis development

The literature on board monitoring is lengthy and dates back to Berle and Means (1980). The board of directors is an apex body in an organisation which monitors the activities of internal management. The board of directors in most public corporations are comprised of inside directors who hold other positions in the firm and outside directors who have no such affiliation. Generally, internal monitoring is likely to be stronger when the board of directors and its committees, are dominated by outside directors. The outside directors are often seen as independent and objective monitors, protecting the interests of various stakeholders against managerial opportunism. Fama and Jensen (1983) argue that outside directors have greater incentives to monitor corporate decisions on behalf of shareholders, since they "...have incentives to develop reputations as experts in decision control...the value of their human capital depends primarily on their performance as their internal manager" (p. 315). A significant aspect of an effective board committee is that outside directors give adequate time and devotion to their jobs and it can be determined by how busy a director in the board committee is (Song and Windram 2004). There are conflicting views on the consequences of directors' busyness. One view suggests that holding multiple directorships (proxy for busyness) allows knowledge spill-over to take place in the boards they sit on and thus, potentially enhance their reputation as decision experts (Fama 1980; Ferris et al. 2003; Kaplan and Reishus 1990; Shivdasani 1993; Yermack 1996). For example, a busy audit committee director has a good experience and this will enhance his monitoring effectiveness (Song and Windram 2004). However, the opponents argue that a busy director may have less time to dedicate to each individual board committee he serves in. For instance, Morck et al. (1988) claim that

¹⁷ Sheik is a term used to entitle the front (leader or governor) of a tribe who inherits the title after his father.

¹⁸ As an additional test, we also control ownership structure on the board of directors.

time factor can negatively influence directors' effectiveness in monitoring. Lipton and Lorsch (1992) also suggest that time is a main constraint for directors in any board. Core et al. (1999) report that more directorships can make directors very busy, therefore, the ability of over committed directors serving on multiples boards, is dampened (Core et al. 1999; Fich and Shivdasani 2006) to perform their fiduciary role. Similarly, Faleye et al. (2011) suggest that the dynamics of internal work assignment through the board internal committees' responsibilities generates even greater directors' over-commitment. Other studies (e.g., Colquitt et al. 2001; Leventhal 1976), suggest that directors serving on multiple internal board monitoring committees are hard pressed for time compared to directors serving in board advisory committees. Cashman et al. (2012) report that busy directors serving in numerous committees will have less available time which may eventually reduce their ability to serve in multiple monitoring committees. Furthermore, Ferris et al. (2003) argue that over committed directors serve less frequently on important board committees, such as the audit or the compensation committees.

This line of argument suggests that voluntary adoption of an additional monitoring board committee, such as the RC, will increase directors busyness (Faleye et al. 2011) and this may significantly affect the board's monitoring effectiveness. Despite this controversy, very little research has been undertaken in relation to the effect of multiple monitoring committees' directorships on board monitoring effectiveness, particularly, on audit committee. Our study is the first to test the hypothesis that firms that have multiple internal board monitoring committees tend to do a poor job of managing corporate affairs including reporting of financial performance. The board (directors) Busyness hypothesis of corporate directorships suggests that multiple internal board committees in the board over commit an individual director, and thus, lower the effectiveness of the board (Faleye et al. 2011). Thus, we expect to observe a negative association between FRQ and AC, if the firm adopts a high quality RC. In other words, we expect that an increased work-load would lead to the less effective performance of directors. Hence, in support of internal board busyness, the presence of an additional monitoring committee (e.g., RC) will reduce the effectiveness of AC. Thus, we hypothesize that:

H1a: The voluntary formation of a high quality monitoring RC significantly reduces the effectiveness of AC.

We try to ascertain how the voluntary formation of RC reduces the board's effectiveness by relying on signalling theory. Board-signalling theory suggests that companies voluntarily create board internal committees and select its directors to signal its legitimacy and quality (Certo 2003; Spence 1973). Certo (2003) demonstrates that the prestigious structure of the board is important as it allows managers to influence the perceptions of customers, suppliers, and investors. On the other hand, directors (that is independent directors) accept the board's membership to signal their talent as decision makers (Fama and Jensen 1983).

From a signalling perspective, in the presence of asymmetric information, firms voluntarily form

RC and assign membership to signal firm value (Certo 2003). When a firm voluntarily forms an additional oversighting committee (e.g., RC), they disclose it in the corporate governance section of their annual reports, hence, readers are able to observe the signal. Choosing prestigious directors for RC (for example, those who are qualified and independent) will make this signal costly to imitate (Certo 2003). However, the voluntary formation of a credible and prestigious monitoring committee (e.g., RC) may on the other hand, compromise the quality of other monitoring committees. Specifically, we expect that RC could lower the monitoring quality of AC due to several reasons: First, in all codes of corporate governance in GCC countries, the risk management is assigned to AC except in Kuwait (starting from the year 2016)¹⁹, hence, adopting a separate RC will lead to an overlap of the risk management responsibilities. For instance, financial reporting is oversighted by AC, while risk reporting is shown to be under the responsibility of RC (Subramaniam et al. 2009; Hawkamah 2010). These overlapping duties between RC and AC indicate dual membership in both committees. However, busyness hypothesis indicates that the directors who serve in AC are the busiest directors and boards will face difficulties in assigning them to more monitoring committees (Ferris et al. 2003). Second, Sun et al. (2014) provide evidence from financial firms that a busy director in AC has a lower ability to manage and monitor the firm's risk. Accordingly, we expect the firm that has introduced an RC to makes directors in the AC to opt moving to RC or not serving in both committees. If this is the case, we will observe that the firms after adopting an RC, compromise the ability of ACs, thus, we hypothesize that:

H1b: Voluntary formation of RC compromises the composition and monitoring quality of AC and thus reduces FRQ.

3. RESEARCH DESIGN

3.1. Sample and Data

We collect our sample from financial companies listed in the six GCC capital markets (Bahrain, Saudi Arabia, Kuwait, Oman, Qatar, and UAE) for the year 2007 - 2011. Data on corporate governance are hand-collected from annual reports and S&P Capital IQ, while all control variables data are collected from S&P Capital IQ database. We exclude industrial firms, firms inactive in capital market, and firms' cross listed in GCC. This procedure results in 705 observations. We then winsorize all continuous variables at the 1st and 99th percentiles to mitigate undesirable influence of outliers. Due to FRQ models that uses lag variables and exclusion of firms with missing values on key variables, we obtain a total sample of 649 firm-year observations for our regressions (see Panel A of Table 1 for sample selection criteria).

¹⁹ In Kuwait risk management issues are assigned under risk committee, however, the code of corporate governance is not yet mandatory till 2016.

Table 1 Panel A. Sample Distribution Year and Country Firms (Obs.)

<i>Number of firms available in S & P Capital IQ for the GCC countries</i>	629
<i>Less:</i>	
<i>Industrial firms</i>	421
<i>Joint listed firms</i>	2
<i>Firms with unavailable annual report for disclosure items</i>	65
<i>Final Sample year observations FRQ</i>	141 (649 Obs.)

Panel B of Table 1 presents sample distribution that are used for our regressions by country and year. UAE is represented by 150 firms-year observations, followed by Kuwait (138) and Oman (101) year observations. Panel C of Table 1 also

shows sample distribution based on year and financial sector. Banks presents 45% of the sample size followed by financial firms (153 observations), Insurance (116 observations) and Investment firms (83 observations).

Table 1 Panel B. Sample Distribution Year and Country

<i>Country</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2012</i>	<i>Total</i>
Bahrain	17	17	17	17	17	85
K.S.A	18	18	18	18	18	90
Kuwait	27	28	28	28	27	138
Oman	21	20	22	17	21	101
Qatar	17	17	17	17	17	85
U.A.E	30	30	30	30	30	150
Total	130	130	132	127	130	649

Table 1 Panel C. Sample Distribution Year and Financial Sector

<i>Industry</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>Total</i>
Bank	60	59	60	58	60	297
Financial	31	31	31	29	31	153
Insurance	23	23	24	23	23	116
Investment	16	17	17	17	16	83
Total	130	130	132	127	130	649

3.2. Dependent Variables

Following prior literature (e.g., Faleye et al. 2011; Klein 2002; Rahman and Ali 2006), we rely on a proxy for the board and audit committee's

effectiveness, by using Financial Reporting Quality. Based on Kothari et al. (2005), this study adopts performance-adjusted discretionary accruals by estimating the model below, using the year and industry that has at least 9 observations:

$$T\text{-accruals}_{i,t} = \alpha_0 + \alpha_1 \Delta \text{Asset}_{i,t-1} + \alpha_2 \Delta \text{Rev}_{i,t} + \alpha_3 \text{PPE}_{i,t} + \alpha_4 \text{ROA}_{i,t} + \varepsilon_t \quad (1)$$

We also adopt the modified Jones (1991) model, suggested by Klein (2002), by estimating the model

below, using the year and industry that have at least 9 observations:

$$T\text{-accruals}_{i,t} = \alpha_0 + \alpha_1 \Delta \text{Asset}_{i,t-1} + \alpha_2 \Delta \text{Rev}_{i,t} + \alpha_3 \text{PPE}_{i,t} \quad (2)$$

Where $T\text{-accruals}_{i,t}$ is calculated as the change in non-cash current assets, less the change in current liabilities, less depreciation and amortizations expenses for firm i in year t , scaled by lagged total assets ($\text{Asset}_{i,t-1}$). $\Delta \text{Rev}_{i,t}$ is calculated as revenue growth of one year at year t for firm i scaled by lagged asset. $\text{PPE}_{i,t}$ is the sum total of the firm's property, plant and equipment scaled by lagged total asset, and $\text{ROA}_{i,t}$ is the firm's return on assets in year t for firm i . The residuals from the model are the discretionary accruals. Consistent with previous studies (Chen et al. 2011; Srinidhi and Gul 2007), we compute the absolute value and then multiply by -1 ($\text{FRQ}_{i,t}$). The higher the values, the greater the value of $\text{FRQ}_{i,t}$.

3.3. Independent Variables and Conditional test

3.3.1. DummyAudCom

Previous literature (e.g., Klein 2002), suggests that firms with AC provide meaningful monitoring on FRQ. We test this relationship between FRQ and AC (*DummyAudCom*) in the presence of risk committee.

3.3.2. AudFactor

Factor analysis is widely used to capture the characteristics of the committee in governance studies (Sun et al. 2009; Tao and Hutchinson 2013). Prior literature utilize components factor analysis test to determine the board committees' characteristics. Consistent with Tao and Hutchinson (2013), we conduct factor analysis to obtain one eigenvalue that represents all observable values

which are: 1. Independence²⁰ which is equal to 1, if AC directors are a majority, otherwise 0; 2. If AC has at least one directors with a professional and academic qualification in accounting and finance (e.g., CPA)²¹, it is equal to 1 otherwise 0; 3. AC's size is equal to 1, if RC's size is higher than the median RC's size of the firm, otherwise 0; and 4. AC's chair is equal to 1, if AC is chaired by an independent director, otherwise 0. Un-tabulated results show that our eigenvalue of 3.630, is highly representative of 72.61 % proportion, and other eigenvalues of AC characteristics scored less than one eigenvalue.²² We expect this measure to have a negative association if a firm has adopted RC.²³

Likewise, we calculate the proxy for quality of RC (*RisFactor*) by conducting components factor analysis of 4 variables of RC compositions. To arrive at a consistent measure for RC, we also use the four characteristics that we used in AC namely: 1. Independence equals 1, if RC directors are a majority, otherwise 0; 2. If RC has at least one director with a professional qualification, it is equal to 1 (e.g., CPA), otherwise 0; 3. RC's size is equal to 1 if RC's size is higher than the median RC's size of the firm, otherwise 0; and 4. RC's chair is equal to 1 if RC is chaired by an independent director, otherwise 0. We obtain one eigenvalue of 2.667 (66.68% proportion), and other eigenvalues are less than 1, then we predict the *RisFactor* with 2.667 eigenvalue. Finally, firms with higher *RisFactor* (proxy for high quality RC) are recorded as 1, if the quintile of *RisFactor* $\geq 50\%$.²⁴

3.3.3. AudComScaled

Beasley and Salterio (2001) suggest that independence, qualification and size are interdependent characteristics in the board. Hence, in this measure, we aggregate the 4 characteristics of AC mentioned in section 3.3.2, then the total is scaled by 4 items. We regress this measure with FRQ, in the presence of RC=1.

3.4. Control Variables

Based on previous studies (e.g., Francis and Wang 2008; Klein 2002; Leuz et al. 2003; Vafeas 2005), we use firm-specific and country-specific level variables as control. First, for the firm-specific factor, we use

the firm's LMVAL_t as a natural logarithm of the total firm market value at the year end. In addition, we control for *Leverage* which is the sum total of short and long term liabilities scaled by total assets (e.g., Woitdte and Yeh 2013). *AuditBig* is equal to 1 if a firm employs one of the big accounting firms (Big four), otherwise 0. Also, following Burgstahler et al. (2006), we control for firm's profitability using Return on Assets (*ROA*). In agreement with Francis and Wang (2008), we add two growth variables; *BM* is calculated as the book value over market value (Klein 2002; MacGregor 2012); *RavGrowth* is also included, based on (Francis and Wang 2008), calculated as total revenue change (total revenue_t less total revenue_{t-1}). We also follow Vafeas (2005), Burgstahler et al. (2006) and Xie et al. (2003) to control for internal board busyness. a. *MajIndDir* is equal to 1 if the firm has majority of independent auditors, otherwise 0. For instance, Xie et al. (2003) and Vafeas (2005) suggest that an independent board manages to protect the shareholders' interests and increases the firm's earning quality. b. *MoreComDir* is equal to 1, if the board's chairman is assigned in at least one of the board committees, otherwise 0. Based on busyness literature (e.g., Faleye et al. 2011), we argue that a busy chairman will devote less time to managing the firm. c. Following prior literature (e.g., Brickley et al. 1997; Xie et al. 2003), we include that *DualityCEO* is equal to 1 if the firm's chairman and CEO is held by one person, otherwise 0.

We also control for country-specific factors using, a). *GovFactor*: Following Leuz et al. (2003) and Gul et al. (2013), we conduct a Factor Analysis (*GovFactor*_p²⁵ of country level governance (which covers regulatory quality²⁶ and control of corruption from Kaufmann et al. (2009)),²⁷ and country investor protection index (which covers the extent of directors' liabilities and ease of shareholders to suit directors and managers from (La Porta et al. 2000)); b). We also include the country's *MCapDev* in year_t, calculated by, total country market capitalization in year_t scaled by country GDP in year_t as a country-specific measure to control for country omitted variables (Pástor et al. 2008). Finally, we fixed effects and the firm's random effects (see discussion section 4.3 on the model selection).²⁸

3.5. Empirical Model

To examine the conditional test of "voluntary" adoption of risk monitoring committee and the association between AC and FRQ, we employ the following model:

²⁰ The definition of independence is an area where there are differencing approaches among the GCC countries. For example, In Oman, K.S.A and U.A.E, an independent director should not be an employee or senior executive within the preceding 2 years, in Qatar within preceding 3 years and 1 year in Bahrain, while prior career is not mentioned in the code of governance of Kuwait. Hence, in this study, a director is considered independent, if he/she meets the definition of independence as per country code.

²¹ We consider academic qualification in accounting and finance (Ph.D., Master, and Bachelor) and professional accounting and finance certification (e.g., CPA, ACCA, and CFA).

²² Generation of eigenvalue was also used as a proxy for quality measure (see Miihkinen 2012).

²³ Components factor analysis correlation table for AC and RC are available upon request.

²⁴ We also repeat our analysis using greater than median quintile of (75%), and we find a consistency in the results. However, when we replace our analysis below the median quintile (*RisFactor* $\leq 50\%$), we observe a U-Shaped association (positive association), that is, when the quality of RC composition is low, the quality of AC improves FRQ.

²⁵ We check the factor value year by year and find that values vary for each country and year.

²⁶ Regulation Quality consists of trade policy, competitive environment and labour market policies.

²⁷ Control of Corruption consists of transparency and corruption.

²⁸ Furthermore, we segregate our sample based on 2 code financial industry (Bank, Financial, Insurance and Investment), and when we fix the industry effects for all our main models, unreported results show consistent evidence.

$$FRQ_{i,t} = a_0 + a_1 DummyAudCom_{i,t} + a_2 LMVAL_{i,t} + a_3 Leverage_{i,t} + a_4 AuditBig_{i,t} + a_5 BM_{i,t} + a_6 RavGrowth_{i,t} + a_7 MajIndDir_{i,t} + a_8 MoreComDir_{i,t} + a_9 DualityCEO_{i,t} + a_{10} GovFactor_{i,t,j} + a_{11} MCapDev_{i,t,j} + \sum Year + \epsilon_{i,t} \quad (3)$$

Our main variable of interest is *DummyAudCom*, we predict a_1 to be negative for H_1 , if the firm voluntarily adopts a high quality of RC (RisFactor > 50% quintal).

To examine the association between FRQ and the quality of AC in the presence of RC (H_{1b}), we repeat equation (1), and replace (a_1) *DummyAudCom* with two measures of quality of AC: *AudFactor* and *AudComScaled*, then we replace our conditional test by replacing *RisFactor*, with *DummyRisCom*:

$$FRQ_{i,t} = a_0 + a_1 AudFactor_{i,t} + a_2 LMVAL_{i,t} + a_3 Leverage_{i,t} + a_4 AuditBig_{i,t} + a_5 BM_{i,t} + a_6 RavGrowth_{i,t} + a_7 MajIndDir_{i,t} + a_8 MoreComDir_{i,t} + a_9 DualityCEO_{i,t} + a_{10} GovFactor_{i,t,j} + a_{11} MCapDev_{i,t,j} + \sum Year + \epsilon_{i,t} \quad (4.1)$$

$$FRQ_{i,t} = a_0 + a_1 AudComScaled_{i,t} + a_2 LMVAL_{i,t} + a_3 Leverage_{i,t} + a_4 AuditBig_{i,t} + a_5 BM_{i,t} + a_6 RavGrowth_{i,t} + a_7 MajIndDir_{i,t} + a_8 MoreComDir_{i,t} + a_9 DualityCEO_{i,t} + a_{10} GovFactor_{i,t,j} + a_{11} MCapDev_{i,t,j} + \sum Year + \epsilon_{i,t} \quad (4.2)$$

We expect the sign of the coefficient (a_1) between FRQ and quality of AC (*AudFactor* and *AudComScaled*) to be negative and significant, if firms adopt additional monitoring committee (if $RC = 1$), suggesting that adopting additional monitoring committee (e.g., RC) will compromise the effectiveness of the existing monitoring committee (e.g., AC).

Subramaniam et al. (2009) covers both financial and non-financial firms, while we cover only financial firms. Since risk exposure of financial firms is higher, establishment of separate risk committee is more apparent for financial sectors. Second, Aebi et al. (2012) cover only the financial crisis period. Further, our mean of *DummyAudCom* is lower than Carson (2002) where she investigates only 361 firms from top 500 Australian listed firms. Mean (S.D) for $FRQ_{Kothari}$ and FRQ_{Jones} are 8.61 (58.6) and 2.07(9.35) respectively. Our results are consistent with prior research in earning quality for instance, in FRQ proxy's mean.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Descriptive Statistics

Panel D of Table 1 reports summary statistics for the variables included in the regression models. The mean [Standard Deviation (S.D)] value for *DummyAudCom*, *AudFactor* and *AudComScaled* variables are 0.65(0.48), -0.02 (0.84), and 1.03 (1.0) respectively. *RiskFactor* and *DummyRisCom* is -0.02 (0.82), and 0.38 (0.49). In the sample, 38% financial firms have dedicated risk committee (RC), which is higher than that of Subramaniam et al. (2009) of 33% and Aebi et al. (2012) of 8%. There may be two reasons for this differential statistics. First,

Based on current discretionary accrual derived from (Jones 1991) is 2.20. However, our variables discussed above have exhibited over-dispersion since in most cases their variances are higher than their means. That might be due to selection bias error; hence we later test for sample selection bias problem in section 4.5. Moreover, the Table shows that there is a large dispersion among the sample firms in terms of control variables, which illustrates a considerable diversity in the sample.

Table 1 Panel D. Descriptive statistics

Variables	N	Mean	S.D	Min	Mdn	Mix
(ABS) $FRQ_{Kothari}$	649	-8.61	58.60	-1404.17	-3.11	0.00
(ABS) FRQ_{Jones}	669	2.07	9.35	0.00	0.12	118.46
(ABS) FRQ_{Carson}	325	3.59	11.61	0.00	0.36	117.29
<i>DummyAudCom</i>	649	0.65	0.48	0.00	1.00	1.00
<i>AudFactor</i>	649	-0.02	0.84	-1.29	0.00	2.36
<i>AudComScaled</i>	649	1.03	1.00	0.00	1.00	5.00
<i>RiskFactor</i>	649	-0.02	0.82	-0.60	-0.60	2.68
RC	649	0.38	0.49	0.00	0.00	1.00
<i>LMVAL_{it}</i>	649	6.19	1.70	2.46	6.17	9.74
<i>Leverage_{it}</i>	649	0.67	0.33	0.00	0.72	2.39
<i>AuditBig_{it}</i>	649	0.90	0.30	0.00	1.00	1.00
ROA%	649	1.86	5.23	-49.30	2.14	32.80
BM%	649	3.20	13.25	-0.38	0.93	230.05
<i>RavGrowth_{it}</i>	649	11.87	72.00	-172.08	2.49	439.10
<i>MajIndDir_{it}</i>	649	0.33	0.47	0.00	0.00	1.00
<i>MoreComDir_{it}</i>	649	0.27	0.45	0.00	0.00	1.00
<i>DualityCEO_{it}</i>	649	0.08	0.28	0.00	0.00	1.00
<i>GovFactor_{it,j}</i>	649	0.02	1.01	-1.48	-0.15	1.60
<i>MCapDev_{it,j}</i>	649	71.89	36.51	24.60	72.50	163.90

4.2. Univariate t-Test

Panel D of Table 1, reports the mean difference and *t*-statistic of variables for firms with (without) separate RC. We find that the FRQ proxies and Quality of AC (*AudFactor*) are significantly higher for

firms with separate RC (*t*-value = 1.739, 2.038, 1.738, 2.292, and 8.429) at ($p < 0.01\%$ level) respectively. The table also shows that the firm that establishes separate RC has larger size, leverage, busyness proxies (*MoreComDir* and *DualityCEO*) and *AuditBig*.

Table 2 Panel E. Means differences between presence (absence) of RC and Quality of RC

	Risk Committee Mean		Difference	<i>t</i> -statistic
	Yes	No		
FRQ _{Kothari}	-3.063	-1.803	1.259	1.739*
FRQ _{Jones}	-3.016	-1.490	1.521	2.038**
FRQ _{RM}	-2.964	-2.670	2.293	1.738*
<i>AudFactor</i>	0.477	0.810	0.6811	8.429***
LMVAL	6.417	5.941	-0.4757	3.53***
Leverage	0.656	0.642	-0.0333	1.3401
<i>AuditBig</i>	0.941	0.880	0.0608	2.673***
ROA%	1.883	1.732	0.1517	0.446
BM%	1.832	1.777	0.0554	0.2902
RavGrowth	7.714	14.403	6.689	1.213
MajIndDir	0.357	0.334	0.0235	0.6414
<i>MoreComDir</i>	0.343	0.222	0.1203	3.535***
<i>DualityCEO</i>	0.014	0.118	0.1037	5.09***
<i>GovFactor</i>	-0.194	0.123	0.3176	4.158***
MCapDev _t	65.636	73.258	7.6228	2.697***

FRQ_{Kothari}: Earning Quality based on Kothari et al. (2008) calculated for each year in each industry; FRQ_{Jones}: Earning Quality based on Jones (1991) mode calculated for each year in each industry; FRQ_{RM}: Earning Quality based on Dechow and Dichev, 2002 calculated for each year in each industry; *DummyAudCom*: firms recorded 1 if audit committee existed, otherwise 0; *AudFactor*: quality of audit committee calculated based on component factor analysis obtained from 4 characteristics : qualification, majority of independence, independent chair and size; *AudComScaled* is total score of audit committee from the four characteristics divided on 4; *RiskFactor*: *AudFactor*: quality of risk committee calculated based on component factor analysis obtained from 4 characteristics which are qualification, majority of independence, independent chair and size; *Size*: natural log of firms' market value proxy for firm's size; *Leverage*: total short and long term debt over total asset; *AuditBig*: firm is reported 1 if at least one of auditor in year *t* is from the big accounting firm; *ROA*: Return of Asset, *BM*: firms' book value divided on market value; *RavGrowth*: firms' total revenue growth calculated as the difference of total revenue in year *t* and *t*-1; *MajIndDir*: is firm-specific governance measure calculated if firm's has majority independent board of directors 1, otherwise 0; *MoreComDir*: Busyness measure if the chairman of the board is a member in at least one of the board committee 1, otherwise 0; *DualityCEO*: if firm's chairman and CEO is one person 1, otherwise 0; *GovFactor*: score obtained after factor analysis of country investor protection index (which covers extent of director liability and ease of shareholders' suit against directors and managers) and country level governance (which covers regulatory quality and control of corruption); *MCapDev*: country level measure calculated total stock market divided on GDP in year *t* and country

Table 2 reports the Pearson correlation matrix for variables included in the regression analysis. In line with our hypothesis and as expected, the correlation between the FRQ proxies and AC is positive and significant, while this association is negative and significant with RC. For instance, the correlation coefficient between FRQ proxies (FRQ_{Kothari} and FRQ_{Jones}) and quality of AC (*AudFactor*) are 0.785, 0.0740 at ($p < 0.05\%$ level). Moreover, busyness proxy (*DualityCEO*) is significantly and negatively correlated with the FRQ proxies, suggesting that internal busyness proxied by duality of CEO and Chairman, reduce the firms' FRQ, while for second measure of board internal busyness (*MoreComDir*), Table 2 provides mixed correlation results. Likewise, unreported results show mixed evidence for outside directorship (proxy of external board busyness). Specifically, we find negative results with FRQ_{Kothari} but not with other FRQ proxies. These results suggest that external directorship plays a less important role in the GCC financial firms' reporting quality and this in fact is consistent with TNI Survey (2008), that external directorship is not an important phenomenon in the GCC region. In addition, our results in Table 2 are in line with prior hypotheses in terms of control variables. For example, we find positive (significant) results between FRQ and (leverage, LMVAL, *AuditBig* and country governance as well as the investor protection level). This also validates our control variables used in our regression analysis.

4.4. Regression Analysis

4.4.1. Association between FRQ and *DummyAudCom* in the presence of High quality *RisFactor*

Table 3 presents Random Effect (RE) estimates of H_{1a} . We statistically test for the empirical model (pooling, random effect, or fixed effect regression), which is the most suitable for estimating the relationship. Specifically, following Aivazian et al. (2005), we conduct the Lagrangian Multiplier (LM) test of the random effect model (Breusch and Pagan 1980). The null hypothesis is that the individual effect, a_i , is 0 for all i . The null hypothesis is not rejected at the 1% significance level, which suggests that Random Effect regression is appropriate for our model. Thereafter, we follow Hausman (1979) test to choose our model between fixed effect and random effect. Fixed effect models suggest that individual firms and time have different intercepts in the regression equation, while random effect assumes that individual firms group and time have different disturbance. The null hypothesis is that fixed effect is not correlated with the regressor (or our main independent and control variables). We fail to reject the null hypothesis in all of our models, suggesting that random effects model is still more appropriate; therefore, time-invariant variables should be included in our equation. We also test for Heteroskedasticity, using Wald test, which rejects the fact that our models are homoscedastic, hence, we robust and cluster firms into 69 groups.

Table 2. Person Correlation Matrix

	1	2	3	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
EQ _{Kothari}	1.0000																	
EQ _{Jones}	0.9041***	1.0000																
EQ _{DD}	0.7513***	0.7633***	1.0000															
DummyAudCom	0.0979**	0.0956**	0.0771	1.0000														
AudFactor	0.0785**	0.0740**	0.0523	0.6922***	1.0000													
AudComScaled	0.0873**	0.0917**	0.0621	0.5149***	0.7720***	1.0000												
RisComFactor	-0.0769**	-0.0458	-0.0853	0.0454	0.2916***	0.6261***	1.0000											
LMVAL	0.3143***	0.2205***	0.3236***	0.0249	-0.0883**	-0.0382	-0.0392	1.0000										
Leverage _t	0.1766***	0.1419***	0.1125**	0.0723**	0.0795**	0.0507	-0.0464	0.3561***	1.0000									
AuditBig _t	0.0657***	0.0588	0.0365	0.0314	0.1014***	0.0394	0.0463	0.1849***	0.1863***	1.0000								
ROA _t	-0.0074	-0.0333	-0.0067	-0.0719**	0.0110	0.0202	0.0551	0.0320	-0.0340	0.0440	1.0000							
BM	0.0804**	0.0534	-0.0181	-0.1241***	-0.0226	0.0957***	0.1683***	0.2917***	0.3036***	-0.0481	-0.0709**	1.0000						
RavGrowth	0.0346	0.0165	0.0453	-0.0544	0.0282	0.0451	0.0286	-0.0231	0.0109	-0.0261	0.2585***	0.0071	1.0000					
MajIndDir	-0.0373	-0.0214	-0.0733	0.2073***	0.5111***	0.6389***	0.5460***	-0.1840***	-0.0009	0.0943**	0.0638**	0.0347	0.0287	1.0000				
MoreComDir	0.0459	0.0685*	-0.0051	0.3056***	0.3906***	0.5962***	0.3913***	0.0186	0.0600*	0.0672*	0.0648*	0.0179	0.0627*	0.2921*	1.0000			
DualityCEO	-0.0635*	-0.0447	-0.0915*	-0.3188***	-0.2965***	-0.1383***	0.0934***	-0.0865**	-0.1422***	-0.0672*	-0.0377	-0.0094	-0.0384	-0.0398	-0.0502	1.0000		
GovFactor _t	0.0631	0.0598	0.0866	-0.2950***	-0.3922***	-0.2754***	-0.0999***	0.3508***	-0.0028	-0.0889**	-0.0934**	0.1844***	-0.0208	-0.2704***	-0.1221***	0.2800***	1.0000	
MCapDev	-0.0355	-0.0762**	-0.0262	-0.1693***	-0.3337***	-0.2206***	-0.0706*	0.0949**	-0.0913***	-0.1032***	0.1765***	0.0190	0.0372	-0.2377***	-0.0640*	0.1574***	0.2078***	1.0000

FRQ_{Kothari}: FRQ based on Kothari et al. (2008) calculated for each year in each industry; FRQ_{Jones}: FRQ based on Jones (1991) mode calculated for each year in each industry; FRQ_{DD}: FRQ based on Dechow and Dichev, 2002 calculated for each year in each industry; DummyAudCom: firms recorded 1 if audit committee existed, otherwise 0; AudFactor: quality of audit committee calculated based on component factor analysis obtained from 4 characteristics : qualification, majority of independence, independent chair and size; AudComScaled is total score of audit committee from the four characteristics divided on 4; RiskFactor: AudFactor: quality of risk committee calculated based on component factor analysis obtained from 4 characteristics which are qualification, majority of independence, independent chair and size; Size: natural log of firms' market value proxy for firm's size; Leverage: total short and long term debt over total asset; AuditBig: firm is reported 1 if at least one of auditor in year t is from the big accounting firm; ROA: Return of Asset, BM: firms' book value divided on market value; RavGrowth: firms' total revenue growth calculated as the difference of total revenue in year t and t-1; MajIndDir: is firm-specific governance measure calculated if firm's has majority independent board of directors 1, otherwise 0; MoreComDir: Busyness measure if the chairman of the board is a member in at least one of the board committee 1, otherwise 0; DualityCEO: if firm's chairman and CEO is one person 1, otherwise 0; GovFactor: score obtained after factor analysis of country investor protection index (which covers extent of director liability and ease of shareholders' suit against directors and managers) and country level governance (which covers regulatory quality and control of corruption); MCapDev: country level measure calculated total stock market divided on GDP in year t and country i.

In all tables, we illustrate the p value for LM between OLS and RE and Hausman test (p-value) between fixed effects and random effects and robust and cluster effects. We hypothesize that firms that voluntarily adopt RC are more likely to signal their prestigious board, and in order to keep their signal costly to imitate, RC composition should be at a high level and should be observed. However, we assume that these firms will reduce the effectiveness of AC to improve FRQ. As hypothesized earlier, we can expect that in a firm where the composition quality of RC is at a higher level, the AC has a significant and negative association with FRQ. In Table 3, we find that in the presence of a high RC (RisFactor), the relationship between AC and FRQ is significant and negative. Specifically, the coefficient (α_1) of FRQ and *DummyAudCom* is -1.043 at ($p < 0.1\%$ level), and the coefficient of FRQ_{Kothari} is -1.299 but not significant. We also find that the consistent sign (negative) of the firm's size (*LMVAL*), *leverage*, *BM*, *AuditBig* are consistent with previous findings

(Burgstahler et al. 2006; Francis and Wang 2008; Klein 2002; MacGregor 2012; Vafeas 2005; Woitke and Yeh 2013; Xie et al. 2003). Although, we collect our sample from the financial industry, motivated by prior literature, we disaggregate our sample based on two-code industry based on the Capital IQ database, obtaining (4 classes of sub-industry, based on stock markets classification (1. banks, 2. Financial, brokerage and superannuation, 3. Insurance, and 4. Investment). Unreported results show robust evidence even after industry fixed effect. For instance, for the FRQ_{Jones} model, we find 1.282 coefficient at ($p < 0.1\%$ level) and for FRQ_{Kothari} model, it is -0.623 but not significant. Then we re-run the regression and if *RisFactor* quality < 50 , we expect that α_1 will be positive. Un-tabulated result finds a positive association of 1.0584. These results suggest that the "voluntary" formation of RC generates more monitoring responsibilities on the board, which compromises the AC (quality and composition), and thus, FRQ is reduced.

Table 3. FRQ and Audit Committee in presence of Quality Risk Committee

	FRQ _{Kothari}	FRQ _{Jones}
<i>Intercept</i>	5.990*** (2.65)	3.215 (1.09)
<i>DummyAudCom</i>	-2.533* (-1.68)	-0.899 (-0.39)
<i>LMVAL</i>	-0.681** (-2.57)	-0.885*** (-3.25)
<i>Leverage</i>	-1.729* (-1.76)	-0.742 (-1.00)
<i>AuditBig</i>	-1.197 (-1.08)	-0.344 (-0.40)
<i>ROA</i>	0.024 (0.76)	0.028 (0.83)
<i>BM</i>	0.216*** (2.88)	0.182*** (2.77)
<i>RavGrowth</i>	-0.003 (-1.17)	0.001 (0.50)
<i>MajIndDir</i>	0.258 (0.33)	0.348 (0.49)
<i>MoreComDir</i>	0.916 (1.30)	0.367 (0.64)
<i>DualityCEO</i>	-2.646 (-1.58)	-3.475 (-1.23)
<i>GovFactor</i>	-0.439 (-0.73)	-0.253 (-0.40)
<i>MCapDev</i>	-0.010 (-0.70)	0.017 (1.07)
<i>Robust/Cluster</i>	Yes	Yes
<i>Year FE</i>	Yes	Yes
<i>N</i>	649	646
<i>N-RisFactor</i>	148	149
<i>LM (p-value): OLS vs RE</i>	0.000	0.000
<i>LM: Chi(2)</i>	20.41	20.47
<i>Hausman (p-value): FE vs RE</i>	0.2437	0.0608
<i>Sargan-Hansen</i>	14.95	20.346

FRQ_{Kothari}: FRQ based on Kothari et al. (2008) calculated for each year in each industry; FRQ_{Jones}: Earning Quality based on Jones (1991) mode calculated for each year in each industry; *DummyAudCom*: firms recorded 1 if audit committee existed, otherwise 0; *RisFactor*: quality of risk committee calculated based on component factor analysis obtained from 4 characteristics which are qualification, majority of independence, independent chair and size; *Size*: natural log of firms' market value proxy for firm's size; *Leverage*: total short and long term debt over total asset; *AuditBig*: firm is reported 1 if at least one of auditor in year t is from the big accounting firm; *ROA*: Return of Asset, *BM*: firms' book value divided on market value; *RavGrowth*: firms' total revenue growth calculated as the difference of total revenue in year t and t-1; *MajIndDir*: is firm-specific governance measure calculated if firm's has majority independent board of directors 1, otherwise 0; *MoreComDir*: Busyness measure if the chairman of the board is a member in at least one of the board committee 1, otherwise 0; *DualityCEO*: if firm's chairman and CEO is one person 1, otherwise 0; *GovFactor*: score obtained after factor analysis of country investor protection index (which covers extent of director liability and ease of shareholders' suit against directors and managers) and country level governance (which covers regulatory quality and control of corruption); *MCapDev*: country level measure calculated total stock market divided on GDP in year t and country i.

4.4.2. Association between FRQ and Quality of AC in presence of RC H_{1b}

Table 4 exhibits the association between FRQ and Quality of AC (*AudFactor*), in the presence of the dummy variable of RC (1, if a firm adopts a separate RC). As mentioned earlier, *AudFactor* is calculated based on factor analysis of 4 characteristics of AC (qualification, independence, size, and AC Chairman's independence). (We did not include meeting frequency and meeting duration, as we find very few companies that disclosed time and meeting frequencies in their annual reports and in other databases. In addition, most of the firms that disclose meeting frequencies do not disclose meeting duration. Furthermore, we find that the few firms that disclosed meeting related information have adopted RC which will inflate our models by more zeroes). In this test, we assume that a firm that adopts RC (without considering the quality of RC), reduces the quality of AC, and hence, lowers FRQ. Consistent with our hypothesis, we find that the existence of RC, moderates the coefficient (α) between FRQ (proxies $FRQ_{Kothari}$ and FRQ_{Jones}) and quality of AC. We find significant and negative association between $FRQ_{Kothari}$ (FRQ_{Jones}) and *AudFactor* at coefficient of 2.101, (1.812) at ($p < 0.05\%$ level). For *AudComScaled* (sum scores of the four AC characteristics (dummies)), our results show same inference sign at ($p < 0.05\%$) level and a coefficient of 2.316 (2.494). Furthermore, we find significant sign of our internal busyness proxy (*DualityCEO*) at ($p < 0.01\%$), while *MoreComDir* another proxy for internal busyness proxy, found to be positive but not significant. Consistent with prior literature, we also find that *LMVAL*, *Leverage*, *BM*, *DualCEO* and country level measures (*McapDev*), have significant inference. Even after fixing the industry effects, we find that for instance, for FRQ_{Jones} at ($p < 0.05\%$) significance level for both *AudFactor* and *AudComScaled*, is negative but not significant for the $FRQ_{Kothari}$ model. This suggests that the voluntary formation of RC lowers the quality of AC which negatively influences the FRQ.

In the aforementioned discussion, our results are obtained after regressing the aggregated measures of AC (*AudFactor* and *AudComScaled*), with FRQ, in the presence of RC. However, motivated by previous studies (e.g., Woidtke and Yeh 2013), we then test each individual characteristics in the presence and absence of RC. In this test, we expect to observe a U-shaped relationship (positive association between AC and FRQ) if firms do not adopt the RC, and negative relationship (negative association between AC and FRQ) if firms adopt high quality RC. This is exactly what we find. Specifically, Un-tabulated results show that firms that adopt RC suppress the association between AC and FRQ (e.g., $FRQ_{Kothari}$). On the other hand, we find a positive association between AC and FRQ for firms without RC. However, coefficients are not significant except for the independent Chair of AC.

In summary, our results suggest that the formation of RC reduces the quality of AC composition which in turn lowers financial reporting quality. This result is generally consistent with the recent findings of Tani and Smith (2015), who demonstrate that the busyness of the audit committee chair and financial expert weaken the monitoring and oversight role that audit committees play in the financial reporting process.

4.5. Self-selection bias

RC is a growing practice in financial firms; hence we collect our sample from financial firms. However, choosing financial firms and testing the hypothesis in the presence of RC can create a selection bias problem, that the estimators are inconsistent and bias. For instance, average firms without RC, may have higher than average FRQs and a firm with AC, may have lower than average FRQ, evidenced by over-dispersion of our mean and variance in our main variables. Therefore, we conduct a self-selection bias test. Specifically, we test Heckman's (1979) procedure, where we first compute the Inverse Mills ratio (*InvMills*) γ from a probit model for random effect model of AC in the firms then we add *InvMills* ratio in our control variables in all equations to control for self-selection bias.

In the probit model for random effect model, we include three variables that determine the probit model of AC, which are; number of board of directors, the Firm's size ($assets_{log}$) and total debt over total asset based on Bradbury (1990) and Chau and Leung (2006). Firstly, Bradbury (1990), Certo (2003) and Faleye et al. (2011) suggest board size and composition, and monitoring committee, determined the assignment of AC membership, hence, we include board size. Song and Windram (2004) and Carson (2002), find that the firm's size has a positive association with the formation of AC, while Carson (2004) report a negative association between AC and (total debt / total assets). Table 5 presents the second-stage probit regression model, where we find that the regression coefficient for AC is negatively and significantly associated with $FRQ_{Kothari}$ ($p < 0.05\%$), suggesting that even after controlling for self-selection bias, our inference is un-changed, that is in the presence of high quality of RC, the association between AC and FRQ is negative.

4.6. Additional Analysis and Sensitive tests

4.6.1. Other measure of FRQ

We also test for sensitivity analysis of our dependent variable (FRQ), using a third measure that has been widely used in previous literature [(Dechow and Dichev 2002) therefore, FRQ_{DD}]. The third proxy of Financial Reporting Quality is calculated based on discretionary accrual of Dechow and Dichev (2002) as below:

$$T\text{-accruals}_t = \alpha_0 + \alpha_1 OCF_{t-1} + \alpha_2 OCF_t + \alpha_3 OCF_{t+1} + \alpha_4 \Delta Rev_t + \alpha_5 PPE_t + \epsilon_{it} \tag{5}$$

Where OCF_{t-1} is cash from operation scaled by lagged total asset, OCF_t is cash from operation scaled by lagged total asset, OCF_{t+1} is cash from operation scaled by total asset, Rev_t is change of

total revenue scaled by total lagged asset, PPE_t is the total of the firm's property, plant and equipment scaled by total lagged asset. Residual represents the estimation errors in current accrual that is not

associated with OCF, change in Revenue and the firm's level of PPE. This procedure results in less data and we find only 325 year observations.

We regress *AudFactor* and *AudComScaled* with both FRQ proxies, in presence of RC. Panel A Table 6 shows that *AudFactor* (*AudComScaled*) is -2.611 which is significant at ($p < 0.01\%$ level) with FRQ_{DD} . The sign and significant levels in control variables in the regression models are in line with the baseline regression. Our results are consistent with our hypothesis which states that the presence of RC lowers FRQ through reducing the quality of audit monitoring committee.

4.6.2. Average of FRQ proxies

Following Chen et al. (2011) and Biddle et al. (2009), we also calculate the average of three FRQ measures FRQ_{Ave} : $FRQ_{Kothari}$, FRQ_{Jones} and FRQ_{DD} . Chen et al. (2011), suggest that using average proxy for FRQ is more appropriate for three reasons. First, one single measure cannot cover all facets of FRQ. Second, aggregating different proxies of FRQ help to generalize the results. Third, using average proxy reduces measurement error that is generated from using one proxy which consists of factors other than FRQ. Panel B of Table 6 shows that our inference is unchanged, that is, we find that the coefficient of *AudFactor* (*AudComScaled*) are significantly and negatively associated with FRQ_{Ave} of 1.396 (1.779), in the presence of RC at ($p < 0.05\%$ level).

Table 4. FRQ and Quality of Audit Committee in presence of Dummy Risk Committee

	FRQ _{Kothari}		FRQ _{Jones}	
<i>Intercept</i>	2.277 (1.62)	3.446** (2.22)	1.128 (0.91)	2.328* (1.70)
<i>AudFactor</i>	-2.101** (-2.27)		-1.821** (-2.19)	
<i>AudComScaled</i>		-2.316** (-2.31)		-2.494** (-2.36)
<i>LMVAL</i>	-1.139*** (-2.78)	-1.058*** (-2.70)	-0.980** (-2.34)	-0.883** (-2.30)
<i>Leverage</i>	-3.816** (-2.15)	-4.152** (-2.34)	-3.677** (-2.02)	-4.009** (-2.14)
<i>AuditBig</i>	0.786 (0.86)	0.284 (0.29)	0.181 (0.28)	-0.348 (-0.57)
<i>ROA</i>	-0.037 (-0.65)	-0.04 (-0.69)	-0.063 (-1.04)	-0.07 (-1.11)
<i>BM</i>	0.717*** (2.60)	0.692** (2.55)	0.598* (1.86)	0.575* (1.85)
<i>RavGrowth</i>	-0.002 (-1.33)	-0.002 (-1.30)	-0.001 (-0.35)	-0.001 (-0.37)
<i>MajIndDir</i>	2.551** (2.04)	2.580* (1.94)	2.631** (2.27)	3.051** (2.20)
<i>MoreComDir</i>	1.057 (1.15)	1.722 (1.62)	0.653 (0.65)	1.386 (1.22)
<i>DualityCEO</i>	-4.205*** (-3.59)	-3.190*** (-3.65)	-5.452*** (-3.56)	-4.997*** (-3.91)
<i>GovFactor</i>	-0.32 (-0.52)	-0.247 (-0.40)	0.001 (0.00)	0.055 (0.08)
<i>MCapDev</i>	0.026 (1.34)	0.026 (1.33)	0.044** (1.97)	0.043** (1.97)
<i>Robust/Cluster</i>	Yes	Yes	Yes	Yes
<i>Year FE</i>	Yes	Yes	Yes	Yes
<i>N</i>	647	647	649	649
<i>N-RC</i>	255	255	250	250
<i>LM (p-value): OLS vs RE</i>	0.000	0.000	0.000	0.000
<i>LM: Chi(2)</i>	194.05	180.09	14.23	14.15
<i>Hausman (p-value): FE vs RE</i>	0.263	0.2463	0.313	0.3192
<i>Sargan-Hansen statistic</i>	13.483	13.765	13.81	13.716

FRQ_{Kothari}: FRQ based on Kothari et al. (2008) calculated for each year in each industry; FRQ_{Jones}: FRQ based on Jones (1991) mode calculated for each year in each industry. *AudFactor*: quality of audit committee calculated based on component factor analysis obtained from 4 characteristics: qualification, majority of independence, independent chair and size; *AudComScaled* is total score of audit committee from the four characteristics divided on 4; RC equal 1 if a firm voluntarily adopted risk committee, otherwise 0; *Size*: natural log of firms' market value proxy for firm's size; *Leverage*: total short and long term debt over total asset; *AuditBig*: firm is reported 1 if at least one of auditor in year t is from the big accounting firm; *ROA*: Return of Asset, *BM*: firms' book value divided on market value; *RavGrowth*: firms' total revenue growth calculated as the difference of total revenue in year t and $t-1$; *MajIndDir*: is firm-specific governance measure calculated if firm's has majority independent board of directors 1, otherwise 0; *MoreComDir*: Busyness measure if the chairman of the board is a member in at least one of the board committee 1, otherwise 0; *DualityCEO*: if firm's chairman and CEO is one person 1, otherwise 0; *GovFactor*: score obtained after factor analysis of country investor protection index (which covers extent of director liability and ease of shareholders' suit against directors and managers) and country level governance (which covers regulatory quality and control of corruption); *MCapDev*: country level measure calculated total stock market divided on GDP in year t and country i .

Table 5. Probit Self-Sample Selection Bias: FRQ and Quality of Audit Committee in presence of Dummy Risk Committee

	FRQ _{Kothari}	FRQ _{Jones}
Intercept	7.785***	3.787
	(2.78)	(1.14)
AudComDummy	-2.641**	-0.958
	(-1.97)	(-0.43)
LMVAL	-0.803***	-0.922***
	(-2.73)	(-3.09)
Leverage	-2.610**	-1.018
	(-2.3)	(-1.13)
AuditBig	-1.302	-0.363
	(-1.13)	(-0.42)
ROA	0.029	0.029
	(0.92)	(0.88)
BM	0.254***	0.194***
	(3.41)	(2.70)
RavG	-0.003	0.001
	(-1.12)	(0.51)
MajIndDir	0.317	0.363
	(0.40)	(0.51)
MoreComDir	0.899	0.35
	(1.25)	(0.60)
DualityCEO	-2.921*	-3.602
	(-1.93)	(-1.31)
GovFactor	-0.401	-0.24
	(-0.66)	(-0.37)
MCapDev	-0.012	0.017
	(-0.77)	(1.04)
InvMills	-9.932*	-3.227
	(-1.71)	(-0.65)
Robust/Cluster	Yes	Yes
Year FE	Yes	Yes
N	464	455
N-RC	148	149

FRQ_{Kothari}: FRQ based on Kothari et al. (2008) calculated for each year in each industry; FRQ_{Jones}: FRQ based on Jones (1991) mode calculated for each year in each industry. *AudFactor*: quality of audit committee calculated based on component factor analysis obtained from 4 characteristics : qualification, majority of independence, independent chair and size; *AudComScaled* is total score of audit committee from the four characteristics divided on 4; *Size*: natural log of firms' market value proxy for firm's size; *Leverage*: total short and long term debt over total asset; *AuditBig*: firm is reported 1 if at least one of auditor in year t is from the big accounting firm; *ROA*: Return of Asset, *BM*: firms' book value divided on market value; *RavGrowth*: firms' total revenue growth calculated as the difference of total revenue in year t and t-1; *MajIndDir*: is firm-specific governance measure calculated if firm's has majority independent board of directors 1, otherwise 0; *MoreComDir*: Busyness measure if the chairman of the board is a member in at least one of the board committee 1, otherwise 0; *DualityCEO*: if firm's chairman and CEO is one person 1, otherwise 0; *GovFactor*: score obtained after factor analysis of country investor protection index (which covers extent of director liability and ease of shareholders' suit against directors and managers) and country level governance (which covers regulatory quality and control of corruption); *MCapDev*: country level measure calculated total stock market divided on GDP in year t and country i; *InvMills* is predicted residual from Probit regression between, *Board_Size*, *Size*, and *Total debt /Total Asset*.

4.7. Potential time-series dependence

We perform the analyses at firms that do not adopt RC_{t-1} in the previous year, but adopt the RC_t in the current year. First, if a firm does not adopt RC_{t-1}, we expect that there is less internal monitoring busyness, due to less incentive to create or signal their prestige RC. Second, if a firm voluntarily adopts RC_t in the current year, it is more likely that the firm with voluntary RC will face more internal busyness issue on the board. Therefore, we re-run our regressions for firms that did not adopt RC in the previous year (RC_{t-1}=0), but adopted RC in the current year (RC_t=1). Un-tabulated results provide consistent evidence of negative association between FRQ_{Ave} and the quality of AC in all regressions. For instance, the coefficients association between *AudComScaled* and all FRQ proxies (FRQ_{Kothari}, FRQ_{Jones}, FRQ_{DD}, and FRQ_{Ave}) are 2.742, 2.426, 2.434, 0.001, and 1.712 respectively, which are all significant at ($p < 0.05\%$ level). We also find negative, but not significant, using *AudFactor*. This also provides robustness for our hypothesis that a firm

that voluntarily chooses to adopt RC has less FRQ due to lower composition quality of AC.

4.8. Board Ownership Representatives Setting in GCC

One of the salient features in the GCC is that the boards of publicly listed companies are represented by members of the Government, private families and ruling families (TNI Survey 2008). Hence, we repeat our regressions including the three types of ownership (*GovDir*, *FamilyDir* and *RoyalDir*). After adding the three types of directors, un-tabulated results lend consistent support (not changed) regarding sign and the statistical magnitude, while some coefficients show highly significant results after controlling for the three ownership attributes. The coefficients regressions of *AudFactor* (*AudComScaled*) and FRQ proxies (FRQ_{Kothari}, FRQ_{Jones}, FRQ_{DD}, and FRQ_{Ave}) are 1.868(2.293), 1.567(2.523), 2.253(2.786), and 1.158(1.770) respectively, and all are negative and significant at ($p < 0.05\%$ level) and for FRQ_{DD}, significant level at ($p < 0.01\%$). Moreover, we regress if *AudCom* is dummy (1 or 0) with FRQ_{Ave}

in the presence of high quality composition of RC (RisFactor). We find a negative and significant association between *DummyAudCom* and FRQ_{AVE} of 1.033 at ($p < 0.05\%$). Further, the *RoyalDir* and *GovDir*

are found to be negative with FRQ proxies, while *FamilyDir* is positive with FRQ. We also noticed that the significance level varies depending on the main independent variable (FRQ).

Table 6 Panel A: Additional Analysis: FRQ and Quality of Audit Committee in presence of Dummy Risk Committee using Dechow and Dichev, 2002 and Teoh et al., (1998)

	FRQ _{pd}	
<i>Intercept</i>	0.636	2.357
	(0.27)	(0.97)
<i>AudFactor</i>	-2.611***	
	(-3.49)	
<i>AudComScaled</i>		-3.192***
		(-3.09)
<i>LMVAL</i>	-1.019*	-1.076*
	(-1.66)	(-1.73)
<i>Leverage</i>	-4.576***	-4.694***
	(-2.66)	(-2.79)
<i>AuditBig</i>	-1.567	-1.50
	(-1.42)	(-1.38)
<i>ROA</i>	-0.056	-0.052
	(-0.99)	(-0.91)
<i>BM</i>	0.673**	0.691**
	(2.47)	(2.44)
<i>RavG</i>	-0.008	-0.009
	(-1.56)	(-1.43)
<i>MajIndDir</i>	3.951***	4.107***
	(3.76)	(3.09)
<i>MoreComDir</i>	1.244	1.804
	(1.02)	(1.28)
<i>DualityCEO</i>	-5.886**	-5.070*
	(-2.18)	(-1.79)
<i>GovFactor</i>	-2.480**	-2.274**
	(-2.49)	(-2.26)
<i>MCapDev</i>	0.049*	0.051*
	(1.682)	(1.67)
<i>Robust/Cluster</i>	Yes	Yes
<i>Year FE</i>	Yes	Yes
<i>N</i>	324	324
<i>N-RC</i>	130	130
<i>LM (p-value): OLS vs RE</i>	0.000	0.000
<i>LM: Chi(2)</i>	157.69	125.05
<i>Hausman (p-value): FE vs RE</i>	0.5243	0.575
<i>Sargan-Hansen statistic</i>	10.068	9.51

FRQ_{pd}: FRQ based on Dechow and Dichev, 2002 calculated for each year in each industry; *AudFactor*: quality of audit committee calculated based on component factor analysis obtained from 4 characteristics : qualification, majority of independence, independent chair and size; *AudComScaled* is total score of audit committee from the four characteristics divided on 4; *RC* equal 1 if a firm voluntarily adopted risk committee, otherwise 0; *Size*: natural log of firms' market value proxy for firm's size; *Leverage*: total short and long term debt over total asset; *AuditBig*: firm is reported 1 if at least one of auditor in year *t* is from the big accounting firm; *ROA*: Return of Asset, *BM*: firms' book value divided on market value; *RavGrowth*: firms' total revenue growth calculated as the difference of total revenue in year *t* and *t-1*; *MajIndDir*: is firm-specific governance measure calculated if firm's has majority independent board of directors 1, otherwise 0; *MoreComDir*: Busyness measure if the chairman of the board is a member in at least one of the board committee 1, otherwise 0; *DualityCEO*: if firm's chairman and CEO is one person 1, otherwise 0; *GovFactor*: score obtained after factor analysis of country investor protection index (which covers extent of director liability and ease of shareholders' suit against directors and managers) and country level governance (which covers regulatory quality and control of corruption); *MCapDev*: country level measure calculated total stock market divided on GDP in year *t* and country *i*.

5. CONCLUSION

The primary purpose of this study is to enhance our understanding of internal board busyness and its effect on the qualities of corporate monitoring and financial reporting. We investigate whether the voluntary adoption of an additional monitoring committee (e.g., RC) adversely influences the board's audit committee's effectiveness (e.g., AC).

Using a unique dataset from six GCC countries, we obtain a number of interesting results. First, we find new evidence that the voluntary adoption of high quality RC has an adverse consequence on

audit committee's effectiveness through less monitoring of a firm's FRQ. Second, we find that the voluntary adoption of RC reduces AC's effectiveness. In other words, our results indicate that voluntarily adopting a Risk Committee reduces the quality of Audit Committee composition which in turn, reduces financial reporting quality. Our findings are robust after controlling for several firm-specific and country-specific factors, and using various proxies for FRQ and AC. Our conclusions remained unchanged when we use alternative models and tests.

Table 6 Panel B: Additional Analysis: Average FRQ

	FRQ _{Ave}	FRQ _{Ave}
Intercept	0.819	1.691*
	(0.97)	(1.91)
AudFactor	-2.166**	
	(-2.58)	
AudComScaled		-2.835**
		(-2.56)
LMVAL	-0.820**	-0.738*
	(-1.99)	(-1.83)
Leverage	-5.479**	-5.807**
	(-2.42)	(-2.51)
AuditBig	-0.117	-0.581
	(-0.22)	(-1.14)
ROA	-0.045	-0.051
	(-0.86)	(-0.95)
BM	0.719**	0.699**
	(2.38)	(2.35)
RavG	-0.003	-0.003
	(-1.50)	(-1.52)
MajIndDir	3.041***	3.293***
	(2.85)	(2.71)
MoreComDir	0.957	1.600*
	(1.14)	(1.75)
DualityCEO	-5.049***	-4.291***
	(-4.54)	(-4.94)
GovFactor	-0.499	-0.443
	(-0.67)	(-0.59)
MCapDev	0.052*	0.051*
	(1.86)	(1.85)
Robust/Cluster	Yes	Yes
Year FE	Yes	Yes
N	669	669
N-RC	250	250

FRQ_{Ave} is average of three measures of FRQ_{Kothari}, FRQ_{Jones} and FRQ_{DP}; DummyAudCom: firms recorded 1 if audit committee existed, otherwise 0; AudFactor: quality of audit committee calculated based on component factor analysis obtained from 4 characteristics : qualification, majority of independence, independent chair and size; AudComScaled is total score of audit committee from the four characteristics divided on 4; RiskFactor: AudFactor: quality of risk committee calculated based on component factor analysis obtained from 4 characteristics which are qualification, majority of independence, independent chair and size; Size: natural log of firms' market value proxy for firm's size; Leverage: total short and long term debt over total asset; AuditBig: firm is reported 1 if at least one of auditor in year t is from the big accounting firm; ROA: Return of Asset, BM: firms' book value divided on market value; RavGrowth: firms' total revenue growth calculated as the difference of total revenue in year t and t-1; MajIndDir: is firm-specific governance measure calculated if firm's has majority independent board of directors 1, otherwise 0; MoreComDir: Busyness measure if the chairman of the board is a member in at least one of the board committee 1, otherwise 0; DualityCEO: if firm's chairman and CEO is one person 1, otherwise 0; GovFactor: score obtained after factor analysis of country investor protection index (which covers extent of director liability and ease of shareholders' suit against directors and managers) and country level governance (which covers regulatory quality and control of corruption); MCapDev: country level measure calculated total stock market divided on GDP in year t and country i.

This study contributes to corporate governance literature in several important ways. First, prior studies focused primarily on investigating the effect of outside board busyness on a firm's board internal advising role, however, whether introducing voluntary monitoring RC enhances or undermines board effectiveness has not been investigated yet, despite its importance. Our study is the first to test how the voluntarily formation of an additional board monitoring committee such as the RC reduces the effectiveness of monitoring by the audit committee. Second, we theoretically introduce an interaction between signalling and busyness theories to explain how the voluntary creation of an additional monitoring committee (e.g., RC) can influence the board's effectiveness, by testing the conditional effects between the FRQ and the monitoring quality of AC in presence of RC. Third, our study investigates the interplay of relationship between the audit committee, financial reporting quality and risk management committee. Our results suggest that the internal busyness of the board monitoring sub-committee can harm shareholders' interests through increasing the oversight time of monitoring directors on the board.

In sum, we find that the busyness of board members can have a significant impact on the effectiveness of their monitoring abilities and capacity. Our findings suggest that multiple layers of monitoring capacity viz-a-viz the existence of both an audit and risk committee may impair the quality of monitoring provided by that audit committee. The implication is that the regulators need to consider directors' commitments and busyness in making rules for mandatory establishment of risk committee. In addition, firms who intend to improve their financial reporting quality should think seriously about the consequences of adding a new committee on the effectiveness of audit committee before deciding to form this new committee.

Overall, this study has implications for the corporations, regulators and investors and should attract the attention of policy makers. This study has international implications for regulators that have rules governing the existence and composition of committees. It is expected that the findings of this study would be instructive and applicable to other countries in the Middle East region, due to the similarity in their social, political and economic environment.

The study, however, has a few limitations that suggest a number of avenues for future research. First, the study focuses primarily on whether the voluntary adoption of RC adversely influences the board's audit committee's effectiveness. There are other committees that are formed by the board that may have an adverse effect on the audit committee's effectiveness which may warrant future investigation. Second, we use GCC firms in our sample. Future studies could extend the research to other countries that have similar corporate governance environments in the Middle East region. Finally, since we exclude non-financial firms from our sample, new insights may be gained by investigating these types of firms in the future.

REFERENCES

- Aebi, V., G. Sabato, and M. Schmid. 2012. Risk management, corporate governance, and bank performance in the financial crisis. *Journal of Banking & Finance* 36 (12):3213-3226.
- Aivazian, V. A., Y. Ge, and J. Qiu. 2005. The impact of leverage on firm investment: Canadian evidence. *Journal of Corporate Finance* 11 (1):277-291.
- Al-Shammari, B., P. Brown, and A. Tarca. 2008. An investigation of compliance with international accounting standards by listed companies in the Gulf Co-Operation Council member states. *The International Journal of Accounting* 43 (4):425-447.
- Allen, W. 1992. Redefining the role of outside directors in an age of global competition. *Speech to the Ray Garrett, Jr. Corporate and Securities Law Institute, Northwestern University*.
- Amenta, E. 2000. *Bold relief: Institutional politics and the origins of modern American social policy*. Princeton University Press.
- Atiyah, H. S. 1992. Research note: Research in arab countries, published in Arabic. *Organization Studies* 13 (1):105-110.
- Beasley, M. S., and S. E. Salterio. 2001. The Relationship between Board Characteristics and Voluntary Improvements in Audit Committee Composition and Experience. *Contemporary Accounting Research* 18 (4):539-570.
- Biddle, G. C., G. Hilary, and R. S. Verdi. 2009. How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics* 48 (2):112-131.
- Boron, A. 1995. *State, capitalism, and democracy in Latin America*. Lynne Rienner Publishers Boulder, CO.
- Bradbury, M. E. 1990. The incentives for voluntary audit committee formation. *Journal of Accounting and Public Policy* 9 (1):19-36.
- Breusch, T. S., and A. R. Pagan. 1980. The Lagrange multiplier test and its applications to model specification in econometrics. *The Review of Economic Studies* 47 (1):239-253.
- Brickley, J. A., J. L. Coles, and G. Jarrell. 1997. Leadership structure: Separating the CEO and chairman of the board. *Journal of Corporate Finance* 3 (3):189-220.
- Burgstahler, D. C., L. Hail, and C. Leuz. 2006. The importance of reporting incentives: earnings management in European private and public firms. *The Accounting Review* 81 (5):983-1016.
- Carson, E. 2002. Factors associated with the development of board sub-committees. *Corporate Governance: An International Review* 10 (1):4-18.
- Cashman, G. D., S. L. Gillan, and C. Jun. 2012. Going overboard? On busy directors and firm value. *Journal of Banking & Finance* 36 (12):3248-3259.
- Certo, S. T. 2003. Influencing initial public offering investors with prestige: Signaling with board structures. *Academy of Management Review* 28 (3):432-446.
- Chaney, P. K., M. Faccio, and D. Parsley. 2011. The quality of accounting information in politically connected firms. *Journal of Accounting and Economics* 51 (1):58-76.
- Chau, G., and P. Leung. 2006. The impact of board composition and family ownership on audit committee formation: Evidence from Hong Kong. *Journal of International Accounting, Auditing and Taxation* 15 (1):1-15.
- Chen, F., O.-K. Hope, Q. Li, and X. Wang. 2011. Financial reporting quality and investment efficiency of private firms in emerging markets. *The Accounting Review* 86 (4):1255-1288.
- Colquitt, J. A., D. E. Conlon, M. J. Wesson, C. O. Porter, and K. Y. Ng. 2001. Justice at the millennium: a meta-analytic review of 25 years of organizational justice research. *Journal of Applied Psychology* 86 (3):425.
- Core, J. E., R. W. Holthausen, and D. F. Larcker. 1999. Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics* 51 (3):371-406.
- Dechow, P. M., and I. D. Dichev. 2002. The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review* 77 (s-1):35-59.
- Faleye, O., R. Hoitash, and U. Hoitash. 2011. The costs of intense board monitoring. *Journal of Financial Economics* 101 (1):160-181.
- Fama, E. F. 1980. Agency problems and the theory of the firm. *The Journal of Political Economy*:288-307.
- Fama, E. F., and M. C. Jensen. 1983. Separation of ownership and control. *Journal of Law and Economics*:301-325.
- Ferris, S. P., M. Jagannathan, and A. C. Pritchard. 2003. Too busy to mind the business? Monitoring by directors with multiple board appointments. *The Journal of Finance* 58 (3):1087-1112.
- Fich, E. M., and A. Shivdasani. 2006. Are busy boards effective monitors? *The Journal of Finance* 61 (2):689-724.
- Field, L., M. Lowry, and A. Mkrtychyan. 2013. Are busy boards detrimental? *Journal of Financial Economics* 109 (1):63-82.
- Francis, J. R., and D. Wang. 2008. The joint effect of investor protection and big 4 audits on earnings quality around the world. *Contemporary Accounting Research* 25 (1):157-191.
- Gul, F. A., G. S. Zhou, and X. K. Zhu. 2013. Investor protection, firm informational problems, big N auditors and cost of debt around the world. *Auditing: A Journal of Practice and Theory*.
- Hawkamah. 2010. Hawkamah brief on corporate governance codes of the GCC, Hawkamah the institute for corporate governance and OECD, annual conferences, Muscat Oman, November
- Heckman, J. J. 1979. Sample selection bias as a specification error. *Econometrica: Journal of The Econometric Society*:153-161.
- Hertog, S. 2012. *How the GCC did it: formal and informal governance of successful public enterprise in the Gulf Co-operation Council countries*. OECD.
- Hicks, A. M. 1999. *Social democracy & welfare capitalism: a century of income security politics*. Cornell University Press.

35. Jiraporn, P., M. Singh, and C. I. Lee. 2009. Ineffective corporate governance: Director busyness and board committee memberships. *Journal of Banking & Finance* 33 (5):819-828.
36. Jones, J. J. 1991. Earnings management during import relief investigations. *Journal of accounting research* 29 (2):193-228.
37. Kaplan, S. N., and D. Reishus. 1990. Outside directorships and corporate performance. *Journal of Financial Economics* 27 (2):389-410.
38. Kaufmann, D., A. Kraay, and M. Mastruzzi. 2009. Governance matters VIII: aggregate and individual governance indicators, 1996-2008. *World bank policy research working paper No.4978 : available at <https://openknowledge.worldbank.org/bitstream/handle/10986/4170/WPS4978.pdf?sequence=1>*
39. Klein, A. 2002. Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics* 33 (3):375-400.
40. Kothari, S., A. J. Leone, and C. E. Wasley. 2005. Performance matched discretionary accrual measures. *Journal of Accounting and Economics* 39 (1):163-197.
41. La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny. 2000. Investor protection and corporate governance. *Journal of Financial Economics* 58 (1):3-27.
42. Leuz, C., D. Nanda, and P. D. Wysocki. 2003. Earnings management and investor protection: an international comparison. *Journal of Financial Economics* 69 (3):505-527.
43. Leventhal, G. S. 1976. The distribution of rewards and resources in groups and organizations. *Advances in Experimental Social Psychology* 9:91-131.
44. Lipton, M., and J. W. Lorsch. 1992. A modest proposal for improved corporate governance. *The Business Lawyer*:59-77.
45. MacGregor, J. 2012. Audit committee equity holdings, the risk of reporting problems, and the achievement of earnings thresholds. *Journal of Accounting and Public Policy* 31 (5):471-491.
46. Miihkinen, A. 2012. What drives quality of firm risk disclosure?: The impact of a national disclosure standard and reporting incentives under IFRS. *The International Journal of Accounting* 47 (4):437-468.
47. Morck, R., A. Shleifer, and R. W. Vishny. 1988. Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics* 20:293-315.
48. Ozel, I. 2003. Beyond the orthodox paradox: the breakup of state-business coalitions in 1980s Turkey. *Journal of International Affairs* 57 (1):97.
49. Pástor, L., M. Sinha, and B. Swaminathan. 2008. Estimating the intertemporal risk-return tradeoff using the implied cost of capital. *The Journal of Finance* 63 (6):2859-2897.
50. Rahman, R. A., and F. H. M. Ali. 2006. Board, audit committee, culture and earnings management: Malaysian evidence. *Managerial Auditing Journal* 21 (7):783-804.
51. Shivdasani, A. 1993. Board composition, ownership structure, and hostile takeovers. *Journal of Accounting and Economics* 16 (1):167-198.
52. Sidani, Y., and A. Al Ariss. 2013. Institutional and corporate drivers of global talent management: Evidence from the Arab Gulf region. *Journal of World Business*.
53. Song, J., and B. Windram. 2004. Benchmarking audit committee effectiveness in financial reporting. *International Journal of Auditing* 8 (3):195-205.
54. Spence, M. 1973. Job market signaling. *The quarterly journal of Economics* 87 (3):355-374.
55. Srinidhi, B. N., and F. A. Gul. 2007. The differential effects of auditors' nonaudit and audit fees on accrual quality. *Contemporary Accounting Research* 24 (2):595.
56. Subramaniam, N., L. McManus, and J. Zhang. 2009. Corporate governance, firm characteristics and risk management committee formation in Australian companies. *Managerial auditing journal* 24 (4):316-339.
57. Sun, J., S. F. Cahan, and D. Emanuel. 2009. Compensation committee governance quality, chief executive officer stock option grants, and future firm performance. *Journal of Banking & Finance* 33 (8):1507-1519.
58. Sun, J., G. Lan, and G. Liu. 2014. Independent audit committee characteristics and real earnings management. *Managerial Auditing Journal* 29 (2):153-172.
59. Tanyi, P. N., and D. Smith. 2015. Busyness, expertise, and financial reporting quality of audit committee chairs and financial experts. *Auditing: A Journal of Practice & Theory* 34 (2): 59-89.
60. Tao, N. B., and M. Hutchinson. 2013. Corporate governance and risk management: The role of risk management and compensation committees. *Journal of Contemporary Accounting & Economics* 9 (1):83-99.
61. TNI Survey, H., Mudara 2008. Power Matters: A Survey of GCC Boards, edited by N. Saidi. Hawkahah & Mudara.
62. Vafeas, N. 2005. Audit committees, boards, and the quality of reported earnings. *Contemporary Accounting Research* 22 (4):1093-1122.
63. Woidtke, T., and Y.-H. Yeh. 2013. Corporate Governance and the Informativeness of Accounting Earnings: The Role of the Audit Committee. *Pacific-Basin Finance Journal* 23:1-24.
64. Xie, B., W. N. Davidson III, and P. J. DaDalt. 2003. Earnings management and corporate governance: the role of the board and the audit committee. *Journal of Corporate Finance* 9 (3):295-316.
65. Yermack, D. 1996. Higher market valuation of companies with a small board of directors. *Journal of Financial Economics* 40 (2):185-211.

CREDIT RISK: FROM A SYSTEMATIC LITERATURE REVIEW TO FUTURE DIRECTIONS

Flavio Barboza*, Herbert Kimura**, Vinicius A. Sobreiro**,
Leonardo F. C. Basso***

* Universidade Federal de Uberlândia, Faculdade de Gestão e Negócios, Uberlândia (Brazil)

** Universidade de Brasília, Departamento de Administração, Brasília (Brazil)

*** Universidade Presbiteriana Mackenzie, São Paulo (Brazil)

Abstract

More than 3000 papers on risk management have been published since 2000. Although research on risk management is moving towards filling knowledge gaps, the large number of papers has a negative side. Young researchers have difficulty in constructing a concise and comprehensive basis of knowledge that allows new gaps to be found instead of addressing issues already resolved. Bearing this in mind, the aim of this paper is to present a systematic literature review on credit risk for academic papers. To meet this objective, the main studies on credit risk were classified and coded, and a citation-based approach was used to determine their relevance and contributions to the state of the art. This identified some gaps and research recommendations.

Keywords: Credit Risk, Literature Review, Finance, Economics.

Acknowledgement

We thank Santander Bank, Coordination for Higher Education Staff Development (CAPES), and Mackenzie Presbyterian University for financial support.

1. INTRODUCTION

A common thread in the economics literature is that agents spend part of their income on consumption. Although this process seems to be very simple and to have little importance for the economics system as a whole, it is actually not simple at all because agents — mainly families — do not pay in cash most of the time, but instead use credit. As a consequence, in simple terms, financial institutions provide credit for agents (families) because they believe they will receive the same amount plus an additional sum for providing this credit, and they can then loan this capital to other agents (companies) for business expansion. Managing the risk for this credit supply is very complex (Crouhy et al., 2000) because non-compliance with the credit terms agreed will affect all parties involved, especially financial institutions.

There are many reasons for studying credit risk. Caouette et al. (2008) highlighted the increase in credit risk and described credit market events that prompted increasing research into this issue, such as the new Basel accords, the sophistication of market participants, the increase in the supply of credit derivatives, and the emergence of hedge funds. However, a large part of literature is addressed to studies of portfolio risks (Atahau and Cronje, 2015), default events and asymmetric information while other topics, such as regulatory capital, are less investigated. In this context, the Basel I and II accords have highlighted the role of credit risk in risk management for financial institutions, which in turn intensified the search for more sophisticated and more robust models to measure credit risk because of the strong influence

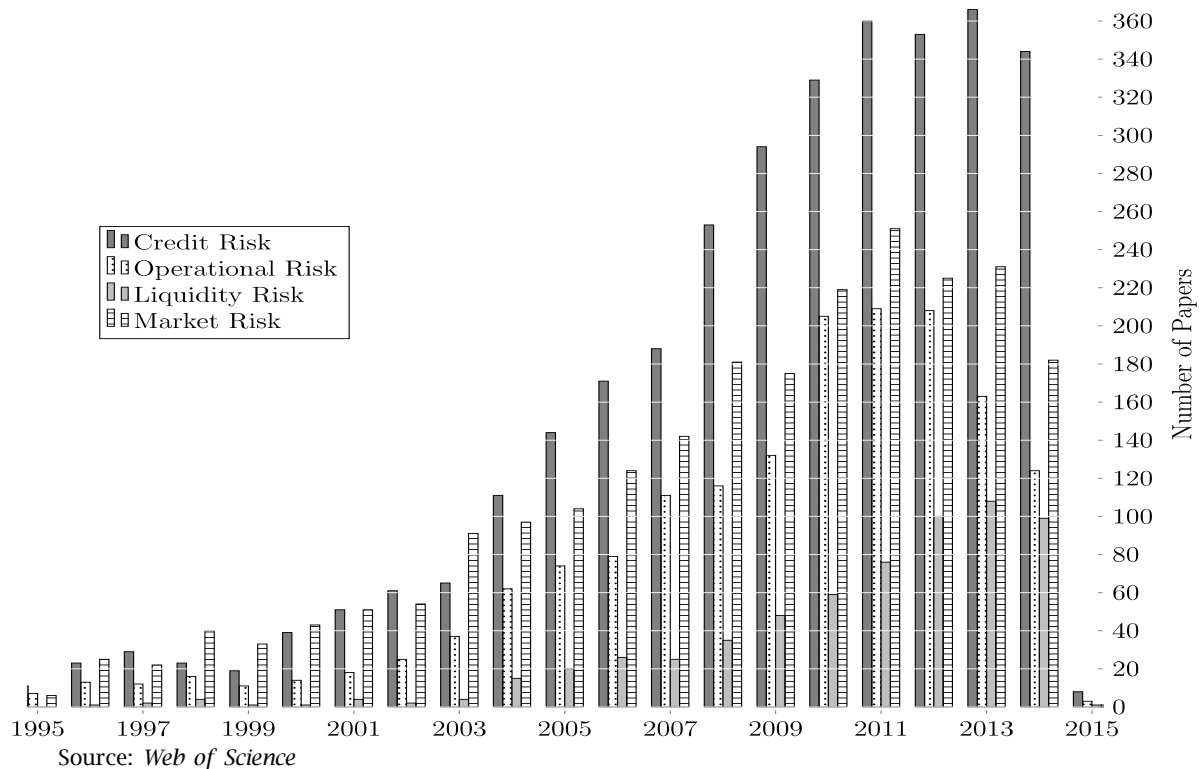
of economic capital on bank returns (Altman and Sabato, 2007; Tian et al., 2012).

The literature on credit risk has followed the same trend as for agents connected to this subject; in other words, has been expanding in recent years (Chava and Purnanandam, 2010; Jorion and Zhang, 2007). In comparison to operational, market, and liquidity risks, the number of publications on credit risk points to a global ongoing increase in studies on this subject, as illustrated by Figure 1.

As a consequence, the proposition of new tools, techniques, and models to measure and predict credit risk has also increased; examples include mathematical and statistical approaches such as simulations (Morellec, 2003; Hackbarth et al., 2006; Battiston et al., 2012), econometric analysis (Angelini et al., 2008; Griffin and Tang, 2012; Jiménez et al., 2014), and multivariate statistics (George and Hwang, 2010; Eom et al., 2003; Gordy and Howells, 2006; Veronesi and Zingales, 2010; Altman and Sabato, 2007). Optimisation processes (Bielecki et al., 2005) and the most recent and sophisticated theories have also been applied, such as the use of a copula approach to measure correlation, as reported by Rosenberg and Schuermann (2006) and others (Denev, 2014). Copula is a suitable method to check the dependence of the bivariate distribution with fat tails, which is very common in time series studies in finance.

For those starting to study credit risk, it is difficult to identify milestone or framework studies and any knowledge gaps because of the plethora of ideas, innovations, models, and empirical evidence. Motivated by this problem, we carried out a systematic review of the literature on credit risk and its components in an attempt to show academic advances made in the last 15 years and any gaps that remain or have recently emerged.

Figure 1. Number of studies published on managing risks that were indexed in the main academic databases.
Source: Web of Science



Allen (2004) reviewed the literature concerning about mortgages markets and the influence of Basel Accords I and II. Her conclusions emphasized we have many issues to solve about credit risk models, capital requirements, among other topics. We did not find any systematic review related to credit risk or analogous subjects in the last 15 years. It is important to highlight that a systematic review allows us to impose limits on this work because credit risk is such a comprehensive subject and there are a large number of studies in this area. Conversely, as emphasized by Jabbour (2013), a systematic review of the literature can identify studies about emerging subjects within a specific area of knowledge such as credit risk.

The remainder of the paper is organised as follows. Section 2 presents the research methodology used. In Section 3, we describe the classification and codification used. Section 4 outlines the key concepts regarding credit risk. The main outcomes are reported in Section 5. Finally, Section 6 features the main conclusions and limitations, and directions for future work.

Brief conceptual description of credit risk

Banking activity has been carried out for a very long time. According to Hoggson (1926), there is evidence that, Hamurabi laws, which date back to 2000 BC, regulated the use of water, land rents, and agent commissions, debts, and interest in the Mesopotamian Valley. The presence of rules regarding loans suggests the necessity of establishing a mechanism to manage credit risk, and more specifically to mitigate default risks.

In the context of scientific knowledge, we can argue that credit modelling has been contemplated since the origin of finance theory. Seminal work by

Modigliani and Miller (1958) is connected to credit analysis, since a capital structure comprising a firm's own resources and capital from third parties entails the risk of non-payment of debts, and therefore the existence of a probability of default.

In the context of the strong connection between credit elements and key research on corporate finance and investments, it is important to highlight that capital structure induces agency problems (Jensen and Meckling, 1976) among stockholders and creditors, and supports the assessment of stocks and debts based on the logic of option pricing (Merton, 1974).

Almost two decades later, Leland (1994) was working on this relationship. He developed a well-known structural model that considers the level of leverage as a proxy to determine default boundaries. To enlarge this work, Leland and Toft (1996) presume finite maturity debt by avoiding time dependence. Both papers have been prominent until now (He and Xiong, 2012). For example, Morellec (2003); Yu (2005); Hackbarth et al. (2006); Zhu (2006); Duffie et al. (2009) among others, reinforce their importance. However, Almeida and Philippon (2007) criticize those results because "they do not emphasize the difference between objective and risk-adjusted probabilities of distress". Chen (2010) also contests the observation of the default event and the debt level treated as a constant in Leland's model. Additionally, Eom et al. (2003) suggest the liquidation values assumed by Leland and Toft (1996) are doubtful.

According to Jarrow and Protter (2004), the studies of Black and Scholes (1973) and Merton (1974) in particular provide the basis for one of the main classes of credit risk models, the structural

approach, through which corporate debts have clauses of options regarding the company's assets (Giesecke, 2004). The second class of credit models (also called reduced-form) is more recent, originating from studies by Artzner and Delbaen (1995), Jarrow and Turnbull (1995), and Duffie and Singleton (1999). This class considers that default occurs with calibrated intensity via market prices in an exogenous manner (Giesecke, 2004). Because of this attribute, these models can be applied exclusively in public companies (Bonfim, 2009). Zhu (2006) explains that reduced-form models have many applications, with emphasis being placed on the relationship between CDS and bond spreads, but some assumptions cannot be found in practice, such as risk-free rate, to be constant. Furthermore, Jarrow and Turnbull (2000) recommend them for risk management and pricing. In this historical context, credit study not only has practical relevance because it is connected to operations that humans have been performing for centuries, but also has theoretical importance because it is related to many studies that provide the basis for finance theory.

For aspects directly related to credit analysis, studies by Beaver (1966) and Altman (1968) represent theoretical milestones for research on the development of models to predict failure and bankruptcy.

While Beaver (1966) conducted a univariate analysis to identify financial indexes that could help to predict companies that fail and those that do not, Altman (1968) carried out a multivariate analysis, adapting a classification technique — discriminant analysis — to calculate a score for the bankruptcy risk of publicly listed companies in the US manufacturing sector.

Seminal work by Altman (1968) had considerable repercussions and remains popular in the literature Campbell et al. (2008); its has been adapted for other sectors and contexts. For example, Edmister (1972) investigated the bankruptcy risk of small companies and Sinkey (1975) analysed the bankruptcy of financial institutions. Taffler (1984) developed models for different types of companies in the UK and Altman and Hotchkiss (2005) discussed risk modelling results for non-manufacturing companies and for the credit of emerging markets. Altman's method has some counterpoints, which are adjusted in the model based on logistic regression. On the other hand, Altman and Sabato (2007) assert that Ohlson's model does not provide better prediction power than Altman (1968).

Although the predictive power of models based on multivariate statistics, such as those of Altman (1968) and Ohlson (1980), has decreased (Begley et al., 1996), more recent artificial intelligence and machine learning techniques have represented a new research line for credit risk, specifically for bankruptcy prediction. For instance, Galindo and Tamayo (2000) studied 9000 models of credit risk assessment via statistical and machine learning techniques such as neural networks, classification and regression trees (CART), and the K-nearest neighbour algorithm. Khandani et al. (2010) analysed

consumer credit using CART to improve the classification of credit card holders.

We can describe a lot of pros and cons of these techniques, but that is not the core idea of this paper. However, we can cite that don't require assumptions (Angelini et al., 2008). In the case of support vector machine (SVMs), Tian et al. (2012) made a clarification about SVMs technique by presenting some variations of it. The major issue for machine learning is the occurrence of the overfitting phenomena, because the more independent variables included in the model, the more overestimated the dependent variable will be, which is not desirable for any classification case, especially in credit risk.

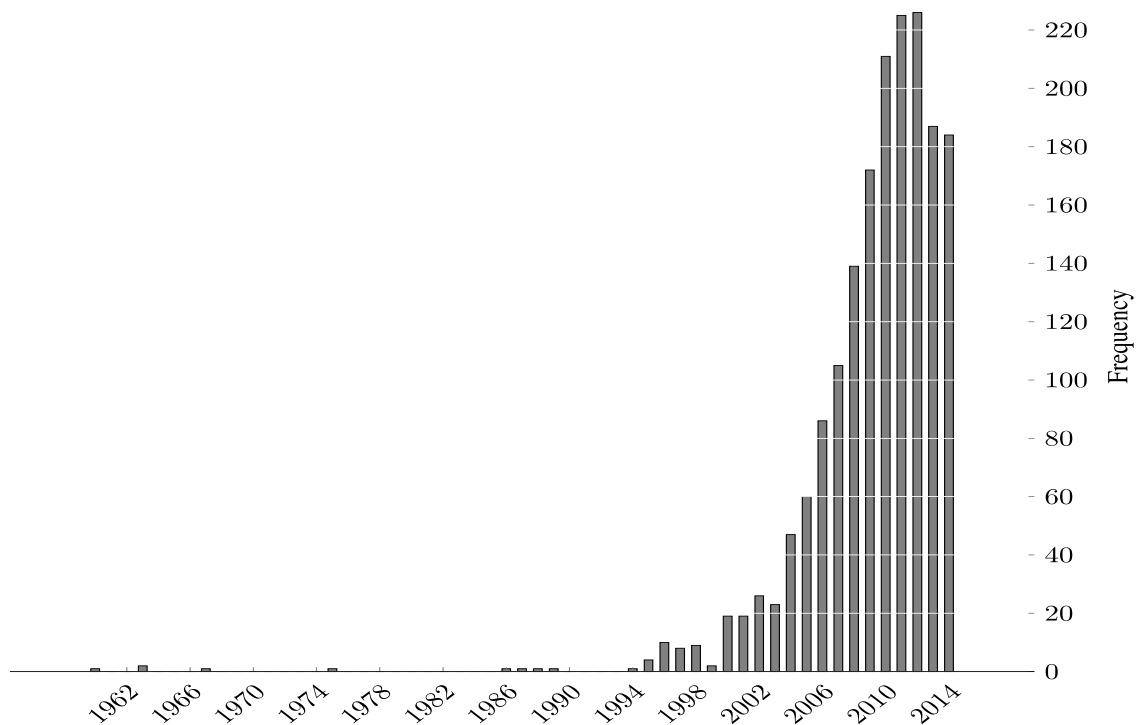
Another research line regarding credit analysis involves risk modelling developed based on demands arising from banking regulation, notably the Basel guidelines (Allen et al., 1996). Studies of models used by market practitioners, such as KMV default probability (Crosbie and Bohn, 2002), Credit Metrics (Gupton et al., 2007), Credit Risk+ (CSFB, 1997), and Credit Portfolio View (Wilson, 1997a,b) have also been carried out. For example, Agarwal and Taffler (2008) compared Altman's Z-score and two models based on market variables. Their results show no significant difference among the models for predicting firm failure. Moreover, Crouhy et al. (2000) conducted a great review of bank models. The authors perceived that no model is better than any other, as they can all provide good results for determining regulatory capital.

Latter research prompted by regulation involves assessment and prevention of systemic crises and mechanisms for assessment of the counterparty credit risk. More specifically, regulation needs exemplified in the BIS document (2012) have encouraged lines of research on adjustment of credit assessments, especially for operations involving derivatives.

Despite not being extensive, the list of topics is complemented by studies analysing credit spread (Forte and Peña, 2009) and operations based on transactions or credit risk, such as securitisation (Greenbaum and Thakor, 1987) and credit derivatives (Norden and Wagner, 2008). There are also many studies on bankruptcy and corporate finance with a diversity of interconnections. For instance, George and Hwang (2010) investigated bankruptcy risks and leverage, while Berk et al. (2010) analysed human capital, capital structure, and bankruptcy risk.

3. RESEARCH METHODOLOGY

Our search for studies on credit risk covered January 2000–December 2014. This period was chosen because of its representativeness with regard to the number of publications on managing risks; the topic of credit risk comprises 97.5% of the studies published during this period. Although this is an interesting fact, it was already noted by Caouette et al. (2008). To corroborate this, Figure 2 shows the results of a simple search using the keyword 'Credit Risk' in the Scopus database.

Figure 2. Number of documents found in a search of the *Scopus database* using 'Credit Risk' as keyword.

Our literature search was carried out using the following three databases:

Proquest;

Scopus (in conjunction with Science Direct); and Web of Science Core Collection.

These academic databases were chosen because of the scope of the bibliometric information supplied. They comprise a large volume of articles from different publishers, including Elsevier, JSTOR, Springer, Taylor & Francis, Emerald, and Wiley, and offer data on the number of citations of each article. Our research involved the following steps.

Step 1: Analysis of positive and negative points of the databases. We took into account the scope, the total period for data capture, the search method (simple and advanced), the clarity of the information provided, and inconsistencies among search engines. This step was carried out to confirm whether the same search parameters were used identically in all databases.

Step 2: Use of the following search parameters: Keywords: 'Credit Risk', 'Probability of Default', and 'Bankruptcy' ;

Language filters: English;

Areas of concentration: Business, Economics, and Finance;

Type of material: Article;

Source: Scholarly Journals; and Period: January 2000-December 2014.

Step 3: Selection of the most-cited articles. In this step, to define the number of papers to be considered, the articles were ordered based on citations. Thus, articles published during the period considered (2000-2014) that were not cited were excluded from the analysis.

Step 4: Downloading of articles and database creation. Using the results from Step 3, the articles were downloaded, and basic information (title,

author names, year of publication, publisher name, journal name, keywords, JEL classifications, DOI number) and the number of citations were collected for each article to create a database.

Step 5: Descriptive statistics. The database created in Step 4 was subjected to descriptive analysis to identify information, patterns, and gaps.

Step 6: Reading and coding of articles. All the articles were read to identify the objective, the results, and contributions to the field of credit risk. In addition, each article was classified and coded as described in Section 4.

Classification and coding

Classification is one of the most important aspects of our systematisation because it identifies the main characteristics of the articles reviewed. This systematisation of the literature was performed according to Lage Junior and Godinho Filho (2010), Jabbour (2013), and Seuring (2013). We first identified the following data from each study:

Title;

Author names;

Affiliations;

Country of origin of the author or of the institution according to the address supplied in the article;

Year of publication;

Journal name;

Volume, issue number, and final and initial pages (this information was collected to establish if there were special editions on credit risk in any journal);

Origin and period of time considered in the data used by each study;

Keywords;

Number of citations of the article in the Scopus and Web of Science databases; and Digital Object Identifier (DOI) reference.

Some of these data required greater consideration before collection. The following procedures were used:

If an author was affiliated to more than one institution, we identified only the most important institution according to the following criteria:

Contact details for the author;

The first institution named by the author; and

Current location if neither of the previous conditions was satisfied.

Not all articles listed the same keywords, so we used the following sources to search for these data:

We first searched for any version of the paper in the Social Science Research Network (SSRN)

database of working papers, which provided most of the keywords for articles published, for instance, in the Journal of Finance.

If no version of the article was found in the SSRN database, we used the Web of Science Plus database, which has a tool called Keyword Plus that provides keywords by selecting words that appear more frequently in the titles of the most-cited works.

After this analysis, 17 articles were identified as being unrelated to credit risk and were excluded from our database. For the remaining articles, seven classification categories were defined. For each of these categories, other subcategories were established, as shown in Table 1.

Table 1. Categories and subcategories used in this work

<i>Category</i>	<i>Meaning</i>	<i>Codes for alternatives</i>
		A - Risk management.
		B - Credit risk modelling.
1	Main subject.	C - Rating analysis.
		D - Predictions/forecasting.
		E - Credit derivatives.
		F - Other.
		A - Theoretical framework.
		B - Time series analysis.
2	Method.	C - Multivariate analysis.
		D - Simulation and computational methods.
		E - Empirical analysis (case studies or similar).
		F - Other.
		A - Financial institutions.
		B - Corporate (balance sheets).
3	Type of data source.	C - Bonds.
		D - Derivatives.
		E - Macroeconomics.
		F - Other.
		A - USA.
4	Data source location.	B - Europe.
		C - Asia.
		D - Global / other / not mentioned.
		A - Economic capital or potential loss.
		B - Pricing.
5	Variable of interest.	C - PD.
		D - LGD.
		E - Other.
		A - New perspectives.
		B - Consistent with other paper(s).
6	Findings.	C - Old model and/or different data (source).
		D - Comparisons.
		E - Other.
		A - Less than 3 years.
		B - Between 3 and 5 years.
7	Period of analysis.	C - Between 6 and 10 years.
		D - More than 10 years.
		E - Not applicable.

The first category, Main Subject, identifies the topic and any subject considered as a subcategory. The following subcategories were considered:

Risk management: This subcategory includes articles that investigated risk in a more comprehensive or general manner, focusing on management.

Credit risk models: Articles in this subcategory addressed credit risk modelling.

Rating analysis: This subcategory includes papers on credit qualities of any nature, with an assessment or criticism of the category, focusing on attributes, criteria, and considerations. Notable features are prediction models and risk management, but these do not play a more

significant role than the category. In the case of predictions, it is worth noting the difference between this and other classifications. Since the category is Main Subject, almost all papers have some type of prediction; however, this does not mean that they qualify for the D subcategory. Thus, if the subject was better classified as risk management or a model of credit risk or rating, we ignored this qualification. Nevertheless, if there was a strong influence of econometric and statistical treatment for predictability, for instance, and this objective competed with other categories, the work was classified in both categories.

Credit derivatives: This subcategory comprises studies that involve derivatives such as Credit

Default Swap (CDS) and Collateralised Debt Obligation (CDO).

Other: This subcategory includes studies whose main subject did not fall into any of the previous options.

The Method category is related to the main method applied or used by the authors in their study. There are six options, and an article may be included in more than one category, as well as in all the other eight criteria investigated. It is important to remember that the most significant aspect in this item is the method used for the main subject in the paper. Thus, for instance, theoretical articles that used a regression or statistical technique in a small part of the study were not taken included in this subcategory. The subcategories for this category are as follows:

Theoretical Framework: This subcategory includes studies directly contributing to the theoretical framework for credit risk, which mainly involves criticizing or complementing conceptual aspects. These papers sometimes use sophisticated tools or mathematical abstractions.

Times Series Analysis: In this subcategory, the main study characteristics are a regression analysis, robust statistical tests and, if necessary, other analyses that are relevant to the validity of the research.

Multivariate Analysis: This subcategory comprises articles on research of a phenomenon using statistical techniques that do not fit a time series, such as probability and correlations.

Simulation and Computational Method: This subcategory includes articles that used more recent computer simulation techniques for empirical data, such as machine learning.

Empirical Analysis: This subcategory encompasses articles that address phenomena made evident by a small number of samples, such as case studies or samples represented by exceptions to a specific assumption in a population.

Note that articles using panel data analysis are classified as Time Series Analysis. Articles with multivariate or cross-sectional analysis carried out over time were also assigned to the same subcategory.

Type of Data Source is a very objective category, as are Analysis Period, with articles classified according to the type of data considered. For theoretical articles, the data source was identified as the one most often indicated or cited by the author in suggesting applications, even if it was not necessarily studied. The same approach was applied for studies that carried out a simulation. Again, taking into account banking data (economic capital, risk models, etc) and, simultaneously, other organizations classify the study in both options.

The Data Source Location or Geographic Location in which data were collected is the fourth category. In this case, the sources were quite clear in the papers. Studies involving countries apart from the USA, Europe, and Asia were classified as the fourth possibility.

The fifth category is the main Variable of Interest in the studies. This category was more comprehensive in cases in which the authors did not emphasize any of their results. The pricing

subcategory comprises studies focusing on return on assets, derivative spreads, and valuation, among other topics. It should be noted that the recovery rate variable was included in the LGD subcategory.

The Findings category was very well explored in the papers. Overall, authors were quite emphatic when presenting an innovation derived from their studies. In a broad sense, this category identifies the relationship between these more recent studies and previous studies. Therefore, its subcategories are self-explanatory.

The final category is the period covered by the data. This was separated into four size subcategories. There was no quantitative treatment of these data to avoid tendencies and errors of proportion in the analysis.

2. RESULTS AND DISCUSSION

Our searches identified more than 3000 scientific papers during 2000–2014. It was not feasible to investigate this amount of material, so objective selection of papers was necessary. Therefore, apart from the filters used in the primary search, other objective criteria were taken into account. The first one was to verify the number of citations per year since publication, and to analyse only those articles with an average of at least five citations. With this focus, recent articles were not excluded, outliers (potentially seminal articles) remained in the selection, and obsolete works (papers that were once a reference or not but became out-dated or do not effectively contribute to knowledge) were discarded. This reduced the sample to approximately 100 articles. During further collection of detailed information and analysis, other articles were excluded because they did not adhere to the credit risk topic. The final sample consisted of 83 papers.

To identify the origin of the research and the current main collaborators in this area of knowledge, we verified the main authors and the respective institutions with the greatest frequency in our database, as shown in Table 2 and Table 3.

The main articles on the topic of credit risk were concentrated in four journals, as shown in Table 5. However, articles of great importance appeared in other journals, such as studies by Hillegeist et al. (2004), Bielecki et al. (2005), and Ericsson et al. (2009) published in the *Review of Accounting Studies*, *Mathematical Finance*, and the *Journal of Financial & Quantitative Analysis*, respectively. For the journals listed in Table 5, the total number of citations during January 2000–December 2014 is shown in Figure 3. According to the *Scopus* database, the *Journal of Financial Economics* is the most-cited journal, even though it is not the journal with the greatest number of articles on credit risk.

Table 2. List of the main researchers in descending order of number of publications in the period 2000–2014

<i>Author</i>	<i>Papers</i>	<i>h-index</i>	<i>Citations (GQC)</i>	<i>Local Citations (NLC)</i>
<i>Darrel Duffie.</i>	3	17	1992	18
<i>Viral V. Acharya.</i>	2	17	1148	7
<i>Stefano Battiston.</i>	2	4	125	0
<i>Michael B. Gordy.</i>	2	6	390	5
<i>John M. Griffin.</i>	2	7	140	5
<i>J. Grunert.</i>	2	2	75	0
<i>Robert A. Jarrow.</i>	2	8	212	5
<i>Gabriel Jiménez.</i>	2	6	180	2
<i>Phillip Jorion.</i>	2	10	382	3
<i>Others.</i>	1	NA	NA	87
Total	83	-	-	132

Source: Web of Science.

Table 3. Number of articles published by institution

Institution	Papers
New York University.	4
University of California.	4
University of Mannheim.	3
Arizona State University.	2
Bank for International Settlements.	2
Board of Governors of the Federal Reserve System.	2
Cornell University.	2
ETH.	2
London Business School.	2
Massachusetts Institute of Technology.	2
Stanford University.	2
University of Chicago.	2
University of Toronto.	2
Washington University.	2
Total.	33

The list is less extensive for research location. Table 4 summarizes the data.

Table 4. Country of origin of researchers and institutions in descending order of number of publications

<i>Country</i>	<i>1st author</i>	<i>2nd author</i>	<i>3rd author</i>	<i>4th author</i>	<i>5th author</i>	<i>All together</i>
USA.	46	44	20	6	2	118
Germany.	6	5	2	0	0	13
UK.	6	4	2	0	0	12
Canada.	5	4	2	0	0	11
Italy.	2	5	4	0	0	11
China.	4	3	1	1	0	9
Spain.	4	3	1	1	0	9
Switzerland.	5	1	1	0	0	7
Sweden.	1	1	1	1	0	4
Greece.	1	1	1	0	0	3
Netherlands.	1	1	0	0	0	2
Singapore.	0	1	1	0	0	2
Denmark.	0	1	0	0	0	1
Israel.	0	1	0	0	0	1
Paraguay.	0	0	1	0	0	1
Portugal.	1	0	0	0	0	1
Turkey.	1	0	0	0	0	1
Total.	83	75	37	9	2	206

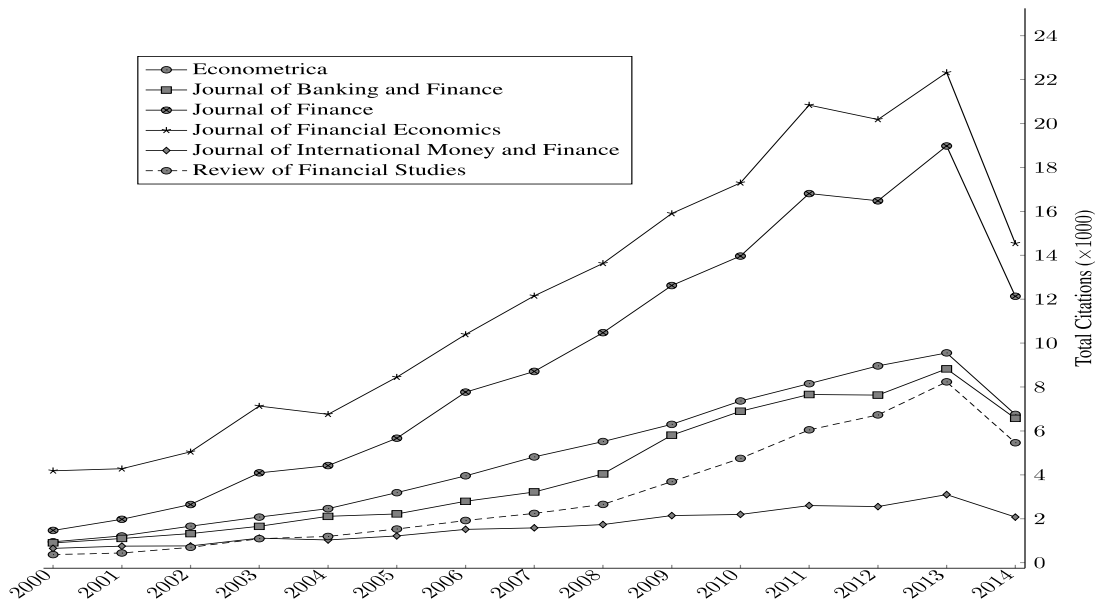
Table 5. Journals ordered according to their representation in the sample. Source: Scopus, Web of Science, and Proquest databases

Journal	Articles Published	Total Citations[†]
Journal of Banking & Finance.	22	62,768
Journal of Finance.	16	138,219
Journal of Financial Economics.	15	183,113
Review of Financial Studies.	10	47,061
Econometrica.	3	72,928
Journal of International Money & Finance.	2	25,054
Others (with 1 article published).	15	NA

Source: Scopus, Web of Science, and Proquest databases.

† The last column indicates the total number of citations in all papers from 2000 to December 19, 2014.

Figure 3. Total number of citations of the main journals taken into account in this research



Source: Scopus database

Table 6 shows the classification results for the articles, including the categories and subcategories identified in Table 1, and Table 7 provides a brief description of the objective, the conclusions, and the contribution of each study to the area of credit risk.

Overall, the studies we analysed were not concentrated on a single subject, but there was a strong tendency to focus on risk management, credit risk models, and statistical analysis of credit derivatives. Some articles fell into more than one classification because other subjects were equally addressed or were connected to the main subject. We also identified a small number of papers in the A-B, A-C, B-E, B-F, C-E, D-F, and A-C-D-E subcategories. For example, Jiménez and Saurina (2004) highlighted that the literature has been using data generated only in the USA. Gropp et al. (2006)

affirmed that there are difficulties in working with some stock market indicators. A possible explanation is the lack of skill among researchers and risk managers outside the USA in dealing with data scarcity and understanding the relation between macroeconomic measures and market information. Thus, we can identify the following gap that should be addressed in future research.

Gap1 : Analysis or extension of the work by Jiménez and Saurina (2004) and Gropp et al. (2006) should be further explored, because it is possible to analyse the risk for counterparts, as done by Jarrow and Yu (2001), or even to transfer risk through derivatives and its effects, providing alternative data to develop research on credit risk.

A new study about CDS and credit ratings have shown that it is possible to make interesting analysis.

Figure 5. Classification results for category 2, method applied

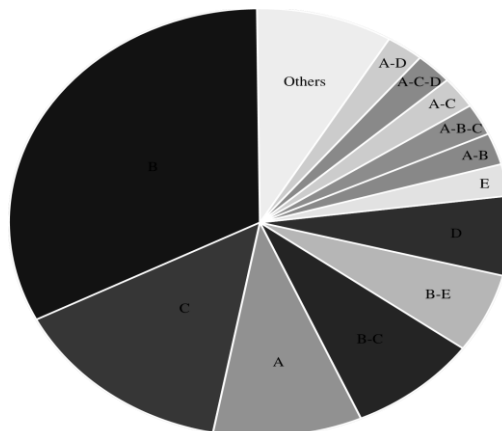


Table 6. Article classification according to categories 1-7 in Section 4.

Study	Main subject	Method	Data source	Location	Variable	Findings	Period
Crouhy et al. (2000).	B	E	A	E	F	D	E
Gordy (2000).	B	D-E	A	E	C	D	E
Huang et al. (2009).	A	B-C	A-D-E	A	B-C	A	C
Rosenberg and Schuermann (2006).	A	B-C-E	A	A	A	A-D	C
Chatterjee et al. (2007).	B	D	B	B	D	C	B
George and Hwang (2010).	F	A-C	B	A	F	A	D
Angelini et al. (2008).	F	A-B	B	A	F	A-D	D
Yu (2005).	B	A-C	B-C-D	A	B	B	D
Gopalan et al. (2007).	D	B-E	B	C-D	F	A	D
Errais et al. (2010).	B-E-F	A-C-E	D	A	F	A	D
Gross (2002).	B-D	B	F	A	C	C	A
Zhu (2006).	B-E-F	B-E	C-D-E	A-B-C	B	A-D	B
Amato and Furfine (2004).	C	B	B	A	F	C	D
Hillegeist et al. (2004).	B	B	A	A	C	C-D	D
Ivashina (2009).	F	B	A	A	B	A	D
Griffin and Lemmon (2002).	F	B	B	A	F	E	D
Morellec (2003).	F	A-C-D	F	E	F	A-B	E
Hackbarth et al. (2006).	A	A-C-D	B-F	E	B-F	A-B	E
Jiménez and Saurina (2004).	A-B	C	A	B	C	A	D
Das et al. (2007).	A-B-D	B-C	B	A	C-F	A	D
Agarwal and Taffler (2008).	B-D	C-E	A	B	C-F	C-D	D
Bielecki et al. (2005).	A	A	F	E	F	A	E
Güntay and Hackbarth (2010).	D-E	B	C	A	F	A	D
Carling et al. (2007).	B-C	B	A-B-E	B	C	A-B-D	D
Jarrow and Yu (2001).	A-B-D	A	C-D	E	B	A-C	E
Battiston et al. (2007).	F	D	B	E	F	A	E
Jorion and Zhang (2009).	A-E	B	A-B-D-F	A	F	A-B-C	D
Bonfim (2009).	B-D	C	B-E	B	C	E	C
Allen and Carletti (2006).	A-D	D	A	E	F	B	E
Acharya et al. (2011).	A-F	B-C	B-E-F	E	F	A	D
Battiston et al. (2012).	A	A	F	E	F	A	E
Vassalou and Xing (2004).	B-F	B	B	A	B-C	B-C	D
Griffin and Tang (2012).	C-E	B	D	E	B-F	A	D
Davydenko and Franks (2008).	A-F	B	B	B	F	D	D
Mansi et al. (2004).	A-E	B	B	A	B	B	D
Acharya et al. (2007).	B-D-E	B	B	A	D	A-B-C	D
Gropp et al. (2006).	A-C-D-E	C	A-D	B	B	D-E	D
Brissimis et al. (2008).	A-D-F	B	A	B	F	A-C	D
Poon (2003).	F	C	B	A-B-C	B	A	D
Maudos and de Guevara (2004).	A-F	B	A	B	B	C	D
Bharath and Shumway (2008).	E	B	C	B	B	A	A
Duffie et al. (2009).	B-D	C	B	A	C	C-D	D
Jorion and Zhang (2007).	B-D-E	C	B	A	C	A	D
Jiménez et al. (2014).	A-E	B	D	A-E	B	B-C	B
Beber et al. (2007).	A-D-F	B	A	B	F	E	C
Hennessy and Whited (2007).	D-F	A-D	B	E	B	B-C	E
Campbell et al. (2008).	A-B-D	C	B	A	B-C	C-D	D
Jappelli and Pagano (2002).	A-D-F	B	A	E	F	E	A
Hertzfel et al. (2008).	F	B	B	A	F	A	D
Chava and Purnanandam (2010).	A-D-F	B	B	A	B-C-F	C-E	D
Foos et al. (2010).	A	B	A	E	F	A	D
Chen (2010).	B-E	A	B-E	E	A-B	A	E
Tang and Yan (2010).	E	B-E	D-E	A	F	A	C
Altman and Sabato (2007).	B-D	C	B	A	C	B-C	C
Duffie et al. (2007).	B-D	B-E	B	A-E	C	D-E	D
Chen et al. (2008).	B	A-D	D	A	F	C-E	D
Lin et al. (2011).	A-F	B	B-E	E	F	A	D
Houweling and Vorst (2005).	A	A-E	A-D	A	B	A	A
Gordy and Howells (2006).	B-C	C	C-D	A-B	B	D	A
Tian et al. (2012).	A-D	D	A	E	A	A	E
Grunert and Weber (2009).	A-C	D	B-C-E	A-B-C-E	C-F	A-B	D
Bangia et al. (2002).	B	A	F	E	F	B-D	E
He and Xiong (2012).	B	B-E	B	B	F	B	D
Nickell et al. (2000).	B-D	A	B-C	E	B-F	A	E
Eom et al. (2003).	C	C	C	E	F	B-D	D
Schaefer and Strebulaev (2008).	B	C	B-C	A	B	D	D
Duffie and Lando (2001).	D-E	B-C	C	A	B	C	C
Veronesi and Zingales (2010).	E	C	C	E	F	B-C	E
Norden and Weber (2009).	E	B	B-C	A-B-C	B	B	B
Guiso et al. (2013).	F	E	B	A	F	E	A
Ericsson et al. (2009).	E	B	D	A	F	A	B
Collin-Dufresne et al. (2001).	E	B-D	B-C	A	F	A	C
Bao et al. (2011).	F	B-C	C	A	F	E	B
Goss and Roberts (2011).	A	B-C	A	A	F	A	D
Jarrow and Turnbull (2000).	A	A	F	E	F	E	E
Bhamra et al. (2009).	B	A-B-C	B-E	A	B-C	A	D
Hull et al. (2004).	C	A-B-C	C-D	A-B-C-E	F	B	B
Almeida and Philippon (2007).	C	A-B	C	E	B	A-B	E
Grunert et al. (2005).	B-C	C-D	A	B	C	C	B
Demiroglu and James (2010).	A-F	B	F	A	F	B	C
Zhou (2001).	F	A	F	E	B-C-D	A	E
Brown and Dinc (2009).	A	B-C	A	E	C	B-C	C
Dooley and Hutchison (2009).	D	B	D	A	F	E	A

Table 7. Brief descriptions of the main objective, conclusions, and contribution of each article considered in this study

<i>Study</i>	<i>Main objective</i>	<i>Main conclusion</i>	<i>Main contribution</i>
Crouhy et al. (2000).	Compares KMV and credit portfolio view models.	The models have different approaches but it is not possible to identify which is the best.	Mathematically details the working process of the techniques analysed.
Gordy (2000).	Compares Credit Risk+ and Risk Metrics models.	The models are similar in managing loan portfolios if the volatility effect in Credit Risk+ is low; highlights that Credit Risk+ is more sensitive to credit quality, demonstrating a broader assessment of this risk factor.	Comprehensive study of the two models including the entire theoretical context.
Huang et al.(2009).	Modelling and stress testing to measure systematic risk in financial institutions using financial data and CDS spreads.	Systematic risk is greater when the average PD or exposure to common factors increases.	The model features advances in measuring the systematic risk of attaching a proxy to credit risk.
Rosenberg and Schuermann (2006).	Implements a method for applying copulas to measure operational, market, and credit risks.	Risks can be calculated separately and adjusted with the copulas technique.	Implementing copulas in risk management.
Chatterjee et al. (2007).	Uses the neural network technique for PD estimation.	The model was considered efficient in two application approaches.	The model uses neural networks for 15 financial variables in predicting PD for Italian companies.
George and Hwang (2010).	In-depth analysis of household credit risk in accordance with US bankruptcy legislation.	Demonstrates the existence of a balance between prices and defaults in households with the same characteristics.	The model reveals the sensitivity of macroeconomic factors.
Angelini et al.(2008).	Discusses the negative relation between returns and leverage.	Low asset returns are directly related to systematic risk, which also increases with the insolvency cost; by contrast, companies with high costs prefer smaller leverage, which generates a smaller PD value.	The book-to-market index is not a measure of the risk of financial difficulties, but captures exposure to price risk, which is not related to capital structure.
Yu(2005).	Examines the relation between the term structure of credit spreads and the quality of accounting information.	The quality of accounting information may result in an increase in financial costs.	Empirically proves the term structure effect (e.g., companies that publicize more precise information have lower credit spreads in the short term).
Gopalan et al. (2007).	Investigates the way corporate groups participate in the capital market.	Corporate groups in India initially exist to protect member companies against financial difficulties.	Highlights the positive and negative points of corporate groups.
Errais et al. (2010).	Presents a method rarely used in the literature, the affine point process, using a top-down approach applied to derivatives pricing.	A self-extracting technique for assessing credit portfolios can be applied to bonds and loans.	A mathematical tool demonstrates how the affine point process works in the analysis of credit risk.
Gross (2002).	Studies credit card clients to verify PD throughout the duration.	The relation between default and the economic basis changed during the period analysed.	Uses duration in a study of credit card consumers and assesses the stability of credit risk in these cases.
Zhu (2006).	Discusses the impact of development of the credit derivatives market in the pricing of credit risk.	The results indicate that CDS spreads are more likely to provide a precise indicator of the price of credit risk than spreads of financial obligations.	Compares bonds and CDS spreads to verify the sensitivity of credit risk associated with the derivatives market.
Amato and Furfine (2004).	Addresses the relation between credit ratings and business cycles using a probit model with financial and macroeconomic variables to determine credit rating.	The credit risk rating of a company varies with cyclical changes in business and with financial risks.	The results revealed pro-cycling in ratings for high-investment companies and change assessments, which indicates possible sensitivity to the business cycle.
Hillegeist et al. (2004).	Discusses positive and negative aspects of traditional models of bankruptcy prediction (Z-score and O-score) and the Merton model.	The Merton model shows better performance in predicting bankruptcy.	Compares the most commonly used prediction models in the market.
Ivashina (2009).	Examines shared ownership of a market leader bank and the impact of the stock on the banking charge spread.	Banks with larger and more competitive portfolios have a competitive advantage because they can offer lower financing costs.	Includes the effects of market dominance and unions in the analysis.
Griffin and Lemmon (2002).	Analyses the relation between the book-to-market index, insolvency risk, and stock prices.	The average return for companies with a high possibility of insolvency is low, and is affected by decreasing stock prices and the BM/ME rate.	The results confirm that companies with large information asymmetries are more likely to have unstable stock prices.
Morellec (2003).	Analyses the impact of a manager's opportunistic behaviour on asset prices, indebtedness decisions, and company value.	When the number of growth options in a company's investment group increases, the cost of overinvestment decreases, which reduces indebtedness.	Confirms that changes in the economy affect indebtedness.
Hackbarth et al. (2006).	Studies the sensitivity of credit risk to macroeconomic changes and to capital structure.	Confirms the hypothesis that credit risk is influenced by macroeconomic changes such as choice of capital structure, as evidenced by a high default rate in periods of crisis.	Builds a consistent theoretical framework for sophisticated credit risk management in terms of leverage and market perspectives.
Jiménez and Saurina (2004).	Analyses the impact of loan characteristics such as guarantees, type of creditor institution, and creditor-borrower relationships on credit risk.	Guarantees increase the probability of loan non-compliance; there are significant differences in credit risk assumed by different creditors; investment banks loans are more risky than those of commercial banks.	Credit risk model with European data that takes into account characteristics seldom considered in this area, with interesting results.
Das et al.(2007).	Proves the efficiency of a model formulated in a Poisson stochastic process to verify the intensity of defaults throughout time, and reviews research analysing default correlations with macroeconomic variables using copulas.	Joint hypotheses testing revealed that default intensities are properly measured and have a doubly stochastic property.	Introduces a credit risk model affected by default intensities using a Poisson process.
Agarwal and Taffler (2008).	Compares two credit risk models based on market information to the Z-score model proposed by Altman(1968).	The Z-score is more precise, but it does not have statistical significance; its advantage relies on better adjustment of incomes to risk, profit, return on invested capital, and risk-adjusted return on capital when compared to market-based credit risk assessment; tests reveal that all models collect information about bankruptcy, but no method replaces any other.	Analysis of credit risk using models based on accounting data is more robust than market variable models.
Bielecki et al.(2005).	Searches for the optimal solution for asset selection in an investment/asset portfolio.	The solution can be obtained via a risk management approach using European options.	A new optimisation model that takes into account aversion to bankruptcy.

Table 7. Brief descriptions of the main objective, conclusions, and contribution of each article considered in this study (Continued)

<i>Study</i>	<i>Main objective</i>	<i>Main conclusion</i>	<i>Main contribution</i>
Güntay and Hackbarth (2010).	Analyses whether variations in prediction lead to changes in bond markets similar to those in the stock market.	Bonds of companies with different return predictions have significantly higher credit spreads and more elevated future returns than similar bonds.	Institutional differences between stock and securities markets are worth studying in more details.
Carling et al.(2007).	Proposes a model based on duration to explain the survival time to borrower default in a credit portfolio.	Macroeconomic variables show significant explanatory power for default risk, and for a series of common financial indexes.	The model takes into account the macro effect and can explain the absolute level of risk.
Jarrow and Yu(2001).	Proposes the generalization of existing reduced-form models to include default intensity.	Risk factors in the entire market and counterpart risks specific to companies interact to create a variety of form for the term structure of credit spreads.	New perspective for reduced-form models.
Battiston et al.(2007).	Identifies the minimum group of mechanisms that qualitatively reproduce a company and its standards for production, growth, and bankruptcy.	Theoretical model that takes into account local interactions and what creates a serial bankruptcy effect.	Analysis of the correlation between space-time, growth, and bankruptcy.
Jorion and Zhang (2009).	Development of a credit risk model that captures the interference caused by relations with bankrupt counterparts.	Stock prices react negatively and the CDS spread increases when the company has direct relationships with bankrupt debtors.	The authors state that this is the first study that uses a direct and clear company-counterpart connection to measure risk.
Bonfim(2009).	Simultaneous assessment of the effects of some dimensions of corporate credit risk, taking into account the company's accounting information, as well as macroeconomic and financial data, to understand how idiosyncratic and systematic risk factors determine default.	The results reveal that the macroeconomic dynamic has an important additional (and independent) contribution in explaining what leads companies to default.	Confirms that economy is a determining factor in default; an excessive risk assumption of companies in periods of economic expansion is noted.
Allen and Carletti (2006).	Shows the effect of credit risk transferences made by banks and insurance companies.	The result can be positive diversification; otherwise, it can cause contagion as a result of credit risk.	Detailed assessment of financial innovation processes that lead to positive outcomes or risk contagion.
Acharya et al.(2011).	Investigates the connection between creditors' rights and companies' investment policies.	Companies tend to reduce their risks in countries where creditors are strongly protected by the law.	Discusses creditors' rights and the benefits of a corporation in a more protected environment.
Battiston et al.(2012).	Presents a network model based on the borrower-creditor relationship for financial institutions, taking into account inter-relations in accounting data.	Diversification of individual risk can have an ambiguous effect at the system level.	Highlights the effects of risk diversification on systemic risk via a new model of cascading default.
Vassalou and Xing (2004).	Studies the relation between default risk and stock returns, using the Merton model as a measure.	Small companies have higher returns than larger companies if they assume high default risks; stocks generate higher returns instead of increasing their value.	The author states that this is the first study that uses the Merton model to measure credit risk for individual companies and evaluate their effect on stock returns.
Griffin and Tang (2012).	Proposes an empirical analysis and criticises credit classifications applied to CDOs.	Correlation between model and real classifications is low for the better classified group, so adjustments are necessary; adaptations that include additional factors do not have informational power.	Applies recent theoretical models of credit classification to real data and discusses norms defined by the models and practiced in the market.
Davydenko and Franks (2008).	Empirically assesses the nature of adjustments in loan contracts and the extent to which they mitigate the effect of the bankruptcy code on default results.	Banks adjust their financing and reorganisation practices in response to the bankruptcy code of a country.	No publications on default in different countries were found for comparison of data.
Mansi et al. (2004).	Discuss the relationship between auditor characteristics and debt financing.	The better qualified the auditor, the smaller the return for bondholders; more evident for firms with a low credit classification.	Highlights relevant aspects of auditor influence and the cost of third-party capital.
Acharya et al. (2007).	Assesses how sector difficulties affect the creditors of a company close to default recovery.	The economic situation of the sector plays an important role and affects the creditor recovery rate at the time of default.	Addresses the implications of assessment models for corporate bonds.
Gropp et al. (2006).	Examines the financial difficulties of banks using credit risk determinants.	The distance to default has small explanatory power and spreads are good indicators of bank fragility.	Uses derivative spreads combined with asset prices to address market discipline.
Brissimis et al. (2008).	Analyses the relation between bank performance and sector reform.	Greater regulation induces banks to improve their performance.	Empirical study of the entire reform period that pinpoints the main performance indicators for financial institutions.
Poon (2003).	Uses several mathematical tools to show return correlation in the stock market.	Uses several mathematical tools and applies a model that can show return correlation in the stock market.	New multivariate model that assesses the dependency structure among markets.
Maudos and de Guevara(2004).	Proposes an empirical model to compute the interest margin and its determinants for European banks in the 1990s.	In the period analysed, the concentration index was high for the banking sector, which decreased competitiveness and increased interest margins.	The model can determine interest margins involving competitiveness and operational costs.
Bharath and Shumway (2008).	Investigates how investors apply resources and assess corporate bonds.	Investors assess the default possibility and the liquidity of bonds from which they plan to obtain a return.	Reveals that the European securities market shows similar behaviour to the US market in terms of investor concern regarding credit quality and liquidity.
Duffie et al. (2009).	Analyses development of the Merton model in relation to factors associated with the distance to default.	The model cannot measure <i>PD</i> , but works as an information source to predict default.	Modifications of the traditional Merton model may offer greater explanatory power.
Jorion and Zhang (2007).	Examines the conditional probability distribution for losses in a credit portfolio.	Ignoring nonobservable aspects may cause biased VaR estimates for higher-volume credit portfolios.	The method used is more efficient in measuring losses in corporate bond portfolios and can be applied to other types of analysis.

Table 7. Brief descriptions of the main objective, conclusions, and contribution of each article considered in this study (Continued)

<i>Study</i>	<i>Main objective</i>	<i>Main conclusion</i>	<i>Main contribution</i>
Jiménez et al. (2014).	Studies the contagion effect in a sector with a default event on the prices of assets and derivatives.	A bankruptcy event impacts the bonds of companies in the same sector, whereas liquidation affects the stock price of firms in corresponding sectors because of competitiveness.	Proposes a connection between contagion effects, sector characteristics, and default.
Beber et al. (2007).	Applies a two-stage model to determine the credit quality of companies and its impact on financial institutions.	Low overnight interest rates cause an increase in bank risk, reflected by a larger number of lending transactions, because less capitalized banks will risk even more, which is evidenced by a larger volume of non-guaranteed concessions.	Pinpoints the aspects of risk taken that are connected to a monetary policy.
Hennessy and Whited (2007).	A structural model based on investment, cash, leverage, and default is to estimate financing costs in simulations.	Analyses confirm that the simulated outcomes are close to reality; corporate financing costs can be explained by bankruptcy costs and other rates.	The effect of choice of financing costs is very subtle because the context is fundamental.
Campbell et al. (2008).	Investigates factors connected to bankruptcy events and the stock prices of companies with high PD.	High PD assets are likely to yield low returns on average.	Reduced-form model that has very few errors.
Jappelli and Pagano (2002).	Uses primary data to study information sharing among financial institutions in the credit market.	Information sharing and the volume of loans follow the same trend.	Evidence from different countries indicates that banks share information to mitigate credit risk.
Hertzel et al. (2008).	Investigates contagion effects derived from bankruptcy events in sector terms and collaborators.	There are abnormal negative returns in supplier companies and there are signs of intersectoral contagion when the market receives default indicators or petitions for bankruptcy.	A bankruptcy event affects collaborators as well as companies in the same sector.
Chava and Purnanandam(2010).	Assesses the impact of default risk on stock prices.	Reveals a strong relation between the expected return and default risk.	Stock returns are estimated using ex ante data for the implied cost of capital via a proxy.
Foos et al. (2010).	Examines the relation between increases in loan losses and bank performance.	An abnormal increase in loan volume leads to greater institutional losses.	Sudden growth in a specific activity may lead to undesirable results.
Chen(2010).	Develops a structural model that includes macroeconomic variables.	The model meets its goal and is presented in a consistent way.	Model focuses on the effects of a risk premium in financing decisions and corporate bonds prices.
Tang and Yan(2010).	Studies the correlation between market risk and credit risk for derivatives.	Macroeconomic swings, growth rates, growth volatility, investor sentiment, and jump risk contribute to good model performance.	Risk model that includes growth measures and rates in analysing credit derivatives.
Beber et al. (2007).	Applies a two-stage model to determine the credit quality of companies and its impact on financial institutions.	Low overnight interest rates cause an increase in bank risk, reflected by a larger number of lending transactions, because less capitalized banks will risk even more, which is evidenced by a larger volume of non-guaranteed concessions.	Pinpoints the aspects of risk taken that are connected to a monetary policy.
Hennessy and Whited (2007).	A structural model based on investment, cash, leverage, and default is to estimate financing costs in simulations.	Analyses confirm that the simulated outcomes are close to reality; corporate financing costs can be explained by bankruptcy costs and other rates.	The effect of choice of financing costs is very subtle because the context is fundamental.
Campbell et al. (2008).	Investigates factors connected to bankruptcy events and the stock prices of companies with high PD.	High PD assets are likely to yield low returns on average.	Reduced-form model that has very few errors.
Jappelli and Pagano (2002).	Uses primary data to study information sharing among financial institutions in the credit market.	Information sharing and the volume of loans follow the same trend.	Evidence from different countries indicates that banks share information to mitigate credit risk.
Hertzel et al. (2008).	Investigates contagion effects derived from bankruptcy events in sector terms and collaborators.	There are abnormal negative returns in supplier companies and there are signs of intersectoral contagion when the market receives default indicators or petitions for bankruptcy.	A bankruptcy event affects collaborators as well as companies in the same sector.
Chava and Purnanandam(2010).	Assesses the impact of default risk on stock prices.	Reveals a strong relation between the expected return and default risk.	Stock returns are estimated using ex ante data for the implied cost of capital via a proxy.
Foos et al. (2010).	Examines the relation between increases in loan losses and bank performance.	An abnormal increase in loan volume leads to greater institutional losses.	Sudden growth in a specific activity may lead to undesirable results.
Chen(2010).	Develops a structural model that includes macroeconomic variables.	The model meets its goal and is presented in a consistent way.	Model focuses on the effects of a risk premium in financing decisions and corporate bonds prices.
Tang and Yan(2010).	Studies the correlation between market risk and credit risk for derivatives.	Macroeconomic swings, growth rates, growth volatility, investor sentiment, and jump risk contribute to good model performance.	Risk model that includes growth measures and rates in analysing credit derivatives.
Altman and Sabato (2007).	Assesses the performance of a model in measuring PD in small and medium Italian companies.	The model is more precise than a generic model.	Applies logistic regression to measure PD for SMEs using only financial variables.
Duffie et al. (2007).	Proposes a multiperiod credit risk model using macroeconomic covariates and firm-specific dynamics.	In some industries, the term structure of default risk rates is strongly associated with the economic situation and capital structure of the firms.	Analysis of a predictive PD model using time and macroeconomic covariate measures.
Chen et al. (2008).	Discusses how the stock price may contain information and its influence on future returns.	BAA-AAA bond spreads are explained from a pure credit perspective.	Identifies possible ways of determining spread.

Table 7. Brief descriptions of the main objective, conclusions, and contribution of each article considered in this study (Continued)

Study	Main objective	Main conclusion	Main contribution
Lin et al. (2011).	Examines the impact of control rights on a company's value.	Identifies possible ways of determining spread.	Perception of the influence of control rights on the capital cost.
Houweling and Vorst (2005).	Examines the impact of control rights on a company's value.	Use of European and Asian data reveals that inconsistencies between cash flow and control rights lead to higher debt-financing costs.	Assesses the financial performance of banks before and after the plan via credit derivatives.
Gordy and Howells (2006).	Evaluates the effect of the revised Paulson plan on the market.	The plan met its goal and was able to achieve efficient redistribution of resources.	Evaluation of the financial performance of banks before and after the plan via credit derivatives.
Tian et al. (2012).	Applies reduced-form models to price CDS premia.	Reduced-form models are more objective and more precise in CDS pricing.	The study is based on over 10,000 bonds, including sovereign bonds.
Grunert and Weber (2009).	Analyses the rating interdependence between macroeconomic variables and US companies and their business cycles.	The probability of a rating change is significantly supported by the business cycle.	Uses a business cycle when assessing ratings and proves the results via stress tests.
Bangia et al. (2002).	Reviews classification methods based on machine learning and proposes several formats and applications.	Support vector machines achieve good results in finance and economics.	Clarifies important points for the technique used.
He and Xiong(2012).	Tests four hypotheses on the credit quality of borrowers and the recovery rate.	Confirms the four hypotheses proposed.	Calculates the recovery rate using macroeconomic variables.
Nickell et al. (2000).	Examines a model that verifies the interaction between debt liquidity and credit risk.	A decrease in debt market liquidity induces an increase in the default liquidity premium.	Mathematically demonstrates a model that meets its goal taking into account the possibility of debt rollover.
Eom et al. (2003).	Assesses the evolution of a rating transition matrix for long-term bonds.	There is no strong relation between risk classification attributed by rating agencies and PD.	PD is associated with the stage of the business cycle.
Schaefer and Strebulaev (2008).	Compares the empirical performance of five models in pricing bonds.	The models exhibit wide variation in prediction errors and substantial differences in direction and intensity.	Theoretical demonstration of the mathematical and statistical context of each of the models.
Duffie and Lando (2001).	Uses a structural model to predict the hedge proportion for bonds strictly linked to the credit risk of a firm.	Returns on the company's equity and risk-free bonds explain approximately half of bond returns of the same investment grade.	Critical analysis of the model performance.
Veronesi and Zingales (2010).	Applies a reduced-form model to compute the term structure for company bonds in the case of information asymmetry.	Considering the lack of transparency, the model can verify the fall in bond prices when an issuer defaults.	Building of the Z model is evaluated stepwise, which provides an overview of the model.
Norden and Weber (2009).	Examines the behaviour of stock prices in relation to movements for CDS and bonds.	Stock prices react in the opposite direction to changes in derivative prices.	Contributes to investigation of market efficiency involving credit derivatives.
Guiso et al. (2013).	Investigates the impact of default costs for individuals and their assets.	Such costs increase with wealth and are linked to both financial and sentimental factors; there is also the possibility of contagion.	Very few papers take this strategic view when discussing default.
	Notes the sensitivity of a company's derivatives		
Ericsson et al. (2009).	Notes the sensitivity of a company's derivatives in deformation of the capital structure, taking into account volatility and the risk-free interest rate.	Confirms the theoretically supposed effect via statistical validation.	Applies default risk variables to study spreads.
Collin-Dufresne et al. (2001).	Investigates the impacts of contingent-claim and no-arbitrage standpoints on credit spreads.	A ratio of 25% was observed for movements in credit spreads associated with the probability of default and the recovery rate.	Changes in credit spreads for bonds cannot be explained by considering only financial data measures for companies or information for the securities market.
Bao et al. (2011).	Discusses the relationship between asset pricing and bond liquidity.	Illiquid bonds are strongly linked to lower asset prices and are associated with factors such as maturity, rating, and amount.	Liquidity may be explained by fluctuations in asset prices.
Jarrow and Turnbull (2000).	Tests macroeconomic variables for inclusion in a reduced-form model.	Some models are not able to observe the risk associated with derivatives; reduced-form models are sensitive to credit risk and the market, and are suitable for pricing and risk management.	Suggests that inclusion of economic variables can improve predictions of credit spreads by reduced-form models.

Table 7. Brief descriptions of the main objective, conclusions, and contribution of each article considered in this study (Continued)

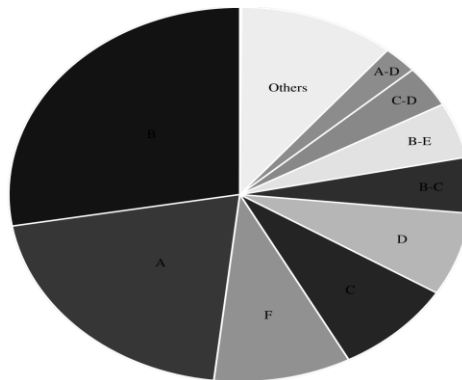
Study	Main objective	Main conclusion	Main contribution
Bhamra et al.(2009).	Develops a theoretical analysis of third-party capital costs and equity to verify the impact of macroeconomic variables on risk premia and credit spreads.	The model can determine <i>PD</i> and credit spread and simultaneously calculate premium equity and stock prices.	Proposes a relation between asset pricing and corporate finance.
Hull et al.(2004).	Evaluates the sensitivity of credit spreads to bond yields and announcements by rating agencies.	Confirms a negative relationship between credit spreads and the credit rating of firms.	Theoretical model used to study the link between credit spreads and spreads on the bond interest rate.
Almeida and Philippon (2007).	Examines the impact of corporate bond prices on the credit risk of firms.	The marginal risk-adjusted costs of financial distress and the marginal tax benefits of debt have similar volumes.	Capital structure can be influenced by insolvency costs.
Grunert et al.(2005).	Investigates the involvement of non-financial factors in internal credit ratings.	More precise prediction of the probability of default prediction when non-financial factors are included in the model.	Inclusion of non-financial measures in credit risk assessment.
Demiroglu and James (2010).	Investigates common features in <i>LBO</i> financing deals involving private equity groups.	Private equity groups with poor <i>LBO</i> reputation have a negative influence on credit spreads and financing structure.	The authors related private equity groups to <i>LBO</i> financing costs.
Zhou(2001).	Develops a reduced-form model addressing diffusion aspects from structural models.	The structural model used can be adjusted for credit spreads and reveals patterns in credit risk variables.	Risk linked to debt and credit derivatives can be assessed through default risk and interest rate risk.
Brown and Dinc(2009).	Examines the 'too big to fail' phenomenon for banks in emerging markets.	In fragile sectors, ailing banks tend to be protected by regulatory forbearance.	Role of the banking regulator in countries with an emergent market.
Dooley and Hutchison (2009).	Search for information on changes in emerging markets and credit spread default trends when default events occur in the USA.	US defaults have a significant impact on emerging markets.	Analysis based on VaR to verify links between markets.

Regarding the method used, it is noteworthy that econometrics has often been applied to time series, representing 38% of the methods used in the articles. Nevertheless, the abstract nature of theoretical studies did not affect the importance of their impact, demonstrating the need for this type of literature. We noted that computing methods and/or simulations are seldom used in studies on credit risk or even cited. A possible answer for this is the uncertainty in the outputs, i.e., there is no measure for validation or a confidence interval, as in statistical analysis. The main issue in the computing models is overfitting (When the model presents a large number of parameters and the performance does not increase or, in some cases, decreases

instead). Based on this argument, we can identify the following gap.

Gap2 : Apart from work by Chatterjee et al. (2007), Battiston et al. (2007), Allen and Carletti (2006), Tian et al. (2012), Collin-Dufresne et al. (2001), and Grunert and Weber (2009), there is a shortage of studies on credit risk that address the use of computing methods and/or simulations in depth and including validation analyses. There is indication of an increase in studies featuring this approach, but they still do not stand out as research references. It is possible that the abstract nature and innovative method, combined with the tendency for empiricism in economics and finance, are inhibitory factors.

Figure 6. Classification results for category 3, type of data source.



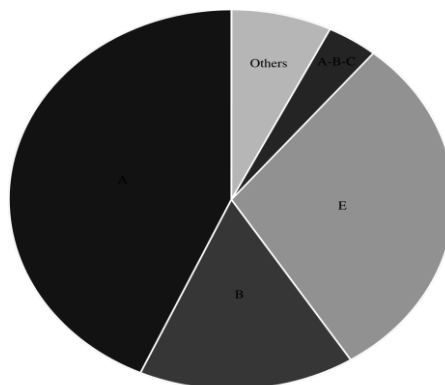
We noted a scattered distribution for the types of data applied in research, with the exception of research into companies that controls this variable. This is probably because of data availability and the difficulty in analysing data derived from financial institutions. For instance, SEE COCPAPERS. This study, if extended to many countries, might be an auspicious empirical analysis.

By contrast, macroeconomic variables are often cited in credit risk models, but they are still very

rarely applied to other subjects, even with the increase in transparency of governmental institution accounts. Therefore, the following gap is apparent.

Gap3 : The work carried out by Chen (2010) and Bonfim (2009) in analyzing macroeconomic variables when considering credit risk should be extended, especially for countries that have already made account information available.

Figure 7. Classification results for category 4, origin of the data



Results for the data origin show large concentration of research in the USA and some results for Europe, but other countries are practically unexplored. Although emerging markets may contribute more to our understanding of credit risk in the coming years, especially because they are a great source of credit risk in any situation, studies on these countries, such as Gopalan et al. (2007), are scarce. One purpose that could be more explored by

peers is a reference research involving emerging markets that have common culture and the recent crisis.

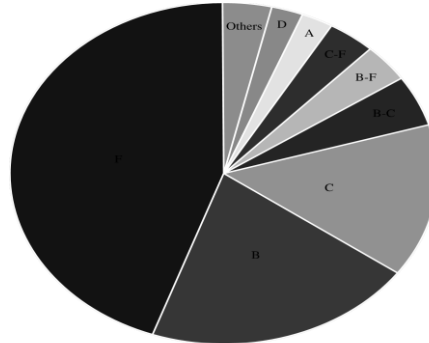
It is important to highlight that the greater collection of US data is probably explained by the intensity of the national market, the number of companies in the financial market, and the greater interest of US researchers in studying their country's characteristics, while emerging economies are very

constrained. In this sense, more research about credit risk in these markets are constantly necessary.

In the case of variables of interest, we noted that authors worked with several measures and that

the study objective was not always closely related to credit risk. However, some studies developed analyses in which some dimensions had a strategic role.

Figure 8. Classification results for category 5, variable of interest



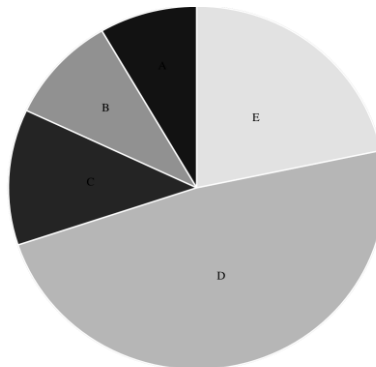
At the same time, variables were often associated to greater complexity models, demanding an attentive and sometimes subjective search. It is evident that there is a lack of publications on exposure to default in large-impact studies. Therefore, we can identify the following gap.

Gap4 : Studies on exposure to default are required that take into account the other gaps identified.

In addition, very few articles discussed LGD or the recovery rate, which is another issue that

requires research attention. It is very likely that the justification for this lack of works is associated with difficulties in obtaining data. Even in the USA, where there are a large number of data and databases, empirical results for the recovery rate are not fully publicised or widely known. In the same way, the topics of expected losses and economic capital are rarely addressed, even after the Basel II accord began to encourage banks to develop their own models to calculate capital requirements and more discussion of its implementation is required.

Figure 9. Classification results for category 9, period of analysis.



The final category is the period of analysis. The majority of articles used a data analysis period of >10 years, which indicates a tendency towards long-term analysis. Analysis over a longer time horizon allows more robust results, because statistical inferences will be more reliable and patterns that should be taken into account in future work on credit risk may become apparent.

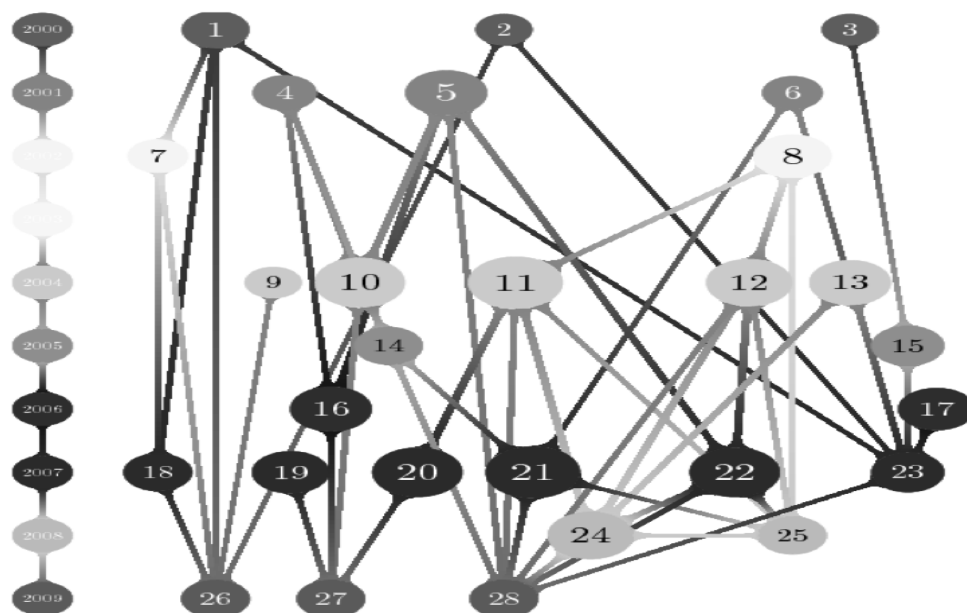
Besides our systematization to identify directions for future studies, we investigated the bibliographic references in each article using a citation-based approach. Our aim was to identify literature patterns, especially for articles that can lead to new research dimensions in the area of credit risk. The results are shown in Figure 10.

It should be noted that articles published after 2009 are not included in Figure 10. These papers are still very recent, and new studies probably chose one of the 28 articles mentioned in Table 7, as a

reference. This also indicates that the most relevant papers demonstrate greater concern regarding reference quality; thus, tools measuring the performance of scientific publications, such as the h-index and impact factor, are taken into account. This is a feature of well-elaborated, cohesive, and consistent research.

Many papers have demonstrated in the last years concerns about financial crises. Bank risks was another commented topic, and coupled to crises periods was strongly analysed. Shocks in Economy/Financial framework were also commented in the newest studies. In essence, observing in critical periods linked to particular influences provides the most of papers today. Consistent theories were not produced credit risk in the last years and seminal articles like Modigliani and Miller (1958) still persist fundamental concepts for new research.

Figure 10. Map of the references cited in the 83 articles in our database for papers with two or more citations. The size of the nodes is given by the number of selected citations, such described in Table 7.



We noted 52 connections identifying local citations, and 28 papers cited by the studies in our database had more than five annual citations. Table 8 lists the articles shown in Figure 10 and the

Number of Local Citations (NLC) and total citations (Global Number of Citations, GQC) according to the Scopus database.

Table 8. Study articles with at least two citations of other papers also included in our research (i.e., NLC ≥ 2). The last column shows the Global Number of Citations (GQC)

#	Num. Artic	Article	NLC	GQC
1	1	Crouhy et al. (2000).	2	153
2	2	Gordy (2000).	5	151
3	3	Jarrow and Turnbull (2000).	2	56
4	4	Duffie and Lando (2001).	9	201
5	5	Jarrow and Yu (2001).	3	104
6	6	Zhou (2001).	4	104
7	8	Bangia et al. (2002).	3	92
8	11	Griffin and Lemmon (2002).	5	88
9	12	Hillegeist et al. (2004).	6	176
10	13	Vassalou and Xing (2004).	8	259
11	15	Eom et al. (2003).	7	134
12	18	Jiménez and Saurina (2004).	2	45
13	21	Hull et al. (2004).	5	110
14	23	Yu (2005).	2	60
15	26	Houweling and Vorst (2005).	3	53
16	30	Zhu (2006).	4	65
17	32	Hackbarth et al. (2006).	5	69
18	33	Das et al. (2007).	7	98
19	34	Carling et al. (2007).	2	34
20	35	Duffie et al. (2007).	7	135
21	37	Jorion and Zhang (2007).	3	62
22	40	Acharya et al. (2007).	7	82
23	42	Almeida and Philippon (2007).	4	46
24	46	Bharath and Shumway (2008).	6	143
25	50	Campbell et al. (2008).	2	136
26	52	Bonfim (2009).	2	31
27	58	Chen et al. (2008).	2	38
28	60	Duffie et al. (2009).	2	60
		Sum	119	2785

Source: Scopus database

3. CONCLUSIONS

Credit risk has been increasingly studied by researchers and market practitioners. Interest in the subject is clearly justified, since financial losses of any intensity are undesirable and can cause

perspective changes, contagion, default events, and even bankruptcy in high-volume scenarios. Our study involved a systematic analysis of articles on credit risk published in the literature in the last 15 years.

Our results highlight relevant aspects of the 83 articles considered, in particular their similarities, contextualisation, and applicability in terms of the abstract, methodological analysis, and study scope. We conclude that interest in credit risk is growing (Figure 1), but applications remain concentrated on predictive modelling and credit derivatives. Economic capital, exposure to default, and LGD are areas for potential research, especially the latter, which authors consider the most relevant subject. However, the lack of data limits the consideration of LGD in empirical studies. By contrast, theoretical studies are mathematically sophisticated and their arguments create interest in future research, so they are cited very often.

This work adds important results to the academic literature and indicates some gaps that should be addressed (Section 5). These can be summarised as follows:

The concept of credit risk is highly associated with contagion. Nowadays, it has connected to economic shocks and crises.

There has been very little study of loss quantification, either as capital requirements or capital recuperated, or of the magnitude of exposure for default events. Models for predicting defaults are more frequent in the literature.

Computational models seem to be the future for studies on credit risk models in many ways, but they need more consistent results and validation measures.

Although we have contributed with a systematic review of the literature on credit risk and pointed out directions for future studies, future systematic reviews could be carried out to identify true connection networks in citation maps or bibliometric analyses, since we did not address the issue of self-citation. Tools such as the area diffusion of complex networks could be used for this purpose.

REFERENCES

- Acharya, V. V., Amihud, Y., Litov, L., Oct 2011. Creditor rights and corporate risk-taking. *Journal of Financial Economics* 102 (1), 150-166.
- Acharya, V. V., Bharath, S. T., Srinivasan, A., Sep 2007. Does industry-wide distress affect defaulted firms? Evidence from creditor recoveries. *Journal of Financial Economics* 85 (3), 787-821.
- Agarwal, V., Taffler, R., Aug 2008. Comparing the performance of market-based and accounting-based bankruptcy prediction models. *Journal of Banking & Finance* 32 (8), 1541-1551.
- Allen, F., Carletti, E., Jan 2006. Credit risk transfer and contagion. *Journal of Monetary Economics* 53 (1), 89-111.
- Allen, L., May 2004. The Basel Capital Accords and International Mortgage Markets: A Survey of the Literature. *Financial Markets Inst & Instr* 13 (2), 41-108.
- Allen, L., Jagtiani, J., Landskroner, Y., Aug 1996. Interest rate risk subsidization in international capital standards. *Journal of Economics and Business* 48 (3), 251-267.
- Almeida, H., Philippon, T., Nov 2007. The Risk-Adjusted Cost of Financial Distress. *The Journal of Finance* 62 (6), 2557-2586.
- Altman, E. I., Sep 1968. Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance* 23 (4), 589-609.
- Altman, E. I., Hotchkiss, E., 2005. *Corporate Financial Distress and Bankruptcy: Predict and Avoid Bankruptcy, Analyze and Invest in Distressed Debt*, 3rd Edition. Wiley Finance.
- Altman, E. I., Sabato, G., Sep 2007. Modelling Credit Risk for SMEs: Evidence from the U.S. Market. *Abacus* 43 (3), 332-357.
- Amato, J. D., Furfine, C. H., Nov 2004. Are credit ratings procyclical? *Journal of Banking & Finance* 28 (11), 2641-2677.
- Angelini, E., di Tollo, G., Roli, A., Nov 2008. A neural network approach for credit risk evaluation. *The Quarterly Review of Economics and Finance* 48 (4), 733-755.
- Artzner, P., Delbaen, F., Jul 1995. Default Risk Insurance and Incomplete Markets. *Mathematical Finance* 5 (3), 187-195.
- Atahau, A. and Cronje, T., 2015. Loan Portfolio Structure and Performance of Government Owned Banks in Indonesia: Does Size Matter? *Corporate Ownership & Control*, 11 (4), 379-390.
- Bangia, A., Diebold, F. X., Kronimus, A., Schagen, C., Schuermann, T., Mar 2002. Ratings migration and the business cycle, with application to credit portfolio stress testing. *Journal of Banking & Finance* 26 (2-3), 445-474.
- Bao, J., Pan, J., Wang, J., May 2011. The Illiquidity of Corporate Bonds. *The Journal of Finance* 66 (3), 911-946.
- Battiston, S., Delli Gatti, D., Gallegati, M., Greenwald, B., Stiglitz, J. E., Jun 2007. Credit chains and bankruptcy propagation in production networks. *Journal of Economic Dynamics and Control* 31 (6), 2061-2084.
- Battiston, S., Gatti, D. D., Gallegati, M., Greenwald, B., Stiglitz, J. E., Sep 2012. Default cascades: When does risk diversification increase stability? *Journal of Financial Stability* 8 (3), 138-149.
- Beaver, W. H., 1966. Financial Ratios As Predictors of Failure. *Journal of Accounting Research* 4, 71-111.
- Beber, A., Brandt, M. W., Kavajecz, K. A., Jan 2007. Flight-to-Quality or Flight-to-Liquidity? Evidence from the Euro-Area Bond Market. *Review of Financial Studies* 22 (3), 925-957.
- Begley, J., Ming, J., Watts, S., 1996. Bankruptcy classification errors in the 1980s: An empirical analysis of Altman's and Ohlson's models. *Review of Accounting Studies* 1 (4), 267-284.
- Berk, J. B., Stanton, R., Zechner, J., Jun 2010. Human Capital, Bankruptcy, and Capital Structure. *The Journal of Finance* 65 (3), 891-926.
- Bhamra, H. S., Kuehn, L.-A., Strebulaev, I. A., Oct 2009. The Levered Equity Risk Premium and Credit Spreads: A Unified Framework. *Review of Financial Studies* 23 (2), 645-703.
- Bharath, S. T., Shumway, T., Mar 2008. Forecasting Default with the Merton Distance to Default Model. *Review of Financial Studies* 21 (3), 1339-1369.
- Bielecki, T. R., Jin, H., Pliska, S. R., Zhou, X. Y., Apr 2005. Continuous-Time Mean-Variance Portfolio Selection With Bankruptcy Prohibition. *Mathematical Finance* 15 (2), 213-244.
- Black, F., Scholes, M., Jan 1973. The Pricing of Options and Corporate Liabilities. *J Polit Econ* 81 (3), 637-654.
- Bonfim, D., Feb 2009. Credit risk drivers: Evaluating the contribution of firm level information and of macroeconomic dynamics. *Journal of Banking & Finance* 33 (2), 281-299.
- Brissimis, S. N., Delis, M. D., Papanikolaou, N. I., Dec 2008. Exploring the nexus between banking sector reform and performance: Evidence from

- newly acceded EU countries. *Journal of Banking & Finance* 32 (12), 2674-2683.
27. Brown, C. O., Dinc, I. S., May 2009. Too Many to Fail? Evidence of Regulatory Forbearance When the Banking Sector Is Weak. *Review of Financial Studies* 24 (4), 1378-1405.
 28. Campbell, J. Y., Hilscher, J., Szilagyi, J., Dec 2008. In Search of Distress Risk. *The Journal of Finance* 63 (6), 2899-2939. Caouette, J. B., Altman, E. I., Narayanan, P., Nimmo, R., May 2008. *Managing Credit Risk*, 2nd Edition. John Wiley & Sons, Inc.
 29. Carling, K., Jacobson, T., Linde, J., Roszbach, K., Mar 2007. Corporate credit risk modeling and the macroeconomy. *Journal of Banking & Finance* 31 (3), 845-868.
 30. Chatterjee, S., Corbae, D., Nakajima, M., Rios-Rull, J.-V., Nov 2007. A Quantitative Theory of Unsecured Consumer Credit with Risk of Default. *Econometrica* 75 (6), 1525-1589.
 31. Chava, S., Purnanandam, A., Jun 2010. Is Default Risk Negatively Related to Stock Returns? *Review of Financial Studies* 23 (6), 2523-2559.
 32. Chen, H., Nov 2010. Macroeconomic Conditions and the Puzzles of Credit Spreads and Capital Structure. *The Journal of Finance* 65 (6), 2171-2212.
 33. Chen, L., Collin-Dufresne, P., Goldstein, R. S., Aug 2008. On the Relation Between the Credit Spread Puzzle and the Equity Premium Puzzle. *Review of Financial Studies* 22 (9), 3367-3409.
 34. Collin-Dufresne, P., Goldstein, R. S., Martin, J. S., Dec 2001. The Determinants of Credit Spread Changes. *The Journal of Finance* 56 (6), 2177-2207.
 35. Crosbie, P. J., Bohn, J. R., 2002. Modeling default risk. Tech. rep., KMV.
 36. Crouhy, M., Galai, D., Mark, R., Jan 2000. A comparative analysis of current credit risk models. *Journal of Banking & Finance* 24 (1-2), 59-117.
 37. CSFB, 1997. *Creditrisk+*: A credit risk management framework. Tech. rep., Credit Suisse First Boston.
 38. Das, S. R., Duffie, D., Kapadia, N., Saita, L., Feb 2007. Common Failings: How Corporate Defaults Are Correlated. *The Journal of Finance* 62 (1), 93-117.
 39. Davydenko, S. A., Franks, J. R., Apr 2008. Do Bankruptcy Codes Matter? A Study of Defaults in France Germany and the U.K. *The Journal of Finance* 63 (2), 565-608.
 40. Demiroglu, C., James, C. M., May 2010. The role of private equity group reputation in LBO financing. *Journal of Financial Economics* 96 (2), 306-330.
 41. Denev, A., 2014. Financial Networks As Directed Cyclic Graphs-Draft." *Corporate Ownership & Control* 11(4), 520-529.
 42. Dooley, M., Hutchison, M., Dec 2009. Transmission of the U.S. subprime crisis to emerging markets: Evidence on the decoupling - recoupling hypothesis. *Journal of International Money and Finance* 28 (8), 1331-1349.
 43. Duffie, D., Eckner, A., Horel, G., Saita, L., Oct 2009. Frailty Correlated Default. *The Journal of Finance* 64 (5), 2089-2123.
 44. Duffie, D., Lando, D., May 2001. Term Structures of Credit Spreads with Incomplete Accounting Information. *Econometrica* 69 (3), 633-664.
 45. Duffie, D., Saita, L., Wang, K., Mar 2007. Multi-period corporate default prediction with stochastic covariates. *Journal of Financial Economics* 83 (3), 635-665.
 46. Duffie, D., Singleton, K. J., Oct 1999. Modeling term structures of defaultable bonds. *Review of Financial Studies* 12 (4), 687-720.
 47. Edmister, R. O., Mar 1972. An Empirical Test of Financial Ratio Analysis for Small Business Failure Prediction. *The Journal of Financial and Quantitative Analysis* 7 (2), 1477-1493.
 48. Eom, Y. H., Helwege, J., Huang, J.-Z., Oct 2003. Structural Models of Corporate Bond Pricing: An Empirical Analysis. *Review of Financial Studies* 17 (2), 499-544.
 49. Ericsson, J., Jacobs, K., Oviedo, R., Feb 2009. The Determinants of Credit Default Swap Premia. *JFQ* 44 (1), 109.
 50. Errais, E., Giesecke, K., Goldberg, L. R., Jan 2010. Affine Point Processes and Portfolio Credit Risk. *SIAM J. Finan. Math.* 1 (1), 642-665.
 51. Foos, D., Norden, L., Weber, M., Dec 2010. Loan growth and riskiness of banks. *Journal of Banking & Finance* 34 (12), 2929-2940.
 52. Forte, S., Peña, J. I., Nov 2009. Credit spreads: An empirical analysis on the informational content of stocks, bonds, and CDS. *Journal of Banking & Finance* 33 (11), 2013-2025.
 53. Galindo, J., Tamayo, P., 2000. Credit Risk Assessment Using Statistical and Machine Learning: Basic Methodology and Risk Modeling Applications. *Computational Economics* 15 (1/2), 107-143.
 54. George, T. J., Hwang, C.-Y., Apr 2010. A resolution of the distress risk and leverage puzzles in the cross section of stock returns. *Journal of Financial Economics* 96 (1), 56-79.
 55. Giesecke, K., 2004. *Credit Risk Modeling and Valuation: An Introduction In Credit Risk: Models and Management*, Vol. 2. Riskbooks.
 56. Gopalan, R., Nanda, V., Seru, A., Dec 2007. Affiliated firms and financial support: Evidence from Indian business groups. *Journal of Financial Economics* 86 (3), 759-795.
 57. Gordy, M. B., Jan 2000. A comparative anatomy of credit risk models. *Journal of Banking & Finance* 24 (1-2), 119-149. Gordy, M. B., Howells, B., Jul 2006. Procyclicality in Basel II: Can we treat the disease without killing the patient? *Journal of Financial Intermediation* 15 (3), 395-417.
 58. Goss, A., Roberts, G. S., Jul 2011. The impact of corporate social responsibility on the cost of bank loans. *Journal of Banking & Finance* 35 (7), 1794-1810.
 59. Greenbaum, S. I., Thakor, A. V., Sep 1987. Bank funding modes. *Journal of Banking & Finance* 11 (3), 379-401.
 60. Griffin, J. M., Lemmon, M. L., Oct 2002. Book-to-Market Equity, Distress Risk, and Stock Returns. *The Journal of Finance* 57 (5), 2317-2336.
 61. Griffin, J. M., Tang, D. Y., Jul 2012. Did Subjectivity Play a Role in CDO Credit Ratings? *The Journal of Finance* 67 (4), 1293-1328.
 62. Gropp, R., Vesala, J., Vulpes, G., 2006. Equity and Bond Market Signals as Leading Indicators of Bank Fragility. *Journal of Money, Credit, and Banking* 38 (2), 399-428.
 63. Gross, D. B., Mar 2002. An Empirical Analysis of Personal Bankruptcy and Delinquency. *Review of Financial Studies* 15 (1), 319-347.
 64. Grunert, J., Norden, L., Weber, M., Feb 2005. The role of non-financial factors in internal credit ratings. *Journal of Banking & Finance* 29 (2), 509-531.
 65. Grunert, J., Weber, M., Mar 2009. Recovery rates of commercial lending: Empirical evidence for German companies. *Journal of Banking & Finance* 33 (3), 505-513.
 66. Guiso, L., Sapienza, P., Zingales, L., Jul 2013. The Determinants of Attitudes toward Strategic

- Default on Mortgages. *The Journal of Finance* 68 (4), 1473-1515.
67. Güntay, L., Hackbarth, D., Oct 2010. Corporate bond credit spreads and forecast dispersion. *Journal of Banking & Finance* 34 (10), 2328-2345.
 68. Gupton, G. M., Finger, C. C., Bhatia, M., 2007. Riskmetrics group. Tech. rep., RiskMetrics Group.
 69. Hackbarth, D., Miao, J., Morellec, E., Dec 2006. Capital structure, credit risk, and macroeconomic conditions. *Journal of Financial Economics* 82 (3), 519-550.
 70. He, Z., Xiong, W., Mar 2012. Rollover Risk and Credit Risk. *The Journal of Finance* 67 (2), 391-430.
 71. Hennessy, C. A., Whited, T. M., Aug 2007. How Costly Is External Financing? Evidence from a Structural Estimation. *The Journal of Finance* 62 (4), 1705-1745.
 72. Hertzfel, M., Li, Z., Officer, M., Rodgers, K., Feb 2008. Inter-firm linkages and the wealth effects of financial distress along the supply chain. *Journal of Financial Economics* 87 (2), 374-387.
 73. Hillegeist, S. A., Keating, E. K., Cram, D. P., Lundstedt, K. G., Mar 2004. Assessing the Probability of Bankruptcy. *Review of Accounting Studies* 9 (1), 5-34.
 74. Hoggson, N. F., 1926. *Banking through the ages*. Dodd, Mead & Company.
 75. Houweling, P., Vorst, T., Dec 2005. Pricing default swaps: Empirical evidence. *Journal of International Money and Finance* 24 (8), 1200-1225.
 76. Huang, X., Zhou, H., Zhu, H., Nov 2009. A framework for assessing the systemic risk of major financial institutions. *Journal of Banking & Finance* 33 (11), 2036-2049.
 77. Hull, J., Predescu, M., White, A., Nov 2004. The relationship between credit default swap spreads, bond yields, and credit rating announcements. *Journal of Banking & Finance* 28 (11), 2789-2811.
 78. Ivashina, V., May 2009. Asymmetric information effects on loan spreads. *Journal of Financial Economics* 92 (2), 300-319.
 79. Jabbour, C. J. C., May 2013. Environmental training in organisations: From a literature review to a framework for future research. *Resources, Conservation and Recycling* 74 (1), 144-155.
 80. Jappelli, T., Pagano, M., Oct 2002. Information sharing, lending and defaults: Cross-country evidence. *Journal of Banking & Finance* 26 (10), 2017-2045.
 81. Jarrow, R. A., Protter, P., 2004. Structural versus reduced form models: a new information based perspective. *Journal of Investment Management* 2 (2), 1-10.
 82. Jarrow, R. A., Turnbull, S. M., Mar 1995. Pricing Derivatives on Financial Securities Subject to Credit Risk. *The Journal of Finance* 50 (1), 53-85.
 83. Jarrow, R. A., Turnbull, S. M., Jan 2000. The intersection of market and credit risk. *Journal of Banking & Finance* 24 (1-2), 271-299.
 84. Jarrow, R. A., Yu, F., Oct 2001. Counterparty Risk and the Pricing of Defaultable Securities. *The Journal of Finance* 56 (5), 1765-1799.
 85. Jensen, M. C., Meckling, W. H., Oct 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3 (4), 305-360.
 86. Jiménez, G., Ongena, S., Ríos-Rull, J.-V., Saurina, J., 2014. Hazardous Times for Monetary Policy: What do Twenty-Three Million Bank Loans Say About the Effects of Monetary Policy on Credit Risk-Taking? *Econometrica* 82 (2), 463-505.
 87. Jiménez, G., Saurina, J., Sep 2004. Collateral, type of lender and relationship banking as determinants of credit risk. *Journal of Banking & Finance* 28 (9), 2191-2212.
 88. Jorion, P., Zhang, G., Jun 2007. Good and bad credit contagion: Evidence from credit default swaps. *Journal of Financial Economics* 84 (3), 860-883.
 89. Jorion, P., Zhang, G., Oct 2009. Credit Contagion from Counterparty Risk. *The Journal of Finance* 64 (5), 2053-2087.
 90. Khandani, A. E., Kim, A. J., Lo, A. W., Nov 2010. Consumer credit-risk models via machine-learning algorithms. *Journal of Banking & Finance* 34 (11), 2767-2787.
 90. Lage Junior, M., Godinho Filho, M., May 2010. Variations of the kanban system: Literature review and classification. *International Journal of Production Economics* 125 (1), 13-21.
 91. Leland, H. E., Sep 1994. Corporate Debt Value, Bond Covenants, and Optimal Capital Structure. *The Journal of Finance* 49 (4), 1213-1252.
 92. Leland, H. E., Toft, K. B., Jul 1996. Optimal Capital Structure, Endogenous Bankruptcy, and the Term Structure of Credit Spreads. *The Journal of Finance* 51 (3), 987-1019.
 93. Lin, C., Ma, Y., Malatesta, P., Xuan, Y., Apr 2011. Ownership structure and the cost of corporate borrowing. *Journal of Financial Economics* 100 (1), 1-23.
 94. Mansi, S. A., Maxwell, W. F., Miller, D. P., Sep 2004. Does Auditor Quality and Tenure Matter to Investors? Evidence from the Bond Market. *J Accounting Res* 42 (4), 755-793.
 95. Maudos, J., de Guevara, J. F., Sep 2004. Factors explaining the interest margin in the banking sectors of the European Union. *Journal of Banking & Finance* 28 (9), 2259-2281.
 96. Merton, R. C., May 1974. On the Pricing of Corporate Debt: The risk Structure of Interest Rates. *The Journal of Finance* 29 (2), 449-470.
 97. Modigliani, F., Miller, M. H., 1958. The cost of capital, corporation finance and the theory of investment. *American Economic Review* 48 (3), 261-297.
 98. Morellec, E., Aug 2003. Can Managerial Discretion Explain Observed Leverage Ratios? *Review of Financial Studies* 17 (1), 257-294.
 99. Nickell, P., Perraudin, W., Varotto, S., Jan 2000. Stability of rating transitions. *Journal of Banking & Finance* 24 (1-2), 203-227.
 100. Norden, L., Wagner, W., Dec 2008. Credit derivatives and loan pricing. *Journal of Banking & Finance* 32 (12), 2560-2569.
 100. Norden, L., Weber, M., Jun 2009. The Co-movement of Credit Default Swap, Bond and Stock Markets: an Empirical Analysis. *European Financial Management* 15 (3), 529-562.
 101. Ohlson, J. A., 1980. Financial Ratios and the Probabilistic Prediction of Bankruptcy. *Journal of Accounting Research* 18 (1), 109-131.
 102. Poon, S.-H., Oct 2003. Extreme Value Dependence in Financial Markets: Diagnostics, Models, and Financial Implications. *Review of Financial Studies* 17 (2), 581-610.
 103. Rosenberg, J. V., Schuermann, T., Mar 2006. A general approach to integrated risk management with skewed, fat-tailed risks. *Journal of Financial Economics* 79 (3), 569-614.
 104. Schaefer, S. M., Strebulaev, I. A., Oct 2008. Structural models of credit risk are useful: Evidence from hedge ratios on corporate bonds. *Journal of Financial Economics* 90 (1), 1-19.
 105. Seuring, S., Mar 2013. A review of modeling approaches for sustainable supply chain management. *Decision Support Systems* 54 (4), 1513-1520.

106. Sinkey, J. F., Mar 1975. A Multivariate Statistical Analysis of the Characteristics of Problem Banks. *The Journal of Finance* 30 (1), 21-36.
107. Taffler, R. J., Jun 1984. Empirical models for the monitoring of UK corporations. *Journal of Banking & Finance* 8 (2), 199-227. Tang, D. Y., Yan, H., Apr 2010. Market conditions, default risk and credit spreads. *Journal of Banking & Finance* 34 (4), 743-753.
108. Tian, Y., Shi, Y., Liu, X., Mar 2012. Recent advances on support vector machines research. *Technological and Economic Development of Economy* 18 (1), 5-33.
109. Vassalou, M., Xing, Y., Apr 2004. Default Risk in Equity Returns. *The Journal of Finance* 59 (2), 831-868. Veronesi, P., Zingales, L., Sep 2010. Paulson's gift. *Journal of Financial Economics* 97 (3), 339-368.
110. Wilson, T., 1997a. Portfolio credit risk I. *Risk* 10 (9), 111-117. Wilson, T., 1997b. Portfolio credit risk II. *Risk* 10 (10), 56-61.
111. Yu, F., Jan 2005. Accounting transparency and the term structure of credit spreads. *Journal of Financial Economics* 75 (1), 53-84.
112. Zhou, C., Nov 2001. The term structure of credit spreads with jump risk. *Journal of Banking & Finance* 25 (11), 2015-2040. Zhu, H., May 2006. An Empirical Comparison of Credit Spreads between the Bond Market and the Credit Default Swap Market. *Journal of Financial Services Research* 29 (3), 211-235.

“INTEGRATED” PUBLIC GROUPS: INSIGHTS ON BOUNDARIES AND DIVESTMENT OPPORTUNITIES

Vincenzo Zarone*, Alessia Patuelli**, Simone Lazzini***

*Department of Economics and Management, University of Pisa, Via C. Ridolfi 10, 56124, Pisa, Italy.

**Department of Economics and Management, University of Pisa, Via C. Ridolfi 10, 56124, Pisa, Italy.

***Department of Economics and Management, University of Pisa, Via C. Ridolfi 10, 56124, Pisa, Italy.

Abstract

This paper analyses recent tendencies of managing public real estate and public stake-holdings in a sample of Italian municipalities. The data, retrieved from the Italian Ministry of Interior (Central Department of Local Finances), has been analysed to understand if the local public group, intended in a wider sense and including both subsidiaries and real estate property, is changed over time, in terms of size and composition. The first results show that there has not been adequate divestment to postulate on a general reduction of the boundaries of the “Integrated” Public Groups.

Keywords: Local Authorities, Italy, Public Management, Real Estate, Subsidiaries, Local Public Group

JEL Code: H54 (Infrastructures, Other Public Investment and Capital Stock); R38 (Government Policy); H11 (Structure, Scope, and Performance of Government)

1. INTRODUCTION AND LITERATURE REVIEW

This research is aimed at analysing recent tendencies concerning ‘local public groups’ with specific reference to public stake-holdings in companies and local PA’s real estate portfolios.

In Italy, the phenomenon of public share-holdings in private companies began in the early 20th century. Then, both public intervention and investment grew in many economic sectors, following the crash of 1929. Such reforms were initially aimed at preventing markets from failing. However, the system ran into difficulties in the 1970s, basically because of its copious size and lack of efficiency (Buchanan & Tullock, 1962).

The Entrepreneurial PA model had been superseded with privatisations during the 1990s, also due to new obligations regarding public finances imposed by the EU (Maastricht Treaty and Stability and Growth Pact). However, divestments of public companies have fallen dramatically since 2000. Indeed, the opposite phenomenon was experienced both on a national and local level, as enterprises controlled by the Ministry of Economy and Finance and by regional, provincial and municipal authorities have continuously grown (Assonime 2008). This new trend gives local PA’s the power to interact strongly, vertically, and horizontally with other organisations (Kooiman, 1999-2000) in a framework of public governance (Pierre and Peters, 2000).

The growing phenomenon of managerial models in PA’s induced by New Public Management (Hood, 1991-1995-2001; Barzelay, 2001; Kettl, 2000) was subject to strong criticism. Pollit (1993) sees it as paving the way towards ‘Neo-Taylorism’, whilst

Lynn (2001) underlines a somewhat excessive emphasis on seeking efficiency, flanked by administrative principles that recall scientific management. Global convergences towards a NPM paradigm (Aucoin, 1990; Osborne & Gaebler, 1992) were subject to reconsiderations and criticism. Many scholars converged on the previously mentioned known as “Public Governance” (Pierre and Peters, 2000), or “New public service” (Denhardt & Denhardt, 2000), considering citizens as the target of the PA governance system. Also, some authors noted that change is received depends highly on each country’s institutional traditions (Wright, 1994). In fact, according to their tradition, each country has received NPM reforms differently. One of the reasons is that PA perception is different between different countries (Van de Walle, 2006). This can affect the choice between economic rationality and the search for social cohesion. The two ideal extremes in such trade-off are Eastern European countries, often considered latecomers in the application of NPM, and Anglo-saxon countries, that are usually considered the forerunners of NPM. These latter maintain the idea of a minimal PA (Kuhlmann, 2010). Italy is usually considered a latecomer, having adopted NPM with delays and hesitation. This is also due to its Napoleonic traditional administrative culture, which was oriented towards a strong role of the State in the economy (Kuhlmann, 2010). Some authors (Cepiku e Meneguzzo, 2011) compared Italy to Neo-Weberian paradigms, analysing how Italy has implemented recent reforms and how they differ from NPM.

These considerations support the neo-institutional approach to study changes, focusing on how institutions and organisations incorporate

values and power (Hall & Taylor 1996; Lowndes 1996).

Given the increasing importance of share-holdings or controlling interests by local PA's in companies (Unioncamere, 2007; IRPA, 2012), this research is focused on the proportions and amounts Italian municipalities have invested in thousands of companies belonging to different sectors (Corte dei Conti, 2014). The companies' inefficiencies and their recurring losses have contributed to expanding the public debts, together with the urgency and sensitivity of policy-makers to redraw the boundaries of the public group (Borgonovi et al., 2013). This topic is also relevant considering the massive cost such companies burden the state with, which amounts to approximately € 26 million for 2013, consisting of all the payments the ministries paid to the companies owned by the public sector (Corte dei Conti, 2014).

2. RESEARCH QUESTIONS

This research analyses how local authorities manage their share-holdings and real estate portfolio, considering the privatization practises (Anselmi, 2014), divestments, and new investments in subsidiaries and real estate recently performed by Italian local authorities.

This wider perspective is necessary given the complexity of local public group. In local public groups, collaboration and interaction with private entities (connected to the PA with different levels of formal agreements) can lead to greater flexibility and to increase the efficiency in addressing stakeholders' demands (Hrytsenko, 2012). In order to analyse public policy's results properly, we also need to step back to see the full picture and how the boundaries of the State changed (Bevir et al, 2003) even at the local level.

Thus, we believe that a comprehensive approach to the changes in the local integrated public group could include both the stakes held by local administrations and the real estate. By "local integrated public group", we mean both the stakes held by local administrations in companies or other entities and the real estate portfolio of local authorities.

In fact, when evaluating an institution's objectives and range of influence, both the amounts invested in stake-holdings and the real estate portfolio should be considered.

A peculiar aspect of local authorities' real estate portfolio is the 'illiquid' tendency (meaning the customary habit of divesting assets in a long-term) and the 'heterogeneous' nature of investments even from a financial standpoint.

The patrimonial consistency, both in terms of financial participation (stake-holdings in companies involved in managing public services), as well as real estate assets (disposable and non-disposable assets) is measurable for each local authority in the specific section of their financial statement.

This paper is aimed at verifying whether local authorities reduced their amounts of financial participations and real estate assets. Therefore, we will consider both the trend of investments and stakes in companies and the amounts invested in

real estate. Further considerations will follow for financial problems in local authorities, considering indexes of structural deficiency.

Specifically, Research Questions (RQ) will cover two main areas:

RQ1: How has investments' consistency by local authorities trended?

RQ1.1: How has the relation between disposable and non-disposable assets been affected? Is there a 'compensation' effect between these two aggregates?

RQ2: How have the boundaries of local "integrated" public groups changed, jointly considering investments in real estate as well as stake-holdings?

The importance of such questions is further supported by political and institutional debate, formalised in specific documents such as the Document of Economics and Finance, approved by the Government on 8 April 2014, which reintroduced the theme of privatisation and foresaw the reduction of public intervention on both national and local levels. Moreover, there have been numerous attempts at making a spending review, introduced with the Budget Law for 2007 and confirmed by Budget Law for 2008 (MEF, 2007). Legislative Decree #78 of 2010 was also aimed at reducing share-holdings of small and medium-small sized municipalities.

With the intention of rationalising expenditure, the practice of linear clean cuts needs to be overcome and replaced by different solutions that increase public efficiency, based on leaner business models that have longer-term sustainability, heading to a model where regulations are enforced by specific Authorities.

3. METHODOLOGY

This research belongs to the research field which investigate the trends in state-participated companies and in local authorities' real estate portfolio. One of its aims is to ascertain whether there is a relation between divestment in companies, deficits in the finances of local authorities, and the real estate management. Therefore, we intend to verify whether the areas covered by local public groups are being reduced in terms of divestment in stake-holdings and in real estate, especially where those municipalities are running at a loss.

This paper elaborates on these areas from an analytical-descriptive viewpoint, combining different dimensions through meta-data and secondary data (Saunders, Lewis & Thornhill, 2003), multiple research methods (Johnson, Onwuegbuzie & Turner, 2007) and concentrating on the elaboration of data through descriptive statistics. The sample of municipalities is composed of 20 Italian regional capital cities. This choice gives a representative idea of the 20 regions Italy is made up of. Moreover, regional capitals are larger and more complex than smaller cities, which provides an idea of how greater difficulties are managed.

Table 1. Description of the sample: the 20 Italian regional capital cities

<i>Sample: 20 Italian regional capital cities</i>			
Ancona	Campobasso	Milan	Rome
Aosta	Catanzaro	Naples	Trento
Bari	Florence	Palermo	Trieste
Bologna	Genoa	Perugia	Turin
Cagliari	L'Aquila	Potenza	Venice

For each municipality specific financial statement items were considered, based on the data provided by the Ministry of Interior (Central Department of Local Finance). Specifically, data was collected for the years 2010, 2011 and 2012. The need to study approved financial statements has

given on one hand reliable official data from the Ministry of Interior, but on the other has not made it possible to analyse more recent data.

The following table illustrates the data collected, divided into macro-areas, subsections, and singular items.

Table 2. Description of data collected

<i>Macro-area</i>	<i>Sub-section</i>	<i>Item</i>
Revenue	Income from sale, capital transfers, or collection of credit	Sale of real estate and building rights on real estate assets
Capital Expenditure	Liabilities	Acquisition of real estate assets
		Stake-holdings
		Transfer of capital
		Acquisition of buildings
Details of expenditure in capital account for the acquisition of real estate assets	-	Acquisition of land
		Building and maintenance of tendered works
		Total
		Tangible assets
Consistency, initiation and reimbursement of loans to institution based on their reference value in the Assets Account	Assets Account	Intangible assets
	Liabilities Account	Financial assets
		Debt towards controlled companies
		Connected companies
Management of residual liabilities and total accruals at year end	Sources of financing initiated for the interventions reported in the annual list of public works	Transfer of Real Estate Assets
		Total

The financial information was then integrated with the resident population's data for each municipality as at 2012 (source: Ministry of Interior).

Most of the data was analysed using descriptive statistics to identify general patterns for each municipality.

4. RESULTS

In this paragraph we present the data collected and elaborated in order to try to sketch a first answers to the research questions.

RQ1: How has investments' consistency by local authorities trended?

Table 3. Average aggregated assets value

	<i>Average 2010</i>	<i>Average 2011</i>	<i>Average 2012</i>	<i>% 2010-2012</i>
A) Assets (total)	2.787.425.069,25	2.896.855.347,85	2.973.193.040,03	6,66%
Intangible assets	3.917.302,85	3.463.318,00	3.147.733,74	-19,65%
Tangible assets -Of which:	2.308.746.136,80	2.437.033.002,95	2.532.637.900,35	9,70%
1. State-owned goods	453.475.857,00	483.645.110,35	516.222.188,60	13,84%
2. Land (non-disposable assets)	55.155.468,60	58.796.674,45	59.563.959,61	7,99%
3. Land (disposable assets)	13.717.627,15	12.423.998,65	12.694.682,92	-7,46%
4. Buildings (non-disposable assets)	755.704.218,55	719.502.079,90	748.371.379,11	-0,97%
5. Buildings (disposable assets)	77.505.743,95	98.153.418,10	102.182.076,54	31,84%

To ascertain the amount of fixed assets, we collected and analysed data in different sections, firstly considering tangible and intangible assets. The total assets (tangible and intangible) for 2012 was an average of € 2,973,193,040.03 (totalling € 59,463,860,800.52). This was an increase of 6.66% (+ € 185,767,970.77) from the initial amount at the start of the study in 2010.

This increase can be partly explained by breaking the numbers down into their components. Concerning intangible assets, there was a decrease over the three-year period: from € 3,918,302.85 to € 3,147,733.74 between 2010 and 2012. This amounts to a reduction of 19.65% (- € 769,569.11). This was

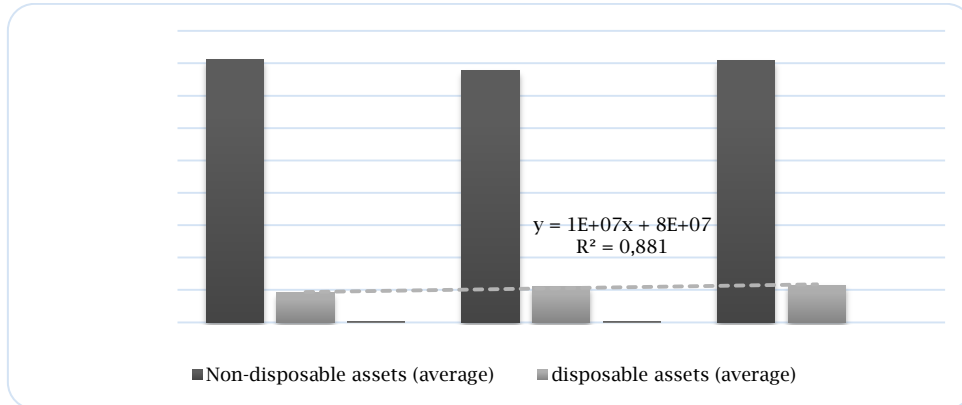
compensated by increasing tangible assets: a 9.7% increase from 2010 to 2012 (+ € 223,891,763.55).

The dynamics of tangible assets can be explained in the financial statements of the local authorities by five items: state-owned property (non-disposable), land (non-disposable assets), land (disposable assets), buildings (non-disposable assets), and buildings (disposable assets). Data was initially analysed collectively, to identify a trend, and then each municipality was taken into separate consideration, to ascertain the presence of any variances between non-disposable and disposable assets.

State-owned property increased in value from € 453,475,857.00 to € 516,222,188.60 (+13.84% or € 62,746,331.60), land relating to non-disposable assets jumped from € 55,155,468.40 to € 59,563,959.61 increasing by 7.99% (+ €

4,408,491.01). On the other hand land disposable assets dropped from € 13,717,627.15 to € 12,695,682.92 over the period (-7.46% or - € 1,022,944.23).

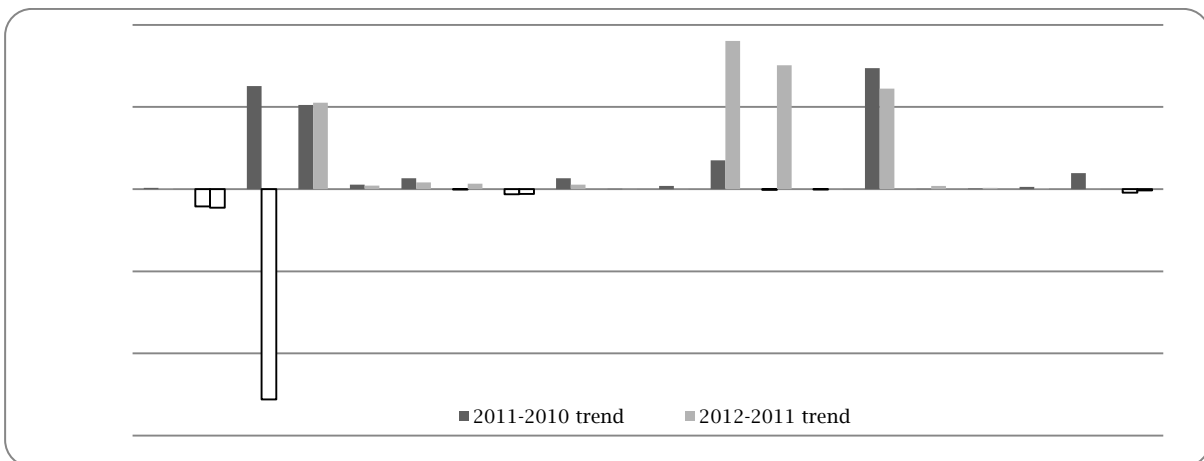
Table 4. Disposable and non-disposable assets; trend 2010-2012



Regarding buildings, the non-disposable assets for each municipality in consideration decreased collectively by 0.97% in the three-year period (from € 755,704,218.55 to € 748,371,379.11 for a variation of - € 7,332,839.44); building disposable assets, on the other hand experienced a different trend jumping 31.84% (from € 77,505,743.95 to € 102,182,076.54 and a difference of + € 24,676,332.59).

The research focused, then, on variations in total fixed assets for each municipality. In this initial stage, aspects such as differences between tangible or intangible assets were not taken into consideration. First results clearly show that 13 out of the 20 municipalities in consideration had steadily increased their fixed assets in the last 3 years. Four had alternating trends, and three (Turin, Bologna and Cagliari) had continuously reduced their fixed assets.

Table 5. Variation of total fixed assets for each municipality in the sample



About the “Source of financing for public works from the annual plan” (source: database of Italian Ministry of Interior), the data regarding “Sale of fixed assets carried out” has been related to the “total” amounts from sources of financing.

The aim was to understand how much of the local authority’s fixed assets has been sold to finance the construction of new public works.

Other forms of financing (not considered in this analysis) that is possible to activate to realize the public works listed in the annual plan, are, for instance: mortgaging, “income from building permits”, “contributions from public service bodies”,

“income from transfers of private capital”, “administrative profit”, “revenue from finances other than contributions”, and “other forms of financing”. Data was analysed both by year and by individual municipality. The ratio gives 4.78% in 2010, 5.4% in 2011, and 5.36% in 2012. On average, a relatively low amount (5.18%) of new public works are financed by sale of fixed assets.

However, there are some exceptions to the average in the cases of Bologna, Florence, Perugia, and Ancona, whose percentages were above a 10% ratio (reaching an average 17% for the three-year period in Ancona).

Table 6. Sale carried out and source of financing for public works for each municipality; 2010-2012

Municipalities	Sale of assets carried out			Total source of financing for public works (from the annual plan of public works)		
	2010	2011	2012	2010	2011	2012
Aosta	0	0	0	0		232.071
Turin	150.000	0	0	43.917.691	70.575.969	65.260.111
Genoa	956.180	0	0	117.392.070	88.192.223	2.791.846
Milan	857.600	16.406.706	6.500.000	596.780.364	387.397.956	260.943.495
Trento	0	0	0	0	0	0
Venice	555.000	850.000	310.500	44.001.464	57.451.550	51.675.268
Trieste	2.179.534	4.186.980	2.967.616	53.626.942	33.503.246	31.217.143
Bologna	6.545.645	7.188.784	568.052	58.768.763	34.671.898	6.329.578
Florence	12.925.752	3.839.193	1.030.879	70.106.098	47.499.157	22.269.564
Perugia	1.096.110	492.296	135.730	8.431.762	10.329.896	426.930
Ancona	1.454.897	2.268.704	1.738.179	12.162.700	13.785.702	6.925.753
Rome	14.581.114	50.375.955	22.250.109	574.553.855	1.157.447.010	1.598.576.180
L'Aquila	650.565	39.000	350.000	17.197.330	181.564.555	3.350.000
Campobasso	0	0	0	3.925.062	3.510.600	1.871.086
Naples	0	0	0	91.704.484	7.760.000	9.128.257
Bari	101.000	444.124	292.500	40.415.690	27.867.408	22.763.420
Potenza	0	0	0	10.508.256	14.251.677	28.026.602
Catanzaro	196.299	1.142.162	102.655	43.110.781	16.486.480	34.437.298
Palermo	0	0	0	0	11.712.845	0
Cagliari	2.632.581	3.753.052	0	20.173.410	23.404.834	1.018.891

The analysis also focused on ascertaining the presence of an opposing trend between the variations of disposable and non-disposable assets for each municipality.

RQ1.1: *How has the relation between disposable and non-disposable assets been affected? Is there a 'compensation' effect between these two aggregates?*

The research attempted to ascertain whether there were any relations between disposable and non-disposable assets, in order to identify any compensatory phenomena between the two that might exist. The opposing variations for each municipality were recorded for the two periods (2010-2011 and 2011-2012).

For the 20 municipalities in the 2010-2011 period, the analysis showed in 7 cases an opposing trend in the variation of disposable and non-disposable assets, but these variations do not have a significant compensatory effect (no data available for the municipality of Aosta).

About the, the research aimed also to deepen the internal sub-division of the category "fixed assets" on Land and Buildings, trying to understand whether there were any relations between disposable and non-disposable assets specifically for land and buildings.

For the 20 municipalities in the 2010-2011 period, opposing variations between disposable and non-disposable land were 7, while there were only 5 for the same item in 2011-2012. Summarily, as far as land is concerned, on 40 observations (20 municipalities times two periods), the analysis showed 12 cases of an opposing trend. Despite this, these variations do not have a compensatory effect.

However, an increase in value for non-disposable assets for land emerged: 13 municipalities witnessed a rise. Only Ancona was subject to a constant reduction in non-disposable assets for land for the period in question. Lastly, the remaining three municipalities had alternating trends.

Regarding variations in land disposable assets, it is harder to identify a univocal trend. Indeed, six municipalities have constantly reduced their assets, six have constantly increased them (sometimes in very small quantities), while seven municipalities have had alternating trends throughout the three-years period.

Regarding buildings, there was no clear trend regarding how non-disposable assets were managed. Eight municipalities constantly reduced their non-disposable assets for buildings, while a mere three had continuously increased. Other eight had alternating trends.

Regarding disposable fixed assets such as buildings, however, nine municipalities show that they have reduced their portfolio during the three-year period in question. Five municipalities, on the other hand have progressively increased, while a further five have had an alternating administration.

About divestment/acquisition of disposable and non-disposable building assets, in the 2011-2010 period, there were three municipalities that had decreasing values for disposable and non-disposable building assets, while there were ten in the 2012-2011 period. Similarly for assets relating to land, out of 40 observations regarding buildings in the two time periods only 13 showed a drop. However, these variations between disposable and non-disposable building assets don't compensate each other in each municipality.

Before analysing the trends between real estate assets and stake-holdings in the sample municipalities, it is important to recall some premises from the previous research question. Firstly, graphs 11 and 12 show a descriptive statistical analysis regarding the variations in fixed assets.

Different tendencies arise from stake-holdings analysis. Only five municipalities have increased their stake-holdings over the three-year period, while seven have reduced them. Six municipalities have had alternating trends in the same three-year period. The three municipalities that had constantly reduced their real estate assets in the previous analysis, had similar behaviour for stake-holdings: two out of three (Turin and Cagliari) had decreased stake-holdings throughout the three years, while Bologna had had a reduction in 2010-2011, that was significantly countered in 2011-2012.

We also compared variations between fixed assets (excluding stake-holdings) and stake-holdings (total) for the three-year period.

Table 7. Non-disposable and disposable assets variation for each municipality; 2010-2012

<i>Municipality</i>	<i>non-disposable assets variation</i>	<i>disposable assets variation</i>
Aosta	0	0
Turin	-49.548.821	-396.063.283
Genoa	26.707.875	-732.952.812
Milan	47.486.152	252.140.784
Trento	33.602	2.635.158
Venice	-16.467.104	-40.164.062
Trieste	-11.592.777	-3.631.455
Bologna	2.688.814	-75.010.937
Florence	-5.306.510	3.226.648
Perugia	-2.920.967	813.833
Ancona	24.739.449	-64.856.217
Rome	-6.587.914	-106.543.087
L'Aquila	-2.743.179	699.414.728
Campobasso	-498.326	74.441
Naples	455.505.739	452.222.851
Bari	7.171.823	293.719
Potenza	2.297.902	40.678.146
Catanzaro	-3.977.643	-4.323.138
Palermo	-185.029	-87.654.082
Cagliari	6.264.682	1.211.797

Table 8. Fixed assets (except financial assets) and financial assets variation for each municipality; 2011-2010 and 2012-2011.

	<i>Fixed assets (total except financial assets)</i>		<i>Financial assets (total)</i>	
	<i>Variation 2011-2010</i>	<i>Variation 2012-2011</i>	<i>Variation 2011-2010</i>	<i>variation 2012-2011</i>
Aosta	4.876.756,00	3.099.182,35	3.350.000,00	0,00
Turin	-3.604.241,00	-87.167.573,73	-102.179.737,00	-25.319.159,53
Genoa	627.118.916,00	-1.151.359.814,84	-268.556,00	-128.550.318,21
Milan	471.702.949,00	463.745.030,51	40.282.182,00	61.834.865,70
Trento	27.256.108,00	21.776.756,34	0,00	-491.671,67
Venice	74.966.948,00	50.853.961,04	-8.631.263,00	-10.057.145,20
Trieste	-2.771.680,00	32.478.032,97	79.910,00	-1.063,42
Bologna	-31.710.029,00	-40.444.601,80	-200.000,00	11.649.203,66
Florence	60.041.766,00	21.200.224,68	5.491.225,00	6.389.176,83
Perugia	2.335.859,00	2.019.668,07	-6.241,00	-2.884,91
Ancona	20.233.295,00	657.658,27	-283.615,00	27.556,44
Rome	71.126.523,00	1.138.428.644,86	103.834.860,00	-237.307.018,45
L'Aquila	-3.838.044,00	750.095.881,30	106.886,00	3.966.067,50
Campobasso	-76.991,00	787.320,79	-50.000,00	-0,18
Naples	734.021.432,00	631.263.243,00	1.632.423,00	-18.854.254,00
Bari	-4.328.680,00	19.869.859,30	6.568.083,00	-1.114.899,15
Potenza	428.712,00	7.000.118,44	2.640.624,00	35.957,31
Catanzaro	13.091.934,00	10.728.369,06	0,00	-5.132.432,09
Palermo	98.044.550,00	6.001.647,09	-852.247,00	-3.958.610,56
Cagliari	-21.825.045,00	-6.936.053,15	0,00	-457.081,10

RQ2: How have the boundaries of local “integrated” public groups changed, jointly considering investments in real estate as well as stake-holdings?

We performed this analysis using the same criteria adopted to observe the trends between disposable and non-disposable assets. The purpose was to understand whether there were any trends between reducing real estate and other fixed assets and divestment of stake-holdings (financial assets).

Similar variations between fixed assets (excluding stake-holdings) and stake-holdings (total) in the 2010-2011 period were 12 (Aosta, Turin, Milan, Trento, Bologna, Florence, Rome, Campobasso, Naples, Potenza, Catanzaro), while there were nine in the 2011-2012 period (Aosta, Turin, Genoa, Milan, Florence, Ancona, L'Aquila, Potenza, Cagliari). Despite this, whilst finding similar trends for the two periods, when analysing the period as a whole, only six municipalities follow the same trend regarding fixed assets (non-financial) and stake-holdings.

Of these six, four tend to increase their “integrated” public group, while only two tend to be

reducing. The results don't reveal any significant trend concerning increases or reductions to real estate assets and stake-holdings: therefore there are no clear evidences supporting a strong will to reduce the boundaries of the “integrated” local group, even if this would be the trend to pursue according to literature contributions and to ongoing legislation.

5. CONCLUSION

Overall, the results shown in previous paragraphs detail a poor propensity to divest stake-holdings, notwithstanding the urges to do so from ongoing legislation and regulatory bodies (see Law 244/2007, aimed at eliminating from the boundaries of local public groups those “companies whose purpose is to produce goods and services not strictly necessary for the pursuing institutional goals”).

However, when thinking on how to implement effective spending review processes, such reforms should be deeply linked to the redefinition of the boundaries of public groups (local and non). Also, an appropriate distribution of competences and

responsibilities for each level of governance and an identification and prioritization of the objectives of public administration are essential for creating sustainable collective welfare model.

The first question of the research was aimed at ascertaining any relation or opposing trend between disposable and non-disposable assets for both land and buildings. Generally speaking, for the periods 2010-2011 and 2011-2012, a slight variation for land, shows there might be a compensatory phenomenon between the two items. However, the variations show that the two do not compensate each other perfectly. We looked for similar trends in buildings. In the three-year period total amounts did not vary far from the variations to land, showing less movements possibly due to compensations. On the whole, it is not possible to maintain a compensatory phenomenon between disposable and non-disposable assets for land or buildings.

The second question was aimed at establishing the development of "integrated" local public group boundaries, considering the trends of real estate assets and stake-holdings in local institutions. We compared real estate assets (excluding stake-holdings) and (total) stake-holdings, to ascertain whether there were any parallelisms in the divestment or increase in integrated local groups. On the whole, there was no clear trend of a reduction in integrated local public groups: in most cases the municipalities have not followed a unique strategy of increasing or decreasing their boundaries in terms of stake-holdings or real estate assets.

Amongst the sample, only two municipalities (Turin and Cagliari) have constantly reduced both stake-holdings and real estate assets throughout the period. Again, this shows a low propensity to reduce the boundaries of the local public group.

6. LIMITS OF RESEARCH AND FUTURE DEVELOPMENTS

The results of this research, instead of showing clear trends of either acquisition or divestment, highlighted how larger municipalities behave differently in Italy (Milan, Roma, and Naples in particular, but also Turin and Genoa), compared to other regional capitals that have less significant variations in their real estate assets and stake-holdings.

There are two possible roads ahead for future research. The first one could focus the attention on specific case-studies, using a wide range of quantitative and qualitative data. This would mean that future research would be on a narrower range of cities, specifically those hereinbefore mentioned, for a deeper analysis possibly over a wider time frame. Alternatively, future research could include a wider sample of cities, for example considering those with more than 60,000 inhabitants, to understand the difficulties regarding institutional financing. These developments could help to put the premises to draft a roadmap for redefining integrated local public group boundaries. It could be interesting to understand what are the most important factors driving the changes, if endogenous factors are prevalent (tied to strategic choices or contingencies due to lack of resources), or whether divestment of real estate assets and stake-

holdings depends exclusively on regulatory pressure.

REFERENCES

1. Anselmi, L. (2014), *Percorsi aziendali per le pubbliche amministrazioni*. Edizione rivista ed ampliata. Studi di economia e politica aziendale (Vol. 18), Giappichelli, Torino.
2. Assonime (2008), *Principi di riordino del quadro giuridico delle società pubbliche*, Roma.
3. Aucoin, P. (1990), "Administrative reform in public management: paradigms, principles, paradoxes and pendulums", *Governance*, (3), 115-137.
4. Barzelay, M. (2001), *The New Public Management*, University of California Press, Berkeley.
5. Bevir, M., Rhodes, R. A. W. and Weller, P. (2003), "Tradition of Governance: Interpreting the Changing Role of the Public Sector", *Public Administration*, 81(1), 1-17.
6. Borgonovi, E., Fattore, G., and Longo, F. (2013), *Management delle istituzioni pubbliche*. Terza edizione, Egea, Milano.
7. Buchanan, J., and Tullock, G. (1962), *The calculus of consent - Logical foundations of constitutional democracy*, University of Michigan Press, Ann Arbor.
8. Cepiku, D. and Meneguzzo, M. (2011), "Public administration reform in Italy: a shopping-basket approach to the new public management or the new Weberianism?", *International Journal of Public Administration*, 34(1-2), 19-25.
9. Corte dei Conti (2014), *Gli organismi partecipati dagli enti territoriali*, Roma.
10. Denhardt, R. B. and Denhardt, J. V. (2000), "The New Public Service: Serving Rather than Steering", *Public Administration Review*, 60(6), 549-559.
11. Hall, P., and Taylor, R. (1996), "Political science and the three new institutionalisms", *Political Studies*, (42), 936-957.
12. Hood, C. (1991), "A public management for all season?", *Public Administration*, 69(1), 3-19.
13. Hood, C. (1995), "The "New Public Management" in the 1980s: variations on a theme", *Accounting Organization and Society*, 20(2/3), 93-109.
14. Hood, C. (2001), "Convergence: the useful myth?", *Public Administration*, 79(4), 933-947.
15. Hrytsenko L. (2012), "Public-Private Partnership: World Practice and Ukrainian Perspectives", *Corporate Ownership and Control*, 9 (2), pp. 515-518.
16. IRPA, (2012), *Il capitalismo municipale*, Rapporto n. 1/2012.
17. Johnson, R., Onwuegbuzie, A., and Turner, L. (2007), "Toward a definition of mixed methods research", *Journal of Mixed Methods Research*, 1(2), 112-133.
18. Kettl, D. F. (2000), *The global public management revolution: a report on the transformation of governance*, Brookings Institution Press, Washington.
19. Kooiman, J. (1999), "Social-political governance: overview, reflections and design", *Public Management Review*, 1(1), 67-92.
20. Kooiman, J. (2000), "Societal Governance: levels, models, and orders of social-political interaction", in J. Pierre (Ed.), *Debating governance: authority, steering and democracy*. Oxford University Press.
21. Kuhlmann, S. (2010), "New Public Management For The "classical Continental European Administration": Modernization At The Local Level In Germany, France And Italy", *Public*

- Administration, 88(4), 1116-1130. doi:10.1111/j.1467-9299.2010.01869.x.
22. Lowndes, V. (1996). "Varieties of new institutionalism: a critical approach". *Public Administration*, 74(2), 181-197.
 23. Lynn, L. (2001), "The myth of bureaucratic paradigm: what traditional public administration really stood for", *Public Administration Review*, 61(2), 144-160.
 24. Osborne, D., and Gaebler, T. (1992), *Reinventing Government: How the Entrepreneurial Spirit is Transforming the Public Sector*, Addison-Wesley, Reading.
 25. Pierre, J., and Peters, B. G. (2000), *Governance, politics and the state*, Macmillan, London.
 26. Pollitt, C. (1993), *Managerialism and the public services: the Anglo-American experience*, Basil Blackwell, Oxford.
 27. Saunders, M., Lewis, P., and Thornhill, A. (2003), *Research Methods for Business Students* (3rd ed.), FT Prentice Hall, Harlow.
 28. Stiglitz, J. E. (1992), *Il ruolo economico dello Stato: un saggio*, Il Mulino, Bologna.
 29. Unioncamere (2007), *Le società partecipate dagli enti locali*, Rapporto 2007.
 30. Van de Walle, S. (2006), "The impact of public service values on services of general interest reform debates", *Public Management Review*, 8(February 2015), 183-205. doi:10.1080/14719030600587422.
 31. Wright, V. (1994), "Reshaping the State: the implications for public administration", *West European Politics*, (17), 102-134.

BOARD GOVERNANCE, OWNERSHIP STRUCTURE AND FINANCING DECISIONS IN EMERGING MARKET

Md Safiullah*

*Assistant Professor, Department of Banking and Insurance, University of Dhaka, Bangladesh

Abstract

This paper aims to contribute to the corporate governance literature by examining the effects of board governance and ownership structure on financing decisions in an emerging country context. Using hand collected corporate governance data from a panel sample of 110 publically-listed firms in Bangladesh over 2009-2012, this study finds that the corporate debt ratio is not related to standard board of directors mechanisms. The results indicate that board of directors play little role in resolving conflicts in an environment with the presence of strong principal-principal agency conflict. The study also finds no evidence of institutional investors' activism in a manner that is consistent with the goals of other outside stockholders due to the weak regulatory and market discipline. This empirical evidence from the principal-principal agency conflicts (conflict of interest between majority shareholders and minority shareholders) offers insights to policy makers in emerging countries interested to protect minority shareholders' rights and to ensure effective corporate governance of capital structure decisions.

Keywords: Ownership Structure, Emerging Markets, Corporate Board

1. INTRODUCTION

The field of corporate governance addresses a wide variety of topics with firm performance as focus. But a significant issue in corporate governance in recent years has been how to resolve the agency problem of financing in large corporations, particularly, after the collapse of major corporations in developed countries (e.g., Enron, WorldCom, Bear Sterns, Lehman Brothers). More recently, similar issues have been highlighted in major corporations in developing countries (e.g. Petrobras in Brazil). Therefore, this paper attempts to examine the effect of corporate governance mechanisms on financing decisions in publicly listed firms in Bangladesh.

The link between corporate governance and debt financing has been an issue of concern in both the corporate governance and corporate finance literatures (Morellec et al.2012;Cain and Mckeon,2014). The extant literature has found that agency conflicts have a strong influence on capital structure decisions of the firm (Jensen and Meckling, 1976; Shleifer and Wolfenzon, 2002). Researchers have extensively investigated the impact of ownership structure (e.g., management ownership, institutional ownership, block holders ownership) on capital structure decisions (Kim and Sorenson,1986; Vivek, Young and Myungsoo, 2012; Erwan , Boris and Norman, 2012; Bathala, Moon and Rao, 1994; Magdalena, 2012; Fosberg, 2004, Chen and Steiner,1999). However, there have been few studies that have considered the impact of board governance and ownership structure on debt financing decisions (Monks and Minow, 2004; Dailly and Dalton, 2003) and even less research has been carried out to investigate this relationship in emerging country context.

The issue of agency problem in debt financing is particularly significant in emerging economies. It has been found that principal-principal agency conflicts between dominant insider shareholders (or directors/promoters) and outsider minority shareholders are much more prevalent in emerging economies (La Porta, Lopez and Shleifer,1999; Claessens et al., 2000, 2002;Young et al.2008) than in the countries of dispersed shareholders as pictured by Berley and Mean (1932). Therefore, insider shareholders have incentives and the ability to expropriate outsider shareholders. Studies have shown that dominant insider shareholders in emerging economies employ management from their own block and strategically use debt to expropriate outsider minority shareholders (Harvey, Lins and Roper, 2004; Faccio, Lang and Young, 2001).

The expropriation risks can be minimized with an efficient capital market, strong regulatory institution and effective corporate governance. However, the lack of well-developed capital markets and weak regulatory institutions in emerging economies places a greater reliance on internal corporate governance mechanisms in resolving agency problems in corporate financing. A particular issue in emerging markets is that ownership and control are often not fully separated and the controlling shareholders in firms have significant power. Therefore, the board's role is crucial in safeguarding the interests of minority shareholders (Bebchuk and Hamdani, 2009).

Previous studies explore a subset of known corporate governance variables. But we know that individual governance mechanisms do not work in isolation but are often interrelated at different levels of analyses. Therefore, we tested the direct effects of for each set of board and ownership structure

variables against debt financing decision. We then tested interaction effects between variables and thus contribute to the field by analysing the possible interactions among these actors to explore how they might matter in financing decision. The latter represents an area of literature that has been largely unexplored in a systematic way.

This paper is the first to comprehensively examine the direct and interaction effect of board governance, ownership structure on financing decisions in an emerging country context. The rest of this paper follows this introduction with an overview of the corporate governance context in Bangladesh, a theoretical and empirical literature review, research methodology, empirical results and discussion and conclusion.

2. CORPORATE GOVERNANCE IN BANGLADESH

It is important to note that there are significant differences between the corporate governance context in Bangladesh and other developed economies. The Companies Act 1994 and Banking Companies Act 1991 and SEC Act 1993 are the main regulatory framework of Bangladesh. The Bangladesh Securities and Exchange Commission (hereafter BSEC) issues the corporate governance codes for listed firms.

The listed companies of Bangladesh are a mix of government and private companies, joint ventures and multinational enterprises dominated by family owned companies (Farooque et al. 2007). Family-based boards of directors/sponsors have more controlling ownership (up to 50%; see company Act, 1994) and influence in policy decisions. Even though institutions hold significant ownership rights in many companies, these are also family-run institutions. Minority shareholders have fewer legal protections from the expropriation of corporate insiders.

The accounting system of Bangladesh is similar to that followed in developed economies and can be categorized as operating at a satisfactory level (Karim and Ahmed, 2005). However, the ownership structure differs from Anglo-Saxon countries (e.g., UK, USA, Australia). The operational control of the company mostly resides with family controlled boards that intensify information asymmetry problems. Therefore, agency conflict between dominant shareholders (directors/promoters) and minority shareholders is more acute than between management and shareholders (Oman et al., 2003).

In this regard, the BSEC promulgated a corporate governance code and compliance order for listed companies in 2006 to protect the rights of minority shareholders and to make firms more accountable and transparent in their financial and nonfinancial transactions. This order is primarily centered on the insider system of corporate governance (board composition and structure). Moreover, the stock market is less liquid, firm size is much smaller, firms are highly dependent on bank finance even the tax system is also different from other developed countries. Previous studies show that differences in ownership structure, market characteristics and legal environment have significant impacts on financing decision of firms (Faccio, Lang and Young, 2001; La Porta, Lopez and Shleifer, 2000). Given the above differences between

corporate governance system in developed and developing countries the motivation for this study is to examine whether the corporate governance mechanisms in Bangladesh play a role in resolving agency conflicts between dominant shareholders (directors/sponsors in Bangladesh) and minority shareholders in relation to debt financing and whether the factors which have found to be significant in developed countries hold in a developing country like Bangladesh.

3. REVIEW OF PREVIOUS RESEARCH

Debt financing has become an integral part of the mainstream research literature in corporate finance because of its impact on firm performance and value. For instance, Modigliani and Miller (1963) argue that debt increases the value of the firm and return on equity because of its tax deductible feature. Ghosh and Doocheol (2010) state that debt financing considerably affects organizational survival, growth and earnings quality. Scott (1977), Chang and Rhee (1990), Harris and Raviv(1991), Ozkan (2001) provide evidence that debt financing tends to provide a positive signal of management performance and efficiency. In contrast, Hamada (1969) argues that the debt ratio is positively associated with cost of new equity financing and risks faced by shareholders. Debt ratio beyond the optimal level increases the risk of investment, reduces further access to capital and reduces firm performance and reputation (Cantor, 1990; Whited, 1992 also see Enron case).

It is evident that debt financing also creates agency conflicts as the objectives of shareholders and managers may differ. One view in the literature is that self-interested managers generally prefer to use less debt than the shareholders expect to avoid further monitoring from the lender and their self-interest seeking behaviour tends to lead to a capital structure which is not in the best interests of shareholders (Hart and Moore, 1995; Jensen, 1993). Capital structure, therefore, depends on the severity of agency conflict (Fischer, Robert and Josef, 1989). Managers' self-interest sometimes leads to underinvestment or sub-optimal investment decisions (Shleifer and Vishny, 1989), results in more control over the firm's resources and lowers returns for shareholders (Harris and Raviv, 1990; Jensen and Meckling, 1976). Managers also tend to dislike debt capital as it increases firm risk (Berger, Ofek and Yermack, 1997), reduces the possibilities for potential fund diversion and reduces available free cash flow because of covenants and fixed financial obligation (Jensen and Meckling, 1986; Erwan, 2004). In contrast, equity investors tend to prefer more use of financial leverage, which is likely to be at odds with managerial preferences. In other cases, managers may take on excessively high debt in order to protect firm profits, for example, where the firm is in financial distress (Opler and Titman, 1994) and managerial compensation is linked to firm performance (John and John, 1993).

Corporate governance mechanisms are a means to discipline such managerial excesses. Luo (2007) categorizes corporate governance mechanisms on the basis of market, discipline and culture, but this classification itself incorporates broad components which can also be characterized under internal and

external mechanisms. Internal governance mechanisms govern the functioning of senior management where the board is seen as an independent institution and an apex body of the internal control system. Internal mechanisms of corporate governance include the characteristics of the board (e.g. board size, composition of the board, board diversity, board orientation), CEO duality, managerial ownership, institutional shareholding, management compensation and incentive plans (Cremers and Nair, 2005; Gillan, 2006). External governance mechanisms are embedded with the rules, laws, and factors that influence the operations of a firm from the perspective of capital providers i.e. shareholders and debt-holders. External mechanisms are used to evaluate all firms in the same jurisdiction while internal mechanisms are firm specific and are used to evaluate the individual firm and very useful for investment decision. These are viewed as effective in resolving agency conflict or deterring corporate managers seeking self-interest on a macro-economic or market-wide level (Shleifer and Wolfenzon, 2002; Shleifer and Vishny, 1997). Both types of governance mechanisms complement each other rather than substitute for each other and work together in a system to stimulate the long-term returns and governance of firms (Cremers and Nair, 2005). However, owing to the weak external governance mechanisms in Bangladesh, this research study focuses on the internal governance mechanisms

4. DETERMINANTS OF CAPITAL STRUCTURE

Existing research literature on corporate governance mechanisms and financial leverage has the following two strands. Firstly, financial leverage itself plays a role as a corporate governance mechanism to resolve the shareholder-management conflict. Financial leverage increases engagement of the bond market, credit rating agencies, banks and financial institutions and relies on covenants to discipline self-interest seeking managerial behavior. Secondly, strong corporate governance practices increase the firm's value, reduce the cost of debt financing, and hence lead to more debt (Jensen and Meckling, 1986). However, the impact and the relationship between capital structure and governance mechanisms depend on the structure of the financial market and, of course, on the extent of debt financing in the firm.

Florackis and Ozkan (2009) provide strong evidence of a significant effect of corporate governance practices on capital structure. It can be expected to reduce agency conflict and discipline management to act for the best interests of the shareholders and resolve low debt problems (Erwan Boris and Norman, 2012; Berger, Ofek and Yermack, 1997). Corporate governance can also be used as a risk and cost mitigation tool. The idea is that default risk is an important determinant of debt cost and corporate governance mechanisms can minimize factors causing default risk e.g., informational risk, agency risk, etc. Therefore, corporate governance influences both cost reduction and reduction of risk. According to Bhojraj and Sengupta (2003) effective corporate governance reduces agency costs and improves managerial performance resulting in a lower default risk. In

addition, good governance plays a role in reducing the cost of debt financing, reducing credit risk and maximizing utilization of available resources. Corporate governance practices also reduce information asymmetry by disclosing credible financial and operational information (Ajinkya, Bhojraj and Sengupta, 2005). It can ensure a balanced capital structure decision and sustainable development of the firm which protects the rights of principals (Al-Najjar and Hussainey, 2011; Vakilifard, 2011).

Evidence from the literature suggests that firms' characteristics e.g., liquidity, the size of the firm, growth, profitability and the tangibility, also have significant effects on the capital structure decision (Chang and Rhee, 1990; Asteriou et al., 2007; Titman and Wessels, 1988; Harris and Raviv, 1990; Lipson and Mortal, 2009; Rajan and Zingales, 1995; Ozkan, 2001). Since a firm's capital structure is likely to be affected by many factors other than the board composition and ownership structure variables, the paper controls the above firm's characteristics variables. Control variables aim to provide more accurate and unbiased results, absence of these may inflate the regression results.

5. EFFECT OF CORPORATE GOVERNANCE MECHANISMS ON CAPITAL STRUCTURE

Some studies have considered the board characteristics in corporate financing research. Previous research shows that the board's size is closely related to group dynamics, coordination and efficiency in decision making. Research on board size show mixed results. For instance, board member size is significantly and positively related to the capital structure decision (Abdoli et al., 2012; Jensen, 1986). However other studies find no relationship between board size and financing decisions (Zong-jung, 2006; Kajanathan, 2012). Additionally, extant literature also finds a negative relationship between board size and debt financing (Berger, Ofek and Yermack, 1997; Magdalena, 2012; Wen et al., 2002). Based on these previous studies, we test the following hypothesis:

H₁. There is a positive relationship between board size and capital structure of firms.

Another aspect of board structure that is often investigated in financing decisions is board composition (Daily and Dalton, 1994). Board composition affects the independence of the board (non-executive directors) to ensure board decisions free from the influence of executives and chairman. The literature suggests that outsider-dominated boards provide better monitoring of management activities than insider-dominated boards and generate lower costs for companies (Mayers et al., 1997; Weisback, 1988). Specifically, many studies have considered the impact of board composition on board independence in financing policy and demonstrate mixed results. The literature suggests that independence of board members is inversely related to financial leverage (Abdoli et al., 2012; Zong-Jung, 2006; Fosberg, 2004; Magdalena, 2012). However other studies also find a positive impact of board independence on leverage (Firth, 1995; Friend and Hasbrouck, 1988; Kajanathan, R., 2012), which implies that an independent board mitigates

manager's incentives to low debt. We, therefore, test the following hypothesis:

H₂. There is a positive relationship between board independence and capital structure of firms.

Chairman of the board and CEO duality is concerned with the concentration and control of power in one person's hand (Booth, Cornett and Tehranian, 2002; Hart, 1995). It has been shown that the collapse and scandals of large corporations (Enron, WorldCom etc.) can materialize because of over empowering CEO as Chairman of the board. Even though there is an additional cost of monitoring the monitor (chairman) potential benefits supersede the cost (Bebchuk and Fried, 2003). However, very few studies have investigated the impact of CEO duality on capital structure and the existing work shows mixed results. For instance, (Ahmadpour et al., 2012) find that CEO duality influences financial leverage positively but other studies (Zong-Jung, 2006; Maryam et al. 2012) find that CEO duality has no significant relationship with the capital structure decision. Therefore, in this study we test the following hypothesis:

H₃. There is a positive relationship between CEO-Chairman separation and capital structure of firms.

In addition to this, the diversity of board has also acquired a higher strategic salience within organizations and generates wide-ranging interest (Erhardt, Werbel and Sharder, 2003). Moreover, it is evident that gender diverse boards generate high quality solutions and lead to higher company performance (Nielsen and Huse, 2010). It also increases competition within the firm's internal labour market and serves the best interests of both primary and secondary stakeholders improving its reputation (Rose, 2007). Other measures of diversity have not been investigated widely except director's experience, expertise and demography (Bear, Rahman and Post, 2010). But as far we know studies of financing policy have rarely investigated the impact of board diversity as an explanatory variable. Therefore, this study tests the following hypothesis:

H₄. There is a positive relationship between board diversity and capital structure of firms.

Another aspect of board structure is the orientation of board. An audit committee composed of board members is such a structure. The International Organization of the Securities Commission (IOSC 2002) explains an audit committee is a proxy of shareholders. The audit committee is responsible for governing the functioning of the organizations in compliance with the shareholders' interests. The audit committee is also responsible to ensure transparency and accountability of transactions and to ensure credible financial information disclosure. In order to enhance corporate governance quality and a good monitoring system within the listed firms, the Bangladesh Securities Exchange Commission (BSEC) has also strongly recommended setting up an audit committee with independent directors in the audit committee. Therefore, this study considers the impact of the presence of an audit committee and independence of audit committee and tests the following hypothesis:

H₅. There is a positive relationship between board audit committee and capital structure of firms.

H₆. There is a positive relationship between independence of audit committee and capital structure of firms.

The extant literature has also investigated the impact of managerial shareholdings on debt financing decisions but the relationship is not precisely defined (Brailsford, Oliver and Pua, 2002). For instance, managerial shareholding is negatively related to leverage decisions, which suggests that managers want to keep the debt ratio as low as possible to avoid risk of debt (Bathala et al., 1994; Jensen, 1992; Friend and Lang, 1988; Firth, 1995). This may occur because increased managerial ownership increases the control over the firms and, therefore, controlling rights shift from shareholders to management (Timothy, Barty and Sandra, 2002). However, research also finds a positive relationship between managerial ownership and debt capital and infers that getting the rights of ownership motivates management to act for the best interests of shareholders and increase optimal behaviors in financing decisions reducing expropriation of shareholders wealth (Jensen and Meckling, 1976; Kim and Sorensen, 1986; Agrawal and Mandelker, 1987; Mehran, 1992; Berger, Ofek and Yermack, 1997; Chaganti and Damanpour, 1991). However, the practicing company Act (1994: Sec:91) in Bangladesh states that the subscribers of the memorandum shall be deemed to be the directors of the company until the first director is appointed and also requires directors to hold qualification shares to be elected as directors of the company. Therefore, this study examines the effect of managerial shareholdings as a proxy of director's shareholdings and tests the following hypothesis:

H₇. There is a negative relationship between managerial shareholdings and capital structure of firms.

Another variable that has been examined widely in the corporate financing and governance literature is the role of institutional shareholders. It is argued that institutional shareholders (mutual funds, trust funds, pension funds, etc.), by owning a large proportion of ownership right influence the strategic policies of corporations both in domestic and international financial markets. Since the twentieth century institutional share ownership has increased significantly compared with individual share ownership even in the UK where 65-80% of shares are owned by institutions and the US where the figure is 55-60% (Mallin, 2006). Institutional shareholders' dissatisfaction against management plays a prominent role particularly where the management of the firm does not practice good governance (Cremers and Nair, 2005). Moreover, institutional investors play a key role in promoting stakeholders' interest and engagement in their invested companies (Armour, Deakin and Konzelmann, 2003). However, the extant literature also shows mixed effects of institutional shareholdings in capital structure. For instance, it is evident in the literature that a significant positive association exists between institutional ownership and financial leverage (Chen and Steiner, 1999; Abdoli, et al., 2012). However, evidence of an inverse relationship (Bathala et al., 1994; Zong-Jung, 2006; Hussainey and Aljifri, 2008) and no significant relationship (Nedal and Abuuzayed, 2009; Magdalina, 2012) between institutional

shareholdings and debt capital is also documented in several studies. Following the previous research we included institutional shareholdings as an explanatory variable and test the following hypothesis:

H_8 . *There is a positive relationship between institutional shareholdings and capital structure of firms.*

6. SAMPLE, SAMPLE PERIODS AND OBSERVATIONS

This study uses a sample of 260 companies listed on the Dhaka Stock Exchange (DSE) before 2009 as the initial data-set. Following some prior studies of this genre, financial institutions including investment funds are removed from the list because of a lack of comparable data in the financial institutions sections. A sample of 130 companies is then obtained. The sample is further reduced to 110 companies due to missing data.

This is a balanced panel data study and sample firms are selected from 17 different economic segments for the period 2009-2012. Dependent variable, independent variable and control variable data for each sample firm were collected for this 4-year period. As mentioned earlier the Bangladesh Securities and Exchange Commission (BSEC) publicized a corporate governance compliance order and made it obligatory for all listed companies in June 2006. In order to allow time for firms to comply with the order, this study considers the 4-year period starting from 3 years after the BSEC order. Due to the structural variation of the companies and regulators in financial companies, this study only examines non-financial companies. The total no. of non-financial companies in the sample is 110 and the total number of observations for the 4 year-time period is 440. Even though the

sample is small, a panel data study is in line with many previous studies. For instance, Al-Najjar and Hussainey(2011) considers a 4-year study period, Wen *et al.* (2002) consider a 3-year study period, Magdalina (2012) also considers a 3-year study period in their research.

7. DATA AND VARIABLES

This study consists of only secondary data. Intended data of corporate governance provisions and capital structure related data are collected from the audited annual reports and stock exchange publications. Annual reports are available on the companies' websites as well as on the website of the stock exchange. More specifically, data for the corporate governance variables were collected from the introductory section (e.g., preview of company management, audit report, the directors' report) of the financial report. Data for the debt ratios were sourced from the annual and semi-annual audited financial statements.

This paper includes dependent, independent, control and interaction variables. Capital structure is the dependent variable. The independent variables focus on internal corporate governance characteristics (as described in the literature review section). In addition, following previous studies (e.g. Chang and Dutta, 2012; Lipson and Mortal, 2009; Asteriou and Hall, 2007; Chen and Zhao, 2006) this study includes firm size, liquidity, profitability (return to equity) and tangibility as control variables. Interaction variables are interrelated variables of board composition and ownership structure. Detailed explanations of variables are given in table 1.

Table 1. Description of variables

Variable label	Variable	Variable definition
Bsz	Board size	Number of total directors on the board
Bind	Board Independence	% of independent directors to total directors (independent)
Ccs	CEO and Chairman separation	Dummy variable whereby 0 = CEO acts as Chairman and 1 =
Acom	Audit committee	Dummy variable whereby 1 = presence of audit committee and 0 =
Acomind	Audit committee independence	Dummy variable whereby 1 = presence of independent directors
Bdiv	Board diversity	Gender diversity. Proportion of women on the board to total
Insh	Institutional shareholdings	Proportion of institutional shareholdings to total outstanding
Msh	Managers shareholdings	Proportion of shares held by managers/directors/sponsors to
Fsz	Firm size	Log total assets
Liq	Liquidity	Ratio of current assets and current liabilities
Profi	Profitability/Return on Equity	Ratio of Net income and Average shareholders' equity
Tang	Tangibility	Ratio of fixed assets to total assets
Capstr	Capital structure	Total debt ÷ total assets

8. THE MODEL

The tests involve three stages. First, to test for a relationship between board compositions and debt financing decision, board related variables are

$$\text{Debtr} = \alpha + \beta_1 \text{Bind} + \beta_2 \text{Bsz} + \beta_3 \text{Ccs} + \beta_4 \text{Acom} + \beta_5 \text{Acomind} + \beta_6 \text{Bdiv} + \beta_7 X + \epsilon \quad (1)$$

Second, to test for a relationship between board compositions, ownership structure and debt financing decision all independent variables are

$$\text{Debtr} = \alpha + \beta_1 \text{Bind} + \beta_2 \text{Bsz} + \beta_3 \text{Ccs} + \beta_4 \text{Acom} + \beta_5 \text{Acomind} + \beta_6 \text{Bdiv} + \beta_7 \text{Insh} + \beta_8 \text{Msh} + \beta_9 X + \epsilon \quad (2)$$

included together with the control variables. This paper uses following model for cross sectional regression and panel data regression (pooled model) in line with the study of Farinha (2003) and Crutchley and Hansen (1989):

included together with the control variables and also use the following regression equation:

Finally, to examine the interaction effects of interrelated variables and debt financing, interaction of interrelated variables are included together with the control variables:

$$\text{Debtr} = \alpha + \beta_1 \text{Bind} * \text{Ccs} + \beta_2 \text{Acom} * \text{Bind} + \beta_3 \text{Bind} * \text{Bdv} + \beta_4 \text{Acom} * \text{Ccs} + \beta_5 \text{Insh} * \text{Bind} + \beta_6 \text{Msh} * \text{Insh} + \beta_7 \text{Bdv} * \text{Acom} + \beta_8 \text{X} + \epsilon \quad (3)$$

where, Debtr is the debt ratio; Bsz is the size of the board; Bind is the independence of the board; Insh is the institutional shareholdings, Ccs is the CEO-Chairman separation; Acom is the audit committee, Acomind is the audit committee independence, Bdiv is the board diversity, Msh is the managers/directors shareholdings, X is the firm specific control variables such as firm size, liquidity,

profitability, tangibility and α denotes intercept, β for coefficients and ϵ for error terms.

9. DESCRIPTIVE STATISTICS

Table 2 is a summary of descriptive statistics of all thirteen variables, which consist of eight independent, one dependent and four control variables.

Table 2. Descriptive statistics of variables

Variables	Mean	Minimum	Maximum	Std. Deviation
Debtr	.3333	.01	.83	.18544
Bind	.2755	.10	.63	.12419
Bsz	7.3656	4.00	14.00	1.72772
Ccs	.3781	.00	1.00	.48568
Acom	.6094	.00	1.00	.48865
Acind	.4094	.00	1.00	.49249
Bdv	.5000	.00	1.00	.50078
Msh	.4179	.00	.95	.25423
Insh	.1642	.00	.62	.35716
Fsz	5.2968	2.33	11.68	1.50507
Liq	1.7272	.04	7.98	.95719
Profi	.1648	-.58	.75	.14544
Tang	.4989	.06	.91	.17913

The results in the table 2 also demonstrate that the minimum and maximum values of debt- total asset ratios for the sample firms range from 1 percent to 83 percent with an average and standard deviation of 34 percent and 19% respectively. However, in this instance it is apparent there are many firms with too low a debt ratio, which prevents them from benefiting from a tax shield but there are also heavy risky firm with a high debt ratio in the capital structure.

The descriptive result also shows that on average the board in our sample companies consists of seven members with a minimum size of four members and a maximum size of fourteen members but a large standard deviation of board members between the firms is noticeable. The mean proportion of independent directors to total directors of selected sample firms is about 33%. This proportion takes account of only independent directors without any share ownership claim. It is also apparent that there are companies with higher number of independent directors even though there are companies where the independent director's proportion should be increased significantly from the current level of only 1 percent.

The shareholding patterns of institutions demonstrate a significant discrepancy between firms. The average proportion is 16.42% even though there are firms with no institutional shareholders and also there are firms with a higher proportion (62%) of institutional shareholding. The institutional investor's equity ownership is much lower than other countries (see literature review). Chairman and CEO of selected firms are separate on an average in 37.81% cases, but in 62.11% of cases the Chairman and the CEO is the same individual who holds control in both the executive committee and in the board. This happens because a large portion of

listed firms of Bangladesh are family-owned and controlled and hence there is a low level of delegation of authority and responsibility to the hired CEO. The average proportion of the presence of the audit committee is 60.94%. However the average presence of independent directors in the audit committee is only 40.94%. Although there is huge scope for improvement, the compliance with governance guidelines is progressing gradually. The board of directors of enterprises are moderately diverse. A diversity of the board is present in 50% of cases, but a higher standard deviation indicates the huge variation from the mean value that results from the perfect non-diverse board. The average managerial/directors shareholding is 41.79% and the maximum proportion is 95%. A higher percentage of the managerial/directors shareholding necessitates strong corporate governance mechanisms to protect minority shareholder rights.

10. CROSS-SECTIONAL REGRESSION RESULTS

Table 3 presents a summary of the cross-sectional regression result which shows how and which governance variables of this study impact the financing decision of firms in a particular year.

In this instance two regression models are run for each year. Model 1 explains the effects of board composition variables and model 2 explain the effect of board composition and ownership structure variables on debt financing. Results in both models for year 2012 show a significant negative relationship between audit committee independence and the capital structure of the firm. It implies that a higher percentage of independent directors in the audit committee lead firms to use less debt which is in line with management expectations. It may likely to happen because of their less financial expertise

and less scope to play active role in the family bound directors dominated board. Even though it is evident in organizational theory that the more independent directors in the committee promotes

more effective board communication to stakeholders and increase the moral capital of the organization; we found a deviation from theoretical proposition.

Table 3. Summary of cross-sectional regression results

Variables	2012		2011		2010		2009	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Constant	(.224)	(.275)	(.409)	(.483)	(.365)	(.374)	(.551)	(.548)
Bind	(0.349) [.195]	(0.303) [.170]	(0.1) [.064]	(0.043) [.027]	(0.25) [.144]	(0.293) [.169]	(-.262) [-260]	(-.271) [-269]
Bsz	(0.016) [.119] 0.3	(0.017) [.131] 0.257	(0.002) [.018] 0.881	(0.008) [.070] 0.566	(-.011) [-.114] 0.343	(-.007) [-.075] 0.521	(-.012) [-.148] 0.214	(-.012) [-.146] 0.225
Ccs	(0.025)	0.021	(-.012)	(-.008)	(0.003)	(0.004)	(0.08)	(0.081)
Acom	(0.009) [.022] 0.849	(0.01) [.024] 0.836	(-.011) [-.028] 0.824	(-.01) [-.023] 0.85	(0.011) [.029] 0.817	(0.003) [.007] 0.952	(-.020) [-.066] 0.546	(-.020) [-.069] 0.54
Acomind	(0.112) [.279]	(0.108) [.270]	(0.02) [.050]	(0.029) [.072]	(0.054) [.133]	(0.036) [.090]	(-.048) [-.166]	(-.049) [-.166]
Bdv	(0.01) [.026]	(0.018) [.045]	(0.026) [.065]	(0.054) [.135]	(0.031) [.084]	(0.126) [.135]	(0.031) [.111]	(0.032) [.111]
Msh		(-.126) [-.160] 0.182		(-.237) [-.302] .019**		(-.221) [-.297] .018**		(0.012) [.021] 0.851
Insh		(0.045) [.027] 0.822		(-.097) [-.058] 0.653		(-.046) [-.167] 0.182		(-.027) [-.023] 0.834
Fsz	(.028) .044**	(.027) .060**	(.035) .025**	(.031) .044**	(.015) 0.3	(.005) 0.761	(.028) .028**	(.028) .029**
Liq	(-.028) 0.158	(-.032) .100***	(-.035) 0.122	(-.031) 0.164	(-.027) 0.319	(-.017) 0.522	(-.002) 0.943	(-.001) 0.968
Profi	(0.036) 0.809	(0.046) 0.757	(0.155) 0.351	(0.127) 0.433	(0.019) 0.904	(-.004) 0.98	(-.120) 0.298	(-.118) 0.312
Tang	(.016) 0.9	(.023) 0.854	(0.085) 0.526	(0.069) 0.609	(0.127) 0.281	(0.105) 0.362	(0.272) .013**	(0.279) .015**

The results for the year 2011 shows a significant negative relationship between managerial shareholding and debt ratio in model 2 ($b = -0.237$, $p < 0.05$). The negative relationship between managerial shareholdings and debt ratio supports the hypothesis of manager's desire to keep low levels of debt in the firm's capital structure than expected to establish their more control. The same outcome of the year 2011 is also persist in the year 2010 and results a significant negative relationship ($b = -0.221$, $p < 0.05$) between managerial shareholding and debt ratio.

Moreover, 2009 shows relatively different results and shows a significant relationship between debt ratio and CEO-Chairman separation along with board independence. CEO-chairman separation is positively related to the debt ratio in both models. It is evident in the literature that CEO duality is also an important cause of the agency problem because a higher controlling power of the CEO both in board and management influences management's opportunistic behaviour and hence lowers its creditworthiness to investors. When the CEO is the chairman of the board, then it implicitly means that the board cannot play an active role as an independent institution. Therefore, separation of CEO and chairman should reflect a better performing board and should also facilitate more debt financing. The significant positive relationship does supports the above discussion and theoretical proposition that managers are keen to maximize shareholders benefit. Additionally, in line with the previous outcome board independence also affects debt financing negatively that is quite clearly against of corporate governance principle. In brief, in family owned and managed corporate environment

independent directors have less scope to play role and interestingly, in many cases independent directors are appointed from the block of same family. Therefore interest of dominant shareholders comes first rather than interest of minority shareholders.

The effects of control variables on capital structure are also in line with existing literature. This paper also finds a positive relationship between capital structure and firm size for the entire sample period except 2010. It indicates higher the size of the firm the lower is the debt ratio. In the theoretical and practical literature it is also apparent that firm size matters significantly in the capital structure decision and follows the pecking order theory of capital structure in many instances i.e. small firms tend to finance more from internal source (retained earnings) and increase the debt ratio with the increasing of firms size. Kurshev and Strebulaev (2006), Asteriou *et al.* (2007) also argue that in general the likelihood of default is less in the case of large size firms because of a more diversified portfolio. It increases their acceptance and credit ratings to creditors and, therefore, gives easier access to finance at a lower rate. This finding is also consistent with the study of Hall, Hutchinson and Michaelas (2000), Watson and Wilson (2002).

In the year 2012 it is evident that liquidity of the firm negatively impacts the debt ratio. That implies firms are likely to use less debt in their capital structure if they experience surplus liquidity. Surplus liquidity substitutes for external financing. This also supports the pecking order theory of financial arrangements and maintains the order of financing e.g., internal source (liquidity or retained earnings), debt and then equity financing.

Additionally, a higher liquidity of firms decreases the cost of issuing equity financing and decreases use of leverage. Alternatively, it can also be argued that a higher long-term debt ratio creates more short term liabilities and decreases the level of liquidity (Erwan, 2001; Lipson and Mortal, 2009).

This research paper also finds the positive impacts of tangibility to the debt ratio in 2009 which state that a higher percentage of tangible assets increase the secured collateral and lead firms to have more debt capital. This result is also consistent

to the study of Rajan and Zingales (1995), Harris and Raviv (1991) but this paper finds apparently no significant impact in the case of profitability and the debt ratio.

11. POOLED PANEL REGRESSION RESULTS

Table 4 shows a summary of the pooled panel data regression results.

Table 4. Summary of panel data regression (pooled model)

<i>Independent variables</i>	<i>Model 1: Board composition</i>	<i>Model 2: Board and ownership</i>
Board independence	(.006)	(-.003)
Board size	(-.003)	(-.002)
CEO-Chairman separation	(.028)	(.026)
Board orientation	(.003)	(.005)
Audit committee independence	(.006)	(.004)
Board diversity	(.009)	(.016)
Managerial shareholdings		(-.151)
Institutional shareholdings		(-.025)
Firm size	(.029)	(.026)
Liquidity	(-.028)	(-.028)
Profitability	(.056)	(.047)
Tangibility	(.105)	(.082)
Constant	(.472)	(.526)

In earlier regression model we find some of other variables affect financing decision randomly and aligned to a particular year but the panel regression results provide evidence of only statistically significant negative relationship ($b = .151$, $p < 0.1$) between capital structure and managerial shareholdings. In cross-sectional regression we find the impact of managerial shareholdings is significant in all sample year except 2009 and in pooled regression we find the same direction of relationship. Therefore, we conclude that identical finding in both the cross-sectional and panel data regression analyses increases the robustness of this study. Like previous studies of capital structure, this study finds the same outcome

for control variables. Firm size, liquidity and tangibility impacts capital structure decision significantly. However, it is apparent that profitability of the firms has no effect on the capital structure decision.

12. INTERACTION VARIABLES REGRESSION RESULTS

This study incorporates interaction effects of related variables viewing that independent effect of a particular variable may not represent real happening while interaction of variables may explain the facts more fully.

Table 5. Results of interaction effects of variables

Independent Variables	B	Beta	P-value	VIF
Constant	.479		.000*	
Bind-Ccs	.088	.077	.248	1.545
Acind-Bind	.051	.045	.471	1.374
Bind-Bdv	.042	.035	.557	1.203
Acom-Ccs	-.049	-.107	.133	1.766
Bdv-Acom	.112	.054	.123	1.567
Insh-Bind	.010	.006	.914	1.052
Msh-Insh	-.392	-.111	.045**	1.050
Firm size	-.028	-.226	.000*	1.029
Liquidity	-.027	-.142	.011**	1.080
Profitability	.053	.041	.455	1.058
Tangibility	.095	.092	.100**	1.112

The study includes seven different interactions and shows the interaction effects of independent directors and CEO chairman separation, interaction effects of audit committee and independent directors, interaction effects of independent directors and board diversity, interaction effects of audit committee and CEO chairman separation, interaction effects of board diversity and audit committee, interaction effects of institutional shareholdings and independent directors and interaction effects of managerial shareholding and institutional shareholdings. The result shows almost

no significant effect of interaction variables on debt financing in firms of Bangladesh. However, only interaction effects of managerial shareholdings and institutional shareholdings is significant and negative to the debt financing decision of firms. This finding shows that higher presence of managerial shareholdings neutralizes the role of institutional shareholders as well as board and thus increases the robustness of the study supporting previous findings.

13. COMPARISON WITH MODELS

Table 5 shows the summary statistics comparing three models where the control variables, board

composition and control variables, board composition, ownership structure and control variables are included in the model 1, 2 and 3 respectively.

Table 6. Summary statistics of models robustness

Model	R ²	R ² Change	F-statistics	Sig.(P-value)
1	0.090	.090	17.828	0.000*
2	0.096	0.067	18.291	0.000*
3	0.136	0.046	24.016	0.000*

Note: In all tables values in parenthesis and [] indicates coefficient and beta value respectively. P-values are marked * to indicate significant at 1% level, ** to indicate significant at 5% level and *** to indicate significant at 10% level. The direction of coefficient value explains the relationship between variables.

This paper finds that 9 % (R² = .090) of the capital structure decision can be explained by the control variables but model 2 and 3 provides the best prediction in explaining variance in the dependent variables. It is clear that 13.6 % (R² = 0.136) of capital structure decision can be explained by the new predictors. The value of F-statistics and the value of significance for models show that the independent variables used together in all models are significantly better in predicting the dependent variable and also is an evidence of goodness of fit model without collinearity in any case.

This paper posed eight research hypotheses at the beginning that can be analyzed now in light of the evidence. Tables 3-6 provide evidence in support of the hypotheses. The financing decision depends mostly on the relative influence of managerial shareholdings. In addition, the study also finds that some of other variables affect financing decision randomly and only aligned to a particular year. Importantly, no statistically significant impact is evident between debt ratios and board size, audit committee, board diversity, institutional shareholdings in any case. Our findings are robust because our main result holds when we control for the firm characteristics affecting capital structure decision and also when we incorporate interaction effects to check for more robustness.

14. CONCLUSION

This paper aims to contribute to the corporate governance literature by examining the effect of board composition on financing decisions in an emerging country context. The empirical study finds that board compositions play no role in debt financing decision of firms in Bangladesh. The finding also finds that family bound managers/directors with more controlling power and significant share ownership prefer less debt in the firm's capital structure which supports the strong presence of conflict of interests between dominant shareholders (directors/promoters in Bangladesh) and minority shareholders. The study also finds no significant relationship between debt ratio and institutional ownership, which is consistent with the passive engagement of institutional investors. That suggests that institutional investors are not interested in the capital structure decision of firms. This may be either because of the non-engagement tendencies of institutional investors in the firms' decision making or the lack of a level playing field for activism by institutional investors. The study affirms that

corporate governance is not working in explaining important financial decision of firms in Bangladesh.

We hope that this research paper will provide an insight to policy makers of Bangladeshi regulators and other like-structured developing market economies seeking to protect minority shareholder's right and to ensure effective corporate governance practices in capital structure decisions. This paper is not certainly without limitations. In particular, the number of sample firms and observations is low due to the small number of listed companies and unavailability of public data in Bangladesh and, therefore, the results may not be representative of other countries. An extension of this paper would consider firms from other developing countries and add more observations to strengthen the findings.

REFERENCES

- Abdoli, M., Lashkary, M., & Dehghani, M. 2012. Corporate governance and its effects on the corporate financial leverage. *Journal of Basic and Applied Scientific Research*, 2:8552-60.
- Agrawal, A., & Mandelker, G.N. 1987. Managerial incentives and corporate investment and financing decisions. *Journal of Finance*, 42:823-37.
- Ahmadpour, A., Samimi, J.A., & Golmohammadi, H. 2012. Corporate governance and capital structure: evidence from Tehran stock exchange. *Middle-East Journal of Scientific Research*, 11:531-535.
- Ajinkya, B., Bhojraj, S., & Sengupta, P. 2005. The association between outside directors, institutional investors and the properties of management earnings forecasts. *Journal of Accounting Research*, 43:343-376.
- Al-Najjar, B., & Hussainey, K. 2011. Revisiting the capital-structure puzzle: UK evidence. *Journal of Risk Finance*, 11: 329-338.
- Armour, J., Deakin, S. F., & Konzelmann, S.J. 2003. Shareholder primacy and the trajectory of UK corporate governance. *Cambridge Centre for Business Research Working Paper*, No. 266.
- Asteriou, D., & Hall, S. 2007. *Applied econometrics: a modern approach using Eviews and Microfit*. Basingstoke, Palgrave Macmillan.
- Bathala, C. T., Moon, K. P., & Rao, R. P. 1994. Managerial ownership, debt policy and the impact of institutional holdings: an agency perspective. *Financial Management*, 23:38-50.
- Bear, S., Rahman, N., & Post, C. 2010. The impact of board diversity and gender composition on corporate social responsibility and firm reputation. *Journal of Business Ethics*, 97:207-221.
- Bebchuk, L. A., & Fried, J. M. 2003. Executive compensation as an agency problem. *Journal of Economic Perspectives*, 17:71-92.

10. Bebchuk, L., & Hamdani, A. 2009. The elusive quest for global governance standards. *University of Pennsylvania Law Review*, 157:1263-1317.
11. Berger, P., Ofek, E., & Yermack, D. 1997. Managerial entrenchment and capital structure decisions. *The Journal of Finance*, 52:1411-1438.
12. Berle, A.A., & Mean, G.C. 1932. *The modern corporation and private property*. New York: Macmillan.
13. Bhojraj, S., & Sengupta, P. 2003. Effect of corporate governance on bond ratings and yields: the role of institutional investors and the outside directors. *The Journal of Business*, 76:455-475.
14. Booth, J.R., Cornett, M.M., & Tehranian, H. 2002. Boards of directors, ownership, & regulation. *Journal of Banking and Finance*, 26:1973-1996.
15. Brailsford, T., Oliver, B., & Pua, S. 2002. The relationship between ownership structure and capital structure, *Accounting and Finance*, 42:1-26.
16. Cain, D.M., & Mckeon, B.S. 2014. CEO personal risk-taking corporate policies, *Journal of Financial and Quantitative Analysis*, Forthcoming. Available at SSRN: <http://ssrn.com/abstract=1785413> or <http://dx.doi.org/10.2139/ssrn.1785413>
17. Cantor, R. 1990. Effects of leverage on corporate investment and hiring decisions. *Federal Bank of New York Quarterly Review*: 31-41
18. Chaganti, R., & Damanpour, F. 1991. Institutional ownership, capital structure and firm performance, *Strategic Management Journal*, 12:479-91.
19. Chen, C., & Steiner, T. 1999. Managerial ownership and conflicts: a nonlinear simultaneous equation analysis of managerial ownership, risk taking, debt policy and dividend policy, *Financial Review*, 34:119-36.
20. Chang, B., & Dutta, S. 2012. Dividends and corporate governance: Canadian evidence. *The IUP Journal of Applied Finance*, 18:1-30.
21. Chang, R., & Rhee, S. 1990. The impact of personal taxes on corporate dividend policy and capital structure decisions. *Financial Management*, 19:21-31.
22. Chen, L., & Zhao, X. 2006. On the relation between the market-to-book ratio, growth opportunity, & leverage ratio. *Finance Research Letters*, 3:253-266.
23. Claessens, S., Simeon, D., & Larry, H. P. L. 2000. The separation of ownership and control in East Asian corporations. *Journal of Financial Economics*, 58:81-112.
24. Claessens, S., & Joseph, F. 2002. Corporate governance in Asia: a survey. *International Review of Finance*, 3:105-129.
25. Cremers, K. J. M., & Nair, V. B. 2005. Governance mechanisms and equity prices. *The Journal of Finance*, 60:2859-2894.
26. Crutchley, C., & Hansen, R. 1989. A test of the agency theory of managerial ownership, corporate leverage and corporate dividends. *Financial Management*, 18:36-76.
27. Daily, C.M., & Dalton, D. R. 1994. Bankruptcy and corporate governance: the impact of board composition and structure. *Academy of Management Journal*, 37:1603-1617.
28. Daily, C.M., Dalton, D.R., & Cannella, A.A. 2003. Corporate governance: decades of dialogue and data. *Academy of Management Review*, 28:371-382.
29. Erhardt, L.N., Werbel, D., & Shrader, C.B. 2003. Board of director diversity and firm financial performance. *Corporate Governance: An International Review*, 11:102-110
30. Erwan, M. 2004. Can managerial discretion explain observed leverage ratios? *Review of Financial Studies*, 17: 257-294.
31. Erwan M., Boris, N., & Norman, S. 2012. Corporate governance and capital structure dynamics. *The Journal of Finance*, LXVII: 803-848.
32. Farinha, J. 2003. Dividend policy, corporate governance and the managerial entrenchment hypothesis: an empirical analysis. *Journal of Business Finance and Accounting*, 30:1173-209.
33. Faccio, M., Lang, L. H. P., & Young, L. 2001. Dividends and expropriation. *American Economic Review*, 91:54-78.
34. Faccio, M., Lang, L.H. P., & Young, L. 2001. Debt and corporate governance. *Working Paper*. Vanderbilt University.
35. Faroque, O., Zijl, T., Dunstan, K., & Karim, W.A. 2007. Corporate governance in Bangladesh: link between ownership and financial performance. *Corporate Governance: An International Review*, 15:1453-1468.
36. Firth, M. 1995. The Impact of institutional stockholders and managerial interests on the capital structure of firms. *Managerial and Decision Economics*, 16:167-175.
37. Fischer, E.O., Robert, H., & Josef, Z. 1989. Dynamic capital structure choice: theory and tests, *Journal of Finance*, 43:19-40.
38. Florackis, C., & Ozkan, A. 2009. Managerial leverage and corporate incentives: evidence from the United Kingdom. *Accounting and Finance*, 49:531-553.
39. Fosberg, R. H. 2004. Agency problems and debt financing: leadership structure effects. *International Journal of Business in Society*, 4:31-38.
40. Friend, I., & Hasbrouck, J. 1988. Determinants of capital structure. *Research in Finance*, 7:1-19.
41. Ghosh, A., & Doocheol, M. 2010. Corporate debt financing and earnings quality. *Journal of Business Finance and Accounting*, 37:538-559.
42. Gillan, S. L. 2006. Recent developments in corporate governance: an overview. *Journal of Corporate Finance*, 12:381-402.
43. Hall, C., Hutchinson, P. J., & Michaelas, N. 2000. Industry effects on the determinants on the unquoted SMEs' capital structure. *International Journal of the Economics of Business*, 7:297-312.
44. Hamada, R.S. 1969. Portfolio analysis, market equilibrium and corporation finance. *The Journal of Finance*, 24:13-31.
45. Harris, M., & Raviv, A. 1990. Capital structure and the informational role of debt. *The Journal of Finance*, 45:321-349.
46. Harris, M., & Raviv, A. 1991. The theory of capital structure. *Journal of Finance*, 46: 297- 355.
47. Hart, O., & Moore, J. 1995. Debt and seniority: an analysis of the role of hard claims in constraining management. *American Economic Review*, 85:567-585.
48. Hart, O. D. 1995. Corporate governance: some theory and implications. *Economic Journal*, 105:678-680.
49. Harvey, C. R., Lins, K. V., & Roper, A. H. 2004. The effect of capital structure when expected agency costs are extreme. *The Journal of Financial Economics*, 74:3-30.
50. Hussainey, K., & Aljifri, K. 2008. Corporate governance mechanisms and capital structure in UAE. *Journal of Applied Accounting Research*, 13:145-160.
51. Jensen, M. C., & Meckling, W. 1976. Theory of the firm: managerial behaviour, agency costs and

- ownership structure. *Journal of Financial Economics*, 3:305-360.
52. Jensen, M.C., & Meckling, W. 1986. Agency cost of free cash flow, corporate finance, & takeovers. *American Economic Review Papers and Proceedings*, 76:323-329.
 53. Jensen, M.C. 1993. The Modern industrial revolution, exit, & the failure of internal control systems. *The Journal of Finance*, 48:831-880.
 54. John, T. A., & John, K. 1993. Top-management compensation and capital structure. *Journal of Finance*, 48: 949-974.
 55. Kajanathan, R. 2012. Effect of corporate governance on capital structure: case of Srilankan listed manufacturing companies. *Journal of Arts, Science and Commerce*, 3:63-71.
 56. Karim, A. K. M. W., & Ahmed, J. U. 2005. Compliance to international accounting standards in Bangladesh: a survey of annual reports. *The Bangladesh Accountant: Journal of the Institute of Chartered Accountants in Bangladesh*, 48:23-41.
 57. Kim, W. S., & Sorenson, E. H. 1986. Evidence on the impact of the agency costs of debt on corporate debt policy. *Journal of Financial and Quantitative Analysis*, 21:131-44.
 58. Kurshev, A., & Strebulaev, I. 2007. Firm size and capital structure. *Working Paper*, Stanford University.
 59. La Porta, R., Lopez, F., & Shleifer, A. 1999. Corporate ownership around the world. *Journal of Finance*, 54: 471-517.
 60. La Porta, R., Lopez, F., & Shleifer, A. 2000. Agency problems and dividend policies around the world. *Journal of Finance*, 55:1-33.
 61. Lipson, M. L., & Mortal, S. 2009. Liquidity and capital structure. *Journal of Financial Markets*, 12:611-644.
 62. Luo, Y. 2007. *Global dimensions of corporate governance*. Blackwell Publishing.
 63. Magdalina, R. 2012. Influence of corporate governance on capital structure decision. *World Review of Business Research*, 2:37-49.
 64. Mallin, C. 2006. The role of institutional investors in corporate governance. *Runall.text*, 6:76-95.
 65. Maryam, M., Ramezan, A., & Hossein, H. 2012. Corporate governance and financial decision making in the firms listed on Tehran stock exchange. *International research Journal of Finance and Economics*, 93:165-193.
 66. Mayers, D., Shivdasani, A., & Smith, C.W. 1997. Board composition and corporate control: evidence from the insurance industry. *Journal of Business*, 70:33-62.
 67. Mehran, H. 1992. Executive incentive plans, corporate control and capital structure, *Journal of Financial and Quantitative Analysis*, 27:539-60.
 68. Miller, M., & Modigliani, F. 1963. Corporate income taxes and the cost of capital: a correction. *American Economic Review*, 53:433-43.
 69. Monks, R.A.G., & Minow, N. 2004. *Corporate Governance*, Oxford: Blackwell Business.
 70. Morellec, E., Nikolov, B., & Schurhoff, N. 2012. Corporate governance and capital structure dynamics, *Journal of Finance*, 3:803-848.
 71. Nedal A., & Abuzayed, M. 2009. Ownership structure and corporate financing. *Applied Financial Economics*, 19:1975-1986.
 72. Nielsen, S., & Huse, M. 2010. The contribution of women on boards of directors: going beyond the surface. *Corporate Governance: An International Review*, 18:136-148
 73. Oman, C., Fries S., & Buitter W. 2003. Corporate governance in developing, transition and emerging-market economies. *Development Centre Policy*, No. 23, OECD, Paris.
 74. Opler, T. C., & Titman, S. 1994. Financial distress and corporate performance. *Journal of Finance*, 49: 1015-1040.
 75. Ozkan, A. 2001. Determinants of capital structure and adjustment to long run target: evidence from UK company panel data. *Journal of Business Finance and Accounting*, 28:175-198
 76. Rajan, R.G., & Zingales, L. 1995. What do we know about capital structure? Some evidence from international data. *Journal of Finance*, 50:1421-60.
 77. Rose, C. 2007. Does female board representation influence firm performance? The Danish evidence. *Corporate Governance: An International Review*, 15:404-413
 78. Scott, J. 1977. Bankruptcy, secured debt and optimal capital structure. *Journal of Finance*, 32:1-19.
 79. Shleifer, A., & Vishny, R. 1989. Management entrenchment: the case of manager-specific investments. *Journal of Financial Economics*, 25:123-139.
 80. Shleifer, A., & Vishny, R. W. 1997. A survey of corporate governance. *The Journal of Finance*, 52:737-783.
 81. Shleifer, A., & Wolfenzon, D. 2002. Investor protection and equity markets, *Journal of Financial Economics*, 66: 3-27.
 82. Titman, S., & Wessels R. 1988. The determinants of capital structure. *Journal of Finance*, 43:1-19.
 83. Timothy, J. B., Barty, R. O., & Sandra, L. H.P. 2002. On the relation between ownership structure and capital structure. *Accounting and Finance*, 42:1-26.
 84. Vakliflar, R.H. 2011. Effect of corporate governance on capital structure. *European Journal of Economics, Finance and Administrative Sciences*, 35:165-172.
 85. Vivek, M., Young, K. P., & Myungsoo, S. 2012. Equity or debt financing: does good corporate governance matter? *Corporate Governance: An International Review*, 20:195-211.
 86. Watson, R., & Wilson, N. 2002. Small and medium size enterprise financing: a note on some of the empirical implications of a pecking order. *Journal of Business Finance and Economics*, 29:557-578.
 87. Whited, T. 1992. Debt, liquidity constraints and corporate investment: evidence from panel data. *Journal of Finance*, 47:1425-1461.
 88. World Bank, Bangladesh Economic Update, 2012.
 89. Weisbach, M. S. 1988. Outside directors and CEO turnover. *Journal of Financial Economics*, 20:431-460.
 90. Yermack, D. 1996. Higher market valuation of companies with a small board of directors. *Journal of Financial Economics*, 40:185-211.
 91. Young, N.M., Peng, W.M., Ahlstrom, D., Bruton, D.G., and Jiang, Y. 2008. Corporate governance in emerging economies: A review of the principal-principal perspective, *Journal of Management Studies*, 45:196-220.
 92. Wen, Y., Rwegasira K., & Bilderbeek, J. 2002. Corporate governance and capital structure decisions of the Chinese listed firms. *Corporate Governance: An International Review*, 10:75-83.
 93. Zong-J. W., & Xioa-L. D. 2006. Corporate governance and financial distress. *The Chinese Economy*, 39:5-27.

THE FINANCING METHODS FOR SMALL AND MEDIUM COMPANIES: COMPARISON BETWEEN ITALY AND GERMANY

Rossi Matteo*, Giacosa Elisa**, Mazzoleni Alberto***

*University of Sannio, DEMM Department, Benevento, Italy

**University of Turin, Department of Management, Turin, Italy

***University of Brescia, Department of Economics and Management, Brescia, Italy

Abstract

The aim of this paper is to identify the appropriate financing methods for Small and Medium-sized Enterprises (SMEs) - with particular reference to alternative instruments to the banking ones - by comparing Italian and German companies. Based on a sample of Italian and German SMEs and thanks to a quantitative method, the research methodology was developed by the following logical steps: i) illustration of the informative matrix used, thanks to which it's possible to identify different types of financing instruments (also those alternative to the banking ones) the most suitable for the analyzed companies; ii) adoption of the informative matrix to the sample of Italian and German companies; iii) comparison Italy-Germany. Several differences emerged between Italian and German small and medium-sized companies, regarding the most suitable suggested financing forms. The degree of effectiveness of the financing instruments alternative to the debt appears influenced by the analysed space-time context. With reference to Italy, the effectiveness of these instruments is rather modest. With reference to Germany, it occurs the opposite scenario. The originality of the paper is linked to the current profound changes in both economic and normative terms. The research tries to lead companies to change their financial culture, also considering financial instruments alternative to the bank debt particularly suitable for small and medium-sized enterprises.

Keywords: Financing Sources; Smes; Italian Small And Medium-Sized Enterprises; German Small And Medium-Sized Enterprises; Financial Culture; Alternative Financing Instruments; Minibonds; Commercial Paper; Listing.

1. INTRODUCTION

The identification of the most appropriate financing instruments for small and medium-sized enterprises is a relevant topic, as they impact on their financial structure. As the financial structure influences the company's growth, the financing process constitutes one of the dominant research topics in the literature. Different possibilities, distinguished by debts (such as the accounts payable, the banking system and the other various financial entities different than bank) and equity (such as own resources granted by the shareholders) are available.

Italian companies have a high financial dependency towards the banking system. This is due to several factors, such as the abundance of past granted loans and ability of the banks to meet the companies' financial needs (Del Giudice, 2011). Nevertheless, the last decade has been characterized by a gradual disentanglement of the banks towards providing funds (especially with regards to company's fixed assets), due to the financial crisis. This aspect, combined to a limited financial culture within the company, in terms of alternative financial instruments to the banking ones, causes difficulties in financing the company's growth.

New financial methods in terms of debts and equity are available thanks to a legislative process: consequently, small and medium-sized enterprises

have the possibilities to diversify their funding process. In addition to the banking system, companies can also choose some financial instruments alternative to the bank (commercial papers, mini-bond, debt funds, hybrid debt securities). In the meantime, new operators are available to underwrite debt securities and shares of the small and medium-sized enterprises.

German economic context represents a useful benchmark for Italian ones, as the German economic sector is composed of small and medium-sized companies. In addition, the German economy is considered as the most advanced one in the European Union. Making a comparison of the two economic systems is quite difficult, as it involves cultural, social and institutional variables (Arrighetti and Ninni, 2012; Arrighetti, A. et al., 2012; Boffelli and Urga, 2015; Bozio et al., 2015; Falzoni and Grasseni, 2012; Florio et al., 1998; Foresti and Trenti, 2012; Guerrieri and Esposito, 2012; Hall and Oriani, 2004; Ivanov, 2009; Lotti and Santarelli, 2001; Manello and Rolfo, 2012).

Nevertheless, the research fits into this context of observation. The aim of the research is to identify the appropriate financing methods for small and medium-sized enterprises (with particular reference to alternative instruments to the banking ones), by comparing Italian and German companies.

The originality of the paper is linked to the

current profound changes both in the economic and normative terms. Companies need to change their financial culture, also considering financial instruments alternative to the bank debt particularly suitable for small and medium-sized enterprises. This could allow an improvement in the financing opportunities, permitting the companies to reduce their dependence on the banking system and increasing the collection of money.

The paper is structured as follows. The second paragraph is focused on the analysis of the literature, with particular reference to two interesting lines of research: the first one is focused on the identification of the company's financial structure, and the second one is about the traditional and alternative financing methods. The third paragraph is dedicated to the research method. Findings are illustrated in the fourth paragraph, which is followed by discussion of the results. Finally, the conclusions and implications of the study are set out, along with the limitations of the research.

2. LITERATURE

The company's financial structure represents a relevant topic in the literature, as it could influence the company growth (Becchetti and Trovato, 2002; Carpenter and Petersen, 2002; European Investments Bank, 2003; Fagiolo and Luzzi, 2004; Fazzari et al., 1988; Gambini and Zazzaro, 2008): indeed, the collection of funds impacts on the investments opportunities, and the lack of money could obstacle the aforementioned growth (Honjo and Harada, 2006; Lang et al., 1996; Giacosa, 2015; Oliveira and Fortunato, 2006; Mahérault, 2000; Venanzi, 2010). Researchers are usual to quantify the growth in quantitative terms (i.e. the revenues, the value added, the production value, the fixed assets, the intangible assets, etc.) or in qualitative ones, considering that the growth causes the formation or the development of the company attitudes (Donaldson, 1994; Grandinetti and Nassimbeni, 2007).

Since the company growth creates a financial requirements, financial needs definition and quantification have been deeply analyzed (Bianchi, 1975; Campedelli, 1998; Ferrero, 1972), and complied to the corporate strategy (Ansoff, 1974; Chandler, 1962; Coda, 1988; Corbetta, 1999; Invernizzi, 2008): otherwise, a lack in the collection of funds could force a revision of the strategic choices.

Some research lines of studies characterize the literature about the financial structure:

a) the first group of researchers studies the company's financial structure and the combination between financial resources and investments;

b) the second group of researchers focused on the most appropriate financing instruments (traditional and alternative) to the company's condition.

According to the first group, the company's financial structure requires an optimal combination between investments and funding. When considering funding, the choice between the use of equity or the external borrowings is so relevant, as it impacts on the financial and economic sphere (Baginski and Hassel, 2004; Bernstein and Wild, 1998; Brealey et

al., 1999; Capasso et al., 2015; Giacosa and Mazzoleni, forthcoming; La Rocca, 2007; Miglietta, 2004; Rossi, 2014a and 2014b; Rossi et al., 2015; Singer, 2000).

In these terms, the company's ability to repay the debt through the financial resources derived from its core business has been investigated: several indicators permit to evaluate this aspect, including operating revenue in terms of turnover (Ferrero et al., 2006; Giacosa, 2011 and 2012; Giacosa and Mazzoleni, 2012). A right definition of financial structure also permits to protect the power within the company (Becchetti and Trovato, 2002; Carpenter and Petersen, 2002; Fazzari et al., 1988; Herrera and Minetti, 2007; Honjo and Harada, 2006; Lang et al., 1996; Machauer and Weber, 2000; Oliveira and Fortunato, 2006), when considering different types of shareholders (Levinthal, 1988; Prendergast, 2000; Rasmusen, 1987; Ross, 2004; Shavell, 1979).

In addition, the relationship between the investments and financing could be developed thanks to a series of indicators, used to analyse the financial statements (Baginski and Hassel, 2004; Ferrero et al., 2003; Foster, 1986; Giroux, 2003; Helfert, 1997; Higgins, 2007; Ingram et al., 2002; Meigs et al., 2001; Value, 2001).

Some researches made a comparison between the financial structure of small and medium-sized enterprises and large ones on several European and American countries; they analyzed their financial structures and performances and the effects of the economic and financial crisis (de Socio et al., 2014; De Bonis et al., 2012; Rivaud-Danset et al., 2001).

According to the second group, the choice in terms of financing, distinguishes debts (such as the accounts payable, the banking system and the other various financial entities different than bank) from equity (such as own resources granted by the shareholders) (Caselli et al., 2013; Giacosa, 2015; Giacosa et al., forthcoming).

In terms of equity, the issue of new shares could be an alternative choice (Anderson and Reeb, 2003; Bracci, 2007; Gualandri and Schwizer, 2008; Mulkay and Sassenou, 1995; Osteryoung et al., 1992), even if it reduces a company control (Gallucci et al., 2012).

If the company chooses the debt solutions, it emerges a great interest in observing the solvency of the firm, thanks to the company's attitude to repay debts: in these terms, financial resources deriving from the core business represent a valid element to judge this capability, identifying the company's ability to self-financing (Ferrero et al., 2006; Giacosa, 2011 and 2012).

The choice of funders is relevant: companies generally recourse to the banking system or to other various financial entities. Several studies focused on the financial policy conducted by the companies, especially in terms of the financial constraints to growth, the financial structure as an element of the company investigation, and the financial policies of the company (Dallocchio et al., 2011; Galbiati, 1999; La Rocca, 2007; Venanzi, 2003; Zazzaro, 2008).

A more recent literature focuses on innovative financial instruments than banking channel: commercial paper, mini-bonds, hybrid instruments, and the listing on AIM represent one of the most popular topic (Appio, 2013; Bompani and Catelani,

2012; De Luca and Ferri, 2009; Ordine dei Dottori Commercialisti di Milano, 2011; Urbani, 2013).

Even if innovative financial instruments represent a means to cover the company financial needs, few researchers focused on the choice between debt, equity or hybrid instruments, as part of the definition of the financial structure, especially according to small and medium-sized enterprises.

The aim of this research is to fill this gap: it highlights the access to new alternative financial instruments, which permit the company to diversify its financing process and increase the collection of funds. In particular, the increase of the financing opportunities allows the company to change the financial culture, decreasing the predominance of the banking channel and strengthening the adoption of alternative forms of financing.

3. METHODOLOGY

3.1. The sample

The aim of the research is to identify the appropriate financing methods for small and medium-sized enterprises (with particular reference to alternative instruments to the banking ones), by comparing Italian and German companies.

The companies have been identified using the Aida-Bureau van Dijk database for the Italian ones, and Amadeus-Bureau van Dijk database for the German enterprises. They have been classified according to business sector, adopting the NACE classification of the European Institute of Statistics (Eurostat).

Conducting the research required identification of two samples:

- a) the sample of Italian companies;
- b) the sample of German companies.

For the first sample, the population taken into consideration consists of 758,153 Italian companies (this is the number of Italian companies, present in

AIDA database on the analysis reference day). For the second sample, the population taken into consideration consists of 201,854 German companies (this is the number of German companies, present in Amadeus database on the analysis reference day).

The following selection criteria have been considered in the creation of the samples:

- the companies' financial statements related to 2011, 2012 and 2013 were available, and the one from 2013 was the last one deposited at the moment of assessment. This three-year period was considered as the minimum necessary to carry out the research on analyzed companies;

- the companies' financial statements were not prepared in accordance with IAS (International Accounting Standards), to ensure the cohesion of analysed data;

- the companies belong to economic activities of NACE, considered as relevant. The assessment was conducted on the basis of the companies' concentration in the individual economic activities of NACE. In this way, the companies belonging to its residual economic activities have been excluded;

- the companies' production value in 2013 was between 5 and 250 million euro. The reason for using the "production value" instead of "sales" was to extend the analysis about the companies working on order;

- the company's financial statements presented details on "Total debt". For analytical purposes, the companies, whose detailed financial debt was not available, were excluded from the survey.

As the manufacture sector consists of 23 significantly diversified activities, it has been further divided in the sectors such as: food, automotive, pharmaceutical, rubber-plastic, machinery, metal-mechanic, petrochemical, textile and other manufacturing.

The final sample is composed of 41,344 Italian companies and 12,219 German companies (Table 1).

Table 1. The sample

<i>Sector</i>	<i>Italy</i>	<i>Germany</i>
Agriculture	743	77
Food	2,189	277
Accommodation and catering	522	103
Attività culturali	190	70
Financial Activities	176	102
Professional Activities	1,539	918
Automotive	510	166
Trade	12,891	3,424
Building	2,762	1,076
Pharmaceutical	214	72
Rubber - plastic	1,839	433
ICT	950	454
Real estate	716	891
Machinery	3,921	1,232
Other manufacturing	2,763	448
Metal-mechanic	3,220	810
Petrol-Chemical	998	249
Business services	892	411
Textile	2,077	133
Transportation and storage	2,232	711
Utilities	0	162
Total for geography area	41,344	12,219

Source: Own elaboration

3.2. The method

The aim of the research is to identify the appropriate financing methods for small and medium-sized enterprises (with particular reference to alternative instruments to the banking ones), by comparing Italian and German companies.

In order to achieve the aim of this research, the following research question has been formulated:

RQ: Which are the main differences between Italian and German small and medium-sized enterprises, regarding the most suitable suggested financing forms?

The research methodology was developed by the following phases:

a) illustration of the informative matrix used, thanks to which it's possible to identify different types of financing instruments (also those alternative to the bank's one) the most suitable for the analyzed companies;

b) adoption of the informative matrix to the sample of Italian and German companies;

c) comparison Italy-Germany.

All the aspects of the observation are illustrated below.

A) Illustration of the framework

Our framework is represented by a model illustrated in the previous publication (Giacosa and Mazzoleni, forthcoming), which is able to identify the appropriate financing methods for small and medium-sized enterprises (with particular reference to alternative instruments to the banking ones).

The model takes into consideration the following analysis areas:

a) with a reference to the company's growth, CAGR indicator (*Compound Annual Growth Rate*)

was used, which is calculated using the following formula:

$$CAGR = \sqrt[m]{\frac{PV_m}{PV_n}} - 1$$

where:

PV_n, PV_m = Production value achieved by the company in years "n" and "m", assuming that $m > n$.

b) with a reference to the company's profitability, the indicator EBITDA to production value was used, as it enables to measure the company's ability of generating cash flow. The formula is as follows:

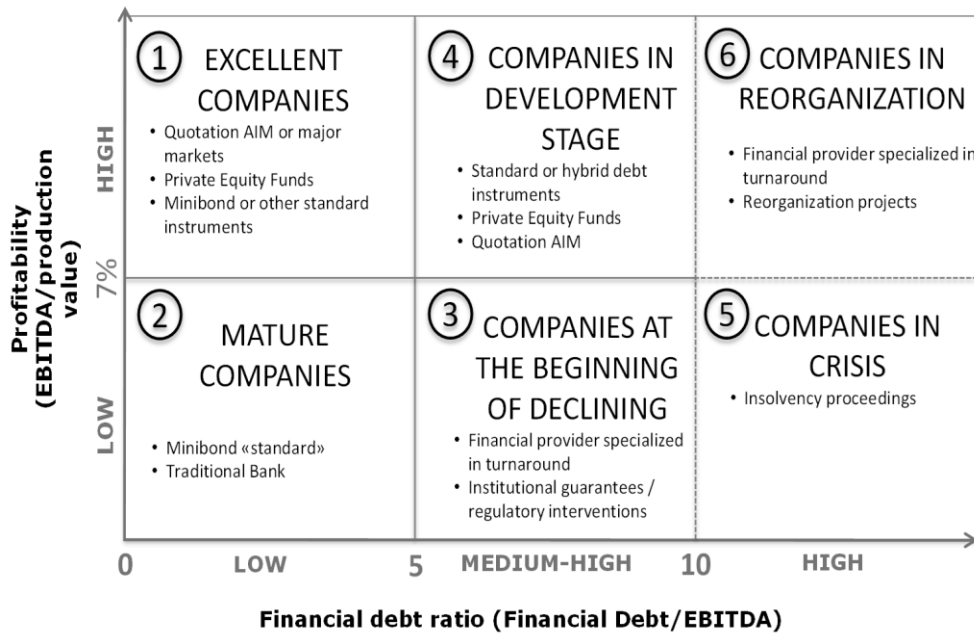
Profitability in the year "n" = Ebitda (n)/Production value (n)

c) with a reference to the capacity of financial debt's repayment, the indicator Financial Debt to EBITDA was used, as it enables to identify the period necessary to repay the borrowings by the use of the resources generated from core business activity.

Ability to repay the financial debt in the year n = Financial Debts (n)/Ebitda (n)

The framework model is composed by six quadrants. A bubble, which appears in the informative matrix within each quadrant, represents the group of companies belonging to the same quadrant. Its position indicates the average profitability and the average financial debt ratio of the companies belonging to the matrix. The average growth instead is illustrated by the size of the bubble. In the situation, when the average growth of the quadrant's companies was negative, an average growth equal to 0,20% was assumed. Thanks to this assumption it was possible to define the position of the bubble on the graph. Each quadrants of the informative matrix has been matched to the financing instruments, considered as suitable for the companies belonging to this quadrant (Figure 1).

Figure 1. The subjective dimension in financing choices



Source: Giacosa and Mazzoleni, forthcoming

The framework distinguishes different categories of companies, using the model of classification of the credit risk, which is similar to the rating agencies such as Moody's, Standard & Poor's and Fitch Ratings – the best known global rating agencies, and CERVED, which is recognized in Italy. The ratings from AAA to BBB are identified as investment grade, what means relatively safe investments, attractive for institutional investors. The ratings from BBB are called speculative grade, what means investment with a high level of risk, and more profitable because of this, in the same time. The following categories of companies have been identified by the framework:

1) investment grade companies: different categories of companies have been identified:

a) Star companies and Excellent companies – presented in the first quadrant, which is characterized by average profitability above 7% and average financial debt below 5. The so-called “*star companies*” are characterized by high growth rate (above 5%). Their financial state of health allows them to use, as alternative to the banking channel, the following financial methods: debt (mini-bond or commercial papers) standard or hybrid²⁹; recourse to the capital market through private equity companies; quotation on the major or minor markets (AIM). Generally speaking, the access to the credit even from the banking channel is not a problematic issue for these companies.

b) Mature companies – presented in the second quadrant, characterized by average profitability below 7% and average financial debt below 5. These companies show a decrease in profitability, but their advantage is a modest debt. The banking channel represents the most common way to finance them, as it takes into consideration the historical values, but there is also a possibility to use the standard form of mini-bond, as well³⁰;

2) high risk companies³¹: the following categories have been identified:

a) Companies at the beginning of decline – presented in the third quadrant are characterized by average profitability below 7% and average financial debt between 5 – 10, therefore they have significant difficulties to obtain the credit from the banking system. That is why they recourse to financial markets in reference to both: capital and debt (the exception is the situation, when the companies have started a recovery process and it's directed to specialized interlocutors in financing the companies with a high level of debt). Only the parties operating in the context of crisis or at the beginning of crisis (such as private equity funds or funds specializing

in the acquisition of distressed debt (acquisition of equity capital in non-performing companies)) could be potentially interested in investing in this kind of companies.

b) Companies in the development stage – presented in the fourth quadrant, characterized by average profitability above 7% and average financial debt between 5-10. In this case the company can use the following types of instruments: hybrid debt or equity instruments, private equity operators and the quotation on the smaller markets (under condition that are available necessary information support in order to prospects).

c) Companies in crisis – presented in the fifth quadrant, characterized by average profitability below 7% and average financial debt above 10. This kind of companies are in advanced state of crisis and can be a subject to bankruptcy procedures, which usually involve a liquidation of company's assets. Because of negative judgements on its creditworthiness (due to a highly tensioned financial situation) and on the development prospect of the business (showing loss of turnover), it is impossible for them to obtain bank loans and use the financial instruments alternative to bank debt.

d) Companies in reorganization – presented in the sixth quadrant, characterized by average profitability above 7% and average financial debt above 10. These companies are described as distressed companies, but they have defined and have started the industrial reorganization process. These companies can obtain the credit through banking channel or derived from other forms financing, as well as through the assistance of a financial provider specializing in turnaround.

B) Application of the informative matrix to the sample of Italian and German companies

In order to identify the most suitable financial instruments for the sample of Italian and German companies, the framework before was applied.

The placement of a company in the proper quadrant of the informative matrix was conducted as follows. Firstly, was necessary to calculate for each company the average values of the three indicators mentioned before (except “*growth*”, because the CAGR presents an average growth rate in the three-year period). For this reason, the following formulas have been used:

²⁹ The mini-bond, in general, are distinguished as “standard” instruments (subscribed by companies with an excellent financial performance) and “hybrid” (accept some reservations, as subscribers are potentially interested in the company's performance and its value, even prospective one).

³⁰ As standard form was assumed the mini-bond's emission without guarantee or conversion clauses. In financial terms can also be discussed a mini bond Plain Vanilla.

³¹ An indicator used to calculate the ability to repay debt is cohesive with the European Central Bank proposals in reference to classifying the companies as *high risk* by the individual nation's banks. Indeed, the ECB has provided the presence, among others, of indicator *Financial Debt to EBITDA* above 6 in reference to *asset quality review* of the main European banks credits, as a *trigger event*. See the European Central Bank (March 2014), *Asset Quality Review. Phase 2 Manual*, pp. 100 et seq.

$$CAGR = \sqrt{\frac{PV_{2013}}{VDP_{2011}}} - 1$$

$$Average\ Profitability = \frac{EBITDA_{2011} + EBITDA_{2012} + EBITDA_{2013}}{PV_{2011} + PV_{2012} + PV_{2013}}$$

$$Average\ Financial\ Debt\ Ratio = \frac{Financial\ Deb_{.2011} + Financial\ Deb_{.2012} + DFinancial\ Deb_{.2013}}{EBITDA_{2011} + EBITDA_{2012} + EBITDA_{2013}}$$

The next step was to compare calculated average values for each company with the cut-off points identified before, to define the placement of the companies in the informative matrix.

When the companies were finally placed in the informative matrix, it was necessary to calculate for each quadrant the average value of the three indicators of all of the companies belonging to that quadrant. It was done using the following formulas:

$$CAGR = \sqrt{\frac{PV_{c2013}}{PV_{c2011}}} - 1$$

$$Average\ Profitability = \frac{EBITDA_{c2011} + EBITDA_{c2012} + EBITDA_{c2013}}{PV_{c2011} + PV_{c2012} + PV_{c2013}}$$

$$Average\ Financial\ Debt\ Ratio = \frac{Financial\ Deb_{.c2011} + Financial\ Deb_{.c2012} + DFinancial\ Deb_{.c2013}}{EBITDA_{c2011} + EBITDA_{c2012} + EBITDA_{c2013}}$$

where:

PV_{c2013} , PV_{c2012} , PV_{c2011} = Production value achieved by the companies from the cluster C in 2013, 2012 and 2011; $EBITDA_{c2013}$, $EBITDA_{c2012}$, $EBITDA_{c2011}$ = Ebitda realized by the companies from the cluster C in 2013, 2012 and 2011; $Financial\ Deb_{.c2013}$, $Financial\ Deb_{.c2012}$, $Financial\ Deb_{.c2011}$ = financial debts reached by the companies from the cluster C in 2013, 2012 and 2011; c = the quadrant of the informative matrix; can have values 1, 2, 3, 4, 5, 6.

We said that a bubble appearing in the informative matrix within each quadrant represents the group of companies belonging to the same quadrant. Its position indicates the average profitability and the average financial debt ratio of the companies, which belong to the matrix. The size of the bubble illustrates the average growth, instead. In the situation, when the quadrant's companies presented negative average growth, we assumed that it is equal to 0,20%. In this way, it was possible to define the position of the bubble on the graph.

C) Comparison Italy-German

In order to make a comparison of the two countries mentioned above, we considered the location of the Italian and German companies in the informative matrix and the average values obtained in each quadrant of the matrix, calculated in the way described in the previous point B). In addition, we analyzed the main stock markets (and the features of their segment) for trading the debt securities of the small and medium-sized enterprises: it impacts on the financial opportunities for Italian and German companies.

4. FINDINGS

The application of the informative matrix was conducted with the reference to:

- Italian companies of the sample;
- German companies of the sample.

The sample on which the survey was carried out consisted of 41,344 Italian companies. The figure presented below (Figure 2) shows the position of the companies in the informative matrix. Thanks to this graphical presentation, it is possible to carry out the three-dimensional analysis of each quadrant, what means that the position of a bubble within each quadrant defines the average values of both: profitability and ability of financial debt's repayment by the companies belonging to the quadrant. The bubble's dimension presents the average growth of the quadrant, instead.

According to the figure presented above, it emerged that:

- the first quadrant shows that 28.40% of the analysed companies are classified as Star and Excellent companies. The companies classified as a star companies had a growth rate above 5% and accounted 10.8% of them. The growth of the remaining 17.60% of the companies was below 5% and even negative (-5.05%). The star companies have a high average profitability, equal to 15% and a low average ability to repay the financial debt (1.25), in the same time. The rest of the companies belonging to the first quadrant presents a little bit lower annual average income, equal to 14.73%, and little bit higher level of average debt ratio (1.31);

- a relevant part of the Italian companies (28.3%) belongs to the second quadrant, within which an average profitability is below 7% (precisely 3.87), average ability to repay the financial debt is below 5 (precisely 2.03) and an annual average growth is positive, meaning equal to 2.11%;

- in the third quadrant is located 15.3% of the Italian companies, with indicator EBITDA/Production on average of 3.61% and average financial debt ratio equal to 7.19. What is more, all of the companies registered an annual growth a little bit below 0 (-0.10%);

- the fourth quadrant represents further 5% of the analysed Italian companies. Their average profitability is quite high (equal to 13.81%), but they have the financial debt ratio above 5 (precisely equal

to 6.79). An annual average growth of all of the companies was negative (-2.12%);

- the fifth quadrant account 13.1% of the Italian companies, their profitability, comparing to other quadrants of the informative matrix, is lower (2.23%), average financial debt's ratio is higher (19.49) and they presented the negative growth (equal to -2.87%);

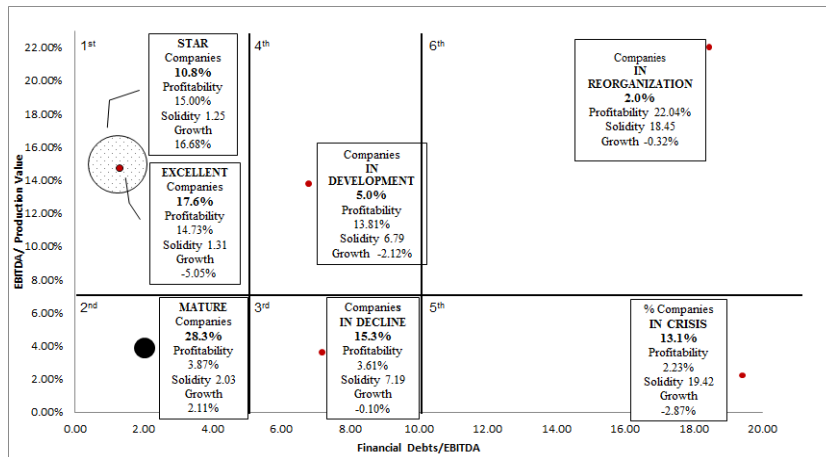
- in the sixth quadrant is placed only 2% of the companies, and it is the less populated quadrant of the informative matrix. In reference to the other quadrants, the companies belonging to the 6th one

are characterized by higher profitability (22.04%), high financial debt's ratio (18.45) and their annual average growth is a little bit below 0 (-0.32%).

On the graph presented above, 3,228 Italian companies are not introduced, because of their negative EBITDA (they did not generate resources necessary to repay the financial debt's contracts).

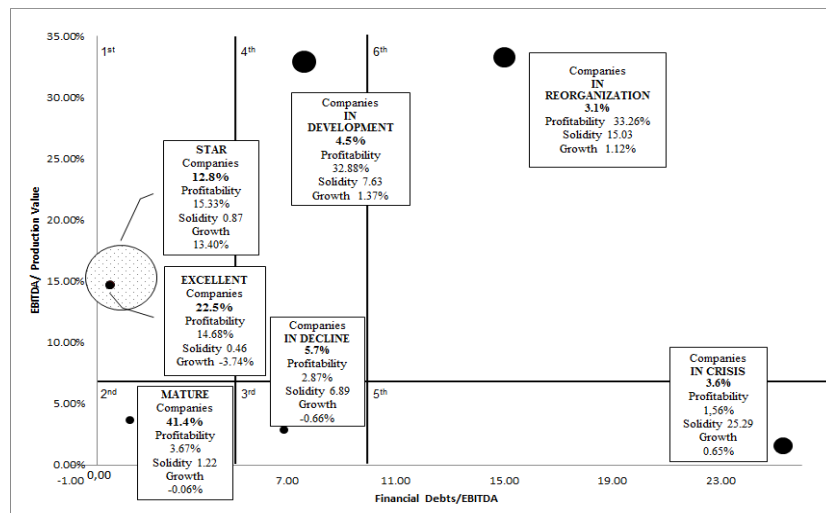
Subsequently, the survey was conducted on a sample of 12.219 German companies. The figure 3 represents the position of the companies in the informative matrix.

Figure 2. The informative matrix for Italian companies



Source: Own elaboration

Figure 3. The informative matrix for German companies



Source: Own elaboration.

In reference to the figure presented above, it emerged that:

- the first quadrant shows that 35.3% of the analysed German companies are classified as Star and Excellent companies. 12,8% of them had a growth above 5% in the period 2011-2013, therefore are classified as star companies, while the remaining 22.5% is characterized by a growth below 5%, even negative (equal to -3.74%). The companies classified as a star companies have a high average profitability ratio (above 15.33%) and accounted average ability to repay the financial debt equal to 0,87. The rest of

the companies belonging to the first quadrant present slightly lower annual average income (comparing to the previous ones), equal to 14.73%, and lower level of average debt ratio (0.46);

- the analysis showed that a significant part of the German companies (41.4%) is placed in the second quadrant. The companies are characterized by an average profitability of 3.67%, good financial condition (ability to repay their financial debt is equal to 1.22) and an annual average growth a little bit below 0 (-0.06%);

- only the 5.7% of the German companies are classified as companies at the beginning of decline (the third quadrant). Those are characterized by a profitability on average of 2,87%, by a financial debt ratio of 6.89 and by a negative annual average growth (-0.66%);

- the 4.5% of the companies are defined as companies in development (the fourth quadrant). Those are characterized by high level of average profitability (32.88%), by medium-high level of financial debt (7.63) and a positive annual average growth (1.37%);

- in the fifth quadrant are placed 3.6% of the German companies, characterized by a little bit worse profitability comparing to other quadrants, equal to 1.56% and an average financial debt ratio of 25.29. Those companies have an average annual growth of 0,65%;

- the sixth quadrant is the one with the minor number of companies (3.10%). The companies belonging to this quadrant are characterized by higher profitability in comparison with the other quadrants (33.26%), a very high level of financial debt ratio (15.03) and a positive annual average growth (1.12).

On the graph (Figure 4) there are not represented 782 companies because of their negative EBITDA (they did not generate resources necessary to repay the financial debt's contracts).

It is interesting to compare the results obtained for the two sample, in order to identify the characteristics of the companies belonging to the various quadrants. The principal results are presented below (Table 2).

Table 2. Comparison Italy/Germany: companies' position in the informative matrix

Categories of companies in the informative matrix	Italy		Germany	
	NR	%	NR	%
Star Companies	4,466	11%	1,560	13%
Excellent Companies	7,278	18%	2,748	22%
Mature companies	11,704	28%	5,058	41%
Companies at the beginning of decline	6,340	15%	699	6%
Companies in development	2,076	5%	554	5%
Companies in crisis	5,436	13%	439	4%
Companies in reorganization	816	2%	379	3%
Negative Ebitda	3,228	8%	782	6%
Total	41,344	100%	12,219	100%

Source: Own elaboration

Table 3 contains, for each quadrant, the comparison of the indicators used in the survey, in the context of the two samples.

Table 3. Comparison Italy/Germany: profitability, financial debt ratio and growth of the companies analysed in the period 2011-2013

Categories of companies in the informative matrix	Profitability		Financial Debt Ratio		Growth	
	Italy	Germany	Italy	Germany	Italy	Germany
Star Companies	15.00%	15.33%	1.25	0.87	16.68%	13.40%
Excellent Companies	14.73%	14.68%	1.31	0.46	-5.05%	-3.74%
Mature companies	3.87%	3.67%	2.03	1.22	2.11%	-0.06%
Companies at the beginning of decline	3.61%	2.87%	7.19	6.89	-0.10%	-0.66%
Companies in development	13.81%	32.88%	6.79	7.63	-2.12%	1.37%
Companies in crisis	2.23%	1.56%	19.42	25.29	-2.87%	0.65%
Companies in reorganization	22.04%	33.26%	18.45	15.03	-0.32%	1.12%
Negative Ebitda	-6.35%	-7.11%	-7.19	-5.56	-7.43%	-1.01%
Total	6.65%	8.30%	4.73	3.50	0.17%	0.52%

Source: Own elaboration

The overall comparison shows that the economic and financial situation of the German companies is better than in Italy. About 76% of them is placed in the quadrants with better level of profitability and financial position (star, excellent and mature), as opposed to 57% in Italy.

In particular, 13% of the companies analysed in Germany, in comparison with 11% of those Italian, is classified as star companies, with profitability greater than 7%, debt ratio of less than 5, and growth of more than 5%; 22% of German companies, versus 18% of Italian ones, is always placed in the first quadrant, but with a growth of less than 5% (excellent enterprises); 41% of German companies, as opposed to 28% in Italy, is classified as mature companies with low profitability, but good ability to repay financial debt.

For a further demonstration of the economic and financial difficulties of the Italian companies in comparison with the German ones, it's possible to see, that the percentage of the companies at the beginning of decline and in crisis in Italy (respectively 15% and 13%) is much higher than that one recorded in Germany (respectively 6% and 4%).

In terms of profitability, it emerges that German companies, in the considered three-year period, have recorded on average a profitability higher of 1.3% in respect to the Italian ones. In particular, a big difference can be observed in the case of the companies in development, which in Italy have an average profitability equal to 13.81%, as opposed to 32.88% detected for the German companies.

The German companies show better ability to repay its financial debt in comparison with the

Italian ones. Especially with a reference to the companies star, excellent and mature whose PFN/EBITDA ratio in Italy is respectively equal to 1.25, 1.31 and 2.03, meaning that they are higher than in case of the German ones (respectively 0.87, 0.46 and 1.22). As we noticed in the first quadrant, which contains the companies star and excellent, the German companies' ability to repay the financial debt is less than one year, what is appreciated by the credit system, especially the bank one.

With reference to the growth, in terms of average production value analysed within the three-year period, instead, we can affirm that the German companies are increasing on average greater than the Italian ones (0.52% of the German companies versus the negative growth of Italian ones equal to 0.20%).

The table 4 shows a comparison between Italy and Germany in terms of the main markets of trading of the debt instruments for the small and medium-sized enterprises.

Table 4. Comparison Italy/Germany: stock markets dedicated for trading

<i>Market previsto per le PMI</i>	<i>Country</i>	<i>Year of creation</i>	<i>Number of Bond Issues</i>	<i>Source</i>
Entry Standard Frankfurt	Germany	2003	57	http://en.boerse-frankfurt.de/bonds/entry-standard-bonds
Mittelstandsbörse Deutschland	Germany	2011	3	http://www.boersenag.de/Mittelstandsbourse_Deutschland/Anleihen
M: access bond	Germany	2005	4	https://www.maccess.de/gelistete-unternehmen/unternehmen-anleihen
Bondm	Germany	2010	7	https://www.boerse-stuttgart.de/de/Bondm-Index-EUR-Index-DE000SLA0BX3-Zusammensetzung-377
ExtraMOT PRO	Italy	2013	143	http://www.borsaitaliana.it/borsa/obbligazioni/prolink/ricerca-avanzata.html?page=8

Source: Own elaboration

According to the table presented above, Entry Standard in Frankfurt was founded in 2003 and today it accounts 57 issues; on the Mittelstandsbörse Deutschland, which was founded in 2011 are listed the financial debt instruments of only 3 companies; M: access bond was created in 2005 and on this market currently we can see a quotation of 4 financial debt instruments; Bondm, which was formed in 2010 and is managed by Boerse Stuttgart, allows the trading of financial debt instruments issued by SMEs for both, professional investors and retail public – today, the number of issues in its case is equal to 7.

5. DISCUSSION

Empirical application of the informative matrix showed, that the degree of effectiveness of the financing instruments alternative to the debt appears influenced by the analysed space-time context.

Referring to the RQ, several differences emerged between Italian and German small and medium-sized companies, regarding the most suitable suggested financing forms.

With reference to Italy, the effectiveness of the instruments alternative to bank debt is rather modest for a number of reasons, such as:

- limited access to debt market because of strict valuation methods shared by financial investors (according to empirical analysis a small minority of the potentially interested companies meets the requirements for access to the instruments alternative to bank debt):

- lack of financial market's approval for the companies classified as not investment grade (located in the informative matrix in the following quadrants: 3rd (at the beginning of decline), 4th (in development), 5th (in crisis) and 6th (in reorganisation)), with Financial debt to EBITDA ratio above 5, even with a high profitability in the 4th and 6th quadrant.

- the companies mentioned above could access this kind of debt or equity instruments, where the assessment is based not only on the historical values but especially on the estimated economic and financial results (for example hybrid debt instruments or listing at the AIM market).

With reference to Germany, it occurs the opposite scenario:

- the number of German companies that are meeting the requirements to get an access to the debt market is higher than in case of the Italian context;

- about 45% of the German companies are classified as mature companies, meaning the companies attractive for banks;

- about 76% of German companies has been classified in quadrants with high levels of profitability and low financial debt (star, excellent and mature), as opposed to 57% in Italy.

- only 25 % of the German companies analysed is classified as high risk companies. In the informative matrix they are placed in the 3rd (at the beginning of decline), 4th (in development), 5th (in crisis) and 6th (in reorganization), and their Financial debt to EBITDA ratio is above 5, even with a high profitability, in the 4th and 6th quadrant.

In addition, it emerged that:

- differences between Italian and German companies are more evident if we focus on the companies in crisis, which account 13% in Italy and 4% in Germany, with negative profitability that is equal to 8% in Italy and 6% in Germany;

- the companies in the "best" quadrants, meaning the excellent and mature companies are those that have drawn to a lesser extent on external financing, and have supported their development through a careful choice of financial independence from the third parties. It is therefore possible to say that the abundance of the credit received from the banks, especially in Italy caused a worsening of the companies' competitiveness conditions and their ability to resort to financing instruments alternative to the bank.

6. CONCLUSIONS, IMPLICATIONS AND LIMITATIONS

Several differences emerged between Italian and German companies regarding the most suitable suggested financing forms. These differences are also due to the different characteristics existing between two countries:

- Germany, earlier than Italy, has provided the introduction of the markets dedicated to the debt securities of the small-medium sized enterprises, and today it is a country with the greatest number of those markets: Entry Standard Frankfurt, Mittelstandsbörse Deutschland in Hamburg-Hannover, M: access bond in Monaco of Bavaria and finally Bondm in Stuttgart. Today, the market accounts 71 issues;

- in Italy, ExtraMOT PRO segment is reserved instead to the professional investors, for the trading of bonds (including convertible bonds, whose shares arising from the conversion are traded on a regulated market), commercial paper, participating instruments and project bonds and has been activated on February 11th, 2013. The new segment was created to offer the SMEs a flexible, cheap and efficient domestic market, that size the opportunities and tax benefits arising from the new regulatory framework (Decree Law no. 83/2012). The market accounts 143 issues;

- however, in Germany the various stock exchanges have scheduled a special segment for trading the financial debt instruments of SMEs nearly a decade before Italy. The total number of issues is lower than in Italy, where the financial debts instruments for SMEs are a recent reality.

In addition, the effectiveness of the financing instruments alternative to the debt seems quite modest for several reasons, such as:

- according to the conducted analysis with reference to Italy, the companies characterized by a low ability to repay financial debt have a negative growth and a lower profitability comparing to the quadrants with a high investment grade (except of the 6th quadrant), what may means that the abundance of the credit by Italian companies in terms of growth and profitability, have caused the worsening of their economic-financial condition;

- German companies have performed much better in supporting the debt in comparison to Italian ones - 76% of them are classified in the quadrants with a good ability to repay the debts (within 5 years). In general, also in case of the German companies, by decreasing the ability to repay debt (meaning an increase of Deb. Fin/ EBITDA ratio), the growth decreases or does not assume this values to be considered in line with profitability levels achieved by them.

Even if the majority of German SMEs could be financed by recourse to the debt market, it emerged that the main markets for trading of debt securities of SMEs are characterized by a lower number of issues than the ExtraMOT Pro segment provided for the Italian Stock Exchange. It means that the German financial market (with regards to the debts) for SMEs is not a developed market; in addition, emerging differences between the German and Italian firms are due to the different cultural background of those two countries and not to the different level of the financial market's development. In fact, German

companies tend to be more capitalized than Italian ones.

Generally speaking, the companies with higher growth rates and better profit performance pursue a prudent policy according to the financing sources deriving from bank. Because of that, the companies have to follow the growth path consistent with the self-financing and/ or with ability of shareholder to ensure capital resources.

The innovative financing instruments (from the point of view of risk capital and debt) have a significant role in acceleration the disengagement the companies' needs from the banking system. Nevertheless, the expected impact can not be immediate, because of the company's culture and non-perfect functioning of the capital market.

The research is characterized by series of theoretical and practical implications. With reference to the theoretical implications, the research can represent a contribution to the scientific debate, because it permits the company to know different financing methods. It can influence the process of growth and competitiveness of the companies, but can also impact on other factors such as corporate culture, the adoption of the planning and control tools and on the use of economic-financial communication instruments. With reference to the practical implications, the following results could be distinguished: for companies, greater financing opportunities enable the company to change its financial culture, decreasing predominance of the banking channel and using the alternative sources of financing; for legislature: it appears the necessity to reduce the selectivity in the process of the company's evaluation in order to create an easier access to the alternative instruments.

The research is characterized by several limitations, which nonetheless do not affect significantly the conclusions and proposed observations:

- the use of only three indicators to evaluate the economic and financial situation of the company (what is justified by a strong correlation with the economic and financial situation of the company). Nevertheless, a system of indicators would be more appropriate in increasing information about each company;

- the model is based on only quantitative variables, without considering any qualitative variables (such as investment projects, brand's originality, market share and other important variables). These variables could describe the company's business, producing some useful information in the determination of the financing sources;

- database used for consulting the financial statement of the Italian and German companies are different;

- lastly, German companies are classified within the informative matrix created for Italian companies. This fact may means that the number of German companies classified in the high risk quadrants is in a relevant way lower than the number of the Italian ones.

REFERENCES

1. Anderson, R.C. and Reeb, D.M. (2003) 'Founding family ownership and firm performance: Evidence

- from the S&P 500', *Journal of Finance*, Vol. 58 No. 3, pp.1301 - 1328.
2. Ansoff, I.H. (1974), *La strategia d'impresa*, FrancoAngeli, Milano.
 3. Appio, C.L. (2013) *Emissione di cambiali finanziarie e accesso delle piccole e medie imprese al mercato dei capitali*, Cacucci, Bari.
 4. Arrighetti, A. and Ninni A. (2012) 'German and Italian manufacturing performances: a premise to a comparison', *Economia e Politica Industriale*, Vol. 2, pp.5 - 16.
 5. Arrighetti, A., Breda, E., Cappariello, R.C., Clemens, M.C., Ninni, A., Schumacher, D. (2012), 'Competitiveness in manufacturing. Germany vs. Italy - a comparison', *Working Paper*, Department of Economics, Parma University.
 6. Baginski, S.P. and Hassel, J.M. (2004) *Management decision and financial accounting reports*, Thomson South-Western, Mason.
 7. Becchetti, L. and Trovato, G. (2002) 'The Determinants of Growth for Small and Medium Sized Firms. The Role of the Availability of External Finance', *Small Business Economics*, Vol. 19 No. 4, pp.291 - 306.
 8. Bernstein, L. and Wild, J.J. (1998) *Financial Statement Analysis*, McGraw-Hill, New York.
 9. Bianchi, T. (1975) 'La finanza aziendale', in Ardemani E. (a cura di), *Manuale di Amministrazione Aziendale*, Isedi, Milano.
 10. Boffelli, S. and Urga, G. (2015) 'Macroannouncements, bond auctions and rating actions in the European government bond spreads', *Journal of International Money and Finance*, Vol. 53, pp.148 - 173.
 11. Bompani, A. and Catelani, E. (2012) *Project Bond & Commercial Paper*, FrancoAngeli, Milano.
 12. Bozio, A., Emmerson, C., Peichl, A., Tetlow, G. (2015) 'European Public Finances and the Great Recession: France, Germany, Ireland, Italy, Spain and the United Kingdom Compared', *Fiscal Studies*, Vol. 36 No. 4, pp.405 - 430.
 13. Bracci, E. (2007) 'La piccola impresa familiare', in Bracci, E. and Vagnoni, E. (Ed.), *Le piccole imprese familiari. Il capitale intellettuale nella gestione del ricambio generazionale*, FrancoAngeli, Milano.
 14. Brealey, R.A., Myers, S.C. and Sandri, S. (1999) *Principi di finanza Aziendale*, 3^a ed., McGraw-Hill, Milano.
 15. Campedelli, B. (1998) *Analisi aziendale: strumenti concettuali, metodologici e di valutazione dell'impresa*, Giappichelli, Torino.
 16. Capasso A., Gallucci C., Rossi M. (2015), 'Standing the test of time. Does firm performance improve with age? An analysis of the wine industry', *Business History*, Vol. 57 No. 7, pp.1037-1053.
 17. Carpenter, R. and Petersen, B. (2002) 'Is the Growth of Small Firms Constrained by Internal Finance?', *Review of Economics and Statistics*, Vol. 84, pp.298 - 309.
 18. Caselli, S. Chiarella, C. Gatti, S. and Gigante, G. (2013) *The capital markets for Italian companies: a resource to relaunch the country and renew growth CAREFIN* (Center for Applied Research in Finance).
 19. Chandler, A. (1962) *Strategy and Structure: Chapters in The History of American Industrial Enterprise*, Mit Press, Cambridge.
 20. Coda, V. (1988) *L'orientamento strategico dell'impresa*, Utet, Torino.
 21. Corbetta, G. (a cura di) (1999) 'La gestione strategica', in Brunetti, G., Coda, V. and Favotto, F., *Analisi, previsioni, simulazioni economico-finanziarie d'impresa*, Etas, Milano
 22. Dallochio, M., Tzivelis, D. and Vinzia, M.A. (2011) *Finanza per la crescita sostenibile*, Etas, Milano.
 23. De Bonis, R., Pozzolo, A.F. and Stacchini, M. (2012) *The Italian banking system: Facts and interpretations*, *Economics & Statistics Discussion Paper*, No. 068/12.
 24. De Luca, P. and Ferri, S. (2009) *Le scelte di finanziamento in ottica strategica: equity, debito e strumenti ibridi*, Ipsoa, Milano.
 25. de Socio, A., Maza, L.A., Silveira, V. and Bürker M. (2014) *Financial structure and profitability of European companies*, Bank for the Accounts of Companies Harmonized.
 26. M. (2011), "The Italian Entrepreneurial Outlook", in Del Giudice M., Della Peruta M.R., Carayannis E.G. (eds), *Knowledge and Family Business*, Springer, New York
 27. European Central Bank (2014) *Asset Quality Review. Phase 2 Manual*. https://www.bankingsupervision.europa.eu/ecb/pub/pdf/assetqualityreviewphase2manual201403e_n.pdf
 28. European Investments Bank (2003) 'Europe's changing financial landscape: The financing of small and medium-sized enterprises', *EIB Papers*, Vol. 8 No. 2.
 29. Fagiolo, G. and Luzzi, A. (2004) 'Do Liquidity Constraints Matter in Explaining Firm Size and Growth? Some Evidence from the Italian Manufacturing Industry', *Sant'Anna School of Advanced Studies. Working Paper Series*, 8.
 30. Falzoni, A.M. and Grasseni, M. (2012) 'Modelli di specializzazione e imprese esportatrici : Italia, Francia e Germania confrontò', *Economia e politica industriale*, Vol. 39 No. 3, pp.89 - 111.
 31. Fazzari, S., Hubbard, G. and Peterson, B. (1988) 'Financing Constraint and Corporate Investments', *Brooking Papers on Economic Activity*, Vol. 1 No. 1, pp.141 - 195.
 32. Ferrero, G. (1972) *Le analisi di bilancio*, Giuffré, Milano.
 33. Ferrero, G. et al. (2006) *Analisi di bilancio e rendiconti finanziari*, Giuffré, Milano.
 34. Florio, M., Peracchi, F. and Schokai, P. (1998) 'Market Organization and Propagation of Shocks: The Furniture Industry in Germany and Italy', *Small Business Economics*, Vol. 11 No. 2, pp.169-182.
 35. Foresti, G. and Trenti, S. (2012) 'Struttura e performance delle esportazioni : Italia e Germania a confronto', *Economia e politica industriale*, Vol. 39 No. 2, pp.77-109.
 36. Galbiati, P. (1999) *La struttura finanziaria delle imprese*, Egea, Milano.
 37. Gallucci, C., Nave, G. and Santulli, R. (2012) 'Nuove modalità di dialogo banca-impresa: il ruolo degli asset familiari', *Esperienze d'Impresa*, Vol. 1, pp.1 - 24.
 38. Gambini, A. and Zazzaro, A. (2008) 'Gli effetti della durata e dell'esclusività delle relazioni banca-impresa sulla crescita dimensionale delle imprese', in A. Zazzaro (a cura di), *I vincoli alla crescita delle imprese*, Carocci, Roma
 39. Donaldson, G. (1994) *Corporate Restructuring*, Harvard Business School Press, Boston.
 40. Giacosa, E. (2011) *L'economia delle aziende di abbigliamento*, Giappichelli, Torino.
 41. Giacosa, E. (2012a) *La comunicazione economico-finanziaria d'impresa. Finalità, strumenti e comportamenti attuali e teorici in un modello "ideale" di comunicazione*, Giappichelli, Torino.
 42. Giacosa, E. (2012b) *Mergers and Acquisitions (M&As) in the Luxury Business*, McGraw-Hill, Milano.
 43. Giacosa, E. (2015) *Fabbisogno finanziario ed indebitamento nelle piccole medie imprese*, FrancoAngeli, Milano.

43. Giacosa, E. and Mazzoleni, A. (2012), *Il progetto di risanamento dell'impresa in crisi*, Giappichelli, Torino.
44. Giacosa, E. and Mazzoleni, A. (forthcoming), 'A decision model for the suitable financing for Small and Medium Enterprises', *International Journal of Managerial Financial Accounting*.
45. Giroux, G. (2003) *Core concepts of Financial Analysis. A User Approach*, Wiley, River Street, Hoboken.
46. Grandinetti, R. and Nassimbeni, G. (2007) *Le dimensioni della crescita aziendale*, FrancoAngeli, Milano.
47. Gualandri, E. and Schwizer, P. (2008) 'The Role of the Public Sector', in Gualandri, E. and Venturelli, V. *Bridging the Equity Gap for Innovative SMEs*, Palgrave Macmillan Houndmills, Basingstoke GBR, pp.145 - 172.
48. Guerrieri, P. and Esposito, P. (2012) 'Italia e Germania: due modelli di crescita export-led a confronto', *Economia e politica industriale*, Vol. 39 No. 2, pp.17 - 53.
49. Hall, B.H. and Oriani R. (2004) 'Does the Market Value R&D Investment by European Firms? Evidence from a Panel of Manufacturing Firms in France, Germany, and Italy' NBER Working Paper No. 10408, National Bureau of Economic Research. Available on <http://www.nber.org/papers/w10408>.
50. Helfert, E.A. (1997) *Techniques of Financial Analysis*, McGraw-Hill, New York.
51. Herrera, A.M. and Minetti, R. (2007) 'Informed Finance and Technological Change: Evidence from Credit Relationship', *Journal of Financial Economics*, Vol. 83 No. 1, pp.225 - 269.
52. Higgins, R.C. (2007) *Analysis for Financial Management*, McGraw-Hill Irwin, New York.
53. Honjo, Y. and Harada, N. (2006) 'SME Policy, Financial Structure and Firm Growth: Evidence from Japan', *Small Business Economics*, Vol. 27 No. 4, pp.289 - 300.
54. Ingram, R.W., Albright, T.L. and Baldwin, B.A. (2002) *Financial Accounting. Information for decisions*, Thomson South-Western, Mason.
55. Invernizzi, G. (a cura di) (2008) *Strategia aziendale e vantaggio competitivo*, McGraw-Hill, Milano.
56. Ivanov, S. (2009) 'Demographic and economic factors of labour supply: Long-term projections and policy options for France, Germany, Italy and the United Kingdom', *Vienna Yearbook of Population Research Vol. 7, Impact of migration on demographic change and composition in Europe*, Austrian Academy of Sciences Press, Vienna.
57. La Rocca, M. (Eds.), (2007) *Politiche finanziarie d'impresa*, Egea, Milano.
58. Lang, L., Ofek, E. and Stulz, R.M. (1996) 'Leverage, Investment and Firm Growth', *Journal of Financial Economics*, Vol. 40 No. 1, pp.3 - 29.
59. Levinthal, D. (1988) 'A Survey of Agency Models of Organization', *Journal of Economic & Organization*, Vol. 9, No. 2, pp.153 - 185.
60. Lotti, F. and Santarelli, E. (2001) 'Linking Knowledge to Productivity: A Germany-Italy Comparison Using the CIS Database', *Empirica*, Vol. 28 No. 3, pp.293 - 317.
61. Machauer, A. and Weber, M. (2000) *Number of Bank Relationships: An Indicator of Competition, Borrower Quality, or Just Size?*, Center for Financial Studies, Working Paper Series, 6.
62. Mahéroul, L. (2000) 'The influence of going public on the investment policy', *Family Business Review*, Vol. 13 No. 1, pp.71 - 79.
63. Manello, A. and Rolfo, S. (2012) 'La meccanica strumentale in Germania e Italia: due modelli a confronto', *Economia e politica industriale*, Vol. 39 No. 2, pp.139 - 161.
64. Meigs, R.F. et al. (2001) *Financial Accounting*, Irwin McGraw-Hill, New York.
65. Miglietta, N. (2004) *La struttura finanziaria obiettivo nel sistema impresa*, Giappichelli, Torino.
66. Mulkay, B. and Sassenou, M. (1995) 'La hiérarchie des financements des investissements des PME', *Revue Économique*, Vol. 8 No. 2, pp.345 - 363.
67. Oliveira, B. and Fortunato, A. (2006) 'Firm Growth and Liquidity Constraints: A Dynamic Analysis', *Small Business Economics*, Vol. 27 No. 2, pp.139 - 156.
68. Ordine dei dottori commercialisti di Milano (2011), *Commissione finanza e controllo di gestione, Patrimonializzare e sostenere la competitività delle PMI italiane: la quotazione su AIM Italia*, S.A.F. Luigi Martino, Fondazione dei dottori commercialisti di Milano, Milano.
69. Osteryoung, J.S., Constand, R.L. and Nast, D.A. (1992) 'Financial ratios in large public and small private firms', *Journal of Small Business Management*, Vol. 30 No. 3, pp.35 - 46.
70. Prendergast, C. (2000) 'What Trade-Off of Risk and Incentives?', *American Economic Review*, Vol. 90 No. 2, pp.421 - 425.
71. Rasmusen, E. (1987) 'Moral Hazard in Risk-Averse Teams', *The RAND Journal of Economics*, Vol. 18 No. 3, pp.428 - 435.
72. Rivaud-Danset, D., Dubocage, E. and Salais, R. (2001) Comparison between the financial structure of SMEs and that of large enterprises (LES) using the BACH database, Economic Paper available on: http://europa.http://europa.eu.int/economy_finance
73. Ross, S.A. (2004) 'Compensation, Incentives, and the Duality of Risk Aversion and Riskiness', *The Journal of Finance*, Vol. 59, No. 1, pp.207 - 225.
74. Rossi, M. (2014a) 'The use of capital budgeting techniques: an outlook from Italy', *International Journal of Management Practice*, Vol. 7 No. 4, pp.297-312
75. Rossi, M. (2014b) 'Capital budgeting in Europe: confronting theory with practice', *International Journal of Managerial and Financial Accounting*, Vol. 6 No. 4, pp.341-356.
76. Rossi, M. (2015), 'The efficient market hypothesis and calendar anomalies: a literature review', *International Journal of Managerial and Financial Accounting*, Vol.7 No.3/4, pp.285 - 296.
77. Rossi, M., Lombardi, R., Nappo, F. and Trequattrini, R. (2015) 'The capital structure choices of agrifood firms: evidence from Italian SMEs', *Int. J. Management Practice*, Vol. 8 No. 3, pp.172-186.
78. Shavell, S. (1979) 'Risk Sharing and Incentives in the Principal and Agent Relationship', *The Bell Journal of Economics*, Vol. 10 No. 1, pp.55 - 73.
79. Singer, P. (2000) 'Alla ricerca della struttura finanziaria ideale', *Esperienze d'impresa*, Vol. 1.
80. Urbani, A. (2013) *Le cambiali finanziarie nelle dinamiche del mercato*, Cedam, Assago.
81. Value, B. (2001) *Guide to Analysing Companies*, The Economist, Profile Books, London.
82. Venanzi, D. (2003) *Le decisioni di struttura finanziaria delle imprese italiane*, Morlacchi, Perugia.
83. Venanzi, D. (2010) *Il puzzle della struttura finanziaria*, Pearson Prentice Hall, Milano.
84. Zazzaro, A. (2008), *I vincoli finanziari alla crescita delle imprese*, Cacucci, Bari.

DISPOSITION EFFECT AND INVESTOR UNDERREACTION TO INFORMATION

Mondher Bouattour*, Ramzi Benkraiem**, Anthony Miloudi***

*Assistant Professor, La Rochelle Business School & LGCO University of Toulouse, France

**Associate Professor, Audencia Business School, Nantes France

***Professor, La Rochelle Business School & CRIEF University of Poitiers, France

Abstract

The purpose of this paper is to explain the underreaction of investors to information. In order to study the adjustment of prices to a fundamental value, we implement experimental markets with fluctuating fundamental values. The experimental design employed involves two treatments differentiated according to the information disclosed to the participants. The results show an underreaction to a change in the fundamental value. This underreaction is greatest when most of the subjects are facing a paper loss. This suggests that the disposition effect has a strong impact on price formation. Once most of the subjects are in a paper gain situation, the underreaction is at its lowest level when they receive good news. Thus, underreaction to information is influenced by paper gains and losses.

Keywords: Underreaction to information, Disposition effect, Experiment

Code JEL: C92 - Laboratory, Group Behavior; G12 - Asset Pricing; G14 - Information and Market Efficiency

1. INTRODUCTION

The informational efficiency market hypothesis requires that prices fully reflect all available information at any time. Thus, the price of a stock is a good estimate of its fundamental value. The use of relevant information by rational investors is likely to create equality between the fundamental value of a stock and its price (Fama, 1970). In the presence of investors who are not perfectly rational any mispricing would be corrected by the arbitration mechanism and prices would gradually converge to the fundamental value. For stocks, the fundamental value is equal to the present value of future dividends. Of course, the flow of dividends is unknown and investors should anticipate this according to the information they have. Thus, to determine the fundamental value of a stock, the investor is expected to use the available information optimally, i.e., to anticipate future dividends rationally. However, in financial markets, investors tend to underestimate the significance of the financial information. This underestimation could lead to an underreaction to information.

Previous event studies have empirically examined the underreaction of investors to information. They demonstrate the existence of abnormal returns over several months, and consequently invalidate the efficient market hypothesis (EMH). These abnormal returns are a proxy of the underreaction of investors at the time of information disclosure (Vega, 2006; Chordia et al., 2009). The gradual price adjustment to the arrival of new information has been found in these following events: earning announcements (Bernard and Thomas, 1989; Truong, 2011; Zhang et al., 2013), stock repurchases (Ikenberry et al., 1995), dividend and omission announcements (Michaeli et al., 1995; Liu et al., 2008), stock splits (Desai and Jain, 1997; Ikenberry and Ramnath, 2002) and analysts' forecasts (Hou et al., 2014).

Another stream of theoretical and empirical research seeks to explain this underreaction to information through a behavioral paradigm³². To this end, underreaction to information has been explained as the result of cognitive biases among investors. Behavioral finance offers explanations that are essentially based on the concept of bounded rationality and investigates price formation in the presence of investors who are not perfectly rational. Grinblatt and Han (2005) suggest that the explanation for the underreaction to information is related to investor preferences and offer a model that is based on the disposition effect.³³ According to Shefrin and Statman (1985), the disposition effect is the tendency of investors to sell winning stocks too quickly and hold losing stocks too long. The tendency of investors to hold losing stocks creates an imbalance between supply and demand for securities, which alters the price formation. The existence of investors prone to the disposition effect implies an underreaction to information (Grinblatt and Han, 2005; Hur et al., 2010). Frazzini (2006) shows that underreaction to information exists only when the news and the paper gain or loss at the aggregate level have the same sign. Hur et al. (2010) show that the disposition effect has a significant impact on prices when stocks are held by individual investors.

This paper aims to study the reaction of investors to the disclosure of new information. Its main objectives are i) to test the existence of underreaction to information, and ii) to check if this

³² Rational explanations also exist to explain underreaction to information. These explanations are related to microstructure issues, such as the illiquidity of securities (Bossaert and Plott, 2000; Chordia et al., 2009) and the impact of transaction costs on trading fluidity (Lesmond et al., 2004; Ng et al., 2008 to name a few).

³³ The disposition effect is not the only behavioral explanation for underreaction to information. We direct the reader to the models of Barberis et al. (1998) and Daniel et al. (1998), which refer, respectively, to anchoring and self-attribution biases.

underreaction is related to the disposition effect, i.e. selling winning stocks too quickly and holding losing stocks too long implies. Thus, our research question is to investigate whether the presence of investors displaying the disposition effect generates stock price underreaction to information. To circumvent the problems related to the calculation of abnormal returns, we follow an experimental method. In this method, the phenomenon of underreaction is more easily detectable. In addition, experimentation allows us to measure variables that are difficult to quantify using real market data, as is the case, for example, for the fundamental value of a stock (Kirchler, 2009) and paper gains and losses.

This research shows the existence of underreaction to information. It is more pronounced when most participants hold stock with a paper loss. In contrast, when subjects are facing a paper gain, the prices adjust more strongly to the fundamental value. Thus, the reluctance of subjects to sell losing stocks prevents the price adjustment to the fundamental value and creates an underreaction to information. The findings discussed and presented in this article should provide useful insights for investors as well as asset managers. This research is one of the first experimental studies bringing together the disposition effect and underreaction to information. Research that has independently studied the disposition effect and underreaction to information is, however, more common. Thus, the methodological approach and the empirical results of this research enrich the existing literature regarding the impact of the disposition effect on price formation in financial markets.

The remainder of this paper is organized as follows. Section 2 presents the literature review and the hypotheses to be considered. Section 3 describes the experimental design. Section 4 reports and discusses the main empirical findings. Section 5 provides the conclusion.

2. LITERATURE REVIEW AND HYPOTHESES

If investors underreact to information, the correction of this initial assessment error takes place during the months following the event. Thus, abnormal returns are positive after announcements of good news and negative following bad news (Michaely et al., 1995; Ikenberry and Ramnath, 2002). In the months following earnings announcements, stocks with positive surprises (compared with the analysts' expectations) have abnormal returns higher than those of stocks for which the surprises are negative (Bernard and Thomas, 1989). Thus, the prices do not immediately incorporate good or bad news. More recently, Truong (2011) analyses abnormal returns over different event windows and shows post-earnings announcement drift. A hedge strategy of going long on the top quintile of earnings for surprise stocks and short on the bottom quintile of earnings for surprise stocks generates a positive excess return in the year following earnings announcements. Generally speaking, the event study methodology is used due to the impossibility of calculating the exact fundamental value of stock. This kind of methodology is mainly based on theoretical models to assess expected returns. Therefore, price adjustment is not directly testable since the use of a computational model of expected returns is required. According to Fama (1970, 1991), results are conditioned by the choice of the

estimation model of theoretical returns (known as the joint hypothesis problem).

Experimental studies have compared price changes with that of the fundamental value. According to Weber and Welfens (2007), the initial underreaction to announcements of good or bad news is followed by a tendency after the event for prices to converge slowly to a new fundamental value. Kirchler (2009) was interested in subjects' reaction to fundamental information in experimental markets with symmetric and asymmetric information. When information is symmetric, all subjects have the same information and changes in the fundamental value from one period to another are highly visible in the prices. However, in markets with asymmetric information, the dissemination process is much slower and the price adjustment to the fundamental value is weak. In experimental studies, subjects are continuously informed of the fundamental value of a stock, so a direct comparison of the established price and fundamental value is possible. Thus, an underreaction is detected when the price adjustment to the fundamental value is small. Therefore, we formed the first following hypothesis:

Hypothesis 1 (H1): The underreaction of investors to information exists if prices adjust weakly to the fundamental value.

Behavioral finance explains that the underreaction to new information can be attributed to cognitive biases. While the expected utility theory provides that decisions are made based on final wealth, prospect theory suggests that these decisions are taken on the basis of gains and losses in respect to a reference point (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992). Individuals are risk averse with regard to gains and risk takers in relation to losses. In a situation of paper gains, investors prefer to secure their gain. In the case of paper losses, investors prefer to keep their stock and wait until prices rebound.

Investors prone to the disposition effect use one or more reference points when assessing their paper gains and losses. The benchmarks used are the purchase price, the average price over the previous period and the maximum price reached (Oehler et al., 2003; Baucells et al., 2011). Grinblatt and Han (2005), Frazzini (2006), Hur et al. (2010) and Zhao et al. (2011) assume that investors use the purchase price of a stock to assess their paper gains and losses. However, this variable is solely a proxy of the true variable because it is calculated based on previous transaction prices and volumes.

Grinblatt and Han (2005) show that the disposition effect alters price formation and generates an underreaction to information. This underreaction depends on the proportion of investors prone to the disposition effect. Indeed, the reluctance of some investors to sell losing stocks creates an imbalance between supply and demand, which implies an underreaction to information. Their model shows that the equilibrium price is the weighted average of the fundamental value of the stock and the reference price. When most investors trade the stock with a paper gain, the information is quickly reflected in stock prices. At the opposite, when investors negotiate stock with a paper loss, reluctance to sell losing stocks prevents the incorporation of information into prices. More precisely, two situations arise depending on the paper gain or loss. In the paper gain position, the

adjustment of prices to new information is faster than in the paper loss position. Hence, we can formulate our second hypothesis as follows:

Hypothesis 2 (H2): The underreaction to information is more pronounced when most subjects are in a paper loss position.

Frazzini (2006) and Lin and Rassenti (2012) have studied the reaction of investors depending on both the quality of news (good or bad) and paper gains and losses. Frazzini (2006) uses trading volumes and daily returns to analyse the effect of paper gains and losses on investor reaction to earnings announcements. The author finds results that confirm that trading between disposition-prone investors influences prices and generates a post-earnings announcement drift. According to Frazzini (2006), when investors are in a paper gain (or loss) position at the aggregate level, prices underreact to the announcement of good (or bad) news. The author states that prices underreact to negative news when most of the current holders are facing a paper loss; whereas, when most investors are facing a paper gain, stock prices underreact to positive news. Therefore, we can form the following hypothesis:

Hypothesis 3 (H3): When most of investors are facing a paper gain, stock prices underreact to positive news, and when most of investors are facing a paper loss, stock prices underreact to negative news.

3. EXPERIMENTAL DESIGN

3.1. Market model

We consider two treatments - T1 and T2 - that differ according to the information disclosed to the subjects. Each treatment consists of six experimental sessions, each of which has 24 periods. Every period lasts 100 seconds. This periodicity is used by Kirchler (2009), Kirchler and Huber (2009) and Hanke et al. (2010). At the beginning of each session, the subjects were briefed using written instructions³⁴ which were followed by four trial periods.³⁵ The experiments were programmed and conducted with z-Tree (Fischbacher, 2007).

In the first treatment (T1), each subject was informed of the dividend for the current period and those of the next three periods (Kirchler and Huber, 2009). This assumed that the participants were well informed and knew the exact values of future dividends (Kirchler and Huber, 2007). Dividends followed a random walk without drift and were determined as follows:

$$D_t = D_{t-1} + \varepsilon_t \quad (1)$$

Where D_t is the dividend for the current period t ; ε_t is a normally distributed random variable with a mean of zero and a variance equal to 0.16. The dividend for the first period was set at 2 EU per stock. The fundamental value of the stock was calculated by applying the dividend discount model (DDM) and assuming the last dividend to be perpetual:

$$FV_t = \sum_{i=t}^{t+2} \frac{D_i}{(1+r_e)^{i-t}} + \frac{D_{t+3}/r_e}{(1+r_e)^3} \quad (2)$$

FV_t is the fundamental value of the stock in period t and r_e is the discount rate of the DDM that corresponds to the risk-adjusted interest rate of 10% with a 3% risk-free rate³⁶.

In treatment T2, the subjects were only informed of the dividend for the current period and the fundamental value of the stock. To allow comparison between treatments, we used the same sets of fundamental values as calculated in treatment T1. The series of dividends D_t was calculated by multiplying the FV_t series of the first treatment by 0.1. During this second treatment, the dividend for the first period was not equal to 2 EU. We informed subjects that the dividend for the first period was around 2 EU and would change randomly. Typically, the fundamental value is calculated using the following formula:

$$FV_t = \frac{D_t}{r_e} \quad (3)$$

In the second treatment, the dividend D_t for the current period was assumed to be constant and perpetual, and r_e is the risk-adjusted interest rate of 10%.

The major difference between the two treatments (T1 and T2) was the quality of the information disclosed to the subjects.³⁷ This choice of two treatments allowed us to test the robustness of our results in two different controlled environments.

3.2. Trading mechanism

In both treatments, the subjects traded in a continuous double auction market with an open order book, which is representative of most real stock markets. The interaction between the participants took place through a computer network. They could trade stocks with the other participants by proposing limit orders or by accepting offers in the market price. Market orders have priority over limit orders as market orders are executed instantaneously. All limit orders were recorded in the order book based on the prices offered. Partial execution was possible and an exchange was then concluded at the price offered for the desired quantity. Trading was done without transaction costs. Going short on money or stocks was not allowed. To ensure liquidity, the prices offered had a maximum of 1 decimal place. Holdings of money and stocks were carried over from one period to the next.

The trading screen provided traders in real-time with current information in their stocks, money holdings and their wealth. The screen served as an interface for the participants and allowed them to

³⁴ See experimental instructions in Appendix A.

³⁵ At the beginning of each experimental session subjects were briefed with written instructions. Afterwards we ran four trial periods to allow subjects to become familiar with the market.

³⁶ In a vast majority of experimental studies, the authors select the risk-free interest rate and the risk-adjusted interest rates respectively far from 2% and 8.5% per year (see e.g. Kirchler and Huber, 2007). These interest rates were chosen in function of the real financial market conditions at the time of the realization of the experimental study.

³⁷ Successive definitions of the informational efficiency hypothesis are always based on the concept of fundamental information (Fama, 1970, 1991). Here, we proposed two treatments that differed in the quality of information disclosed to the subjects. If the experimental markets were efficient, prices should have incorporated all available information in both the T1 and T2 treatments.

receive information about dividends and the fundamental value of stocks, observe the offers in the order book, trade with other participants and visualize the evolution of the prices during the current period.

After each period a history screen provided a common information on the dividend, the fundamental value and the closing price and individual information on average purchase price and the profit in EU. (See section 3.4 below for details on calculus of the profit).

3.3. Experimental implementation

We conducted our experimental sessions in the computer laboratory at La Rochelle Business School during the year 2011. The subjects were business students volunteered for the experimental study. All these students took finance classes and are familiar with financial concepts presented in the instructions. When asked, participants confirmed that they understood the experimental design. Sixty-nine subjects participated in the first treatment and 72 in the second, for a total of 141. Each student participated in only one session of the 12 experimental sessions (6 sessions by treatment). From 10 to 14 students participated in each session. Although the number of periods in each session was fixed at 24, we informed the subjects in the instructions that the experiment would be randomly terminated between periods 20 and 30, with equal probability for each period. The objective was to control the end of the experiment and to avoid some participants engaging in strategic behavior in the final periods (Kirchler and Huber, 2009; Hanke et al., 2010).

At the beginning of each experiment, all subjects were assigned 1,000 experimental units (EU) and 50 stocks. The wealth of each subject depended on the number of stocks in its possession and on the interest earned on the money held at the end of each period. Wealth was also a function of the market price and evolved during each transaction. It changed systematically even if the subject did not intervene at the time of the previous transaction. At the end of each period, subjects receive the current dividend for each stock they own. When a subject sold a part of its stocks, its retention of money increased in real time. For holding cash, the participants received a risk-free interest rate of 3% at the end of each period. The risk-adjusted interest rate (10%) serves as the discount rate in the DDM formulas. This rate kept constant until the end of the experiment. Within the framework of our experiments, we focused solely on the purchase price of the stock as the reference price. This choice was motivated by two reasons. First, referring to the experimental study by Oehler et al. (2003), the purchase price is the reference point most used by subjects to assess their paper gains and losses. Second, if we had studied several reference points, it would have been difficult to know which point had been used by each subject. During the experiments, the subjects were thus informed only of their average purchase price. This price was displayed in real time on each subject's trading screen and changed after each purchase transaction.

3.4. Incentive Structure

To motivate the students and encourage them to make good decisions, an incentive structure was set up in the form of purchase vouchers. The pay-off for each subject at the end of each session was calculated in EU and is equal to the sum of the profits over all the 24 trading periods of the session. For a given period, the profit is equal to the change in the wealth. At the end of each trading period, the wealth is calculated on the basis of the closing price. The final profit (expressed in EU) allows determining a rank for each participant. The value of the purchase voucher, between 0 and 30 euros, is depending on the rank (see Table A1 in Appendix A). The purchase vouchers were awarded to subjects at the end of every experimental session.

4. RESULTS AND DISCUSSION

4.1. Descriptive statistics

The purpose of the descriptive analysis is to study the evolution of average prices in relation to the fundamental value. Figure 1 provides information of the relationship between average prices (\bar{P}) and fundamental values (FV) within the 12 experimental markets. Each graph represents a market characterized by a change in the fundamental value and average prices related to treatments T1 and T2.

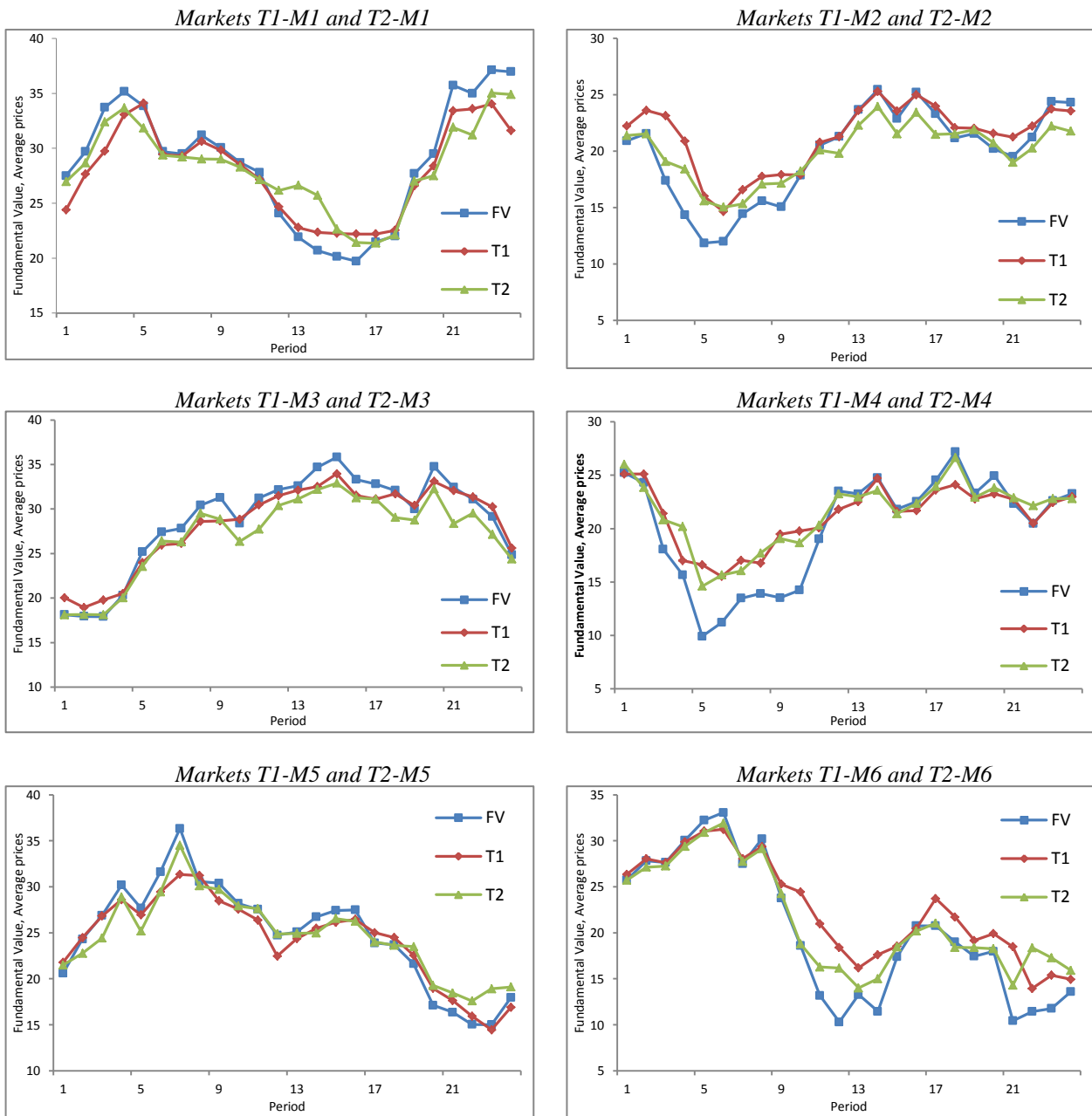
Figure 1 shows underreaction in all 12 experimental markets. Indeed, the stocks were undervalued in bullish and overvalued in bearish markets. When the fundamental values reached extreme minimal values, the subjects did not issue enough selling orders to allow prices to reach this fundamental value and preferred to keep their stocks. Although purchase orders at prices approaching the fundamental value existed in the order book, the subjects did not agree to sell the stocks in their possession at low prices. Similarly, when the fundamental value increased, the subjects negotiated the stock at a price below the fundamental value. Those subjects wishing to sell stocks submitted prices around the fundamental value, but buyers preferred to purchase stocks at lower prices.

Mispricing between prices and fundamental values remained even during the final periods of the experimental sessions. This suggests that the learning effect was low and did not have an impact on the subjects' trading strategies. This result is in line with those of Theissen (2000), which shows that the learning effect has no impact on the improvement of informational efficiency.

Table 1 provides a brief overview of the descriptive statistics for each market and each treatment. Underreaction exists if the relative change in the fundamental value $DFV_t = (FV_t - FV_{t-1})/FV_{t-1}$ from one period to another is accompanied by a smaller relative price change $D\bar{P}_t = (\bar{P}_t - \bar{P}_{t-1})/\bar{P}_{t-1}$.

This table shows the standard deviations of both relative changes in the fundamental value and the average prices. We calculated the ratio of these two standard deviations to study the price elasticity. This table also shows the levels reached by the fundamental values and average prices.

Figure 1. Fundamental values (FV) and average prices for the two treatments (T1 and T2) over the trading periods



In all 12 markets, the standard deviation of returns is less than the standard deviation of changes in fundamental values. The mean of the ratio of standard deviations is equal to 0.66 and 0.73, respectively, for treatments T1 and T2. This result suggests that prices adjust less to the fundamental value in the first treatment. In some of the markets, the standard deviation of the price change is only around half the standard deviation of changes in the fundamental value. This is the case for the T1-M4 and T1-M6 markets. Thus, a change in the fundamental value of an EU is accompanied by a smaller price change.

We also studied the minimum and maximum levels reached by the fundamental value and the relative market prices. Generally, prices did not adjust to the fundamental value in either case. Indeed, the values in column $\text{Min}(FV)$ are lower than

those in column $\text{Min}(\bar{P})$ in 11 of the experimental sessions. The only exception relates to the T1-M5 session. In this market, the minimum fundamental value is 15.02 EU, and prices fell to 14.46 EU. This observation can be explained by the mimetic behavior of the subjects. Observing the offers of other participants in the order book, they embarked on massive selling operations. During this experimental session, the fundamental value reached 36 EU (see Figure 1) and the subjects cashed significant dividends. Afterwards, the fundamental value began to decline until reaching 15 EU during period 23. The subjects observe the dividends on the trading screen for the current period (1.50) and the next three (1.48, 1.39, 1.47) and believe that holding the stock become too risky. In this context, it seems more interesting to sell the stock and to collect more

interest. Comparison of columns Max(FV) and Max(\bar{P}) also shows that prices did not adjust to the fundamental value when they reached their maximum values. The values in column Max(\bar{P}) are lower than those in column Max(FV) for the 12 experimental sessions, which demonstrates that

trading between subjects did not allow the prices to reach extreme fundamental values.

From these statistics, we can conclude that the participants underreacted to information in the experimental markets. Following the announcements of increases and decreases in dividends, prices adjusted only partially to the fundamental value.

Table 1. Under-reaction to information - Descriptive statistics

	$\sigma(DV)$	$\sigma(D\bar{P})$	$\frac{\sigma(D\bar{P})}{\sigma(DV)}$	Min (FV)	Min (\bar{P})	Max (FV)	Max (\bar{P})
Treatment T1							
T1-M1	0.096	0.082	0.85	19.71	22.19	37.12	34.09
T1-M2	0.115	0.086	0.75	11.85	14.65	25.46	25.28
T1-M3	0.090	0.066	0.73	17.91	18.93	35.82	33.95
T1-M4	0.157	0.088	0.56	9.91	15.52	27.19	25.11
T1-M5	0.111	0.089	0.80	15.02	14.46	36.34	31.34
T1-M6	0.204	0.103	0.50	10.30	13.95	33.07	31.24
Mean	0.129	0.086	0.66				
Treatment T2							
T2-M1	0.096	0.080	0.84	19.71	21.36	37.12	35.02
T2-M2	0.115	0.079	0.69	11.85	15.03	25.46	23.94
T2-M3	0.090	0.081	0.90	17.91	18.11	35.82	32.90
T2-M4	0.157	0.097	0.61	9.91	14.61	27.19	26.65
T2-M5	0.111	0.096	0.86	15.02	17.59	36.34	34.50
T2-M6	0.204	0.129	0.63	10.30	14.00	33.07	31.91
Mean	0.129	0.093	0.73				

Ti-Mj represents the experimental session Mj (from 1 to 6) of the treatment Ti (T1: treatment with disclosure of the dividend for the current period and the next three periods; T2: Treatment with disclosure of the dividend for the current period only); FV: fundamental value; \bar{P} : average price; $\sigma(DV)$: standard deviation of fundamental value change; $\sigma(D\bar{P})$: standard deviation of average prices change.

4.2. Econometric estimation of underreaction

The underreaction of investors to information exists if prices adjust weakly to the fundamental value. As the result, we can study the adjustment of prices to new information by running the following panel data regression for each of the two treatments:

$$\Delta\bar{P}_{i,t} = \alpha + \beta\Delta FV_{i,t} + \varepsilon_{i,t} \tag{4}$$

All variables in our model are expressed in first difference in order to avoid spurious regressions, where $FV_{i,t}$ is the change in the fundamental value and $\Delta\bar{P}_{i,t}$ is the change in the average price established in the market following the disclosure of the information. The index i represents the experimental session from 1 to 6 for each treatment

and t is the trading period from 2 to 24. It is possible to test directly the null hypothesis $H_0: \beta = 1$ (EMH) versus $H_1: \beta < 1$ (underreaction). Nevertheless, equation (4) suffers from the autocorrelation problem. (We run equation 4 for each treatment and we obtain the Durbin-Watson statistics (DW) respectively equal to 2.51 for T1 and 2.47 for T2. If there is no serial correlation the DW statistic will be around 2.). Kirchler (2009) solved this problem by including lagged values both in the dependent and explanatory variables to eliminate any autocorrelation. (To solve the residual autocorrelation, Kirchler (2009) integrates three lags for the dependent and explanatory variables in their model.) In our case we test for the presence of two lags both in $FV_{i,t}$ and $\Delta\bar{P}_{i,t}$. Our equation (4) therefore takes the following form:

$$\Delta\bar{P}_{i,t} = \alpha + \beta_0\Delta FV_{i,t} + \sum_{l=1}^2 \beta_l \Delta FV_{i,t-l} + \sum_{l=1}^2 \gamma_l \Delta\bar{P}_{i,t-l} + \varepsilon_{i,t} \tag{5}$$

Hence, the change in the average price of this period ($\Delta\bar{P}_{i,t}$) depends on changes in the fundamental value of the current period ($\Delta FV_{i,t}$) and the last two periods ($\Delta FV_{i,t-l}$) and on changes in the mean prices ($\Delta\bar{P}_{i,t-l}$) of the past two periods. If information is immediately integrated into prices, the coefficient β_0 should be equal to 1 ($\beta_0=1$). The significance of the difference from 1 of this coefficient is studied using the Wald test. We include both cross-section and period fixed effects in each panel regression for T1 and T2. Additionally, we applied the White’s diagonal covariance method to account for heteroskedasticity in the disturbances. The results are shown in Table 2.

The coefficients of $\Delta FV_{i,t-l}$ ($l = 0, 1$ and 2) are between 0 and 1 and are significant. The most important value is that of $\Delta FV_{i,t}$ ($l = 0$). The coefficient β_0 is higher for the second treatment (0.654 for T2 against 0.488 for T1) which confirms that the underreaction is more pronounced in the first treatment. This is explained by the fact that the subjects in the second treatment were more responsive to the disclosure of new information. The two coefficients β_0 are significantly lower than 1 (p value = 0.000 for both treatments). Thus, if we retain the definition that information is immediately incorporated into prices ($\beta_0=1$) then the underreaction hypothesis is confirmed (H1) in each of the two treatments. Our results are in line with those obtained by Kirchler (2009).

The variables $\Delta\bar{P}_{i,t-l}$ ($l = 1$ and 2) have a negative and significant impact on the change of current prices in both treatments. We can explain this result by suggesting that subjects are more focused on the evolution of the fundamental value

rather than on changes in previous average prices (Kirchler, 2009). This result is also consistent with Grinblatt and Han (2005), who show a strong return reversal effect for short and long horizons.

Table 2. The regression results of under-reaction to information

$$\Delta\bar{P}_{i,t} = \alpha + \beta_0\Delta FV_{i,t} + \sum_{l=1}^2 \beta_l \Delta FV_{i,t-l} + \sum_{l=1}^2 \gamma_l \Delta\bar{P}_{i,t-l} + \varepsilon_{i,t}$$

Variables	T1	T2
α	-0.102 (-1.002)	-0.005 (-0.055)
ΔFV	0.488*** (10.702)	0.654*** (15.280)
ΔFV_{-1}	0.409*** (5.881)	0.169* (1.762)
ΔFV_{-2}	0.229*** (2.936)	0.246** (2.574)
$\Delta\bar{P}_{-1}$	-0.415*** (-3.883)	-0.282** (-2.496)
$\Delta\bar{P}_{-2}$	-0.186** (-1.987)	-0.237** (-2.071)
Fixed effects	CS&P	CS&P
DW	2.033	2.090
R ²	0.737	0.810
n	126	126
Wald P: $\beta_0 = 1$	0.0000	0.0000

T1: treatment with disclosure of the dividend for the current period and the next three periods; T2: Treatment with disclosure of the dividend for the current period only; $\Delta\bar{P}$: average prices change; ΔFV : fundamental value change; ΔFV_{-1} and ΔFV_{-2} : the two lags of ΔFV ; $\Delta\bar{P}_{-1}$ and $\Delta\bar{P}_{-2}$: the two lags of $\Delta\bar{P}$; t-statistics are provided in parentheses; DW: Durbin-Watson statistic; R²: coefficient of determination; n: number of observations; Wald P: probability value of the Wald test for the null hypothesis.

CS: cross-section fixed effects; P: period fixed effects

***: significant at 1% level; **: significant at 5% level; *: significant at 10% level.

Thus, the current price change is a function of changes in the fundamental value. However, trading between participants did not allow prices to adjust fully to the fundamental value, which confirms H1. The current price change also depended on past prices changes, which corroborates the study by De Bondt and Thaler (1985). Winning stocks in the past tended to generate lower performance and losing stocks led to higher future returns.

4.3. Underreaction and disposition effect

The experimental method allows exact calculation of the average purchase price of the stock for each subject. This average purchase price (APP) was calculated using the weighted average cost method. The reference price (RP) is the purchase price of the stock at the aggregate level. It was calculated at the beginning of each trading period, as follows:

$$RP_t = \frac{1}{n} \sum_{i=1}^n APP_{i,t} \tag{6}$$

Where n is the number of subjects participating in the experimental session and t is the number of periods ranging from 1 to 24.

In our experiments, the current price and the average purchase price of each subject were shown on the trading screens and subjects compared the current price to their average purchase price. In some cases, there were subjects in a gain position and others in a loss situation. The aggregate capital gain (G) indicating the difference between the average price of the period and the reference price determined if the stock was negotiated from a paper gain or paper loss situation at the aggregate level. We calculated the variable G as follows:

$$G_t = \frac{\bar{P}_t - RP_t}{\bar{P}_t} \tag{7}$$

A positive (or negative) G meant that subjects negotiated the stock with a paper gain (or loss) at the aggregate level.

To test whether an underreaction to information is more pronounced when most subjects negotiated a stock with a paper loss (H2), we decomposed the variable ΔFV of the panel data regression (5) into two variables. The first, denoted $\Delta FV.G^-$, is the change in the fundamental value when the subjects are in a paper loss position ($G < 0$). The second, denoted $\Delta FV.G^+$, is the change in the fundamental value when the subjects negotiated a stock with a paper gain ($G > 0$). Formally:

$$\Delta FV.G^- = \Delta FV * d_1 \text{ where } d_1 = \begin{cases} 1 & \text{if } G < 0 \\ 0 & \text{otherwise} \end{cases} \tag{8}$$

$$\Delta FV.G^+ = \Delta FV * d_2 \text{ where } d_2 = \begin{cases} 1 & \text{if } G > 0 \\ 0 & \text{otherwise} \end{cases} \tag{9}$$

The specification to test is as follows:

$$\Delta \bar{P}_{i,t} = \alpha + \beta_{01} \Delta FV \cdot G_{i,t}^- + \beta_{02} \Delta FV \cdot G_{i,t}^+ + \sum_{l=1}^2 \beta_l \Delta FV_{i,t-l} + \sum_{l=1}^2 \gamma_l \Delta \bar{P}_{i,t-l} + \varepsilon_{i,t} \tag{10}$$

If the underreaction to a change in the fundamental value is more pronounced when subjects are in a paper loss situation, then the coefficient of the variable $\Delta FV \cdot G^-$ should be less than the coefficient of the variable $\Delta FV \cdot G^+$. However,

if the β_{01} and β_{02} coefficients are of the same size and less than 1, then the underreaction exists both when subjects are in paper gain and loss situations. The results of the regression model (10) are shown in Table 3.

Table 3. Under-reaction to information as function of paper gains and losses

$$\Delta \bar{P}_{i,t} = \alpha + \beta_{01} \Delta FV \cdot G_{i,t}^- + \beta_{02} \Delta FV \cdot G_{i,t}^+ + \sum_{l=1}^2 \beta_l \Delta FV_{i,t-l} + \sum_{l=1}^2 \gamma_l \Delta \bar{P}_{i,t-l} + \varepsilon_{i,t}$$

Variables	T1	T2
α	-0.176 (-1.633)	-0.114 (-1.188)
$\Delta FV \cdot G^-$	0.393*** (5.553)	0.529*** (8.119)
$\Delta FV \cdot G^+$	0.585*** (11.578)	0.783*** (16.298)
ΔFV_{-1}	0.417*** (6.052)	0.149 (1.544)
ΔFV_{-2}	0.224*** (3.004)	0.231** (2.595)
$\Delta \bar{P}_{-1}$	-0.408*** (-3.906)	-0.237** (-2.146)
$\Delta \bar{P}_{-2}$	-0.181** (-2.127)	-0.215** (-2.093)
Fixed effects	CS&P	CS&P
DW	2.005	2.088
R ²	0.750	0.827
n	126	126
Wald P:	$\beta_{01} = 1$	0.0000
Wald P:	$\beta_{02} = 1$	0.0000
	$\beta_{01} = \beta_{02}$	0.0334

T1: treatment with disclosure of the dividend for the current period and the next three periods; T2: Treatment with disclosure of the dividend for the current period only; $\Delta \bar{P}$: average prices change; $\Delta FV \cdot G^-$: the change in the fundamental value when subjects are in a paper loss position ($G < 0$); $\Delta FV \cdot G^+$: the change in the fundamental value when subjects are in a paper gain position ($G > 0$); ΔFV_{-1} and ΔFV_{-2} : the two lags of ΔFV ; $\Delta \bar{P}_{-1}$ and $\Delta \bar{P}_{-2}$: the two lags of $\Delta \bar{P}$; t-statistics are provided in parentheses; DW : Durbin-Watson statistic; R²: coefficient of determination; n: number of observations; Wald P: probability value of the Wald test for the null hypothesis.

CS: cross-section fixed effects; P: period fixed effects

***: significant at 1% level; **: significant at 5% level; *: significant at 10% level.

The coefficients of the variables $\Delta FV \cdot G^-$ and $\Delta FV \cdot G^+$ are, respectively, 0.393 and 0.585 for the first treatment, and 0.529 and 0.783 for the second. They are significant at the 1% level. Thus, the reaction of the subjects was reflected in the prices, both when a stock was traded with a paper gain and with a paper loss. The Wald test shows that these coefficients are significantly different from 1 (p value = 0.000 for both treatments). Thus, underreaction exists when the subjects are in paper gain or paper loss positions at the aggregate level³⁸. These results demonstrate that, with respect to the change in the fundamental value (ΔFV), the price adjustment ($\Delta \bar{P}$) is low when most investors are in a paper gain situation ($G > 0$) or in a paper loss situation ($G < 0$). Thus, the price changes are lower than those of the fundamental value in paper gain and loss situations.

The coefficient of $\Delta FV \cdot G^-$ is significantly less than the coefficient of $\Delta FV \cdot G^+$ in both treatments. This result shows that underreaction is more

pronounced when most of the subjects negotiated the stock with a paper loss, which strongly confirms the hypothesis 2. When most of the subjects are facing a paper loss, i.e. the average price is lower than the aggregate purchase price, stock prices underreact to news. Thus, reluctance of some subjects to sell their losing stocks prevented the adjustment of prices to the fundamental value. However, prices were more elastic to changes in the fundamental value when most of the subjects held a stock with a paper gain, i.e. the average price is higher than the aggregate purchase price. These results confirm that the disposition effect induces an underreaction to information.

4.4. Underreaction, quality of news and disposition effect

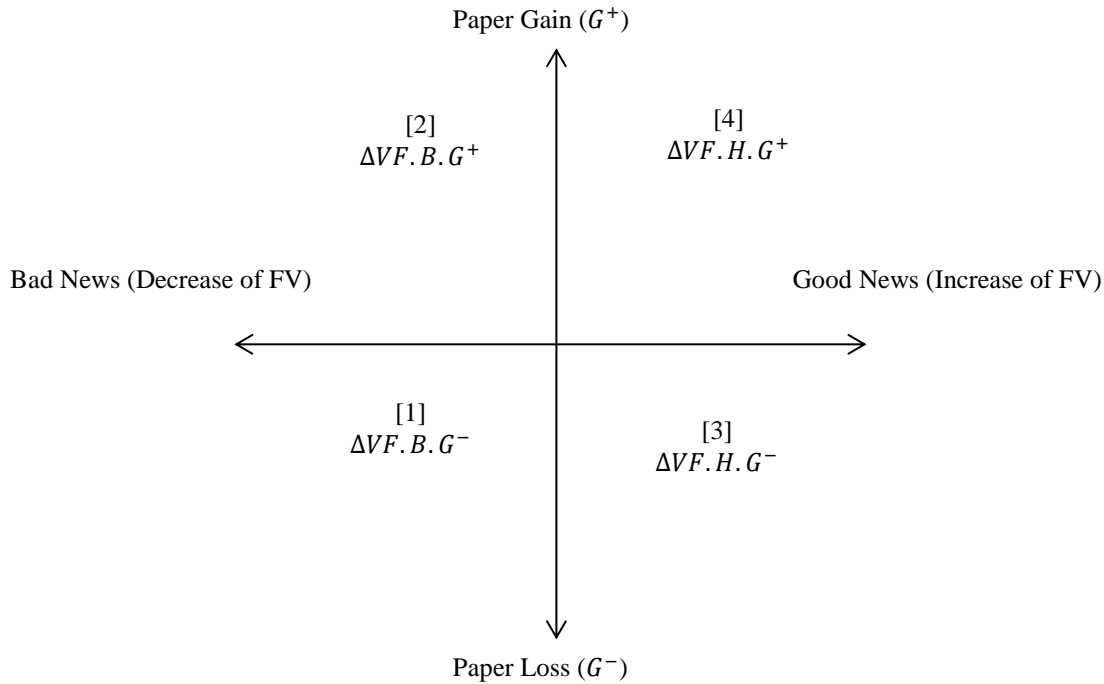
Hypothesis H3 states that when most of investors are facing a paper gain, stock prices underreact to positive news, and when most of investors are facing a paper loss, stock prices underreact to negative news. In our experimental setting, an increase in the fundamental value was considered as good news and a decrease in the fundamental value as bad news. Upon the arrival of information (good or bad), a

³⁸ For example, a positive G means that subjects negotiate the stock with a paper gain at the aggregate level, i.e. the average price is higher than the aggregate purchase price. Under these conditions, most investors trade the stock with a paper gain while the others trade the stock with a paper loss.

stock was traded either at a paper loss or a paper gain at the aggregate level. The interaction of these two variables involved four situations in which subjects could be involved: [1] a decrease in fundamental value and a paper loss: $\Delta FV.D.G^-$, [2] a

decrease in fundamental value and a paper gain: $\Delta FV.D.G^+$, [3] an increase in fundamental value and a paper loss: $\Delta FV.I.G^-$, and [4] an increase in the fundamental value and a paper gain: $\Delta FV.I.G^+$.

Figure 2. Four situations as function of news (Good, Bad) and paper gain (G^- , G^+)



Formally:

$$\Delta FV.D.G^- = \Delta FV * d_1 \text{ where } d_1 = \begin{cases} 1 & \text{if } \Delta FV < 0 \text{ and } G < 0 \\ 0 & \text{otherwise} \end{cases} \quad (11)$$

$$\Delta FV.D.G^+ = \Delta FV * d_2 \text{ where } d_2 = \begin{cases} 1 & \text{if } \Delta FV < 0 \text{ and } G > 0 \\ 0 & \text{otherwise} \end{cases} \quad (12)$$

$$\Delta FV.I.G^- = \Delta FV * d_3 \text{ where } d_3 = \begin{cases} 1 & \text{if } \Delta FV > 0 \text{ and } G < 0 \\ 0 & \text{otherwise} \end{cases} \quad (13)$$

$$\Delta FV.I.G^+ = \Delta FV * d_4 \text{ where } d_4 = \begin{cases} 1 & \text{if } \Delta FV > 0 \text{ and } G > 0 \\ 0 & \text{otherwise} \end{cases} \quad (14)$$

Using panel data regression (5), the ΔFV variable is replaced by the four variables $\Delta FV.D.G^-$, $\Delta FV.D.G^+$, $\Delta FV.I.G^-$ and $\Delta FV.I.G^+$. The specification to test is as follows:

$$\Delta \bar{P}_{i,t} = \alpha + \beta_{01} \Delta FV.D.G^-_{i,t} + \beta_{02} \Delta FV.D.G^+_{i,t} + \beta_{03} \Delta FV.I.G^-_{i,t} + \beta_{04} \Delta FV.I.G^+_{i,t} + \sum_{l=1}^2 \beta_l \Delta FV_{i,t-l} + \sum_{l=1}^2 \gamma_l \Delta \bar{P}_{i,t-l} + \varepsilon_{i,t} \quad (15)$$

One should expect coefficients β_{01} and β_{04} to be less than 1 and coefficients β_{02} and β_{03} to be equal to 1. This suggests that β_{01} should be less than β_{02} for decreases in fundamental value, and β_{04} should be less than β_{03} for increases in fundamental value. Table 4 shows the results of the regression model.

The variables $\Delta FV.D.G^-$, $\Delta FV.D.G^+$, $\Delta FV.I.G^-$ and $\Delta FV.I.G^+$ have a positive and significant impact on the dependent variable. According to the Wald tests, all the values of β_0 are less than 1. This result shows that subjects underreact to good and bad

news when they are facing a paper gain and a paper loss.

The null hypothesis $\beta_{01} = \beta_{02}$ is accepted for both treatments, suggesting that no difference in reaction to decreases in fundamental value is detected. This shows that participants underreacted in the same way to a reduction in the fundamental value of the stocks they possess in situations of paper gain or paper loss. Dividend decrease announcements are thus poorly perceived and the disposition effect has no impact on price formation.

In contrast, the null hypothesis $\beta_{03} = \beta_{04}$ is rejected. The coefficient of the variable $\Delta FV.I.G^-$ is lower than that of $\Delta FV.I.G^+$. So, underreaction to an increase in fundamental value is more pronounced when most of the subjects were facing paper losses. The variable $\Delta FV.I.G^+$ has the highest coefficient in both treatments. It is equal to 0.625 and 0.790, respectively, in the first and second treatments. This result suggests that underreaction is less pronounced when the changes in the fundamental value and the paper gain have a positive sign. When subjects are in a paper gain position, prices adjust to the fundamental value, since buyers want to take

the maximum dividends while sellers want to concretize their paper gains. Since most of the subjects were in a paper gain position, the stock offer is important, which improves the adjustment degree of prices to the fundamental value. These participants sell their stocks to maximize their money holding (and thus their wealth) and take more interest at the end of the trading periods. As a consequence, paper gains and losses influenced the behavior of the subjects when good news was announced, which allowed us to conclude that the disposition effect alters the price formation for positive changes in the fundamental value.

Table 4. Under-reaction to information as function of news and paper gains and losses

$$\Delta \bar{P}_{i,t} = \alpha + \beta_{01} \Delta FV.D.G^-_{i,t} + \beta_{02} \Delta FV.D.G^+_{i,t} + \beta_{03} \Delta FV.I.G^-_{i,t} + \beta_{04} \Delta FV.I.G^+_{i,t} + \sum_{l=1}^2 \beta_l \Delta FV_{i,t-l} + \sum_{l=1}^2 \gamma_l \Delta \bar{P}_{i,t-l} + \varepsilon_{i,t}$$

Variables	T1	T2	
α	-0.122 (-0.687)	0.004 (0.031)	
$\Delta FV.D.G^-$	0.479*** (4.791)	0.627*** (7.252)	
$\Delta FV.D.G^+$	0.490*** (4.207)	0.738*** (8.672)	
$\Delta FV.I.G^-$	0.212* (1.708)	0.325*** (2.634)	
$\Delta FV.I.G^+$	0.625*** (6.955)	0.790*** (10.698)	
ΔFV_{-1}	0.396*** (5.542)	0.139 (1.458)	
ΔFV_{-2}	0.214*** (2.918)	0.222** (2.348)	
$\Delta \bar{P}_{-1}$	-0.397*** (-3.601)	-0.239** (-2.253)	
$\Delta \bar{P}_{-2}$	-0.206** (-2.406)	-0.236** (-2.154)	
Fixed effects	CS&P	CS&P	
DW	2.005	1.996	
R2	0.759	0.835	
n	126	126	
Wald P:	$\beta_{01} = 1$	0.0000	0.0000
	$\beta_{02} = 1$	0.0000	0.0028
	$\beta_{03} = 1$	0.0000	0.0000
	$\beta_{04} = 1$	0.0001	0.0055
	$\beta_{01} = \beta_{02}$	0.9381	0.3532
	$\beta_{03} = \beta_{04}$	0.0024	0.0008

T1: treatment with disclosure of the dividend for the current period and the next three periods; T2: Treatment with disclosure of the dividend for the current period only; $\Delta \bar{P}$: average prices change; $\Delta FV.D.G^-$: Decrease of the fundamental value when subjects are in a paper loss position; $\Delta FV.D.G^+$: Decrease of the fundamental value when subjects are in a paper gain position; $\Delta FV.I.G^-$: Increase of the fundamental value when subjects are in a paper loss position; $\Delta FV.I.G^+$: Increase of the fundamental value when subjects are in a paper gain position; ΔFV_{-1} and ΔFV_{-2} : the two lags of ΔFV ; $\Delta \bar{P}_{-1}$ and $\Delta \bar{P}_{-2}$: the two lags of $\Delta \bar{P}$; t-statistics are provided in parentheses; DW : Durbin-Watson statistic; R²: coefficient of determination; n: number of observations; Wald P: probability value of the Wald test for the null hypothesis.

CS: cross-section fixed effects; P: period fixed effects

***: significant at 1% level; **: significant at 5% level; *: significant at 10% level.

5. CONCLUSION

This research studied the impact of the disposition effect on price formation. In accordance with the experimental design, the participants were continuously informed of the fundamental value of a stock and their reference prices. This framework is powerful to test the relationship between the disposition effect and the underreaction to news without making auxiliary assumptions related to the estimation of theoretical returns in event studies.

The results show that prices do not adjust to the fundamental value when they reach the maximum and minimum values. The price changes are lower than the fundamental value changes in all the experimental sessions, which suggest

underreaction to information. When most of the subjects held a stock with a paper gain, the prices are more elastic to changes in the fundamental value. However, the underreaction is more pronounced when the subjects trade stocks with a paper loss. Thus, the reluctance of subjects to sell losing stocks prevented the adjustment of prices to the fundamental value. Holding losing stocks breaks the supply and demand of the stock, and implies a low price adjustment. This result confirms that the disposition effect induces an underreaction to information.

The underreaction of the subjects following a negative change in the fundamental value is of the same magnitude whether they were in a paper gain or a paper loss situation. However, underreaction to

an increase in the fundamental value is more pronounced when the participants are facing a paper loss. The price adjustment is the most important when the change in the fundamental value is positive and the subjects are in a paper gain position. The sellers of a stock in a paper gain position wished to concretize their unrealized gains and, in turn, collect interest, and buyers wanted to collect more dividends by increasing the number of stocks they held.

The results of this research may interest several actors. If investors are aware of the impact of the disposition effect on price formation, their reaction to good or bad news will not be affected by their paper gain or loss; but will be influenced by the informational content of the announcement. This will contribute to greater informational efficiency. Our research may also be useful to arbitrageurs in enabling them to build strategies that will allow stock prices to reach their fundamental values. Finally, the study of the impact of the disposition effect on price formation allows managers of rated companies to predict the extent of underreaction to information. When most investors trade a stock with a paper gain, the information will be incorporated quickly into stock prices. However, if a stock is traded with a paper loss at the aggregate level, underreaction will be pronounced.

In this paper, we studied the impact of the disposition effect on stock price formation without considering the impact on trading volumes. Our analysis focused on the price adjustment in the presence of paper gain and paper loss situations. We have shown that holding losing stocks prevents the adjustment of prices and implies an underreaction to information. A search path is to study trading volumes in paper gain and paper loss situations. This line of research may be conducted using aggregate or individual data.

REFERENCES

1. Barberis N., Shleifer A., Vishny R. W., (1998), « A Model of Investor Sentiment », *Journal of Financial Economics*, vol. 49, n° 3, p. 307-343.
2. Baucells M., Weber M., Welfens F., (2011), « Reference Point Formation and Updating », *Management Science*, vol. 57, n°3, p. 506-519.
3. Bernard V., Thomas J., (1989), « Post-Earnings-Announcement Drift: Delayed Price Response or Risk Premium? », *Journal of Accounting Research*, vol. 27, Supplement, p. 1-36.
4. Bossaert P., Plott C., (2000), « Basic principles of asset pricing theory: evidence from large-scale experimental financial markets », *Social Science Working Paper*, 1070. California Institute of Technology.
5. Chordia T., Goyal A., Sadka G., Sadka R., Shivakumar L., (2009), « Liquidity and Post-Earnings Announcements Drift », *Financial Analysts Journal*, vol. 65, n° 3, p. 18-32.
6. Daniel, K., Hirshleifer D., Subrahmanyam A., (1998), « Investor Psychology and Security Market Under- and Overreactions », *Journal of Finance*, vol. 53, n° 6, p. 1839-1886.
7. De Bondt W., Thaler R., (1985), « Does the Stock Market Overreact? », *Journal of Finance*, vol. 40, n° 3, p. 793-805.
8. Desai H., Jain P. C., (1997), « Long-run Common Stock Returns Following Stock Splits and Reverse Splits », *Journal of Business*, vol. 70, n° 3, p. 409-433.
9. Fama E. F., (1970), « Efficient Capital Markets: A Review of Theory and Empirical Work », *Journal of Finance*, vol. 25, n° 2, p. 383-417.
10. Fama E. F., (1991), « Efficient Capital Markets: II », *Journal of Finance*, vol. 46, n° 5, p. 1575-1617.
11. Fischbacher U., (2007), « z-tree: Zurich Toolbox for Readymade Economic Experiments », *Experimental Economics*, vol. 10, p. 171-178.
12. Frazzini A., (2006), « The Disposition Effect and Underreaction to News », *Journal of Finance*, vol. 61, n° 4, p. 2017-2046.
13. Grinblatt M., Han B., (2005), « Prospect Theory, Mental Accounting, and Momentum », *Journal of Financial Economics*, vol. 78, n° 2, p. 311-339.
14. Hanke M., Huber J., Kirchler M., Sutter M., (2010), « The Economic Consequences of a Tobin tax - An experimental Analysis », *Journal of Economic Behavior & Organization*, vol. 74, n° 1-2, p. 58-71.
15. Hou T. C., Hung W., Gao S. S., (2014), « Investors' Reactions to Analysts' Forecast Revisions and Information Uncertainty: Evidence of Stock Price Drift », *Journal of Accounting, Auditing & Finance*, vol. 29, n° 3, p. 238-259.
16. Hur J., Pritamani M., Sharma V., (2010), « Momentum and the Disposition Effect: The Role of Individual Investors », *Financial Management*, vol. 39, n° 3, p. 1155-1176.
17. Ikenberry D. L., Ramnath S., (2002), « Underreaction to Self-selected News Events: The Case of Stock Splits », *The Review of Financial Studies*, vol. 15, n° 2, p. 489-526.
18. Ikenberry D., Lakonishok J., Vermaelen T., (1995), « Market Underreaction to Open Market Stock Repurchases », *Journal of Financial Economics*, vol. 39, n° 2-3, p. 181-208.
19. Kahneman D., Tversky A., (1979), « Prospect Theory: An Analysis of Decision under Risk », *Econometrica*, vol. 47, n°2, p. 263-291.
20. Kirchler M., (2009), « Underreaction to Fundamental Information and Asymmetry in Mispricing between Bullish and Bearish Markets. An Experimental Study », *Journal of Economic Dynamics & Control*, vol. 33, n° 2, p. 491-506.
21. Kirchler M., Huber J., (2007), « Fat Tails and Volatility Clustering in Experimental Asset Markets », *Journal of Economic Dynamics and Control*, vol. 31, n° 6, p. 1844-1874.
22. Kirchler M., Huber J., (2009), « An Exploration of Commonly Observed Stylized Facts with Data from Experimental Asset Markets », *Physica A: Statistical Mechanics and its Applications*, vol. 388, n° 8, p. 1631-1658.
23. Lesmond D. A., Schill M. J., Zhou C., (2004). « The illusory nature of momentum profits », *Journal of Financial Economics*, vol. 71, p. 349-380.
24. Lin S., Rassenti S., (2012), « Are Under- and Overreaction the Same Matter? Experimental evidence », *Journal of Economic Behavior and Organisation*, vol. 84, n° 1, p. 39-61.
25. Liu Y., Szewczyk S. H., Zantout Z., (2008), « Underreaction to Dividend Reductions and Omissions? », *Journal of Finance*, vol. 63, n° 2, p. 987-1020.
26. Michaely R., Thaler R., Womack K., (1995), « Price Reactions to Dividend Initiations and Omissions: Overreaction or Drift? », *Journal of Finance*, vol. 50, n° 2, p. 573-608.
27. Ng J., Rusticus T. O., Verdi R. S., (2008), « Implications of Transaction Costs for the Post-Earnings Announcement Drift », *Journal of Accounting Research*, vol. 46, n° 3, p. 661-696.

28. Oehler A., Heilmann K., Lager V., Oberlander M., (2003), « Coexistence of Disposition Investors and Momentum Traders in Stock Markets: Experimental Evidence ». *Journal of International Financial Markets, Institutions and Money*, 13, pp. 503-524.
29. Shefrin H., Statman M., (1985), « The Disposition to Sell Winners Too Early and Ride Losers Too Long: Theory and Evidence », *Journal of Finance*, vol. 40, n° 3, p. 777-790.
30. Theissen E., (2000), « Market Structure, Informational Efficiency and Liquidity: An Experimental Comparison of Auction and Dealer Markets », *Journal of Financial Markets*, vol. 3, n° 4, p. 333-363.
31. Truong C., (2011), « Post-earnings Announcement Abnormal Return in the Chinese Equity Market », *Journal of International Financial Markets, Institutions & Money*, vol. 21, n° 5, p. 637-661.
32. Tversky A., Kahneman D., (1992), « Advances in prospect theory: Cumulative representation of uncertainty ». *Journal of Risk and Uncertainty*, 5, pp. 297-323.
33. Vega C., (2006), « Stock price reaction to public and private information ». *Journal of Financial Economics*, vol. 82, p. 103-133.
34. Weber M., Welfens F., (2007), « How do Markets React to Fundamental Shocks? An Experimental Analysis on Underreaction and Momentum », *SSRN Working Paper Series*. University of Mannheim - Department of Banking and Finance.
35. Zhang Q., Cai C., Keasey K., (2013), « Market reaction to earnings news: A unified test of information risk and transaction costs ». *Journal of Accounting and Economics*, vol. 56, p. 251-266.
36. Zhao Y., Su R., Hooper K., (2011), « Accounting Conservatism and Disposition Effect », *International Journal of Business and Management*, vol. 6, n° 10, p. 94-101.

Appendix A. Experimental instructions for treatment T1

Dear Participant! You will participate to an experimental session. We ask you that you please refrain from talking to other participants.

Background of the experiment

All participants will negotiate the stocks of a fictitious company for 20 to 30 consecutive periods (years). Each period will last 100 seconds. At the beginning of the experiment, each participant is endowed with 1000 experimental units (EUs) and 50 stocks.

Characteristics of the market

The only fundamental information you receive is the dividend of the stock. The dividend follows a random walk process without drift (randomly change at the beginning of each period).

D_t is the dividend for the current period t and ε_t is a normally distributed random variable with a mean of zero and a variance of 0.16. The dividend for the first period is set at 2 EUs per stock held.

At the beginning of each period, each subject knows the dividend for the current period and coming dividends for the next three periods. The market is characterized by a symmetric information structure. Therefore, all participants receive every period the same information. At the end of each period, you will cash the current dividend for each stock you own. A risk-free interest rate of 3% is paid for money holdings in each period. The risk-adjusted interest rate for the stock valuation is equal to 10% per period. In addition to dividends displayed on the trading screen, the fundamental value (FV) is also provided to all participants. It is calculated by applying the dividend discount model and assuming that the last dividend is constant and perpetual:

$$FV_t = \sum_{i=t}^{t+2} \frac{D_i}{(1+r_e)^{i-t}} + \frac{D_{t+3}/r_e}{(1+r_e)^3}$$

Example: Dividends of this period (t) and the next three periods ($t+1$, $t+2$ and $t+3$) are 2.00; 1.92; 1.83 and 1.71. The FV is calculated as follows: $2 + 1.92/1.1 + 1.83/1.12 + 1.71/0,1/1.13 = 18.14$. This value is shown in the top left of the trading screen.

Trading mechanism

Trading will occur with a continuous double auction market mechanism. For each bid and ask that you enter, you have to insert the price and the number of stocks you want to trade. Prices should include a maximum of 1 decimal place. Exchange takes place without transaction costs. The stock price will be determined by your and other interventions in the market. You will be free to determine the number of offers to submit. Short selling and buying on credit are not allowed.

A participant wishing to submit a limit order must specify the price and the number of stocks. A limit purchase offer is only valid if the proposed price is higher than the best offer on the market at the time of the proposal. A limit sale offer is only valid if the proposed price is lower than the best offer on the market at the time of the proposal. The offer is then publicly communicated to all participants. The best offer may be accepted at any time by another participant. Orders at market price are executed instantly. Partial execution of limit orders is possible, and in such cases a transaction is concluded at the price offered for the desired quantity.

Wealth

At any time, your wealth is equal to the sum of money you hold and the market value of your stocks (the number of stocks you hold multiplied by the current price). So, your wealth will change in real time according to changes in the market price, even if you took no action in the last transaction.

When you purchase stocks, your money holdings decrease and the number of your stocks increase immediately. Similarly, when you sell stocks your cash holdings increase and the number of your stocks decreases immediately. Thus, your wealth is a function of the orders you place and offers you accept. At the end of each trading period, an interest rate of 3% per year on your money holding and dividends for your stocks will be added to your cash.

Example: Suppose that at the end of a given period, you have 57 stocks with a market price of 23.8 and 808.2 EUs in cash. If the dividend of the period is 2.00, your wealth increases from 2164.8 to 2303.46 (Interest $(808.2 * 3\% = 24.24)$ and dividends $(57 * 2.00 = 114)$).

Trading screen

The trading screen which is the main screen of the experiment serves as an interface for participants. It allows you to place your bids and asks, to accept the offers of the other participants and to observe in real time all the information that may interest you. Among this information: the dividends, the fundamental value of the stock, the number of stocks you own, your money holding, your current wealth, orders placed by all participants and the market price of the current trading period (see Figure A1).

In addition to this information, you are provided your average purchase price which is calculated using the weighted average cost method. This price change when you purchase stocks, but not when you sell. It is equal to the fundamental value of the stock at the beginning of the experiment.

Example: You have 40 stocks with an average purchase price of 22 EU. If you buy 10 stocks for 25 EU, your average purchase prices will rise from 22 to 22.6 EU.

$$[(40 * 22) + (10 * 25)] / (40 + 10) = 22.6 \text{ EU.}$$

Subject profit

Each subject's profit at the end of the experiment is calculated in Experimental Units and is equal to the sum of the profits over all the 20-30 trading periods of the session. For a given period, the profit is equal to the change in the wealth.

On the basis of the final profit, each participant is assigned a rank. Your rank only depends on your trading performance. A voucher-based tournament incentive structure is used. The value of the voucher awarded is between 0 and 30 €. The table below assigns the value of the voucher.

Table A1. Ranks and vouchers

Your rank	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Voucher (€)	30	25	20	15	15	15	10	10	10	0	0	0	0	0

History screen

After each period, a history screen provides a short summary on the dividend and the fundamental value, your average purchase price, the closing price and your profit of the trading period (see Figure A2)

Figure A1. Trading screen (T1)

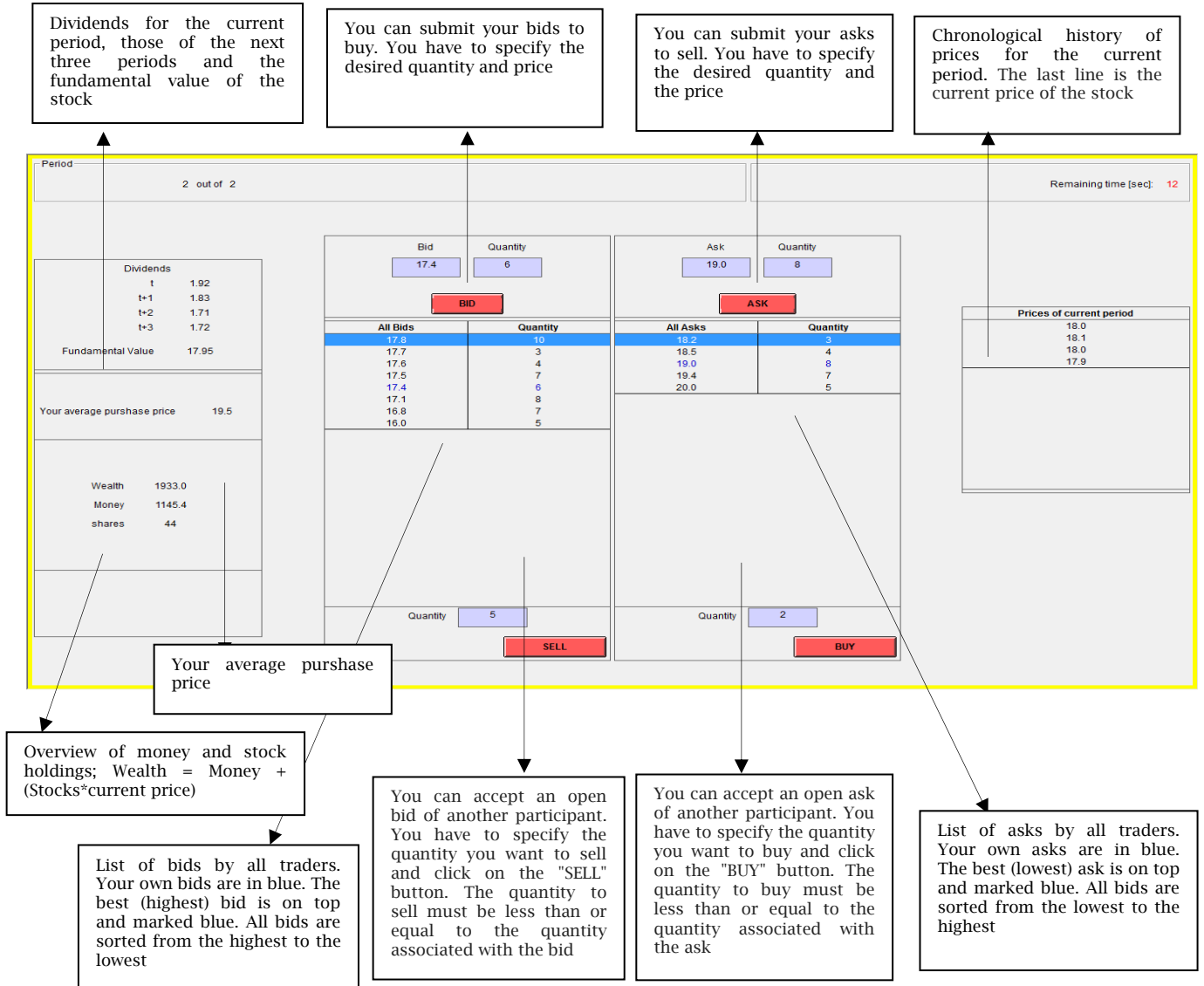
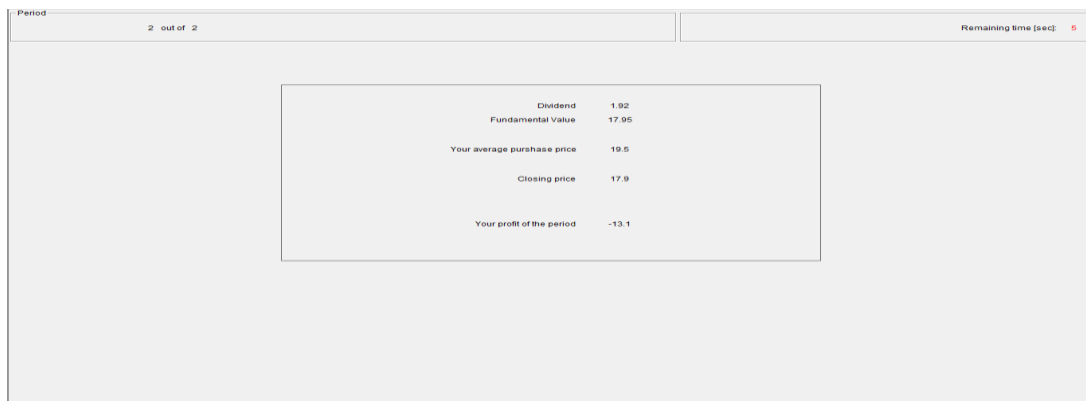


Figure A2. history screen (T1)



Experimental instructions for treatment T2

The instructions for T2 were identical to those for T1 with the exception of the dividend information level.

The only fundamental information you receive is the dividend of the stock. The dividend follows a random walk process without trend (randomly change at the beginning of each period). The dividend for the

first period is around 2 EU. At the beginning of each period, each participant is informed only of the dividend for the current period. In addition to the dividend displayed on the trading screen, the fundamental value (FV) of the stock value is also provided to all participants. It is calculated using the following formula:

$$FV_t = \frac{D_t}{10\%}$$

The trading screen is above (Figure A3). The history screen is the same as Treatment T1.

Figure A3. Trading screen (T2)

Dividend and fundamental value of the stock for the current period

You can submit your bids to buy. You must specify the quantity and the price at which you wish to buy

You can submit your asks to sell. You must specify the quantity and the price at which you wish to sell

Chronological history of prices for the current period. The last line is the current price of the stock

Period: 2 out of 2 Remaining time [sec]: 12

Dividend t: 1.79
Fundamental Value: 17.95
Your average purchase price: 19.4
Wealth: 1919.5
Money: 845.5
shares: 60

Bid: 17.4 Quantity: 6
ASK

All Bids	Quantity	All Asks	Quantity
17.0	10	19.2	3
17.7	3	19.5	4
17.6	4	19.0	8
17.5	7	19.4	7
17.4	6	20.0	5
17.1	8		
16.8	7		
19.0	5		

Prices of current period
18.0
18.1
17.9

Quantity: 5 SELL
Quantity: 2 BUY

List of bids by all traders. Your own bids are in blue. The best (highest) bid is on top and marked blue. All bids are sorted from the highest to the lowest

You can accept an open bid of another participant. You have to specify the quantity you want to sell and click on the "SELL" button. The quantity to sell must be less than or equal to the quantity associated with the bid

You can accept an open ask of another participant. You have to specify the quantity you want to buy and click on the "BUY" button. The quantity to buy must be less than or equal to the quantity associated with the ask

List of asks by all traders. Your own asks are in blue. The best (lowest) ask is on top and marked blue. All asks are sorted from the lowest to the highest

FINANCIAL INNOVATION IN RETAIL BANKING IN SOUTH AFRICA

B Smit*, F J Mostert*, J H Mostert*

*Department of Business Management, Stellenbosch University, South Africa

Abstract

Innovation in general refers to an action to do something differently. Financial innovation, which embodies the topic of this research, has therefore the creation of financial products, services and/or systems in mind in order to satisfy the needs of customers and clients and ultimately to improve the financial performance of the enterprises concerned. As the requirements of customers and clients change continuously, financial innovations are important for the survival of enterprises. Capital investments to accommodate financial innovations should be considered very carefully as they will determine the business activities of an enterprise for many years. The objective of this research focuses on the improvement of financial decision-making by executive managers in retail banking when they are engaging in financial innovations. A literature study represented the start of this research to provide a proper basis for compiling the empirical study's questionnaire. The empirical study consisted of an opinion survey where the three pillars of financial innovation were addressed, viz.: products and services innovation, organisational innovation and distribution channel innovation. The empirical study indicated amongst others the importance of these three pillars of financial innovations as perceived by eight of the largest banks in South Africa. Furthermore, the obstacles to financial innovations also received the necessary attention. The empirical results of this research should be valuable to countries which are classified as developing economies with emerging market economies, as South Africa is a member of this group.

Keywords: Capital investments, Distribution channel innovation, Financial innovation, Organisational innovation, Products and services innovation, Retail banking

1. INTRODUCTION AND OBJECTIVE OF RESEARCH

Innovation refers in its simplest form to an action to do something differently. Financial innovation in particular has therefore the creation of financial products, services and/or systems in mind in order to sell these products, services and/or systems to the customers and clients to improve the financial performance of specific enterprises. The employment of financial innovation is consequently essential for the survival as well as growth of any enterprise as the needs of customers and clients change continuously.

The South African banking industry consists of a high market concentration as the five largest banks account for more than 85 per cent of the banking sector's total assets (Mlambo & Ncube, 2011:4). As the competition between various banks can be quite vigorously to ensure their sustainability and to enlarge their market share, while capital investments will shape the business activities of an enterprise for many years, executive managers should be careful when evaluating capital investments in the various types of financial innovations.

The *objective* of this research has the improvement of financial decision-making by executive managers in retail banking in mind when they are employing financial innovation. A literature study was essential to provide an adequate basis to compile a questionnaire for the empirical study. The

latter consists of an opinion survey where the three pillars of financial innovation are addressed, viz.:

- products and services innovation,
- organisational innovation and
- distribution channel innovation.

The empirical study focused on the 10 largest retail banks in South Africa. One bank indicated that they felt that the research would provide a competition risk, although it was explicitly stated on the questionnaire that the information would be treated in the strictest confidence and in such a way that no respondent could be identified. Another bank did not complete the questionnaire because they were in the process of changing their business model. It is therefore clear that the empirical survey focused on the perceptions of the eight remaining retail banks when they are employing financial innovation. The following sections focus on the three pillars of financial innovation which were mentioned.

2. PRODUCTS AND SERVICES INNOVATION

Products and services innovation in retail banking consists amongst others of current, savings and other deposit accounts, transactional services, loan products as well as insurance, investment and personal financial management services. These aspects will be discussed in the following sections.

2.1. Current accounts, savings accounts and other deposit accounts

Current accounts usually refer to a bank account which does not earn any interest, but the client may withdraw the money at any time. A *savings account* however usually earns interest on the positive balance, while some other stipulations may be applied by the bank, for example a minimum opening deposit may be required, a notice period may be applicable before the money may be withdrawn and there may be limitations on the withdrawal amount per occasion.

Banks can earn money from current, savings and other deposit accounts in two ways, viz. the bank may lend the money to other parties who are paying a higher interest rate than the cost which may be applicable to the accounts, or the bank may charge fees on these accounts (DeYoung & Rice, 2004:34). Banks however have a problem to differentiate their products from those of their competitors and to create client loyalty (Capgemini & Efma, 2013:6). They may in such a situation opt for a low-cost strategy which may not be to the financial benefit of banks.

2.2. Transactional services

Transactional services provided by banks usually refer to the transferring of money between various accounts, various persons and/or various countries. It is important that banks provide facilities to enable clients to do routine transactions and to simplify the transaction process (Ginovsky, 2013:27). According to The Boston Consulting Group (2012:3) it appears that the strategic importance of transactional banking is enhanced compared to the other segments of the banking industry and that it may provide a pathway to the profitable growth of banks.

Transactional banking can be characterised as “a technology-enabled business” (PwC, 2012:37) which is heavily reliant on the innovative use of technology. It should however be emphasised that a client-focused approach holds the key to the core activities of transactional banking and that capital investments in innovative technology are the means to obtain clients’ satisfaction and loyalty by the banking industry (PwC, 2012:38).

2.3. Loan products

A variety of loan products are offered by banks as well as non-banking institutions in South Africa. Unsecured loans seem to become rather popular in South Africa and the banking sector is paying attention to this trend (O’Neill, 2012:1-5). Innovative loan products by retail banks are therefore vital to retain and increase their market share in this segment of the business sector. There are indications that banks are increasingly interested in the store-card business of various retailers (O’Neill, 2012:2).

Another form of loan facility which is offered by retail banks involve the credit card business. Credit cards may be used as a current payment, where after the owner of the credit card must reimburse the bank on a future date. A credit card is therefore similar to obtaining cash in advance. If the credit balance of a credit card account is not paid on

the due date, the bank will charge interest on the outstanding balance. It may be quite possible that some type of innovative device may be available in the future to pay for purchases which may make the credit card obsolete.

2.4. Insurance, investment and personal financial management services

The combination of insurance with banking services is often called “bancassurance”, where the synergies between insurance and banking is utilised to provide cost-effective financial products concerning the insurance and banking activities of the specific financial institution (McGreevy, 1996:17-18). McGreevy further emphasised that the focus should be on the simplicity of the products, the needs of the particular market segment for the financial products, as well as on a new and better way of providing the combined financial services (1996:17-18). The challenge remains to provide the combined financial products in a unique and new way by applying financial innovation.

Although private banking typically focuses on standard banking services, it may also include the management of clients’ investment portfolios, advice regarding their tax situations, their retirement planning and also their estate planning. Financial innovation regarding the clients’ investment and personal financial management is vital to banks as the clients are often wealthy people who will compare the services of various financial institutions to obtain the best value for the fees that they are paying. Organisational innovation is addressed in the following sections.

3. ORGANISATIONAL INNOVATION

Organisational innovation in retail banking focuses mainly on the bank infrastructure concerning banking information systems, risk assessment and management, capital allocation with reference to the Basel Accords and other organisational innovations. These aspects receive the necessary attention in the next sections.

3.1. Bank infrastructure concerning banking information systems

The bank infrastructure refers to the underlying basic structure of the banking system and includes amongst others the banking distribution channels and the banking information systems. This section will specifically focus on the information technology systems which support financial innovation, while the banking distribution channels will be discussed as the third pillar of financial innovation in a separate section.

Information technology systems represents one of the key infrastructure investments made by banks. The heart of any bank consists of the banking software which process the multitude transactions continuously. According to Goh and Kauffman (2013:9) high-performing banks seem to favour investments in information technology. It appears that the emphasis is also on more security features and upgrades to provide an improved service to the banks’ clients (Wolfe, 2006:8; Wolfe, 2008:7). It

should be clear that financial innovation strive through information technology to find a better way of performing activities by reducing costs, becoming more efficient, connecting with new and existing clients and enhancing the experience of clients (McKenzie, 2013).

3.2. Risk assessment and management

Banks are continuously exposed to risks. Two types of risks are prevalent in the banking sector, viz. operational risk and credit risk. Operational risk may lead to losses caused when operations fail due to internal and external factors (Rajendran, 2012:51-52). The factors focus mainly on failures brought about by systems, processes, humans, third parties or nature according to Rajendran (2012:51-52). Operational losses can be huge, for example 23 large institutions in the U.S. recently had operational losses of \$25.9 billion (Rosengren, 2007:38). Banks should therefore pay special attention to the impact of their systems and processes as well as the impact of humans, third parties or nature when they are occupied in financial innovation.

Credit risk usually refers to the loss which a lender may suffer when the borrower does not meet its contractual obligations concerning the outstanding debt. Financial innovation may provide sophisticated credit scoring techniques to banks to enable them to assess amongst others the creditworthiness, lending capacity and historic performance of potential borrowers to lower the credit risks and associated costs of these financial institutions (Bofondi & Lotti, 2006:344).

3.3. Capital allocation with reference to the Basel Accords

The global financial crisis of 2007 and thereafter underlined the liquidity and capital risks of financial institutions (Van Grootheest, 2011). The Basel Committee on Banking Supervision plays the important role as an international advisory authority on bank regulation to set prudent standards in order to further the best practices of financial regulators which are embodied in the Basel I, II and III accords (World Council of Credit Unions, 2015). There are however the potential that increases in capital requirements may lower shareholders' returns (Centaur Communications Ltd, 2011). Financial innovations may therefore be necessary in order to maintain the profitability, solvency and liquidity of financial institutions.

How would financial innovation help a bank to maintain its financial position while stringent capital requirements prevail? One example involves the application of alternative risk transfer where a bank converge with the insurance industry and/or the capital market to obtain sufficient financial capacity to shield itself when various types of risks prevail (Mostert & Mostert, 2008:347). Alternative risk transfer can employ various innovative financial strategies, focusing amongst others on securitisation, insuratisation, finite risk insurance and captive insurance companies.

3.4. Other organisational innovations

Except for the above-mentioned organisational innovations, there are also other ways according to which organisational innovations can be employed. *Human resource management* can be utilised to enhance innovation as Sheehan *et al.* found that human resource management should have a positive influence on inter alia leadership, the engagement of employees, the motivation of managers to learn and a learning culture (2014:2). These aspects are essential for the development of innovation activities.

The *business processes, systems and structural innovation* also play an important role in this regard. It was found that decentralised decision-making usually enhance the ability of an organisation to innovate when a formal structure and plans prevail (Cosh *et al.*, 2012:301). It should be clear that by decentralising decision-making, employees are given the opportunity to apply their own mind and enhance innovation activities. Distribution channel innovation receives the necessary attention in the next sections.

4. DISTRIBUTION CHANNEL INNOVATION

The distribution channel innovation in retail banking mainly addresses the functioning of branches, automated teller machines, mobile banking and internet banking. These aspects will receive attention in the following sections.

4.1. Branches

A KPMG survey indicated that branches and automated teller machines are the dominant distribution channels of banking in Africa (2013:2). It is obvious that branches provide face to face contact between the clients and the bank and that personalised solutions can be applied in this way. The size of a bank's branch network does not necessarily have a systematic relationship with its profitability according to the findings of Hirtle (2007:3782). It should however be emphasised that many clients may be highly branch loyal and may require the availability of the personalised service. Banks should take the attitude of their clients concerning bank branches into account when they consider the movement towards more innovative distribution channels such as automated teller machines, mobile banking or internet banking.

4.2. Automated teller machines

The core function of automated teller machines is that cash can be withdrawn at any time of the day and usually outside the bank's premises. The clients save time by using the automated teller machines, while banks may also save operational costs in this way (Chandio, 2013:135). The negative effects of automated teller machines are emphasised by Ogbuji *et al.* (2012:180). They stated that users of automated teller machines may profligate by withdrawing money recklessly. The amount of daily withdrawals may be limited as a safeguard in this way. The security attached to the use of automated

teller machines is also of prime importance and measures to protect users should address their education regarding their personal identification numbers (PINs) and the general manner according to which automated teller machines should be used. This type of financial innovation must therefore be carefully managed by banks.

4.3. Mobile banking

The term mobile banking is used for various types of bank transactions through the application of mobile devices including mobile phones (Bećirović *et al.*, 2011:89). Due to the rapid increase in the number of mobile devices globally, banks are currently in a position to offer a variety of financial services to people in developed as well as developing countries at lower costs (Kendall & Voorhies, 2014:9-13).

Mobile banking should provide advantages to banks (Kendall & Voorhies, 2014:9-13), viz. the low cost of connecting to their clients, obtaining huge amounts of data through mobile communications which banks can employ in future, and sending messages to each other when it suits the bank or client personally. The disadvantages of mobile banking are really seriously, as obtaining cyber or physical control of the mobile device, stealing of personal data and using it in malicious manners, obtaining access to the financial records of people and conducting illegal transactions, are but a few to mention (Goodman & Harris, 2010:24-27). Banks should inform their clients on the due diligence needed when employing mobile banking.

4.4. Internet banking

The term internet banking is self-explanatory as it embodies the performance of banking transactions via the internet. Internet banking can save operational cost for banks as a technology based approach is applied. The clients on the other hand can do their routine banking transactions when it suits them, excluding the withdrawal of money.

Research indicated that many clients are still careful to accept the risk associated with internet

banking, as they are cautious that their privacy and personal information may be accessed by unauthorised people (Gerrard *et al.*, 2006:164). The threats to internet access can vary widely from viruses and hackers to espionage and software piracy (Henning & Ebersohn, 2001:274). Furthermore, clients often do not obtain access to internet banking because they do not identify a need to have internet banking, or due to a lack of knowledge concerning internet banking, inertia, inaccessibility to connect to the internet, or the need to have a personal touch when doing banking transactions (Gerrard *et al.*, 2006:164). Banks should address these reasons why clients do not obtain internet banking when they want to enhance financial innovation. The following section focuses on the research methodology to obtain the empirical results.

5. RESEARCH METHODOLOGY

Secondary as well as the primary data was necessary to accomplish the *objective* of this research. The objective was already defined as the improvement of financial decision-making by executive managers in retail banking when they are applying financial innovation. After using the secondary data to compile a questionnaire for the empirical study, the opinion survey was undertaken. Copies of the questionnaire as well as the invitation letter to participate in the opinion survey, were sent to the 10 largest retail banks in South Africa. It was already explained in Section 1 of this paper that eight of these retail banks eventually completed the questionnaires. The empirical results are therefore based on the perceptions of these eight retail banks.

The majority of the questionnaire's questions used a five point Likert interval scale. It was explicitly stated on the questionnaire that, where applicable, the five point Likert interval scale forms a continuum which enabled the weighting of the answers (Albright *et al.*, 2002:224-229 & 245). The answers of the respondents were weighted by assigning the following weights when a five point Likert interval scale was used:

Table 1. The weights assigned to the answers of the respondents

<i>Answers of the respondents:</i>	<i>Weights assigned:</i>
Extremely important	5
Highly important	4
Moderately important	3
Little important	2
Not important	1

The empirical results which were obtained through the opinion survey are shown and discussed in the following sections.

6. EMPIRICAL RESULTS

The primary data of this paper are depicted and described in the next sections by focusing on the following aspects of financial innovation:

- Capital investments in products and services innovation,
- Capital investments in organisational innovation,

- Capital investments in distribution channel innovation,
- Capital investments in all three areas of financial innovation and
- Obstacles to financial innovation

6.1. Capital investments in products and services innovation

Table 2 shows how important the respondents perceived capital investments in the area of products and services innovation.

Table 2. The importance of capital investments in the area of products and services innovation within a retail bank, as perceived by the respondents

<i>Aspects of innovation</i>	<i>Extremely important</i>	<i>Highly important</i>	<i>Moderately important</i>	<i>Little important</i>	<i>Not important</i>
Innovation in <i>current accounts</i>		4	3	1	
Innovation in <i>savings accounts</i>	3	1	4		
Innovation in <i>transactional services</i>	5	2	1		
Innovation in <i>loan products</i>		6	2		
Innovation in <i>insurance services</i>	2	3	3		
Innovation in <i>investment and personal financial management services</i>	3	3	2		

It is interesting to note that five of the eight respondents perceived capital investments in innovation in transactional services as extremely important according to Table 2. The responses

shown in the preceding table were weighted by applying the weights depicted in Table 1 and the weighted responses appears in Table 3.

Table 3. The weighted responses on the importance of capital investments in the area of products and services innovation within a retail bank, in a declining order of importance

<i>Total weighted scores calculated</i>	<i>Mean scores</i>	<i>Declining order of importance</i>	<i>The different aspects of products and services innovation within a retail bank</i>
36	4.50	1	Innovation in <i>transactional services</i>
33	4.13	2	Innovation in <i>investment and personal financial management services</i>
31	3.88	3	Innovation in <i>insurance services</i>
31	3.88	3	Innovation in <i>savings accounts</i>
30	3.75	5	Innovation in <i>loan products</i>
27	3.38	6	Innovation in <i>current accounts</i>
	3.92		TOTAL for products and services innovation

The weighted responses of the preceding table on the importance of capital investments in the area of products and services innovation within a retail bank, indicates that capital investments concerning the innovation in transactional services is perceived by the respondents as *most* important, while the innovation in investment and personal financial management services is regarded as the *second* most important aspect to take into account.

The *next two* aspects of innovation in the area of products and services innovation shown in the preceding table in a declining order of importance, have the same total weighted scores calculated. These two aspects address respectively capital investments concerning innovation in insurance services as well as innovation in savings accounts. It

is concluded that retail banks should pay special attention to the four aspects mentioned in this section when they consider capital investments in the area of products and services innovation. The next section focuses on capital investments in organisational innovation.

6.2. Capital investments in organisational innovation

The importance of capital investments in the area of organisational innovation within a retail bank is depicted in Table 4, based on the perceptions of the respondents.

Table 4. The importance of capital investments in the area of organisational innovation within a retail bank, as perceived by the respondents

<i>Apects of innovation</i>	<i>Extremely important</i>	<i>Highly important</i>	<i>Moderately important</i>	<i>Little important</i>	<i>Not important</i>
Innovation in <i>information technology and systems</i>	6	2			
Innovative <i>risk assessment and risk management practices / procedures</i>	4	4			
Innovation in terms of new <i>capital allocation activities with reference to the Basel accords</i>	2	6			
Innovation in <i>human resources activities</i>	2	5	1		
<i>Business processes, systems and structural innovation</i>	5	2	1		

It should be mentioned that six of the respondents perceived capital investments in innovation in information technology and systems as extremely important in the preceding table, while

the remaining two retail banks regard it as highly important. The weights shown in Table 1 were employed to calculate the total weighted scores which appear in the next table.

Table 5. The weighted responses on the importance of capital investments in the area of organisational innovation within a retail bank, in declining order of importance

<i>Total weighted scores calculated</i>	<i>Mean scores</i>	<i>Declining order of importance</i>	<i>The different aspects of organisational innovation within a retail bank</i>
38	4.75	1	Innovation in <i>information technology and systems</i>
36	4.50	2	Innovative <i>risk assessment and risk management practices / procedures</i>
36	4.50	2	<i>Business processes, systems and structural innovation</i>
34	4.25	4	Innovation in terms of new <i>capital allocation activities with reference to the Basel accords</i>
33	4.13	5	Innovation in <i>human resources activities</i>
	4.43		TOTAL for organisational innovation

Innovation in information technology and systems obtained the highest weighted score calculated according to Table 5, which indicates that this aspect is perceived by the respondents to be *most* important when retail banks are considering capital investments in the area of organisational innovation. It is further concluded that two other aspects seem to be equally important as well as being the *second* most important aspects when retail banks contemplate capital investments in the area of organisational innovation, viz.:

- Innovative risk assessment and risk management practices / procedures and
- Business processes, systems and structural innovation.

These three aspects should therefore receive due attention when retail banks are considering capital investments in the area of organisational innovation. The following section pays attention to capital investments in distribution channel innovation.

Table 6. The importance of capital investments in the area of distribution channel innovation within a retail bank, as perceived by the respondents

<i>Aspects of innovation</i>	<i>Extremely important</i>	<i>Highly important</i>	<i>Moderately important</i>	<i>Little important</i>	<i>Not important</i>
Innovation relating to a <i>bank's branches</i>	4	4			
Innovation in <i>automated teller machines (ATMs)</i>	3	3	2		
<i>Mobile banking</i> innovation	6	2			
<i>Internet banking</i> innovation	6	1	1		

6.3. Capital investments in distribution channel innovation

The respondents were requested to indicate how important they perceive capital investments in various aspects of distribution channel innovation. The empirical results obtained are depicted in the following table.

It should be highlighted from the preceding table that six of the eight respondents indicated that capital investments in mobile banking innovation are extremely important, while the remaining two respondents regarded the capital investments as highly important. The total weighted scores were calculated by applying the weights which appear in Table 1 and the results are depicted in Table 7.

Table 7. The weighted responses on the importance of capital investments in the area of distribution channel innovation within a retail bank, in a declining order of importance

<i>Total weighted scores calculated</i>	<i>Mean scores</i>	<i>Declining order of importance</i>	<i>The different aspects of distribution channel innovation within a retail bank</i>
38	4.75	1	<i>Mobile banking</i> innovation
37	4.63	2	<i>Internet banking</i> innovation
36	4.50	3	Innovation relating to a <i>bank's branches</i>
33	4.13	4	Innovation in <i>automated teller machines (ATMs)</i>
	4.50		TOTAL for distribution channel innovation

The total mean score for the area of distribution channel innovation amounts to 4.50 (according to the preceding table) while the total mean score for the area of organisational innovation is equal to 4.43 (according to Table 5) and the total mean score for the area of products and services innovation is 3.92 (according to Table 3). It is therefore clear that capital investments in the area of distribution channel innovation is perceived by the respondents to be slightly more important than capital investments in the other two areas of innovation.

Taking the total weighted scores calculated of Table 7 into consideration, it is concluded that capital investments in mobile banking innovation is

regarded by the respondents as the *most* important capital investments in the area of distribution channel innovation, while the capital investments in internet banking innovation is considered as the *second* most important aspect to pay attention to. Capital investments in innovation relating to a bank's branches are regarded as the *third* most important aspect in the area of distribution channel innovation by the respondents. These three aspects mentioned in this paragraph should thus receive due attention when retail banks are assessing capital investments in the area of distribution channel innovation. The following section compare the

importance of capital investments in all three areas of financial innovation.

6.4. Capital investments in all three areas of financial innovation

The weighted responses on the importance of capital investments in all three areas of financial innovation within retail banks are depicted in a declining order of importance in Table 8. This table is based on the information of Tables 3, 5 and 7 of this paper.

Table 8. The weighted responses on the importance of capital investments in the different areas of innovation within a retail bank, in declining order of importance

Total weighted scores calculated	Mean scores	Declining order of importance	The different aspects of innovation within a retail bank (all three areas)	Areas of innovation
38	4.75	1	Mobile banking innovation	Distribution channel
38	4.75	1	Innovation in information technology and systems	Organisational
37	4.63	3	Internet banking innovation	Distribution channel
36	4.50	4	Innovation relating to a bank's branches	Distribution channel
36	4.50	4	Innovative risk assessment and risk management practices/procedures	Organisational
36	4.50	4	Business processes, systems and structural innovation	Organisational
36	4.50	4	Innovation in transactional services	Products and services
34	4.25	8	Innovation in terms of new capital allocation activities with reference to the Basel accords	Organisational
33	4.13	9	Innovation in automated teller machines (ATMs)	Distribution channel
33	4.13	9	Innovation in investment and personal financial management services	Products and services
33	4.13	9	Innovation in human resources activities	Organisational
31	3.88	12	Innovation in insurance services	Products and services
31	3.88	12	Innovation in savings accounts	Products and services
30	3.75	14	Innovation in loan products	Products and services
27	3.38	15	Innovation in current accounts	Products and services

It is important to note that concerning the seven aspects of innovation with the highest total weighted scores calculated according to the preceding table, the area of distribution channel innovation as well as the area of organisational innovation each has three aspects. Some aspects of these two areas of financial innovation seem to be quite important according to the perceptions of the respondents. The area of products and services innovation has only one aspect which made it to the top seven of the list and that is innovation in

transactional services. The obstacles to financial innovation are addressed in the following section.

6.5. Obstacles to financial innovation

The respondents were each requested to mention the three most important obstacles for financial innovation which they have experienced. Table 9 depicts the number of respondents who indicated each obstacle.

Table 9. The most important obstacles for financial innovation within a retail bank, as indicated by the respondents

Obstacles	Number of respondents who mentioned the obstacle
Inadequate human resources	6
Inadequate technology	6
Inadequate capital resources	5
Inadequate leadership	3
Time constraints	2
Attitude of clients towards innovation	1
Regulatory requirements	1

Three of the obstacles were mentioned by the majority of the eight respondents, viz.:

- Inadequate human resources,
- Inadequate technology, and
- Inadequate capital resources.

It is quite surprising that inadequate human resources are seen as an obstacle by the respondents, while they have indicated that innovation in human resources activities is one of the not so important aspects when they consider capital investments according to Table 8. It can therefore be concluded that the respondents perceived innovation in human resources as an obstacle, but that executive managers do not apparently realise that capital investments in their

personnel are of utmost importance to provide this aspect of financial innovation.

It is clear according to Table 8 that innovation in information technology and systems is regarded as a very important aspect when the respondents consider capital investments in financial innovation. This empirical finding shows that the respondents have realised the urgent need to address the obstacle mentioned in Table 9 about inadequate technology. The obstacle about inadequate capital resources is inherent to the nature of capital investments as the availability of capital is usually less than the investments opportunities which exit.

7. CONCLUSIONS

A literature study as well as an opinion survey were undertaken to reach the *objective* of this research, which was defined as the improvement of financial decision-making by executive managers in retail banking when they are employing financial innovation. Based on the literature study as well as the empirical survey, the main conclusions of this research are as follows:

(1) Capital investments concerning the innovation in transactional services is perceived by the respondents as *most* important in the *area of products and services innovation* while the innovation in investment and personal financial management services is regarded as the *second* most important aspect to take into account.

(2) Innovation in information technology and systems represents the aspect perceived by the respondents to be *most* important when retail banks are considering capital investments in the *area of organisational innovation*. It is further concluded that the following two aspects seem to be equally important as well as being the *second* most important aspects when retail banks contemplate capital investments in this area of financial innovation, viz.:

- Innovative risk assessment and risk management practices / procedures and
- Business processes, systems and structural innovation.

(3) It was concluded that capital investments in mobile banking innovation is regarded by the respondents as the *most* important capital investments in the *area of distribution channel innovation*, while the capital investments in internet banking innovation is considered as the *second* most important aspect to pay attention to.

(4) Based on the total mean score for each *area of financial innovation* it is clear that capital investments in the area of distribution channel innovation is perceived by the respondents to be *slightly more* important than capital investments in the other two areas of innovation. It is furthermore important to note that concerning the seven *individual aspects of innovation* with the highest total weighted scores calculated, the area of distribution channel innovation as well as the area of organisational innovation each has three aspects. Some aspects of these two areas of financial innovation seem to be quite important based on the perceptions of the respondents.

(5) Three *obstacles* were mentioned by the majority of the respondents, viz. inadequate human resources, inadequate technology, and inadequate capital resources. The second and third obstacles mentioned make sense, but it seems that the obstacle of inadequate human resources did not correspond with the perceptions of the respondents regarding the importance of capital investments for innovation in human resources activities to solve this obstacle.

REFERENCES

1. Albright, S.C., Winston, W.L. & Zappe, C.J. 2002. *Managerial Statistics*. Australia: Duxbury.
2. Bećirović, S., Bajramović, D. & Ahmatović, A. 2011. The role of mobile banking in enhancing economic

- development. Paper presented at the International Conference: Communication and Business Sector. Berane: FMSK, pp. 89-98.
3. Bofondi, M. & Lotti, F. 2006. Innovation in the retail banking industry: The diffusion of credit scoring. *Review of Industrial Organization*, 28:343-358.
4. Caggemini & Efma. 2013. *World Retail Banking Report 2013*. Caggemini & Efma.
5. Centaur Communications Ltd. 2011. Regulation: HSBC warns that new rules will dampen returns. [Online]. Available: <http://search.proquest.com.ez.sun.ac.za/docview/855213035/fulltext?accountid=14049> [30 July 2015].
7. Chandio, J.A. 2013. ATM transactions versus paper based transactions in consumer retail banking. *Journal of Managerial Sciences*, 7(1):135-144.
8. Cosh, A., Fu, X. & Hughes, A. 2012. Organisation structure and innovation performance in different environments. *Small Business Economics*, 39(2):301-317.
9. DeYoung, R. & Rice, T. 2004. How do banks make money? The fallacies of fee income. *Economic Perspectives*, 4Q:34-51.
10. Gerrard, P., Cunningham, J.B. & Devlin, J.F. 2006. Why consumers are not using internet banking: A qualitative study. *Journal of Services Marketing*, 20(3):160-168.
11. Ginovsky, J. 2013. Branch transformation: To self-service and beyond. *ABA Banking Journal*:27. August.
12. Goh, K.H. & Kauffman, R.J. 2013. Firm strategy and the internet in U.S. commercial banking. *Journal of Management Information Systems*, 30(2):9-40.
13. Goodman, S. & Harris, A. 2010. Emerging markets: The coming African tsunami of information insecurity. *Communications of the ACM*, 53(12):24-27.
14. Henning, J.J. & Ebersohn, G.J. 2001. Risks to the South African financial markets - Part 1. *Journal of International Banking Regulation*, 3(3):269-290.
15. Hirtle, B. 2007. The impact of network size on bank branch performance. *Journal of Banking & Finance*, 31:3782-3805.
16. Kendall, J. & Voorhies, R. 2014. The mobile-finance revolution. *Foreign Affairs*, 93(2):9-13.
17. KPMG. 2013. *Africa Banking Industry Customer Satisfaction Survey*. KPMG.COM.
18. McGreevy, B.K. 1996. Brave new world for European bancassurance. *National Underwriter / Life & Health Financial Services*, 100(44):17-18.
19. McKenzie, H. 2013. Banking Technology - Innovation: There is a better way. [Online]. Available: <http://www.bankingtech.com/168982/innovation-there-is-a-better-way/> [28 July 2015].
20. Mlambo, K. & Ncube, M. 2011. Competition and efficiency in the banking sector in South Africa. *African Development Review*, 23(1):4-15.
21. Mostert, J.H. & Mostert, F.J. 2008. Finite risk insurance as a form of alternative risk transfer. *Corporate Ownership & Control*, 6(1):347-356.
22. Ogbuji, C.N., Onuoha, C.B. & Izogo, E.E. 2012. Analysis of the negative effects of the automated teller machine (ATM) as a channel for delivering banking services in Nigeria. *International Journal of Business and Management*, 7(7):180-190.
23. O'Neill, D. 2012. South Africa unsecures its banks. *Euromoney*:1-5. September.
24. PwC. 2012. *Managing for Performance: Transaction Banking*. Pricewaterhouse-Coopers International Limited.

25. Rajendran, M.M.A. 2012. Operational risks involved in banking industries. *Amity Global Business Review*:50-57. February.
26. Rosengren, E.S. 2007. Market and risk management innovations: Implications for safe and sound banking. *Economic Review*, First and Second Quarters:36-39.
27. Sheehan, M., Garavan, T.N. & Carbery, R. 2014. Innovation and human resource development (HRD). *European Journal of Training and Development*, 38(1/2):2-14.
28. The Boston Consulting Group. 2012. *The Transaction Banking Advantage: The Path to Profitable Growth*. Papers presented at Sibos 2012.
29. Van Grootheest, G. 2011. Basel III is forcing banks to innovate: New liquidity requirements demand both stable financing and attractive products. [Online]. Available: <http://zanders.eu/en/publications/article/basel-iii-forces-banks-to-innovate> [30 July 2015].
30. Wolfe, D. 2006. Vendors tout banking software for phones. *American Banker*, 171(199):8.
31. Wolfe, D. 2008. From online banking vendors, more features for customers. *American Banker*, 173(118):7.
32. World Council of Credit Unions. 2015. Advocacy: Basel Accords. [Online]. Available: <http://www.woccu.org/memberserv/advocacy/basel?p=pf> [30 July 2015].

BUSINESS GROWTH AND SOCIAL MEDIA: AN ORGANISATIONAL ISSUE

Claudette Rabie*, Michael C. Cant**, Ricardo Machado***

* Mrs Claudette Rabie is a lecturer at the University of South Africa (Unisa), Department of Marketing and Retail Management.

** Professor Michael Colin Cant is a Full Professor at the University of South Africa (Unisa), Department of Marketing and Retail Management

*** Mr Ricardo Machado is a Senior Lecturer at the University of South Africa (Unisa), Department of Marketing and Retail Management

Abstract

The landscape of marketing has changed considerably over the last decade, with traditional print and broadcast media being expanded and largely replaced by social media platforms. The increasing development of marketing platforms have a large effect on the success and growth of organisations especially within the tourism and hospitality industry, as more travellers are utilising social media as a means of communication and information. The purpose of this research study was therefore to investigate the current use of social media among star-graded accommodation establishments operating in the Western Cape Province of South Africa. A web-based self-administered questionnaire was distributed to star-graded accommodation establishments, who were registered by the Tourism Grading Council of South Africa (TGCSA). A total of 361 useable responses were received. The findings mainly revealed that social media are used in accommodation establishments but that they are still learning how to fully and successfully implement social media platforms in their area of business.

Keywords: Social Media; Accommodation Establishment; Marketing; Usage; Promotional Mix Elements; South Africa; Star-Graded Accommodation Establishments

This article is based on the MCom thesis “The perception of social media as a promotional mix element in star-graded accommodation establishments in the Western Cape province of South Africa”, completed in 2014 by Ms Claudette van Niekerk (now Mrs Claudette Rabie). Therefore, a high level of similarity will be found between the methodology and results of this article and the Master’s study.

1. INTRODUCTION

In the last decade, the landscape of marketing has changed considerably, as traditional media such as print and broadcast media has made way for a new wave of media platforms such as social media, blogs, forums and videos. These new media platforms, however, has an effect on an organisations’ marketing performance and the success of their business (Higuera, 2011; Stephen & Galak, 2010). Even though, at first, the vast majority of businesses did not instantly join the social media revolution (Merrill, Latham, Santalesa & Navetta, 2011), businesses are now going the extra mile to gain a competitive and differentiated advantage (Sweeney & Craig, 2010). The Internet, and social media, has resulted in the development of a number of innovative ways to bring businesses and customers together (Hatter, 2015). Organisations are nowadays more focussed on building online relationships and networks with potential customers (Mustonen, 2009).

The advent of social media, and the increase in the use of social media by consumers, has led to profound and innovative methods of doing business in all sectors and industries. Businesses had to rapidly adapt to this new trend in an effort to reach new customers and to reinforce their relationship with current customers (Perdue, 2010). This is no different for the hospitality industry, for which

social media represents a golden opportunity to constantly communicate with their customers and to forge long-term relationships (Withiam, ND). The main aim of this study was to investigate the current use of social media among star-graded accommodation establishments operating in the Western Cape province of South Africa. The study aimed to obtain a better understanding of the use of social media and how to implement it effectively in the hospitality industry.

2. PURPOSE OF RESEARCH STUDY

This article endeavours to essentially fulfil the gaps in the literature, and broaden the knowledge base regarding the use of social media as a marketing tool in star-graded accommodations establishments, specifically operating in the Western Cape province of South Africa. The research study therefore took on a business-centred approach in an attempt to determine the use of social media as a viable promotional mix element in accommodation establishments, an area that has, up until now, received limited attention in academic literature. The main research objective of this study was therefore to investigate the current use of social media among star-graded accommodation establishments operating in the Western Cape province of South Africa.

Star-graded accommodation establishments was surveyed for this study, due to the hospitality or accommodation industry being a very competitive market and a presence on social media and Internet is regarded as being central to the industry and the success of these establishments. The Western Cape Province was specifically chosen for the purpose of this study because this province is a leading tourism destination with a wide variety of attractions for business and leisure travellers (Western Cape Business, 2011). The researchers are of the opinion that the perception and insights of these establishments would provide a valuable contribution to the body of knowledge to similar accommodation establishments.

3. PROMOTION AND THE SOCIAL MEDIA LANDSCAPE

Promotion, according to Burrows (2009), is a form of communication, where the organisation or marketer conveys a message by means of a communication channel to the intended target market. It can therefore be said that promotion involves the distribution of information regarding a product or service of an organisation by using a combination of seven promotional elements in an attempt to sell these products or services (Moore & Pareek, 2010; Trehan & Trehan, 2010). These seven elements include, direct marketing, public relations, personal selling, sales promotion, sponsorships and new media. The combination of these seven promotional elements are known as the promotional mix, which attempts to create the most favourable combination of different personal and non-personal selling elements to achieve certain marketing objectives (Kurtz, 2011; Sandhusen, 2008). As this research project emphasis was on social media the focus of this discussion will be on new media, as a component of the promotional mix.

2.2. Conceptualising social media

Billions of people now merge a complex collection of e-mail, mobile short messages (SMSs), blogs, wikis, audio and video streams, forums, virtual reality games and social networking sites to connect them to the world and several other people (Hansen, Shneiderman & Smith, 2010), which has led to a fundamentally different way of doing business.

Social media have been explained by various authors as an Internet-based application (Kaplan & Haenlein, 2010; Xiang & Gretzel, 2010), allowing user-generated content to be created by individuals and the general public (Daugherty, Eastin & Bright, 2008; Haataja, 2010). It entails the conversation between people; the sharing of opinions, experiences, content, and information for making a better or more informed choice (Jerving, 2009; Madia & Borgese, 2010; Palmer & Koenig-Lewis, 2009).

Social media is one of the fastest growing means of communication and has revolutionised not only how people interact with one another, but also how businesses interact with their consumers. Facebook, Twitter, LinkedIn and YouTube have been identified as the most used and most popular social media tools for personal and business use. These social media tools have allowed organisations to

deliver unfiltered messages to their target markets, which stimulate relationships, transparency and autonomy (Jenna Communications, ND). By means of utilising social media, businesses, large or small, can reach more customers and build effective long-term relationships if applied correctly. Assenov and Khurana (2012) suggests that an increase in the use of social media as a marketing channel in organisations, will allow them to communicate more effectively with their customers, advertise and also sell their products and service offerings. Organisations should therefore have a strong social media marketing plan and presence on the web in order to successfully utilise social media tools (WordStream, ND). Amidst others, the hospitality or accommodation industry has also started utilising social media as a tool for advertising and creating brand awareness (Assenov & Khurana, 2012). The fact that the use of social media is increasing at such a rate makes it even more crucial that businesses and, in particular, accommodation establishments use these means.

2.3. The hospitality industry and social media

Marketing in the hospitality industry has always been a fundamental element in driving sales. However, since the advent of digital technology, the hospitality industry had to adapt their approach to reap the benefits digital technology has to offer (Ckettmann, 2012). Social media has rapidly become an fundamental channel of marketing and has a major influence on the general public when communicating brand messages and leveraging promotions to generate revenue (Ckettmann, 2012). There are numerous social media platforms and tools that can be used in the hospitality industry, such as Facebook, LinkedIn, Twitter, MySpace and YouTube (Assenov & Khurana, 2012; Lim, 2010). Popular customer review websites frequently used in the hospitality industry is TripAdvisor, which allows customers to share and gather travel related information that is autonomously posted by other travellers (Miguéns, Baggio & Costa, 2008). Peer-review websites, such as TripAdvisor, have given rise to conversations and assessments of accommodation establishments; restaurants and other services on a broad scale (Assenov & Khurana, 2012). These websites, which allows for public expression, have left many establishments scrambling to regain control of their products and images (Windels, 2013).

The hospitality and accommodation industry can make use of social media to engage and communicate with customers and potential clients in order to recognise and satisfy their needs and wants. Social media tools allow establishments to interact with customers before, during and after their stay at the establishment (Lim, 2010). Assenov and Khurana (2012:327) state that social media tools can be utilised in accommodation establishments to serve as a 'cost cutter', as social media is a low cost medium used to communicate, more directly and efficiently, with customers and stakeholders. Windels (2013) identified three social media endeavours accommodation establishments should consider implementing in order to utilise social media effectively:

- The hospitality industry and accommodation establishments should take customer service to the next level, by listening to online conversations and being proactive.

- They should offer customers value and engagement so that their business can grow.

- They should also use social media for target marketing and building new business relationships.

Social media offers the hospitality industry an abundance of advantages, such as being affordable, viral and has the potential to spread brand awareness rapidly and broadly, and it is said to be able to create attention and immense amounts of traffic to their website (Lim, 2010).

2.4. Social media usage in the South African hospitality industry

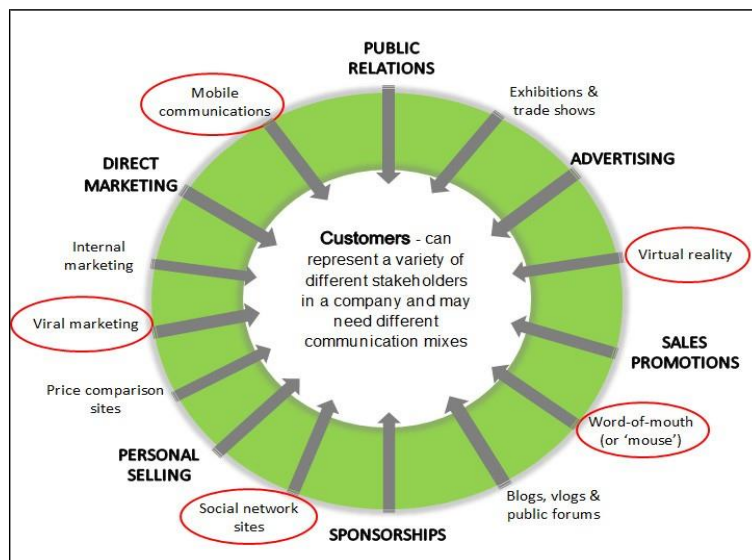
The use of social media has exceeded most expectations and has grown rapidly over the past few years. Empirical literature provides countless justification of the usage and effectiveness of social media by individuals worldwide. Facebook is the most popular choice of individual Internet activity with more than 11.8-million Facebook users in South Africa alone (World Wide Worx, 2015). YouTube has become the second most used social networking platform among South Africans, with an active user base of 7.2-million users (World Wide Worx, 2015). Twitter, on the other hand, who has seen the most growth in the past, has slowed down from a dramatic growth of 129% to a healthily 20% increase in the past year (from 5.5-million users in 2013 to 6.6-million users in 2014) (World Wide Worx, 2015). The intensified use of social media as a corporate platform in South Africa revealed that 95% of major brands in South Africa use Twitter as

a marketing tool, while 93% make use of Facebook. Fifty-one per cent of South Africa's biggest brands indicated that they intend to increase the social media marketing endeavours and budgets, and intend to focus their attention on content marketing (73%) and multimedia content (60%) (World Wide Worx, 2015). These statistics serve as proof that social media has gone mainstream in South Africa, among both individuals and businesses.

2.5. Social media as a hybrid element of the promotional mix

Barnes and Barnes (2009) argue that social media can be considered a hybrid element of the promotional mix seeing that social media allows organisations to communicate with their customers and enables customers to converse with one another. Mangold and Faulds (2009) furthermore argue that social media comprise of characteristics from a variation of certain traditional promotional mix elements, such as advertising, direct marketing and personal selling. Richardson, Gosnay and Carroll (2010), on the other hand, also assert that the promotional mix no longer includes only the traditional six elements of the promotional mix, but that social media, among others, is now regarded as a viable element of the promotional mix. Richardson *et al.* (2010) maintain that the blend of tools used has changed over time from the traditional six promotional mix elements to the inclusion of new media tools, such as mobile marketing, word-of-'mouse' and other social media applications. The expanded communication mix was therefore introduced and is portrayed in figure 1 below (Richardson *et al.*, 2010).

Figure 1: Extended communications mix



Source: Adapted from Richardson *et al.* (2010:57)

Figure 1 shows that at the centre of the extended communication mix is the customer, which can include a variety of different stakeholders in the organisation and might need to use different communication mixes, such as the

marketer or the manager. The traditional promotional mix elements are now merged with new media, such as virtual reality games, word-of-mouse, blogs, vlogs, forums, mobile communications, viral marketing as well as social

networking sites (see Figure 1). These new elements are now being considered as a hybrid element of the promotional mix and should be considered and integrated together with the traditional promotional elements to create a complete marketing message.

4. RESEARCH METHODOLOGY

For the purpose of this research study, the researcher opted to follow an exploratory research approach. To determine the current use of social media as a promotional mix element in star-graded accommodation establishments, a web-based (Survey Monkey) self-administered questionnaire was distributed to star-graded accommodation establishments, who were registered by the Tourism Grading Council of South Africa (TGCSA). The study focused solely on the Western Cape for the purpose of this study, as this province is a leading tourism destination with a wide variety of attractions for business and leisure travellers (Western Cape Business, 2011). The sampling method utilised for this study was simple random sampling in order for the researcher to substitute the non-responses from the list available. The questionnaire was

administered to star-graded accommodation establishments, operating in the Western Cape, and a total of 361 useable responses were received. Data was analysed using SPSS, version 22.

5. RESEARCH FINDINGS

The research findings and interpretation of the empirical study will be discussed in the next section. A summary of the profile of the respondents who participated in the research study will be provided, followed by the use of social media for business and marketing purposes, as well as the current use of social media amongst star-graded accommodation establishments. This section will conclude with a correlational analysis of the current use of social media as a promotional mix element and respondent's perceived effectiveness of the use of social media.

5.1. Profile of respondents

A summary of the profile of respondents who participated in the survey is given in table 1.

Table 1. Summary of the profile of respondents

Type of accommodation establishment			
Formal service accommodation	10,8%	Camping, caravanning & backpackers	3,1%
Guest accommodation	51,8%	Other	6,6%
Self-catering	27,7%		
Stars graded according to TGCSA			
1-star	1,4%	4-star	44,0%
2-star	5,3%	5-star	8,3%
3-star	40,2%	None	0,8%
Position held in establishment			
Manager	26,5%	Owner	61,3%
Marketing manager	3,9%	Front desk/receptionist	1,8%
Sales representative	1,1%	Other	5,4%
Permanent employees employed at establishment			
Less than 5	61,6%	101-150	0,7%
5-10	24,7%	151-200	1,1%
11-50	10,0%	More than 200	0%
51-100	1,8%		
Travellers primarily targeted			
Leisure	37,3%	Local markets	9,0%
Business	3,6%	International markets	9,0%
Both leisure and business	59,1%	Both local and international	82,1%

Table 1 show that respondents mainly encompassed guest accommodation establishments (51.8%), which consist of B&B establishments, guest houses and country houses. The majority of respondents operated a 3- star (40.2%) or 4-star (44%) establishment, with less than 5 employees (61.6%). Respondents who answered the research survey were mostly the owner (61.3%) or the manager (26.5%) of the establishment. These establishments aimed to target leisure and business travellers (59.1%) as well as local and international travellers (82.1%).

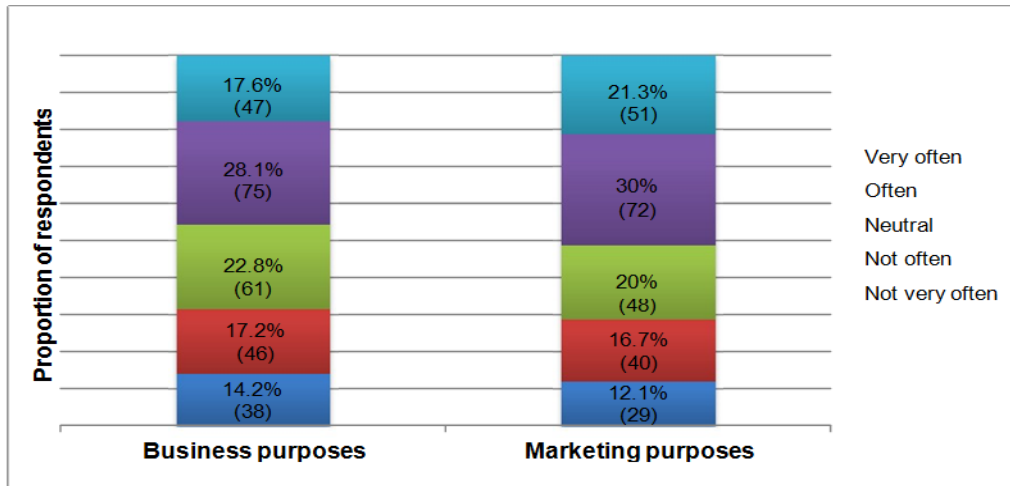
5.2. The use of social media for marketing and business purposes

Respondents were asked to indicate whether they used social media, such as Facebook, Twitter, YouTube, TripAdvisor and Pinterest, as a promotional mix (or marketing) element in their establishment. The majority of the respondents (276 or 77.3%) indicated that they did use social media as

a promotional mix element, while 80 respondents (22.7%) did not. Those respondents (276 or 77.3%) who indicated that they used social media as a promotional mix element were asked to indicate, on average, how often they used social media for business (such as market research and reservations) or, alternatively, marketing purposes (such as to post specials and competitions). The results are shown in Figure 1 below.

Figure 1 indicates that 75 respondents (28.1%) and 72 respondents (30%) used social media often for both business and marketing purposes, respectively. The findings show that respondents used social media for business and marketing purposes in a very similar manner, as the distribution of responses are similar. It can therefore be assumed that, on average, the respondents displayed similar patterns of social media usage for both business as well as marketing purposes.

Figure 1. Use of social media for business and marketing purposes



5.3. Current use of social media

The research study also endeavoured to establish the main reasons as to why star-graded

accommodation establishments currently make use of social media. The results are presented in table 4.

Table 4. Current use of social media in accommodation establishments

<i>Does your establishment currently ...</i>	<i>Yes</i>	<i>No</i>	<i>Total</i>
promote the brand, products and/or services via social media?	216 67.5%	104 32.5%	320 100.0%
use social media to monitor customer trends?	108 34.7%	203 65.3%	311 100.0%
research new product ideas via social media?	108 34.8%	202 65.2%	310 100.0%
collect and track customers' reviews on social media?	200 62.7%	119 37.3%	319 100.0%
determine customer loyalty via social media?	112 35.8%	201 64.2%	313 100.0%
engage in marketing activities on social media?	170 55.2%	138 44.8%	308 100.0%
consider social media as an effective promotional element?	225 72.3%	86 27.7%	311 100.0%

Evident from table 4 is that respondents used social media in their establishment mainly to achieve the following:

- Consider social media an effective promotional element (225 or 72.3%);
- Promote their brand, products and/or services via social media (216 or 67.5%);
- Collect and track customers' reviews on social media (200 or 62.7%); and
- Engage in marketing activities on social media (170 or 55.2%).

Respondents, however, did not use social media to monitor customer trends (203 or 65.3%), research new product ideas (202 or 65.2%) or determine customer loyalty via social media applications (201 or 64.2%). From these results, it appears that the respondents currently only used social media for promotional purposes and not to conduct any form of marketing research. Star-graded accommodation establishments should consider utilising social media for research purposes, as it could be beneficial to their growth and success.

5.4. Current use of social media as a promotional mix element vs. perceived effectiveness of the use of social media

Furthermore, the study aimed to determine the relationship between respondent's use of social media as a promotional mix element and their perceived effectiveness of the use thereof. Table 5 shows the correlations between the current use of social media as a promotional mix element and respondents' perceived effectiveness of the use of social media in their establishments.

Table 5 shows that more than half of the respondents who currently used social media in their establishment perceived their establishment's use of social media as 'getting there' (124 or 51.5%). As expected, respondents who did not use social media would not perceive their social media endeavours to be effectual (24 of 34.4%). To investigate the possibility that there may be a statistical relationship between respondents' perceived effectiveness of the use of social media and whether they were implementing social media in their establishment, the data was subjected to a chi-square test of independence. The results of the chi-square test are shown in table 6.

Table 5. Cross-tabulation: Current use of social media as a promotional mix element vs. perceived effectiveness of the use of social media (n=311)

			Do you use social media as a promotional element in your establishment?		Total	
			Yes	No		
Currently our establishment's use of social media is ...	Extremely ineffective	Frequency count	18 _a	24 _b	42	
		Percentage (%)	7.5%	34.3%	13.5%	
	Ineffective	Frequency count	38 _a	31 _b	69	
		Percentage (%)	15.8%	44.3%	22.2%	
	Getting there	Frequency count	124 _a	12 _b	136	
		Percentage (%)	51.5%	17.1%	43.7%	
	Effective	Frequency count	50 _a	2 _b	52	
		Percentage (%)	20.7%	2.9%	16.7%	
	Extremely effective	Frequency count	11 _a	1 _a	12	
		Percentage (%)	4.6%	1.4%	3.9%	
	Total		Frequency count	241	70	311
			Percentage (%)	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of "Do you use social media (such as Facebook, Twitter, YouTube, TripAdvisor, Pinterest, etc.) as a promotional element (i.e. marketing tool) in your establishment?" categories whose column proportions do not differ significantly from one another at the .05 level.

Table 6. Chi-square test: Current use of social media as a promotional mix element vs. perceived effectiveness of the use of social media (n=311)

	Value	df	Asymp. sig. (2-sided)
Pearson chi square	75.137 ^a	4	.000
Likelihood ratio	74.369	4	.000
Linear-by-linear association	59.779	1	.000
N of valid cases	311		

a. 1 cell (10.0%) has expected count less than 5. The minimum expected count is 2.70.

The chi-square test of independence revealed at the .1% level of significance that there is a significant relationship between the respondents' current use of social media as a promotional mix element and how effectively they perceived they were currently using social media ($\chi^2(4) = 75.137, p < .001$). The proportion of respondents that were using social media (59 or 63.4%) was larger for those who were getting there, effective and extremely effective in their social media activities, than for those who were using social media ineffectively and extremely ineffectively. The converse is true for those who were not using social media. The findings would therefore suggest that star-graded accommodation establishments should familiarise themselves with social media to be more effective in their use and implementation of social media. The more familiar one is with social media, the more effectively one will be able to implement it.

6. RECOMMENDATIONS AND CONCLUSIONS

The main purpose of this research study was to determine the current use of social media as a promotional mix element in star-graded accommodation establish, operating in the Western Cape of South Africa. The findings indicated that the majority of respondents were currently using social media for both business (45.7%) and marketing (51.3%) purposes at the time of the study. These respondents started utilising social media approximately one to two years prior to the study, but did not have a permanent employee who was solely responsible for the social media activities of the establishment. The results also suggested that respondents primarily utilised social media to promote the brand, product and/or service (67.5%);

track customer reviews (62.7%); and engage in marketing activities (55.2%).

Accommodation establishments in the Western Cape that were surveyed, however, generally used social media less to monitor customer trends (65.3%), research new product ideas (65.2%), or to determine customer loyalty via social media applications (64.2%). Alternatively, respondents (72.3%) considered social media as an effective promotional mix element. These findings suggest that social media is perceived to be a viable promotional mix element among star-graded accommodation establishments operating in the Western Cape Province of South Africa.

It is recommended that star-graded accommodation establishments consider implementing social media for the purpose of predicting and monitoring customer trends. Ostrowski (2013:1) is of the opinion that social media has frequently been leveraged for the purpose of anticipating trends. Stoutenburgh (2014) further states that social media can be used as an early warning system that assists in enlightening businesses as to what direction they should be venturing into to be successful. Also, by utilising social media for the purpose of monitoring customer trends, businesses have the ability to create proactive communication strategies to provide consumers with solutions across a wide range of issues (Stoutenburgh, 2014). Utilising social media for the purpose of tracking customer trends can therefore be beneficial to a business in understanding customer needs and wants and continuing to be a leading competitor in the market.

REFERENCES

1. Assenov, I. & Khurana, N. 2012. Social media marketing and the hospitality industry: evidence

- from Thailand. Paper presented at *The 2012 International Conference on Business and Management, Phuket, Thailand, 6-7 September 2012*. [Online] Available from: https://www.academia.edu/7995211/Social_Media_Marketing_and_the_Hospitality_Industry_Evidence_from_Thailand [Accessed: 2015-08-20].
2. Barnes, N.D. & Barnes, F.R. 2009. Equipping your organisation for the social networking game. *Information Management Journal*, 43(6):28-33. [Online] Available from: <http://0-search.proquest.com.oasis.unisa.ac.za/docview/227726153/139492BEA70689585A3/1?accountid=14648> [Accessed: 2012-09-12].
 3. Burrows, J.L. 2009. *Marketing*. 3rd ed. Ohio: South-Western.
 4. Ckettmann. 2012. *Social media and the hotel industry, why they are a perfect match*. [Online] Available from: <http://www.cision.com/us/2012/09/social-media-for-the-hotel-industry/> [Accessed: 2015-08-20].
 5. Daugherty, T., Eastin, M. & Bright, L. 2008. Exploring consumer motivations for creating user-generated content. *Journal of Interactive Advertising*, 8(2):16-25. [Online] Available from: <http://jiad.org/download?p=101> [Downloaded: 2012-09-12].
 6. Haataja, M. 2010. *Social media applications in marketing communications of marketing oriented companies*. Unpublished master's thesis. Aalto University. [Online] Available from: http://epub.lib.aalto.fi/fi/ethesis/pdf/12342/hse_ethesis_12342.pdf [Downloaded: 2012-09-12].
 7. Hansen, D.L., Schneiderman, B. & Smith, M.A. 2010. *Analysing social media networks with Nodexl: insights from a connected world*. [Online] Available from: http://research.microsoft.com/enus/um/redmond/events/fs2010/presentations/shneiderman_fryling_smith_nodexl-social_network_analysis_in_excel_71110_v02.pdf [Downloaded: 2012-06-09].
 8. Hatter, K. 2015. *Competitive advantage of social media*. [Online] Available from: <http://smallbusiness.chron.com/competitive-advantage-social-media-39239.html> [Accessed: 2015-03-24].
 9. Higuera, V. 2011. *Advantages and disadvantages of traditional marketing*. [Online] Available from: <http://smallbusiness.chron.com/advantages-disadvantages-traditional-marketing-25573.html> [Accessed: 2012-07-07].
 10. Jenna Communications. Not Dated. *Branding your company through social media*. [Online] Available from: <http://jennacommunications.com/wp-content/uploads/2011/11/socialmediaprogram1.pdf> [Downloaded: 2015-08-20].
 11. Jerving, J. 2009. *Social networking as a marketing tool*. [Online] Available from: http://www.cunacouncils.org/download/white_papers/wp_social_networking_marketing_tool.pdf [Downloaded: 2012-06-04].
 12. Kaplan, A.M. & Haenlein, M. 2010. Users of the world, unite! The challenges and opportunities of social media. *Business Horizon*, 53(1):59-68. [Online] Available from: <http://dx.doi.org/10.1016/j.bushor.2009.09.003> [Accessed: 2012-09-15].
 13. Kurtz, D.L. 2011. *Contemporary marketing*. 14th ed. [Online] Available from: <http://books.google.co.za/books?id=R5rrSPNyUEgC&lpg=PA500&dq=%22promotional%20mix%22&pg=PP1#v=onepage&q=%22promotional%20mix%22&f=false> [Accessed: 2012-10-30].
 14. Madia, S.A. & Borgese, P. 2010. *The social media survival guide*. 2nd ed. New Jersey: Full Court Press.
 15. Mangold, W.G. & Faulds, D.J. 2009. Social media: the new hybrid element of the promotion mix. *Business Horizons*, 52(4):357-365. [Online] Available from: <http://dx.doi.org/10.1016/j.bushor.2009.03.002> [Accessed: 2012-09-15].
 16. Merrill, T., Latham, K., Santalesa, R. & Navetta, D. 2011. *Social media: the business benefits may be enormous, but can the risks - reputational, legal, operations - be mitigated?* [Online] Available from: <http://www.acegroup.com/us-en/assets/ace-progress-report-social-media.pdf> [Downloaded: 2015-07-09].
 17. Miguéns, J., Baggio, R. & Costa, C. 2008. Social media and tourism destinations: TripAdvisor Case Study. Paper presented at the *IASK ATR2008 (Advances in Tourism Research) Conference, Aveiro, Portugal, 26-28 May 2008*. [Online] Available from: http://www.uib.cat/depart/deeweb/pdi/acm/arxiu_s/intermediacio_tfg/baggio-aveiro2.pdf [Downloaded: 2015-08-20].
 18. Miller, M. 2012. *B2B digital marketing: using the web to market directly to businesses*. New York: Pearson.
 19. Moore, K. & Pareek, N. 2010. *Marketing: the basics*. 2nd ed. New York: Routledge.
 20. Mustonen, P. 2009. *Social media - a new way to success?* [Online] Available from: http://info.tse.fi/julkaisut/kr/KRe1_2009.pdf [Downloaded: 2012-06-05].
 21. Page, R.E. 2012. *Stories and social media: identities and interactions*. New York: Routledge.
 22. Palmer, A. & Koenig-Lewis, N. 2009. An experimental, social network-based approach to direct marketing. *International Journal of Direct Marketing*, 3(3): 162-176. [Online] Available from: <http://dx.doi.org/1108/17505930910985116> [Downloaded: 2012-09-12].
 23. Perdue, D.J. 2010. *Social media marketing: gaining a competitive advantage by reaching the masses*. [Online] Available from: <http://digitalcommons.liberty.edu/honors/127/> [Accessed: 2015-03-24].
 24. Richardson, N., Gosnay, R.M. & Carroll, A. 2010. *A quick start guide to social media marketing: high-impact, low-cost marketing that works*. London: Kogan Page.
 25. Sandhusen, R.L. 2008. *Marketing*. 4th ed. [Online] Available from: <http://books.google.co.za/books?id=HxiL-2j51PMC&lpg=PP1&dq=marketing&pg=PR2#v=snip&pg=PA45&dq=promotional%20mix&f=false> [Accessed: 2012-10-30].
 26. Sweeney, S. & Craig, R. 2010. *Social media for business: 101 ways to grow your business without wasting your time*. Canada: Maximum Press.
 27. Trehan, M. & Trehan, R. 2010. *Advertising and sales management*. [Online] Available from: <http://books.google.co.za/books?id=ixKWbIU1tN8C&pg=PA45&dq=promotional+mix&hl=en&sa=X&ei=YrmPUMiFD8SKhQeyp4DQCA&ved=0CC4Q6AEwAA> [Accessed: 2012-10-30].
 28. VinIntell. 2012. *Social media in the wine industry*. [Online] Available from: http://www.sawis.co.za/info/download/vinintell_march_2012_issue_11.pdf [Downloaded: 2012-06-11].
 29. Weber, L. 2007. *Marketing on the social web*. New Jersey: John Wiley & Sons.
 30. Western Cape Business. 2011. *Tourism and leisure*. [Online] Available from: http://www.westerncapebusiness.co.za/pls/cms/ti_secout.secout_prov?p_sid=24&p_site_id=127 [Accessed: 2012-08-07].
 31. Windels, J. 2013. *3 ways hotels (and other businesses) should be using social media*. [Online] Available from:

- <http://blog.hootsuite.com/brandwatch-hotels-social-media/> [Accessed: 2015-08-20].
32. Withiam, G. Not dated. *Social media and the hospitality industry: holding the tiger by the tail*. [Online] Available from: <https://www.hotelschool.cornell.edu/research/chr/pubs/roundtableproceedings/roundtable-15500.html> [Accessed: 2015-08-05].
33. WordStream. Not dated. *Guide to using social media for marketing*. [Online] Available from: <http://www.wordstream.com/social-media-marketing> [Accessed: 2015-08-20].
34. World Wide Worx. 2015. *South African social media landscape 2015*. [Online] Available from: <http://www.worldwideworx.com/wp-content/uploads/2014/11/Exec-Summary-Social-Media-2015.pdf> [Downloaded: 2015-08-06].
35. Xiang, Z. & Gretzel, U. 2010. Role of social media in online travel information search. *Tourism Management*, 31(2): 179-188. [Online] Available from: <http://dx.doi.org/10.1016/j.tourman.2009.02.016> [Accessed: 2012-09-15].
36. Zhang, C. 2007. *Fundamentals of environmental sampling and analysis*. New Jersey: John Wiley & Sons.