JOURNAL OF CORPORATE GOVERNANCE, INSURANCE AND RISK MANAGEMENT

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THE JOURNAL OF CORPORATE GOVERNANCE, INSURANCE AND RISK MANAGEMENT

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Organizational Performance and Competitive Advantage Determinants of Creative SMEs

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ABSTRACT	ARTICLE INFO
The purpose of this paper is to examine the determinants that associated with IT utilization and further how IT utilization influences competitive advantage and organizational performance in creative SMEs sector. The samples used in this research were 400 creative SMEs in Yogyakarta, Indonesia. Purposive sampling method was taken. Structural Equation Modeling (SEM) by using Partial Least Squares (PLS) was conducted to examine the validity, reliability, and the proposed hypotheses. The determinants of IT utilization covering management commitment, and direct and indirect supports from government were significantly influence IT utilization. IT utilization does not significantly influence performance directly. The influence of IT utilization on performance is indirect via competitive advantage. Considering that management commitment and government supports is vital to IT utilization, management and government collaborations should be developed and improved. Strategic IT development is vital to create competitive advantage and further to achieve higher organizational performance. The management commitment to build people equity for employees and management is urgent since it provides the basis for IT successful engagement.	

1. INTRODUCTION

Toffler has made a forecast about creative economy wave as the fourth generation wave which nowadays has become a reality (Tofler, 1980). Creative economy that is represented through creative industry with creative ideas and skills as its foundation is finally certifiable to support Indonesia as well as its national economy. Creative industries in Indonesia, including Daerah Istimewa Yogyakarta (DIY), have lately grown well. Although it is still in small and medium scales, it has been able to open up employment opportunities with promising prospects. The potential of local products from creative industry are still widely open and spacious. In Yogyakarta, the potency of creative industry to grow is still major (http://krjogja.com, 2013; Kedaulatan Rakyat, 2013). It is largely known among Indonesians that the province of Yogyakarta is considerably more advanced in terms of creative industry, especially

in handcraft, animation, and fashion industries. This has made the province as one of the barometer of highly creative products that has its own attraction for tourists.

The creative assets that are spread across creative SMEs in Yogyakarta are in accordance with the target of Indonesia's government to make Indonesia as the center of creative industry of ASEAN region in 2014. The Governor of Yogyakarta, Sri Sultan Hamengkubuwono X has continuously motivating all SMEs (Small and Medium Enterprises) business to increase their creativities and innovations by applying business and technology incubation. In order to make Yogyakarta as the center of creative economy, information and communications technology, an ICT center has been built as the center of ICT business incubation to complement digital creative ecosystem. The objective is to increase the number of game, edutainment, music, animation and software developers especially in the city of Yogyakarta (http://jogjadigitalvalley.com, 2013). Unfortunately, in general, the utilization of IT in creative SMEs is relatively low (Achjari *et al*., 2010). The reason is limitation of budget, human resource, technology investment, knowledge and expertise in managing business (Levy and Powell, 2005; Gutter and Saleem, 2005; Cui, *et al.,* 2008). Besides, there is a finding of low management commitment and expectation for government support. Survey proved that management commitment (Ghobakhloo *et al.,* 2011) and government support (Alam and Noor, 2009; Mensah and Saffu, 2010) have influenced IT utilization. It is already known that SMEs with IT possession in Yogyakarta haven't utilized their IT for strategic activities (Wahid and Indarti, 2007; Muafi, *et al.,* 2012b). These problems can be said as the main causes of IT utilization failure. This IT utilization failure may influence business development (Zhu, *et al*., 2002) and competitive advantage (Majeed, 2011; Harari, 1997) as well as long-term organizational performance (Sarosa, 2007; Silvius, 2006), particularly for SMEs in Indonesia (Asmarani, 2006; Handriani, 2011).

2. THEORY AND HYPHOTESES

2.1. Management commitment and IT utilization

A consistent quality of technology resource and human resource is an important factor in utilizing IT. This utilization will create problems if there is no commitment from management to succeed it. There is a necessity for high commitment and positive attitude towards change because it will affect positively for organization (Steers, 1977). Management commitment has a direct influence to IT utilization on SMEs in developing countries (Thong and Yap, 1995). Armstrong (2000) explained that there are two important matters in measuring commitment: strong willingness to accept organization value and objectives and readiness to run a business by the name of organization. Armstrong (2000) also adds that a committed organization tends to relate in consistent activities. Several things that need to be considered when an organization has commitment themselves are: (1) management should communicate their value to increase creativity and ability to adapt with change, (2) if organization's intention is not the same with its members', then there shall be an acceptance for such intention so it will still provide benefits, safety and comfortability for its members.

The importance of management commitment towards organization has also been stated by Natalisa (1999). Top management should express their commitment constantly and transparently to the other organization member within the organization. Natalisa (1999) advised that a leader with high management commitment should be able to motivate the employees and show that he is a good and highly motivated leader. Management commitment and attitude in utilizing IT has a significant influence towards IT utilization (Ghobakhloo, *et al.,* 2011; Jones and Griffith, 2005, Kwahk, 2006). Compeau and

Higgins (1995) proved that persuasion from managers to organization members has a higher correlation in utilizing IT as compared to social pressure from peers and subordinates. The role of top management has a strategic central position for all company activities for current and future conditions, including IT utilization (Ghobakhloo, *et al*., 2011). Endraswari (2006) stated that the success of IT implementation relies on the participation of top management. The involvement of top management becomes an important matter to apply IT because IT is an integrated part of company planning and it depends on top management decision. Top management support includes two senses, which is participation and involvement.

Top management should take an active role to learn the benefits that can be gained from the use of computers and their use in the organizational activities daily, in addition to the strategic interests of their company, even though (Jarvenpaa, *et al.,* 1991) suggested that the executives do not need to have expertise in IT. Endraswari (2006) and Jarvenpaa, *et al.,* (1991) further added that top management participation means involvement and decision-making in utilizing IT, especially in the process of planning, developing, and implementing information system. Such participation may take form as time and energy related to IT. Furthermore, Endraswari (2006) also added that the role of top management is creating and reviewing the process of planning, monitoring, and evaluating results. Other statement by Molla (2004) emphasized that management should have a continuous commitment in utilizing IT for long term use. Management commitment is important considering that future SMEs is becoming more and more depending on IT utilization. The theoretical and empirical discussions thus led to this following hypothesis:

Hypothesis 1. There is a significant positive influence of management commitment on IT utilization

2.2. Government Support and IT Utilization

Government has a significant role in IT utilization for SMEs, including promoting and supporting SMEs' network (Alam and Noor, 2009). Government could also serve to encourage the use of e-commerce for a company (Xu, *et al.,* 2004). Supports can take form as a financial support for online tax and e-procurement system, the enactment of law and policy regarding IT utilization and safety, as well as deciding software standard to be used by a company (Chui *et al.,* 2008). Sarosa and Underwood (2005) stated that government support and regulation are expected by SMEs in Indonesia to support their businesses. Based on the review by Hoffman (2012), in giving IT support for society, government should act in two stages: (1) formative, means creating and building new system to push efficiency, and (2) scaling up, means generating benefits. In formative stage, government enables in: the implementation of regulation balance and monitoring the feedback process. In scaling up stage, government may function itself as participant. Both stages can be used to push IT usage efficiently. Further, government as facilitator can build new facility in the future. The significant role of government's supports in improving SME's performance has been stated in some studies (e.g. Mensah and Saffu, 2010; Tambunan, 2007; Maynard, 2007). This support can be direct or indirect. Indirect support can shape policy making and legislation as well as creating conducive environment for SME's business development (Tambunan, 2007; Maynard, 2007), while direct support could take form as financial support and business development services such as marketing and training (Tambunan, 2007; Maynard, 2007). Molla (2004) added that government should be committed to SMEs in utilizing IT through promotion, support, facilities, and e-commerce as well as providing tools and other aspects. Munizu (2010) adds that external factors like Indonesian's government policy have a significant and positive influence towards SME's performance. Based on the above rationale the following hypotheses are proposed:

Hypothesis 2. There is a significant positive influence of indirect government support on IT utilization.

Hypothesis 3. There is a significant positive influence of direct government support on IT utilization.

2.3. IT Utilization, Competitive Advantage and Organizational Performance

Information technology (IT) is defined as a set of technology used by an organization to generate, process, and disseminate information in every form. Therefore, information technology provides the support for company operational effectively and efficiently (Laudon and Laudon, 2000; Utomo and Dodgson, 2001). IT is useful to reduce cost in business activity, especially for SMEs to allocate and save their budget for other use. Several literatures explained that IT is vital to support businesses and to increase organizational performance (Sarosa, 2007; Andrew and Papp, 2000). Furthermore, IT utilization on business organization in Malaysia has been proven to be very strategic to support competitive advantage (Valida, *et al.*, 1994). IT has the capacity to support and influence competitive advantage. IT helps organization to optimize and control functional operation in the decision-making process. IT can also be used as a competitive tool as a popular instrument to influence organizational performance and process coordination of technology and corporation, as well as a business strategy (Daneshvar and Ramesh, 2010). Sarosa (2007) explained that the utilization of IT on SMEs can be classified into four groups: (1) internal development where SMEs may use and develop IT to solve company's internal resources issues, (2) external development where SMEs may use and develop IT software for external use, (3) commercial off the self (COTs) implementation where SMEs may obtain COTs product with or without IT adaptation, and (4) management application managed by vendors.

In comprehension of Soh and Markus (1995) study, IT can make businesses to run more efficiently, more effectively, and more flexible and more innovative. The outcome from IT is also affecting organization structure, task, and employee. IT users often feel resistant later when IT has been implemented (Pinto, 1994; Jones and Griffith, 2005). The outcome of IT will not only have an impact on organizational change, but also it will change the structure, task, and individual employees. Furthermore, in relation to organizational performance, it needs to be known that several empirical studies show that organizational performance can be measured by using different methods. Based on several authors, organizational performance can be determined by financial and non-financial performance (Muafi, 2009). In this study, non-financial measurement is used, including affectivity, efficiency, and organization adaptation (Homburg, *et al.,* 1999), job satisfaction (Harel and Tzafrif, 1999), and service (Alleyne, *et al.,* 2005). Superior organizational performance reflects a company's competitive advantage. Competitive advantage is an ability to win market competition through distinct ways that cannot be done by competitors (Poter, 1998). The results from several previous researches show that competitive advantage influences organizational performance (Majeed, 2011; Agha and Alrubaiee, 2012; Rose, *et al.,* 2010). Competitive advantage will be obtained if a company is able to use their superior resources, including the skills to achieve a superior customer value and a relatively low cost (Porter, 1998). Competitive advantage can also be enhanced from the company's age (Ismail *et al.,* 2010). The age of the company turned out to have an impact to strengthen the competitive advantage held by the company. A finding by Rose *et al.* (2010) concluded that the company's age is the only thing able to enhance the relationship between competitive advantage and organizational performance. Such relationship can be achieved in a really old company while the company size has no enhancement effect on the relationship between competitive advantage and organizational performance. Based on the above rationale the following hypotheses are proposed:

Hypothesis 4. There is a significant positive influence of IT utilization on organizational performance.

Hypothesis 5. There is a significant positive influence of IT utilization on competitive advantage.

Hypothesis 6. There is a significant mediation of competitive advantage on the influence of IT Utilization to organizational performance.

3. METHODOLOGY

By conducting survey method, the population for this research was all creative SMEs residing in Yogyakarta. The main reason is that most SMEs in this region have positive response in IT utilization (Achjari, *et al.* 2010; Muafi, *et al.*, 2012b). Data from this study was solicited by mailed instruments from the owners or managers of all 400 creative SMEs. Even though 100 respondents are sufficient for research that uses PLS statistical analysis (Hair, *et al.,* 1995), this study distributed 400 questionnaires across five regencies in Yogyakarta in order to better represent the population. Purposive sampling was chosen resulting 368 questionnaires well returned (response rate of 92%). A Likert Scale was used with 7 alternatives answers from highly disagree to highly agree. The items used are as follows: management commitment (Com = 4 items), direct government support (DG = 5 items), indirect government support (IG = 6 items), IT utilization (IT Util = 5 items), organizational performance (Perf = 4 items) and competitive advantage (CA = 5 items). SEM technique using PLS (Partial Least Square) was used due to its powerful technique to analyze latent variables in structural equation models with various indicators (Sirohi, et al., 1998). PLS also does not require a normal data distribution (Ringle, *et al.,* 2005; Roostika, 2011). The practicality of the PLS application is supported by Fornell and Bookstein (1982, p.440) who argue that data from social science research often do not satisfy the requirements of multi-normality and attain the sample size required for maximum likelihood estimation. PLS is also a prediction-oriented technique. The PLS approach is particularly useful for predicting a set of dependent variables when a large set of independent variables is involved (Chin, 1995). In the management areas, the use of PLS software has been noted in a number of studies (e.g. Ulaga and Eggert, 2006, Whittaker, *et al.* 2007, Wang, *et al.* 2007).

4. RESULTS

4.1. Descriptive data

Data from valid 368 respondents' response is shown in Table 1. The descriptions for respondents' characteristics analyzed in this research were based on respondents' status, type of business, company's age, number of employees, and IT functions. The respondents in this research mostly work on handicraft businesses (112 respondents – 30%), with less than 5 years of age (152 SMEs – 41%), having a number of employees less than 50 people (298 SMEs – 81%), and using IT to type their reports (200 SMEs – 54%).

Table 1

Respondents' Characteristics

Respondents' Characteristics	Amount	Percentage
Business Type		
Advertising	67	18
Handcraft	112	30
Fashion	30	15
Printing & Publishing	40	8
Architecture	27	11
Design	37	7
Antique Goods	17	5
Others	20	5
Age of Company		
< 5 Years	152	41
5 – 10 Years	98	27
11 – 15 Years	59	16
15 – 20 Years	34	9
> 20 Years	25	7
Number of Employees		
< 50 people	298	81
51 – 100 people	59	16
100 – 500 people	11	3
IT Utilization		
Typing Reports	200	54
Designing Products	88	24
Accessing Internet	39	11
Presentation	24	7
Others	17	5
Totals	368	100

4.2. Validity and reliability assessment

PLS allows the measurement and structural models to be analyzed at once (Chin, 1998). However, in using PLS researchers are usually follow two stages: 1) the assessment of the measurement model, which focuses more on the reliability and validity of the measures; and 2) the assessment of the structural model which is more concerned with the path coefficients, and selecting the best final model (Hulland, 1999). The measurement model is to test that each construct is a good measure. The measurement model in PLS is evaluated by examining convergent validity involving: (1) the individual loading of each item, (2) Internal Composite Reliability (ICR), and (3) Average Variance Extracted (AVE) (Roostika, 2011). The analysis of discriminant validity involves cross loadings and AVE square roots.

The examination in measurement model have resulted that some items were not considered as valid and reliable. Items IG1, IG2, IG3, IT 1, and CA4 were found to have low loadings. Chin (1998) recommended that item loading less than 0.5 should be dropped as a measure. Item Perf5 also faced problem with CA1 and CA2 in cross loading examination. Item Perf5 was dropped for further analysis. As part of the measurement model, six items were dropped and were not included in the following structural model analysis. After dropping all problematic items, re-running PLS, and carefully re-examine the outer loadings, AVE, ICR, cross loading, and AVE square roots, no more validity and reliability problems occurred and the results are described in the following tables and figure. Table1. Shows the evidence of validity in terms of item loading where all items included in the measure have satisfied Chin (1998) recommendation that all item loadings should not be less than 0.5.

Table 1. Outer loadings

	Original Sample (O)	Sample Mean (M)	T Statistics (|O/STERR|)
CA1 <- Comp Advantage	**0.8526**	0.8504	25.8678
CA2 <- Comp Advantage	**0.866**	0.8678	29.811
CA3 <- Comp Advantage	**0.8001**	0.7914	16.4879
Com1 <- Commitment	**0.8748**	0.8761	40.3381
Com2 <- Commitment	**0.8889**	0.8913	32.1716
Com3 <- Commitment	**0.8674**	0.8616	21.7424
Com4 <- Commitment	**0.8259**	0.8217	16.228
DG1 <- Direct Govt Support	**0.917**	0.9194	58.0887
DG2 <- Direct Govt Support	**0.7879**	0.7787	12.0071
DG3 <- Direct Govt Support	**0.7231**	0.7104	8.5132
DG4 <- Direct Govt Support	**0.841**	0.8414	21.0585
DG5 <- Direct Govt Support	**0.8671**	0.8689	25.2931
IG4 <- Indirect Govt Support	**0.6341**	0.6152	4.7402

IG5 <- Indirect Govt Support	**0.8561**	0.8503	23.0456
IG6 <- Indirect Govt Support	**0.8615**	0.8614	28.1252
IT2 <- IT Utility	**0.551**	0.5465	4.028
IT3 <- IT Utility	**0.8345**	0.8298	17.5577
IT4 <- IT Utility	**0.8787**	0.8758	26.1875
IT5 <- IT Utility	**0.8077**	0.8068	18.919
Perf1 <- Performance	**0.8017**	0.7997	17.1379
Perf2 <- Performance	**0.8148**	0.8118	17.7716
Perf3 <- Performance	**0.8482**	0.8501	29.937
Perf4 <- Performance	**0.782**	0.7764	16.3543

The AVE, ICR, and Cronbachs alpha as shown in table 2. PLS provides a reliability test using Internal Composite Reliability (ICR) and Cronbach Alpha. Even though Fornell and Larcker (1981) suggested that ICR should produce a value of 0.7 or higher, some of the ICR value in this study were lower than 0.7. This value is considered acceptable since ICR is not the only reliability measure while Cronbachs alpha in this study is satisfactory (> 0.6). AVE measures the average variance that is shared between a set of items and their respective construct (Hulland, 1999). AVE examines how a latent construct explains the variance of a set of items that are supposed to measure that latent construct. A construct should have AVE above 0.5 to satisfy convergent validity which explains that at least 50% variance of the indicators is captured by the construct (Fornell and Larcker, 1981). Table 2 shows that all AVE value were higher than 0.5.

The discriminant validity is shown when the indicators relate higher to their corresponding construct than they are with other constructs. Cross loadings and AVE square roots were used to assess the discriminant validity. Table 3 shows that each group of indicators/items loads higher for its respective construct than indicators/items of other constructs. The last procedure of testing discriminant validity was by checking AVE square root. It is done by comparing the square root of the AVE for each construct/dimension with the correlations between the construct and other constructs in the model. The AVE square root of each construct should be larger than the correlations between the construct and any other constructs (Staples et al., 1999). Table 4 shows that all AVE square root are higher as required.

Table 2. AVE, ICR, Cronbachs Alpha

	AVE	Composite Reliability	R Square	Cronbachs Alpha	Communality	Redundancy
CA	**0.7057**	**0.8778**	0.0748	**0.7912**	0.7057	0.0522
Com	**0.7475**	**0.9221**	0	**0.8877**	0.7475	0
DG	**0.6887**	**0.9166**	0	**0.8897**	0.6887	0
IG	**0.6257**	**0.8312**	0	**0.6969**	0.6257	0
IT Util	**0.6061**	**0.8569**	0.4647	**0.7826**	0.6061	0.1129
Perf	**0.6594**	**0.8856**	0.655	**0.828**	0.6594	0.4113

Table 3. The crossloadings

	CA	Com	DG	IG	IT Utility	Performance
CA1	**0.8526**	0.214	0.0392	0.2766	0.2111	0.6543
CA2	**0.866**	0.2904	0.1011	0.3614	0.288	0.7093
CA3	**0.8001**	0.3455	-0.0171	0.2538	0.1828	0.6378
Com1	0.1962	**0.8748**	0.31	0.4693	0.5193	0.2609
Com2	0.2192	**0.8889**	0.3013	0.4545	0.4242	0.2473
Com3	0.3042	**0.8674**	0.1969	0.4229	0.4032	0.2855
Com4	0.4684	**0.8259**	0.2115	0.5634	0.4178	0.4493
DG1	0.0662	0.3027	**0.917**	0.2374	0.5346	0.1083
DG2	0.0587	0.119	**0.7879**	0.0506	0.313	0.1444
DG3	-0.0242	0.2179	**0.7231**	0.0878	0.2055	0.0781
DG4	0.0743	0.2811	**0.841**	0.2034	0.4117	0.1234
DG5	0.016	0.2767	**0.8671**	0.2339	0.5146	0.0546
IG4	0.2897	0.3166	0.0867	**0.6341**	0.2934	0.2453
IG5	0.3111	0.521	0.1189	**0.8561**	0.4126	0.2441
IG6	0.2629	0.4538	0.2784	**0.8615**	0.4697	0.2359
IT2	-0.1197	0.1845	0.4222	0.1907	**0.551**	0.0271

IT3	0.281	0.4697	0.3027	0.4315	**0.8345**	0.3455
IT4	0.2044	0.4027	0.5179	0.4002	**0.8787**	0.2961
IT5	0.3111	0.4659	0.4107	0.4739	**0.8077**	0.3372
Perf1	0.5392	0.3613	0.0831	0.3191	0.3959	**0.8017**
Perf2	0.6467	0.2009	0.1082	0.1136	0.2278	**0.8148**
Perf3	0.7296	0.2613	0.1183	0.3199	0.2871	**0.8482**
Perf4	0.6489	0.3446	0.0703	0.2219	0.2747	**0.782**

Table 4. AVE Square root

	CA	Com	DG	IG	IT Utility	Performance
Competitive Advantage	**0.84**	0	0	0	0	0
Commitment	0.3363	**0.8465**	0	0	0	0
Direct Govt Support	0.0522	0.2992	**0.8298**	0	0	0
Indirect Govt Support	0.3569	0.552	0.2175	**0.791**	0	0
IT Utility	0.2735	0.5155	0.5127	0.5053	**0.7785**	0
Performance	0.7955	0.3559	0.118	0.3003	0.3608	**0.812**

4.3. The structural model

An overview of the structural model resulting from PLS analysis is presented in Figure 1. and table 5. The following sections will evaluate the structural model by using: (1) R-square (2) structural path coefficients; and (3) t-statistics. R Square (R^2) measures the percentage of the construct's variation and the extent to which the independent constructs predict the dependent construct (Chin, 1998). The bigger the R2, the more predictive power the model implies. The R^2 of IT utility is 0.465, meaning that together, commitment, direct government support, and indirect government support explain IT utility 46.5%. R^2 of competitive advantage is very low 7.5%, and R^2 of organizational performance is high (65.5%). As can be seen from both table 5 and figure 1, the path coefficient between IT utility and performance is not significant ($\beta = 0.155$), meaning the relationship is rejected. This means that to gain performance, the SMEs should build competitive advantage in the IT sector. The path coefficient showing relationship between competitive advantage and performance is considered high (0.753). The path coefficient between IT utility and competitive advantage is 0.274 which is significant at $\alpha = 0.03$. All the three exogenous variables have significantly influenced IT utility with respectively: commitment = 0.243, direct government support = 0.377, and indirect government support = 0.289. Table 5 summarizes the t-statistic explaining the significance of all the relationships and hypotheses proposed.
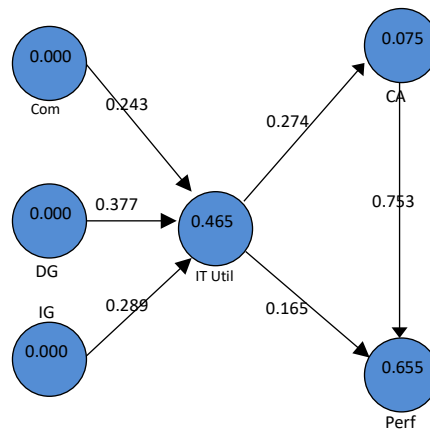
Figure 1. Result of the proposed research model (Standardized Coefficient)

Table 5. Path Coefficients

Path coefficient	t-statistic	Original Sample	Sign	Result
H_1 : Com → IT utility	2.4915	0.2431**	0.013	H1 is accepted
H_2 : IG → IT utility	2.9281	0.289**	0.003	H2 is accepted
H_3 : DG → It utility	4.3929	0.3771**	0.000	H3 is accepted
H_4 : IT util → Performance	1.42	0.1549	0. 16	H4 is rejected
H_5 : IT util → Comp Advantage	2.1472	0.2735*	0.03	H5 is accepted
H_6 : CA → Performance	9.5416	0.7531**	0.000	H6 is accepted

Note: * $\alpha = 0.05$; ** $\alpha = 0.01$

5. DISCUSSIONS

It is undeniable that SMEs could increase the strength of the Indonesian economy (Muafi, *et al*., 2012b; Sarosa, 2007). There are 3.9 million Indonesian SMEs in 2013 that absorbed 10.3 millions labors and contributed as much as 19.579 million dollar export value (http://www.antaranews.com, 2013). First finding in this research shows that SMEs owners have a high level of commitment in IT utilization (Hypothesis 1 is accepted). SMEs have well participated, given fund support, and well motivated. This finding reinforces the study by Ghobakhloo, *et al*. (2011), Jones and Griffith (2005), Kwahk (2006), and Thong and Yap (1995) on the influence of commitment to IT utility. Unfortunately, the use of IT is mostly as far as for typing, working on reports, internet access, presentations, product design, and other applications that are not considered as strategically significant and have not been employed to optimize the business growth and global competition. In general, they have not yet engaged in an information system that could integrate all functions of management, such as finance and accounting, production, sales, purchasing, and project management services as strategic IT assets to support their business competitiveness.

In other words, the SMEs lack an integrated information system for all management functions such as finance and accounting, production, sales, purchasing, project management, service, and various others. The limitation of resources, be it human resources, technology, financial, and other resources are most common problems occurred in Indonesian SMEs. This finding also is in accordance with most business process owned by SMEs where most business are done manually and only few employees who are able to implement IT application to help their operational business. Major parts of the operational activities are still being done separately (Saputro, *et al.*, 2010). The increasing trend of IT utilization in the societies and SMEs therefore makes it necessary for the management to keep encouraging and communicating the value of IT benefits to their employees. The participation in IT utility is not only benefitting the business but also so increasing employees' creativity as well as their adaptability, safety, and comfortability.

As advised by Endraswari (2006), management can devote the time and energy to manage IT for the sake of strategic and operational decisions, especially in planning, reviewing, and monitoring the results. Besides that, management should initiate constant and transparent training for organizations member within the company. Compeau and Higgins (1995) advised that persuasion from manager to organizations member has a higher correlation with IT utilization rather than social pressure from colleagues and underlings. Top management or owners have a strategic central position in all company activities including IT utilization (Ghobakhloo, *et al.*, 2011). Top managers need to involved and actively take part in the planning processes, developing, and implementing information system. All of the IT investments being made would be meaningless if there is no support from the government.

The result shows that direct and indirect support by the government has a significant influence on IT utilization (Hypothesis 2 and 3 are accepted). The government should give supports to SMEs either direct or indirectly. Indirect support includes: government regulations, exhibitions/promotions, payment services, and business climate, as well as protecting design, process, and products of creative SMEs through copyrights. This supports will help SMEs from foreign pursuit and claim. Direct support includes: giving work capital with low interest, donation, facilities, tax reduction, training, mentoring, and software assistances. These supports are deemed important for creative SMEs considering global era is highly competitive now. The finding is also in accordance with the studies by Sarosa and Underwood (2005), Mensah and Saffu (2010), Tambunan (2007), Maynard (2007), and Munizu (2010) which stated that support and regulations by the government are expected by SMEs in Indonesia to motivate and protect their businesses. The result from this research also concluded that by utilizing IT, competitive advantage will be gained and further, SME's operational performance will be higher.

The result from this research showed that IT utilization has a significant positive influence on competitive advantage of creative SMEs in Yogyakarta (Hypothesis 5 is accepted). Further, SMEs competitive advantage has a significant positive influence on the performance of creative SMEs (hypothesis 6 is accepted). This finding is in line with the study from Majeed (2011), Agha and Alrubaiee (2012), and Rose, *et al.* (2010). Their studies have identified the IT utilization and competitive advantage relationship. The significance of IT utilization consequence on competitive advantage has been analyzed by Valida, *et al.* (1994). On the other hand, this study rejects Hypothesis 4 proposing the IT utilization direct influence on performance. This means that this study does not support Sarosa's (2007) and Andrew and Papp's (2000) findings. Sarosa (2007) and Andrew and Papp (2000) believed that the utilization of IT will make their companies become more effective, efficient, and can increase job satisfaction and services as well as making the organization be able to adapt with external environment pressure.

Performance can only be reached when the creative SMEs engaged in competitive advantage. Competitive advantage as found in the model explains 65.5% meaning that it is considered strong variable to predict performance. The low predictive value (R-square) of IT utilization to competitive advantage can be interpreted that the dependency of creative SMEs in IT utilization is very low. Even though competitive advantage contributes strongly to organizational performance, however, IT usage contribution remains weak for both competitive advantage and performance. The limitation of SMEs human resources, IT investments, and other SMEs resources lacking have made IT contribution to performance is very limited. Competitive advantage in terms of ability to strategically exploiting integrated IT for creative SMEs business should be established otherwise high performance is hard to achieve. With many young generations involve in SMEs creative business, there is a positive trend that increase in IT utilization among creative SMEs in Yogyakarta could be expanded and be more optimized.

With the introduction of ERP (*Enterprise Resources Planning*) among business in any size, ERP could be one of the alternatives to solve this problem. SMEs lack ability to win market competition through regular IT support. In reality, due to many higher education institutions reside in Yogyakarta, the government has promoted the contributions of academic institutions to support IT utilization among creative SMEs. Training and application on ERP for creative SMEs can be speeded up with the involvements of the higher education students. Mutual benefits will exist while students can learn the challenges in running creative SMEs, the creative SMEs acquire the IT knowledge more effectively. Overall, it is obvious that we cannot let the creative SMEs to stand by themselves. Supports from all parties including government, industries and academic institution are a must. The government continuous involvements in terms of providing support subsidies, providing attractive markets, and protecting the creative industry from bigger and foreign industries are the works that the creative SMEs would appreciate. Industries via CSR could be one solution as to increase the creative SMEs productivities that proved to employ more than 95% of Indonesian labor. Academic institutions similarly should increase the involvements and contributions, in terms of building creativity, better technology, and better networking.

6. CONCLUSIONS AND IMPLICATIONS

The findings in this research show that IT utilization of creative SMEs in Yogyakarta Indonesia is influenced by management commitment and government support be it direct or indirect. IT utilization has been believed as an important factor that may influence competitive advantage and organizational performance. This finding concludes that IT utilization has no significant direct influence on organizational performance. However, this study have identified that IT utilization could indirectly influence organizational performance via competitive advantage. The lack of human resource capability and SMEs resource limitation are the major reason why IT utilization has not directly increase creative SMEs performance. Only SMEs which enable to employ IT strategically as competitive advantage that may benefit IT utilization as to increase their performance.

In theory, this study enriched the contribution of IT utilization model in creative SMEs sector in a developing country that academic should considers the role of competitive advantage as mediating variable on the IT utilization and organizational performance. Managers' commitments, direct and indirect supports from government are important variables to predict IT utilization in the SMEs creative industries in developing countries.

In practice, with the significant of IT utilization indirect influence to performance via competitive advantage, SMEs need to increase their skill, knowledge, and ability to improve creativity and innovation for their organizations (Muafi, 2012a). Moreover, creative SMEs in Yogyakarta need to be committed to have people equity for employees and management because it could serve as strategic assets for the higher IT engagement to increase competitive advantage. Work experience and competency of human resource can be done by doing human capital mapping related to their capability to plan, implement, and evaluate the company's IT. The mapping is highly needed so that SMEs can better compete in the current global era. All will run smoothly if there are management commitment and supports from the government, either directly or indirectly.

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Is UK financial reporting becoming less prudent?

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A B S T R A C T	**A R T I C L E I N F O**

This paper seeks to discover whether as a result of the removal of prudence as a concept within the revised 2010 Conceptual Framework, the accounts of companies in the FTSE100 in the UK have displayed any trends to be more or less conservative/prudent. The research design uses the two most popular measures of accounting conservatism (prudence) used in literature, Market-to-Book ratio and the Basu Asymmetric Timeliness model (Basu 1997) and compares the period prior to the change in the 2010 Conceptual Framework with the same measures post the change. The study finds that using both measures of conservatism, the levels of conservatism have fallen since the removal of prudence from the Conceptual Framework. This paper has implications for the users of financial statements and standard setters as the lower levels of prudence or accounting conservatism are associated with higher levels of risk (litigation) and costs (agency costs) which can affect stock valuations.

1. INTRODUCTION

The current version of the Conceptual Framework (CF) was issued by the International Accounting Standards Board (IASB) in September 2010 after a lengthy consultation process in which it canvassed input from accounting professionals in practice, industry, government and academia across the world. The purpose of the CF remained unchanged from the previous 'Framework for the Preparation and Presentation of Financial Statements' (the Conceptual Framework) published in 1989. It 'sets out the concepts that underlie the preparation and presentation of financial statements for external users' (IASB 2010, p6). It is designed to provide help for both the Board and practitioners to use, review and develop International Financial Reporting Standards, to 'promote harmonisation of regulations, accounting standards and procedures relating to the presentation of financial statements' (IASB 2010, p6).

The IASB considers the scope of the CF is to clarify the objectives of financial reporting, by underpinning the IFRSs with guidance on the 'qualitative characteristics of useful financial information' (IASB 2010, p7) and by defining the various key elements of information in the financial statements. In previous iterations of the CF and indeed throughout the history of accountancy, the concept of prudence was embedded as an important characteristic of financial information (Basu 1997, Maltby 2000). However, during the consultation process leading up to the 2010 revised publication of the CF, the IASB decided to remove references to prudence, feeling that it was inconsistent 'with the desirable quality of neutrality, which encompasses freedom from bias' (International Financial Reporting Standards Foundation 2013). It was felt that accountants could not be expected to be prudent without displaying some downward bias on the figures represented. Whilst it was the subject of some considerable debate at the time of the consultation, the decision was taken to remove prudence in the 2010 version (International Financial Reporting Standards Foundation 2013).

Critics of this move such as Watts (2006) claimed that management would then have the tendency to recognise assets or gains which were of uncertain value or existence or to use partial fair value assessments of asset values. This could then introduce greater subjectivity into the accounting process, such as the relative strengths of parties to negotiate to agree valuations for assets which are not so readily measureable. Wang (2010) suggested that over time, income maximisation tends to emerge as the most consistent outcome in continuing negotiations over asset valuations. This might suggest that in the long run, agreeing asset values may not be manipulated for management gain, but that in the short run, social motivations may well provide outcomes which may not be to the benefit of the shareholders.

Clearly there is some scope for lack of clarity around this issue to ensure that there is no abuse by management in manipulating figures for personal advantage when prudence is removed as a consideration. The trade-off between the need for reliable information and pressures to report good figures could result in assets being inappropriately valued when there is no concept of prudence versus that enhanced test of caution if there were.

2. DEFINITION OF PRUDENCE/ACCOUNTING CONSERVATISM

In accounting literature, the words 'prudence' and 'accounting conservatism' are used interchangeably. Conservatism tends to be used more commonly in US-based accounting

literature, whilst prudence is in more traditional European parlance. Whilst the IASB favours the term 'prudence', given the prevalence of the term 'conservatism' in the literature, the author of this study has tended to use both terms interchangeably throughout the paper.

What is prudence? Prudence in the context of accounting has been in existence for centuries (Basu 1997, Watts 2003), although its meaning has changed over time. Initially seen as 'a moral virtue conducive to honesty and competence in business' (Maltby 2000), it became more a method of preventing overzealous distribution of funds from businesses by deliberately understating profits and assets, to a more contemporary meaning which tends to operate more in the interests of investors (Maltby 2000). Now it is regarded more as an element of caution to ensure that assets are not overstated and that they are verifiable (EFRAG 2013).

In the absence of a universally agreed definition of conservatism, given the ever-evolving use and understanding of the word, many authors have adopted the Basu definition of conservatism as: 'resulting in earnings reflecting 'bad news' more quickly than 'good news'' and 'accountants' tendency to require a higher degree of verification for recognising good news than bad news in financial statements' (Basu 1997, p4). This clearly represents an evolution in the meaning of the concept from when it was first adopted in accountancy. Others may consider it to mean showing the lowest values for assets and the highest values of liabilities, such as Sterling discusses as part of the stewardship role of accountants (Sterling 1967).

This shift in understanding of the concept is one of the reasons that the IASB and FASB viewed it as conflicting with the need for the financial statements to be unbiased and for the figures to be reliable (International Financial Reporting Standards Foundation 2013), citing the example that investors carry out the evaluations of management performance, and that management need to provide measures, not evaluations (Hines 1991). Both bodies were keen to clarify that a cautious approach is acceptable, whereas deliberate manipulation of figures is not (International Financial Reporting Standards Foundation 2013).

In their recent bulletin, the European Financial Reporting Advisory Group (EFRAG 2013) agrees that there is much debate about the meaning of prudence, taking that stance that it should ensure that 'assets and income are not overstated and that liabilities and expenses are not understated' on the basis of additional verification for gains than for losses, similar to the Basu definition (Basu 1997). However there are criticisms that it can introduce bias and smoothing of results to provide 'cushions' in good years against poor years (EFRAG 2013). The inability

of the users of the financial statements to know exactly what prudence measures have been adopted in the figures they see can be cause for information asymmetry and uncertainty.

With regards to the removal of prudence from the framework, it is clear that there are differing interpretations of the concept which add to the debate. Those who believe it is still incorporated (albeit more implicitly than previously) within the accounting standards themselves (such as inventory valuation being the lower of cost and net realisable value) and therefore do not object to its removal contrast against those who feel it should remain an explicit part of the Conceptual Framework to counter any potential 'creep' of poor practice of earlier recognition of gains. Most interpretations appear to agree however, that ideally, prudence should be that important element of 'caution' (EFRAG 2013).

2.1 What are advantages and disadvantages of prudence?

Some users of the financial statements are more interested in the potential for downside risk than the opportunity for potential upside (EFRAG 2013). Therefore the early recognition of liabilities or losses appeals to this group of financial statement users, in preference to a lower threshold of recognition for gains or assets. Ahmed and Duellman (2007) cite the reduction of agency costs as a benefit of conservatism. This is echoed by Kwon, who adds that not only do contracting-type agency costs reduce with conservatism, but that the costs of suboptimal management decisions can be better controlled when reporting conservative earnings, rather than neutrally or liberally measured earnings (Kwon 2005).

Watts (2003) argues that accounting conservatism has evolved as part efficient contracting to reduce 'deadweight losses' which emanate from agency problems. It acts as a degree of caution where uncertainty exists and acts as a natural foil for the tendency of management to be more overoptimistic, whether that is consciously or subconsciously. By offsetting this management bias, it constrains payments out of the firm to both management and shareholders, hence sharing the value more equitably across all stakeholders and acting as an 'efficient contracting mechanism' (Watts 2003).

The information asymmetry which exists between managers and the outside world can result in managers diverting funds away from value-creating activities into their own remuneration, hence reducing the availability of resources for positive NPV projects (Watts, Zimmerman

1986). The counter to this is that by demanding greater verification standards in the recognition of gains (to which managerial remuneration or bonuses may be attached), then management's ability to overstate earnings or gains or hide losses is reduced (Watts 2003). However, if there is a high level of management ownership within the company, then the information asymmetry and agency distance is lower and the company is likely to demonstrate lower conservatism (Lafond, Roychowdhury 2008). This element of insider-ownership to reduce information asymmetry is important, as several studies (LaFond, Watts 2008, Beatty, Weber et al. 2008, Khan, Watts 2009) find that firms with higher asymmetry or lower institutional shareholdings are more likely to be conservative. Information asymmetry can also affect bid prices made by uninformed investors for the company's shares as the tendency in situations of high asymmetry is for investors to reduce their bid prices hence reducing firm values (LaFond, Watts 2008, Iatridis 2011).

Lafond and Watts (LaFond, Watts 2008) confirmed this positive linkage between accounting conservatism and information asymmetry, but found also that information asymmetry was the driver, not conservatism. Chi and Wang took this further by suggesting that conservatism is positively related to information asymmetry and that 'information asymmetry in the current period will further drive an increase of conservatism in the next period.' (Chi, Wang 2010). They have a concern that without conservatism encouraged by the standard setting bodies such as IASB and FASB, investors will need to be more aware of the issue of information asymmetry and its effect on company financial statements. Their concern is that facing a situation of uncertainty, companies will counter difficulties in accounts preparation and that the benefits of conservatism to creditors and shareholders will be lost, even though stakeholders appear to value conservatism (Chi, Wang 2010).

UK firms have typically a higher level of institutional ownership than US firms, which results in more demands for greater access to the firm by its institutional shareholders than by individual non-employee owners (Ahmed, Duellman 2007). Where there is a large separation between ownership and control, the demand for conservatism grows (Lafond, Roychowdhury 2008). Ramalingegowda and Yu found that where institutions are actively monitoring firms, especially in firms with more growth options, then institutions will demand more conservatism to manage uncertainty and information asymmetry (Ramalingegowda, Yu 2012). This is important in share valuations, as institutional shareholders have more impact in price setting and have a better appreciation of the benefits of corporate governance than non-institutional

shareholders. As conservatism is a key tool of corporate governance, then this is important for firms, investors and standard setters (Ramalingegowda, Yu 2012).

Hui et al (Hui, Matsunaga et al. 2009) consider conservatism as a mechanism to reduce information asymmetry and potential litigation by reporting bad news on a timelier basis in substitution for voluntary managerial forecasts issued to the market. This is also perceived as a method of improving the reliability of reported earnings (LaFond, Watts 2008) since management is less likely to manipulate and overstate earnings.

A more recent paper from Hui et al (Hui, Klasa et al. 2012) studies the effects of suppliers and customers on a firm's accounting conservatism and find that the more powerful the supplier and customer base is, the quicker the firm recognises losses. This stakeholder base uses the accounting data of the firm to assess its performance and whether to do business with it. It has a preference for early recognition of losses (conservatism) rather than of gains as it does not profit from overstatement, but faces risk of default with losses, so early recognition is a way to manage the risk in a timelier manner. Powerful suppliers and customers value conservatism and reward it with ongoing commercial relationships.

Whilst not strictly speaking conservatism in the conventional accounting sense, Iatridis examines whether voluntary disclosure of sensitive accounting information hinders profitability (Iatridis 2008). These disclosures can be viewed as a conservative approach to financial accounting and with information disclosure to wider stakeholders. Iatridis found that by adopting international financial reporting standards and making voluntary disclosures about accounting practices that firms have higher profitability, suggesting enhanced quality and reliability of financial information, and reduced uncertainty and information asymmetry for stakeholders which can allow firms to raise capital more easily (Iatridis 2008).

Conservatism also has impacts on debt contracting (Watts 2003); Beatty et al found that firms with more conservatism incorporated income escalators in debt financing (Beatty, Weber et al. 2008). Firms prepare more conservative financial reports in response to lenders' demands for conservatism. Ahmed et al and Zhang (Ahmed, Duellman 2007, Zhang 2008) then find that when firms exhibit more conservatism, they reduce the cost of debt by securing lower interest rates from lenders. This increased verification of gains and losses therefore reduces information uncertainty which can then filter through to a lower cost of capital (García Lara, García Osma

et al. 2011). Zhang also found that lenders benefit from conservatism through more timely indications of default risk in a company, but that such conservative companies are more likely to breach a debt covenant after a negative price shock (Zhang 2008). This is because they are more likely to recognise bad news on a timelier basis than good news, which can then result in a breached debt covenant.

Zhang also expresses concern in the apparent move of bodies such as the Financial Accounting Standards Board (FASB) away from reliability/conservatism to more 'relevant' accounting standards, which tends to be reflected by fair value in the accounts and which is inherently less conservative (Zhang 2008). Whilst fair value recognises unrealised gains and losses earlier, which can be said to improve the transparency of information in the accounts, it is inherently the opposite of conditional conservatism, which requires additional verifiability before gain recognition (Kim, Pevzner 2010).

From the shareholders' standpoint, empirical evidence suggests that conservative firms are less likely to deliver bad news to the market, by not missing analyst forecasts, presenting weaker earnings or dividends (Kim, Pevzner 2010). Kim and Pevzner also suggest that by increasing the amount of information to the market, conservative firms reduce information asymmetry which then affects the market's reaction to news emanating from such firms, impacting share prices, as the market has a tendency to react stronger to good news (given the higher level of verifiability to this news by conservative firms) and weaker to bad news (Kim, Pevzner 2010). By improving the reliability of future cash flow forecasting, conservative firms are rewarded by higher valuation multiples (Kim, Pevzner 2010). In addition, D'Augusta et al found that for conservative companies, the higher quality information they provide results in a reduction in investor disagreement around earnings announcement dates, and consider this when valuing companies (D'Augusta, C.,Bar-Yosef, F.,Prencipe, A 2013).

Alam and Petrushka (2012) highlight the importance of monitoring conservatism from a fraud detection standpoint, finding that ex-post firms committing fraud demonstrate considerably lower levels of accounting conservatism for at least 3 years prior to the initial fraud occurring. They indicate that if companies suddenly appear to change their accounting practices, it could be a marker of potential fraud.

National and legal frameworks can have an impact on conservatism as can the institutional, regulatory, tax-policies and economic framework of a given country (Watts 2003, Bushman, Piotroski 2006). Those countries with high state involvement recognised good news faster than bad, whilst those with high quality judicial systems reported bad news in earnings faster than good (Bushman, Piotroski 2006).Whilst this study concentrates exclusively on the UK FTSE100 firms, other authors (Ball, Kothari et al. 2000) have concluded that common law systems such as the US and UK, as opposed to code law systems are instrumental in recognising economic losses quicker, but that information asymmetry in code-law countries finds a more timely resolution by having closer ties with major stakeholders. Lobo and Zhou found that the introduction of the Sarbanes-Oxley Act in the US caused a significant increase in the level of conservatism in the accounts, both in terms of lower discretionary accruals but also in the quicker recognition of losses than gains (Lobo, Zhou 2006). Other regimes have taken a different approach to conservatism; Chinese authorities have viewed conservatism as a capitalist method to actively manipulate figures and exploit the workforce, although this is changing (Lin, Tian 2012).

Ahmed and Duellman (2007) also point out some of the differences of US and UK GAAP, in that UK GAAP tends to be more lenient in approach, by allowing capitalisation of development costs as intangible assets and allowing upward revaluations of assets, which are both prevented under US GAAP. This more permissive culture is also presented against the acknowledgement that US firms have higher risks of litigation than their UK counterparts, and is therefore more likely to be conservative in their accounting approaches (Ahmed, Duellman 2007). This additional conservatism is likely to reduce ex-post litigation costs, both in terms of being sued in the first place but also the increased chance of the case being dismissed entirely (Ruch, Taylor 2011).

The role of conservatism in corporate governance is a recurring theme in the literature (Watts 2003, Ahmed, Duellman 2007). By acting as that perceived 'degree of caution' (International Financial Reporting Standards Foundation 2013), firms practicing accounting conservatism are more likely to recognise economic losses earlier, which can highlight potentially loss-making projects earlier and avoid those which may deliver a negative NPV. A further example of this is for firms who face high litigation risk to recognise losses more quickly to avoid potential litigation costs (Watts 2003). Watts also highlights the benefit of more timely loss recognition compared with gains for its effect of lowering tax charges.

Asgari and Behpouri (2014) consider that high-governance firms are more likely to produce accounting statements with high quality earnings information, rather than weaker ones where the imperative to show unverifiable results may be stronger. They also assert that conservatism is thus a long-standing method of solving agency issues. Ettredge et al also see improved corporate governance in periods following corrections of overstated earnings as key in increased conservatism (Ettredge, Huang et al. 2012). Indeed, in a recent study by Francis et al found that during the financial crisis of 2007-9 better managed companies demonstrating conservative accounting had higher performing shares than those who were less conservative (Francis, Hasan et al. 2013).

Chi and Wang (2010) argue that conservatism is necessary in an uncertain business world by maintaining the asymmetric timeliness in recognising gains as opposed to losses and by setting the threshold of verification for the recognition of assets higher than that of liabilities. This asymmetric recognition of losses is also believed to focus not only analysts' but also management's attention on underlying causes of poor performance and on the need to manage debt covenants effectively, which can reduce information asymmetry and improve decision-making (Iatridis 2011). As such it takes account of the fact that the legal and business environment in which accountants operate is not always clear-cut but that managers still have an all-important stewardship role which is to balance often quite conflicting social relations of capital to allow an 'equal return on capital' (Maltby 2000).

Conservatism is not without its critics: the 'degree of caution' may also undermine the benefits of conservatism if not balanced (Ahmed, Duellman 2007, Beaver, Ryan 2000), as it may lead to early termination of projects which whilst giving an overall positive NPV incur substantial cash flows at the start or a total rejection of projects with only small positive NPVs.

Other criticisms of accounting conservatism include the fact that it may result in bias and noise in the accounts which may generate 'soft' accounting numbers, increase information asymmetry and affect valuations (Givoly, Hayn 2002, LaFond, Watts 2008). Givoly and Hayn's 2002 study highlighted that there has been a growing conservatism in accounts over the last decades, which users of the financial statements should be aware of in ascertaining the worth of the firm, as it has led to persistent declines in reporting profitability, increased losses and increased dispersion of earnings. (Givoly, Hayn 2002). This is a finding echoed by Chen et al

(Chen, Folsom et al. 2013) who found that conditional conservatism causes a reduction in earnings persistence and results in lower earnings multiples. This could be a real disadvantage for investors who may not realise the full worth of their holdings if the information asymmetry from good news means that uninformed investors sell out too soon (Kim, Pevzner 2010). However, Kim et al were not convinced by this argument, stating that earnings persistence provides lower uncertainty and more predictability in projecting future performance which can be factored into earnings multiples and forecasts (Kim, Pevzner 2010).

Despite the current removal of prudence or accounting conservatism from the Conceptual Framework, Watts (2006) is of the belief that it will prevail in practice. Whilst some managers will use its removal to commit fraud, Watts believes that this will have far-reaching consequences for standards and standard-setting bodies, unless standards are constructed in such a way as to remove areas of potential misinterpretation, but which will necessarily re-introduce some element of bias into the financial statements (Watts 2006).

3. RATIONALE AND METHODOLOGY

This study examines whether companies preparing their financial statements under IFRS have reacted in any way to the removal of conservatism or prudence from the Conceptual Framework issued in 2010.

The timing of any change will always be difficult to assess accurately, as whilst statement of financial position (SOFP) items such as provisions could potentially have an effect from December 2010, other elements of conservatism through the statement of comprehensive income (SOCI) such as the potential understatement of income or overstatement of costs, may take longer to materialise. The other issue with timing is that the time elapsed since September 2010 is still relatively short; those companies with a December 31st year end have only issued accounts to December 31 2013 (at time of writing) so any changes in behaviour may be difficult to perceive.

The sample chosen for this study centred on the FTSE 100 companies in the UK, as they are most likely to have been adopting IFRS for several years, been audited as complying with IFRS and also subject to the removal of prudence from the Conceptual Framework in 2010. In order to make a reasonable comparison, it is necessary to have an equal number of observations prior

and post the CF change. This meant that given the change occurred effective in 2010, and for the sake of equality of potential impact only those firms with a December 31 year end were chosen, only four year ends have occurred since the change up to time of writing (2010, 2011, 2012 and 2013), and therefore only three ends prior should be chosen (2006, 2007, 2008 and 2009). By eliminating firms without a December 31 year end, this will affect the choice of firms and industries in the sample; e.g. there are no retail organisations in the sample as they tend to publish their accounts on a March year end basis, after seasonal Christmas sales. This is not expected to have a significant impact on the results.

By eliminating those firms not having a December 31 year end, or not having sufficient data available (for example not having been in the FTSE for the requisite number of years), the sample was reduced to 45 firms, giving a total of 360 firm years across the eight year period under study. Accounting data was sourced from the FAME database, year-end stock prices from the London Stock Exchange and number of shares from company annual reports.

The two most popular measures of conservatism were calculated (Wang 2009), firm Market to Book (MTB) values (Beaver, Ryan 2000, Givoly, Hayn 2002, Roychowdhury, Watts 2007, Feltham, Ohlson 1995) and Basu's 2007 measure of asymmetric timeliness in earnings (AT). These were chosen not only for their wide acceptance in literature, but also as indicators of the two different forms of conservatism – conditional and unconditional.

Conditional conservatism is concerned with the asymmetric timeliness of recognising gains compared with losses, and with requiring a greater degree of verification for good news reporting rather than bad (Basu 1997). Unconditional conservatism is the systematic understatement of net assets (Roychowdhury, Watts 2007) or the early recognition of losses irrespective of whether news is good or bad. Conditional conservatism is referred to as ex-post or dependent on news, in that management write down assets by impairing them in times of bad news or uncertainty, but do not to revalue them upwards at a later date when conditions are favourable again. Conditional conservatism has been growing in the US for the last 3 decades (Watts 2003, Ball, Kothari et al. 2000), and is viewed as a method likely to increase contracting efficiency, through its earlier recognition of losses.

Iatridis (2011) found that companies displaying more conditional conservatism but less unconditional conservatism tend to report higher quality accounting disclosures, which is linked

to higher profitability and liquidity. The reason for the inverse relation between conditional and unconditional forms is that conditional conservatism has the benefit of improving contracting efficiency whereas unconditional conservatism can allow managers to manipulate figures for their own benefit or tax and litigation reasons (Iatridis 2011). By selecting certain accounting policies to benefit managerial interests by anticipating future bad news (Beaver, Ryan 2005), managers may create 'noise' and bias in the accounts, which whilst it may achieve a management target, help to obtain good finance terms or possibly reduce agency costs or risks of litigation (Iatridis 2011), it may actually undermine the quality of the reporting and lead to poor economic decision-making (Ball, Shivakumar 2006). Beaver and Ryan also assert that unconditional conservatism can build up 'accounting slack' or 'unrecorded goodwill' such that it can cover the use of conditional conservatism in bad news times, until such a point that this slack is used up when the news is particularly bad (Beaver, Ryan 2005). In such an eventuality, this can cause large amounts of information asymmetry and can undermine the reliability of the financial statements.

Therefore for this study, it was deemed important to evaluate any impacts of the Conceptual Framework change on both a measure of conditional and unconditional conservatism. The MTB is regarded as a measure of unconditional conservatism, whereas Basu's AT is deemed a more appropriate measure of conditional conservatism (Chi, Wang 2010).

3.1 Market-to-book ratio

The MTB ratio is regarded as having a positive relation with conservatism (Feltham, Ohlson 1995, Givoly, Hayn 2000, Khan, Watts 2009), as high MTB is synonymous with higher firm growth options compared with book assets. Furthermore, the higher demands for gain verification versus loss verification results in net assets being cumulatively understated compared with market values (Khan, Watts 2009), which is continuous in conservative companies since they select the most prudent write-downs of expenses and also tend to reduce their agency costs (Watts 2003, Roychowdhury, Watts 2007). Beaver and Ryan (2000) adapted the basic MTB measure, which encompasses the relative understatement of book net assets to their market value, to take account of the bias and lag components, as the two sources of variation in the ratio. Whilst they determine the importance of bias, rather than lag, on the future book returns, and this adapted methodology has been subsequently adopted by others such as Ahmed and Duellman (2007). As this study was to determine any more general change in conservatism, this adaptation was not adopted here, using instead the raw MTB ratio. A MTB

ratio greater than 1 is deemed to indicate conservatism, and an increasing score suggests increased conservatism (Feltham, Ohlson 1995, Givoly, Hayn 2000).

3.2 Basu's 2007 measure of asymmetric timeliness in earnings (AT)

Basu's equation is given in (1) below:

$$\frac{EPS_{it}}{P_{it}} = \alpha_0 + \alpha_1 DR_{it} + \beta_0 R_{it} + \beta_1 R_{it} DR_{it} + \varepsilon_{it} \qquad (1)$$

where:

EPSit :   Earnings per share for firm i year t

Pit: Opening stock market price for firm i year t

Rit: Stock markets return for firm i year t

DRit: Dummy variable that is equal to 1 if the stock market return for firm i

                 in year t is negative, and equal to 0 if the stock market return for firm i in year t
                 is non- negative.

Despite being the most-used measure of conservatism, there are nonetheless criticisms with the Basu AT measure; for example that there are large variations in measurement between large and small companies (Givoly, Hayn 2000), it is not easy to calculate firm specific AT over a short time frame (Ahmed, Duellman 2007) and also that it does not measure conservatism prior to the period under study unless taken cumulatively over several periods (Roychowdhury, Watts 2007). However, given the nature of this study, using predominantly large firms, to determine if there have been any short run changes (due to the fact that there were only 4 years of available data post the CF change), these model weaknesses were not deemed significant in this study.

Roychowdhury and Watts found that there is a negative correlation between the Basu measure and end of period MTB in short run situations (one to two years) (Roychowdhury, Watts 2007) but that when taken over a longer period, the association becomes more positive. This is because of the influence of the starting MTB and cumulative net asset conservatism which has occurred prior to the measurement period (Beaver, Ryan 2005). Their argument centres around the issue that high MTB (more conservative) firms, which have high 'rents' (or growth options) or unveriafiable increases in asset values, are less impacted by bad news (i.e. low earnings

timeliness) than low MTB firms. This is because the majority of the decrease in value from the bad news occurs from a decline in value of those growth options or unveriables asset values, and therefore this is unlikely to be a large asset write-down, since these values were unrecorded in the books originally (since they were only perceived by the market, not by the accountants preparing the accounts) (Roychowdhury, Watts 2007). The converse is true for low MTB (less conservative) firms, as any changes (from positive or negative news) are more likely to result in the already recorded asset values. Therefore the relationhip between the MTB at the beginning of any study and asymettric timeliness is likely to be negative. However, this effect reduces over extended periods of time so that the relationship is likely to be more positive (or certainly less negative), the longer the time frame under study (Roychowdhury, Watts 2007).

4. RESULTS

4.1 Market to book ratio

The market to book (MTB) ratio is the second most popular proxy for accounting conservatism (Wang 2009). The ratios were calculated from the numbers of shares outstanding in the individual company reports and from year end share prices from the London Stock Exchange. These were then averaged across the four years prior to the change in the Conceptual Framework (2006-2009 inclusive) and for the four years post the change (2010-2013 inclusive). This was then scatter plotted in figure 1 to determine whether MTB ratios had changed over that period. The slope coefficient of the line of

best fit was 0.661, suggesting that MTBs have fallen since the change occurred, inferring less conservatism post-CF change.
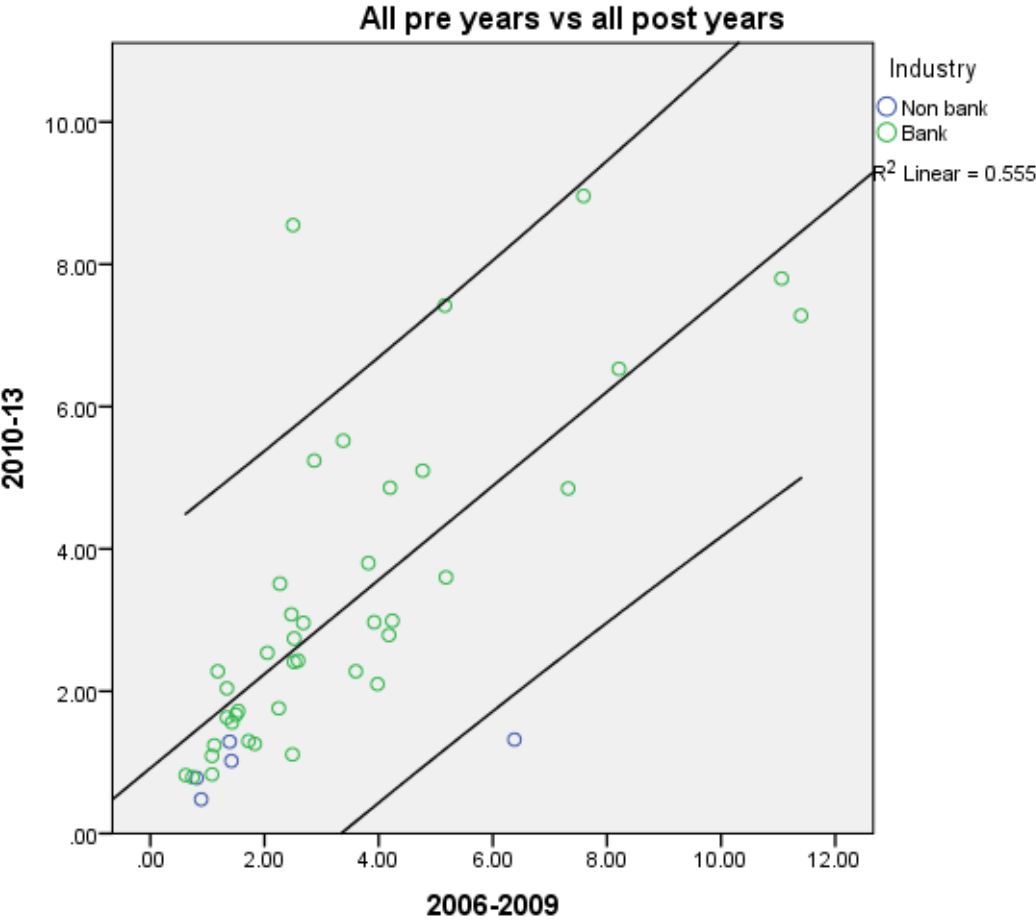
Figure 1: Scatter plot of average MTB ratios for four years prior to CF change against four years post the CF change.

In order to test further this result, other factors were considered. During the four years prior to the CF change, most major economies experienced the global financial crisis, which affected results and share prices, particularly during the year 2008. Therefore, a second scatterplot was made of the four year period post the change, juxtaposed against the three years prior, but without 2008, (i.e. 2006, 2007 and 2009 only). This plot had a slightly lower slope coefficient of 0.622, suggesting much lower MTBs (and even lower conservatism) post the change.

Two further plots were tested, both based on figure 1, but both without the transitional year of 2010. This was on the basis that the CF change was effective only from September 2010 and therefore companies were unlikely to have changed their accounting behaviour significantly in such a short time frame. These plots took the four years (2006-2009) prior to the CF change against only three years post (2011, 2012 and 2013), and then the three years (2006, 2007 and 2009) prior and three years post (2011, 2012 and 2013), again to determine whether the global financial crisis in 2008 caused the MTB to skew the results. (For sake of space, these plots are not shown). The four years prior against three year post has a slope coefficient of 0.614, again indicating lower MTBs since the CF change, thus lower conservatism. The three years prior and post the change has a flatter line, with a coefficient of 0.573, demonstrating that conservatism has been reducing more markedly since the CF change, despite any changes for the turbulent year (2008) of the financial crisis and the transitional year of the CF change. This is unexpected given the general finding that conservatism as measured by MTB tends to increase over time (Feltham, Ohlson 1995, Givoly, Hayn 2000). Indeed, a straight plot of MTB ratios over the eight time period in figure 2 below would seem to show a change in direction in MTB since 2008. This may be because of reduced expectations of growth in the market following the

inancial crisis (Givoly, Hayn 2000) rather than marked changes in accounting reporting behaviour, as it is perhaps too short a time frame as yet to make such an inference.
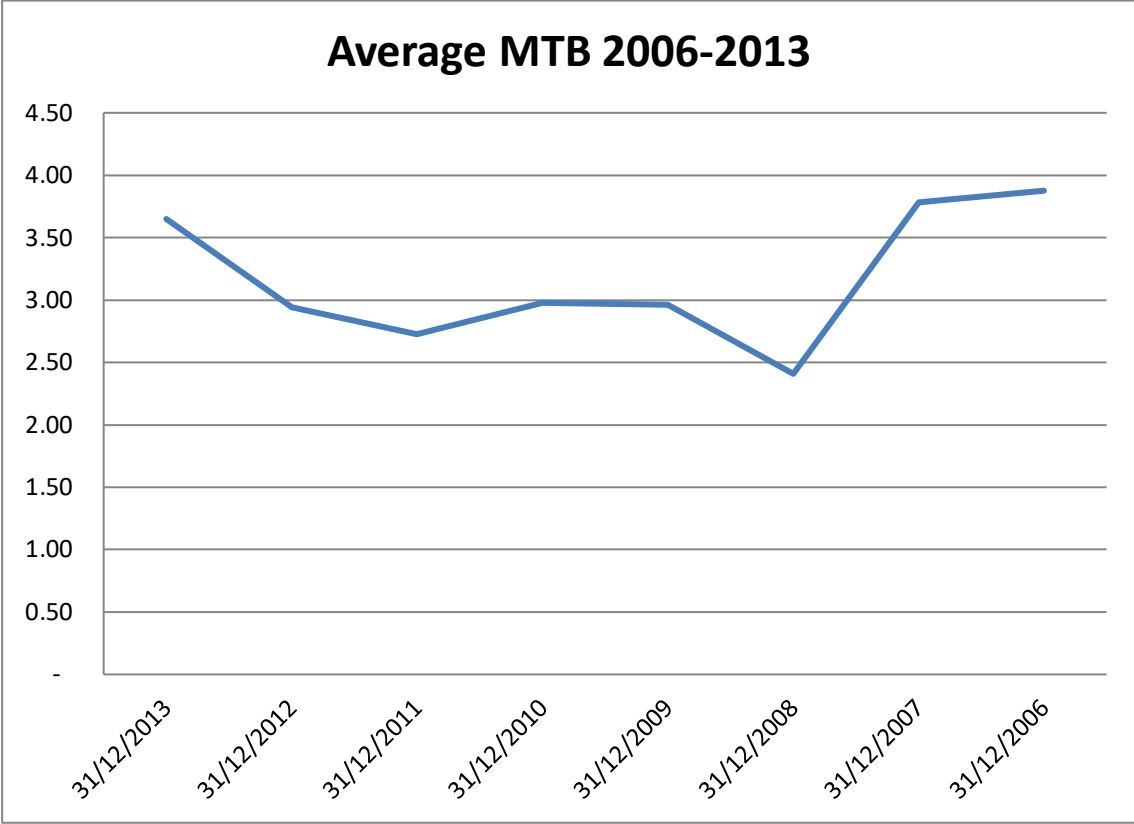
Figure 2: Plot of average MTB ratios for four years prior to CF change and four years post the CF change.

Looking at the one sector of industry which was arguably most impacted by the financial crisis, that of the banks, all of the five banks in the study showed on average lower MTBs (less conservatism) than the general sample of 45 both pre and post the change (2.18 in the four years prior to the CF change versus a sample average of 3.26, falling to a banking average of 0.98 in the four years post the CF change in comparison with a sample average of 3.07). This suggests that banks have become markedly less conservative over time, although again, this could be more attributable to changed valuations of banks by the market which has depressed their share values, than actual reporting changes. Clearly, given the perceived risk-taking behaviour of the banking sector in general prior to the crisis, this may well represent a re-adjustment of market to book values, especially given the financial restructuring which took place in several banks post the crisis period.

One interesting observation from the data is that the standard deviations of the average MTBs over the same time scales also suggests much less variability of MTB post the CF change as shown in table 1. This suggests that whilst the market has undergone an adjustment to market values, the reduced variability between market and book values indicates more consensus and acceptance of the value of the underlying assets relative to potential gains and losses.

Table 1: Standard deviations of Market-to-book ratios

	4 years pre-change (2006-2009)	4 years post change (2010-2013)
Standard deviation	2.79	2.39

4.2 Basu model

The second model used was the most popular conservatism proxy in the literature (Wang 2009), that of the Basu (Basu 1997). Two models, the original Basu model (Model 1 below) and a revised model to take account of the removal of prudence from the Conceptual Framework were estimated (Model 2 below).

Model 1: $\frac{EPS_{it}}{P_{it}} = \alpha_0 + \alpha_1 DR_{it} + \beta_0 R_{it} + \beta_1 R_{it} DR_{it} + \varepsilon_{it}$

Model 2: $\frac{EPS_{it}}{P_{it}} = \alpha_0 + \alpha_1 DR_{it} + \beta_0 R_{it} + \beta_1 R_{it} DR_{it} + \gamma_0 CF_{it} + \gamma_1 CF_{it} * DR_{it} +$

$\gamma_2 CF_{it} * R_{it} + \gamma_3 CF_{it} * R_{it} * DR_{it} + \varepsilon_{it}$

where:

EPS_{it} :	Earnings per share for firm i year t
P_{it}:	Opening stock market price for firm i year t
R_{it}:	Stock markets return for firm i year t
DR_{it}:	Dummy variable that is equal to 1 if the stock market return for firm i in year t is negative, and equal to 0 if the stock market return for firm i in year t is non- negative.
CF_{it}	Dummy variable that is equal to 1 if the period was post the change in the CF and 0 otherwise.

As a first step, Basu's (Basu 1997) model is reproduced using the FTSE100 dataset. This model regresses earnings, as expressed by deflating earnings per share by price, on total stock returns. These regressions are run for 'good news years', where stock returns are positive, and 'bad news years' where stock returns are negative. This is modelled using a dummy variable, DR, which is 0 in a 'bad news year', and 1 in a 'good news year'. By using the β_0 slope coefficient as 'good news' and the $\beta_0 + \beta_1$ slope coefficients as 'bad news', therefore β_1 represents the Basu asymmetric timeliness coefficient, which equates to a measure of conservatism in the sample, or how quickly good news is reflected in

earnings compared with bad news. This model sets the base line of the study for all 360 firm years.

In order to evaluate the effect of the removal of the concept of prudence from the Conceptual Framework, model 2 is estimated. This uses the Basu (Basu 1997) model as its base, but after Lobo and Zhou (Lobo, Zhou 2006), it introduces the coefficient γ_2, which with β_0, measures how quickly earnings reflect good news after the CF change compared with β_0 alone which measures it in the period prior to the CF change. If this change has affected companies' reporting behaviour by encouraging them to be less conservative and recognising good news in their earnings figures earlier, we would expect γ_2 to be greater than 0. If the change to the CF has encouraged companies to reflect bad news less quickly (i.e. be less prudent) in their accounting figures, the measure of conservatism of β_1 prior to the CF change should be greater than post the change, which is represented by $\beta_1 + \gamma_3$, such that γ_3 should be less than 0.

As with the MTB model, further iterations of the test were also carried out. These are summarised in table 2 below:

Table 2: Basu model variants tested

	Model 2a	Model 2b	Model 2c	Model 2d
Years prior to CF change	2006-2009	2006-2009	2006, 2007, 2009 only	2006, 2007, 2009 only
Years post the CF change	2010-2013	2011-2013	2010-2013	2011, 2012, 2013 only

The results of the regressions are in table 3.

Table 3: Comparisons of Basu's model of conservatism pre and post change to the Conceptual Framework

Variable	Model 1	Model 2a	Model 2b	Model 2c	Model 2d
	Basu basic 4+4	Revised 4+4	Revised 4+3	Revised 3+4	Revised 3+3
Intercept	0.072	0.076	0.076	0.078	0.078
	(7.796)**	(5.688)**	(5.433)**	(6.843)**	(6.574)**
DR	0.009	0.005	0.005	-0.005	-0.005
	(0.552)	(0.218)	(0.211)	(-0.200)	(-0.190)
R	0.025	0.055	0.055	0.053	0.054
	(1.355)	(2.255)	(2.159)	(2.633)**	(2.536)
R*DR	0.165	0.137	0.137	0.004	0.004
	(3.199)**	(2.236)	(2.136)	(0.037)	(0.035)
CF		-0.002	-0.004	-0.003	-0.006
		(-0.091)	(-0.196)	(-0.203)	(-0.320)
CF*DR		0	0.007	0.011	0.017
		(0.009)	(0.172)	(0.325)	(0.471)
CF*R		-0.081	-0.104	-0.08	-0.102
		(-2.151)	(-2.287)	(-2.552)	(-2.743)**
CF*R*DR		0.07	0.102	0.204	0.236
		(0.548)	(0.711)	(1.525)	(1.623)
Adjusted R^2	7.10%	10.40%	11.20%	5.90%	7.30%
N	360	360	315	315	270

t statistics are in

Parentheses

In model 1, the β_0 slope coefficient is small and not significant in this sample, whilst the $\beta_0 + \beta_1$ coefficients are positive and significant. This suggests that earnings are significantly more sensitive to negative returns as positive returns in this sample of 360 firm years over this eight year time period. This finding is agreement with Basu (2007). The explanatory power of the model is not particularly strong; although the p-value statistical hypothesis test is less than 0.05 and therefore this combination of independent variables can predict the outcome of the dependent variable, this explanatory power is only 7.10%.

Model 2a estimates the effect of the change in the Conceptual Framework which excluded the concept of prudence with effect from September 2010. Under model 2a, CF denotes the change period, with the assumption that accounts with a December 31 year end in the four years prior to 2010, that is 2006, 2007, 2008 and 2009 are prepared under 'prudent' conditions, whilst accounts with a year end from December 31 2010, up to 2013 (at date of writing) are prepared under conditions where prudence was no longer a recognised concept. In this case, we can see that γ_2 is actually slightly negative, albeit not significantly, which would suggest that earnings are slightly less sensitive to good news in the period following the CF change. For γ_3, the coefficient on CF*R*DR, the result is also negative, although not to a significant level. This would indicate that companies are slightly more conservative post the CF change compared with in prior years, which is in contrast to the MTB findings.

With an adjusted R^2 of 10.40%, the CF change does not appear to provide more explanatory evidence to the impacts of conservatism in this sample. Clearly, behavioural change takes time (and the author would certainly advocate a longer time frame to be considered in future studies), and it may be quite unlikely that companies preparing accounts to December 31 2010 would have reflected all significant accounting changes in the intervening period between September and December 2010. For that reason, model 2 was re-estimated, using years 2006-2009 inclusive as the period pre-CF change, and

only 2011, 2012 and 2013 as the three years post-CF change, giving a total of 315 firm years and this is summarised by model 2b.

The results for model 2b do provide a slightly higher adjusted R^2 at 11.2%. This would suggest that the impact of the change year has had some (relatively minor) impact, but that there are other events which have occurred during this time period which may have created further 'noise'.

The most precipitous event during the 2006-2013 period was the global financial crisis, which significantly impacted earnings and stock returns worldwide, in particular in 2008. Therefore model 2c attempts to evaluate the possible effect of this 'noise', by removing the 2008 figures from the pre-CF change period, such that this is now represented by 2006, 2007 and 2009 years only. In model 2c, the post-CF change period includes the years 2010-2013 inclusive.

Regarding the results of model 2c, the score and significance of β_1 falls such that earnings are now much less sensitive to negative returns than positive ones. γ_2 is negative whilst γ_3 is positive (neither to a significant level). If γ_2 were greater than zero, this would indicate less conservatism, but this finding would indicate that firm earnings are now less sensitive to good news post the CF change than in prior years (γ_2) (although this is not at a significant level) and that firms were more conservative in reporting in the years prior to the CF change. This is also reflected in the negative γ_3, which indicates that bad news is being reflected more quickly in earnings, which again suggests an increase in conservatism post the changes.

The results do not change significantly when the transitional year of 2010 is removed from the post-CF change period, which is reflected in model 2d. In this case, three years pre-CF change and three years post-CF change are included, giving a sample size of 270

firm years. This suggests that 2010 itself was not a pivotal year of change in accounting reporting behaviour.

5. DISCUSSION AND CONCLUSION

Taking the two most accepted measures of conservatism, the MTB and Basu's AT (Basu 1997) and analysing them in the period prior to and after the removal of the concept of prudence from the IASB Conceptual Framework, this study has found that there has been an apparent conflicting picture in the level of conservatism demonstrated by the sample firms in the eight year time study, with the MTB method showing a fall in conservatism and the asymmetrical timeliness measure finding an increase in conservatism. The results do not change when removing the year of implementation of the Conceptual Framework 2010 and the peak year of the financial crisis, 2008. This finding is perhaps surprising given previous studies which have found conservatism to be generally increasing over time (Basu 1997, Givoly, Hayn 2000), although the findings are in line with Roychowdhury and Watts (2007) which found a negative relationship between the two measures, albeit that this was on a short run basis. Interestingly, an earlier version of this paper took the same sample firms over a shorter time frame (three years pre the change and three years post) and both MTB and the Basu model resulted in decreased conservatism. The addition of two extra years at the beginning and end of the study period appear to have mitigated the effects of large falls in earnings reported during the 2008 financial crisis which then corrected in the shorter study period hence showing an apparent fall in conservatism. Firms will have perhaps taken the opportunity of a general bad news event to 'clear their decks' of any stored up bad news and reviewed policies to address the changing economic realities. ial crisis will have resulted in a re-calibration of firm values and growth perceptions, and a renewed focus on the timeliness and evidence required to recognise gains and losses in the accounting books, and therefore it is perhaps not surprising that the Basu model will see an increase in conservatism.

This study is not suggesting that the apparent decrease in unconditional conservatism (as evaluated by the MTB) is causally related to the decision of the IASB to remove the reference to prudence in the Conceptual Framework 2010. During the time frame of the

study, the UK economy was dramatically affected by the financial crisis of 2007-2009, which had a significant impact on the values of shares as growth prospects were reviewed and numbers of shares (both criteria in the MTB ratio), as some firms would have had to re-evaluate their capital structure as a result of the crisis and the reduced availability of debt financing.

Earnings (a determinant in Basu's model) would also have been impacted by the crisis to the extent that Because of this, further research should be carried out to determine more precisely the impacts of the financial crisis on the policies and practices of firms in the FTSE100 to pinpoint the determinants to this apparent decrease in conservatism.

It remains surprising that after the financial crisis (which one might expect to impact on conservatism) that post-crisis there was not a trend towards increased conservatism. Whilst the crisis may have precipitated some managers to write down assets and include as much bad news as possible during the height of the crisis, since then, it is not unreasonable to expect a return to more conservative practices. Added to this is the fact that practitioners have long been trained and practised conservative accounting practices, so it is unlikely that there would be any rapid change in accounting policies to produce this result.

With the many cited benefits to conservatism (lower agency costs, bank charges, less chance of default, higher share prices and higher profits (although this latter one is open to contention)), it would seem generally good business sense for firms to adopt conservative accounting. Indeed, it is already embedded within accounting standards without it being explicitly mentioned in the Conceptual Framework.

So is prudence a necessary inclusion in the Conceptual Framework? The challenge now is the perception and understanding of the word has changed from the original meaning of 'a moral virtue conducive to honesty and competence in business' (Maltby 2000) to that of having a degree of caution in ensuring assets/gains are not overstated and liabilities/losses are not understated(International Financial Reporting Standards Foundation 2013), but that can be deliberately taken to extremes for personal gain. By insisting that the financial statements must be neutral and unbiased, the IASB is possibly attempting to re-introduce the original intent back into accounting, stating that they have

concern that by keeping prudence in the Conceptual Framework would cause conflict with the need for accounts to be unbiased(International Financial Reporting Standards Foundation 2013). Clearly, the period since the introduction of the Conceptual Framework 2010 introduction is still short, and a more longitudinal study should be carried out to determine whether a clearer picture emerges of the impact of removing prudence from the CF.

The findings in this study should be treated with caution; the sample size was small, sample selection necessarily excluded some industries and the time frame since the change in the Conceptual Framework is short. Although it appears that prudence has decreased since the change, there has been a significant economic event in the same time period, which will have inevitably affected the results. More longitudinal research should be carried out on this issue, using a wider range of conservatism measures not included in this study, to help to determine any other trends. Whilst there may be an apparent decrease in the accounting conservatism in the UK FTSE companies, it may not be

appropriate to extrapolate this finding into a different jurisdiction because of the individual impacts of economies, government and culture.

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Anticipated shock, monetary policy and welfare in the small open economy

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A B S T R A C T

This paper judges the welfare implications of anticipated and unanticipated Productivity shocks in a small open economy. The purpose model is two country New Keynesian dynamic stochastic general equilibrium model with the characteristics of nominal rigidities and monopolistic competition. This study finds out the higher degree of openness increase the welfare cost in the anticipated shocks. The response of optimal policy to anticipated shocks demonstrates the larger and delayed on macroeconomic variables than unanticipated shocks. Optimal monetary policy rule has a potential to curb the inflation and meet an optimal level of the real exchange rate volatility. Movements in real exchange rate resist the terms of trade externality and upturn the effectiveness of monetary policy. In addition, monetary authorities focus on the goal of exchange rate stabilization in their policy decisions.

1. INTRODUCTION

This paper examines whether or not the anticipated future shocks improves the welfare of the small open economy. For this purpose, this study computes and compares the welfare effect of anticipated and unanticipated shocks on macroeconomic variables. Furthermore, evaluates the effect of degree of openness on welfare cost of small open economy under anticipated and unanticipated shocks. Particularly, research hypothesis of this study suggest that the anticipated productivity shock can be welfare gaining in the small open economy. The present model based on two country small open economy model of (Gali and Monacelli, 2005) analyzes the domestic productivity shock on macroeconomic variables. To estimate the accuracy of the respective model, (Reid, 2009) suggests that this open economy model is stylized because of its simplicity and submission of few shocks in the economy but in the mean while there are some deficiencies to evaluate the major puzzles in macroeconomics. In addition the role of government sector in the baseline framework this study follows the (Furlanetto, 2006).[1] In this model the terms of trade, directly links in the New Keynesian Phillip's curve as a source of internal distortion. In addition, real exchange rate fluctuation describes the effect of home bias in order to examine the simple monetary policy rules. In a small open economy the presence of home bias restricts the optimal mark up volatility under unitary elasticity of substitution and terms of trade fluctuations affect

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[1] (Furlanetto, 2006) extended the New Keynesian open economy model into the public sector and the outcome of this study to estimate the lower values of output multiplier and the bigger expansionary effect can occur in fixed exchange rate owing to fiscal shocks.

the real exchange rate volatility.[2] The stylized model assumes law of one price allows home base in household's preferences and optimal risk sharing in the home and the foreign country. The framework is base on monopolistic competition and nominal rigidities. Firms are assumed as monopolistic competitors facing the well-defined demand schedule for its own production maximization of profits. Nominal rigidities are the important element of the new-keynesian model and the main feature of the non neutrality of monetary policy. The assumption includes rational agents in the New Keynesian dynamic stochastic general equilibrium (DSGE) models such as household, firms and governments intending to maximization of their objective functions in time to illustrate the behaviour of the economy in the short-term period shocks.

This small open economy model characterizes the home bias in consumption, nominal rigidities, imperfect competition and complete asset markets. In recent studies (Corsetti and Pesenti, 2001), (Sutherland, 2002), (Parrado and Velasco, 2001) and (Benigno and Benigno, 2003) develop the New Keynesian small open economy model. The focus of these studies is examining the welfare implications of alternative monetary policy rules. The model framework includes IS curve, Phillip curve, based on forward-looking variables. These studies emphasize the importance of the role of monetary policy coordination associated with internal and external distortions in the economy. These studies show that when the elasticity of inter-temporal substitution between home and foreign products is one, then the terms of trade fluctuations become independent of giving utility function. (Corsetti and Pesenti, 2001) concluded that the expansionary monetary policy can create the worse effect in the long-term result as a reduction in the consumer's purchasing power in an open economy under these distortions. (Obstfeld and Rogoff, 1995) proposed the exchange rate redux model for welfare implications. The model features are monopolistic competition, one period advance price setting mechanism and availability of nominal bonds. This model also assumes no home bias in government spending as it illustrates the consumption of products are optimally consumed in government as well as domestic agent. Other studies which scrutinize the welfare of the small open economy model under price stickiness are (Scmitt and Uribe, 2000) and (Clarida et al., 2001). (Said et al., 2012) estimates the small open economy model to ponder the optimal monetary policy in Morocco and suggests that the Taylor rule with targeting exchange rate policy outperforms as an optimal monetary policy in Moroccan economy. (Adam et al., 2009) analyzes the implication alternatives monetary policy rules in African countries. The changes mainly occur in the monetary policy regimes when the export, Foreign aid and foreign direct investment inflows were increasing in these countries. There is a trade-off between interest rate and exchange rate (nominal and real) volatility, latter the lending behaviour of banking, quasi fiscal burden of upsurge domestic borrowing and raise concern about private investment. (Malik and Ahmed, 2010) explores the taylor rule and suggests that State Bank of Pakistan conduction the pro-cyclical policy means more focus on growth instead of inflation and output gap variability, which reduces to some extent after financial reforms. The external fiscal disturbance is the reason of monetary policy weakness. (Mahmood and Shahab, 2012) delves into the monetary policy reaction function use exchange rate in the policy rule under the New Keynesian approach and propose that flexible inflation targeting rule is more appropriate than the strict inflation targeting. The welfare loss can be reduced if the central bank avoids discretionary monetary policy. (Choudhri and Malik, 2012) inquest the open economy model for the monetary policy analysis, including the government borrowing constraints and proposed that strict interest rate rule help to curb the inflation and improvement in welfare of households. In response of interest targeting rule with output this study shows that there is a negative response of inflation variability and output which affect households at different income level.

In brief, the main findings of this study are as follows (i) Pakistan is emerging small open economy and monetary authorities have choice to adopt the targeting rules in the economy, (ii) The Taylor style interest targeting rule supports for the better alternative option for monetary authorities to attain the highest welfare in an open economy, (iii) The impulse response to anticipated shocks

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[2] Other studies extended this model are (Sedghi, 2009) compares optimal monetary policy with financial stability and (Paoli, 2009) for small open economy model.

demonstrate the persistent, larger and delayed response on macroeconomic variables than unanticipated shocks, (iv) unanticipated shock has lower variation from steady state as compare to anticipated shock in macroeconomic variables (v) Taylor rule helps to improve the macroeconomic stability when economy is facing multiple shocks.

The rest of paper continues as includes: In section 2 and 3 formats the two country endowments DSGE model to show the monetary policy in the presence of domestic shocks. Section 4 demonstrates the parameter estimation of the quantitative model. Section 5 concludes.

2. STRUCTURE OF THE MODEL

The structure of the model follows the approach of (Gali and Monacelli, 2005) and (Silveira, 2006) as a baseline framework for the open economy model. Two countries represent home and foreign, one is consider as small open economy and other is the rest of the world. The characteristics of these countries are having homogeneous consumption, similar technology and all goods are traded. Home country policy decisions are ineffective for the foreign country. The features of this model are monopolistic competition, nominal rigidities, and home bias in consumption. Including the nominal rigidities, followed the sticky price model of (Calvo, 1983). In this setup, fractions of firms to choose the price taking decision over time. Taking the assumption of monopolistic competition means households in both countries producing the differentiated goods.

2.1. Households

The households are the representative of the complex structure of a small open economy. The utility function of the representative household is

$$E_0 \sum_{t=0}^{\infty} \beta^t U(C_t, N_t) \tag{1}$$

Where N_t denotes hours of labour, and C_t is the composite consumption index defied by

$$C_t \equiv \left[(1-\alpha)^{\frac{1}{\eta}} C_{H,t}^{\frac{\eta-1}{\eta}} + \alpha^{\frac{1}{\eta}} C_{F,t}^{\frac{\eta-1}{\eta}} \right]^{\frac{\eta}{\eta-1}} \tag{2}$$

Where $\eta > 0$ the parameter of elasticity of is the intertemporal elasticity of substitution between home C_H and foreign-produced goods C_F. The consumption of differentiated products produces at home and foreign can be illustrated as sub indices. The $C_{H,t}$ is the index of consumption of domestic goods given by constant elasticity of substitution (CES) production. Where $j \epsilon [0,1]$ denotes the good variety. $C_{F,t}$ is an index of imported goods given by:

$$C_{H,t} \equiv \left[\int_0^1 C_{H,t}(j)^{\frac{\varepsilon-1}{\varepsilon}} dj \right]^{\frac{\varepsilon}{\varepsilon-1}} \tag{3}$$

$$C_{F,t} \equiv \left[\int_0^1 (c_{i,t})^{\frac{\gamma-1}{\gamma}} di \right]^{\frac{\gamma}{\gamma-1}} \tag{4}$$

$c_{i,t}$ is the index of the quantity of goods imported from country i and consumed by domestic household. The given CES function is

$$C_{i,t} \equiv \left[\int_0^1 (c_{i,t})^{\frac{\varepsilon-1}{\varepsilon}} dj \right]^{\frac{\varepsilon}{\varepsilon-1}} \tag{5}$$

Here $\varepsilon > 1$ is the elasticity of substitution between varieties produced in the given country. The parameter $\alpha \epsilon [0,1]$ represents the natural index of openness and it is inversely related to the degree of home bias in consumption. Parameter $\theta > 0$ represents the intertemporal substitution between home and foreign goods. While γ represents the intertemporal substitution between production of products in different foreign countries. The demand function of respective goods and country is given for all $i, j \epsilon [0,1]$,

$$C_{H,t}(j) = \left(\frac{P_{H,t}(j)}{P_{H,t}}\right)^{-\varepsilon} C_{H,t} \quad C_{i,t}(j) = \left(\frac{P_{i,t}(j)}{P_{i,t}}\right)^{-\varepsilon} C_{i,t}$$

Where $P_{H,t}(j) \equiv \int_0^1 P_{H,t}(j)dj^{\frac{1}{1-\varepsilon}}$ is the price index of domestic produced goods and $P_{i,t} \equiv \left(P_{i,t}(j)^{1-\varepsilon}dj\right)^{\frac{1}{1-\varepsilon}}$ is the price index of imported goods in the domestic country for all i ∈ [0,1] followed from the demand function that $\int_0^1 P_{H,t}(j) C_{H,t}(j)dj = P_{H,t}C_{H,t}$ and $\int_0^1 P_{i,t}(j)C_{i,t}(j)dj = P_{i,t}C_{i,t}$. On the origin the optimal allocation of expenditure on imported goods implies $C_{i,t} = \left(\frac{P_{i,t}}{P_{f,t}}\right)^{-\gamma} C_{F,t}$ for all ∈ [0,1], and where $P_{f,t} \equiv (\int_0^1 P_{i,t}^{1-\gamma}di)^{\frac{1}{1-\gamma}}$ is the imported goods index price in terms of domestic currency. This implies the total spending on imported goods as $\int_0^1 P_{i,t} C_{i,t}di = P_{f,t}C_{F,t}$

Finally, the allocation of spending between home and foreign goods is given by:

$$C_{H,t}(j) = (1 - \alpha) \left(\frac{P_{H,t}}{P_t}\right)^{-\eta} C_t \quad C_{F,t}(j) = \alpha \left(\frac{P_{F,t}}{P_t}\right)^{-\eta} C_t$$

$$P_t \equiv \left[(1 - \alpha)\left(P_{H,t}\right)^{1-\eta} + \alpha\left(P_{F,t}\right)^{1-\eta}\right]^{\frac{1}{1-\eta}}$$

The utility function (U) regarding consumption and hours worked can be expressed as

$$U(C,N) \equiv \frac{C^{1-\sigma}}{1-\sigma} - \frac{N^{1+\varphi}}{1+\varphi} \tag{6}$$

The maximization of utility function is subject to a sequence of budget constraints of the form:

$$\int_0^1 P_{H,t}(j)C_{H,t}(j)dj + \int_0^1 \int_0^1 P_{i,t}(j)C_{i,t}(j)djdi + E_t\{Q_{t,t+1}D_{t+1}\} \leq D_t + W_t N_t \tag{7}$$

Here $P_{i,t}(j)$, is the price of variety j imported from home country, D_{t+1} represents the nominal payoff in period t + 1 of the portfolio held at the end of period t, and w_t represents the nominal wage. The given units of domestic currency, $Q_{t,t+1}$ is the stochastic discount factor for one period ahead nominal payoff relevant to the domestic household. Given that, aggregate consumption expenditure of the domestic household is $P_{H,t} C_{H,t} + P_{F,t} C_{F,t} = P_t C_t$. Thus, budget constraint in the given period is respectively.

$$P_t C_t + E_t\{Q_{t,t+1}D_{t+1}\} + T_t \leq D_t + W_t N_t \tag{8}$$

Thus the optimal condition for the household problem as follows.

$$C_t^\sigma N_t^\varphi = \frac{W_t}{P_t} \tag{9}$$

The log linear form of the equation (9)

$$w_t - p_t = \sigma c_t + \varphi n_t \tag{10}$$

The given standard intertemporal optimality condition is

$$\beta \left(\frac{C_{t+1}}{C_t}\right)^{-\sigma} \left(\frac{P_t}{P_{t+1}}\right) = Q_{t,t+1} \tag{11}$$

To determine the Stochastic Euler equation take expectations on both sides then rearrange is given as follows.

$$\beta R_t \left\{\left(\frac{C_{t+1}}{C_t}\right)^{-\sigma} \left(\frac{P_t}{P_{t+1}}\right)\right\} = 1 \tag{12}$$

$$c_t \equiv E_t\{c_{t+1}\} - \frac{1}{\sigma}(r_t - E_t\{\pi_{t+1}\} - \rho) \tag{13}$$

The lower case letters represents the logs of the respective variables, here $\rho \equiv \beta^{-1} - 1$ is the time discount rate and $\pi_t \equiv p_t - p_{t-1}$ is consumer price index (CPI) inflation. The $R_t = \frac{1}{E_T\{Q_{t,t+1}\}}$ denote

as the gross return on riskless discount bond for one period payoff in terms of per unit domestic currency in next period.

2.2. Domestic inflation, CPI inflation, real exchange rate, and terms of trade

The effective term of trade between home and foreign country is written as

$$S_t \equiv \frac{P_{F,t}}{P_{H,t}} \tag{14}$$

The log linear form of the given equation

$$s_t = \int_0^1 s_{i,t} \, di \tag{15}$$

The equation of CPI is expressed in log linear form with a symmetric steady state under the condition of purchasing power parity.

$$p_t \equiv p_{H,t} + \alpha s_t \tag{16}$$

Where $s_t \equiv p_{F,t} - p_{H,t}$ represents the log of effective term of trade, inflation is defined as the rate of change in good price index and the link between inflation and term of trade is expressed as

$$\pi_t = \pi_{H,t} + \lambda \Delta s_t \tag{17}$$

Here λ represents the index of openness which fulfills the gap of two measures of inflation in terms of percentage changes in terms of trade. The given assumption of law of one price holds for individual goods at all the times implies that $\pi_t = \pi_t^*$.

$$P_{F,t} = e_t + p_t^* \tag{18}$$

Where $e_{i,t} = \int_0^1 e_{i,t} \, di$ is the log of nominal effective exchange rate and $P_{i,t}^i = \int_0^1 P_{i,t}^i(j)^{1-\varepsilon} dj$ is the log of domestic price index for i's country and $P_t^* = \int_0^1 P_{i,t}^i di$ is the log of world price index respectively. In world domestic and consumer price indices are similar. From the terms of trade's definition the following expression can be obtained.

$$s_t = e_t + P_t^* - P_{H,t} \tag{19}$$

The next step determines the relation between the real exchange rate and term of trade. The bilateral exchange rate for country i can be defined as $Q_{i,t} \equiv \varepsilon_{i,t} P_{i,t} / P_t$ the consumer price index ratios of both countries expressed in their domestic country respectively. Now $q_t \equiv \int_0^1 q_{i,t}$ is the log of effective real exchange rate expressed as:

$$q_t = (1 - \alpha) \, s_t \tag{20}$$

2.3. Note on international risk sharing

The first order condition for the country's representative housed while assuming the structure of complete asset markets can be expressed for country i:

$$\beta \left(\frac{c^i_{t+1}}{c^i_t}\right)^{-\sigma} \left(\frac{P^i_t}{P^i_{t+1}}\right) \left(\frac{\varepsilon^i_t}{\varepsilon^i_{t+1}}\right) = Q_{t,t+1} \tag{21}$$

Combining equations (11) and (21) the real exchange rate can be expressed as

$$C_t \equiv \vartheta_i \, C^i_t \, Q^{\frac{1}{\sigma}}_{i,t} \tag{22}$$

Here constant ϑ_i depends on the initially certain conditions associated with relative net asset positions, such as zero steady state of net foreign asset holdings under this condition it values is equal to one for all i. In the condition of symmetric steady state while holding the law of one price the domestic and foreign consumption as well as exchange rate is also equal to one.

$$C_t = C^*_t + \frac{1}{\sigma} \, q_t \tag{23}$$

Where $c^*_t \equiv \int_0^1 c^i_t di$ represents the log of world consumption index. In first order approximation holds the equality condition under the condition of $\eta \neq 1$. This assumption makes the linkage between domestic and world consumption at international level. Under the complete risk sharing assumption, the optimal price of riskless bond in term of foreign currency is $\varepsilon_{i,t}(R^i_t)^{-1} = E_t\{Q_{t,t+1}\varepsilon_{i,t+1}\}$. The combination of pricing equation with domestic bond pricing equation $(R_t)^{-1} = E_t\{Q_{t,t+1}\}$ determines the interest parity condition. The log linear form is given:

$$r_t - r^*_t = E_t\{\Delta e_{t+1}\} \tag{24}$$

Combine with terms of trade (in log terms) definition the stochastic difference equation of the above equation is denoted by:

$$s_t = (r^*_t - E_t\{\pi^*_{t+1}\}) - (r_t - E_t\{\pi_{H,t+1}\}) + E_t\{s_{t+1}\} \tag{25}$$

Steady state under the condition of purchasing power parity implies the zero mean of the real interest rate differential as in first difference terms of trade is stationary. This can happen only in the case of unit root in technology parameter. This equation illustrates the combination of Euler's equation of consumption for both domestic and foreign economies associated with the complete risk sharing.

2.4. Firms

Productions function with the linear technology of the differentiated goods that produce in the firms of the home economy.

$$Y_j(j) = A_t N_t(j) \tag{26}$$

A represents the labour productivity thus the stochastic process can be expressed as

$$a_t = \rho_a a_{t-1} + \varepsilon_t^a \tag{27}$$

Here $N_t \equiv \int_0^1 N_t(j)dj = \frac{Y_t Z_t}{A_t}$ and $Z_t \equiv \int_0^1 \frac{Y_t(j)}{Y_t}dj$ j symbolize the firm-specific index and real marginal cost of all identical domestic firms is given by:

$$mc_t = -v + w_t - p_{H,t} - a_t \tag{28}$$

Here $v \equiv -\log(1 - \tau)$, τ stands for the employment subsidy. The domestic aggregate output index as for the consumption represent as

$$Y_t \equiv \left[\int_0^1 Y_t(j)^{1 - \frac{1}{\varepsilon}} dj \right]^{\frac{\varepsilon}{\varepsilon - 1}} \tag{29}$$

The aggregate relationship in the first order approximation requires

$$y_t = a_t + n_t \tag{30}$$

2.5. Price setting mechanism

This model is based on the assumption of Calvo-type staggered price setting mechanism. This assumption considers the domestically differentiating goods thus inclusion of domestic firm's participation, $1 - \alpha_t$ Is the fraction of random selection of domestic firm's decision based optimal prices while α_t is the fraction of firms having sticky prices. The optimal price of producers can set their prices at time T is therefore:

$$\left(P_{H,t} \right)^{1-\sigma} = \alpha P_{H,t-1}^{1-\sigma} + (1 - \alpha)\left(P_t(h) \right)^{1-\sigma} \tag{31}$$

$P_{H,t}$ symbolize the newly domestic prices in log terms and $\mu = log\left(\frac{\varepsilon}{\varepsilon - 1} \right)$, is the markup in the economy. The pricing behavior is selected as adaptive and firms set their prices as a markup as expected optimal marginal cost for the future rather than to observe only marginal cost of current period. The complete flexible price economy represent as $\alpha \to 0$. Now the markup rule is $P_{H,t} = \mu + mc_t + p_{H,t}$.

$$P_{H,t} = \mu + (1 - \beta\theta) \sum_{k=0}^{\infty} (\beta\theta)^k E_t\{mc_{t+k} + p_{H,t}\} \tag{32}$$

3. EQUILIBRIUM

3.1. Goods market equilibrium

The goods market equilibrium condition for the home requires

$$Y_t(j) = C_{H,t}(j) + \int_0^1 C_{H,t}^i(j)di + G_t(j)$$

$$Y_t(j) = \left(\frac{P_{H,t}(j)}{P_{H,t}}\right)^{-\varepsilon} \left[(1-\alpha)\left(\frac{P_{H,t}}{P_t}\right)^{-\eta} C_t + \alpha \int_0^1 \left(\frac{P_{H,t}}{\varepsilon_{i,t} P_{F,t}^i}\right)^{-\gamma} \left(\frac{P_{F,t}^i}{p_t^i}\right)^{-\eta} C_t^i di + G_t(j)\right] \tag{33}$$

The production of goods is equal to domestic consumption plus foreign consumption of domestic goods j plus public consumption of same good Here $C_{H,t}^i(j)$ stands for demand for goods j from country i's that produced in the home country. Substituting equation (32) into aggregate domestic output's definition $Y_t \equiv \left[\int_0^1 Y_t(j)^{1-\frac{1}{\varepsilon}} dj\right]^{\frac{\sigma}{\sigma-1}}$ thus to obtain:

$$Y_t - G_t = \left(\frac{P_{H,t}}{P_t}\right)^{-\eta} C_t \left[(1-\alpha) + \alpha \int_0^1 (S_t^i S_{i,t})^{\gamma-\eta} Q_{i,t}^{\eta-\frac{1}{\sigma}} C_t^i di\right] \tag{34}$$

S_t^i stands for the effective terms of trade for country i and $S_{i,t}$ represents the bilateral term of trade across both countries. As for the special case of $\varsigma = \theta = \gamma = 1$ the above condition can be expressed as

$$Y_t = C_t S_t^{1-v} \tag{35}$$

From previous $\int_0^1 (S_t^i) di = 0$, the first order approximation of equation (34) expressed as a log linear form in symmetric steady state:

$$y_t - \varrho g_t = c_t + \alpha\gamma s_t + \alpha\left(\eta - \frac{1}{\sigma}\right) q_t$$

$$= c_t + \frac{\alpha\omega}{\sigma} s_t \tag{36}$$

$$g_t = \rho_g g_{t-1} + \varepsilon_g$$

Here $\omega \equiv \sigma\gamma + (1-\alpha)(\sigma\eta - 1)$ the condition $\sigma = \eta = \gamma = 1$ implies $\omega = 1$. This condition similar across countries, for country i expressed as $y_t^i = c_t^i + \frac{\alpha\omega}{\sigma} s_t^i$. The world market equilibrium condition can be expressed as

$$y_t^* \equiv \int_0^1 y_i di \tag{37}$$

Here c_t^* and y_t^* are the log term indexes of world's output and consumption. Combining (36) with (22) and (13).

$$y_t = y_t^* + \frac{1}{\sigma_\alpha} s_t \tag{38}$$

$$\sigma_\alpha \equiv \frac{\sigma}{(1-\alpha) + \alpha\omega} > 0$$

Combine equation (36) with Euler equation (13):

$$y_t = E_t\{y_{t+1}\} - \frac{1}{\sigma}(r_t - E_t\{\pi_{t+1}\} - \rho) - \frac{\alpha\omega}{\sigma} E_t\{\Delta s_{t+1}\} \tag{39}$$

Here $\theta = (\sigma\gamma - 1) + (1-\alpha)(\sigma\eta - 1) = \omega - 1$.

3.2. Supply side: Marginal cost and inflation dynamics

The link between inflation dynamics and real marginal cost in the small open economy is expressed as:

$$\pi_{H,t} = \beta E_t\{\pi_{H,t+1}\} + \lambda \widehat{mc}_t \tag{40}$$

$$\lambda \equiv \frac{(1-\beta\alpha)(1-\alpha)}{\alpha}$$

Now determine the real marginal cost expressed as function of domestic output is different in open economy as compare to the close economy due to difference in their respective consumption and output. Particularly it shows:

$$mc_t = -v + \sigma y_t^* + \varphi y_t + s_t - (1+\varphi)a_t \tag{41}$$

Above equation is the equality of equations (23) and (30) demonstrates the marginal cost is rising. Real wage effect is illustrated through the intertemporal consumption and leisure relationship as wealth effect influence on labour supply. Any changes in term of trade directly effects on the wages of products associated with real wage. The real marginal cost associated with domestic output and productivity owing to technological innovations occurs in small open economy demonstrates:

$$mc_t = -v + (\sigma_\alpha + \varphi)y_t + (\sigma - \sigma_\alpha)y_t^* - (1+\varphi)a_t \tag{42}$$

3.3. Equilibrium dynamics

Although for some special cases, real marginal cost is directly converge into the foreign output movements in the above expressions. In the model the x_t is the output gap represents as a log deviation of domestic output y_t and natural output $\bar{y}_t$. In the absence of nominal rigidities the equilibrium of output is $x_t \equiv y_t - \bar{y}_t$. While the natural level of output is determine by applying $mc_t = -\mu$ at t and solve for the output thus obtain

$$\bar{y}_t = \Omega + \Gamma a_t + \alpha\psi \, y_t^* \tag{43}$$

Here $\Omega \equiv \frac{\vartheta - \mu}{\sigma_\alpha + \varphi}$, $\Gamma \equiv \frac{1+\varphi}{\sigma_\alpha + \varphi} > 0$, and $\psi \equiv -\frac{\Theta\sigma_\alpha}{\sigma_\alpha + \varphi}$.

The link between real marginal cost and output gap illustrated as $\widehat{mc}_t = (\sigma_\alpha + \varphi)x_t$ and now combine with equation (40) to determine the equation of New Keynesian Phillips curve (NKPC) regarding output gap for small open economy:

$$\pi_{H,t} = \beta E_t\{\pi_{H,t+1}\} + k_\alpha x_t \tag{44}$$

Here $k_\alpha \equiv \lambda(\sigma_\alpha + \varphi)$. for the special case of $\sigma = \eta = \gamma = 1$ as in the absence of openness the slope coefficient forms the NKPC for the close economy. Follow the equation (39), to determine the dynamic IS equation for small open economy regarding the output gap

$$x_t = E_t\{x_{t+1}\} - \frac{1}{\sigma_\alpha}(r_t - E_t\{\pi_{H,t+1}\} - \overline{rr}_t) \tag{45}$$

$$\bar{r}_t \equiv \rho - \sigma_\alpha \Gamma(1 - \rho_a)a_t + \alpha\sigma_\alpha(\Theta + \psi)E_t\{y_{t+1}^*\} + \frac{\gamma\sigma_\alpha\varphi(1 - \rho_g)}{\varphi(1 - \gamma) + \sigma_\alpha}g_t + \frac{\gamma\varphi(\sigma - \sigma_\alpha)(1 - \rho_g)}{\varphi(1 - \gamma) + \sigma_\alpha}g_t^* \tag{46}$$

The $\overline{rr}_t$ is natural rate of interest for the small open economy. The degree of openness creates an impact on responsiveness of the output gap regarding changes in interest rate.

3.4. Welfare cost

The consumer welfare loss because of deviations from the optimal policy can be expressed as steady state consumption requires that

$$W = -\frac{1 - \alpha}{2}\sum_{t=0}^{\infty}\beta^t\left[\frac{\varepsilon}{\lambda}\pi_{H,t}^2 + (1 + \varphi)x_t^2\right] \tag{47}$$

Taking expectations to equation (47) and $\beta \to 1$ the resultant welfare loss of the policy deviated from strict inflation targeting can be demonstrated as variance of inflation and output gap:

$$V = -\frac{1 - \alpha}{2}\left[\frac{\varepsilon}{\lambda}var(\pi_{H,t}) + (1 + \varphi)var(x_t)\right] \tag{48}$$

3.5. Monetary policy rule

In this model the interest targeting rule as an optimal monetary policy is used to examine the difference asset market structures. The optimal policy rule stabilized the interest rate with output, inflation and real exchange under alternative asset market structure. In the policy rule, 'i' is the interest rate, 'q' is the real exchange rate, 'y' is the output, 'y*' is the potential output and π_t is the consumer prices inflation. In addition, w_y, w_q, w_π are the weights relative to output gap, real exchange rate, and inflation.[3]

$$i_t = w_y(y - y^*)_t + w_q q_t + w_\pi \pi_t \tag{49}$$

4. EMPIRICAL ANALYSIS

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[3] The coefficients of the policy rules can estimate through the regression equation the series is taken as Pakistan money market rate, consumer price index and output gap. Data series taken from 1971-2012 and source is International Financial Statistics.

4.1. Calibration

The benchmark values of parameters are described below in order to evaluate the research analysis.[4] The elasticity of substitution between home and foreign goods is calibrated as $\eta = 1$. The inverse of intertemporal substitution can be taken as $\varepsilon = 1$. The inverse elasticity of labour supply is calibrated as $\varphi = 2$. The degree of openness in the baseline framework set as $\alpha = 0.34$ implies the average annual values of (import + export / GDP) ratio start of the period from 1971 to 2012. The discount factor is calibrated as $\beta = 0.98$. The measure of price stickiness of the firm is taken as $\theta = 0.75$ is taken as average annual value of Pakistan consumer price index (price changes) from 1950 to 2010 and data source is federal bureau of statistics. The elasticity of substitution between differentiated products is set as $\sigma = 1$ on this model. In the baseline Taylor rule coefficients with respect to inflation, output and real exchange rate is set as $w_\pi = 0.31$, $w_x = 0.18$ and $w_q = 1.2$. The variables taken for estimation of Taylor coefficient are the money market rate as nominal interest rate, consumer price inflation and GDP growth rate as an output and real exchange rate. The selected variables periods start from 1971 to 2012 and data source is federal bureau of statistics. This study uses HP-filtered annual based data for stochastic shock process. In the productivity shock output per worker is taken as a proxy for labour productivity in Pakistan and the sample period of this series from 1980 to 2012. The data source of this series is taken from world development indicators and international financial statistics.

$$a_t = 0.9a_{t-1} + \varepsilon_{a_t} \qquad\qquad \sigma_{\varepsilon_a} = 0.025$$

4.2. Result analysis

In the result analysis pursue the impulse response and welfare approximation under anticipated and unanticipated productivity shock. The impulse response analysis explores the behaviour of macroeconomics variable under the positive productivity shock while the welfare approximation analysis compares the welfare loss in the flexibility and stickiness of prices, in addition, the comparison of welfare approximation under the open and close economy.

In figure 1, the impulse response to an unanticipated and anticipated productivity shock mention that boost in productivity raises demand of home goods relative to foreign goods, reduce the output gap. In an anticipated shock, low producer and consumer prices demands competitiveness of domestic good results expansion in production. The rise in productivity appreciates the nominal and real exchange rate after some periods the nominal and real exchange rate start decline towards the equilibrium, results to upturn the output and afterwards it start to declines toward steady state as the exchange rate appreciation boost the exports of home goods, terms of trade boosts the competitiveness of the domestic economy. In a similar pattern the domestic and consumer price inflation are little jumped before reached to steady state equilibrium. In an unanticipated shock the consumer price inflation fuel with productivity due to cutting in nominal interest rate and deviation from steady state is lower than anticipated shock. The rise in domestic productivity reduces the real marginal cost, expedites reduction in domestic inflation and boosts the output. The productivity shock responds negatively to the output gap and positive response in output boosts the net exports further improvement in terms of trade.

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[4] The Dynare 4 toolkit is used to analyze the impulse response of different shocks. Dynare is Matlab toolkit widely used for simulation and estimation of DSGE models.
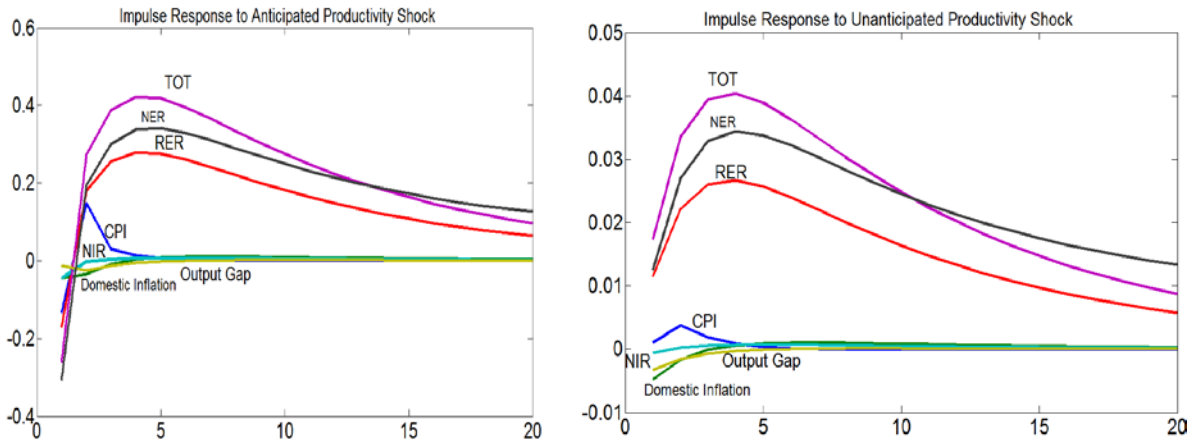
Figure 1: Impulse response to anticipated and unanticipated productivity shock

Figure 2 insinuates impulse response of macroeconomic variables under different elasticity of substitution. The solid line represents the anticipated shock and dashed line represents the unanticipated shock.
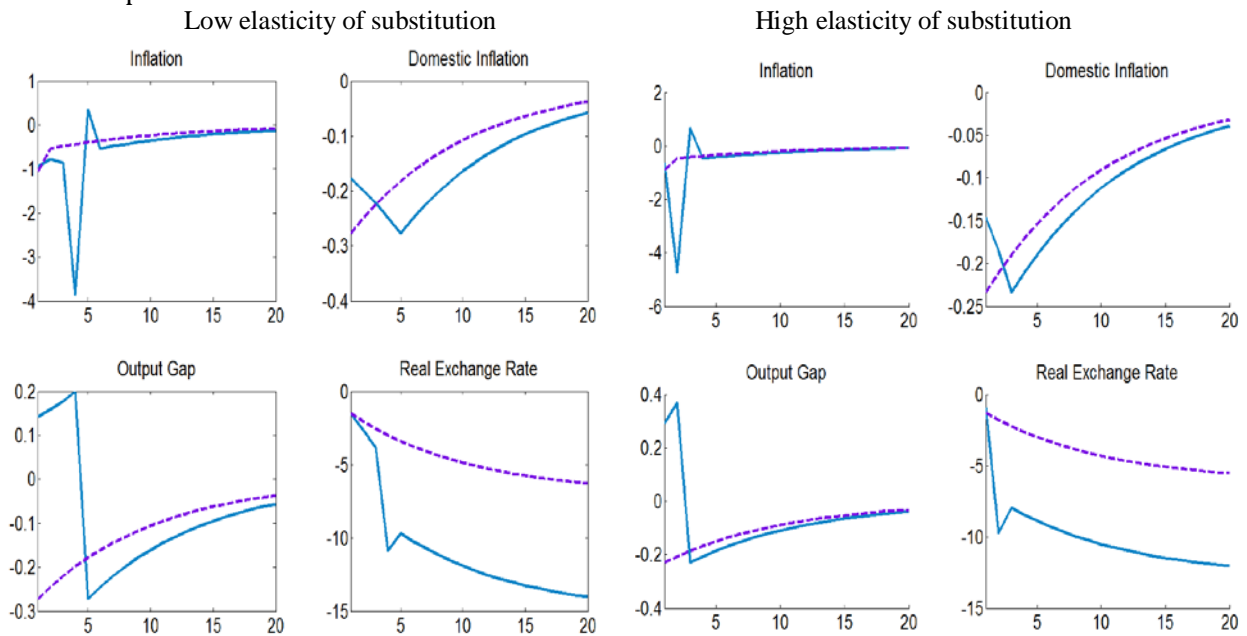
Figure 2: Impulse response to anticipated and unanticipated productivity shock

Monetary policy rule provides an incentive to focus on exchange rate or inflation stabilization because it depends on the elasticity of substitution between home and foreign goods. In low substitution elasticity, the anticipated changes in the productivity shock results the sharp incline in prices while reduces the output gap. Policy rule restricts the movement in exchange rate results the real exchange rate appreciation. The appreciation can shift the production from the domestic to foreign sector results reduction in domestic consumption. Therefore, focus on inflation stabilization can be welfare improving for the small open economy. In the high elasticity of substitution the exchange rate stabilization is welfare improving owing to the optimal risk sharing does not affect on consumption while the appreciation can shift the production stabilizes the domestic production. In our analysis focus on the policy rule with more exchange rate stabilization the complete asset markets will be welfare improving when home and foreign goods are close substitutes. High intertemporal substitution elasticity is welfare enhancing reign of the real exchange appreciation under the unanticipated productivity shock while, the anticipated shock significances the positive output gap associated with high inflation which decreases the welfare associated owing to the instability of the policy rule.
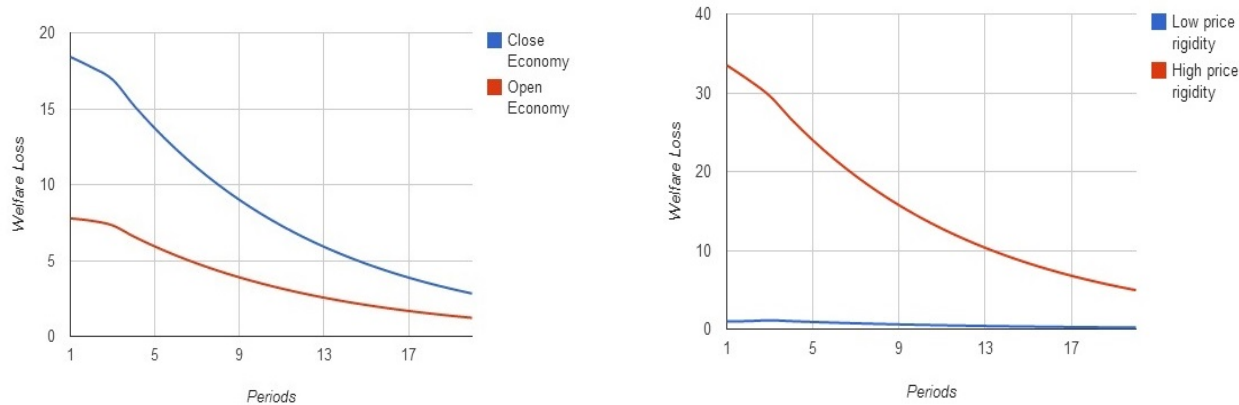
Figure 3: Anticipated welfare approximaton of policy rules

In welfare evaluation of the optimal monetary policy rule, the figure 3 exhibits the welfare loss of anticipated shock in the policy rule. Welfare approximation associated with policy rule is evaluated on extreme case of price rigidness and the price flexibility. Price stickiness produces the surge in inflation and output sharply raises the welfare loss. In comparison of price rigidities, the higher price rigidities cause higher welfare loss as compare to lower price rigidity. High trade openness   can   reduce the
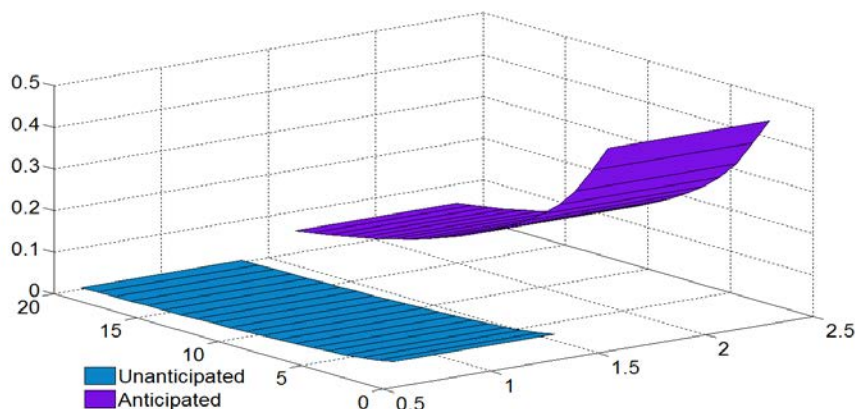
macroeconomic adjustment cost in the economy.

Figure 4: Welfare cost approximation under Taylor rule

In comparison of degree of openness, the lower degree of openness have higher welfare cost associated to policy rule as compare to the higher degree of openness. In addition, this study analyzed the welfare approximation of policy rule not only with anticipated shock but also with unanticipated shock. For this purpose, figure 4 compares the welfare cost estimation under anticipated and unanticipated productivity shock. Anticipated shock has more welfare cost in contrast with unanticipated shock owing to higher anticipated output gap and inflation.

5. CONCLUSION

This study compares the welfare approximation of alternative policy rules under anticipated and unanticipated productivity shocks. The framework of the model is based on sticky prices and limited case featured the representation of the closed economy model. In comparison of shocks, an anticipated shock has higher welfare loss in policy rule as compare to the unanticipated shock while the welfare also depends on the nature and intensity of shock. In the flexible pricing system

reduces the welfare loss in anticipated shocks. Policy makers are act independently in monetary policy it enhance the welfare improvement in the small open economy. Monetary authorities have focus on exchange rate stabilization in their decision. The future exploration is including the interest parity shock to analyze the welfare effect in the small open economy.

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Improving Unified Process Methodology by Implementing New Quality Management Discipline

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A B S T R A C T

Unified process, a leading software development methodology, allows project teams to incrementally build their software and structurally defines project roles, phases, iterations and disciplines. One of the issues that arise when applying unified process is absence of discipline for quality assurance and control. This research aims to define new discipline entitled "quality management of software development" and its processes, in order to produce modified version of unified process, suitable for continually controlling quality in software development projects. This discipline will integrate ISO 9126 "Software engineering – product quality", which is an international standard for addressing software quality and quality control tools, as proposed by Project Management Book of Knowledge 2010. Main hypothesis of this research is that, by defining and integrating new discipline of quality management, project teams that employ this new, modified version of unified process, will be able to produce software of higher quality level. Experimental research is conducted on four software development projects, ranging from 2009 to 2010, two of which use standard, and two of which use modified unified process model. Research results show higher software quality levels in two projects that use modified unified process methodology.

Introduction

Unified process is a leading software development methodology, used by hundreds of thousands of software development teams across the world. It is an iterative methodology, which allows project teams to incrementally build their software. Unified process defines project roles (human resource organization), phases and iterations (used for scheduling) and disciplines, which are used to organize type of work undertaken in a project. Among others, disciplines include requirement specifications, analysis and design and project management. One of the issues that arise when applying unified process is absence of discipline for quality assurance and control. This paper aims to address this problem by further researching on capabilities to improve standard Unified Process model with existing standards for quality control and assurance.

Literature overview

Overview of unified process
Unified Process is an iterative software development methodology which came formally into existence in 1999, when Ivar Jacobson, Grady Booch and James Rumbaugh published their book "*The Unified*

Software Development Process" (Jacobson, Booch, & Rumbaugh, 1999). This methodology became very popular worldwide, especially after IBM adopted its own variant entitled Rational Unified Process. As an iterative methodology, it is frequently used as it overcomes major problems of sequential software development approach such as: managing of rapidly changing requirements, risk management (strategy, tools & techniques), poor project organization, formal documentation, inability to adopt to changing business environments, poor testing performance and record, etc., as identified by Xiong (2011).

Unified process is organized into a *static* and *dynamic structure*. Static structure deals with organizing project work into disciplines (such as analysis and design, or testing), which are superset of work type to be done (Kroll & Kruchten, 2003). Each of them defines a set of activities, or tasks to be completed and artifacts, documentation and code to be produced. Finally static structure covers project roles, which serve to group project members into teams, based on their specialty (e.g. analyst, project manager, developer). Dynamic structure deals with time - project phases, iterations and milestones.

Focusing on quality, it is obvious that Unified Process defines a discipline called "testing". This discipline describes how to do testing, or quality control. As all iterative and agile methodologies do, Unified Process uses concept of continuous testing (quality control). Since most common problem of sequential software development approach is that quality control is done only at the end of the project, Unified Process focuses on doing quality control continually throughout the project. Main driver for this concept is fact that if a bug or defect is identified in early phase of the project, it will be cheaper and faster to fix it, than in later phases. However, we must note that Unified Process is not a standard and, as such, does not define a set of standardized tools to do quality control with. Also, it primarily deals with quality control and not quality management and improvement, not giving project managers a tools and standard to deal with quality (Hindle, Godfrey, & Holt, 2010). On the other hand, Unified Process never discusses what are characteristics of quality software, how to structure or to test these non-functional requirements (Losavio, Chririnos, Matteo, Levy and Ramande-Cherif, 2004).

Project Management Body of Knowledge and quality tools

In order to improve Unified Process, as out base software development methodology, from a quality management perspective, we introduce *Project Management Body of Knowledge (PMBOK)*. This is the top most standard for project managers since late 1980s. Created by The Project Management Institute (PMI), it defines nine knowledge areas, among them, quality management knowledge area. Each knowledge area defines processes and tools which are needed for project managers to perform well. As a basic concept, PMBOK introduces six project management constraints – time, resources, costs, quality, scope and risks. By balancing these constraints, project managers can drive themselves through projects.

Quality management knowledge area defines three processes: *quality planning*, *quality control* and *quality assurance*. They represent logical steps towards achieving high levels of quality within projects. Three main goals that PMBOK defines for all projects are: strive to satisfy client's requirements, to produce error-free products (software) and continuously improve quality. PMBOK recommends plan-do-check-act, Six Sigma and Total Quality Management (TQM) as basis for continuous quality improvement (Phillips, 2007).

Tague (2004, p. 15) reflect on PMBOK recommendations with inclusion of seven basic quality control tools, as defined by Ishikawa (1990): cause and effect (fishbone) diagram, control charts, flowchart diagrams, histograms, Pareto diagrams, run charts and scatter charts. These tools help by presenting data visually and organizing them using proved methods, in order to help project and quality managers to

assess control measurements, to project trends, model root causes of the problems, see correlation between two variables, etc.

ISO 9126 Software engineering – product quality

Although PMBOK recommends quality tools, it also fails to define a standard way to measure software quality level. Also, the problem is how to look at the software quality as it's not a material good or product. To standardize this International Standards Organization (ISO) defined ISO 9126 standard, entitled "*software engineering – product quality*". This standard covers software quality characteristics and quality evaluation process.

ISO/IEC (2002) standard 9126 defines six general characteristics of quality software, as follows:

- *Functionality* – are the required functions available in the software?
- *Reliability* – how reliable is the software?
- *Usability* – is the software easy to use?
- *Efficiency* – how efficient is the software?
- *Maintainability* – how easy is to modify the software?
- *Portability* – how easy is to transfer to another environment?

These six characteristics are divided into sub-characteristics, which further refine questions asked to evaluate software quality level in certain area.

Software quality evaluation is split into: *preparation* and *evaluation* (as illustrated in the figure 1). Preparing software quality evaluation encompasses four sub-phases, where quality requirements are defined for the project; then metrics for measuring certain quality properties are chosen; levels for ranking are defined (range of values which are treated as satisfactory or unsatisfactory); and evaluation criteria (summarizing results) are defined. Evaluation process encompasses three sub-phases: measurement, in which metrics are applied to software and give out certain quantitative results; ranking, in which it is evaluated if they are satisfactory or unsatisfactory; and assessment.
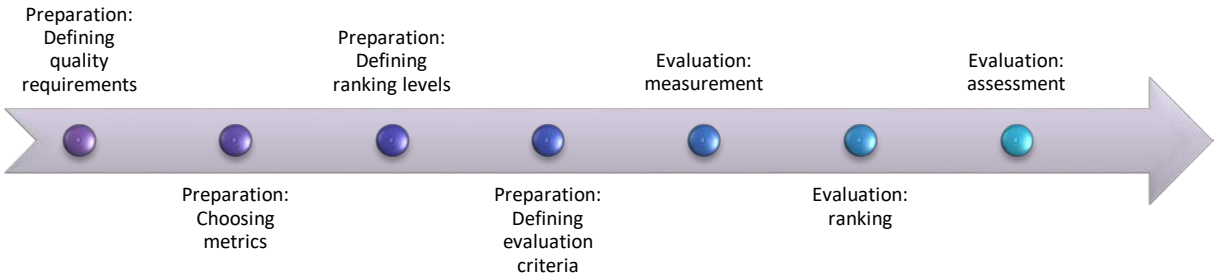
Figure 1 - Software quality evaluation process in ISO 9126 standard, ISO/IEC (2002)

Research methodology

ISO 9126 standard is present for over two decades in theory and used by large number of companies worldwide. There are number of software development methodologies used, so there are relatively few known authors that tried to improve Unified Process with quality management aspect in mind. In one of the most relevant articles, Losavio et al. (2004) presented an overview of possible integration of Unified Process methodology and ISO 9126 standard, but only in a perspective of building system architecture. Also, authors did not provide model or guidelines on how to practically integrate ISO 9126 into Unified

Process. This research aims to provide exactly that - a structured model for improving Unified Process methodology by integrating ISO 9126 standard into a new discipline.

Unified Process is adaptable methodology and there are many variants of it all over the world. IBM created Rational Unified Process, while other organizations developed Open Unified Process, Enterprise Unified Process and even a mix called Agile Unified Process (integrates agile with iterative software development approach). Since Unified Process is extendable and adaptable, we will be implementing a completely new discipline in Unified Process. This new discipline, called *quality management*, will cover all tasks, activities and artifacts used for purpose of managing software quality. New project role is also defined – a project *quality manager*, who will oversee entire quality management discipline and processes, reporting directly to project manager.

In order to adequately research proposed modified Unified Process methodology, this paper presents experimental research. Experimental research was conducted at Republic of Srpska Securities Commission[1] (RSSEC in further text), which is the capital market regulatory body in Republic of Srpska, Bosnia and Herzegovina. Author of this paper was employed by RSSEC as information technology project manager, leading development of multiple software development project.

Experimental research will compare results from four software development project at RSSEC, ranging from 2009 to 2010. Two project were using standard Unified Process model and other two were using new, modified Unified Process model with new quality management discipline, throughout project lifecycle. Since only two project employing modified model have been continually tracked and evaluated for software quality (actually have software quality level data measured and evaluated), we will evaluate two previous project that used standard model using same metrics to put in perspective level of quality between those project.

Main hypothesis of this research is that, by defining and integrating new discipline of quality management, project teams that employ modified version of Unified Process, will be able to produce software of higher quality level.

QUALITY EVALUATION PROCESS

Defining requirements and metrics
First step in quality evaluation process is definition of non-functional requirements and software quality requirements. This step is completed by extending using use case specifications with minimum acceptable level of quality. After project goes through phase of user acceptance testing, these quality will be used to evaluate is software meets acceptable minimum values.

As a next step, quality manager proposes a set of metrics from ISO 9126 standard. This standard defines three sets of metrics: internal, external and in-use metrics. During software development phase, internal set of metrics are used (ISO/IEC, 2002). For each of six general software quality characteristics, there are many sub-characteristics and many metrics. Main goal of this step is to identify suitable metrics to evaluate software. Quality manager produces list of metrics for reference, with their original.

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[1] More details regarding Republic of Srpska Securities Commission are available on official Web site: www.secrs.gov.ba

Defining rating levels and evaluation criteria

Defining rating levels is a step during which acceptable range of results from evaluations is defined. Rating levels depend on metric and the result it produces. For example, metric for evaluating suitability, entitled "functional adequacy" is calculated by following equation (ISO/IEC, 2002):

$$X = 1 - {A}/{B}$$

Equation 1 - Example of equation used to calculate result for a metric

In this equation, A represents number of functions where problems were detected, while B represents total number of tested functions. Results of this equation are in range of 0 and 1, or represented mathematically: $0 \leq X \leq 1$. When setting rating levels, we are defining minimum acceptable value, below which we treat result as unacceptable. In this example, acceptable result will be only if $X \geq 0,75$.

Defining evaluation criteria follows rating level definition and describes quantitatively how results from different metrics will be summarized. Recommended approach for summarizing results is using weighted scoring model (Saphire, 2008). Using this approach, each metric will be assigned weight. This process produces evaluation planning sheet, as in example below:

Characteristic	Sub-characteristic	Metric type	Metric name	Ranking level	Evaluation criteria (1-10)
Functionality	Suitability	External	Functional adequacy	$X \geq 0,75$	R=5
			Functional implementation completeness	$X \geq 0,90$	R=10
		Internal	Functional adequacy	$X \geq 0,75$	R=5
			Functional implementation correctness	$X \geq 0,75$	R=10
			Functional specification stability	$X \geq 0,25$	R=2

Table 1 - Example of evaluation planning sheet

Measurement, ranking and assessment

Following step in process is organizing project team, with quality manager and project manager defining new work assignments for project team member. Essentially, team members will be given role of quality controllers. Modifying project plan, work break down structure and other planning elements is done in this process, allowing time and resources to do measurements. Quality controllers will be required to take measurements and quantitatively calculate and note results of specific measurement. Measurements are done by using existing Unified Process structure: at the end of each phase and at the end of each iteration.

Important aspect of model is best practice and recommended measurement form. Following table gives template used to record measurement results for one use case specification:

Code/title of use case	K.01.001 – Adding new user to database
Characteristics	Functionality
Sub-characteristic	Suitability
Metric type	Internal
Metric	Functional implementation correctness
Measurement range	5 measurements 01/06/2010 – 17/06/2010

#	Date and time	Author	Phase	Iteration	Result
1.	01/06/2010 16:50	John Smith	Elaboration	E1	0.35652
2.	02/06/2010 12:00	Jane Doe	Elaboration	E2	0.75485
3.	02/06/2010 14:45	John Smith	Elaboration	E3	0.75000
4.	15/06/2010 12:36	Mark Jones	Elaboration	E4	0.80545

5.	17/06/2010 09:00	Jane Doe	Construction	C1	0.85000
6.	...	...	...	...	...

Table 2 - Template for recording measurement results for single use case

Based on measurements through project lifecycle, quality manager can summarize measurements by use cases, characteristics, sub-characteristics and other information, creating various graphical and pivot/cross table representations of quality levels and trends. Besides pivot charting, control charts (recommended by PMBOK) can be used to identify variations in software quality levels. Also, they define lower and upper limits, which clearly identifies if process is out of control. This is essential for project managers to timely react to problems.

Each measurements add news results, which need to be ranked – put in perspective with minimum acceptable quality levels. Ranking is done on metric, iteration and phase levels. Ranking document adds simple pass or fail grades to results.

Analysis of research results

Presentation of results

For purpose of presenting research results, we will summarize ranking data in effective manner using *radar chart*. By employing this chart, percentage of compliant use cases is clearly visible and gives sense about quality level of whole project. Summarizing data by use case on sub-characteristic level is done using following formula:

$$UC_{\ll Sub-characteristic \gg} = \frac{\sum S_{M1} * R_{M1} + S_{M2} * R_{M2} + \cdots + S_{Mn} * R_{Mn}}{\sum R_{M1} + R_{M2} + \cdots + R_{Mn}}$$

Equation 2 - Formula used to summarize evaluation results on sub-characteristics level

Where S_{Mn} represents either acceptable (value 1) or unacceptable result for metric (value 0), and R_{Mn} represents evaluation criteria for metric. We are using previously defined evaluation criteria to summarize results by employing weighted scoring model.

Standard Unified Process Model

Two projects that employed standard Unified Process model have been evaluated after their development has been completed. As proposed by ISO 9126 (2002) external metric are used to evaluate software quality during testing stages of software development lifecycle or during operation phase. As seen in figure 2, two projects do not reach top values in sub-characteristics, except for co-existence, installability and adaptability.
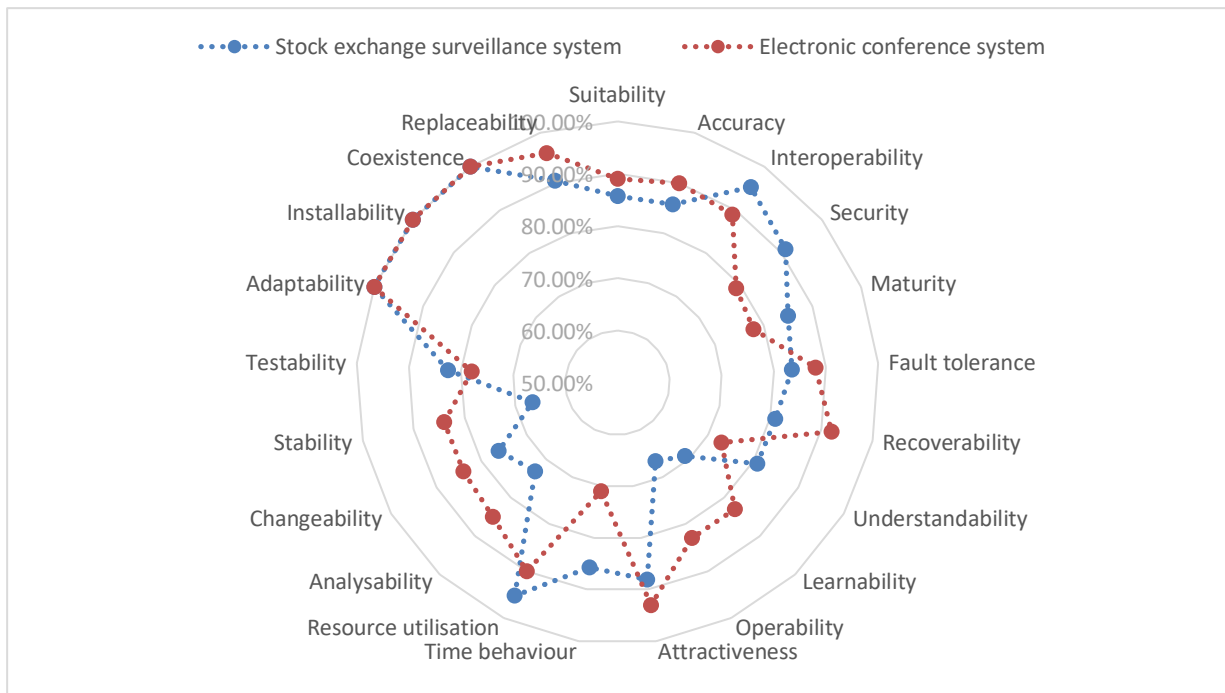
Figure 2 - Software quality level in two projects that used standard Unified Process model

Figure 3 represents data obtained by looking at each project at metric level, and then calculating standard deviation and summarizing it at sub-characteristic level. This chart shows that there is deviation present in quality levels.
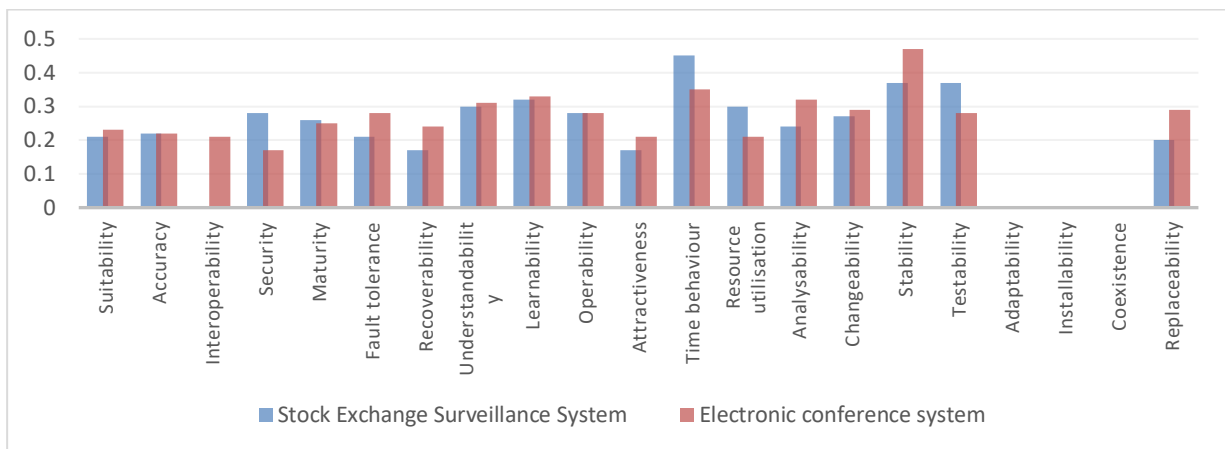
Figure 3 - Standard deviation at metric level, summarized at quality sub-characteristic level in two projects that used standard Unified Process model

Modified unified process model

Two projects that employed modified Unified Process model have been evaluated during their development, starting from first phase of process (inception). As proposed by ISO 9126 (2002) internal metric are used to evaluate software quality during development stages, by testing non-executable code (source code). As seen in figure 4, two projects reach top values (greater than 95%) in nearly all sub-characteristics.
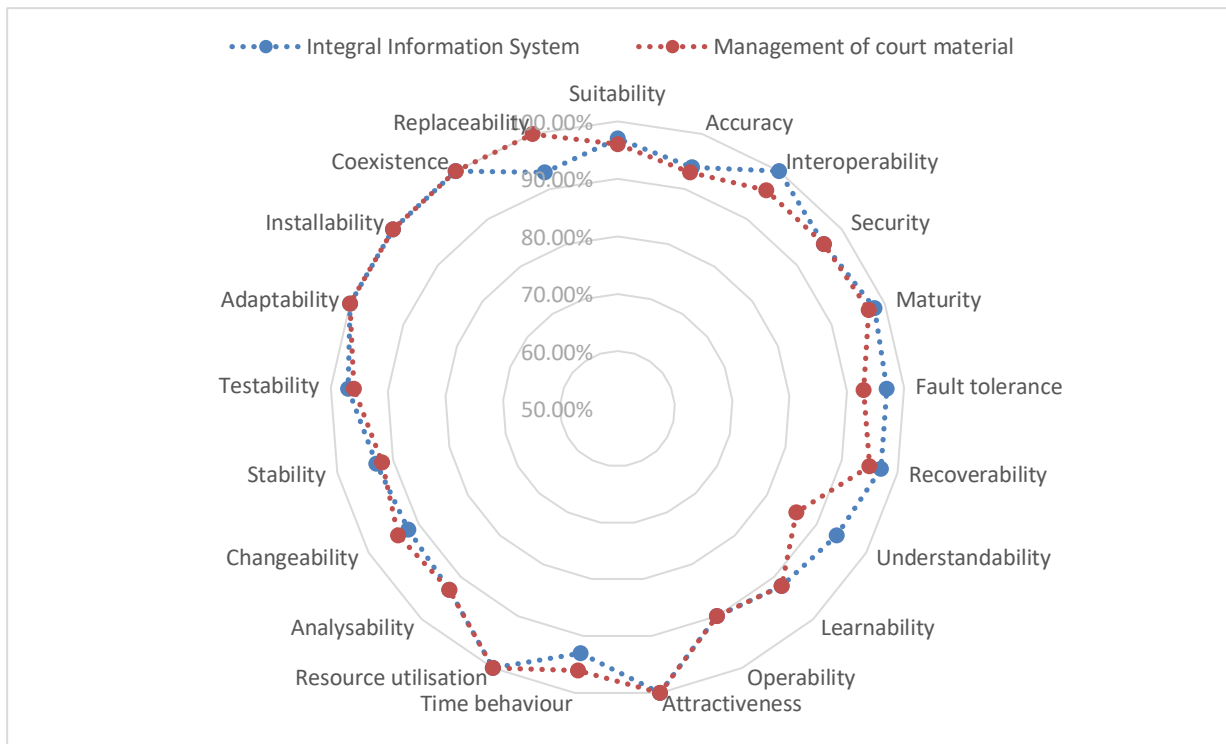
Figure 4 - Software quality level in two projects that used modified Unified Process model

As presented in figure 5 standard deviation is lower than in projects that were using standard Unified Process mode, although some variation is still present.
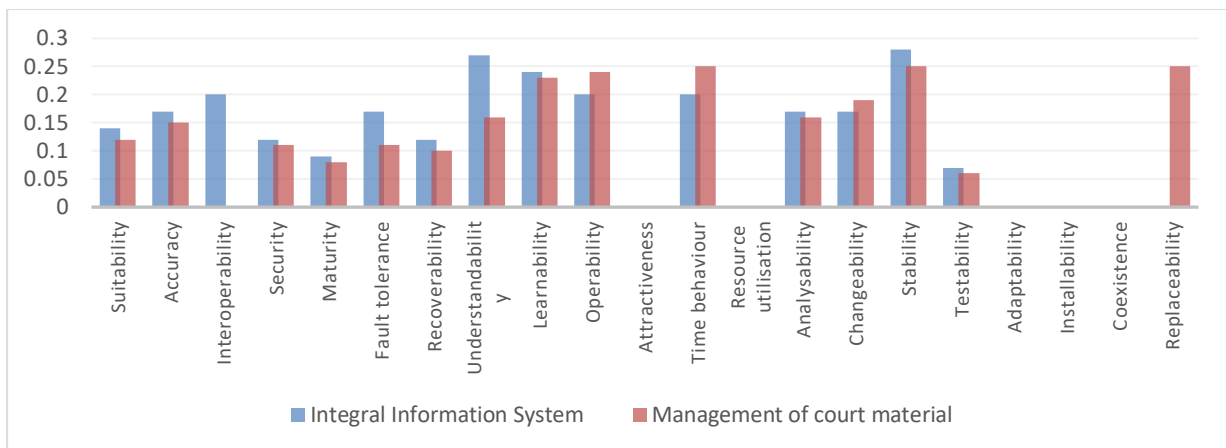
Figure 5 - Standard deviation at metric level, summarized at quality sub-characteristic level in two projects that used modified Unified Process model

DISCUSSION

In order to prove our main hypothesis, we have to prove that modified Unified Process model improved software quality levels. In research results we have provided software quality levels for both models. Figure 6 visualizes software quality levels in a single chart, grouped by software quality characteristics and summarized by model (including all projects which model was applied to).
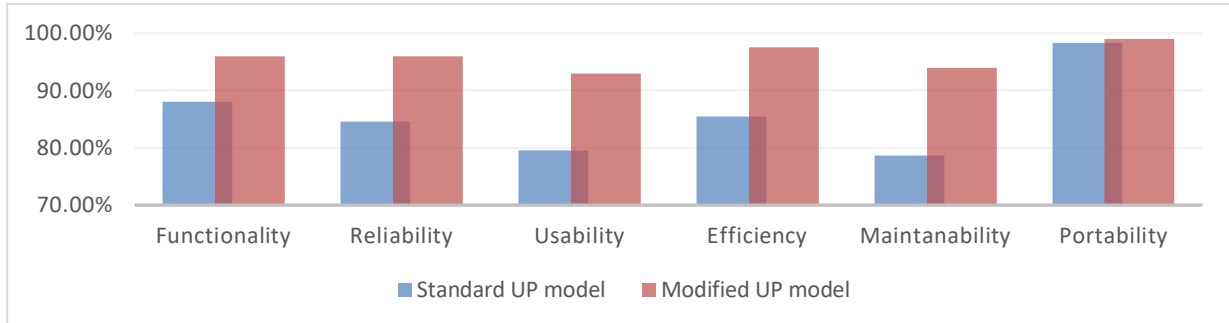
Figure 6 - Comparing software quality level of projects developed using standard and modified Unified Process model, grouped by quality characteristics

As we can see, modified Unified Process model, which integrates Unified Process, PMBOK and ISO 9126 indeed *produces higher software quality level*. Software quality improvement ranges from 0.69% to 15.32%, averaging at 10%. Looking at data in figures 4 and 5, we can conclude that applying modified model contributed to normalizing quality levels, reducing standard deviation and achieving high quality levels in nearly all characteristics.

Radice (2000) indicates in his research that applying tools for statistical process control (Ishikawa tools, recommended by PMBOK), is critical to achieve process control, which is one of the factors for achieving better final software quality levels in modified model. Apart from that, it is important that modified model used these tools continually and evaluated quality in each of the Unified Process phases, as recommended by Gibbs (2007).

If we make reference to Capability Maturity Model, it defines five maturity levels and criteria by which a process or model can be ranked (Miyachi, 2001). Standard Unified Process model is at level 3 (defined), while modified model conforms to all requirements of level 4 (managed) and two requirements of level 5 (optimized), because all of the key processes are implemented: quantitative process management, quality management, defect prevention and management of technology change.

Conclusion

This paper presented structured and systematic process by which new modified Unified Process methodology was built. Integrating Unified Process with quality tools recommended by PMBOK and ISO 9126 standard, we were able to produce a model which was set to improve software quality. Using experimental research, we confirmed that modified model was more successful and helped project team achieve high software quality levels, when compared to standard model. Identified improvement on model basis was more than 10%, indicating there was not a case of statistical errors, but a case of major quality improvement.

This research did not explicitly change existing ISO 9126 models, however, it identified several possible research directions in order to further improve modified Unified Process model. First, ISO 9126 uses both subjective and objective metric gathering tools, with subjective tools being user/consumer

interviews. These tools can generate subjective evaluations of software and further research can potentially identify any tools that can generate more objective data.

Future research will also take existing automated quality control tools and try to create infrastructure for optimizing project workloads of quality controllers and managers by automating or partially automating evaluation process. Modern integrated development environments (IDEs) such as Microsoft Visual Studio and Eclipse allow test automations, but within functional requirements.

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Multidisciplinary Decision-Making Approach to High-Dimensional Event History Analysis through Variable Reduction Methods

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A B S T R A C T

As an analytical approach, decision-making is the process of finding the best option from all feasible alternatives. The application of decision-making process in economics, management, psychology, mathematics, statistics and engineering is obvious and this process is an important part of all science-based professions. Proper management and utilization of valuable data could significantly increase knowledge and reduce cost by preventive actions, whereas erroneous and misinterpreted data could lead to poor inference and decision-making. This paper presents a class of practical methods to analyze high-dimensional event history data to reduce redundant information and facilitate practical interpretation through variable inefficiency recognition. In addition, numerical experiments and simulations are developed to investigate the performance and validation of the proposed methods.

1. INTRODUCTION

Analytics data driven decision-making can substantially improve management decision-making process. In social science areas such as economics, business and management, decision-making is increasingly are based on the type and size of data, as well as analytic methods. It has been suggested that new methods to collect, use and interpret data should be developed to increase the performance of the decision makers (Lohr, S., 2012) (Brynjolfsson, E., 2012).

In the fields of economics, business and management, analyzing the collected data from different sources such as financial reports and consequently determining effective explanatory variables, specifically in complex and high-dimensional event history data provide an excellent opportunity to increase efficiency and reduce costs.

In economics, term event history analysis is used as an alternative to time-to-event analysis which has been used widely in the social sciences where interest is on analyzing time to events such as job changes, marriage, birth of children and so forth (Lee, E. T., and Wang, J. W., 2013). Some aspects make difficulty in analyzing this type of data using traditional statistical models. Dimensionality and non-linearity are among those (Allison, Paul D., 1984). Analysis of datasets with high number of explanatory variables requires different approaches and variable selection techniques could be used to determine a subset of variables that are significantly more valuable to (Yao, F., 2007) (Hellerstein, J., 2008) (Segaran, T., and Hammerbacher, J., 2009) (Feldman, D. et al., 2013) (Manyika, J. et al., 2011) (Moran, J., 2013) (Brown, B. et al., 2011).

The purpose of this study is to design a procedure including a class of methods for variable reduction via determining variable inefficiency in high-dimensional event history analysis where variable efficiency refers to the effect of a variable on event history data. As an outline, the concept of decision-making process, event history analysis, and relevant data analysis techniques are presented in Section 2. The logical model for the transformation of the explanatory variable dataset is proposed and three multidisciplinary variable selection methods and algorithms through variable efficiency are designed in Section 3. The results and comparison of results with well-known methods and simulation patterns are presented in Section 4. Finally, concluding remarks, including the advantages of the proposed methods are discussed in Section 5. The computer package that we use in this research is the MATLAB® R2011b programming environment.

2. BASES AND CONCEPTS

In this section, applied introductions to decision-making process and event history analysis as well as data analysis techniques are presented.

2.1. Decision-Making Process

Decision-making theories are classified based on two attributes: (a) Deterministic, which deals with a logical preference relation for any given action or Probabilistic, which postulate a probability function instead, and (b) Static, which assume the preference relation or probability function as time-independent or Dynamic which assume time-dependent events (Busemeyer, J. R., and Townsend, J. T., 1993). Historically, the Deterministic-Static decision-making is more popular decision-making process specifically under uncertainty. The assumption of decision-making in this study falls in this category as well.

As a process of making choices by setting objectives, gathering information, and assessing alternative choices in a decision-making process, broadly includes seven steps: (1) Defining the decision, (2)

Collecting information, (3) Identifying alternatives, (4) Evaluating the alternatives, (5) Selecting best alternative(s), (6) Taking action, (7) Review decision and consequences (Busemeyer, J. R., and Townsend, J. T., 1993).

A major part of decision-making involves the analysis of a finite set of alternatives described in terms of evaluative criteria. The mathematical techniques of decision-making are among the most valuable factors of this process, which are generally referred to as realization in the quantitative methods of decision-making (Sadeghzadeh, K., and Salehi, M. B., 2010). With the increasing complexity and the variety of decision-making problems due to the huge size of data, the process of decision-making becomes more valuable (Brynjolfsson, E., 2012).

A brief review of event history analysis concept and definition of survival function is following.

2.2. Event History Analysis

Event history analysis consider the time until the occurrence of an event. The time can be measured in days, weeks, years, etc. Event history analysis is also known as time-to-event analysis which generally defined as a set of methods for analyzing such data where subjects are usually followed over a specified time period. Event history (time-to-event data) analysis has been used widely in the social sciences such as felons' time to parole in criminology, duration of first marriage in sociology, length of newspaper or magazine subscription in marketing and worker's compensation claims in insurance (Lee, E. T., and Wang, J. W., 2013) (Hosmer D. W. Jr., and Lemeshow, S., 1999) (Kalbfleisch, J. D., and Prentice, R. L., 2011).

Methods to analyze event history data can be categorized in parametric, semi-parametric and nonparametric methods. Parametric methods are based on survival function distributions such as exponential. Semi-parametric methods don't assume knowledge of absolute risk and estimates relative rather than absolute risk and this assumption is called the proportional hazards assumption. For moderate- to high-dimensional covariates, it is difficult to apply semi-parametric methods (Huang, J., Ma, S., and Xie, H, 2006). In nonparametric methods which are useful when the underlying distribution of the problem is unknown, there are no math assumptions. Nonparametric methods are used to describe survivorship in a population or comparison of two or more populations. The Kaplan-Meier Product Limit estimate is a nonparametric method which is the most commonly used nonparametric estimator of the survival function and has clear advantages since it does not require an approximation that results the division of follow-up time assumption (Lee, E. T., and Wang, J. W., 2013) (Holford, T. R., 2002).

The probability of the event occurring at time t is

$$f(t) = \lim_{\Delta t \to 0} \frac{P(t \leq T < t + \Delta t)}{\Delta t} \qquad (1)$$

In event history analysis, information on an event status and follow up time is used to estimate a survival function $S(t)$, which is defined as the probability that an object survives at least until time t:

$$S(t) = P \ (an \ object \ survives \ longer \ than \ t) = P \ (T > t) \qquad (2)$$

From the definition of the cumulative distribution function:

$$S(t) = 1 - P(T \leq t) = 1 - F(t) \qquad (3)$$

Accordingly survival function is calculated by probability density function as:

$$S(t) = \int_t^\infty f(u) du \qquad (4)$$

In most applications, the survival function is shown as a step function rather than a smooth curve. Nonparametric estimate of $S(t)$ according to Kaplan–Meier (KM) estimator for distinct ordered event times t_1 to t_n is:

$$\hat{S}(t) = \prod_{i=1}^{t}(1 - \frac{d_i}{n_i}) \qquad (5)$$

Where at each event time t_j there are n_j subjects at risk and d_j is the number of subjects which experienced the event.

A review of relevant used data analysis techniques in this study including discretization process as well as data reduction and variable selection methods is presented next.

2.3. Data Analysis Techniques

Discretization Process

Variables in a dataset potentially are a combination format of different data types such as dichotomous (binary), nominal, ordinal, categorical, discrete, and continuous (Interval). There are many advantages of using discrete values over continuous as discrete variables are easy to understand and utilize, more compact and more accurate. Quantizing continuous variables is called discretization process.

In the splitting discretization methods, continuous ranges are divided into sub-ranges by the user specified width considering range of values or frequency of the observation values in each interval, respectively called equal-width and equal-frequency. A typical algorithm for splitting discretization

process which quantifies one continuous feature at a time generally consists of four steps: (1) sort the feature values, (2) evaluate an appropriate cut-point, (3) split the range of continuous values according to the cut-point, and (4) stop when a stopping criterion satisfies.

In this study, discretization of explanatory variables of event history dataset assumed unsupervised, static, global and direct in order to reach a top-down splitting approach and transformation of all types of variables in dataset into a logical (binary) format. Briefly, static discretization is dependent of classification task, global discretization uses the entire observation space to discretize, and direct methods divide the range of k intervals simultaneously. For a comprehensive study of discretization process, see (Liu, Huan, et al., 2002).

Data Reduction and Variable Selection Methods

Data reduction techniques are categorized in three main strategies, including dimensionality reduction, numerosity reduction, and data compression (Han, J. et al, 2006) (Tan, P. et al., 2006). Dimensionality reduction as the most efficient strategy in the field of large-scale data deals with reducing the number of random variables or attributes in the special circumstances of the problem. All dimensionality reduction techniques are also classified as feature extraction and feature selection approaches. Feature Extraction is defined as transforming the original data into a new lower dimensional space through some functional mapping such as PCA and SVD (Motoda, H., and Huan, L., 2002) (Addison, D. et al., 2003). Feature selection is denoted as selecting a subset of the original data (features) without a transformation in order to filter out irrelevant or redundant features, such as filter methods, wrapper methods and embedded methods (Saeys, Y. et al., 2007) (Guyon, I., and Elisseeff, A., 2003).

Variable selection is a necessary step in a decision-making process dealing with a large-scale data. There is always uncertainty when researchers aim to collect most important variables specifically in the presence of big data. Variable selection for decision-making in many fields is mostly guided by expert opinion (Casotti, M., n.d.). The computational complexity of all the possible combinations of the p variables from size 1 to p, could be overwhelming, where the total number of combinations are $2^p - 1$. For example, for a dataset of 20 explanatory variables, the number all possible combinations is $2^{20} - 1 = 1048575$.

Next section presents proposed methodology for multidisciplinary decision-making approach based on proposed analytical model, designed methods and heuristic algorithms for explanatory variable subset selection.

3. METHODOLOGY

In this section, first proposed analytical model for transformation of the explanatory variable dataset to reach the logical representation as a sort of binary variables is presented. Next, in order to select most significant variables in terms of inefficiency, designed variable selection methods and heuristic clustering algorithms are introduced.

3.1. Logical model

A multipurpose and flexible model for a type of event history data with a large number of variables when the correlation between variables is complicated or unknown is presented. The logical model is to simplify the original covariate dataset into a logical dataset by transformation lemma. Next, we show the validation of this designed logical model by correlation transformation (Sadeghzadeh, K., and Fard, N, in press) (Sadeghzadeh, K., and Fard, N, 2014).

The original event history dataset may include any type of explanatory. Many time-independent variables are even binary or interchangeable with a binary variable such as dichotomous variable. Also, interpretation of binary variable is simple, understandable and comprehensible. In addition, the model is appropriate for fast and low-cost calculation. The General schema of high-dimensional event history dataset includes n observations with p variables as shown in Table 1.

Table 1: Schema for high-dimensional event history dataset

Obs. #	Time to Event	Variables			
		Var. 1	Var. 2	…	Var. p
1	t_1	u_{11}	u_{12}	…	u_{1p}
2	t_2	u_{21}	u_{22}	…	u_{2p}
…	…	…	…	…	…
n	t_n	u_{n1}	u_{n2}	…	u_{np}

Each array of p variables vectors will take only two possible values, canonically 0 and 1. As discussed in Section 2, discretization method is applied to values by dividing the range of values for each variable into 2 equally sized parts. We define w_{ij} as an initial splitting criterion equal to arithmetic mean of maximum and minimum value of u_{ij} for $i = 1 \dots n, j = 1 \dots p$. The criteria w_{ij} could be defined by expert using experimental or historical data as well. For any array u_{ij} in the n-by-p dataset matrix $\boldsymbol{U} = [u_{ij}]$, then allocate a substituting array v_{ij} as 0 if $u_{ij} < w_{ij}$ and 1 if $u_{ij} \geq w_{ij}$. The proposed model assumes any array with a value of 1 as desired for expert and 0 otherwise. In other words, $v_{ij} = 0$ represent the lack of the jth variable in the ith observation. The result of the transformation is an n-by-p dataset matrix $\boldsymbol{V} = [v_{np}]$ which will be used in the following methods and algorithms. Also, we define time-to-event vector $\boldsymbol{T} = [t_n]$ including all observed event times. The logical model initially could be

satisfied by proper design of data collection process by based on Boolean logic to generate binary attributes.

To validate the robustness of this model we show that the change of correlation between variables before and after transformation is not significant and the logical dataset has followed the same pattern and behavior as the original; in terms of correlation of covariates. We define correlation matrix for each of original and transformed dataset based on Pearson product-moment correlation coefficient; $M = [m_{ij}]$ and $N = [n_{ij}]$ where $i = 1 \dots n, j = 1 \dots p$, where n_{ij} and m_{ij} denote covariance of variables i and j for original and transformed dataset respectively as follows:

$$n_{ij} = \frac{1}{n-1}\sum_{k=1}^{n}(u_{ik} - \bar{u}_i)(u_{jk} - \bar{u}_j) \qquad i = 1 \dots p, j = 1 \dots p \qquad (6)$$

$$m_{ij} = \frac{1}{n-1}\sum_{k=1}^{n}(v_{ik} - \bar{v}_i)(v_{jk} - \bar{v}_j) \qquad i = 1 \dots p, j = 1 \dots p \qquad (7)$$

where (u_{ik}, v_{ik}) and $(\bar{u}_i, \bar{v}_i)$ represent value of variable i in observation k and mean of variable i in each dataset respectively, and similarly the second parenthesis in equations(6) and (7) are defined for variable j.

The experimental fitted line for the scatter plot of m_{ij} and n_{ij} for any dataset is $y = a + bx$ where b is positive small and a is not significant. For instance, Figure 1 shows the primary biliary cirrhosis (PBC) dataset (Section 4) for an experimental result of an uncensored data with the fitted line of $y = 0.6356x + 0.0116b$.
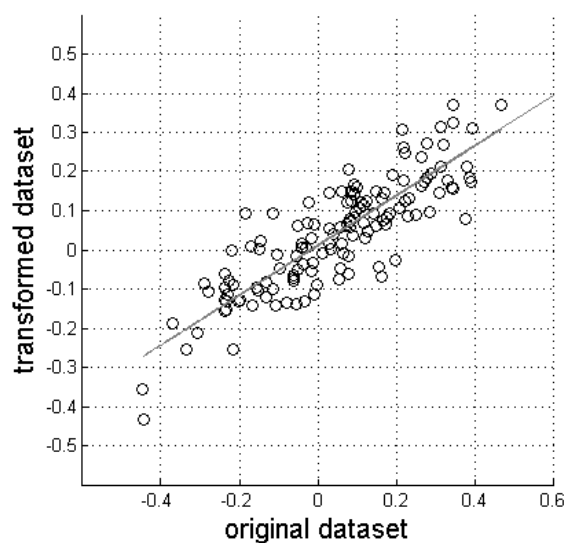
Figure 1: Comparison of covariate correlations in the original and the transformed dataset. Fitted polynomial for the uncensored PBC dataset (Section 4) is $y = 0.0116 + 0.6356x$

The proposed logical model validation and verification of the robustness were presented comprehensively in (Sadeghzadeh, K., and Fard, N, in press) and (Sadeghzadeh, K., and Fard, N, 2014).

In order to select the most significant variables in terms of inefficiency, methods and algorithms are presented next.

3.2. Designed Methods and Heuristic Algorithms

We design a class of methods applying on proposed logical model to select inefficient variables in a high-dimensional event history datasets. The major assumption to design appropriate methods for this purpose is that the variable which is completely inefficient solely can provide a significant performance improvement when engaged with others, and two variables that are inefficient by themselves can be efficient together (Guyon, I., and Elisseeff, A., 2003). Based on this assumption, we design three methods and heuristic algorithms to select inefficient variables in event history datasets with high-dimensional covariates. We use Kaplan-Meier estimator in this study to estimate survival probabilities as a function of time. The n-by-p matrix V is the prepared transformed logical dataset according to Section 3.1, where n is the number of observations, p is the number of variables, and k is the estimated subset size to select for calculation parts in the algorithms.

Recalling V which is constructed by k observation vectors corresponding to each of the variables, $D = [d_{kp}]$ as a k-by-p matrix is a selected subset of V and k is defined as the number of observations in any subset of V, where $k \leq n$. For any variable i, we define vector O^i as a time-to-event vector which includes failure times of any observation j the value of v_{ij} is one. Similarly, we define vector Z^i including failure times of any observation j where the value of v_{ij} is zero. The vectors R and S are defined as follow:

$$r_i = \begin{cases} t_i, & \sum di. \geq 0 \\ 0, & Otherwise \end{cases} \qquad i = 1 \dots n \tag{8}$$

$$s_i = \begin{cases} t_i, & \prod di. = 1 \\ 0, & Otherwise \end{cases} \qquad i = 1 \dots n \tag{9}$$

Vector R is constructed by all non-zero arrays r and similarly vector S is constructed by all non-zero arrays s.

We propose three methods and algorithms to select inefficient variables as follows:

Singular Variable Effect Algorithm

The objective of Singular Variable Effect (SVE) method is to determine the efficiency of a variable by analyzing the effect of the presence of any variable singularly in comparison with its absence in a transformed logical dataset. For p variable, we aim to set vector $\Delta = [\delta i]$ where $i = 1 \dots p$ to rank the efficiency of the variables. The preliminary step for the highest efficiency in this method is to initially clustering the variables based on the correlation coefficient matrix of original dataset, **M**, and choose a representative variable from each highly correlated cluster and eliminate the other variables from the dataset. For instance, for any given dataset, if three variables are highly correlated, only one of them is selected randomly and the other two are eliminated from the dataset. The result of this process assures that the remaining variables for applying methods and heuristic algorithms are not highly correlated.

As an outcome of the SVE procedure, if one hopes to reduce the number of variables in the dataset for further analysis, could eliminate less efficient identified variables or if aims to concentrate on a reduced number of variables, could choose a category of more efficient identified variables as well. Heuristic algorithm for SVE method is:

---

for $i = 1$ to p do
Calculate O^i and Z^i for variable i observation vector in dataset **V**
Compare **T** and O^i with Wilcoxon rank sum test
Save the test score for variable i as α_i
Compare **T** and O^i with Wilcoxon rank sum test
Save the test score for variable i as β_i
Calculate $\delta_i = \alpha_i - \beta_i$
end for
Return $\Delta = [\delta_p]$ as the variable efficiency vector

---

Splitting Semi-Greedy Clustering Algorithm

Splitting Semi-Greedy (SSG) method to select an inefficient variable subset is proposed. A clustering procedure through randomly splitting approach to select the best local subset according to a defined criterion incorporated. In this method we use block randomization which is designed to randomize subjects into equal sample sizes groups. A nonparametric test is used to test a null hypothesis that whether two samples are drawn from the same distribution, as compared to a given alternative hypothesis. Wilcoxon rank sum test is used in this method.

The concept of this method is inspired by the semi-greedy heuristic (Feo, T. A., and Resende, M. G., 1995) (Hart, J. P., and Shogan, A. W., 1987) and tabu search (Gendreau, M., and Potvin, J. Y., 2005). Criterion of this search is similar to *The Nonparametric Test Score (NTS)* method (Sadeghzadeh, K., and Fard, N, in press) which is to collect the most inefficient variable subset via Wilcoxon rank sum test score. At each of *l* trials, all *p* variables from the transformed logical dataset *V* are randomly clustered into subsets of size *k* variables, where one cluster possibly contains less than *k* variables and the number

of clusters is equal to $\lceil p/k \rceil$. To calculated score summation for each variable over all trials, a randomization dataset matrix $\boldsymbol{\Xi} = [\xi_{lk}]$ where each row is formed by k variable identification numbers in any selected subsets for all l trials. Comprehensive experimental results for validation of the proposed methods by comparison with similar methods are presented next. Heuristic algorithm for SSG method is:

for i = 1 to l do
Split the data into equally sized subsets
Compose the dataset $\boldsymbol{D}$ for each subset
Calculate $\boldsymbol{R}$ over the $\boldsymbol{D}$ for each subset
Compare $\boldsymbol{T}$ and $\boldsymbol{R}$ with Wilcoxon rank sum test and save the test score for each subset one by one
Select a subset with the highest test score
Save the test score for variables in the selected subset as $\xi_{i(k+1)}$
end for
Assume $\boldsymbol{\Theta} = [\theta_p]$ as the reverse variable efficiency vector where initially each array as the cumulative contribution score corresponding to a variable is zero
for i = 1 to l do
for j = 1 to k do
Add the value of $\xi_{i(k+1)}$ to the cumulative contribution score θ_p of the variable i based on its identification number = ξ_{ij}
end for
end for
Return $\boldsymbol{\Theta} = [\theta_p]$ as the variable inefficiency vector

Weighted Time Score Algorithm

The Weighted Time Score (WTS) method is a variable clustering technique which selects set of size k variables from the transformed logical dataset $\boldsymbol{V}$ and calculates the score of each variable. The first step is to determine the observations in a selected subset which all k variables are 1 for that observation and eliminate other observation from subset. Cumulative time score over the vector $\boldsymbol{T}$ credit each of variables in the subset. Final score of all variables is reached by aggregation of those credits in l trials. Randomization algorithm randomly chooses a defined l subset of k from the $\boldsymbol{V}$, transformed logical dataset of p variable. We define a randomization dataset matrix $\boldsymbol{\Psi} = [\psi_{lk}]$ where each row is formed by k variable identification numbers in any selected subsets for overall l subsets. Heuristic algorithm for WTS method is:

for i = 1 to l do
Compose the dataset $\boldsymbol{D}_i$ for variable set i in $\boldsymbol{\Psi}$ including variables ψ_{ij} where j = 1 to k
Calculate $\boldsymbol{S}_i$ over the dataset $\boldsymbol{D}_i$
Calculate $\sum t_i$ for $\boldsymbol{S}_i$ as a time score
Save the time score for variables in subset i as $\psi_{i(k+1)}$
end for

Assume $\boldsymbol{\Omega} = [\omega_p]$ as the reverse variable efficiency vector where initially each array as the cumulative contribution score corresponding to a variable is zero
for $i = 1$ to l do
for $j = 1$ to k do
Add the value of $\psi_{i(k+1)}$ to the cumulative contribution score ω_p of the variable i based on its identification number $= \psi_{ij}$
end for
end for
Return $\boldsymbol{\Omega} = [\omega_p]$ as the variable inefficiency vector

The experiment results for these algorithms are followed in Section 4.

4. RESULTS AND ANALYSIS

To evaluate the performance of the designed methods, first well-known and publicly available primary biliary cirrhosis (PBC) dataset (Fleming and Harrington 1991) is considered as the sample collected dataset. These dataset includes 111 uncensored complete observations and 17 explanatory variables in addition to event times for each observation. In order to obtain an approximate value of desired number of variables in any selected subset, we use principal component analysis (PCA) scree plot criterion (Sadeghzadeh, K., and Fard, N, in press) (Sadeghzadeh, K., and Fard, N, 2014). For the original uncensored PBC dataset, approximation of this number is 3.

To verify the performance of the proposed methods, the result of these methods and algorithms for the transformed logical uncensored PBC dataset is compared with the results of Nonparametric Test Score (NTS) method (Sadeghzadeh, K., and Fard, N, in press), Random Survival Forest (RSF) method (Ishwaran, H. et al., 2008) (Ishwaran, I., and Kogalur, U. B., 2007), Additive Risk Model (ADD) (Ma, S., Kosorok, M. R., and Fine, J. P., 2006), and Weighted Least Square (LS) method (Huang, J., Ma, S., and Xie, H, 2006) for similar dataset variable selection, given in Table 1. A comprehensive comparison of NTS, RSF, ADD and LS performance with other relevant methods in high-dimensional time-to-event data analysis such as Cox's Proportional Hazard Model, LASSO and PCR has been presented in (Huang, J., Ma, S., and Xie, H, 2006) (Ishwaran, H. et al., 2008) (Ma, S., Kosorok, M. R., and Fine, J. P., 2006).

Each number in Tables 2 and 3 represents a specific variable in experiment dataset. For example, in Table 2, variable #1 is a selected as an inefficient variable by all methods.

Table 2: Selected inefficient variables in all proposed methods and comparison to NTS, RSF, ADD, and LS method results

Method	Selected Inefficient Variables
SVE	1, 3, 5, 10, 13, 17
SSG	1, 3, 5, 10, 15, 17

WTS	1, 3, 5, 10, 15, 17
NTS	1, 3, 5, 6, 10, 15, 17
RSF	1, 3, 5, 12, 13, 14, 15, 17
ADD	1, 2, 5, 12, 14
LS	1, 2, 3, 14, 15, 17

From the results shown on Tables 2, the SSG and WTS methods have a same performance. More than 80% of inefficient variables which has been detected by other methods (NTS, RSF, LS and ADD) are collected by proposed algorithms at significantly shorter calculation period, where the robustness of this class of methods has examined for several sample datasets.

To show variable inefficiency through three designed methods SVE, SSG, and WTS, graphical representation for the experiment results for uncensored PBC dataset is depicted in Figure 2. Each variable with larger radius and more distance from the center is less efficient and an ideal candidate to remove from dataset if it is desired.
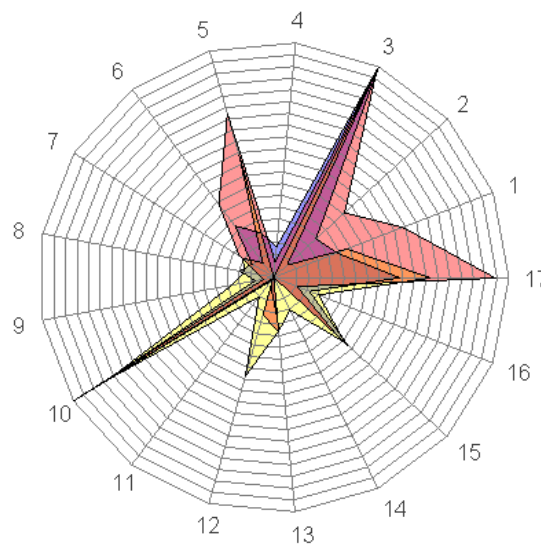
Figure 2: Radar plot of inefficient variables: Normalized inefficiency results from the transformed logical uncensored PBC dataset by SVE algorithm (red), SSG algorithm (green), and WTS algorithms (yellow).

As another validation of the proposed methods, a simulation is designed. We set $n = 400$ observations and $p = 15$ variables and simulated event times from a pseudorandom algorithm. We also set first five variables inefficient, where first two are absolutely inefficient. Some variable vectors are set as a linear function of event time data in addition to constant and periodic binary numbers as well as normal and exponential distributed pseudorandom numbers as independent values of explanatory variables. The results of methods and algorithms applying the simulated data are presented in Table 3. These results are compared with the results from NTS method. From the simulation defined pattern the comparison verifies the performance of all proposed methods.

Table 3: Selected inefficient variables in all proposed methods and comparison to NTS results and simulation defined pattern

Method	Selected Inefficient Variables (No.)
SVE	1, 2, 3, 10
SSG	1, 2, 3
WTS	1, 2, 3, 5, 12
NTS	1, 2, 5
Definition	1, 2, 3, 4, 5

Inefficiency analysis results for the simulation experiment shows that variables with identification number 1, 2 and 3 are detected as inefficient variables by all proposed methods. To reduce the number of variables in the dataset for further analysis, these explanatory variables are the best candidates to be eliminated from the dataset.

5. CONCLUSIONS

The proposed logical model, designed variable selection methods, and heuristic clustering algorithms in this paper are beneficial to explanatory variable reduction through an inefficient variable selection approach to obtain an appropriate variable subset in high-dimensional and large-scale event history data in order to avoid difficulties in decision-making.

By using such novel methods in the fields of economics, business and management, data analysis and decision-making processes will be faster, simpler and more accurate. For example, in business applications, many explanatory variables in a customer survey are defined based on cause and effect analysis process data or similar analytic process outcome. In most cases, correlations of these explanatory variables are complicated and unknown, and it is important to simply understand the efficiency of each variable in the survey. These procedures potentially applicable solutions for many problems in a vast area of science and technologies are presented.

Next step in this study is to considering event data and time-to-event models including new types of dependent variables through well-known models such as accelerated failure time and applying heuristic algorithms especially in the field of artificial intelligence.

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Capital Flight and Unemployment in Nigeria: An Empirical Investigation.

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A B S T R A C T

The growth rate of unemployment in Nigeria is becoming an issue of great concern therefore calling the attention of stake holders to seeking solution to it. On the other hand, capital flight is another issue that has generated great concerns among economists with regards to its growth over the decades particularly in developing countries of which Nigeria is one on the top of the list as shown in the literature. Given these, it is highly essential that the attendant effects of this incredible growth of capital flight are found, however some of these effects are already mentioned in the literature. Given the growth rate of unemployment in Nigeria and the failure of many policies prescribed by the government of Nigeria to curb it, it has therefore become very clear that there are still more factors contributing to unemployment than the ones known. Solving the unemployment problem demands the knowledge of all factors contributing to it. In this paper, capital flight is identified as one of the factors contributing to unemployment in Nigeria. The Ordinary Least Squares Method including Co-integration and Error Correction Mechanism (ECM) were used to investigate this assertion. It was found that in the short run, capital flight contributes positively to unemployment in both current and next years while in the long run, it only contributes positively in the current year while contributing negatively in the next year but leaving an unemployment gap as the contribution of the current year is greater than that of the next year.

1. INTRODUCTION

The outflow of capital from developing countries has increased greatly over the years particularly in Africa. This is becoming a big problem and it is generating serious concerns as it has made Africa a 'net creditor' to the rest of the world as shown by Ndikumana and Boyce (2001). A recent study produced by Global Financial Integrity (GFI) estimates illicit financial flows out of all developing countries at $858 billion to $1.06 trillion a year (Kar and Cartwright-Smith, 2010).

The size of capital flight in developing countries is assuming a serious dimension and posing huge threat to sustainable growth especially in Africa (Ayadi, 2008). Africa lost about USD 700 billion between 1970 and 2008 as a result of capital flight. If flight capital had been

reinvested in Africa with the same level of productivity as that of actual investment, estimates presented in this report suggest that the rate of poverty reduction could have increased 4-6 percentage points a year, on average, over the period from 2000 to 2008 (African Economic Outlook, 2012). The enormity of such a huge outflow of illicit capital explains why donor-driven efforts to spur economic development and reduce poverty have been underachieving in Africa (Kar and Cartwright-Smith, 2010).

Table 1: Africa Illicit Financial Flows, 1970-2008 (in millions of U.S. dollars)

Group	Total IFFs				
	1970s	1980s	1990s	200-2008	1970-2008
Africa	**57,291**	**203,859**	**155,740**	**437,171**	**854,061**
North Africa	19,161	72,020	59,813	78,742	229,737
Sub-Saharan	38,130	131,839	95,927	358,429	624,324
Horn of Africa	2,354	14,131	5,108	15,603	37,197
Great Lakes	6,925	16,079	4,978	10,285	38,267
Southern	5,894	20,581	31,447	116,828	174,751
West and Central	22,956	81,047	54,394	215,712	374,109
Fuel-exporters	20,105	67,685	48,157	218,970	354,917
Nonfuel-exporters	7,867	26,517	22,375	23,342	80,102

Source: Kar and Cartwright-Smith(2010)

Table 1 above showed a detailed account of the illicit financial flow from Africa: Africa lost $57,291 million in the 1970s, $203,859 million (an increment above 100%) in 1980s, the amount reduced to $155, 740 million in the 1990s and has increased greatly to $437,171 million as at 2008.

The proportion of the Sub-Sahara African (SSA) countries is enormous. This actually has generated serious concerns about the region. Sub-Sahara African countries had 66.55%, 64.67%, 61.59% and 81.99% proportions in 1970s, 1980s, 1990s and 2000-2008 respectively. It had a total of 73.10% proportion in the total sum of illicit financial flows during the periods 1970-2008. Ndikumana and Boyce(2012) reported that capital flight has become a chronic problem in the region. Between 1970 and 2010 total capital flight from the 33 SSA countries covered in this report amounts to $814.2 billion in constant 2010 dollars. These countries lost $202.4 billion between 2005 and 2010 alone.

This has great attendant effects on the economies of the affected countries. As noted by Herkenrath (2013), the Organisation for Economic Co-operation and Development (OECD) puts it, IFF "strip resources from developing countries that could be used to finance much-needed public services, from security and justice to basic social services such as health and

education, weakening their financial. Debt burdens, poor wealth distribution, scarce of resources for domestic investments and productive activities are also part of the effects mentioned {see Fofack and Ndikumana(2010), Boyce and Ndikumana(2010,2011,2012)}

The table below shows the capital flight of 33 SSA countries as computed by Ndkumana and Boyce(2012) for the years 1970-2010.

Table 2: Capital flights and unemployment rate in 33 SSA countries.

	Country	Total Capital Flight (billion, constant 2010 $)	Unemployment
1.	Nigeria	311.4	23.9%(2011)
2.	Angola	84.0	26%(2013)
3.	Cote d'Ivoire	56.0	15.7%(2008)
4.	South Africa	38.5	24.4%(2012)
5.	Sudan	38.4	20%(2012)
6.	Congo, Democratic Republic	33.9	46.1(2013)
7.	Gabon	25.5	16%(2010)
8.	Ethiopia	24.9	17.5%(2012)
9.	Mozambique	20.7	17%(2007)
10.	Cameroon	20.0	13.5%(2012)
11.	Congo, Republic	19.9	25%(2012)
12.	Zimbabwe	18.3	95% (2009)
13.	Zambia	17.3	14%(2006)
14.	Tanzania	14.7	10.7%(2010)
15.	Ghana	12.4	12.9%(2005)
16.	Madagascar	11.7	3.8%(2010)

Table 2(Continued)

	Country	Total Capital Flight (billion, constant 2010 $)	Unemployment
18.	Rwanda	9.3	3.4%(2012)
19.	Uganda	8.4	4.2%(2010)
20.	Burundi	6.9	35%(2009)
21.	Kenya	4.9	40%(2011)
22.	Seychelles	4.6	3.3%(2013)
23.	Cape Verde	3.9	10%(2013)

24.	Botswana	3.8	7.5%(2007)
25.	Mauritania	3.1	30%(2008)
26.	Central African Republic	2.7	16.1%(2005)
27.	Chad	1.6	22.6%(2006)
28.	Guinea	1.6	22.3%(2009)
29.	Burkina Faso	1.5	77%(2004)
30.	Malawi	1.4	3%(2011)
31.	Sao Tome And Principe	1.1	13.8%(2013)
32.	Lesotho	1.0	45%(2002)
33.	Swaziland	1.0	40%(2006)
	Total 33 countries	**814.2**	**7.5%(2012)**

Source: Capital flight (Ndikumana and Boyce(2012), Unemployment(compiled by the author from various sources)

* The bracket beside the unemployment rate indicates the year the data was reported.

The table also shows the unemployment rate of the countries. It is sad that most of the countries do not have up to date statistical records. However, it could be seen that the first fifteen countries on the table had unemployment rate above 10%. This may make one to ask: does capital flight contributes to unemployment? If it does, in what way does it contribute, positively or negatively?

The objective of this paper is to show empirically if capital flight has a significant impact on unemployment rate. Nigeria will be used as a case study. Therefore, the scope of this paper is limited to Nigeria only and the data that will be used will range from 1980-2013.

This paper is therefore divided into the next following sections, first is the review of related literatures, the theoretical review after which is the unemployment situation in Nigeria then a discussion on the measurement of capital flight, the methodology, discussion of findings policy implications and conclusion.

2.1 LITERATURE REVIEW

This chapter discusses relevant literature on capital flight, its determinants and how it affects an economy.

Capital flight has been said to be a major cause for high indebtedness of developing countries. Ajayi(2005) noted that when resources are being lost in the form of capital flight, there are

several long-term effects. The first is that the availability of resources for domestic investment is reduced. The rate of capital formation is reduced by capital flight and this adversely affects the country's current and future prospects. Income that is generated abroad as well as wealth held abroad are outside the purview of relevant authorities and cannot be taxed. The resulting effects are a reduction in government revenue and its debt servicing capacity. Therefore, it appears a meaningful resolution of the African debt crisis might involve the arrest of capital flight from Africa (Jimoh, 1991).

On the determinants of capital flight in Nigeria, if an opinion poll is to be conducted majority of Nigerians would say corruption. This is as a result of the high corruption perception in Nigeria. However, beyond opinion polls, economists have identified corruption as one of the factors causing capital flight (Jimoh, 1991;Ajayi, 2005;adetiloye, 2012; Quan and Meenakshi, 2006; Gerald, 2005; Ndikumana and Boyce, 2001; Valerie, et. al., 2005). However corruption is a non-economic variable and its measurement might be challenging. Jimoh(1991) however measured it by using the number of persons convicted and sentenced to prison for offences related to primitive capital accumulation. Using an Ordinary Least Squares(OLS) method of estimation, Quan and Meeknakshi concluded that a positive relationship exists between corruption and capital flight. Another non economic variable is political instability and this has been proven to affect capital flight as corruption.

Schneider(2003) identified inflation as one of the asymmetric information and risk that causes capital flight. Ajayi(1995) noted that when a rising fiscal deficit is financed through the printing of money, it leads to inflationary pressure. To avoid the erosion of their monetary balances by inflation, moving out of domestic assets is one way of avoiding inflation tax. When fiscal deficit is financed through bond sales, domestic residents may expect that at some future date their tax liabilities may increase to pay for the national debt. This would encourage domestic investors to move their assets to foreign countries to avoid potential tax liabilities. Two major works are noted here: firstly, Jimoh(1991) used OLS method to test the impact of difference in domestic and foreign inflation on capital flight, and Li(2012) used the same method of estimation but tested the impact of change in domestic inflation on capital flight. Both of them concluded that there is positive relationship. Davies(2007) likewise stated that low inflation helps to curb capital flight in post-conflict economies by using a panel data set for 77 countries.

Another key determinant is the exchange rate. Schneider(2003) also recognised exchange rate depreciation as an asymmetric risk that affects capital flight. Jimoh(1991) tested the impact of exchange rate over valuation on capital flight. He measured the over valuation as the difference between the effective nominal exchange rate and the trend value of exchange rate. He concluded that a positive relationship exist between capital flight and exchange rate over valuation. Ayadi(2008) also tested the impact of exchange rate which he measured as an average of the yearly exchange rate on capital flight. He concluded that exchange rate depreciation increases capital flight. However Valerie, et. al. (2005), Akanni(2007) and Ajilore(2010) have argued that the value of the external debt be adjusted to changes in the exchange rate.

Ayadi(2008) also showed that interest rate attractiveness causes capital flight. He did this by testing the impact of interest rates differential on capital flight. He concluded that a negative relationship existed among the two. He measured interest rates differential as a difference between domestic short term rate and the United States' 3-month Eurodollar rate (or Nigeria's short term rate minus the US 3-months Eurodollar rate). However, Jimoh(1991) showed that interest rate differential is not a major determinant as it was not significant. It is of much concern anyway to draw a conclusion from the research work as the stationarity tests were not carried out on the variables tested.

On the effects of capital flight, Ndikumana and Boyce(2012) identified six effects of capital flight:

> First, by draining valuable national resources, capital flight widens the resource gaps faced by these countries, perpetuating their dependence on external aid. Moreover, by deepening the resource gaps, capital flight slows down capital accumulation and long-run growth.

> Second, capital flight frustrates African countries' efforts to increase domestic resource mobilization. It erodes the tax base and public expenditure through illicit transfer of private capital abroad, tax evasion and tax avoidance by individuals and companies, and outright embezzlement of government revenue by corrupt officials. These perverse effects force governments to incur further debts, part of which ends up fueling more capital flight.

Third, by draining government revenues and retarding growth, capital flight undermines the poverty reduction agenda.

Fourth, capital flight is both a symptom and an outcome of governance breakdown in source countries as well as in the international financial system. It is a result of corruption, dysfunctional regulation and weak enforcement of rules.

Fifth, capital flight worsens income inequality and it has important social and equity implications. Insofar as the perpetrators of capital flight, tax evasion and tax avoidance are the economic and the political elites, capital flight makes tax incidence more regressive in that wealthy residents incur relatively smaller tax burdens than would otherwise be the case.

Finally, capital flight has important political economy implications for the distribution of power. The political elites are able to consolidate power by financing their oppressive machinery with illicit wealth. As a result, capital flight strengthen dictatorships and provides the means to perpetuate autocratic regimes, as evidenced by the cases of Mobutu in the former Zaïre and the various military dictatorships in Nigeria, Gabon, and Equatorial Guinea.

Furthermore, Herkenrath(2012) identified some social and political implications of capital flight: first is undermining of necessary political changes, secondly, eroding of good governance and distortion of economic policy and also weakning of social and political stability in developing countries.

The impact of capital flight on economic growth has been tested empirically (see Adaramola and Obalade, 2013; Umoru, 2013; Kolapo and Oke, 2012; Otene and Edeme, 2012 and Njimated, 2008).

Two major works are worthy of noting here: Njimated(2008) used Two-Stage Least Squares method to investigate the impact of capital flight on economic growth in Cameroon, likewise, Otene and Edeme did the same for Nigeria using the same method. They both concluded that capital flight has a negative impact on economic growth.

More to the effects, Lin and Wang(2004) tested the relationship between capital outflow and unemployment in the G-7 countries. They specified the model using FDI outflow and Outflow

portfolio investment as the independent variables. They concluded that the outflow FDI reduces unemployment in home countries however the portfolio investment was insignificant in all countries but US where it shows a positive relationship with unemployment.

Lin and Wang(2008) also used panel data to test the relationship between capital outflow and unemployment for 33 countries. They concluded that a positive relationship existed among outflow FDI, outflow portfolio and unemployment.

2.2 RESEARCH GAP

The impact of capital flight on unemployment has not been clearly shown empirically in the literature. However most of them have shed lights on how capital flight affects unemployment in developing countries.

Given the above, the objective of this paper is to show empirically, the impact of capital flight on unemployment using Nigeria as a case study. This paper tends to answer the following research questions:

    i.   What is the relationship between capital flight and unemployment?

    ii.   Does capital flight has a significant impact on unemployment?

2.3 THEORETICAL REVIEW

The theory on the relationship between capital flight and unemployment may not have been explicitly shown. However, the problem of capital mobilisation in developing countries could serve as a basis for this discussion.

Developing countries have been said to have slower growth rate, high level of poverty, low standard of living, unemployment among other problems as a result of low capital formation. (see Hayami and Godo, 2005:43-45; Agarwal, 1996:7-9). It all start from low income, to low savings, to low capital formation then to low standard of living and then back to low income. This movement is termed the vicious circle of poverty (see Jhingan, 2008).

Loans and grants are being given to developing countries so as to improve domestic capital formation, increase domestic investments and thereby reduce unemployment rate. When capital formation increases, investment is expected to increase leading to reduction in unemployment.

Capital flight competes with domestic investment as it reduces capital formation thereby leading to increase in unemployment rate.

The major problem here is the loans and grants given to developing countries especially the SSA countries including income generated from the natural resources in these countries which could aid the reduction of unemployment have been lost due to capital flight.

2.4 UNEMPLOYMENT SITUATION IN NIGERIA

One of the major problems Nigeria is faced with currently is unemployment. From available data, it is clearly shown that unemployment rate has been on an increasing trend. According to National Bureau of Statistics (NBS), the 2011 Annual Socio-Economic Report gave an unemployment rate of 24% compared to 21% in 2010. The unemployment rate was higher in rural areas (26%) than urban areas (17%). An average of 1.8 million people has entered the active labour market every year over the past five years, and the system has not been able to absorb these numbers (African Economic Outlook, 2012). Even though the official estimates of unemployment in Nigeria are not too robust, and they contradict the general opinion about the problem, however, they indicate that there have been steady fluctuations in unemployment rate in Nigeria (Osinubi, 2005). Unemployment rate rose from 11.9% in 2005 to 23.9% in 2011. Salami(2013) noted in Doreo Partners(2013), unemployment rate is growing at the rate of 16% per year.

The problem of unemployment becomes disturbing when the youth unemployment is considered. In 2011, 37.7% of Nigerians age 15-24 and 22.4% of those between ages 25-44 that are willing to work cannot find work. On the average, youth unemployment rate in Nigeria was 46.5% in 2011(BGL, 2012). Salami(2013) also noted that Nigeria's spiralling youth unemployment can be said to have significantly contributed to the dramatic rise in social unrest and crime such as Niger Delta militancy, Boko Haram and the Jos crisis. This was empirically investigated by Torruam and Abur(2014). Using the Granger Causality based on Toda-Yamoto Approach, they concluded that unemployment granger cause crime in Nigeria.

The effect of unemployment is growing beyond crime rates; there have been records of stampede at recruitment centres as a result of large crowds seeking employment whereby some have led to deaths of the job seekers. A recent example is that of Nigeria Immigration Service recruitment exercise.

The Government has at various times and through various schemes 'preached the gospel' of self employment and skill acquisitions for youth and graduates. Some of the schemes include National Youth Service Corps (NYSC), National Poverty Eradication Programme (NAPEP), You-Win, etc. However, it seems these are not working.

Defining capital flight is an issue of discussion as its definition depends on the measurement method to be used. However, for a start, it is referred to as the illicit outflow of capital. Nigeria is a leading country in capital flight among other sub-Saharan African countries. Capital flight in Nigeria is more severe than it is elsewhere in other Sub-Saharan Africa countries. Although reliable and comprehensive data does not exist on the magnitude of capital flight from countries of low-income Africa, it is believed that capital flight particularly from Nigeria has been substantial (Saheed and Ayodeji, 2012).

The chart below shows the trend of capital flight in Million US dollars as reported by Kar and Cartwright-Smith(2010): it is shown that capital flight was growing at low rate before year 2000 however, the growth has been increasing incredibly after that period. An average of $15835.4 million was taken out of Nigeria during the years 2000-2009. It grew at an average rate of 32.6% during the period.
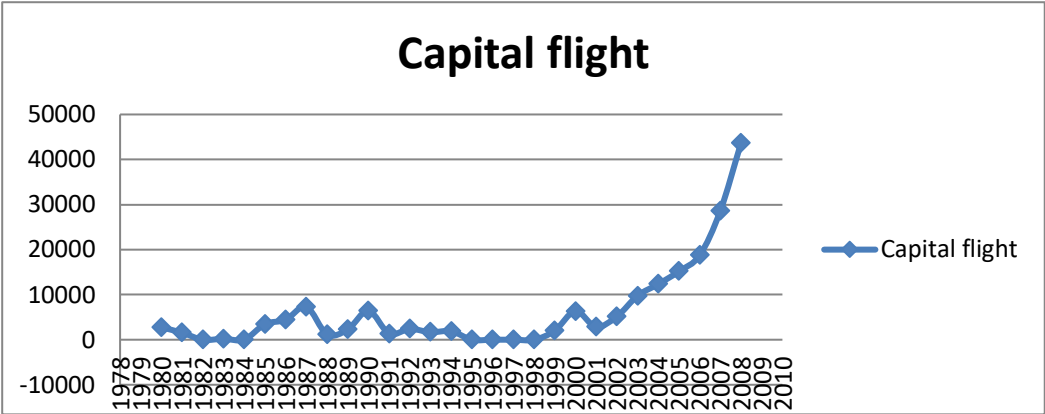
Author's computation using Excel

2.5 MEASUREMENT OF CAPITAL FLIGHT

Capital flight, largely because of its loose definition, is very difficult to measure (Ajilore, 2010). However in past researches, various methods of measurement have been used. Very common among them are the World Bank(1985), Erbe(1985), Cuddingtion(1986), Morgan Guaranty Trust Company(1986) and Khan(1989).

The World Bank method has however been said to cover capital consisting of private capital outflows of any kind that result in the acquisition of foreign assets by the residents of a country however, it is unable to capture illicit flows generated through the mispricing of trade transactions.(see Kar and Cartwright-Smith(2010) and Ajilore(2010)). Therefore a trade misinvoicing model has been suggested whereby the total import and export discrepancies will be added to the World Bank measure.

The Central Bank of Nigeria has carried out a Survey of Foreign Assets and Liabilities in an attempt at collecting such reliable statistics, and provides additional data for the compilation of the country's Balance of Payments and International Investment Position statistics. The survey collects data on: Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Other Capital Flows (OCF) for both inward and outward capital flow in line with international best practice (Mohammed, et. al., 2011). The differences found in the survey are added to the Net Errors and Omissions (NEO) in the Balance of Payments and not only that, also the import and export discrepancies. Since capital flight is essentially concealed, they show up in the error and omissions of the balance of payments entry (Ajayi, 1995). The WB estimates does not use the NEO while some for others it is important (Adetiloye, 2012).

Therefore capital flight is measured here as the addition of NEO to the World Bank Measure.

$$KF_t = \Delta Debt_t + FDI_t - (CAD_t + \Delta FRES_t) + NEO_t ....(1)$$

Where

ΔDebt is Change in External Debt,

FDI is the Net foreign Direct Investment,

CAD is the Current Account Deficit,

ΔFRES is change in Foreign Reserves and

NEO is Net Errors and Omissions.

3. METHODOLOGY

3.1 Model Specification

Unemployment is said to be influenced by growth rate and can also be influenced via the use of fiscal instruments. Therefore, the model is specified thus:

$$UNEM_t = f(GR_t, PE_t)\dots\dots\dots\dots\dots(2)$$

Where

$UNEM_t$ is the unemployment rate at time t,

GR_t is the growth rate at time t and

PE_t is the Fiscal Instrument at time t.

For the sake of this research, capital flight is introduced and the model becomes:

$$UNEM_t = f(GR_t, PE_t, KF_t)\dots\dots\dots\dots(3)$$

Where

KF_t is the capital flight at time t.

Expressing the model econometrically, it becomes:

$$UNEM_t = \alpha + \beta_1 GR_t + \beta_2 PE_t + \beta_3 KF_t + \mu_t\dots\dots\dots\dots(4)$$

Where α is the constant and the βs are the coefficients for the variables with μ representing the error term.

The expected signs are:

$$\frac{\partial UNEMt}{\partial GRt} < 0$$

$$\frac{\partial UNEMt}{\partial PEt} < 0$$

$$\frac{\partial UNEMt}{\partial KFt} > 0$$

The unemployment rate is measured as the proportion of labour force that was available for work but did not work in the week preceding the survey period for at least 39hours; Growth rate is the percentage change in the Real Gross Domestic Product(RGDP) while fiscal instrument is measured as a ratio of total government expenditure to RGDP.

3.2 Nature and Sources of Data

The data used for this research are solely secondary data. The data for public expenditure and the data summed up for capital flight were got from the Central Bank of Nigeria Statistical

Bulletin(2012), the data for unemployment were got from the National Bureau of Statistics and the Growth rate were got from the International Monetary Fund as made available on www.indexmundi.com.

4. ESTIMATION AND DISCUSSION OF FINDINGS

Ordinary Least Squares was the method used in this research. The estimation of equation 4, though the overall significance was good the goodness of fit was not as the R^2 was very low. This led to the introduction of the lag of capital flight. Also, in order to correct autocorrelation in the model, both the capital flight and its lag were converted to logarithms. The estimated model is:

$$UNEM_t = \alpha + \beta_1 GR_t + \beta_2 PE_t + \beta_3 LogKF_t + LogKF_{t-1}\mu_t ....(5)$$

Prior to the estimation, Augmented Dickey-Fuller test and Phillips-Perron test were carried out on each of the variables in order to ascertain their order of integration. This is done so as to prevent spurious regression (see Gujarati and Porter, 2009). The tables below show the results:

Table 3a: Augmented Dickey-Fuller Test

Variable	Level		First Difference	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept
UNEM$_t$	0.536142	0.536142	-2.899097*	-3.339996*
GR$_t$	-2.706428*	-3.013263	-4.071128***	-3.983204***
PE$_t$	2.016638	-1.5042	-3.469646**	-4.134075**
KF$_t$	-3.988662***	-3.918002**	-3.984664***	-3.830134**
KF$_{t-1}$	-2.737333*	-2.526396	-4.356232***	-4.539214***

*, **, *** indicate significant level at 10%, 5% and 1% respectively.

Author's computation using Eviews

Table 3b: Phillips-Perron Test

Variable	Level		First Difference	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept
UNEM$_t$	0.587117	-1.123318	-4.833092***	-5.204681***
GR$_t$	-4.074252***	-4.108793**	-9.530995***	-9.451519***
PE$_t$	1.266040	-2.463085	-8.030472***	-10.05939***
KF$_t$	-2.831418*	-2.801004	-3.961160***	-3.764438**
KF$_{t-1}$	-2.060377	-1.985213	-5.023404***	-5.085566***

*, **, *** indicate significant level at 10%, 5% and 1% respectively.

Author's computation using Eviews

From the above tables, it is revealed that the variables are integrated of order 1 which means they are stationary at first difference.

Table 4: Johansen Co-integration Result

Eigenvalue	Likelihood Ratio	5% Critical Value	1% Critical Value	Hypothesised No. of CE(s)
0.566113	55.51712	47.21	54.46	None **
0.434399	30.46799	29.68	35.65	At most 1 *
0.349476	13.37201	15.41	20.04	At most 2
0.015633	0.472694	3.76	6.65	At most 3

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Author's computation using Eviews

Table 5: Estimation result using OLS

Variable	Coefficient	T-statistic
C	0.5406	0.5908
GR_t	-0.1197	-1.7611*
KF_{t-1}	0.3550	2.6240**
KF_t	-0.3395	-2.6174**
PE_t	1.5357	1.9111*
R^2 = 0.5266	F-statistic = 6.1182***	

*, **, *** indicate significant level at 10%, 5% and 1% respectively.

Author's computation using Eviews

Table 5 above shows the result of the estimated model and the long run effects of the independent variables on unemployment. The R^2 of 0.5266 shows that the independent variables were able to explain approximately 53% variation in the dependent variable and the F-statistic is significant at 1% significant level implying the overall significance of the model.

From the table also show that if growth rate increases by 1% unemployment will reduce on an average by 0.12%. This is in line with the Okun's law which states that increase in growth rate will reduce unemployment.

Furthermore, the table shows that the relationship between unemployment and capital flight differs in the long run. The difference in the sign of capital flight and its lag is worthy of note. This implies that on an average a million increase in capital flight will cause unemployment to increase by 0.00355% while the same increment will reduce unemployment in the coming year by 0.00340%. This makes it known that when capital is taken out of the country at a certain period (t-1), unemployment is being increased as a result of shortage of capital for domestic business and investment, this capital is now being invested in a company abroad who uses it to produce goods and then in the coming year (t) sends it to Nigeria to sell. For the successful marketing of the company's product, some Nigerians will be employed as sales representatives, marketers, etc. However the employment generated by the capital flight of the next year is small compared to the unemployment created by it while it was leaving the country. The unemployment gap is about 0.00015%.

This implies that in the long run there will be a counter effect of capital flight on unemployment particularly in a developing country like Nigeria where imported goods are desired more than domestically produced goods and has most of technological products imported. The openness of the country to imported goods is the gateway by which the counter effect of capital flight will flow into the economy to reduce unemployment. However, this employment generated will be small and be controlled by foreign firms and this could make the employment opportunities created not so pleasing.

However the short run result of the estimated model corresponds to the believed relationship and impact capital flight on unemployment. The table 5 below shows the short run effects of the independent variables on unemployment.

Table 5: Parsimonious ECM result

Variable	Coefficient	T-statistic
C	-0.1301	-0.4394
KF_{t-1}	0.3887	3.2580***
KF_t	0.2525	2.3110**
PE_t	1.9693	2.5497**
ECM_{t-1}	-0.2471	-1.7451*
$R^2 = 0.6086$	F-statistic = 8.1638***	

*, **, *** indicate significant level at 10%, 5% and 1% respectively.

Author's computation using Eviews

The parsimonious ECM was used and it shows the rate at which the short run equilibrium is being corrected. The sign of the ECM is negative and it's significant at 10% significance level. The coefficient of the ECM shows that the discrepancy between the long run and the short run is being corrected at the rate of 25%. More to this, fiscal instrument has a positive impact on unemployment which is contrary to the expected result. It implies that a unit increase in the ratio of government expenditure to RGDP will contribute on an average 1.97% increase to unemployment in the short run. This reveals the impact of the corrupt practises of government office holders on the economy. The bulk of government expenditure in Nigeria has been flown out of the country and invested in foreign firms leading to increase in unemployment in the home country. This is similar to the result got by Osinubi(2005) when he estimated the impact of economic growth on unemployment and poverty.

Furthermore, capital flight and its lag have positive impact on unemployment in the short run. The coefficient of the capital flight shows that a million increase in capital flight will on an average increase unemployment by 0.00253%, the coefficient of the lag shows that on an average, 0.00389% increase in unemployment will further be added in the coming year.

It is also important to note that the growth rate has no effect on unemployment in the short run. This could be the reason for yet high rate unemployment in Nigeria despite the steady economic growth. Some previous researches have wondered the reason for the positive impact on unemployment: it is shown that this may only happen in the short run.

5. POLICY IMPLICATION

i. The government and the monetary authority must continually find ways of reducing capital flight in Nigeria and this starts with the government office holders as they seem to be the major cause of capital flight from Nigeria.

ii. The insignificance of the impact of the growth are in the short run implies that instead of the government focusing on the growth rate of the economy to reduce unemployment, it should rather focus on reduction of corrupt practises and the encouragement of domestic investment as growth rate has no effect on unemployment in the short run except the long run.

iii. Likewise, it is also shown that fiscal instrument is not bringing out the results it is meant to as a result of the high level of corruption of government office holders and thereby government office holders should become sincere in the service they render to the country.

6. CONCLUSION

In this paper, the impact of capital flight, fiscal instrument and economic growth on unemployment was tested empirically. The result got showed that capital flight contributes positively to unemployment in the short run however in the long run, it will reduce unemployment a little bit in the coming year leaving an unemployment gap since the increment caused in unemployment by capital flight in the current year is lesser than the reduction it will bring in the next year. The result got also showed that impact of the wide acclaimed economic growth of Nigeria on unemployment will only be seen in the long run implying that the government should focus more on reducing corrupt practises of the government office holders.

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Determinates of Commercial Banks Liquidity: Internal Factor Analysis

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A B S T R A C T	**A R T I C L E I N F O**
This study was undertaken to explore the determinants of liquidity in Zimbabwean commercial banks. The research paper was motivated by the persistent high liquidity crunch currently be delving operations of commercial banks. An explanatory research design was adopted to find out variables that determine banks liquidity. An Ordinary Least Squares (OLS) model was developed after testing the variables for stationary to avoid spurious regression using the Augmented Dicker-Fuller (ADF) unit root test. Pearson's correlation analysis was used to examine the existence of correlation between the repressors and the regressed. The study identified that non-performing loans are highly negatively related with banks liquidity signifying that this variable influence bank liquidity to a larger extent. A positive relationship between bank size and capital adequacy ratio and liquidity was established. Contrary to expectations a positive relationship was obtained between loan growth and banks liquidity. The following recommendations were made. Banks should devise robust credit risk management tools to reduce credit risk, tap into the offshore markets to obtain more credit to extent to their clients and the central banks should speed up the operation of ZAMCO which is meant to take over banks bad debts.	

I.   INTRODUCTION

According to the Bank for International Settlement (2009) many banks struggled to maintain adequate liquidity during the 2007-2009 Global Financial Crisis. The same phenomenon is being experienced in Zimbabwe since 2009 when the country adopted multiple currencies to address several macroeconomic challenges among them hyperinflation, volatile exchange rates and high interest rates.The multi-currency era has brought significant changes in market conditions and thus the importance of prudential liquidity risk measurement and management. A number of commercial banks are experiencing funding risk as they are unable to raise cash or cash equivalents to finance their operations either through the sale of money market instruments or borrowing from the Central Bank.

The situation is being aggravated by the absence of the Lender of Last Resort (LOLR), inactive money market, lack of confidence in the financial sector (resulting in mattress banking-an

estimated \$3 billion is circulating outside the banking system), uncertain political environment and difficulties in sourcing external lines of credit due to perceived country risk. Moreso, some of the banks are still failing to meet the regulator's minimum capital requirements. As at 30 June 2014, five out of nineteen banking institutions were undercapitalised; this translates to 26 percent (RBZ, MPS July 2014).

As financial intermediaries, banks play a pivotal role in driving the economy. Citing (Levine, 1996)Demirguc-Kunt and Huizinga (1998) opines that the efficacy of financial intermediation affect economic growth. This is achieved by channelling funds from surplus to deficit units in the economy. This view is supported by Sarr & Lybek (2002) who asserts that liquid markets are desirable for economic growth because; a) they facilitate central banks to indirectly transmit its monetary policy instruments to fine tune the economy to a desired state b) allow banks and other financial institutions to make money through duration mismatch and c) enable investors to participate in financial markets easily by entering and exiting the market easily.

However, when banks lack the necessary liquidity to fund the corporate world economic slowdown is usually experienced.According to Moore (2009) liquidity constrained banking systems might hinder economic activity as banks reduce lending. This may lead to company closures, reduced consumption, diminishing aggregate demand and higher unemployment (Bemanke, 1983). As concurred by Biyam (2010) business activity is slowed down as companies fail to restock, pay for their daily expenses and meet maturing obligations.

A reduction in funding by banks has seen the Zimbabwe's economic growth contractingto 3.7 percent in 2013 from an estimated 4.4% in 2012 (AfDB, 2014). Moreso, capacity utilisation has fallen to around 36 percent from a peak of over 50 percent in 2009 (ZNCC, 2014). As a result of this economic stagnation a number of banks have been exposed to default risk. Similarly, in the US, in the aftermath of the Global Financial Crisis (GFC) commercial banks were exposed to Asset & Liability mismatch on both Balance Sheetand Off-Balance Sheet activities (Brunnermeier, 2009). The result was catastrophic. Several banks went under, with the contagion effect being felt world over as the*"global recession"*.

This shows that liquidity of commercial banks is fundamental to both the local economy and the world at large. This is aggravated by the roles played by banks in the economy apart from credit extension. They form the nerve centre of the economy hence the study of liquidity determination is of focus by academics, practioners and regulators.

Studies on the determination of bank liquidity are still very few save for studies such as; Valla et al (2006), Vodova(2011), Moore (2009), Raunch (2010), Fadare (2011), Tseganesh (2012) andChagwiza (2014). To my knowledge, no study has been undertaken to empirically explore

bank specific factors that influence liquidity hording. This study adds foregoing discussions by filling this gap in Sub Saharan Africa. Another interest to this research is the unavailability of the Lender of Last Resort function in the Zimbabwean context.

Panel regression analysis methodology was employed to identify the key determinants of banks liquidity in Zimbabwe using a case study of NMB Bank for the period 2009-2014.

The rest of the paper is structured as follows. Section 2 focus on the review of related literature, Section 3 highlights the methodology adopted for this study, while, Section 4 presents the results. Section 5 makes conclusions and recommendations.

II.   LITERATURE REVIEW

2.1. The Concept of Bank Liquidity and its Measurement

The concept of bank liquidity is elementary in financial markets. It represents a desirable function that should reflect a well organised financial market. Gabrielsen et al (2011) define a liquid market as "*a state of condition when prevailing structure of transactions provide a prompt and secure link between the demand and supply of assets, thus delivering low transaction costs.*" On the other hand, Borio (2009) defines market liquidity as the ability to trade an asset or financial instrument at short notice with little impact on its price.

From the above definitions it can be noted that liquid financial markets are characterised by low transactional costs, easy entry and exit and timely settlement. In most cases market liquidity is gauged by the liquidity of the individual assets in the market. However, Barker (1996) argues that there is no single unambiguous, theoretically correct or universally accepted definition of liquidity. According to the author this is so because some of the important characteristics of liquidity may change over time. From the views of Sarr & Lybek (2002) in good times, liquidity may primarily reflect transaction costs and in bad times, instantaneous price discovery and adjustment to a new equilibrium becomes essential.A bank's liquidity is derived from its Balance Sheet. Moore (2009) discusses the Stock and Flow approach to liquidity measurement. The former utilises balance sheet ratios to identify liquidity movements within a bank. These ratios are:

i.   Loan-to-Deposit (LD) ratio

ii.   Short-term investments to Total Assets ratio

iii.   Liquid asset ratio.

Vodova(2011) provide four Balance Sheet ratios used to measure a bank's liquidity. The ratios discussed are:

$$L_1 = \frac{LIQUIDASSETS}{TOTALASSETS} * 100 \qquad (1)$$

<u>Rule of Thumb</u>: The higher the share of liquid assets to total assets, the higher the absorption capacity of liquidity shocks. However, high value of this ratio may be interpreted as inefficiency due to the lower returns on very liquid assets, hence the need of liquidity-profitability trade off.

$$L_2 = \frac{LIQUIDASSETS}{DEPOSITS+SHORTTERMBORROWINGS} * 100 \qquad (2)$$

<u>Rule of Thumb</u>: The acceptable ratio is 100% or more. This ratio signifies the ability of a bank to meet its funding needs.

$$L_3 = \frac{LOANS}{TOTALASSETS} * 100 \qquad (3)$$

<u>Rule of Thumb</u>: The higher the ratio the less liquid the bank is. This ratio measures the share of loans in total assets. It indicates the proportion of bank's assets being tied up in loans.

$$L_4 = \frac{LOANS}{DEPOSITS+SHORTTERMFINANCING} * 100 \qquad (4)$$

<u>Rule of Thumb</u>: The higher the ratio the less liquid the bank is. This ratio relates to illiquid assets to liquid liabilities. The more illiquid assets it has to liquid liabilities the more prone it is to liquidity risk.

2.2. Empirical Literature on the Determinants of Bank Liquidity

Berrospide (2013) investigated the causes of US banks to hoard liquidity during the recent global financial crisis using regression analysis. Liquidity hoarders were defined as those banks with an average ratio of total liquid asset to total assets which increased by more than 3% post crisis to the crisis period. The author employed a regression framework similar to Cornett et al (2011) to measure liquidity risk. The researcher found that stable funding sources such as bank deposits and capital are the main determinants of liquidity holding and liquidity holding decrease with bank size. Furthermore, in support of the precautionary motive to hold cash, the study revealed that US banks choose to build up liquidity buffer to cushion themselves against expected losses from securities write downs.

Bonner et al (2013) investigated the determinants of banks liquidity holdings using bank specific variables for 30 OECD countries. Their study revealed that without liquidity regulation, banks liquidity holding is determined by a combination of bank specific (business model, profitability, deposit holdings and size) and country specific (disclosure requirements, bank concentration) factors.

Jordan et al (2013) utilised the Vector Autoregressive methodology to analyse liquidity trends in the Bahamas over the period 2001 to 2011. The author noted that excess reserves are

positively related to net domestic assets and negatively related to private sector credit and the Treasury bill rate (using the 1st model). The 2nd model showed that all the variables (net domestic assets, Treasury bill rate, ceiling on lending rate and real Gross Domestic Product) were all significant in explaining the excess reserve built up, except for private sector credit.

Tseganesh (2012) studied the determination of commercial banks liquidity in Ethiopia for the period 2000 to 2011.The author went on to analyse the effects of banks liquidity on profitability. Balanced fixed effect regression was used on eight commercial banks. The results show that capital adequacy, bank size, share of non-performing loans to total loans, interest margins, inflation rate and short term interest rates are statistically significant to explain banks liquidity, contrary to Vodova(2011). More so, Real GDP growth rate and loan growth were found to have a significant impact on bank liquidity.

Wuryandani (2012) investigated the determinants of banks liquidity using longitudinal panel data of individual Indian banks for the period January 2002 to November 2011. The researcher utilised the Generalised Method of Moments (GMM) simultaneous equation methodology. Results indicate that credit, savings and deposit affect precautionary liquidity, whilst financial system and macroeconomic conditions affect involuntary liquidity.

Fadare (2011) sought to assess the development and impact of Nigerian banking liquidity regulations, identify the key determinants of banking sector liquidity in Nigeria and explore the effects financial crisis on the banking sector liquidity regulations. Leveraging on theoretic considerations, the author came up with an Autoregressive Ordinary Least Squares specification. The study showed that in the absence of financial crisis, banks either hold excess liquidity or hold liquidity in line with regulatory requirements. On the contrary,during episodes of financial crisis banks were found to behighly illiquidrelative to benchmarks thereby exposing themselves to financial distress. These results are similar to Vodova (2011)

Moore (2009) explored the main determinants of bank liquidity and also evaluated the impact of banking crisis on liquidity. Using evidence from Latin America and the Caribbean the author found that on average, bank liquidity is about 8% less than what is in line with economic fundamentals during crisis.

The same author provided an assessment of whether behavioural models, linear time series or non-linear time series models are better able to account for liquidity dynamics during a crisis. Employing monthly observations for sixteen Latin America and Caribbean nations for the

period 1970 to 2004, the author found that behavioural models performed exceptionally well in predicting liquidity trends during the crisis in Argentina, Bolivia, Paraguay and Venezuela in both the short and long run.

Vodova (2011a) studied the determinants of liquidity of Slovak commercial banks using bank specific and macroeconomic data from 2001 to 2010. The author employed panel data regression analysis. Results revealed that bank liquidity drops mainly as a result of financial crisis, bank liquid assets also drop with higher profitability, higher capital adequacy ratios and the size of the bank. On the other hand liquidity measured by lending activity of banks is positively related to GDP growth and bank profitability, but negatively related to high levels of unemployment. The following variables; level of interest rates, interest spreads, inflation rate and the level of non-performing loans were found to be of no significance in the determination of Slovak commercial banks.

The same author in (2011b) analysed the determinants of commercial banks liquidity of Czech commercial banks for the period 2001 to 2009. Using panel regression analysis, the author identified a positive link between bank liquidity and capital adequacy, share of non-performing loans and interest rates on loans and interbank transactions contrary to his earlier findings for the Slovak banks. These variables; inflation rate, business cycles and financial crisis had negative effect on liquidity. Based on the findings, the author concluded that the relation between bank size and liquidity is ambiguous.

Aspachs et al (2005) provides a comprehensive analysis of the determinants of UK banks liquidity policy over the period 1985 to 2003. Their study was aimed at investigating how central bank lender of last resort policy affects banks liquidity holding. They found that the greater the likely support from the central bank in the event of a liquidity crisis, the lower the liquidity buffer that banks hold.

III. RESEARCH METHODOLOGY & DATA

This study focused on bank specific variables that determine banks liquidity with a case study of NMB Bank Zimbabwe. This bank was chosen because of data availability(all its financial statements post dollarisation (2009) are publicly available). Following Tseganesh (2012) in order to identify the determinants of liquidity of Zimbabwean commercial banks, initially descriptive statistics were analysed. An Ordinary Least Squares (OLS) model was developed after testing the data for stationarity to avoid spurious regression using the Augmented Dicker-

Fuller (ADF) unit root test. The model was tested for adequacy by carrying out tests of OLS assumptions. Pearson's correlation analysis between the regressors and the regressand was made. Semi-annual data was used in this study which was obtained from the NMB banks' financial statements for the period 2009 to 2014. The data was analysed using Eviews 7 econometric software package.

Banks liquidity was measured using liquidity ratio L_3 described above. The following longitudinal regression model was estimated;

$$L_{it} = \alpha + \beta \cdot X_{it} + \varepsilon_{it} \qquad (5)$$

Where: L_{it} = liquidity ratio L_1 and L_3 for $bank_i$ in $time_t$

$\qquad X_{it}$ = vector of explanatory variables for $bank_i$ in $time_t$

$\qquad \beta$ = coefficient which represents the slope of variable

$\qquad \alpha$ = constant

$\qquad \varepsilon_{it}$ = error term

Incorporating bank specific variables into the modelyield:

$$L_{it} = \alpha + \beta_1 CAR_{it} + \beta_2 SIZE_{it} + \beta_3 LG_{it} + \beta_4 NPL_{it} + \varepsilon_{it} \qquad (6)$$

Where: L_{it} = liquidity ratio L_1 and L_3 for $bank_i$ in $time_t$

$\qquad \beta_{1\ldots4}$ = Coefficient which represents the slope of variable

$\qquad CAR_{it}$ = is the capital adequacy ratio for bank i in period t, proxied by the ratio of equity to total assets i.e.

$$CAR_{it} = \frac{EQUITY}{TOTALASSETS} \qquad (+)$$

$\qquad SIZE_{it}$ = is the size of bank i in period t, proxied by the natural logarithm of a bank's total assets i.e.

$$SIZE = LN(TOTALASSETS) \qquad (+)$$

$\qquad LG_{it}$ = is the growth in loans for bank i in period t, proxied by the natural logarithm of percentage in loans & advances to customers i.e.

$$LG = ln\left(\frac{LOANS\&ADVANCES_t}{LOANS\&ADVANCES_{t-1}}\right) \tag{-}$$

NPL_{it} = is the non-performing loan of bank i in period t, proxied by the share of non-performing loan from the total loan portfolio of a bank i.e.

$$NPL = \left(\frac{NONPERFOMINGLOANS}{TOTALLOANS}\right) \tag{-}$$

IV. RESULTS& THEIR DISCUSSION

4.1. Table 1 Descriptive Statistics

	CAR	LG	LIQRATIO	NPL	SIZE
Mean	18.35455	0.636364	0.792727	15979868	18.63909
Median	17.28000	0.270000	0.820000	8983037.	18.94000
Maximum	38.00000	3.950000	1.000000	41877499	19.39000
Minimum	10.66000	0.010000	0.530000	8420.000	17.03000
Std. Dev.	7.655145	1.130701	0.163346	16965553	0.808980
Skewness	1.697885	2.573325	-0.500929	0.540984	-0.864128
Kurtosis	5.061145	8.147894	1.972540	1.640358	2.477819
Jarque-Bera	7.232305	24.28654	0.943889	1.383836	1.493956
Probability	0.026886	0.000005	0.623788	0.500615	0.473796
Sum	201.9000	7.000000	8.720000	1.76E+08	205.0300
Sum Sq. Dev.	586.0125	12.78485	0.266818	2.88E+15	6.544491
Observations	11	11	11	11	11

The banks mean (average) capital adequacy ratio (CAR) since dollarisation was estimated to be 18.35 percent against the regulator's 12 percent threshold. Using this ratio to reflect the bank's capitalisation, NMB is fairly capitalised. Loan growth is faring well with an average growth of 63.63 percent. However, despite this good performance, the non performing loans (NPL) figure is not pleasing. Although the bank has been very aggressive in dishing out loans it remains challenged in recovering loaned out monies. The NPL figure grew from a tiny $8,420 in 2009 to a staggering $41,977,499 by the first half of 2013. The bank attributed this phenomenal jump in NPLs to economic stagnation and liquidity problems currently bedelving the nation. On theother hand, the bank's liquidity ratio which averaged 79.27 percent is very high. This ratio indicates the proportion of the bank's assets being tied up in loans. In this case 79.27 percent of the bank's total assets are tied in illiquid assets (loans).

4.2. Table 2 Unit Root Test Results

VARIABLE	ADF STATISTIC	CRITICAL VALUE	ORDER OF INTEGRATION	DECISION	SIGNIFICANCE LEVEL
LIQ Ratio	-6.534114	-4.582648 -3.320969 -2.801384	Level	Stationary	1% 5% 10%
CAR	-4.581405	-4.297073 -3.212696 -2.747676	Level	Stationary	1% 5% 10%
LG	-17.28981	-5.295384 -4.008157 -3.460791	Level	Stationary	1% 5% 10%
NPL	-11.76721	-3.007406 -2.021193 -1.597291	Level	Stationary	1% 5% 10%
SIZE	-6.372984	-4.297073 -3.212696 -2.747676	Level	Stationary	1% 5% 10%

All the variables are stationary in levels at 1 percent significance level. This means all the variables have no unit roots hence they are stationary which is a prerequisite condition to run a good regression model.

4.3. Table 3 Model Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.461712	2.693476	-3.512826	0.0126
CAR	0.020429	0.010499	1.945730	0.0996
LG	0.012798	0.054574	0.234516	0.8224
NPL	-1.58E-08	5.07E-09	-3.119812	0.0206
SIZE	0.543163	0.140793	3.857873	0.0084
R-squared	0.779521	Mean dependent var		0.792727
Adjusted R-squared	0.632536	S.D. dependent var		0.163346
S.E. of regression	0.099018	Akaike info criterion		-1.484069
Sum squared resid	0.058828	Schwarz criterion		-1.303208
Log likelihood	13.16238	Hannan-Quinn criter.		-1.598077
F-statistic	5.303379	Durbin-Watson stat		2.274248

Prob(F-statistic)	0.035782			

The table above shows the results of the regression model. The liquidity ratio (proxy for bank liquidity) is the dependent variable which is taken to be influenced by nonperforming loans (NPL), capital adequacy ratio (CAR), loan growth (LG) and bank size (SIZE). Looking at the significance of the regressors the author note that NPL and SIZE have p-values of 2.06 percent and 0.84 percent respectively. They are significant in explaining banks liquidity. Since 50 percent of the regressors are significant this model is good. The R^2 is 78 percent and the adjusted R^2 is 63 percent which is above 60 percent; therefore, we can note that the data is fitted properly. The F statistic is significant with a p-value of 3.58 percent. This means the regressors jointly can influence the independent variable.

Given that the model is good, the following regression equation was estimated:

$$L_{NMBt} = -9.461712 + 0.0204 CAR_{NMBt} + 0.5432 SIZE_{NMBt} + 0.0128 LG_{NMBt}$$
$$- 1.58E - 08 NPL_{NMBt} + \varepsilon_{NMBt}$$

4.4. Discussion of Results

The intercept (β_0) has a coefficient of -9,461712. This means taking the regressors to be zero we expect bank liquidity to be -9,461712 units. This holds for Zimbabwe since the country is faced with a liquidity crunch we expect the intercept to be negative. Capital adequacy ratio has a correlation coefficient of 0,0204 indicating that a 1 percent increase/decrease in capital adequacy ratio translates to 2,04 percent increase/decrease in bank liquidity. Although this coefficient is positive it has a weak explanatory power suggesting that it is not a good indicator of liquidity position of a bank. These results are consistent with Tseganesh (2012) and Vodova (2011) but contrary to the findings of Berrospide (2013) who argue that liquidity holding decrease with bank size.

Commenting on loan growth a correlation coefficient of 0,0128 was established, meaning a 1 percent increase/decrease in loan growth translate to 1,28 percent increase/decrease in bank liquidity. Contrary to expectations this relationship was found to be positive along the lines of Tseganesh (2012). This can be explained by the huge appetite for loans currently obtaining in Zimbabwe whereby loan growth is growing spontaneously with bank liquidity.

A negative correlation coefficient of -1,58E-08 between non performing loans and liquidity position of banks was determined. This suggests that a 1 percent decrease/increase in nonperforming loans causes bank liquidity to increase/decrease by 158 percent. This holds in reality because if a bank fails to collect outstanding loans this scare away depositors hence its liquidity suffers. As expected the nonperforming figure is a significant determinant of bank liquidity in Zimbabwe in the multiple currency era. Tseganesh (2012) and Vodova (2011) oppose these results.

Bank size was found to have a correlation coeffient of 0.5432 indicating that a 1 percent increase/decrease in bank size cause the liquidity position of a bank to increase/decrease by 54,32 percent. This is consistent with our expectations as suggested in section III of the study. These results are in harmony with Bonner et al (2013) and Tseganesh (2012). In relation to the traditional transformation view a positive relationship should exist between bank size and liquidity as indicated in these results.

4.5. Model Diagnostic Tests

4.5.1. Table 4Normality Test

Series: Residuals	
Sample 2009S1 2014S1	
Observations 11	
Mean	0.000000
Median	0.009993
Maximum	0.140751
Minimum	-0.180098
Std. Dev.	0.076699
Skewness	-0.708434
Kurtosis	4.618094
Jarque-Bera	2.120132
Probability	0.346433
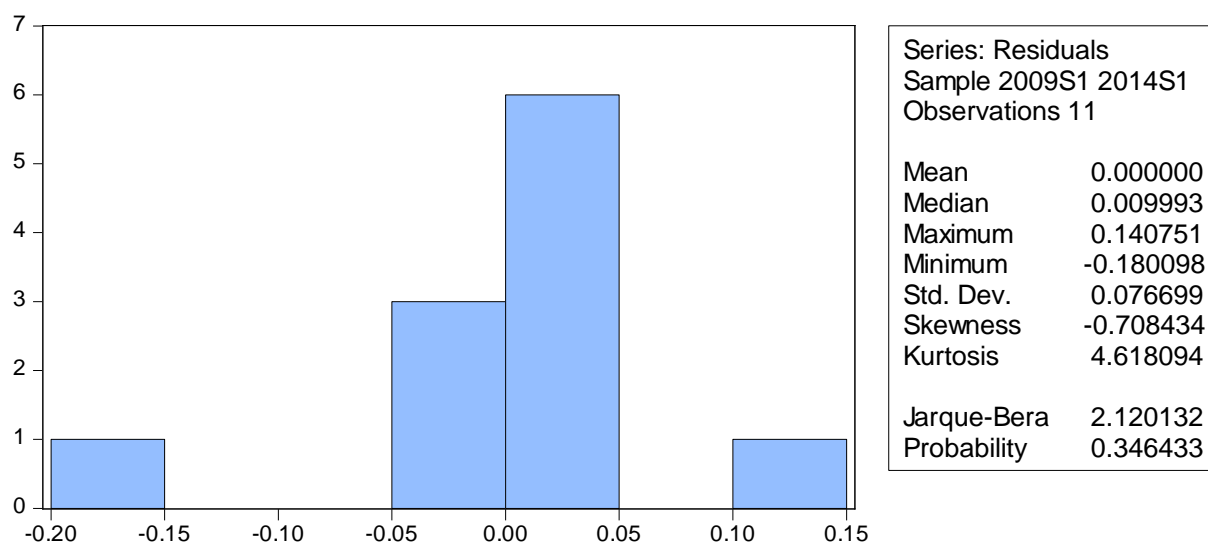
The normality test was carried out using the Jarque-Bera test. The p-value was established to be 34.64 percent which is greater than 5 percent (significance level). Since the p-value is greater than 5 percent, the null hypothesis that residuals are normally distributed cannot be rejected. Therefore the residuals are normally distributed.

4.5.2. Table 5 Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:

| F-statistic | 0.125305 | Prob. F(2,4) | 0.8856 |
| Obs*R-squared | 0.648544 | Prob. Chi-Square(2) | 0.7231 |

Using the Breusch-Godfrey Serial Correlation test to test for serial autocorrelation in the residuals, a p-value of 72.31 percent was determined. The null hypothesis that residuals are not serially correlated cannot be rejected. For this model the residuals are not serially correlated.

4.5.3. Table 6 Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.217235	Prob. F(4,6)	0.9194
Obs*R-squared	1.391531	Prob. Chi-Square(4)	0.8457
Scaled explained SS	0.748962	Prob. Chi-Square(4)	0.9452

This test was conducted using the Breusch-Pagan-Godfrey test. A p-value of 84.57 percent was estimated; therefore the null hypothesis that residuals are homoskedasticity cannot be rejected. In light of these results the residuals are homoskedasticity which is good for our model.

V. CONCLUSION

The aim of this paper was to explore the determinants of commercial banks liquidity in Zimbabwe in the multiple currency era. A case study of NMB bank was used as the sample for the study. Panel data was analysed for the period 2009:Q1 to 2014:Q1.

The study revealed that non performing loans are strongly negatively related with banks liquidity. It follows that as non performing loans rise banks liquidity deteriorates. A positive relationship was identified between bank size and liquidity. In line with theory big banks are expected to be more liquid than smaller ones. A weak positive relationship was obtained between capital adequacy ratio and banks liquidity signifying that in Zimbabwe capital does not play a role in explaining banks liquidity. On the other hand, contrary to expectations loan growth was found to be positively related to banks liquidity although the relationship is very weak. This can be explained by the huge appetite for loans in Zimbabwe by economic agents.

The paper makes the following recommendations. Commercial banks should come up with robust credit risk management tools to reduce non performing loans. More so, domestic banks should look for ways to tap into the diaspora market to obtain more credit lines which will boost their liquidity positions. The central bank should speed up the operation of Zimbabwe Asset Management Company (ZAMCO) that has been established to take up bad debts in banks loan

books. The study advocates other authors to look at a comprehensive study which incorporates more banks into the study using descriptive survey methodology since this study used a case study of one bank.

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VII. APPENDIX

UNIT ROOT TESTS

Null Hypothesis: LIQRATIO has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.534114	0.0012
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
    and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LIQRATIO)
Method: Least Squares
Date: 10/24/14 Time: 10:52
Sample (adjusted): 2010S2 2014S1
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LIQRATIO(-1)	-1.243014	0.190235	-6.534114	0.0028
D(LIQRATIO(-1))	0.403229	0.142898	2.821806	0.0477
D(LIQRATIO(-2))	0.311845	0.166131	1.877106	0.1337
C	1.059408	0.157585	6.722756	0.0025
R-squared	0.926088	Mean dependent var		0.036250

Adjusted R-squared	0.870654	S.D. dependent var	0.159368
S.E. of regression	0.057316	Akaike info criterion	-2.573609
Sum squared resid	0.013141	Schwarz criterion	-2.533889
Log likelihood	14.29444	Hannan-Quinn criter.	-2.841510
F-statistic	16.70611	Durbin-Watson stat	2.473352
Prob(F-statistic)	0.009987		

Null Hypothesis: NPL has a unit root
Exogenous: None
Lag Length: 4 (Automatic - based on AIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.76721	0.0001
Test critical values:	1% level	-3.007406	
	5% level	-2.021193	
	10% level	-1.597291	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
        and may not be accurate for a sample size of 6

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NPL)
Method: Least Squares
Date: 10/24/14   Time: 11:12
Sample (adjusted): 2011S2 2014S1
Included observations: 6 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL(-1)	-4.412539	0.374986	-11.76721	0.0540
D(NPL(-1))	4.753869	0.382175	12.43900	0.0511
D(NPL(-2))	5.697039	0.592793	9.610502	0.0660
D(NPL(-3))	4.090925	0.601383	6.802530	0.0929
D(NPL(-4))	7.684411	0.554083	13.86870	0.0458

R-squared	0.993923	Mean dependent var	5417320.
Adjusted R-squared	0.969616	S.D. dependent var	7437574.
S.E. of regression	1296440.	Akaike info criterion	30.86305
Sum squared resid	1.68E+12	Schwarz criterion	30.68952
Log likelihood	-87.58915	Hannan-Quinn criter.	30.16838
Durbin-Watson stat	2.139613		

Null Hypothesis: SIZE has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.372984	0.0006
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations

and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SIZE)
Method: Least Squares
Date: 10/24/14   Time: 11:13
Sample (adjusted): 2009S2 2014S1
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SIZE(-1)	-0.215933	0.033883	-6.372984	0.0002
C	4.244584	0.629537	6.742392	0.0001

R-squared	0.835441	Mean dependent var		0.236000
Adjusted R-squared	0.814872	S.D. dependent var		0.191671
S.E. of regression	0.082469	Akaike info criterion		-1.975922
Sum squared resid	0.054410	Schwarz criterion		-1.915405
Log likelihood	11.87961	Hannan-Quinn criter.		-2.042309
F-statistic	40.61492	Durbin-Watson stat		2.415125
Prob(F-statistic)	0.000215			

Null Hypothesis: CAR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.581405	0.0067
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
        and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CAR)
Method: Least Squares
Date: 10/24/14   Time: 11:14
Sample (adjusted): 2009S2 2014S1
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAR(-1)	-0.720581	0.157284	-4.581405	0.0018
C	11.23584	3.140814	3.577365	0.0072

R-squared	0.724036	Mean dependent var		-2.056000
Adjusted R-squared	0.689540	S.D. dependent var		6.828005
S.E. of regression	3.804490	Akaike info criterion		5.687097
Sum squared resid	115.7931	Schwarz criterion		5.747614
Log likelihood	-26.43549	Hannan-Quinn criter.		5.620710
F-statistic	20.98927	Durbin-Watson stat		2.886836
Prob(F-statistic)	0.001799			

Null Hypothesis: LG has a unit root

Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on AIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-17.28981	0.0001
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
    and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LG)
Method: Least Squares
Date: 10/24/14   Time: 11:21
Sample (adjusted): 2009S2 2014S1
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LG(-1)	-1.113136	0.064381	-17.28981	0.0000
C	0.924117	0.178151	5.187256	0.0013
@TREND(2009S1)	-0.098188	0.024913	-3.941273	0.0056

R-squared	0.982246	Mean dependent var	-0.394000
Adjusted R-squared	0.977173	S.D. dependent var	1.145942
S.E. of regression	0.173136	Akaike info criterion	-0.426157
Sum squared resid	0.209832	Schwarz criterion	-0.335381
Log likelihood	5.130785	Hannan-Quinn criter.	-0.525737
F-statistic	193.6352	Durbin-Watson stat	1.732111
Prob(F-statistic)	0.000001		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.125305	Prob. F(2,4)	0.8856
Obs*R-squared	0.648544	Prob. Chi-Square(2)	0.7231

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 10/24/14   Time: 11:24
Sample: 2009S1 2014S1
Included observations: 11
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.631251	3.522226	-0.179219	0.8665
CAR	0.001691	0.013307	0.127050	0.9050
LG	-0.002736	0.065533	-0.041743	0.9687
NPL	-1.62E-09	6.99E-09	-0.231067	0.8286
SIZE	0.033630	0.184471	0.182305	0.8642
RESID(-1)	-0.234515	0.571342	-0.410463	0.7025
RESID(-2)	-0.197474	0.522339	-0.378057	0.7246

R-squared	0.058959	Mean dependent var	0.000000
Adjusted R-squared	-1.352604	S.D. dependent var	0.076699
S.E. of regression	0.117643	Akaike info criterion	-1.181201
Sum squared resid	0.055359	Schwarz criterion	-0.927995
Log likelihood	13.49661	Hannan-Quinn criter.	-1.340812
F-statistic	0.041768	Durbin-Watson stat	2.266035
Prob(F-statistic)	0.999216		

MODEL DIAGNOSTIC TESTS

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.125305	Prob. F(2,4)	0.8856
Obs*R-squared	0.648544	Prob. Chi-Square(2)	0.7231

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Log likelihood	13.49661	Hannan-Quinn criter.	-1.340812
F-statistic	0.041768	Durbin-Watson stat	2.266035
Prob(F-statistic)	0.999216		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.217235	Prob. F(4,6)	0.9194
Obs*R-squared	1.391531	Prob. Chi-Square(4)	0.8457
Scaled explained SS	0.748962	Prob. Chi-Square(4)	0.9452

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 10/24/14   Time: 11:24
Sample: 2009S1 2014S1
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.229571	0.350170	-0.655600	0.5364

CAR	0.000240	0.001365	0.176040	0.8661
LG	0.001295	0.007095	0.182523	0.8612
NPL	-3.97E-10	6.59E-10	-0.602397	0.5690
SIZE	0.012663	0.018304	0.691819	0.5149

R-squared	0.126503	Mean dependent var	0.005348
Adjusted R-squared	-0.455829	S.D. dependent var	0.010669
S.E. of regression	0.012873	Akaike info criterion	-5.564410
Sum squared resid	0.000994	Schwarz criterion	-5.383548
Log likelihood	35.60425	Hannan-Quinn criter.	-5.678417
F-statistic	0.217235	Durbin-Watson stat	2.718983
Prob(F-statistic)	0.919409		

Normality Test
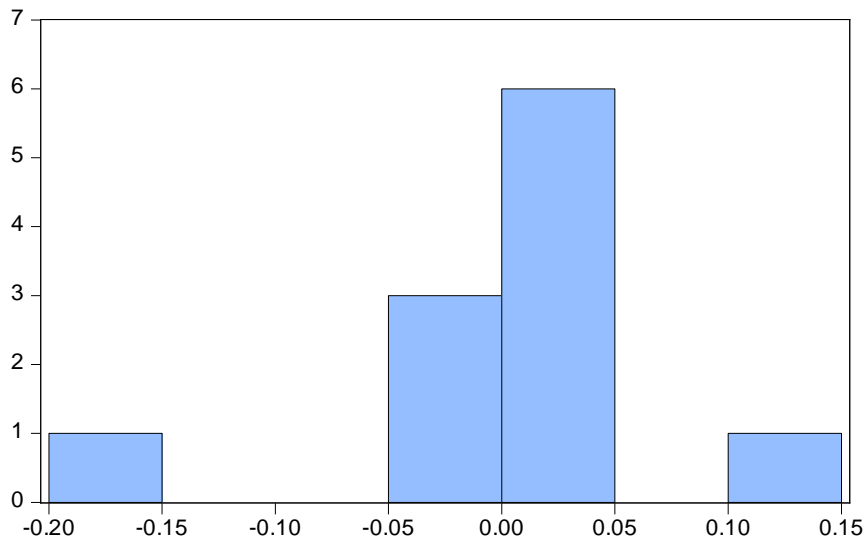
Series: Residuals	
Sample 2009S1 2014S1	
Observations 11	
Mean	0.000000
Median	0.009993
Maximum	0.140751
Minimum	-0.180098
Std. Dev.	0.076699
Skewness	-0.708434
Kurtosis	4.618094
Jarque-Bera	2.120132
Probability	0.346433

Reorganization Strategy for the Tunisian Central Bank

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A B S T R A C T

The analysis of monetary policy in Tunisia highlights three main distinct periods with the support of the IMF: the last in 1987 when the country was in deep recession, after 1989 with the gradual privatization plan launched by the government and recently current period in the end of 2012, after revolution, in which the economic and financial balance recorded major shocks remanding back of the ex-period and the rise in arrow of the inflation. This article aims to provide an overview on key reforms Tunisian financial markets from 1989. These reforms have particularly affected the banking system and the implementation of monetary policy based on the interest rate as an instrument controller for the first phase and also the monetary aggregates, M3 mainly, following the evolution of economic conditions to our days 2014. But from the 90's view that the success recorded by the industrialized countries precursors on Inflation Targeting strategy IT and some developing countries as follower, we will demonstrate the inability of the Tunisian Central Bank TCB to pursue this inflation target announce strategy as a primary objective and the main difficulties before its actual realization in the current difficult economic environment.

1. INTRODUCTION

A range of measures of monetary policy was engaged since the financial reform finally 80's of the last century, built around a program aimed at consolidating the market economy system where the instruments of indirect control override those of direct control. At the favor of the liberalization of the banking activities at the end of the 80s of last century, monetary authorities are attached to implement prudential regulation consistent with international standards for the consolidation financial base of the banks.

Usually, in the context of monetary policy, the monetary authorities Curkierman A. (1992) set a final goal and intermediate objectives. The hierarchy of these objectives, which differs from one economy to another, reveals in Tunisia a clear dominance of the control of inflation, considered necessary to the effectiveness of any policy aimed at strengthening the competitiveness of an economy more and more subject to the mechanisms of the international market.

Thus, the implementation by the Central Bank monetary policy has the ultimate objective of monetary stability, and by controlling the inflation rate close to that observed in the partner countries and competitors. To achieve this ultimate objective of monetary policy Smida M. and Boughrara A. (2004), the Tunisian Central Bank (TCB) uses a monetary aggregate as an intermediate target. The operational target adopted is essentially the interest rate and reserve requirement, exchange rate, etc.

Over the years, the nature and monetary policy tools had to be modified Cukierman A. and Meltzer A. (1986) on several occasions, as a result not only of the appearance of cyclical events, but also the succession of different economic strategies and the crossing of above steps in economic and social development. These actions clearly reflected at the level of monetary policy which accompanies them.

The analysis of monetary policy in Tunisia highlights three distinct periods which extended up to 1986, year of the adoption of the structural adjustment plan (SAP[1]), during which monetary policy was passive. The second period was beginning in 1987, year of the entry into force of the financial reform that has designed a new approach to the conduct of monetary policy and has set a new framework for its operation. The third period is coinciding with the latest financial crisis in 2008 and the period post-revolution 2012, where the country is succeeding by several major economic shocks. The main, according to expert economists, had been that the year 2012 where inflation is accentuating from 3.1 % finally 2008 to 6.7% in 2012.

The Tunisian Central Bank TCB, acting as autonomous Castello M. and Swinburne M. (1992) to maintain its monetary policy, fulfilled all his own instruments Patat J-P. (1986) useful from the rate of inflation as a first tool of control towards intermediate targets and even together with the decision of the liquidation of some public banks in difficult situations in the end of 2012 under the pressure of the IMF[2]. In addition, the TCB continued to support other national banks to not fall into bankruptcy. Despite a few adjustments registered in the end of 2013 by a rate of inflation in vicinity of 6.1%, all these regulatory measures by the TCB brought only short-term affects under the Structural Reform Plan (SRP[3]) provided by the IMF in 2012. Although, the inflation targeting (IT) strategy proves impractical for economic circumstances where happen to the country, in their phase post-revolution 2011.

Generally, to ensure the transition and to succeed the method of monetary regulation by the market, monetary policy Walsh, Carl E., (1997) must inevitably take into account the dynamics of financial reform and the profound changes that are currently mark the global economic and financial environment. These changes continue to impose a necessary improvement of the efficiency of the Tunisian economy, consolidation of its opening to the outside and a promotion of financial innovations.

These new data show that the financial landscape transforms by an abundance of hybrid products combining good yields, an immediate liquidity and low risk of fluctuation in the value of the investment capital. These new financial products contribute to enhance the role of market intermediation and to decline of classical banking intermediation in financing the economy. However, these profound changes are likely to increase the volatility of money demand, pose question of the effectiveness of the monetary aggregate as an intermediary objective. Financial liberalization adopted by Tunisia since 1987 is likely to push the monetary authorities to reshape monetary policy instruments and their modes of interventions by taking into account the new datum.

In this article, we will present, Firstly, the main regulatory changes in the Tunisian financial sphere and the reorganization of the Tunisian capital Market (1989-2010) as a result of measures recommended by the IMF for gradual economic and financial liberalization. Secondly, we propose to study the current situation of monetary policy and the role assigned to the Tunisian Central Bank (TCB) to preserve the value of the local currency and to control, specially, the inflation rate. Finally, we close this paper on the real obstacles facing the adoption of the guidelines Inflation Target (IT) Strategy by the Tunisian Central Bank (TCB), in the current difficult economic environment.

2. EVOLUTION OF THE FINANCIAL SYSTEM AND REORGANIZATION OF TUNISIAN MONEY MARKET (1989-2010): MAJOR REFORMS

In Tunisia, the economic environment has experienced many changes that have had a direct impact on the actual variables of the economy. It has involved economic and financial liberalization measures have adopted within the framework of the Adjustment Structural Plan (ASP) has advocated by the IMF in 1986[4]. By including privatization of some large companies, the establishment of a new regulation regarding the procurement of Tunisian capital, from 1989, (money market, financial market and exchange market) and the gradual liberalization of interest rates.

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[1] In 1986, the monetary authorities have undertaken to implement the following indirect control instruments; (1) partial and continuous rate liberalization of interest debtor and credit, (2) reorganization of the money market to perform operations of purchase and sale of securities and for the issuance of titles like tickets of cash flows, (3) removal of formalities prior permission and the agreement of rediscount to the loans granted by the banks and the introduction of instruments for monitoring of credit as reserves held at the TCB and the repo and also the operation of the open - Market.etc, (4) introduction of prudential standards in the Bank management and the implementation of the rules which must be observed by banks.

[2] cf. International Monetary Found rapport: Impression for Tunisia government and economic assessment, after last revelation 2011, (Nov. 2012).

[3] IMF: rapport for Tunisia, Dec 2012.

[4] The country experienced a severe economic recession unprecedented in their economic history.

2.1. Main indicators of the banking system before the reforms

The national Banking system was partitioning in the early 1980s. It was composing primarily of deposits banks and development banks which were respectively specializing in short-term and medium-term and long-term financing. Commercial Banks financed through deposits, term savings, which accounted for about two-thirds of their total resources. They enjoyed facilities rediscount and advances amounting to 17.5% of their deposits.

Development Banks had access to special government resources and other resources obtained from abroad to the financing of certain credits. They were not allow to accept deposits except in special circumstances, so they therefore had to resort to the above-mentioned special resources as well as their own funds and issuing long-term bonds, generally.

This fragmentation limited competition. It was also reinforced by careful controls of both credits than debtor's interest rates, as well as commissions. Real interest rates were often negative. There was also a refinancing agreement authorization system which restricted the type of credits and prevented Banks to offer different funding modalities.

Money market looked more like a Central Bank rediscounting window. Transactions inter-Bank prohibited and the Central Bank determined both the interest rate and refinancing granted to each Bank. In addition, commercial Banks were subject to obligations of a portfolio. As a result, Banks were hardly motivated to assess their credit decisions outside the criteria laid down by the Central Bank for refinancing.

2.2. Main indicators of the financial system before the reforms

Concerning the Tunisian financial market, its role in the financing of the economy was very small. The capitalization of the Tunisian Stock Exchange (T.S.E) was low on 90's in last century. This reflected to the desire to lock capital Firms and the fear of the entrepreneurs of any shareholding foreign to the family ownership rate or close acquaintances rate.

These structural reasons for the weakness of the market, in addition to other causes including:

- The encouragement of bank savings which was well paid and loosely imposed while equity capitals had disadvantages from the tax point of view.
- Encouragement, also the debt at the expense of participation by the politics of easy subsidized credits and by the requirement of a down payment minimal when granting loans.
- The lack of obligation to inform the public and the inadequacy of the control exercised by the Stock Exchange.
- The lack of professional ethics and self-regulation of the profession, result of the marginalization of securities services in banks that dominated the market until 1994.

2.3. Finance Reforms after 1989

These reforms have affected all financial transactions Lassoued (2004) in terms of:

2.3.1. Credit policy and interest rate

In the context of the overall reform of monetary policy and credit, the Tunisian Central Bank (TCB) has changed licensing terms, control and refinancing of credits from December 1987[5].

The progressive release of receivable interest rates provide to banks more freedom in the decision of credits granting. Indeed, while respecting theoretical ratings, banks freely set their margins[6] with the exception of the priority areas, the rate has remained fixed by the Central Bank until November 1996.

The interest rates on deposits have released except those accounts in convertible dinars (average rate of money market less than two points). The discount as a refinancing technique removed in November 1996, with the elimination of the reserve interest rate, previously to priority activities. The average monthly Rate of Money Market (MMR) has replaced the discount as interest rate. Exchanges of cash between banks are exclusively on the money market where the theoretically variable rate is kept stable by the Tunisian Central Bank, through its interventions in the market.

2.3.2. Financial market reforms

This reform is on the strengthening of integration within the financial market. Indeed, the Tunisian financial

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[5] Bank circulars N° 87-47,on 23/12/1987.
[6] Since : June 15/1994.

system is characterized by segmentation and partitioning that marks the area of activity of the institutions. The latter has a special role in the mobilization of savings and investment financing.

A new law enacted concerning compulsory loans, Investment in Fixed and Variable Capital Companies (IFCC and IVCC)[7] and a new status of the stock exchange[8]. Tax incentives to Companies that opened their capital to the public which grantee this idea. This is to encourage popular shareholdings which take over the State in the capital of the enterprises for privatization.

2.3.3. The Tunisian Bank System TBS

Banking regulation amended by the creation of Investment banks in Tunisia in 1994[9]. Monetary authorities seek to develop activities of Council and assistance in the management of the assets, financial engineering and the creation, development and the restructuring of enterprises.

With a view to opening the banking system to foreign capital a new law introduced in 2001[10] to define the notion of credit institutions. This law totally reforms the Tunisian Banking System TBS by introducing the concept of Universal Bank. Development banks no longer exist in Tunisia following merger-absorption and transformation operations.

2.3.3.1. Reorganization of the Money Market

New marketable debt instruments in the money market have been created (certificates of deposit, commercial paper and Treasury bills) and the Central Bank has been started to conduct its monetary policy in relying primarily on the monetary market.

This policy reinforced by a new organization of the monetary market in 2005[11] that allow the Central Bank to be more effectively use the technique of Open-Market which enable panoply of Government securities to be more useful than companies and individual's securities. Also, through the reform of the financial system, there is a change in monetary policy to do regulation by market forces games.

The monetary regulation is therefore ensured by means of action by interest rates instead of the administrative mechanisms of cap credit and quantitative control.

2.3.3.2. Prudential standards

The Tunisian Central Bank TCB has regulated liabilities of banks due to the risks incurring by their credit activity. This is due to some bank failures relate to a bad division risks and also in the context of the new policy of credit, based on a control a posteriori. Thus, the Central Bank issues accounting rules and prudential standards applicable to banks and financial institutions[12]. These standards concern: the use of own funds, the ratios between shareholder's funds and liabilities, the ratios between capitals which grantee debtor to each and ; that encourage competition which risks in general aspect.

We summarize in table 2 (in annex) mutations in the financial system before and after financial liberalization taking as reference date the year 1989. This typology inspired and adapted to developing countries in particular for the formal sectors distinguishing between a regulated financial system and a liberalized financial system. It derived from the work of Mc Kinnon (1973) and Shaw (1973) that distinguished between financial repression and financial liberalization.

Thanks to these criteria, we can advance the hypothesis that the evolution of the Tunisian financial system constitutes a passage of a financial system based on Bank and administered to a financial system based on the Bank, in the process of liberalization, with domination of the financial institutions.

3. THE CURRENT FRAMEWORK FOR MONETARY POLICY IN TUNISIA AND DIFFICULTY OF THE TARGETING STRATEGY: INSTRUMENTS, LIQUIDITY MANAGEMENT AND EXECUTION

3.1. Role assigned to the Tunisian Central Bank TCB

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[7] Law N°88-92 of 2/8/1988 (JORT of 2/8/1988)
[8] Law N°89-49 of 8/3/1989 (JORT of 21/3/1989)
[9] Law N°94-25 of February 7th, 1994.
[10] Law N°2001-65 of July 10th, 2001.
[11] Circular in credit institutions, N°2005-09,of July 14th, 2005.
[12] Circular N°91-24 of December 17th, 1991 such as modified by the circular to banks, n°99-04, of March 19th, 1999.

The objective assigned to the TCB was the stability of the value of the currency by controlling the rate of inflation to a level close to that of the partner countries and competitors. Monetary stability means a minimum inflation Friedman M. (1968), equilibrium for payments balance and a stable exchange rate in real terms, to preserve the competitiveness of the economy. The intermediate goal is to correlate the growth of the monetary mass with that of economic activity. Conduct Guillard M. (2002) current monetary policy favors the interest rate to ensure a decisive role in the mobilization of savings and the optimal allocation of resources.

Since the year 2000, and to carry out the fine adjustment of bank liquidity, the Central Bank has disconnected the rate of one-off operations to 24 hours from the tender. Thus, the interest rate of the injection and puncture –aspiration- of the Central Bank operations are laid down, respectively, 1/16 point and more and 1/16 less than the tender.

3.2. Instruments of monetary policy: Central Bank intervention in the money market

The Central Bank has a wide range of monetary policy instruments. To manage the liquidity on the money market and guide short-term interest rate, it uses the open-Market operations that allow injecting liquidity into the banking system on receipt of adequate safeguards. In addition, credit institutions require the hold of fraction and reserves in their accounts at the Central Bank. Essentially procedures and instruments of monetary policy Haddou S. (2003) fit into the continuity of those used for financial reform.

Table.1. Technical interventions of the Central Bank in the money market

Nature of transaction	Tender	Repurchase Agreement	Specific operations (Injection or puncture)
Period	7 days.	From 7 days to 3 months.	Just in 24 hours.
Rate	Fixed by the TCB.[13]	Indexed on the behalf of tender with simple major increase[14]	Determined by market conditions[15]
Technical	Purchases effects or debt held by banks.	The sale of debt securities which carry a right of redemption on a specific date, increased by a rate of interest.	Two cases: if there is insufficient liquidity TCB operated ultimately to increase the liquidity in the money market. 2nd case, where there is excess liquidity, the Central Bank intervened to absorb the liquidity in the market.
Banks	Deposit banks acting for theirs own accounts or on behalf of investment banks.	Deposit banks.	Deposit banks.

Source: Financial Statistics, TCB 2013.

On the monetary market the Central Bank TCB may intervene to provide liquidity in various forms as shown in table1. Actually, TCB intervenes in the form of purchases by tender in the course of which the Central Bank provides liquidity in the form of a single communication to banks for 7 days (once a week). In 2001, the Central Bank intervened another technique of loan of liquidity on the money market which was the Repurchase Agreement under Tender of banks which were unable to cover their needs in terms of liquidity on the interbank market. This technique consists in the transfer of debt securities with an agreement to repurchase on a given date, increased by a money market interest rate.

The third technique is that of injection or aspiration -puncture operations-. Whereby, the Tunisian Central Bank involves money market for a period of 24 hours as the case of the situation of liquidity in the market. There are two opposite forms which are the following: If there is lack of liquidity on the money market, the Central Bank involved last spring to ensure this liquidity on the money market. In contrast, the second case where there is liquidity, the Central Bank intervenes to mop up the liquidity on the market.

The choice of the intermediate target is made taking into account the ability of the monetary authorities to regularly monitor the change of the aggregate monetary M2. Indeed, by now the pace of money creation constantly compatible with that of economic growth, monetary policy avoids immediately the appearance of

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[13] Determined considering the evolution of the rate on the interbank market, that of the general index of consumer prices and objectives held regarding monetary policy and regarding the credit.

[14] The increase is at present 1 point.

[15] At present it is the rate of call for tenders.

any inflationary monetary nature.

3.3. Methods of preparation of the annual monetary policy and control scripts

In the light of the results and progress that had been made in terms of modernization of the structures of the financial system, through introduced financial reform, we note that monetary policy has helped to contain monetary growth.

In fact, the average growth rate of the monetary mass M2 during the period [1979-1986] is 15% while that of GDP was 4%, whereas, these rates on [1999-2000] are 13.5% and 8,126%, respectively. Monetary policy has also helped limit inflation which the rate that was 14%, two digits in 1982, has been reduced to 3% in 2008.

3.3.1. Main tools of direct control of the TCB

The traditional tool more accompanied by the contribution of Keynes J-M (1942), as intermediate means to control liquidity in the money market and reach the final objective which is economic growth and the reduction of unemployment, as a result was without failure to control inflation to the mid-seventies (oil shocks). Monetarists[16] Friedman M. (1956[17]), as contrast, have rejected the theory of Keynes in favor of the more credible rules[18] that can control inflation. According to them, it is more crucially controlling the mass money which is now the origin of any growth of inflation.

Other operational variables that are under the Tunisian Central Bank direction are: the supervision of the credit, the discount, minimum reserves and open Market. For the first variable as the name indicates is a technical in which the Tunisian Central Bank allows to control the progression of the appropriations distributed by banks. In 2012, the Central Bank it appealed because this credit framework is efficient to limit the distribution of credits and any source of money creation.

The second instrument which is the discount by what the Central Bank increases its rediscount to compel the other Bank to increase their receivable interest rates whose ultimate goal constrains to grant credits to the economic agents by these banks which them even in refinancing. Although, this instrument abandoned since 1996 as a method of refinancing Bank, this technical involved the refinancing of banks by the Tunisian Central Bank share.

For the third monetary instrument, statutory reserves, which defined by the fact that second-tier banks required to hold an amount (assets) to the Central Bank on unpaid accounts? It is by here that the Central Bank, as the case of the period post-revolution 2011, intervened on these detained reserves in its own accounts to fit the granting of credits of second-tier banks and control therefore the liquidity on the money market by increasing the rate of these reserves.

The last instrument that opened Market referred as a technical will allow the Bank Central to modulate the orientation of the market rate according to their owns goals, making the choice, without the obligation, to buy or sell debt in the interbank market.

3.3.2. Quantitative intermediate targets: the monetary aggregates

The Tunisian Bank Central followed long financial development of the European industrial countries who are major trading partners for the Tunisia. Since 1987, in order to prevent the final objective of monetary stability, monetary authorities had set an intermediate target bearing on the level of expansion of the monetary aggregate M2[19]. The growth of M2 related annually to Tunisian GDP, and to gradually reduce the differential rate of inflation recorded with country partners and competitors of the Tunisia.

The aim is to ensure control of real variables and prices through the control of the monetary aggregates and counterparts, mainly lending to the economy. This management was guide through the stability of the velocity of circulation of money, defined as the ratio of GDP to the money supply.

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[16] In questioning the contribution of Keynes, monetarists pronounced to the late 70's to abandon the discretionary measures in favor rules like the famous rule of Taylor JB. (1993,1999).

[17] 1956, 'Quantity theory of money a restatement', (Fisher, I., 1930 and 1997, Fischer equation, MV= PQ)

[18] Guillard M. (2002), Kydland F. and Prescott E. (1977),

[19] The M2 aggregate includes more of the aggregate M1 (M1 = tickets + parts + deposits on accounts with checkbooks), formed quasi-money term deposits, certificates of deposit, special savings accounts, currency or in convertible dinars and other amount due to the customer. M2 = M1 + deposits near-cash (almost currency).

In 1996, and following the skid of M2, the monetary authorities have chosen the M4[20] aggregate up to 1999 and since then, the Central Bank takes into account the evolution of the two aggregates. The stabilization program adopts by the countries accompanied by financial reforms allowing the direct finance to develop through the activation of stock exchange securities.

Table.2. Monetary aggregates evolution (M3-M2 and M3-M4) in (1996-2013). MDT, unit

Year	M3-M2	M4-M3	Year	M3-M2	M4-M3
1996	854	252	**2005**	1875	2595
1997	819	228	**2006**	1755,65	260,25
1998	913	357	**2007**	1655,65	262,65
1999	991	455	**2008**	1853,879	256,1
2000	1083	646	**2009**	2094,489	203,55
2001	1350	1326	**2010**	1799,734	216,45
2002	1620	2427	**2011**	1949,383	247,568
2003	1598	3197	**2012**	2154	215,4
2004	1620	2887	**2013**	2143	39

Source: Author Attribution, TCB Annual Financial Stat[21], 2013.

Indeed, the encouragement of the investor to participate in the financing of the Government budget, projects, or already existing projects promoted by launching new titles of the Government such as negotiable treasury bonds in stock exchange in 1993 and the comparable treasury bonds in 1997, has allowed economic agents to operate in trade-offs between the different types of monetary investments and financial.

These new measures combined with the partial liberalization of capital movements and financial innovations seem to have made increasing the volatility of money demand (Massoued T. 2004), reducing the effectiveness of monetary targeting traditionally used the monetary aggregates became less precise and their value as widely disputed intermediate monetary target.

Indeed, in this period of abundant financial innovation and especially of instability of the behavior of economic agents, it may be illusory to follow a monetary aggregate. So, to act on the evolution of monetary mass M3 intermediate target, the Central Bank had a set of instruments, including the implementation to achieve the desired objective. The key instrument of the device based on the interest rate.

The Monetary Authority may be front on situation where the only quantitative control of growth in bank credit in the framework would more to a limitation of the expansion of the currency and finance. As a result, the action on the price of funding by the interest rates is more efficient. However, is it possible in a small open economy to act effectively by only interest rates?

In the past, exactly in 1987, the monetary authorities opted for M2 money supply as intermediate goal. Everything similarly, during the period (1987-1995), forecasts of the growth rate of this aggregate, according to the statistics[22] from the TCB, was not always seem to be carried out. Also, it appears that the Tunisian Central Bank TCB can not always achieve its intermediate target during the period studied because of discrepancies recorded between the realized and forecasted (cf. refer to annex table).

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[20] M4 = M3 + Government borrowings from the Public (national debt+ the Treasury bills + equipment coupons) + inter companies debt securities that are issued on the monetary market.
[21] Annual report: (1996 to 2013).
[22] Financial statistics, (1987-1995)
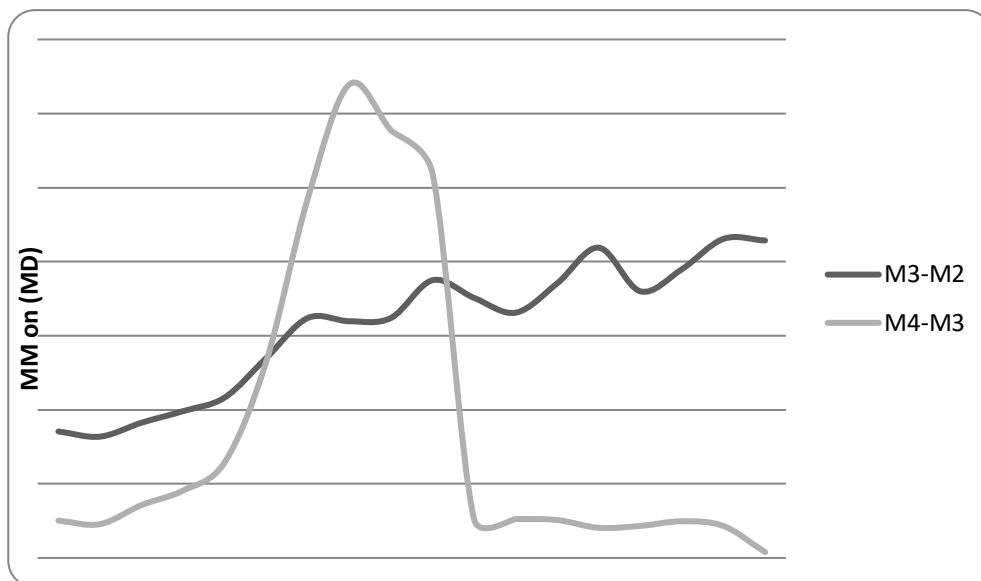
Figure.1. The evolutions gap of the monetary aggregates (M3-M2 and M4-M3)

Source : AuthorAttribution, Annual Financial Stat, Dec.2013.

In these circumstances, the BCT has been changed this target money M2 in 1996 (adoption the monetary aggregate M4 instead of M2). But, it lasts three years, given the inadequacy of the monetary target M4 to control the evolution of monetary mass, the Tunisian Central Bank in 1999 adopted another indicator of the evolution of the presumed final goal more efficient and easily controlled by the monetary authorities, that is the intermediate target M3 instead of M4. Thus, the figure.1above shows the offset of the gaps between development of these aggregates (M3-M2 and M4-M3) from 1996 until 2013.

A significant difference between the achievement of the two curves of (M3 - M2) and (M4 - M3) development observed during the period [2001-2005]. It reached its maximum of 31.2 points in 2003. During the period between [2006-2013], the gap between the standards set and carried out two curves reversed where the gap (M3 - M2) growth, compared away from the curve (M4 - M3) which was falling given the increase of mass M3 medium regular except some small divinations in 2007 and in 2010, ranging from (4.2 points) in 2007 to (2.1 points) in 2010, leaving appear that the Central Bank was able to control the evolution of the monetary aggregate M3[23] despite difficult political-economy of the country after three years in the Tunisian ex-revolution 2011.

In 2003, the exceptional overtaking of the order 31, 2 points explained, according to the TCB[24], as an acceleration of M4 that touched many more near-cash availability as the money supply. Monetary authorities did not always reach the intermediate goals that they settled. However, the rate of inflation remains restrained 3.5 in 2003 which implies that the Central Bank proceeds in support of its reputation in terms of transparency in the management of monetary policy.

Since 2010, the TCB acts as if it had a range of indicators that it used to control monetary policy by manipulating a rule of M3 monetary growth, as shown by the curve (M3 - M2) growth until the end of 2013 and an interest rate which changes influence its decisions, and more. However, although the rate of inflation was not master during this period of economic recession experienced by the country until the end of 2013, the fields of application of an independent monetary policy remains dependent on the nature of the regime change and the mobility of capital (Masson et al., 1997) and the intermediary target monetary held by TCB to control skyrocket inflation 6.1% in late 2013. Most noticing by the figure.1, the difference of these two curves of the monetary mass (M3-M2 and M4-M3) was sinking in (2011-2013). Showing in obvious fact the financial gravity and the economic downturn experienced by the country, during this period. What model could hold the TCB in these difficult macroeconomic conditions, a target inflation will it be the solution? Is the TCB in favor of this strategy, which depends on the preconditions for their actual implementation? Seen that the country currently in the end of 2013 crosses economic difficulties, are these conditions achievable

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[23] M3 = M2 + contract deposits+ bonds issued by banks.
[24] Annual report,1999.

by the Central Bank of Tunisia?

3.4. Inflation targeting possibility in Tunisian economic

The transition to the policy of targeting inflation in Tunisia remains an interesting opportunity to win in price stability[25]. It will allow different domestic and foreign stakeholders to build correct forecasts and formulate good expectations on the economic environment in which they are investing. However, the requirements of this policy remain very restrictive for the country in the sense that the Tunisian capital markets do not have depth and efficiency needed for its implementation until yet.

3.4.1. Inflation Targeting Policy and transparency: industrial countries and satisfactory results

Inflation Targeting Policy seeks action[26] on inflation. Indeed, when inflation attempts to deviate from its target, the Central Bank uses monetary policy instruments to align inflation laid down on the lens. It is as well as several researches conducted Mishkin F.S. (2000b, 2010) to determine the appropriate instrument to conduct such a policy. Taylor J. (1997) was the pioneer who proposed an instrument of conduct of monetary policy for the Bank federal reserve of the United States called "Taylor rule".

Given the simplicity of this rule and since it reduces the econometric investigations, it has gradually emerged as a rule of reference for most of the empirical work even though its original purpose was more descriptive than normative. In one more elaborate way, other then optimal generally qualified normative rules can be derived from small macroeconomic models.

Among the most elaborate works of inflation targeting, which allowed building a solid theoretical framework which governs this new approach is that of Svensson L. (1997). This work includes an equation specifying the "loss function" of the Bank Central and meant to represent the relative importance of the objectives that it continues. These rules, which are refer to as optimal called functions of reactions of central banks. These functions are different from one country to another and from one period to another for the same country.

Thus, having regard to the importance of implementation of the policy of inflation targeting and the obligation and to rely on the prerequisites for their adoption to acquire relevant results: we refer to experience foreign to the four countries, considered, pioneers in this area namely (New Zealand, the Canada, the United Kingdom and the Sweden). The particular emphasis on the behavior of the Central Bank of New Zealand in the case of inflation targeting has been during the period from 1990 to 2005.

This is due to several reasons, on the one hand, New Zealand is the first country which has adopted the policy of inflation targeting, so this is the greatest experience of this Central Bank in this policy. On the other hand, the Central Bank of New Zealand is the single Central Bank that has published data on forecasts of inflation in a number of significant years.

• It seems that the dynamics of inflation be amended in these countries that have adopted this strategy during the period after the implementation of the targets. An explicit policy of inflation targeting may tend to favor the stationary of the process by not allowing the emergence of permanent shocks on inflation.

• It appears on the other hand, as much credibility Patrick P. and Robert A. (2000) monetary policy is reflected on these financial markets, where long-term rates are less influenced by fluctuations in inflation. Thus, economic agents anticipate that shocks observed in the short term will not affect inflation realized over a long enough time horizon (10 years and more).

Furthermore, the strategy based on a direct inflation target seems a bit difficult to manage because it guided by conditions key including paramount importance given to the inflation target while leaving the Central Bank a margin of flexibility, which was not yet sufficiently, met Schaecheter A. and Stone R. and M. Zelmer (2000) in the context of the monetary policy of the developing countries (PED).

3.4.2. Prerequisites in the implementation of this strategy: operational aspects

On the institutional level, current efforts are to give the Central Bank the opportunity to move from a traditional control of the evolution of monetary aggregates to the use of the interest rate as instrument[27] of which, by changing its level, will affect economic transactions and the level of prices.

Under this policy, the Central Bank must declare its adoption of this policy as well as the target, unilaterally

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[25] Agenor P R., (2000a): the World Bank, 45. N -87, p.47

[26] ITP: Inflation Targeting Policy is a framework for the implementation of monetary policy with monitored freedom which forced the Central Bank to ensure low inflation, by setting an explicit target to wait in a period in a given period (e.g. a rate of inflation 2% for the next two years 2012-2013).

[27] Taylor J.B. (1999)

or commonly known with the Government which is likely to strengthen its independence.

The choice of the target must be accompanied by an appropriate time horizon. The choice of a too short period may not let the Central Bank a sufficient margin to achieve its objectives[28] and meet its commitments. The choice of a too long time horizon affects its credibility.

We can summarize the necessary factors for success this policy in the following points:

• A stable macroeconomic environment and a balanced budget situation in which the budget deficit located at tolerable levels.

• A developed and deep financial system that allows certain fluidity in transmission mechanisms of monetary policy as well as a dynamic securities exchange with a large market capitalization and dynamic secondary markets.

• Delineate the role of the Central Bank by quoting, in its statute that its role is to preserve the stability of prices Freedman, C., (1996) and read accurately, confer, thus, independence in the use of suitable instruments[29] that allow it to achieve its objectives.

• A good understanding of the different relationships between economic variables and inflation to better understand and measure the effects of monetary policy and its transmission channels to the economy.

• Have the necessary means for the construction of reliable forecasts and thus take the appropriate decisions.

• Adopt transparency in the implementation of monetary policy through the publication of regular reports analyzing the components of inflation and explaining policy and arguing the decisions of the Central Bank. This will strengthen the confidence of economic agents and the credibility of monetary policy.

3.4.3. What difficulties in front of the realization of this policy in period of post-revolution?

What is remarkable in Tunisia after two years of the 2011 revolution, the verification of these conditions makes it difficult to adopt the policy of inflation targeting, for several reasons:

• An economic context, in the end of 2013, characterized by the resurgence with inflationary pressure and their risk of persistence for 2014.

• The Central bank continues the pursuit of the contraction of bank liquidity from 2012 to ensure price stability and to provide liquidity to banks for the financing of the economy and therefore the prelaunch of economic activity.

• The fragility of the banking system which suffers from a significant level of classified receivables and the weakness of the monetary base which increases the risks within a framework of rigidity of interest rates.

• The weakness of the market capitalization and lack of dynamism in the securities transaction and the virtual absence of the secondary market that limit the effectiveness of the interest rate in the valuation of securities.

• Low quantitative and qualitative information on the follow-up of the economic conditions that limit the ability to forecast the future and global economic climate.

• The lack of in-depth studies and econometric models for the analysis of the relationship between changes in economic variables and inflation and which to better understand the transmission mechanisms of monetary policy in different economic sectors.

• The result is a lack of both short-term forecasts of long-term inflation rate. In addition, the exchange rate regime which is not enough floating.

3.4.4. What role assigned to the Central Bank (TCB)?

After three years of the revolution 2011, the CPI consumer price index has passed to high unusual levels beyond 5%, was established to 5.7% in 2012 and 6.2% in 2013. The persistence of price pressures has led the Central Bank to learn other measures to control the inflation[30] rate, 6.1% in the end of 2013 and stabilize at levels close to European partner countries. To do this the Government has dismissed any influence on monetary policy, as a result, the TCB is actually characterized by its own autonomy and independence from late 2011 to handle monetary policy and the banking system in general.

Thus, the Central Bank after this phase post-revolution 2011 must take a number of measures in order to

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[28] Bernanke.B. et Mishkin.F. (1997)
[29] Taher and Rahmani (2006): "Taylor's rule, exchange rates and asset prices: case of the Tunisia". 5th day of Economics financial,-Tunisia, April 2006. pp.1-26.
[30] *cf.* annual report Central Bank 2012. (Ibid. 2013).

increase the credibility of monetary policy to the public, such as the announcement of a monetary rule consolidated by a transparency program. Indeed, in announcing a monetary rule, monetary authorities had two attitudes. They can either respect it or be tempted to not respect and opt to deny their initial commitment. The trade-off between these two alternatives is made depending on whether the monetary authorities had concerns and short-term considerations or care about the sanction to long term on the part of the markets and the public.

The control of inflation will also reduce the pressure on the dinar, which will ensure a better stability of its value, and therefore, a risk mitigation of change inherent in the national currency, a major element that erroneous forecast of domestic and foreign investors.

In an uncertain environment Meyer L. (2005), the continuous display of stability policies constitutes a decisive element of credibility. Economic policy must send clear signals to the agents and markets. In order to sit its credibility, the Central Bank must be based on transparency and the coordination of policies.

In the implementation of its appropriate strategy, the Central Bank (TCB) has to report to public his actions and the results it obtains. Targets represent an implicit agreement between the Central Bank and the public. In this way, monetary authorities assume a greater responsibility towards the public, in so far as the latter adjusts his expectations of inflation objective mentioned by the Central Bank.

We note that texts organic of the Central Bank, revised[31] in 2006, clarified further the role of the TCB in monetary policy. They could usefully be clarified in the sharing of responsibilities between the Government and the Central Bank regards the policy exchange and the management of the public debt.

Based on statistics published by the TCB or broadcast on the Internet site, we found that the distinction is clear between the monetary policy operations i.e. those carried out on the money market in terms of amounts and rates (injection or aspiration, tender, taking pension, etc.) and lender of last resort, in the regulatory framework as the disclosed data which would gave a clearer vision of the nature of the interventions of the Central Bank.

A current reform on the modernization of the payments system should be accompanied by new legislation consistent with international standards and indicating the distribution of responsibilities and terms of the system operation.

Whenever the Central Bank modifies one of the elements of its monetary policy (interest rates, intermediate target, etc.), the explanation of the reasons that motivated this change through the publication of a press release is likely to provide useful information on the monetary credibility. Thus, the announcement and the precision of the objectives of long and short-term, as well as, detailed rules[32] for the TCB on the money market interventions can clarify the commitment to achieve the ultimate objective of monetary policy.

Since the public knows that the monetary authorities can, for short-term considerations, derive from their commitments, they must implement a device Barro R.J and Gorden D.B. (1983) that will help them to continuously consolidate the credibility of monetary policy. In the case of the TCB, this device must aim to increase the degree of transparency and allow the public to better assess initiatives and the work performed.

Similarly, the announcement of the intervention by the Central Bank rate changes would clarify the role of the latter in the conduct of monetary policy and gave more credibility to the conduct of monetary policy. Thus, discretionary interventions from the TCB to avoid slippage registered affect their credibility as they do not publish the growth rate of the monetary aggregate M3 target in time. That is, they publish the standards of the following year at the end of the current year. These rates have published during the month of June of the current year.

However, the publication of the annual monetary targets as the rate of inflation and the growth of the

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[31] Article 33 revised in May 2006: "the text of the amendment in question also reinforces the independence of the TCB by eliminating any form of monetary financing, what of swear means the ban now use practices windsurfing ticket or monetization of the government deficit and therefore any form of direct financing of the public Treasury." the TCB cannot grant Treasury overdrafts or loans or acquiring securities issued by the State in the primary market. Inputs of the amendment also cover the strengthening of communication policy by the publication of the decisions of the Governing Council and the submission of the financial statements of the TCB to an external audit exercised by two Commissioners to the accounts'. (TCB, Dec. 2006).

[32] Pursuant to section 33 new laws N° 2006-26 of May 15, 2006, amending the law n ° 58-90 of 19 September, 1958 on the establishment and organization of the Tunisian Central Bank (TCB) "the main task of monetary policy is the preservation of price stability. Indeed, a good control of inflation, as reflected by the changes in the index prices to consumption (IPC), allows ensuring non-inflationary growth contributing to job creation and the improvement of good welfare through the preservation of the purchasing power. To do this, the BCT, through the instruments at its disposal, influence the interest rate of the relevant currency market as the main instrument for the conduct of monetary policy in order to achieve the final objective of price stability. This monetary policy framework is based, in addition to the monetary aggregates and credit, on a diverse range of indicators closely linked to inflation. Include this as the import price, the output gap, underlying inflation, etc. Given the importance of the forecast inflation for this monetary policy framework, great efforts are being deployed with the TCB to implement a feature analysis and forecast of the short and medium term inflation which will serve as a reference for decision-making on monetary policy and a means of communication with the public. This approach fits in the context of the development and the strengthening of the analytical framework to better understand the different channels of monetary policy transmission and simulate the impact, including variation in the rate on the main economic variables".

monetary mass of the beginning of the year would increase the transparency of monetary policy. The display of a rule can be used to protect the monetary authorities by immune interventions short-term policy makers or the public opinion and isolate the conduct of monetary action by the electoral timelines. The problem of inconsistency temporary Daniel L. (1997) is thus avoided as demonstrated by the founding work [33] of Kydland and Prescott (1977). However, some Central Banks, by choosing the opacity to protect them from political power, the public opinion or market pressures are able to ensure their policy of price stability.

Analysis of the issue of the credibility of monetary policy has shown that certain technical aspects of the behavior of the Central Bank are likely to either compromise, or promote the credibility of monetary policy. With regard to the TCB, it turns out that it defines clearly its objectives of monetary policy ("preserve the value of the currency while maintaining the rate of inflation to a level close to that observed in the European partners countries and competitors')[34], informs the public of its strategy and explains how its initiatives should match the goals plotted through various publications. (See Figure 2 on the inflation rate in Tunisia, below).
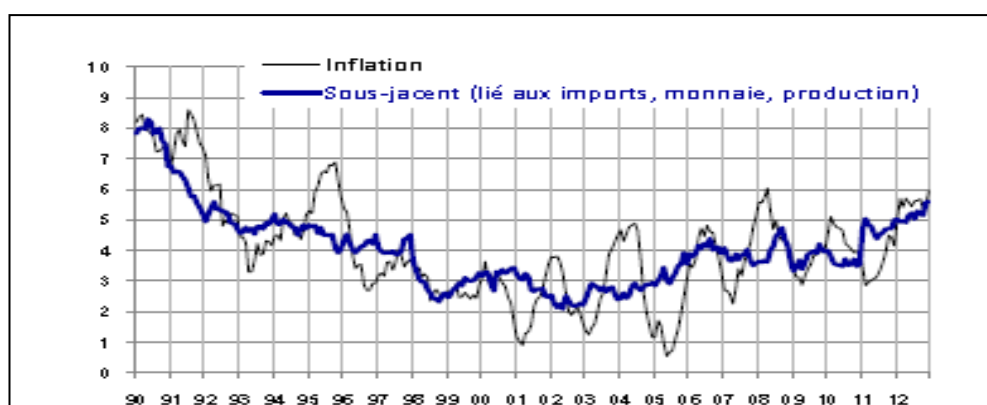
Figure.2. Inflation rate and its underlying in annual sliding for period [1990-2013]

Source: SNI, January 2013.

This graph, showing the annual sliding of the inflation from 1990 until 2013 and its underlying, can be decomposed into two major periods: the first (1990-2005) during which annual inflation rate compared with that of its underlying a continuous decreased gradually until 2005. In this period the Government followed a structural plan to modernize the Bank System and gradually released the financial market. The country's macroeconomic situation has improved towards the end of the early 90's until the end of 2005, where the average inflation rate is around 3.4%.

Concerning the second phase (2006-2013), according to the chart (fig. 2) we note as of the beginning of 2006 until current 2013, inflation has increased gradually each year from 3.8% at the beginning of 2006 to 4.8 on 2008. This rate is some what supported (2009-2010) with an average inflation rate of 3.7%. But most noticing it is on 2011 the year of the Tunisian revolution where inflation was in annual increasing until end of 2013 under the effect of the degradation of the country's economic circumstances and even what to lost of the country's image is serious notes (BB⁻ in early 2013) of the International Rating Institutions like Standard & Poor's [35] in the end of 2012.

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[33] For Kydland and Prescott (1977): the Government uses discretionary policy for some time to ' deceive' economic agents and beyond significantly improve its economic record. To turn this effect, these authors have formulated a maxim-based: "the rule against the Discretion". In fact, the rule will allow the Government to improve the social good, without the discretionary use.

[34] *cf*. TCB Challenges report.

[35] Source: AFP 2013; The mark awarded to the debt the country's long term changes from "BB⁻" to "B", reflecting low Standards & Poor's confidence in the ability of the country to meet its financial commitments. This note is accompanied by a negative development perspective. http://www.africanmanager.com/154338.html
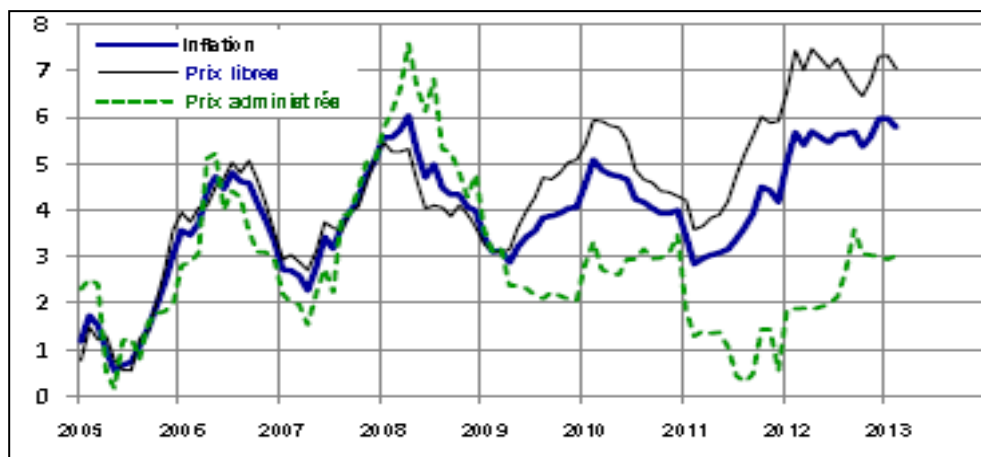
Figure.3. Fluctuation in the inflation rate compared to the price indices: annual sliding [on 2005: 02 to 2013]

Source: SNI, January 2013.

Inflation accelerated in 2006, causing the Central Bank TCB to respond and meet its director 25 basis points interest rate, first settling in three years. The annual rate of increase of consumer prices rose by 2% in 2005 to 4.5% for the first 10 months of 2006. This acceleration in inflation is mainly due to increases in international prices of oil and some commodities prices (inflation of base, excluding products energy and food, for the 10 first months of 2006 is 3%, compared to 2.5% in 2005).

It also reflects the effect delay of the increase in the price of oil on adjustments of rates of transport of end of 2005. Furthermore, the strength of domestic demand and the gradual depreciation of the nominal effective exchange rate probably also contribute to inflationary pressure.

An effect noticing in 2007, inflation again decreased to 2.8%, indicating a macroeconomic stability, fast fires again at the end of the year under the impact of the oil crisis in July 2007 for expected 5.5% in December 2007. Furthermore, as a result of the financial crisis 2008, the inflation rate continued its rise with 6% for the first quarter and is finished by a deceleration until the first months of 2009 with a rate described as stable surrounding of 3%. But quickly this rate of inflation occurs again given the non stability of the global economic environment, registering a jump of 2 points rise for the first months of 2010. Given that the economic situation of the country after two years of the financial crisis has registered a gradual return to his current's economic stability is as well as inflation declined one point to reach 4% in early 2011.

For the period (2011-2013), the country has seen major economic shocks just after the year of the revolution 2011. Within the economic recession and the deterioration of production, for the two years of the revolution, inflation accelerated more than three points compared to the annual average rate (3%) in 2010 mitigating in 2013 an annual 6.2% rate.

4. CONCLUSION

It is true that the adoption of various strategies to control and reduce inflation depends on likely considerations which vary from one country to another. Although, most of these countries that today target inflation have adopted this approach recently, though, the results so far are encouraging, as argued by participants at a recent seminar in IMF high level on the targeting of inflation in 2010. However, this strategy suggests conditions less told important for their actual implementation depending on each country's economic and financial context. The case of the Tunisia: where the economic circumstances from 2009 to 2011 prove major shakes, making it impossible to adopt into account this strategy of inflation targeting by the Tunisian Central Bank. Given that the country was in a period of non-political and economic stability. It is thus that the credibility and the transparency of monetary policy from the TCB to economic agents and investors are uncertain and unreal with a politico-economic environment very moving after the revolution 2011. That activates an inflation rate of 6.1% in 2013 against 2.4% in 2009, unregistered for more than nearly

two decades earlier.

Furthermore, in Tunisia, the best way to reduce uncertainty is the publication by the Central Bank of its forecasts and, possibly, to explain the conditions for their execution. As inflation reacts with some delay, the monetary authorities must explain their short and medium term strategy for monetary policy and the factors that influence their decisions in a manner clear and frequent, prior to the acquisition of a real credibility. The Central Bank must take Masson R., Savastano A. and Sharma, S. (1998), on the other hand, a certain number of measures to enhance the credibility of monetary policy to the public, such as the announcement of a monetary rule consolidated by transparency aspect.

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ANNEXES

Table.2. Evolution of the monetary aggregates gaps [1996.12 - 2013.12]

		M4	Variation %	M3	Variation %	M2	Variation %	M3-M2	Variation %	M4-M3	Variation %
DEC 1996	Result	12505	13,1	9618	13,8	8764	13,9	854	13,6	2887	10,7
	Prevision	12018	8,7	9183	8,7	8380	8,9	797	6	2807	7,6
	Gap	487		435		384		57		80	
DEC 1997	Result	13567	8,6	10981	14,2	10162	16	819	-4,1	2595	-10,1
	Result	12810	10	9495	8	8852	7,9	607	8,8	3351	16,2
	Gap	765		1522		1310		212		-756	
DEC 1998	Result	14836	9,3	11639	6	10726	5,6	913	11,5	3197	23,2
	Prevision	13943	9,1	10908	7,2	10226	7	682	10	3035	-5,1
	Gap	893		731		500		231		162	
DEC 1999	Result	16234	9,3	13807	18,6	12186	19,5	991	8.5	2427	-24,4
	Prevision	14019	0,7	11688	9,1	10988	9,2	700	7,9	2331	-27,2
	Gap	2215		2119		1828		291		96	
DEC 2000	Result	16960	4,5	15634	13,2	14551	13,5	1083	9,3	1326	-45,4
	Prevision	16769	3,3	15102	9,4	14021	9,4	1081,0	9,1	1667,0	-31,3
	Gap	191		532,0		530,0		2,0		-341,0	
DEC 2001	Result	18048	6,4	17402,0	11,3	16052,0	10,3	1350,0	24,7	646,0	-51,3
	Prevision	17913	5,0	16688,0	9,5	15571,0	9,7	1117,0	7,2	1225,0	-3,3
	Gap	135		714,0		481,0		233,0		-579,0	
DEC 2002	Result	18757	3,9	18302,0	5,2	16682,0	3,9	1620,0	20,0	455,0	-29,6
	Prevision	18974	5,1	18474,0	6,2	16694,0	4,0	1780,0	31,9	500,0	-22,6
	Gap	-217		-172,0		-12,0		-160,0		-45,0	
DEC 2003	Result	19814	5,6	19457,0	6,3	17859,0	7,1	1598,0	-1,4	357,0	-21,5
	Prevision	20484	8,0	20027,0	8,4	18030,0	8,0	1997,0	12,2	457,0	-8,6
	Gap	-670		-570,0		-171,0		-399,0		-100,0	
DEC 2004	Result	21694	9,5	21466	10,3	19846	11,1	1620,0	1,4	228,0	8,9
	Prevision	21694	7,8	21303	7,9	19475	7,6	1828,0	10,9	391,0	3,5
	Gap	0		163		371		-208,0		-163,0	
DEC 2005	Result	22997	7,6	22745	7,6	20870	7,3	1875,0	8,4	252,0	4,4
	Prevision	22997	7,6	22745	7,6	20870	7,3	1875,0	8,4	252,0	7,2
	Gap										
DEC 2006	Result	30444, 339	1,6	30181, 689	1,1	28526, 039	1,3	1655, 650	7,1	262, 650	2,1
DEC 2007	Result	30444, 339	2,0	30181, 689	1,2	28526, 039	1,9	1655, 650	7,1	262, 650	6,2
DEC 2008	Result	34757, 643	2,1	34501, 543	1,2	32647, 664	1,1	1853, 879	7,3	256, 100	2,1
DEC 2009	Result	39235, 694	1,2	39032, 144	1,1	36937, 655	1,3	2094, 489	9,1	203, 550	16,2
DEC 2010	Result	40081,243	1,9	39864,793	1,1	38065,059	1,6	1799,734	5,5	216,450	10,1
DEC 2011	Result	43794,964	1,1	43547,396	1,2	41598,013	1,1	1949,383	8,7	247,568	-1,1
DEC 2012	Result	47169,0	1,3	46872,0	1,4	44718,0	2,1	2154,0	0,1	2154,0	14,2

| DEC 2013 | Result | 50272,0 | 1,2 | 50233,0 | 1,3 | 48090,0 | 2,2 | 2143,0 | 32,4 | 39,0 | - |

Sources : SNI, Financial annuel TCB. 2013

The Growing Importance of Changing Nature of Competition

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A B S T R A C T

In this paper, an in depth theoretical overview on the central question in business strategy is provided: Why some firms outperform others? The latest approaches to the concept of competitive advantage were examined. Recent researches show that sustainable competitive advantage is becoming rarer, and that the duration of competitive advantage decreases (Wiggins and Ruefli, 2002). Sirmon, et. al. (2010) point out that competitive advantage is de facto unsustainable and that each advantage of the firm is reduced, as a result of dynamic interactions with competitors. Thus, the paper gives detailed explanation of how and why new perspectives work to unlock the potential for competitiveness. In other words, the purpose of this paper is to examine the theoretical background and insights of behaviour of the firms and the ways of sustaining competitive advantage in the context of hypercompetition, by examining the modes in which firms successfully compete, evolve and survive in times when specific advantages are not sustainable, but of more temporary nature. This extant literature review shows that still and all we face a knowledge gap in realizing the big picture of competitive advantage.

1. INTRODUCTION

In the last two decades, process of globalization, flourishing of capitalism, privatization and deregulation, as well as the wave of technological innovations led to a significant restructuring of the economy. These trends will continue to change the way the business is done in the 21st century, given that their impact is already enormous. Many argue that the age of fast growing competition, or hypercompetition, is result of these trends. A large increase in competition among firms characterizes the new era of competition, resulting in a short time of idea development and even shorter time to make decisions. Above all, the speed at which data, information and knowledge circulate among competitors has reached unimagined levels. Firms able to respond quickly to market demands strengthen their market power and generate advantages; but those that can be even faster, will generate even greater market power and advantage over its competitors. However, there is no guarantee that competitive advantage achieved today will remain unchanged in the long run.

Furthermore, competitive dynamics is becoming more emphasized in many industries, even in those that were, until recently, considered relatively stable. There is the presence of hypercompetitive shift in various industries that are visible through the rapid increase of competitive activity, greater variability

in industry profitability, as well as severe changes in market shares (Ferrier et al., 1999, Thomas, 1996; Thomas and D'Aveni, 2009; Wiggins and Ruefli, 2005). Recent studies showed that sustainable competitive advantage is becoming rarer and that its duration is reduced (Wiggins and Ruefli, 2002). Other researchers suggest more anecdotal and rigorous empirical evidence of concatenation of temporary advantages (D'Aveni, 1994).

Thus, the purpose of this paper is to examine the theoretical background and insights of behavior of the firms and the ways of sustaining competitive advantage in the context of hypercompetition, by examining the modes in which firms successfully compete, evolve and survive in times when specific advantages are not sustainable, but of more temporary nature. Such conditions occur when moves and actions of firms are fast and frequent, as well as the competitors' reaction, or when frequent internal and external capabilities destroy disturbances and discontinuities and thus preventing the sustainability of competitive advantage.

2. THE CHANGES IN BUSINESS ENVIRONMENT

Speed is priority in today's business world. Firms are able to react on moves of competitors more and more quickly, managers have less time to make decisions, while understanding moves of competitors and their activities is becoming increasingly difficult. In addition, the time lag between appearance of a new product on the market and appearance of his imitation is getting shorter, resulting in less opportunities for making extra profits. In fact, studies have shown that the earnings of new products have declined significantly due to the accelerated appearance of imitations on the market, while a newly established monopolies survive an average of 3 or 4 years compared to the previous 33 years. There is a general trend of shorter product life cycle, along with increasing competition which leads to price wars and a general decline in prices, with the exception of luxury products. Although price wars, as a rule, harm the entire industry regardless of who wins, they are becoming a common phenomenon because of the ease of its implementation in the fight with rivals.

In an attempt to restore the competitive vitality, the firm is trying to get in shape. It must be ready to respond quickly and be invisible in situations where the surprise and the first move is what it takes to succeed. If the firm is unable to defeat their competitors directly, then it must find a way to indirectly, in cooperation with other firms, improve its own competitive position. Going deeper into the analysis of the competitive environment, what concerns most managers, and occurs as a result of intense competition, is the fact that the success achieved today, does not necessarily means success tomorrow.

An environment where the advantages are created fast, but also deteriorating fast, is called **hypercompetition** (D'Aveni, 1994). It is characterized by intense competition and rapid moves, where firms must develop strengths quickly, and destroy or compromise the competitors' advantages. Its

appearance is the result of more rapid and intense technological change, caused by the technological development and innovation of firms, but also the distribution and availability of firms' resources.

The principal consequence of hypercompetition is the temporary nature of competitive advantage. Temporary competitive advantage is created as a result of a rapid technological change, globalization, industry convergence, aggressive behavior, competition, deregulation, privatization and the growth of new Asian markets, as well as the pressure of short-term incentives for middle management to achieve results etc. Advantages of firm become more and more temporary in nature, since various disorders can be found in environment, while strokes and activities of competitors are increasing. Regulation of competitive behavior might be partly ensured through appropriate development of the institutional context and effective institutions that regulate competition by preventing secret agreements and other noncompetitive practices. The development of an institutional framework affects the gain of competitive dynamics, namely the competitive interactions among firms to enhance the hypercompetitive environment (Hermelo and Vassolo, 2010).

Hypercompetition and competitive dynamics are the basis for understanding of how the dynamics and intensity of competitive business environment lead to a temporary competitive advantage. Theoretical approach to competitive dynamics shows that the ratio of corporate strategy and business success depends mainly on the strategic behavior of the enterprises, but also the behavior of its competitors and their interaction (Grimm et al., 2005). The theory is focused and related to specific actions taken by the firm and the ways in which competitors respond to these actions. Chen, Smith and Grimm (1992) show that firms achieve competitive advantage through actions or stream of actions, and that the speed of competitors' response depends primarily on the characteristics of specific actions. In the analysis of the features of firm actions, it is important to consider the action volume (Ferrier et al., 1999), the action speed (Yu and Canella, 2007), but also the buffered industry environment (Ferrier, 2001; Derfus et al., 2008).

Researchers of these disciplines have often explored new conditions brought by the emergence of hypercompetition and ever more severe, almost impossible to maintain, competitive advantages over competitors. However, very few researches have examined how the firm should decide, react and prosper in that environment. Thomas and D'Aveni, (2009) in a longitudinal study on reducing the business performance in the conditions of hypercompetition in the U.S. manufacturing industries, show that firms should try to maintain a competitive advantage by finding and citing a series of temporary advantages, which require taking a number of competitive actions in a certain time period, thereby ensuring the growth of business performance. Other studies focus on the impact of certain characteristics of competitive actions that firms make in the performance of the enterprise (Ferrier, 2001), and the impact of Top Management Team (TMT) and its motivation to take actions (Ferrier, 1999). The

motivation of managers to take action is manifested by the initiative of members of top management team in formulating strategy. Entrepreneurial behavior of top management is associated with innovation in various business segments, where innovation enables the firm to adapt effectively to the changing environment in which the firm exists.

Sustainability of competitive advantage depends primarily on the industrial context in which the firm operates and the nature and possible sources of advantage (McNamara et al., 2003; Thomas and D'Aveni, 2004; Wiggins and Ruefli, 2005).

Further on, there is an extensive research related to analysis of achieving or maintaining outstanding business performance of enterprises in hypercompetitive industries (Chen and MacMillan, 1992; Miller and Chen, 1994; Grimm et al., 2005; Ferrier et al., 1999; Chen et al., 2010, Chen et.al., 2010).

Because of the dynamic nature of environment, long-term strategic positioning is not possible, as firms must continually assess their actions and change their strategy once they identify which moves or actions lead to the best results. Principles by which the firm can try to deal with unsustainable advantages can be defined by attempts to introduce new advantages before the competitors do, by taking unpredictable and aggressive actions, and by being constantly up-to-date. There are various studies on the macro-assumptions of temporary advantages at the industry level (D'Aveni, 1994; Warring, 1996; Eisenhardt and Brown, 1998; Ferrier et al., 1999; Wiggins and Ruefli, 2002, 2005; Thomas and D'Aveni, 2009). The fact that hypercompetition leads or does not lead to time compression depends on moderated factors such as: leaders' market value of the competitive advantage, effectiveness of the initiated strategy and intensity of industrial hypercompetition.

Fig. 1 shows the importance of action properties and corresponding responses by competitors, such as the range of actions, speed of response to the action, aggressiveness in taking action, integration of behavior of TMT - Top Management Team, but also the environmental context where these characteristics appear.
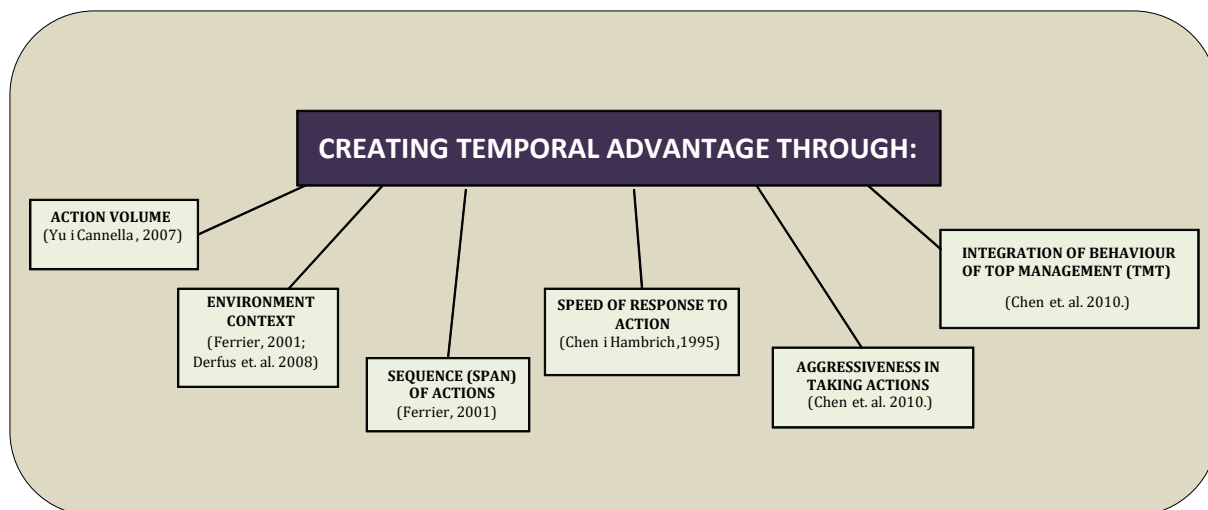
Figure 1: Characteristics of the firms' action that create competitive advantage

Source: Author

Strategic behavior in hypercompetitive industry requires an active presence in the market and aggressiveness of a firm to take action. Such corporate behavior is necessary, but not sufficient. Certain actions may lead to succeeding temporary advantages, while others actions do not have to succeed. The firm will achieve greater success for a longer period of time if there are opportunities to attain sequence of advantages (MacMillan, 1989), but it should bear in mind that the improved performance is not a result of achieving a sustainable advantage, but just a series of temporary advantages. Aggressiveness in taking action reflects on how the firm participates with its competitors in hypercompetitive environment. It is believed that firm has a high level of aggressiveness if, within a short period of time, it takes a large number of actions. Studies show that firms that yield a higher number of actions than its competitors in a year generate greater profits (Young et al., 1996), but also a bigger market share (Ferrier et al., 1999).

Firms' competitive attack is defined by taking numerous competitive actions, which are often opposed by answers of one or more competitors (Ferrier, 2001). Taking strategic action can be seen as an externally focused, specific and visible competitive move initiated by the firm in order to improve its competitive position (Ferrier et al., 1999; Smith et al., 1991; Young et al., 1996).

On the other hand, Pacheco de Almeida (2010) suggests the possibility that, in some cases, there is absence of maintaining the leader position for firms that are leaders in the industry when operating in conditions of hypercompetition. Stated is further explained by the fact that, in hypercompetition, competitive advantages quickly become obsolete, which promotes faster development of new types of advantages from those leaders (D'Aveni, 1994). On the other hand, hypercompetition distorts the expected returns generated by the new advantages, which reduces incentives for leaders to accelerate investment, since faster investment increases costs. Therefore, leaders in hypercompetitive industries

may sometimes prefer a slower recovery of competitive advantage, and thus consciously increase the possibility of self-displacement. Concept of self-displacement represents an explanation of why industry leaders sometimes fail to maintain a leading position in the industry. It differs from previous theories about the phenomenon of leadership displacement that indicates that leaders lose their position because they are not able to respond to the threat of competition or simply are not aware that they exist (Hannan and Freeman 1984, Christensen, 1997). Results of Pacheco de Almeida (2010) research show just the opposite: that leaders are certainly aware and able to respond to the threat of competitors, but sometimes there is a lack of economic incentives for retention (Pacheco de Almeida, 2010).

3. THE CONSEQUENCES OF RISING COMPETITION

The increase in the intensity of competition changes business practices and has several important consequences. The most important consequence is that the way in which firms create advantages must be reviewed and redefined. The traditional model emphasizes sustainable development and long-term competitive advantages competitors can not overcome. However, in today's competitive environment, most of advantages will be neutralized and overcome eventually.

D´Aveni argues that the attempt to build a sustainable advantage in the intense competition is impossible, and thus leads to irrational use of scarce resources so necessary in today's environment (D'Aveni 1994). Also, he believes that in an environment where every advantage is quickly neutralized, any attempt to maintain the existing advantages leads to obstruction of the development of new ones. Furthermore, not taking into account the dynamic environment of competition nor the constant appearance of new competitors is main problem of traditional strategic models and gaining competitive advantages. They usually assume that firms and the environment in which they operate are simple and clear, with the recognized specific causes and effects. However, today's environment is far from stable and predictable.

Gary Hamel and C. K. Prahalad claim that traditional models do not show actual strategic actions (Hamel and Prahalad, 1989). Porter on the other hand highlights the need for more dynamic strategic models that connect actions and reactions of the firms (Porter, 1994). Firm´s actions itself have key impact on the structure and development of the industry over time (Porter and Rivkin, 2000).

Particularly, markets are in constant interaction and imbalance, while strategic decisions determine only partly firm´s results (Miller, 1990). In such an environment, results of the firm arise from its interactions with other firms, and strategic decision-makers play an important role in the development of the overall competitive environment. It is important to point out that sustainability of competitive advantage has not been assumed, exactly the opposite; competitive advantage and success will lead to the reaction of competitors and imitation, ultimately leading to the disappearance of competitive advantage.

Very few researches have examined the way in which the firm should decide, react and improve in hypercompetitive environment. Researchers in this discipline analyze the volatility and the dynamics of the business environment that leads to a temporary advantage (D'Aveni, 1994). Competitive advantage is evanescent, where every advantage that a firm creates decreases over time as a result of reaction of competitors. The above mentioned embodies a key premise of competitive dynamics.

There are many causes of increasing temporal nature of competitive advantages, such as technological change, globalization, industry convergence, aggressive behavior, competition, deregulation, privatization, the growth markets of China and India, the pressure of short-term incentives for middle management to achieve results, etc. However, the actual reasons of appearances and purposes of temporary competitive advantage, including the increased uncertainty of return, have not yet been proven nor explored.

Given that the structure of the industry is slowly changing, competitive advantages derived from the positioning within the industry are relatively stable (Porter, 1980). Resource theory especially analyzes the resources and capabilities that a firm possesses, and assumes that firms can achieve sustainable competitive advantage if they possess unique, valuable, and difficult-to-imitate resources for a certain period of time (Barney, 1991). On the contrary, in the presence of hypercompetition, the dynamic perspective, i.e. types of advantages that are of temporary nature, has replaced traditional and constant sources of competitive advantage. Some studies say that the factors that contribute to the hypercompetition include lowering the entry barriers through a global competition, and provide opportunities for enhanced methods of information spreading, which allow rapid imitation (Bettis and Hitt, 1995). Moreover, some researches have shown that in conditions of hypercompetition, it is not possible to retain outstanding financial performance (Thomas and D'Aveni, 2009).

When tracing endogenous antecedent of temporary competitive advantage, it could be identified the range or the extent to which the firm subjects its decisions, competitive actions and behaviours to its strengths, in which is motivated such behavior. While, in the identification of exogenous antecedents of temporary competitive advantage, one should certainly consider industry structure and industry boundaries, as well as the way in which convergence, i.e. convergence of industry and competitive business models in these industries, support the erosion of advantages, specifically how and why different industrial structure contribute to the erosion speed (D 'Aveni et al., 2010).

Identical institutional and macroeconomic conditions have different effects on the advantage sustainability, depending on the industry, which means that sustainable competitive advantage is not as feasible in all the industries. Various concepts such as "hyperturbulency" in the industrial environment

(McCann and Selsky, 1984), or "highly variable" environment with rapid changes in technology (Eisenhardt, 1989), as well as increased globalization (Bettis and Hitt, 1995; Hitt et al., 1998), assume the achievement of sustainable competitive advantage questionable. Chen, et al. (2010) define the intensity of hypercompetitive environment through the degree of variability in the basic areas using consumer demands and production methods in the industry in which the firm operates. With a variety of conditions that exist in each hypercompetitive industry, such as the competitors' level of aggressiveness, their ability to predict actions, the speed of technological change and the importance of technological characteristics, it is assumed that firms follow different strategic patterns to maintain or achieve a competitive advantage.

In order to survive in an environment of unsustainable advantages, firms must be prepared to often undertake a large number of actions (MacMillan, 1989). Moreover, it is very important for firms to have an effective and efficient organizational structure in order to cope with such high level of activity in the market. A top management team decides on the direction of business development, identifies business opportunities, coordinates activities and mobilizes resources of a firm in order to take advantage of such opportunities, which results in motivation for aggressive competitive engagement (Hambrick et al., 1996; Baron, 2007; Ozgen and Baron, 2007).

The most important characteristics of competitive advantage in hypercompetition are aggressiveness in taking actions and integration of top management behavior (Chen et al., 2010). Firm's competitive behavior is determined by the TMT behavior and with an emphasis on socio-behavioral integration, which is to the degree to which members perform together (Smith et al., 1994; Simsek et al., 2005). The focus is on being prepared to take an action, i.e. the extent to which the firm is willing to participate with competitors and act quickly in the involvement and participation. The dynamics of top management is a very important component of the ability of the competitive behavior of firms (Chen et al., 2007). The assumption of being more dynamic in market and collaborative with competitors is the integration of top management of the firm that depends primarily on compatible traits and members' communication skills (Lin and Shih, 2008).

Market and technological changeovers require fast adaptation of capabilities and routines of a firm, so that it could respond to the demands of the market and/or new technologies. Organizational change is ultimately necessary, but the strategic decision-makers and initiators of changes in the firm are often not able to transform the old routines and capabilities of enterprises, since they themselves are strongly influenced by the old skills, habits, models, routines and information (Henderson and Clark, 1990). Managers can identify and use opportunities that result in a competitive advantage, but to preserve acquired positions and build a long-term sustainable competitive advantage (through entrepreneurial

behavior), it is necessary to strategically manage the resources and capabilities of a firm (Ireland et al., 2003).

Achieving competitive advantage in hypercompetitive industry largely depends on the internal context of a firm. Principles by which the firm can try to deal with unsustainable advantages can be defined by attempts to be the first in achieving a new advantage, by taking unforeseen competitive actions and by constantly monitoring competitors' moves. Hypercompetition refers to the degree of uncertainty and insecurity that causes a deficiency in the necessary information to identify and understand the causal connection (Sirmon et al., 2007). Information deficit results in different levels of awareness about the scope and pace of changes among the participants in the industry, and omissions that often create opportunities for strategic actions, which could significantly pay off in the future. Firms that take action in order to ensure series of temporary advantages have the ability to succeed with a high rate of success as well (MacMillan, 1989; D'Aveni, 1994). However, readiness, more exact the firm´s ability to promptly react to competitors' responses, largely depends on the characteristics of the firm such as its size and reputation and industry affiliation.

4. CONCLUSION

To conclude, dramatic changes caused by globalization, deregulation and technological advance have redefined the nature of the business by increasing competition where every successful innovation, every well played market move leads to creative reaction of competitors, and in a situation where the stakes are too high, firms are sometimes willing to resort to illegal actions (eg. Espionage) in order to protect their own interests.

Because of that, firms should try to achieve a series of temporary advantages, instead of maintaining old ones. In an environment like hypercompetition, firms, especially those considered to be market leaders, are under constant threat of competitors who are able to react almost immediately to firm´s action. In such environment sustainable advantage is quiet questionable since competitors have opportunity to overcome firm´s advantage through technology, data analysis, reverse engineering, etc. But what is more important, achieving competitive advantage depends a lot on firm´s capability to respond on a new market demands before its competitors.

Furthermore, as highlighted in the previous paragraphs, firm must be prepared to take a number of actions, i.e. it must be active participant on the market, which primarily depends on the TMT who should mobilize resources effectively, identify business opportunities and be able to throw away old habits and routines and enhance knew knowledge in order to achieve competitive advantage.

Finally, the result of the hypercompetition is a significant increase in the speed of competitive response, the rise of competitive actions and falling prices. It is expected that these trends will continue in the future, and those firms prepared to respond to market demands, as opposed to those focusing on planning and forecasting, will successfully face an uncertain future.

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Distribution Route Optimization by Utilizing Saving Matrix: Case Study In. Limas Raga Inti Bandung

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A B S T R A C T

Along with the government's policy to convert from kerosene to LPG gas, LPG consumer demand is increasing. It requires the LPG distributors to be able to meet the needs of its customers. PT. Limas Raga Inti is an authorized distributor company PT. Pertamina LPG product devoted to distribute 12 kg. The company's main commitment is to provide the best service to the consumer. One of the efforts to improve the quality of service is to provide optimization of the distribution process. Optimization can be done by determining the distribution of the matrix saving method to obtain the optimal route. The purpose of the optimization of route determination is to provide effectiveness and efficiency of the distribution process. Effectiveness and efficiency can be seen with the speed of delivery time and can overcome the problems that exist in the company. In the process of determining the route to saving matrix, is done in the consumer sorting method which has produced the nearest neighbor and nearest the insert. Then do the repair method using 2-opt and or-opt in order to provide the best route to the selected proposal. Furthermore, the delivery time will be calculated based on the productivity of the proposal and indicating the optimal route. The results of this study are are 4 routes proposed by sorting nearest neighbor method with a total delivery time of 10 hours 30 minutes for 100 customers spread in the distribution area D14. The resulting productivity by 85.11%.

1. INTODUCTION
1.1   General

Government has annually alocated amount of budget around Rp 50 trillion for the fuel subsidy: kerosene, gasoline, and diesel fuel. From of which, kerosene is one of the largest subsidies given to the Indonesian (more than 50% budget of fuel subsidy is wholly exploited to subsidize the kerosene). This budget obtains its hike due to the trend of fuel prices around the world that has unpredictably tended to increase. Considering this fact, the government has set conversion policy from kerosene to Liquefid Petroleum Gas (LPG) since 2007. This policy is aimed to alleviate the dependency of fuel consumption particularly kerosene, diminish the fuel subsidy, minimize the misuse of the subsidized kerosene, and provide the practical, clean, and efficient fuel. State-owned oil and gas firm PT *Pertamina* has raised the price of LPG 12 kg by Rp. 1.000,00 or Rp. 91. 300,00 per cylinder in 2014. The hike has caused 5% consumers of 12-kg LPG canisters in Bandung move to 3-kg LPG canisters (Marboen, 2013). From 5%, it is

generallly used for the importance of household. The other consumers of 12-kg LPG canisters (such as company, cafe, mall, hospital, and restaurant) do not move to 3-kg LPG canisters because they do not speculate the price raise. One of the bread businessmen in Bandung argues that the hike has only small influence, but the distribution of 12-kg LPG canisters must not be stagnant. It means that some consumers highly need the well-managed distribution process to support their business.

Distribution is the process of moving a product from its manufacturing source to its customers. The distribution process is composed by several steps; one of which is functioning the distributor service. Distributor company takes main role to distribute the product from its manufacturing source to its customers. Besides, the distributor can make the significant influence for the sold and distributed products. As an instrument of strategy, the policy of distribution network can be used to strengthen the competition ability of company. Thus, it can be said that the higher distribution intensity is established, the stronger the power has, and also the larger the possibility of selling products is well delivered to the consumers (Ferdinand, 2000). As another effort to raise the significant influence on the product selling, it is necessary to establish a well managed system or route to help the easily spread distribution that can be well environmentally accepted by the consumers as expected. The consumer .. has various demand on the certain product, so it is a deman for the distributor to serve better service for the consumers. The transportation is also highly needed in the distribution process of good due to its influence on the consumer interest to buy the products. Unexpectedly, ytransportation aspect is inspearble form common problems such as traffic, flood, etc. The problems can also be caused by the lack of distribution process and implementation process.

The distribution problem of PT. LRI is the time of delivery of 12-LPG canister to the consumers. The ideal amount of delivery time is maximally predicted for 12 hours after order, but there are some fleets that spend 3-4 hours to deliver the LPG. The interviews with PT. LRI officer showed that the raising problems are due to the long duration of order delivery. This is caused by the company policy applying **the consignment telephone.** This policy exhibits that after the consumers order the LPG, the distribution operatot give an instruction to directly send the LPG to the consumers. If the driver is in free of route, so the order can be directly delivered. In fact, the driver will not directly deliver the LPG rather than going to 2-3 places when receiving the instruction in which the delay of delivery can not be avoided. The second problem is that consumers order 2-3 times in a day that can cause inefficiency on the distribution process. This leads to the uneffective route that makes other orders delayed.

2. REVIEW OF RELATED LITERATURE AND METHODOLOGY

2.1 Review of Related Literature

This research employed direct survey gathered from the object to collect the relevant data. Then, the data were analyzed to find out the distribution and the parameter of the data to obtain the optimal solution. This research functioned the saving matrix to analyze the data. The saving method, according to Pujawan (2005:180), is the method to minimalize the distance, time, or the expenditure by considering the appearing problems. The distance is used as the purpose function when found the direction coordinate of delivery, then the distance will be minimized by all transportation. Based on Wongso (2012), there are some relevant steps to do:

a). Identifying the Matrix Distance

This step is necessary to comprehend the distance between the company warehouse to each grocery store and teh distance among the store. By understanding the coordinate between the warehouse to each store, the standard distance can be patterned. For example it is found coordinates (x_1, y_1) and (x_2, y_2) of two locations:

$$j(1,2) = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2} \qquad (1)$$

The pattern above portrays the distance from fleet of company to each grocery store, or from one store to another store. The result of counting will be functioned to determine saving matrix that will be done in the next step.

b). Identifying Saving Matrix

This step is firstly assumed that every store will be exclusively visited by one truck so that saving can be benefited due to the cluster from two routes or more than two routes to be one route. Saving matrix represents the saving that can be formed by joining two stores in one route.

If each of store 1 and store 2 is inseparably visited, the distance is the commuting distance of the company fleet to the store 1 and vice versa. This also includes the commuting distance of the company fleet to store 2 and vice versa. If the delivery of store 1 and store 2 is joined in one route, the visited distance is from the fleet company to the storee 1 and from store 2 to the company fleet. Picture 2.2 illustrates the change.

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Figure 1: The Change of Consolidation between Store 1 and Store 2 into One Route

Figure 1 visualizes that the change of distance as one of saving ways is that the total of left distance is dikurangi right distance total:

$$2J(G,1) + 2J(G,2) - [J(G,1) + J(1,2) + J(2,G)]$$
$$= J(G,1) + J(G,2) - J(1,2) \tag{2}$$

This result is obtained by assumption that distance (x,y) is equal to distance(y,x). The result above can be generalized into this pattern:

$$S(x,y) = J(G,x) + J(G,y) - J(x,y) \tag{3}$$

$S(x,y)$ is the saving that is got by joining route x and y. By corellating the formula, the distance of saving matrix can be counted for all stores and the result can be used in one table of distance saving matrix.

c). **Alocating The Consumers In One Route Of Transportation Vehicle**
In this step, there will be divide of consumers in a transport route by considering the consumers and capacity of transportation vehicle. A route is categorized *feasible* when the number of all consumers do not exceede the minimal limit of transportation vehicle and the total of demand can be wholly coordinated by one transportation vehicle. The procedure to collect the consumers is based on the largest value of saving matrix. The first thing to do is ranking the the largest value of saving matrix into the transportation vehicle can carry all demands. If the capacity has been maximal, the procedure will be repeated till all consumers are alocated in a certain route.

d). **Organizing The Direction Of Consumer (Store) In A Well Defined Route**
This is the last step of *saving matrix* method. The purpose of this step is raaning the visit of transporttion vehicle to every consuemer that has been grouped in a route to obtain maximal distance. Several beneficial ways to organize the direction of consumer will be elaborated below:

a. *Nearest Insert*

This procedure is started by deciding the transportation vehicle roue that has nearest distance. This procedure, then, should be repeated until all of the consumers are included in the route.

b. *Nearest Neighbour*

This procedure starts its transportation vehicle route from the nearest distance with the restaurant. This route is additionally continued to the nearest consumer from the first consumer that has been early visited. This procedure has to be repeated until all of the consumers are included in the route.

e). **The Improving Method to the Purposively Selected Route**

After obtaining purposively selected route, the next step is giving the improving method in that selected route. It is functione to give more efficient route to the distance. This method improves visible solution by performing a series of side and knot exchange in one route or between the route of transportation vehicle with the direction to reduce the solution payment. The improvement method between route is used in the route improvement (Laporte & Semet 2002). According to Salaki (2010), there are some hints for conducting the improvement method:

a. Method *2-Opt*

This method moves two available strips and reconnects the strips with different match. The analyzis technique of method *2-opt* will be explained in the picture 2 below:
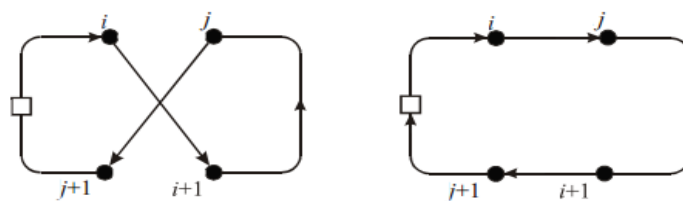
Figure 2: The Route Change by Method *2-Opt*

Based on the figure 2 above, the connecting line (i, i+1) and (j, j+1) is related to (i, j) and (i+1, j+1). from point j to point i + 1 turn counterclockwise to adjust the turn of the route. This method offers new alternative solution by its shorter distance than the sedond method. The steps to determine the well organized route by using the improvement method 2-opt is by exchanging position of two points based on the index.

b. Method Or-Opt

Method Or-Opt is identical with the method 2-Opt, but the number of routes that can be exchanged or added is more than two. The fundamental idea of this method is relocating close consumers. The analysis technique employs method Or-opt will be explored below:
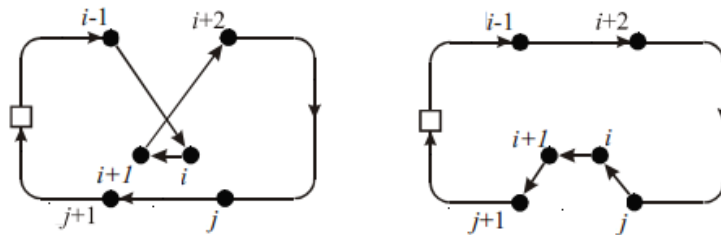
Figure 3: Route Change by Method Or-Opt

Source: Braysy & Gendreau (2005:12)

The analysis technique changes direction from G-(i-1)-(i)-(1+1)-(i+2)-(j)-(j+1)-G to (i-1)-(1+2)-(j)-(i)-(i+1)-(j+1)-G.The improvement analysis will be done by using *software VRP Solver 1.3* to obtain the accuracy of the counting result.

f). Adjoining the Delivery Time on the Alternative Route

The next step after the improvement is by giving delivery time to the alternative route. The analysis technique will be used as the point on the alternative creating. The pattern of delivery time calculation will be elaborated below:

$$T(1,2) = \frac{j(1,2)}{AS} x60 \tag{4}$$

The calculation is done by dividing distance between consumer and the average speed of transportation vehicle. This research employed the average speed of the transportation vehicle Toyota Kijang 50 km/h.

g). Checking Productivity Optimization of The Proposed Route

According to Heizer and Render (2005) productivity is the ratio between the output (goods and services) divided by the input (resources, such as labor and capital). The definition of productivity is well expressed by showing the ratio of output to input. Inputs can include the cost of production and equipment. While the output may consist of sales, revenues, market share, and damage. Productivity is not equal to the production, but the production

is a component of business productivity. (Heizer & Render 2005). Measurement of productivity which only consider one of the resources as the input variables is known as single factor productivity (single-factor productivity). In contrast, productivity measurement that takes into account all input variables (labor, materials, energy, capital) is known as multifactor productivity (multyfactor productivity) or total factor productivity (Heizer and Render, 2005).

2.2   Review of Related Literature

2.2.1   Thesis

Some previous research will be explored below:

1. Taufiq (2013), conducted research entitled **Analisis Rute Distribusi Guna Penjadwalan Sistem Transportasi Produk X dengan Pendekatan metode *saving matrix*.** Transportation System Product X by saving matrix method. This study used a matrix with space variable as saving reference. The object of this research is demand for the product X at. BTR. This research concludes that the space savings were generated by 5022 miles. The difference between the previous research and current research is the product of data processing and analysis techniques.

2. Melati (2008), analyzed Determination of Route Product Distribution by Using Matrix Saving Method to minimize the cost of transportation. This study uses the technique of matrix analysis is the method of saving. The object under study is *Garudafood* products distributed by PT. Sinar Niaga Sejahtera Banjarmasin. The findings show that it was obtained savings of 11.1% in total distance, travel time by 9.04% and 22.75% of the cost per day. However, the difference of the research that is being done is the product of data processing and analysis techniques.

3. Wongso (2012), conducted research entitled Optimization on Route Determination by Forecasting Approach, the Saving Matrix Distribution method, and design of information distribution system of goods. The analysis technique used in this study is a method of saving matrix and forecasting and information system design. The difference between the previous research and the current research is on the method used and the products that were investigated.

4. Wulandari (2007), conducted research with the title of The Determination of the vehicle route in the process of distribution products by saving matrix method to minimize transportation costs. This research was conducted with a case study at PT Bambangan Foodpacker Indonesia. This study uses a technique saving matrix

analysis. The object of this research is canned marine fish sardines. The conclusion of this study is the savings of a total distance were obtained 39.85%, 37.62% for travel time, and 27.64% transportation cost of per month. The difference between the previous research and the current research is the product, and analysis techniques of data processing.

5. Kristiani (2006), conducting research entitled Determination of the route distribution of the cement gresik by using saving matrix method in PT. Varia Usaha Unit Malang. Technique of analysis in this research is the use of route determination of saving matrix. The object of this study is cement Gresik. The finding show that there is distance saving of 19.9 km. The difference between the previous research and the current research is the research object, and analysis techniques of data processing.

6. Salaki, Rindegan (2010), in a journal entitled Distribution Optimization on Route Item Using Heuristric System. The variables of the research were the vehicle routing problem with heuristic methods. This method was begun by constructing route by using nearest-to-depot and then proceed with the repair using the 2-opt, Or-opt, relocate, exchange and cross. The conclusion of this research journal is that the distribution of bakery products to the customers needs 3 vehicles with a total distance of 27.8516 km, 52.7287 and 55.8329 km. The first vehicle served 6 customers with a total of 84 cargo crate, the second vehicle served 9 customers with a total of 158 cargocrate, and the third vehicles served customers with a total of 9 139 cargo crate.

2.2.2 The National Journal

Some previous national journals will be elaborated as follow:

1. Natalia, Christine, Dick (2012), in a journal entitled Application Program Distribution System Design by Saving Method as the Basis Purchase Decision Matrix Fleet with A Case Study at PT. Kabelindo Murni Tbk. This journal uses variable of distribution system application design with a sample population of fleet purchasing decisions. This journal described how the processing of information system design process by using the method of saving matrix as the basis for data processing. The findings indicate that the current transportation system has a lower rental costs than the first alternative with a total cost of USD 196,200,000.00. The difference between the cost of the first

alternative to the second choice is Rp. 202,467,482.00. The chosen system was the second alternative, using a transportation service to deliver to the four distributors in Jakarta, Bekasi and Tangerang.

2. Yuniarti, Astuti (2013), in a journal entitled the Application of Saving Matrix in Scheduling and Determining the the premium route of distribution at the Gas Station Malang. The variables of this research are the scheduling and determining the distribution route of these premium products. The taken population samples are gas station in Malang. The data were analyzed by using saving matrix to determine the purposes and sort premium delivery to the gas stations throughout Malang. The conclusion of this research is the saving distance on the initial distance changed from 261 km to 259.6 km, and a tanker truck that was originally needed 11 pieces declining into 6 pieces.

3. Octora Rahman, Susanty (2013), in a journal entitled Establishment of Distribution Route by Using Clarke & Wright Savings and Algorithm Sequential Insertion. This article examined the formation of route distributions by using the VRP algorithm method Clarke and Wright Savings and Algorithm Sequential Insertion. Clarke and Wright Savings and Sequential Insertion Algorithm were used in this research to provide solutions to problems in PT Panca Lestari Primamulya. The constructed routes in this research indicate that the Sequential Insertion Algorithm is better than Clarke and Wright Savings.

4. Akbar Rahman, Tantrika (2013), in a journal entitled Optimization of Distribution and Material Allocation Flow with Linear Programming Method with Case Study: PT. PLN (Persero) APJ Distribution Malang. The method that is used for the optimization of distribution flow is one of the VRP methods, namely the method of linear programming. This study uses Linear Programming approach to solve the problem of optimizing the flow of materials to the distribution and allocation of the distribution. Linear Programming approach is formulated with an objective function for cost minimization and restricted distribution of some functions related constraints warehouse capacity, demand and capacity of transport modes rayon.

2.2.3 International Journal

Some previous research in the form of national journal will be discussed as follows:

1. Shamsuddin Ahmed (2009) writing *Supply Chain Planning for Water Distribution in Central Asia* functioned *Location Analysis Algoritm* by determining consumer position based on the coordinate and counting saving matrix based on the coordinate. The establishment on this case study was composed by identifying water limit DCs in the city. By well developing distribution and logistic managment, this research dealth with the economical operations, region distributions, and responsive SCM. Additionally, the solution of route determination planning is functioned to develop distribution of drinking water.

2. Chwen-Tzeng Su (2006), in a journal entitled *Dynamic vehicle control and scheduling of a multi-depot physical distribution system* portrayed that there are some necesssary factors to support the optimization of route determination such as the factors of location, quantity, and date of delivery. This research is aimed to provide controlling system on distribution and scheduling to the company which has many branches and distribution regions. The general information or knowledge in distribution, controlling and setting the rule of branches in each area, vehicle route, and consumer feedbacks as the components to maximize the distribution effectiveness should be taken a hint. This article also provides the simulation used to evaluate the available system and offer new acceptable system for all company branches as well as the distribution condition itself.

3. Yiyu Kuo, Hsing Kuo, Chi-Chang Wang (2011), in a journal *Optimizing the VRP by minimizing fuel consumption* argues that there is innovative method to save the trasportation distance by looking at the amount of fuel that is needed in the transportation process. Providing new optimal route can give positive effect on the driver to see the vehice speed, the patch, and the amount og emigation remove. Besides, it can influence the consu,ers on how to consume the fuel.

4. A.C. Caputo L., Fratocchi, P.M. Pelagagge (2006), in a journal entitled *A Genetic for Freight transportation planning* analyzed the transportation of goods by container. The researcher has a conclusion that route determination can be used in all transportation modes. The transportations that were used in this research wer the atutoruck. The hereustic method is considered the best method and the best solution to give distribution savings.

2.3   Methodology

This research employed descriptive research design. Sekaran (2011:158) argues that descriptive research is functined to find out the characteristics of variable that are analyzed in the certain situation.

This research is procedurally inseparable from data collection and data analysis that can be elaborated below:

a). Data Collection

    a. Literature Study

    Literature study is done by searching, reading, and collecting data relvant to the theoretical object under study. Sources used can be accessed through electronic media (website), and print media (journals, textbooks, articles) that are useful to convince the reader as well as support information and phenomena.

    b. Field Survey

    The field survey was conducted to see the problems that occur to make an assessment.

    c. Interview

    Research carried out by direct communication to the relevant parties in order to collect data that can be used as a reference in solving the problem.

b). Metode Analisis Data

    a. The method of data analysis in this study is a method of determining the route saving matrix. Determining the location of consumers was conducted by the method of analysis alghoritm location.Ordering customer visits is determined by the consumer sorting method nearest neighbor and nearest the insert. Optimal route while visits were conducted by sequencing methods improved 2-opt and or-opt. Further analysis of the time and delivery schedules can be done by using the assumptions of existing companies. After that, productivity test was applied by dividing the output (after the repair) with the input (before the repair).

    b. Data Analysis

    The method to analyze data is the method to determine route of saving matrix. The consumer location is applied by location analysis algoritm method. The list of consumer visit is determined by method od consumer list nearest neighbor and nearest insert.

3. FINDINGS

PT. Limas Raga Inti is one of distributor companies of PT. Pertamina Persero. PT. Limas Raga Inti distributes products of PT. Pertamina, one of which is LPG 12 Kg. PT. Limas Raga Inti has many distribution areas in the Bandung city. However, the distribution area in this research is limited to the distribution area D14 that includes the Kembar, Mekar, dan Moh. Toha. The distribution is done by sending a 12 Kg LPG by using vehicles Toyota pick-up type. The vehicle is capable of carrying 50 LPG 12 Kg in one visit. PT. Limas Raga Inti provides 1 unit distribution to area D14.

a). Assumptions of this research includes:

  a. All customer orders can be met by PT. Limas Sports Core Bandung

  b. Consumer demand is fixed and known in advance

  c. Vehicles used to have a capacity of 50 to 12 Kg LPG with an average speed of 50 km / h,

  d. Each location is connected to each other and the distance between the symmetrical location, meaning that the distance between the consumer A to B is equal to the distance of consumer B to A.

  e. The travel time between customer A and B are T (A, B). This time is already included in the service consumers A.

The results of data processing by applying the method of saving matrix on construction and repair methods are described in Table 1.

Table 1: The Construction and the Repair Result on the Route Determination by Saving Matrix

Route	The amount of charge	Composition of Consumer on Route	Distance Total	Total Delivery Time (in hour)
1	50	G-31-89-40-39-42-41-43-97-37-36-38-35-20-19-17-18-16-15-14-13-21-22-34-33-23-32-28-G	171,28	3,4256
2	47	G-45-44-87-88-1-2-3-4-46-47-98-48-49-54-53-79-67-66-65-69-100-99-68-52-51-50-G	132,53	2,6506

3	50	G-55-56-57-59-58-60-64-63-62-61-78-76-77-75-74-71-70-72-73-80-81-83-82-96-G	110,27	2,2054
4	50	G-5-90-7-6-94-93-92-91-8-9-95-12-11-10-24-25-26-27-29-30-86-84-85-G	109,60	2,1920
Total	197	100	523,69	10,4736

Four vehicles as presented in the table 4:25 above are necessary to meet consumer demand and reduce the existing problems. The first route with a total of 50 LPG 12 kg payload includes a warehouse, customer 31, customer 89, customer 40, customer 39, customer 42, customer 41, customer 43, customer 97, customer 37, customer 36, customer 38, customer 35, consumer 20, consumer 19, consumer 17, consumer 18, consumer 16, consumer 15, consumer 14, consumer 13, consumer 21, consumer 22, consumer 34, consumer 33, consumer 23, consumer 32, consumer 28, and warehouses with a total mileage of 171 , 28 and the delivery time for 3 hours 26 minutes. While the second route includes the warehouse, consumer 45, consumer 44, consumers 87, consumer 88, consumer 1, consumer 2, consumer 3, consumer 4, consumer 46, customer 47, customer 98, customer 48, customer 49, customer 54, consumer 53, customer 79, customer 67, customer 66, customer 65, customer 69, customer 100, customer 99, customer 68, customer 52, customer 51, customer 50, and warehouses with a total mileage of 132.53 and delivery time for 2 hours 39 minutes. While the third route includes the warehouse, customer 55, customer 56, customer 57, customer 59, customer 58, customer 60, customer 64, customer 63, customer 62, customer 61, customer 78, customer 76, customer 77, customer 75, consumer 74, customer 71, customer 70, customer 72, customer 73, customer 80, customer 81, customer 83, customers 82, customer 96, and warehouses with a total distance of 110.27 and delivery time for 2 hours 13 minutes. The last route includes the warehouse, consumer 5, consumer 90, consumer 7, 6 consumers, consumers 94, consumer 93, consumer 92, consumer 91, consumer 8, customer 9, customers 95, customers 12, customers 11, customers 10, consumer 24, consumer 25 consumer 26, consumer 27, consumer 29, consumer 30, consumer 86, consumer 84, consumer 85, and warehouses with a total distance of 109.60 as well as the delivery time for 2 hours 12 minutes. Figure 4. is the visualization of the resulting determination of the VRP Solver software version 1.3 based on Table 1.
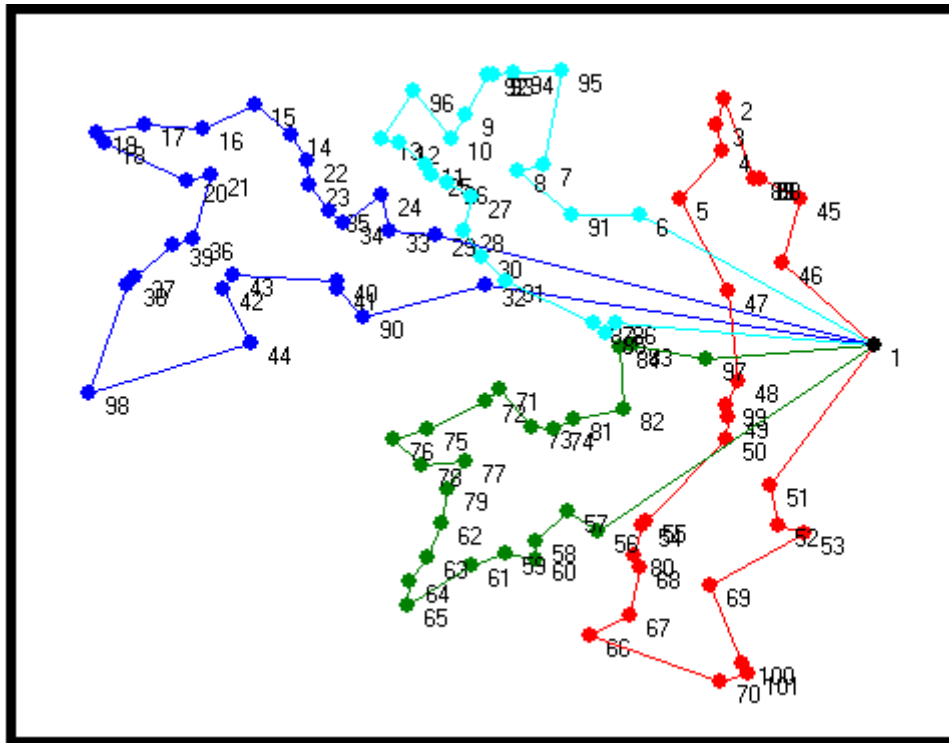
Figure 4: The Visualization Result of Route Determinantion VRP Solver Version 1.3

Figure 4 portrays the 1st route with the blue line, the 2nd route with the red lines, the 3rd route with the green line, the 4th route with the light blue lines. The portrayal is done in the opposite form of regulation due to software version 1.3 of the VRP Solver.

4. CONCLUSION AND SUGGESTION

4.1 Conslusion

Based on the data analysis and the findings previously, this research concludes that:

1) After doing some data processings, the routes that were produced by saving matrix consisted of 4 routes. Of the four routes, the most effective procedure is nearest neighbor procedure. Routes that have been purposively selected, then subsequently analyzed by the method of repair. After a process of analysis by the method of repair, the selected routes were analyzed by giving delivery time based on the mileage.
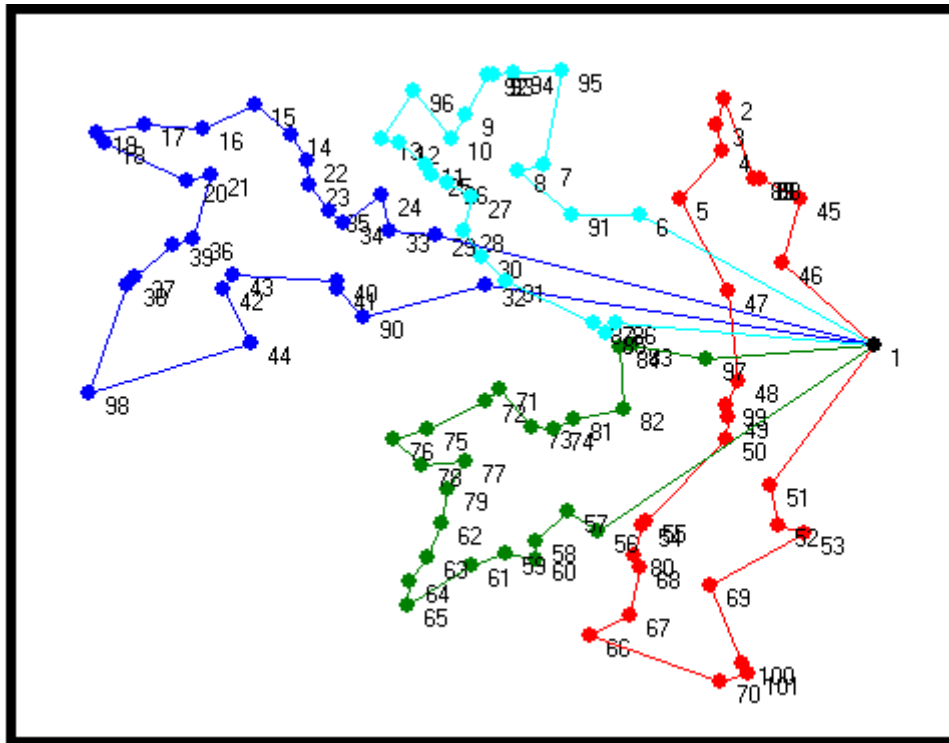
Figure 5: The Visualization Result of Route Determinantion VRP Solver Version 1.3

Figure 5 portrays the 1st route with the blue line, the 2nd route with the red lines, the 3rd route with the green line, the 4th route with the light blue lines. The portrayal is done in the opposite form of regulation due to software version 1.3 of the VRP Solver. By the total delivery time for 10 hours and 30 minutes, The total distance of the 4 routes is 523.69 km

2) Based on the result of the route determination and time of delivery, it can be deemed optimal if the distribution system is implemented on the PT. Limas Raga Inti because it can overcome the existing problems. The first problem solving is firstly centered on the delivery process spending more time than the specified time of the company, 2 hours. The second alternative solution is the consumer ordering more than one in one day. The newly found route can overcome the two problems above because the delivery schedule becomes more structured and utilizes the 1st assumption of customer first visit. Optimization of the route determination route can be categorized optimal because it has a productivity of 85.11%.

4.2 Suggestion

The suggestion for the company is explored as follows:

1) The company should determine delivery routes and schedules prior to delivering the consumer's orders to understand the most optimal direction so as to minimize shipping costs and save distance.

2) The company should implement an information system that can assist convenient ease in every activity of business process. It can be started from identifying consumers and their demand, determining route visits that will be visited, and setting the structured delivery schedule so as to reduce and overcome the existing problems of the company and provide convenience to everyone in the distribution system, such as the distribution operators and fleet drivers who delivered canister.

4.3 Suggestion for the Future Researchers

The suggestion for the next researchers is explored as follows:

1) Further research can be done by comparing several methods such as the method of determining the saving heuristic, Clarke and Wright saving method, large neighborhood, and many more.

2) Further research can also be done by the method of determining the location of the consumer using the rounded Euclidian distance or geodesic approximation.

3) Future studies can also add various repair methods in accordance with the method of route determination and the determination of the location of the consumer for instance the relocated method, exchange, swaps, and cross.

4) Future research can also add the process of forecasting consumer demand to provide a more accurate optimization.

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Capital structure choice in the Baltic countries

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A B S T R A C T

The data set consists of 58 companies listed on the Baltic Stock Exchange over the period from 2005 to 2012. The study analyses the trade-off and the pecking order theories of capital structure by using regression analysis. The empirical results indicate that Baltic listed companies do not apply pecking order to their capital structure. Speed of adjustment varies for long-term debt and short-term debt. Short-term debt is adjusted more quickly than long-term debt. Speed of adjustment also depends on company size and country. Large companies and companies from Estonia adjust their capital structure more quickly than medium companies and companies from Lithuania.

1. INTRODUCTION

Capital structure choice has been analysed and discussed by both academics and managers for several decades. The starting point for the subject of capital structure is the irrelevance proposition of Modigliani and Miller (1958, 1963). Since then two capital structure theories have prevailed – the trade-off theory and the pecking order theory. The pecking order theory states that companies prioritize their sources of financing – at first they prefer to use internal funds, then to borrow, and finally issue equity as a last resort (Myers and Majluf, 1984). The trade-off theory argues the companies choose the debt and equity mix by balancing the benefits and costs of debt. If a company increases its leverage, the tax benefits of debt increase as well. At the same time, the costs of debt also rise (Kraus and Litzenberger, 1973).

The aim of the research is to evaluate the pecking order and trade-off theories of capital structure and determine which one of these performs better for a sample of companies from the Baltic states.

The tasks of the paper are as follows:

- To overview the results of previous research made in this field;

- To evaluate the pecking order and trade-off theories on a sample of 58 listed companies;

- To determine which theory performs better for a sample of companies from the Baltic states.

Analysis is conducted on a sample of 58 listed companies (Baltic Stock Exchange) over the period from 2005 to 2012. The following qualitative and quantitative methods of research are applied in the research paper: the monographic method and panel data regression analysis. The research is based on published papers on the trade-off theory and the pecking order theory, as well as information provided by the Baltic Stock Exchange. Panel data regression performed in STATA.

The remainder of the paper is organized as follows. The following section provides the review of recent studies on the subject of the present paper. Then the methodology and sample of the study is discussed. After the methodology section, empirical results are described. The final section concludes the paper.

2. LITERATURE REVIEW

The pecking order theory states that companies prioritize their sources of financing – at first they prefer to use internal funds, then to borrow, and finally to issue equity as a last resort. The reason of such hierarchy is the information asymmetry, since managers know more about the company performance and future prospects than outsiders do. Managers are unlikely to issue company shares when they believe that shares are undervalued, however they are more inclined to issue shares when they believe they are overvalued. Shareholders are aware of this and they may interpret a share issue as a signal that management thinks the shares are overvalued, and in response shareholders might increase the cost of equity. There is no clear target debt-equity mix.

The trade-off theory states that the company chooses a debt and equity mix by balancing the benefits and costs of debt. If the company increases its leverage, the tax benefits of debt increase as well. At the same time, the costs of debt also rise. The original version of the trade-off theory grew out of the debate over the Modigliani-Miller theorem. Kraus and Litzenberger (1973) formally introduced the tax advantage of debt and bankruptcy penalties into a state preference framework. The trade-off theory predicts that target debt ratios will vary from enterprise to enterprise. Companies with safe, tangible assets and plenty of taxable income ought to have high target ratios. Unprofitable companies with risky, intangible assets ought to rely primarily on equity financing.

According to Myers (1984), a company that follows the trade-off theory sets a target debt-to-value ratio and then gradually moves towards it. The target is determined by balancing debt tax shields against costs of bankruptcy. Frank and Goyal (2005) break Myers' definition into two parts:

Definition 1 – the static trade-off theory – a company is said to follow the static trade-off theory if the leverage is determined by a single period trade-off between the tax benefits of debt and the costs of bankruptcy.

Definition 2 – target adjustment behaviour – a company is said to exhibit target adjustment behaviour if the company has a target level of leverage and if deviations from that target are gradually removed over time.

Target adjustment behaviour has been widely tested empirically (Leary and Roberts, 2005; Alti, 2006, Flanerry and Rangan, 2006; Hovakimian, 2006; Kayhan and Titman, 2007; Huang and Ritter, 2009). Some papers analyse the determinants of optimal interval of capital structure (Fischer, Heinkel and Zechner, 1989; Dudley, 2007) and determinants on how fast companies can adjust their leverage (Dang, Kim and Shin, 2012; Leary and Roberts, 2005).

Most empirical results show a medium adjustment speed. Shyam-Sunder and Myers (1999) report an adjustment speed of 0.75. De Jong, Verbeek and Verwijmeren (2010) show that adjustment speed is different for small and large companies. They used a sample of companies from 1990 to 2005 and the speed of adjustment was 0.21 for small companies and 0.67 for large companies. The adjustment speed differs for different types of countries. For example, Seifert and Gonenc (2010) found that the leverage adjustment speed for emerging countries is 0.49, whereas for US companies the result is only 0.19. Another determinant is the company life-cycle stage. Bulan and Yan (2010) show that growth companies basically do not adjust their leverage (0.08), however mature companies achieved a different result (0.42).

Previous empirical research on evaluating the efficiency of both the pecking order and trade-off theories has provided mixed results.

Shyam-Sunder and Myers (1999) find that the pecking order is an excellent descriptor of corporate capital structure and the target adjustment model also performs well. When both models are tested together, the pecking order results change hardly at all, however performance of target adjustment model decreases.

The study carried out by Sanchez-Vidal and Martin-Ugedo (2005) used a panel data analysis of Spanish companies. The results show that the pecking order theory holds for most subsamples analysed, particularly for the small and medium-sized companies and for the high-growth and highly leveraged companies. Seppa (2008) investigated 260 Estonian non-financial enterprises, using financial statements of 2002/2003 and 2003/2004 and found support for the pecking order theory, however in the long run the evidence supporting this remains weak. The results provide no or very weak support for the fact that the trade-off theory is followed in the long-run. Cotei and Farhat (2009) find that managers tend to adjust toward target leverage but this does not prevent them from deviating from this target to take advantage of the equity market conditions and the information asymmetry problem. Mazen (2012) used French panel data to examine the validity of the static trade-off theory and the pecking order theory. This study cannot formally reject either one of the two theories; however it confirms the importance of considerations provided by the static trade-off theory. Amaral *et al.* (2012) used a sample of non-financial Brazilian companies from 2000 to 2010. The study concluded that the companies follow the pecking order theory; however no evidence was detected concerning the trade-off theory.

Though many research studies have been undertaken in the field of the pecking order and trade-off theories, the results are still unclear. Some studies support the pecking order theory and some support the trade-off theory, while other studies support both of them or none at all.

3. SAMPLE AND RESEARCH METHODOLOGY

The study is based on the financial data collected from financial statements of 58 Baltic listed companies over the period from 2005 to 2012. The sample consists of 22 companies from the Baltic Main List and 36 companies from the Baltic Secondary List. Distribution by countries is as follows: 29 companies from Latvia, 7 from Estonia and 22 from Lithuania.

All companies had all the necessary data for the whole period analysed, therefore a balanced panel of data is achieved. The financial companies were excluded, because their characteristics are different due to the specific balance sheet structure. Data are obtained from the NASDAQ OMX Baltic. Total number of observations is 464.

Although capital structure has been researched for several decades by now, there is still no consensus regarding the best debt ratio to use. Many studies use liabilities against total assets or total capital, however the authors of this study argue that this ratio is not applicable. Both interest bearing debt and non-interest bearing debt is included in the liabilities. Two companies can have the same liabilities/total assets ratio, but the structure of the liabilities can be different. For example, at an extreme one company might have only interest-bearing debt in liabilities, whereas another company might have no interest-bearing debt at all. Therefore it is not correct to consider that both companies have the same capital structure. The use of total liabilities can overestimate the company leverage.

Total assets, total capital or equity is usually used as a denominator. Since in the Baltic countries equity might be a negative due to the accumulated losses, the authors of this study do not use these ratios.

Capital structure variables which are used in this study are shown in Table 1. Only interest bearing debt is used for the nominator and total capital is calculated as the sum of equity, long-term interest bearing debt and short-term interest bearing debt.

Table 1: Used variables in the study

Variable	Abbreviation
Short-term debt to assets	STD/A
Short-term debt to capital	STD/C
Long-term debt to assets	LTD/A
Long-term debt to capital	LTD/C
Total debt to assets	TD/A
Total debt to capital	TD/C

Source: prepared by the authors

This study uses not only the total debt ratios, but also the long-term debt ratios and the short-term debt ratios, since any analysis of leverage based on total liabilities may miss the important differences between long-term and short-term debt (Sogorb-Mira, 2005).

Table 2 shows capital structure variables for all three Baltic countries over the period from 2005 to 2012.

Table 2: Capital structure variables in the Baltic countries from 2005 to 2012

Country	2005	2006	2007	2008	2009	2010	2011	2012	Average
Latvia									
STD/A	6	6	10	9	14	9	8	11	**9**
STD/C	10	11	18	16	14	13	11	16	**14**
LTD/A	8	11	10	12	14	14	18	18	**13**
LTD/C	13	17	16	18	19	18	22	19	**18**
TD/A	14	17	20	21	22	23	26	28	**21**
TD/C	23	28	34	34	33	31	34	35	**31**
Estonia									
STD/A	8	7	6	8	19	6	5	5	**5**
STD/C	19	21	15	18	19	14	12	13	**16**
LTD/A	17	14	16	18	19	19	22	18	**18**
LTD/C	39	31	36	40	39	35	42	40	**38**
TD/A	25	22	21	26	26	25	27	23	**24**
TD/C	58	52	51	58	58	50	53	53	**54**
Lithuania									
STD/A	9	9	11	16	10	12	13	17	**12**
STD/C	16	17	20	27	27	19	22	27	**22**
LTD/A	18	17	15	15	10	11	10	8	**13**
LTD/C	26	28	26	22	15	19	15	13	**20**
TD/A	27	27	26	30	27	23	23	24	**26**
TD/C	42	45	46	49	42	38	37	40	**42**

Source: results calculated by the authors of the paper, using Baltic Stock Exchange data

If capital structure ratio TD/C is analysed, it can be concluded that companies from Estonia have the highest ratio of interest-bearing debt in their capital structure. TD/C for companies in Estonia fluctuated from 50% to 60%. Companies from Latvia started with a small ratio of 23% in 2005, however this debt ratio increased up to 35% in 2012. Debt ratio TD/C for companies from Lithuania was between 40% and 50% from 2005 to 2008. From 2009 to 2011 the debt ratio decreased by more than 10 percentage points, however during last year – in 2012 – this debt ratio showed an upward tendency once again.

In addition some differences regarding the short-term and long-term debt can be recognized. In the case of Estonia most debt is long-term. When examining the situation during the period from 2005 to 2012 it can be stated that the long-term debt for companies from Estonia makes around 70% of its total debt ratio. For companies from Latvia long-term debt proportion in total debt fluctuated more and it was

between 47% and 65%. Finally, with regard to companies from Lithuania the long-term debt proportion in the total debt varied between 33% and 62%.

Therefore it can be concluded that all three Baltic countries show different tendencies regarding the debt ratios and debt allocation between long-term and short-term debt.

In order to test the pecking order and the trade-off theory, the methodology by Shyam-Sunder and Myers (1999) is used in this study.

Shyam-Sunder and Myers propose the time-series hypothesis for the pecking order theory. The funds flow deficit is:

$$DEF_t = DIV_t + X_t + \Delta W_t + R_t - C_t, \qquad (1)$$

where
DIV_t – dividend payments,
X_t – capital expenditures,
ΔW_t – net increase in working capital,
R_t – current portion of long-term debt at start of period,
C_t – operating cash flows, after interest and taxes.
Then tested the following regression:

$$\Delta D_{it} = \beta_0 + \beta_1 DEF_{it} + e_{it}, \qquad (2)$$

where ΔD_{it} is the amount of debt issued (or retired if DEF is negative). The pecking order coefficient is β_1 and is expected to be 1. β_0 is the regression intercept and e_{it} is the error term.

As pointed out by the authors, this does not include equity issues or repurchases, since the pecking order theory predicts that the enterprise will only issue or retire equity as a last resort. They admit that this equation cannot be generally correct, but it is a good description of financing.

For the trade-off theory they propose the following target adjustment model and regression specification:

$$\Delta D_{it} = \beta_0 + \beta_1 (D_{it}^* - D_{it-1}) + e_{it} \qquad (3)$$

D_{it}^* is the target debt level for enterprise i at time t. β_1 is target-adjustment coefficient. The hypothesis to be tested is $\beta_1 > 0$ (indicates adjustment towards the target) and also $\beta_1 < 1$ (implies positive adjustment costs). β_0 is the regression intercept and e_{it} is the error term.

Since the target debt level is unobservable, empirically different proxies are used. Different studies use the average leverage ratio (Jalilvand and Harris, 1984; Shyam-Sunder and Myers, 1999), three year

moving average (Jalilvand and Harris, 1984), industry average ratio (Lev, 1969) or leverage ratio which is derived from the regression model (Kokoreva and Stepanova, 2012). The authors of this study use average leverage ratio and three year moving average.

This methodology has already been extensively used and modified. For example, the test of the pecking order theory is used by Amaral *et al.* (2012), Mazen (2012), Cotei and Farhat (2009), Byoun and Rhim (2003) and the test of the trade-off theory is used by Mazen (2012), Cotei and Farhat (2009), Byoun and Rhim (2003).

In order to estimate the panel regression model, two alternative methods were used: the fixed effects model and random effects model. The pooled regression may distort the true picture across companies. The two most prominent models are fixed effects model (FEM) and the random effects model (REM). In FEM the intercept in the regression model is allowed to differ among individuals in recognition of the fact that each company may have some special characteristics of its own. In order to distinguish the preferable model, F-test and Hausman test is employed.

Models are also evaluated by their R-squared, F-statistics, p-values, White test for heteroscedasticity and Breusch-Godfrey test for autocorrelation.

4. EMPIRICAL ANALYSIS AND DISCUSSION OF RESULTS

The authors of the paper test the trade-off theory and the pecking order theory by using the methodology proposed by Shyam-Sunder and Myers (1999) which has been widely tested empirically.

The tests of trade-off theory were done several times. At first, companies were divided into three equal groups by their total assets. Three year moving average debt ratio was used as target leverage. Regression models showed positive coefficients, F-statistics and p-values of coefficients were less than 0.05. However, one must note that coefficients were significantly larger than 1 and that applies to all debt ratios. If the trade-off coefficient is more than 1, it means that companies over-adjust their debt ratio. Based on the data from Table 2, it can be determined that coefficients of value more than 1 are not justified. In addition almost all models had heteroscedasticity and autocorrelation problems.

Then the company allocation was changed and all companies were divided into three equal groups by their moving three year average. Results were similar to the previous output. Almost all regression models had coefficients of value more than 1, F-statistics and p-values less than 0.05 and showed both heteroscedasticity and autocorrelation problems.

Finally the authors changed the proxy for the target leverage. The results of these regression models differ significantly. Almost all models are statistically significant (F-statistics less than 0.05), coefficients are statistically significant as well (p-value less than 0.05) and there is also no heteroscedasticity and autocorrelation. Results are presented in Table 3.

Variable	Model	Coefficient	P-value	Comments
		Small companies		
TD/A	RE	-0,2728100***	0,000	Heteroscedasticity, autocorrelation
TD/C	FE	0,7136315***	0,000	autocorrelation
LTD/A	RE	-0,1718654***	0,001	Heteroscedasticity
LTD/C	FE	0,5708472***	0,000	Autocorrelation
STD/A	FE	0,7387245***	0,000	Heteroscedasticity, autocorrelation
STD/C	FE	0,7001989***	0,000	Heteroscedasticity
		Medium companies		
TD/A	FE	0,4798671***	0,000	
TD/C	FE	0,4335767***	0,000	
LTD/A	FE	0,5098621***	0,000	
LTD/C	FE	0,6185725***	0,000	
STD/A	FE	0,9137532***	0,000	
STD/C	FE	0,6878322***	0,000	Heteroscedasticity
		Large companies		
TD/A	FE	0,3580199***	0,000	
TD/C	FE	0,6898459***	0,000	
LTD/A	FE	0,6012408***	0,000	
LTD/C	FE	0,7090288***	0,000	
STD/A	FE	0,9748274***	0,000	
STD/C	FE	0,8544689***	0,000	

Note: ***, ** and * indicate significance at the 1%, 5% and 10% confidence level
Source: results calculated by the authors of the paper, using Baltic Stock Exchange data

Heteroscedasticity and autocorrelation can be found only for small companies. However, the results of medium and large companies are consistent to the dynamic trade-off theory of capital structure. Acquired coefficients are between 0.35 and 0.97 and correspond to the rational behaviour. Since the acquired coefficients are positive and statistically significant, it can be concluded that leverage has a tendency to move to the average ratio.

Speed of adjustment is the highest for short-term debt. For example, large companies have a regression coefficient of 0.97 for STD/A ratio, which implies that companies decrease the gap between the actual and target leverage by 97% within a year. Speed of adjustment is a little lower for long-term debt and it varies between 0.50 and 0.70. If long-term debts and short-term debts are analysed separately, it can be concluded that large companies adjust their capital structure faster than medium companies. For example, LTD/A speed of adjustment is 0.51 for medium companies, whereas it is 0.60 for large companies. The achieved results can be explained as follows. Short-term debt can be adjusted in a faster and easier manner. Companies usually use such loan products as credit line and overdraft in their short-term liabilities. Companies can adjust the usage of these products quickly and with no significant adjustment costs. Larger companies adjust their capital structure faster, because they might use their scale of size in negotiation with the creditors.

Table 4 presents the results of regression models if companies are divided by their allocated country.

Table 4: Results of the trade-off theory regression in the Baltic countries, 2005-2012 (results divided by country)

Variable	Model	Coefficient	P-value	Comments
			Latvia	
TD/A	RE	-0,2084323***	0,000	Heteroscedasticity, autocorrelation
TD/C	FE	0,6255866***	0,000	
LTD/A	RE	-0,1153097***	0,007	Heteroscedasticity
LTD/C	FE	0,5304346***	0,000	Autocorrelation
STD/A	FE	0,8727210***	0,000	Heteroscedasticity, autocorrelation
STD/C	FE	0,7999403***	0,000	Heteroscedasticity
			Estonia	
TD/A	FE	0,6194594***	0,000	
TD/C	FE	0,9951138***	0,000	
LTD/A	FE	0,5361976***	0,000	
LTD/C	FE	1,0698260***	0,000	Autocorrelation
STD/A	FE	0,9464656***	0,000	
STD/C	FE	0,9146956***	0,000	
			Lithuania	
TD/A	FE	0,3132576***	0,000	
TD/C	FE	0,3959670***	0,000	
LTD/A	FE	0,4735342***	0,000	Heteroscedasticity
LTD/C	FE	0,6454209***	0,000	
STD/A	FE	0,8399109***	0,000	
STD/C	FE	0,6618735***	0,000	

*Note: ***, ** and * indicate significance at the 1%, 5% and 10% confidence level*
Source: results calculated by the authors of the paper, using Baltic Stock Exchange data

Companies from Latvia have heteroscedasticity and autocorrelation problems, which cannot be stated about the companies from Lithuania and Estonia. The only capital structure variable that can be compared for all three Baltic countries is TD/C. The highest speed of adjustment of capital structure variable TD/C is shown by companies from Estonia (0.99). Companies from Latvia show a medium adjustment speed (0.63), whereas companies from Lithuania indicate a speed of adjustment of 0.40. The results specify that companies from Estonia have financial flexibility and they are able to make capital structure adjustments quickly.

If long-term debts and short-term debts are analysed separately for companies from Estonia and Lithuania, one must conclude that short-term debt is adjusted more quickly than long-term debt. This can be explained with several arguments. First, short-term debt might not include the collateral (for example, bank overdraft). This can be applied to large companies which are listed on the stock exchange due to the low information asymmetry. It implies that granted means can be used faster, since no collateral has to be registered. Second, companies use such bank loan products as overdraft and credit line as their short-term liabilities. These uses of the respective loans can be changed quickly. Third, companies can use their scale of size and competent management team in order to negotiate a better agreement with the creditors.

The static trade-off theory states that an optimal capital structure exists where the company value is maximized. On the other hand, the dynamic trade-off theory states that companies use a specific optimal capital structure interval. In this interval companies allow their leverage to fluctuate and they make adjustments only when the high or low of the interval is achieved. The authors of this paper argue that companies should use an optimal interval and not the single optimal leverage point. First of all, an interval is easier to maintain. Second, it is very costly to try to maintain a single specific capital structure point. Third, one must note the lag factor as well. While the company management identifies the capital structure, makes the decision and applies it all in practice, the current capital structure might have moved once again.

The pecking order theory is tested two times. First, companies were divided by their size or total assets. Second, companies were allocated based on their three year moving average debt ratio. Results for these models did not differ significantly. Most models have both heteroscedasticity and autocorrelation problems. In addition p-values are often higher than 0.05. Nevertheless, the pecking order coefficient is close to 0, which implies that the pecking order theory of capital structure cannot be stated for Baltic listed companies.

5. CONCLUSION

The research covered 58 Baltic listed companies during the period from 2005 to 2012. The study used panel data regression analysis to determine if companies follow the pecking order or the trade-off theory of capital structure. The study finds that:

- Though many research studies have been undertaken in the field of the pecking order and trade-off theories, the results are still unclear. Some studies support either the pecking order theory or the trade-off theory, while other studies support both of them or none at all.

- Listed companies in Latvia can be characterized by the lowest debt ratio, however an increase in the average debt ratio can be observed as well, therefore the gap has been reduced in the recent years. Companies in Estonia have the highest total interest-bearing debt to total capital ratio and most of the debt is long-term.

- There is no evidence that the Baltic countries support the pecking order theory of capital structure.

- Short-term debt is adjusted more quickly than long-term debt. This can be explained with the use of flexible loan products – overdrafts and credit lines.

- Large companies listed on the stock exchange adjust their capital structure more quickly than medium companies. This can be attributed to the high negotiation skills of large companies.

- The speed of adjustment of capital structure variable TD/C is the highest for companies from Estonia (0.99). Companies from Latvia show a medium speed adjustment (0.63), whereas companies from Lithuania indicate a speed of adjustment of 0.40.

- Companies from Estonia adjust their capital structure more quickly than companies from Lithuania. That might be explained by the higher financial flexibility of companies in Estonia.

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Online social support perceived by Facebook users and its effects on stress coping

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A B S T R A C T

Online social support perceived by Facebook users and its effect on stress coping were examined in this study with a sample of 518 college students, who completed a conventional or online survey form, in which they responded to items regarding demographic information, Facebook use, social support from Facebook friends, resilience, and feeling of stress. Four important findings were found: First, the participants reported having received more information and appraisal support than emotional support. Second, Facebook users who frequently used embedded services (i.e., News Feed, Photos, Events, Groups, and Chat) reported having received greater levels of social support than those who occasionally or seldom used these services. Third, Facebook users' perceived social support and resilience were positively correlated with each other, and were both negatively correlated with feeling of stress. Finally, Facebook social support significantly accounted for the variability of stress, after taking into account the effect of resilience. The results are discussed in terms of characteristics of online social support, implications for coping stress in workplace, and suggestions for future research.

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1. INTRODUCTION

Social support is an important part of interpersonal interactions among members of a social group, no matter whether the group is an ethnic, political, professional, or recreational one. Social support is usually provided in the form of sharing information, giving positive feedback, and expressing caring, love, and trust (House, 1981). Support from social group helps individual members cope with hardships and stress, and therefore increase the well-being of the individuals. On the other hand, exchanges of social support bring group members closer to one another, thus enhancing the cohesion and strength of the social group. This feature of exchanging social support is also present in so-called online social networks that have proliferated on the World Wide Web since the advent of many social networking sites (SNSs), such as Facebook, Friendster, and MySpace, etc. For example, when Facebook users press 'Like' in response to photos posted on a friend's personal page, he/she provides social support to their Facebook friends. In fact, why Facebook has been so successful in accumulating more than one billion

active members in less than a decade since its inauguration (Wikipedia, 2014) has to do with the platform it offers that facilitates its users to engage in providing and/or receiving social support in the world of Facebook. Nevertheless, extant research on Facebook has not focused much on online social support exchanged among Facebook users, nor on its effect on personal functioning. The aim of the present study was to examine the characteristics of online social support in the case of Facebook social networks and to evaluate its effect on stress coping.

2. LITERATURE REVIEW

2.1. Social support and its function

Social support, according to House (1981), refers to functional content of relationships, which can be categorized into four broad types of supportive behaviours or acts: instrumental, informational, emotional, and appraisal support. Instrumental support involves the provision of tangible aid and service, such as a colleague's assistance in refining our proposed quality improvement program. Informational support refers to the offering of advice, suggestion, and information to other person who is dealing with a problem. We receive information support when officemates share information about prospective buyers. Emotional support is usually offered by expressing understanding, acceptance, caring, or trust to the person. Finally, appraisal support refers to language or words that help enhance the other person's self-worth and confidence. Heaney and Israel (2008) noted that social support is always intended (by the provider of the support) to be helpful and is provided in an interpersonal context of caring, trust, and respect for each person's right to make his or her own choices.

Social support has been hypothesized to have direct and indirect effects on physical and mental health of individuals (Cohen and Will, 1985; Lazarus and Folkman, 1984). Social support directly affects our health by fulfilling our basic needs of companionship and intimacy and by assuring our sense of belonging and worth. It could also indirectly affect health by enhancing our ability to access resources and confidence in coping with problems, which then attenuate the negative impact of stressors on us. The direct or indirect effects on health have been documented in previous research (Czajkowski et al., 2011; Greenwood et al., 1996; Lett et al., 2005). More recently, Knox and others (1998) reported a strong association between low social support and coronary heart disease. Bekele (2013) found that perceived social support had both direct and indirect effects on health-related quality of life in persons living with HIV/AIDS.

2.2. Social networks and online social support

Advances in computer and networking technologies have transformed Internet into a fascinating and efficient, though unconventional, place for people to interact with others and join in social groups, virtually speaking. SNSs (e.g., Facebook, Friendster, and MySpace) have been attracting hundreds of thousands of active users. Each user has his/her own online social network and belongs to a number of

social groups of different interests. These virtual communities have several advantages over communities of race, religion, or profession (Rheingold, 2000). In the cyberspace, we get to know people first before we choose to befriend them; we are free to choose social group(s) to join in. Furthermore, we would not form prejudices about others regarding their gender and race before we communicate with them.

Just as people exchange social support with members of their social groups in the real world, members of online social groups also engage in providing and/or receiving various forms of social support on the Internet. They help solve the others' technical problems by means of step-by-step online tutoring (instrumental support); they also exchanges ideas or give advices or suggestions to one another (information support). They comfort their friends by voice mails or text messages (emotional support), and send out words that help the other person to build up self-worth and regain self-confidence (appraisal support).

Social support transmitted via the Internet has several advantages. First, online social support comes from a wide variety of sources, such as families, close friends, previous classmates, colleagues or supervisors, and acquaintances or strangers (e.g., fans). Second, it is not restricted to location such that we may receive social support from someone nearby or far away on the other side of earth. Third, online social support can be delivered virtually anytime, immediately or later at a selected time. Fourth, both the provider and the receiver could avoid the embarrassment that sometimes arises in face-to-face social interactions. In other words, online social support has a better chance to be acknowledged and accepted.

2.3. Facebook and online social support

Among many SNSs, Facebook is undoubtedly the most successful one. It has accumulated more than 1.11 billion active members as of 31 March, 2013 (The Associated Press, 2014) and continues to attract many newcomers everyday. The popularity of Facebook can be attributed to many factors, but the most important one is that it meets a basic need of people--the need to be connected with other people. Facebook provides services that help its users maintain and strengthen existing social ties, as well as to establish new relationships (i.e., 'friends you may know' service). Facebook is also a platform for its users to exchange social support with 'friends' in the online social networks (Nabi et al., 2013). Once logged on Facebook, users are geared up to provide or receive social support. Many Facebook services (e.g., Chat, News feed, Photos, etc.) are also devices for Facebook users to give and/or receive various forms of social support. Facebook users are most likely to receive three types of online social support: informational, appraisal, and emotional (Chung et al., 2013). They receive informational support when 'friends' give out advices or share useful information in respond to a question that they have posted on News Feed or Chat. Appraisal support could be garnered when Facebook friends respond positively to the updates of their personal page on Facebook. Receiving a Like, for example, is an indication of assurance and encouragement for many Facebook users. Finally, they receive emotional support on

Facebook as soon as their emotions are recognized and responded to by comforting and encouraging messages from 'friends' of their social network.

Although social support is an important dimension of online interpersonal interactions and has much bearing on personal functioning, research on Facebook users so far has largely focused on other constructs, such as user satisfaction (Pempek et al., 2009), social capital (Ellison et al., 2007; Valenzuela et al., 2009), and privacy concern (Boyd and Hargittai, 2010; Liu et al., 2011; Oz, 2012). To date, except for a few recent studies (i.e., Akbulut and Günüç, 2012; Nabi et al., 2013; Rozzell et al. (2014), there is not much research that addresses on line social support exchanged among Facebook users. The first aim of the present study was to examine this aspect of Facebook user experience, particularly the three aspects of social support and their associations with the use of Facebook services. The research questions of interest were: First, what aspect of online social support is received more often by Facebook users? Second, is online social support perceived by Facebook users related to their use of Facebook services?

2.4. Stress coping, resilience, and online social support

Stress, according to Selye (1956), was physiological and psychological reactions to unpleasant or threatening environmental stimuli. More recently, psychologists tend to view stress as an outcome of person-environment transactions, in which the impact of an external stressor is mediated by the person's appraisal of the stressor and the psychological and social resources at his or her disposal (Cobb, 1976; Cohen and Will, 1985; Lazarus and Folkman, 1984). Two types of appraisals are involved in this process. In the primary appraisal, we gauge the potential threats or harms of a stressful situation, and in the secondary appraisal we evaluate our ability to alter the situation and our ability to manage negative emotional reactions (Glanz and Schwartz, 2008). Our primary and secondary appraisals are then followed by our coping effort and strategies, which then result in differing level of stress. We experience stress only when we perceive insufficient ability and/or resources to counter the stressor. Our stress will be heightened when we sense that our coping fails to attenuate the threats caused by the stressor.

Many factors influence the primary and secondary appraisals in the process of stress coping, two of which are most important: the person's resilience and perceived social support. Resilience could be considered as the capacity of successful adaptation despite challenging or threatening circumstances (Masten et al., 1990), or the ability to maintain a stable equilibrium (Bonanno, 2004). Resilience is commonly seen in children who grow up in disadvantaged conditions (Masten and Coatsworth, 1998), but it is also commonly observed in adolescents and adults (Bonanno, 2004). Resilience is crucial to stress coping, because it helps redefine the stressor (primary appraisal) and increase the strength in solving the problem (secondary appraisal). Individuals with great resilience tend to perceive stressors as less threatening and tend to be competent in dealing with stressors.

Also important in stress coping is the amount of social support perceived by individuals, because it plays an important role in the secondary appraisal of stressful situations. Individuals who are supported by social networks are more confident and competent in confronting the stressor, because they know where to find resources and whom to turn to in order to ease their tension and anxiety. In other words, social support serves as a 'moderator" or a "buffer" to stressful experience (Cobb, 1976; Cohen and Will, 1985). Research has empirically verified the buffering effect of social support in that social support mobilized to help a person to cope with a stressor does reduce the negative impact of the stressor on health (Cohen and Will, 1985; Thoits, 1995).

In a similar vein, we argue that online social support serves a buffer to stressors for frequent users of SNS. For example, Facebook users who frequently receive online social support might have better stress coping than who do not. They might perceive the stressor as less threatening, because of the information shared by their Facebook friends. They might have more or better coping strategies due to ideas or suggestions sent from Facebook friends. They might have less anxiety or fear when the problem is not solved as expected, because their emotions are quickly responded by their Facebook friends. In short, the impact of the stressor is attenuated by the online social support they received from Facebook friends.

Previous research on Facebook has not addressed the effect of online social support on personal functioning. The second aim of the present study was to address this issue by examining the effect of online social support on stress coping in the case of Facebook users. Specifically, two questions were addressed: First, does online social support from Facebook friends contribute to stress coping after taking into account the effect of resilience? Second, which aspects of online social support were relatively more important in making the additional contribution, if any, to stress coping?

3. METHODS

3.1. Participants

Data were collected from two sources of participants. The first consisted of a total of 253 college students being sampled from five universities in northern and central Taiwan, all of whom completed a conventional survey form. The second was college students recruiting from Facebook and BBS (Bulletin Board System) and were asked to respond to an online survey form identical to the one just-mentioned. A total of 319 online survey forms were collected, of which 265 were judged as valid. Of all the participants, 306 (59.07%) were females and 212 (40.93%) were males, including 194 freshmen, 114 sophomores, 106 juniors, and 104 seniors. Among these participants, 91.9% have used Facebook for over one year; 66.2% surfed on Facebook from 2 to 4 hours per day, and 88.6% had 100 and more Facebook friends. In short, these participants were active users of Facebook and belonged to at least one social network on Facebook.

3.2. Instruments

In the survey form, participants responded to the following four types of instruments:

1. Checklist of Facebook Use: This checklist consisted of items regarding their demographic information (gender, age, year in college, type of college, and major) and Facebook use (duration, hours per day, number of Facebook friends, and frequency of using embedded services).

2. Facebook Social Support Scale (FSSC): The FSSC was constructed specifically for the present study to measure online social support perceived Facebook users. Initially, the FSSC consisted of 23 items, and were rated on a Likert-type 5-point rating scale, with 1 as "Totally Disagree," and 5 as "Totally Agree." Factor analysis (Principal component analysis followed by Varimax rotation) revealed that three factors could be extracted: information support (10 items), appraisal support (7 items), and emotional support (6 items). However, in order to make cross-factor comparison, only six items within each factor that had highest loadings were kept to calculate factor scores, with higher score indicating greater level of perceived social support. The internal consistency of each factor was evaluated by Cronbach's alpha coefficients (α), with α being .90 (information), .86 (appraisal), and .74 (emotional).

3. Life Experience Evaluation Form: This 22-item evaluation form assessed the stress experienced by the participants. These items were rated on a 4-point rating scale, with 1 being "Totally Disagree," and 4 being "Totally Agree." However, scores were calculated only from 16 items directly relevant to college life (i.e., academic achievement, social relationship, and career development). Higher score indicated greater level of stress; Cronbach's α for the 16 items was .83.

4. Resilience Rating Scale: A modified version of Adolescent Resilience Scale (Oshio et al., 2003) was used to measure resilience. The scale consisted of 20 items, which were rated on a 6-point rating scale, with 1 for "Totally Disagree," and 6 for "Totally Agree." Greater resilience was indicated by higher score. Cronbach α for this measure was .92.

4. RESULTS

4.1. Relative amount of information, appraisal, and emotional support perceived by Facebook users

Table 1 presents the means and standard deviations of online social support perceived by the participants. To examine whether Facebook users received one particular aspect of social support more than other aspects, we performed a 2 (gender) x 3 (dimension) repeated-measure analysis of variance (ANOVA). The ANOVA yielded only a significant main effect for dimension, $F_{(2, 1152)} = 219.54$, p

< .001. An examination of Table 1 reveals that both males and females reported having received significantly more information and appraisal support than emotional support. Difference between information support and appraisal support was not significant.

Table 1: Relative amount of Facebook user's perceived social support from Facebook friends

Aspect of Social Support	Males (*N*=212)	Females (*N*=306)
Information	22.99[a] (3.56)	23.16[a] (3.85)
Appraisal	22.68[a] (3.65)	23.36[a] (4.00)
Emotion	21.33[b] (3.76)	21.55[b] (3.51)

Note. Numbers are means and standard deviations (in parenthesis). Means with different superscripts are significantly different ($p < .05$).

4.2. Online social support and the use of embedded services

The next set of analyses addressed whether the Facebook user's perceived social support varied as a function of the use of Facebook services (i.e., Photos, News Feed, Like, etc.). Specifically, for each type of service, three 2-way ANOVAs (gender by frequency level) were carried out using information, appraisal, and emotional support as dependent variable. In cases where the number of subjects for a particular frequency level was smaller than 10, the subjects for that level was combined with its adjacent level, and 2 (gender) x 3 (frequency level) ANOVAs were carried out instead. These analyses yielded very similar results in that main effect for gender and interaction effect were not significant, but main effect for frequency level was significant. The means and standard deviations of social support as a function of frequency level and the results of ANOVAs are presented in Table 2.

As can be seen in Table 2, Facebook users who 'frequently' used Photos, News Feed, Like, Group, Chat, Notes, and Events reported having received significantly more information and appraisal support

Table 2: Social support as a function of frequency of use of Facebook embedded services

Frequency Level of Use[1]	Social Support		
	Information	**Appraisal**	**Emotion**
Photos			
I (N=26)	20.96[a] (4.65)	19.88[a] (4.92)	18.73[a] (4.01)
II (N=306)	22.50[a] (3.66)	22.48[b] (3.73)	20.88 (3.43)
III (N=159)	24.28[b] (3.29)	24.28[c] (3.38)	22.67 (3.40)
IV (N=27)	24.74[b] (3.61)	25.96[d] (3.20)	23.59[b] (3.34)
F (3, 510)[2]	12.73***	19.40***	18.49***
News Feed			
I (N=30)	20.17[a] (4.79)	19.27[a] (6.29)	18.20[a] (5.22)
II (N=225)	22.28[b] (3.65)	22.26[b] (3.37)	21.03[ab] (3.38)
III (N=193)	23.74[c] (3.26)	23.73[c] (3.36)	21.89[b] (3.28)
IV (N=70)	25.16[d] (3.25)	25.57[d] (3.37)	23.07[c] (3.31)
F (3, 510)[2]	18.47***	25.06***	17.09***
Like			
I (N=4) + II (N=90)	21.39[a] (4.14)	20.55[a] (4.47)	19.68[a] (4.13)
III (N=202)	22.60[b] (3.34)	22.74[b] (3.19)	21.24[b] (3.28)
IV (N=222)	24.25[c] (3.53)	24.47[c] (3.56)	22.42[c] (3.36)
F (2, 512)[2]	22.65***	35.85***	19.93***
Group			
I (N=7) + II (N=169)	22.18[a] (3.96)	22.32[a] (4.02)	20.65[a] (3.82)
III (N=237)	23.01[b] (3.37)	23.03[a] (3.59)	21.40[a] (3.39)
IV (N=105)	24.78[c] (3.57)	24.48[b] (3.89)	22.96[b] (3.31)
F (2, 512)[2]	16.29***	9.89***	14.64***
Chat			
I (N=8) + II (N=148)	22.06[a] (3.97)	21.97[a] (4.39)	20.51[a] (3.99)
III (N=214)	22.78[b] (3.45)	22.75[b] (3.29)	22.21[a] (3.36)
IV (N=148)	24.61[c] (3.40)	24.74[c] (3.53)	22.82[b] (3.15)
F (2, 512)[2]	17.62***	18.83***	15.48***

Notes			
I (N=282)	22.50^a (3.83)	22.60^a (4.00)	21.11^a (3.62)
II (N=193)	23.55 (3.46)	23.41 (3.73)	21.68 (3.50)
III (N=35) + IV (N=8)	24.84^b (3.52)	24.77^b (2.97)	22.79^b (3.76)
F (2, 512)^2	10.49***	8.67***	4.81**
Events			
I (N=124)	21.48^a (4.27)	21.74^a (4.51)	19.90^a (4.27)
II (N=326)	23.30^b (3.32)	23.23^b (3.56)	21.68^b (3.18)
III (N=59) + IV (N=9)	24.98^c (3.38)	24.80^c (3.25)	23.20^c (3.19)
F (2, 512)^2	19.87***	14.21***	20.31***
Games			
I (N=92)	22.97 (3.05)	22.70 (3.85)	20.87 (3.39)
II (N=294)	23.30 (3.80)	23.31 (3.80)	21.61 (3.60)
III (N=70)	22.94 (3.02)	23.43 (3.27)	21.73 (3.38)
IV (N=62)	22.42 (4.88)	22.18 (4.68)	21.32 (4.20)
F (3, 510)^2	0.46	1.66	1.04

Note. Numbers are means and standard deviations (in parenthesis). Means with different superscripts are significantly different ($p < .05$).
[1]I: Never; II: Occasionally; III: Frequently; IV: Every Time.
[2]Test statistics for main effect of frequency level in the 2-way ANOVAs.
$^*p < .05.$ $^{**}p < .01.$ $^{***}p < .001.$

than those who 'never' or 'occasionally' used these services. As for emotional support, Facebook users who 'frequently' used Photos, News Feed, Like, Group, and Events reported having received significantly more support than those who 'never' or 'occasionally' used these services. It should be noted that, when Game was concerned, no significant differences in the amount of online social support were found among Facebook users of differing frequency levels of use.

4.3. The effect of online social support on stress coping

The last set of analyses concerned whether online social support significantly accounted for the variability of stress after taking into account the effect of resilience. Table 3 presents the correlation among three aspects of social support, resilience, and stress. The positive correlation between social

support and resilience suggests that Facebook users who reported having received more online social support also had a greater tendency to report greater level of resilience. More importantly, the three types of social support and resilience were negatively correlated with stress, suggesting that these variables were meaningful and useful in predicting the extent of stress for Facebook users.

Table 3: Pearson correlation between online social support, resilience, and stress（N=518）

Variable	I	II	III	IV	V
I. Emotional Support	(.74)				
II. Information Support	.64***	(.86)			
III. Appraisal Support	.67***	.73***	(.90)		
IV. Resilience	.29***	.39***	.37***	(.92)	
V. Stress	-.24***	-.21***	-.23***	-.45***	(.83)

Note. Numbers in parenthesis are alpha coefficients; numbers not in parenthesis are Pearson correlation coefficients.
***$p < .001$.

Table 4: Summary of hierarchical regression analysis（$N = 518$）

Variable(s) Entered	B	SE(B)	β	t
Model I				
(Constant)	55.99	1.48		37.79***
Resilience	-0.25	0.02	-0.45	-11.35***
$R^2 = .20$, $F(1,516) = 128.9$, $p < .001$				
Model II				
(Constant)	59.44	2.09		28.38***
Resilience	-0.23	0.02	-0.42	-9.81***
Emotional Support	-0.29	0.11	-0.14	-2.63**
Information Support	0.14	0.12	0.07	1.14
Appraisal Support	-0.06	0.12	-0.03	-0.49
$R^2 = .22$, $\triangle R^2 = .02$, $\triangle F(1,513) = 3.46$, $p < .01$				

**$p < .01$; ***$p < .001$.

In order to examine whether Facebook social support significantly accounted for the variability of stress after the effect of resilience was taken into account, a hierarchical regression analysis was carried out (see Table 4 for the results). As can be seen in Table 4, resilience alone accounted for 20% of variance of stress (Model I), suggesting that it was an important variable in explaining the variability of stress felt by Facebook users. Furthermore, social support additionally accounted for a significant 2% of variance of stress (Model II), after the effect of resilience had been taken into account. It should be noted, however, that β was significant only for emotional support, suggesting that the effect of social support in accounting for stress was mainly contributed by emotional support, rather than information or appraisal support.

5. CONCLUSION

Facebook, Friendster, MySpace, and other SNSs have become more and more influential in the life of many young and old people. In the present study, we proposed that online social networks serve as an important source of social support for SNS users. To take Facebook for instance, in addition to its well-known features of searching friends, updating personal pages, and keeping posted with friends, it also allows users to receive online social support from Facebook friends. Online social support functions nearly the same as social support from conventional, social networks such as families, close friends, and workplace colleagues. In the present study, we found a number of important characteristics of online social support, which are discussed as follows:

5.1. Online social support is more often conveyed in forms of information and appraisal support

First of all, our finding suggests that SNS users are more likely to receive information and appraisal aspects of support than emotional support from online social networks. This characteristic could be attributed to the nature of online interpersonal interaction. The Internet is noted for its far-reaching capacity and speedy transactions of data in the form of texts, which is in favor of the exchange of information and appraisal aspects of social support because they could be correctly conveyed in words. In contrast, emotional support expressed in words tends to be interpreted as superficial or insincere by both the provider and the receiver. Moreover, the asynchronous nature of online interpersonal communication hinders the provision of emotional support, which is best delivered by voices, facial expressions, and body languages (e.g., hugs) right at the time when it is needed. Perhaps Facebook users are aware of such a limitation that they engage less frequently in exchanging emotional support on the Internet.

5.2. Online social support varies with the use of some services provided by SNS

Secondly, we found that online social support perceived by Facebook users varied with the frequency of using several Facebook services (e.g., Photos, News Feed, and Group). One interpretation of this finding is that Facebook users who frequently made use of these services were more likely to receive social support from their Facebook friends. On the other hand, it is plausible that Facebook users who had a greater need of social support tended to use these services more frequently. We believe that both explanations are equally true and that many services provided by SNS facilitate the exchange of online social support. It should be noted, however, that not all services of SNS are equally effective in transmitting social support. Game in particular does not seem to have a strong bearing on social support, as far as the three aspects (information, appraisal, and emotional) were concerned. Game is perhaps more related to another aspect of social support that we did not examine in this study, that is, social companionship (Cohen and Will, 1985; Heaney and Israel, 2008).

5.3. Online social support contributes to stress coping independently and jointly with resilience

Thirdly, online social support contributes to stress copying in two pathways. As far as Facebook users are concerned, it appears that online social support independently helps reduce the feeling of stress, and works together with resilience to attenuate the impact of stressors. It should be noted that, although the independent contribution of online social support is mainly achieved by its emotional element, we should not underestimate the contribution of information and appraisal aspects of online social support because they were significantly correlated with resilience, which accounted for a sizable proportion of variability of stress. It is reasonable to believe that information and appraisal aspects of online social support are important to the build-up of resilience and that these two types of social support have a buffering effect on health, similar to that of offline social support (Cobb, 1976; Cohen and Will, 1985; Lazarus and Folkman, 1984).

5.4. Implication and suggestions

Our findings have an important implication on stress coping in the workplace like corporations and enterprises. Workplace social relationships tend to be formal, restricted, and superficial. Workplace is usually full of stressors: accountability, pressure from managers, and competition or comparison among colleagues, etc. Although an optimal level of stress is conducive to good performance, too much stress often results in low productivity or burnout. In other words, stress coping is very important for every professional man and woman. Under such a circumstance, online social networks appear to be a nice

place to get social support and to release stress, no less important than offline sport or recreational social groups. Online interpersonal interactions tend to be free of stress, because we need not act and react promptly. Online interpersonal interactions also tend to be free of formality and unnecessary courtesy such that we can be ourselves. More importantly, we are able to receive support from online social networks, provided that we make the best use of Facebook or other SNSs, particularly in exchanging online social support with others. Sooner or later, stress from work would not be as intimidating as it used to be because we have become resourceful and resilient as a result of social support we receive, online or offline.

Finally, we like to propose three directions for future research. First, it is of interest to examine whether online social support contributes to stress coping after taking into account the effect of offline social support. One limitation of the present study is that a distinction was not made between online and offline social support. For Facebook users, most of friends in Facebook social networks are also someone they know in offline social groups. As such, online social support from Facebook friends is confounded with social support from offline friends or acquaintances. To distinguish the two, researchers should deploy an experimental approach. For example, participants are requested to stay in a stressful situation where offline social relationships are not accessible, and then the participants' feeling of stress can be observed to determine whether or not it varies with differing amount of online social support. Second, it is also important to further empirically verify the "buffering" effect of online social support on stress coping. For example, it is practically possible to test whether the reception of online social support significantly increases one's confidence in confronting a stressor. In the case of Facebook users under stress, if their level of confidence is significantly elevated soon after they have received online social support, then it can be sure that online social support does function as a buffer to stressors. Still another direction is to examine online social support from the perspective of provider. The question of interest is what factors affect the amount and type of online social support that SNS users provide. Gender might be an important factor, because females are more competent than males in detecting social cues (Hall, 1978) and in talking about relationships (Acitelli, 1992). It is testable whether or not female users are more likely to provide social support during online interpersonal communications, particularly that of emotional aspect. Personality is another important factor that deserves our attention. It is likely that individuals with different dispositions (for example, introverts vs. extroverts) would differ in the extent to which they provide online social support as well as in the type of social support they provide. Only when we have considered the perspectives of both receiver and provider, will we have a more complete view of exchange of online social support.

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KEY DRIVERS INFLUENCING SHOPPING BEHAVIOR IN RETAIL STORE

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A B S T R A C T

The purpose of the study was to determine the key drivers which influence the shopping behavior of the customers in the retail store. In today's competitive world with increasing number of retail stores, the retailers need to be more customer oriented. Retail has changed and expanded in all lines of business, be it apparel, jewelry, footwear, groceries.etc. The modern consumer is posing a challenging task for the Indian retailer. More aware, more confident and much more demanding, therefore the retailers are looking for ways to deliver better consumer value and to increase consumer purchase intention. Retailers tend to differentiate themselves by making their service easier to consumers. The study aims to study the key drivers that can influence shopping behavior in retail store. A survey (store intercept) method was employed to elicit primary information from 300 shoppers in different formats of retail stores of Lucknow. The findings reveal the factors that play a greater role in influencing the shopping behavior of customers in retail store. As such, a survey of retail store customer's attitude towards reduced price, sales promotion, quality of the products, proximity to the home, customer service, store atmospherics were analyzed to identify the key drivers influencing shopping behavior in retail store. A questionnaire based on a five-item Likert scale, as well as random sampling, was employed for data collection. Data analysis was accomplished using SPSS software. The paper has found shopping experience, store image and value for money as three important variable out of which shopping experience emerged as a dominant factor which influences the consumer's shopping behavior in the retail store. Since the research has established empirical evidences in determining the key drivers which influences the shopping behavior of the customers in the retail store, it serves as a foundation for a deeper probe into the shopping behavior of the customers in the retail store research domain in the Indian context

INTRODUCTION

Economists have viewed shopping as an activity that allows consumers to maximize their utility function (Michelle, Corrine and Jane, 1995). But customers tend to exhibit 'economic' as well as 'recreational' shopping behavior (Bellenger and Korgaonkar, 1980). For some it is an act of killing boredom, for others it leads to self-gratification and to another category of shoppers it gives a sense of emotional fulfillment (Tauber, 1972). Involvement has also been described as leisure behavior (Bloch and Bruce, 1984).The service industry and in particular the retail sector, has faced tough competition in the recent economic crisis, therefore it is essential for retailers to use the strategies which focus on satisfying the current customers. New retail formats are growing at a rapid pace in India. There remains a need among Indian businesses to understand the changing behavior of customers towards shopping in organized retail outlets. The paradigm shift in consumers socio-economic, demographic and geographical proportions are driving what was once a traditional small-scale retail outlets into an organized retail formats aimed at catering to the evolving needs and tastes of discerning consumers. But the ever changing consumer's psychographic variables like values, activities, interests, opinions, motives and lifestyles have contributed immensely to the growth of store format typologies such as convenience stores, discount stores, super markets and hypermarkets. People's motives for shopping are a function of numerous variables, many of which are unrelated to the actual buying of products. Shopping experience is a utilitarian effort aimed at obtaining needed goods and services as well as hedonic rewards. Literature in marketing and related behavioral sciences suggests a breadth of consumer motives for shopping. The idea that consumers are motivated by more than simply the utilitarian motive to obtain desired items has been acknowledged at least as far back as the 1960s by Howard and Sheth (1969). Their consumer behavior model, in addition to considering traditional explanatory variables such as needs, brand attitudes, and the impact of shopping behavior on promotions, also examined less explicitly utilitarian consumer motives such as arousal seeking and symbolic communication. Tauber (1972) advanced the idea that shoppers were often motivated by a number of personal and social factors unrelated to the actual need to buy products. He proposed that people shop not just to purchase goods, but to learn about new trends, to make themselves feel better, to gain acceptance with their peers, and simply to divert themselves from life's daily routine. Providing an assortment of product and services is one of the basic features of retailer (Levy and Weitz, 2008). As a key component of the marketing mix, assortment represents a strategic positioning tool for customer acquisition and retention (Grewal et al.,1999; Kahn, 1999; Koelemeijer and Oppewal, 1999; and Stassen et al.,1999).From the consumers prespective,assortment plays a fundamental role in store choice(Kelly and Stephenson,1967;Zimmer and Golden,1988;Kahn,1999; and Briesch et al.,2009). The decision about the quality, price levels, and variety of assortment determines the retailer's market position and image (Kunkel and Berry, 1968; Lindquist,1974-1975;Mazursky and Jacoby,1996;Ailawadi and Keller,2004; and Mantrala et al.,2009).Assortment planning is one of the most challenging task in retailing. Especially the dynamics in consumer perceptions and preferences (e.g., desire of variety, and flexibility, preference instability),retailer constraints(e.g., physical space, budget),and changing environmental factors(e.g., competition-related assortment trends, economic conditions) contribute to the huge difficulty of assortment planning(Mantrala et al.,2009). Regardless of any strategic and operational challenges, consumers expect retailers to offer the right mix of products, at the right price, with the right promotions, at the right time and at the right place.

According to Asubonteng et al. (1996),due to intense completion and hostility of environmental factors, service quality has become a cornerstone marketing strategy for companies. This highlights how important it is for the organizations to improve service quality for their survival and growth since it could help them tackle the challenges they face in the competitive markets. This means service based companies are compelled to provide excellent services to their customers in order to have a sustainable competitive advantage.

Service organizations have begun focusing on the customer perception of service quality because it helps in developing strategies that lead to customer satisfaction (Saravanan and Rao,2007).According to Gummesson(1994),there has been a shift from the focus on goods without much emphasis on services to a focus on services while paying attention to goods. This stresses the importance of service marketing to most service industries. In our competitive era, an attractive store ambiance is essential in encouraging customers to buy products. A considerable number of studies have been performed based on the proposition of the environment of

the store on a satisfaction level and purchase behavior of the consumer (Donovan et al., 1994). Thang and Tan (2003) discovered that store preference is heavily affected by store image. In addition, the store dimensions have significant influence in attracting customers to a store. However, stores can only attract customers if the latter's expectation of the former is fulfilled, and if the customer does not feel a discrepancy between their expectation and what is presented.

The study focuses on hypermarkets, and supermarkets which carry out retailing activities since they deal with the sale of goods and also offer services to the customers in the event of selling goods.

The paper first focuses on the key drivers influencing the shopping behavior in retail store in the relevant literature. It then gives methodological aspects with an emphasis on questionnaire development, sample selection, data collection and data analysis. The data was obtained from a random sample of 300 customers who came for shopping in supermarkets and hypermarkets.

1. Literature Review

Service providers and scholars have long recognized the importance of customer satisfaction as contributing to market share and return on investment for companies. Several definitions and models of customer satisfaction have been proposed by various scholars. The focus of much of the research is on the 'disconfirmation of expectations' theory which explains that "the customer is satisfied when he or she feels that the product's performance is equal to more than what was expected(confirmation).But if the perceived performance falls short of his/her expectations(disconfirmation),then if the customer is dissatisfied"(Oliver,1980). Past studies have shown that shoppers' interaction with the shopping environment influences their patronage decision (Babin and Darden, 1995; Li-Wei and Hui, 2004).While some research on store choice has shown the importance of retailer prices on shopping behavior (Arnold and Tigert 1978; Walters and Rinne 1986; Barnard and Hensher 1992; Bell, Ho, and Tang 1998; Bell and Lattin 1998). Zeithaml (1988) opines that consumers' shopping decisions are not based only on price. Though demographic characteristics such as age, income, education and location of residence affect shopping behavior and store choice (Bellenger et al., 1977; Russell et al., 1999; Prasad and Reddy, 2007),   the level of income negatively impacts both consumer attitudes and purchase intention (Ioannis et al., 2010).

Thang and Tan (2003) adopting Donovan and Rossiter's (1992) stimulus-organism-response model identified that merchandising, accessibility, reputation, in-store service and atmosphere influence customer preference for a store. Celik (2007) developed a Consumer Store Choice Scale wherein attributes relating to location, price quality of products, sales personnel attitude and physical attractiveness formed the basis for development of the scale. Huddleston et al.,(2009) while studying customer satisfaction in food retailing found that price, product assortment, service and service influence store satisfaction. Forsythe and Baily (1996) and Paulins and Geistfeld (2003) found that age and marital status affect the store choice and time spent on the shopping activity.Chetthamrongchai and Davies (2000) found that the relationship between time and shopping attitudes plays a role in shopper patronage behavior. Shopping behavior based on time and shopping attitude can identify different store preferences for different shopper groups. Hsu et.al.,(2010) identified that distance travelled is positively related to satisfaction which in turn influences behavior intensions with reference to grocery store image.

In the Indian context, Prasad and Aryasri (2011) found that demographic factors have a significant influence on grocery store format choice. Sanjeev Varshney 2006 study found that small town Indian shoppers outshop for pleasure and to seek variety.Mulky and Nargundkar (2003) identified that convenience and merchandise assortment were the most important factors influencing grocery store choice behavior. Sinha and Banerjee (2004) found that store convenience and customer service positively influence consumer store choice. Roy's (2005) study on factors governing consumers choice of supermarkets identified that add-on benefits, general services, convenience and variety, influenced store choice.

Steenkamp (2001) has observed that by default, research in marketing has mainly focused on developed economies. It is important to note that in the area of retailing there are a dearth of studies in the Indian context, that analyze the parameters shoppers consider important when they decide which store format they want to shop in which parameters they derive maximum utility from(Sinha et.al.,2005). Though choice of a store has been studied from several dimensions including the cost and effort as well as the non-monetary terms, studies relating to the role and impact of store attributes as well as other associated intangibles is limited. Perceived value has become a new strategic imperative for the retailers (Gale, 1994; Sweeney et al 1997; Sweeney and Soutar, 2001; and Levenburg, 2005). Cognitive definitions of perceived value, wherby the concept is posited as a trade-off between benefits and sacrifices, have traditionally been prevalent among marketers (e.g.zeithml, 1988; Dodds, 1991; Chang and Wildt, 1994; Lapierre et al., and Cronin et al.,2000). Perceived service quality has been found to have a positive impact on perceived service value (Bolton and Drew,1991).Holbrook (1994 and 1999) has developed a useful 'typology of value' that captures diverse aspects of consumption experience: (1) economic value(including quality and price); (2)social value;(3) hedonic value; and (4) altruistic value.

According to Holbrook (199), the dimension of 'of 'excellence' involves a reactive appreciation of the potential ability of the object or experience to accomplish a goal or to perform a function. The notion of 'excellence' thus has a utilitarian emphasis with similar connotations to the concept of 'quality' (Holbrook, 1999). Lapierre et al. (1999) contended that quality is an important element of value ,and that improving quality is the best way to give the customer better value;moreover,the variety of dimensions that comprise quality makes it possible to differentiate products or services in many ways to enhance their value to customers.

Demographics influence consumer behavior by directly influencing consumer attributes, for example values and decision-making styles (Hyllegard, Eckman, Descals & Borja, 2005). Furthermore, education influences people's occupations and their occupations greatly determine their income. Bellenger, Robertson and Greenberg (1977) found that the consumers' level of education also influences shopping centre patronage factors as it relates to store image. Consumers' occupation and education influence preferences in products, media and activities, while income provides the necessary means for consumption behavior (Choi& Park, 2006; Hawkins et al., 2007;Vakratsas,1998). Paulins and Geistfeld (2003)focused on identifying attributes that affect store image preference. They found that consumers are more critical of store image attributes when they have a higher education, but that consumers from different income levels tend to perceive store image similarly. The influence of age on store image perception is frequently investigated. Lumpkin (1985) and Visser and Du Preez (1996) studied the needs of elderly or mature consumers and their findings concluded that age groups within the elderly market differed regarding their preference for store image attributes. Demographic variables in isolation cannot provide a complete picture of the consumer. Studied in isolation, demographics hamper the segmentation process, while demographical characteristics such as age, income and employment status can be misleading. A person's biological age is of less consequence than his/her psychological age, according to Joyce and Lambert (1996).Furthermore, even though income can be tied to spending behavior, it reveals very little about consumer's personal interest, health or discretionary time (Oates et al.,1996). Consumers' lifestyle is therefore a necessary variable when attempting to understand consumer behavior.

Bearden (1977) mentioned the influence of store image as 'consumers choose stores they feel close to their self image,' and he tried to find out store attributes that affect store choice and loyalty for downtown and suburban shopping centers. Hansen and Deutscher (1978) showed that the store image and its attributes make an important role in their choice of retail stores in his study on image attributes. In their model of the process of store choice, Engel, Blackwell, and Miniard (1990) claimed that purchasers' distinguished acceptable stores from unacceptable stores in the process of comparing their evaluation standards with perceived image attributes, and that 'store image is a variable that consumers depend on in their choice of stores.' James, Durand and Dreves (1976) found that image attributes influence consumers' perception and attitudes and they are directly related to sales profits. Schiffman, Dash and Dillion (1977) focused on description of image existing in the competing types of retailers and explained that store image attributes made an important role in the choice of the store type.

According to Collins-Dodd and Lindley (2002), as well as Thang &Tan (2002), merchandise is considered the most important factor contributing to consumer store preference. This view is supported by

Birtwistle and Shearer (2000),Collins-Dodd and Lindley (2003), Sullivan et al. (2002) and North et al. (2003), who found that merchandise has a significant influence on brand perception and store choice across consumer segments. Consumers tend to seek stores with a greater assortment of merchandise to satisfy their needs (Sullivan et al., 2002). A single visit to a store where a consumer may meet with unsatisfactory style could disconfirm a consumer's perception and instantly influence the perception of store image (Newman & Patel, 2004). Erdem et al. (1999) state that consumers who attach greater value to personal gratification would be more inclined to shop at a store with a wide selection of merchandise, whereas Huddleston et al. (1990) found a relationship between the lifestyle characteristics of mature female consumers and merchandise. Hu and Jasper (20 0 6) concluded that a store with more social cues created an even higher favorable preference toward merchandise.

Promotions are a precondition of brand recognition and enhancement, which influence sales (Ratnatunga & Ewing, 2005).One of the major changes in marketing includes new technology in which advertising is consumer focused to nurture customer satisfaction and loyalty (Kliatchko, 2005). Although promotion is viewed as a positive stimulus by management, a study of patronage motives and product purchase patterns found that special events/exhibits and promotions were among the least mentioned motives for product purchase, and were therefore indicated as less important that other store image attributes (Yavas, 2001).Paulins and Geistfeld(2003) reported a distinct difference between highly educated and less educated consumers in the response to advertising. The fact that educated consumers are more selective makes them more difficult to entice through advertising. Thang and Tan (2003) found that promotions have a significant influence on consumer preference. Consumers have to be constantly attracted by advertising to stimulate interest and create store awareness. But consumers are exposed to a large amount of information and advertising messages; therefore an integrated and consistent marketing communication strategy is critical for strengthening the message which marketers strive to send. Du Frene, Engelland, Lehman and Pearson (2005) found that consumer-centric advertising through interactive e-mailing changed consumers 'attitudes towards the brand, which, in turn, affected intention to purchase.

Chowdhary (1999) notes that convenience is a specifically desirable characteristic for older consumers. In a study by Kim and Jin (2001) convenience was cited as a reason for consumers preferring multi-national discount stores over national stores. Store hours comprise another aspect of convenience. Hyllegard et al. (2005) found that store hours are less important to older consumers, because older consumers have more time to shop. Retail stores focusing on younger markets should therefore incorporate a focus around convenience and extended shopping hours. A vital part of convenience is site selection/ location planning, because it influences parking, location and transportation. This is a significant decision because it cannot be altered once made. Location, transportation and traveling time influence the consumer market patronizing the store and, inevitably, sales (Wood & Browne, 2007). Thang and Tan (2003), for instance, note that retailers are chosen on the basis of accessibility, ease of transportation and time duration of traveling. The importance of traveling distance in influencing intention to remain loyal to a store was noted by Miranda et al. (2005). Newman and Patel (2004) reported that, by focusing on features which influence the ease of shopping, retailers are able to differentiate themselves from the competition.

Facilities refer to the provisions made to ease the shopping process and the infrastructure that enhances the consumer's comfort while shopping (Nevin & Houston, 1980).According to Thang and Tan (2003), consumers tend to view a store with good facilities in a favorable light. Consumers' shopping orientations determine their preference for facilities (Moye & Kincade, 2002), therefore facilities contribute to differentiate the retailer from its competition. Features which could differentiate a store by easing the shopping process are the availability of changing rooms, fast checkout facilities and layout (Newman & Patel, 2004). These authors postulated that customers' perceptions and behavior could be altered through any small change made in store image, specifically store entrances, checkouts and queuing. However, if inappropriate, these features could also create an unwillingness to remain in a store.

Sales personnel play an important role in creating the social cues in a store that are found to improve evaluations of store image (Hu & Jasper, 2006). The interaction with customers through sales personnel is central to consumer-focused communication (Knee, 2002).Lee et al. (2005), however, did find a

significant relationship between sales personnel and store loyalty or store satisfaction. Baker et al. (2002) investigated the influence of store environmental cues on customers' perceived merchandise value and patronage intention. They concluded that sales personnel influenced the perceptions of interpersonal service quality, which, in turn, influenced patronage intention, thus underscoring the importance of sales personnel in building store image. The sales personnel's product knowledge is a key store image attribute in male shopping behavior, according to Lee et al. (2005). The personal appearance of sales personnel influences the customers' perception of a store.

Store atmosphere plays a vital role in the consumer's experience. Atmospherics involve a conscious designing of space to affect customers' sensory experience. It mostly has to do with the 'spatial aesthetic' features of the store and serves as a 'silent language' in communication to consumers (Kotler, 1973-1974, p. 48 & 50). These sensory experiences affect a person's emotional state and therefore the way in which product information will be evaluated. A positive store experience enhances satisfaction and will lead to increased shopping frequency, and therefore lead to increased sales (Koo, 2003). Store atmosphere, specifically in reference to design and ambient factors, is a significant variable as it influences consumer preference, interpersonal service quality, merchandise quality and monetary price perception, as well as shopping experience cost (Baker et al., 2002; Thang & Tan, 2003). Furthermore, Newman and Patel (2004) reported that store atmosphere is one of the crucial factors and determinants of store choice. Smell (as part of store interior) is a very strong emotional trigger. The sense of pleasant arousal derived from fragrance increases exploratory tendencies behavior (Orth & Bourrain, 2005). The emotional experience is as important as the shopping experience, because consumers have affective expectations too (Wirtz, Mattila & Tan, 2007). According to Sway (2007), scent marketing can make a consumer feel comfortable and put consumers in a good mood that could positively influence purchasing decisions. Smell is a strong emotional trigger.

Store image influences the way in which consumers evaluate and choose a store (Kleinhans, 2003). Patronage behavior is associated with acts a consumer performs for the purpose of making a purchase from a store. The identity of a store, presented in the store image, communicates useful information to consumers that they utilize during pre-purchase decision-making (North et al., 2003).Store image cues therefore influence consumers' decision-making processes, which result in store choice (Baker et al., 2002). Store image and store positioning also greatly predict store choice and, ultimately, retail success (Baker et al., 2002). Knowledge about the influence of store image perception on patronage behavior may empower retailers to design their stores according to the desired store image that could lead to consequent store choice (Kleinhans, 2003).Birtwistle and Shearer (2001) propose five reasons why consumers choose a particular store, namely stock held, price ranges, quality of products, fashionability of goods and style of clothing. Four of these fall directly under the dimension of merchandise, which contributes to the forming of a store image (Lindquist, 1974-1975)? Therefore it indicates that store image attributes influence patronage behavior. Satisfied consumers, however, do not necessarily remain satisfied customers, let alone loyal. Customer satisfaction increases repeat purchase behavior and the purchase of other products at the same store (Chang & Tu, 2005). According to Chen-Yu and Hong (2002), consumers spend their funds in such a way as to maximize satisfaction, which is also the desired outcome of a marketing strategy. Satisfaction not only reinforces the resolution or intent to repurchase, but also store loyalty (Patterson & Spreng, 1997; Bloemer, Kasper, & Lemmink, 1990; Kincade, Redwine & Hancock, 1992).Customer satisfaction is a response to expectation, product performance after purchase, product experience, or the shopping experience. The response is a reaction from the evaluation of standards; between pre-purchase expectations, wants or ideals and the actually shopping- and/ or product experience (Bloemer & De Ruyter, 1998; Grace,2005; Howard & Sheth, 1969). Therefore customer satisfaction depends on whether the expectations entertained prior to a shopping experience are met. The greater the satisfaction of the customer during purchasing, the greater the intention to repeat purchase (Chen-Yu & Hong, 2002). Baker et al.(2002) affirmed that consumers evaluate store image dimensions as reliable information cues about product attributes, price, quality, value and overall shopping experience. Bitner (1990) reported that consumers concentrate on design and ambient environment cues when evaluating a store. According to Jacoby and Mazursky (1984), consumers depend heavily on pictures of store interiors for information during the shopping experience. Customer satisfaction is therefore reached through a positive evaluation of the desired store image.

It can therefore be deduced that needs satisfaction and shopping satisfaction lead to store choice, which underscores why stores strive toward the needs and goal satisfaction of consumers (Baker et al., 2002). This research outlines the features which can help retailers focus their strategies on appropriate drivers which can influence the shopping behavior of the customers, according to the retailers' own features, and thus attain sustainable competitive advantage through their differentiation.

Marketing literature identifies several store attributes that can differentiate retailers and offer positive value to consumers (e.g.,Hackl et al.,2000;Gomez et al.,et al., 2004., and spiller et al.,2006) including price,sales,sales promotions,quality,commercialized brands (including the store's own brand),proximity,assortment,customer attention, additional services, store atmospherics and opening times,. The findings of a research by Martinez et al. (2010) reveal that among consumers who buy from hypermarkets, perceptions of the quality image, as well as perception of services and convenience, have a positive and significant influence on the maximum level of customer satisfaction. This paper has been taken as a basis for this study and the scale constructed for the study was partially adapted from this paper. This research outlines the features which can help retailers focus their strategies on appropriate consumer's targets, according to the retailer's own features, and thus attain a sustainable competitive advantage through their differentiation.

2. Objectives of the Study

The present study focuses on the customer's shopping behavior in retail stores in the Indian context with the following objectives.

- To determine the key drivers influencing Shopping behavior in retail stores; and
- To analyze the relationship between the factors brought out from the study and the different types of customers.

3. Hypothesis for the Study

The following hypothesis have been formulated for the study

H_0: The variables are uncorrelated with the population

H_1: The variables are correlated with population

H_2: There is no significant relationship between factors influencing shopping behavior of customer in retail store and different types of buyers.

- There is no significant relationship between shopping experience of customer in retail store and different types of buyers.
- There is no significant relationship between store image of the retail store and different types of buyers.
- There is no significant relationship between perception of value for money that a retail store offers to the customer and different types of buyers.

H_3: There is a significant relationship between factors influencing shopping behavior of customer in retail store and different types of buyers.

- There is a significant relationship between shopping experience of customer in retail store and different types of buyers.
- There is a significant relationship between store image of the retail store and different types of buyers.
- There is a significant relationship between perception of value for money that a retail store offers to the customer and different types of buyers.

4. Research Methodology

The Data was collected through questionnaire (refer Appendix) were distributed to customers in different supermarkets and hypermarkets of Lucknow city in the month of May June 2014.

The sampling technique was probabilistic. Questionnaire was randomly distributed to customers over 18 years of age. The number of valid response was 300.

5. Variables Measurement

Questionnaire measured shopping experience, and value for money perceptions of the customers. Customers rated the store on a 5-point Likert scale. (1=Strongly Disagee to 5=Strongly Agree) for 12 questions related to shopping experience, store image and value for money perceptions of the customers.

6. Data Analysis

Table 2 shows the demographics of the respondents for the survey.

Table 1: Demographics of the respondents for the Survey

Gender	Categories	Count	Percentage
	Male	155	51.7
	Female	145	48.3
Age	< 30	105	35
	31-40	114	38
	41-50	54	18
	Above 50	27	9
Marital Status	Single	163	54.3
	Married	137	45.7
Education Level	Graduate	131	43.7
	Post Graduate	115	38.3
	Others	54	18
Monthly Income	< 15,000	19	6.3
	15,0001-20,0000	21	7
	20,0001-30,000	83	27.7
	30,0001-40,000	88	29.3
	>40,000	89	29.7
Occupation	Student	69	23
	Working Professional	116	38.7
	Unemployed	21	7
	Self Employed	94	31.3

7. Testing of Hypothesis One

In order to identify the underlying dimensions in the perceptions of key drivers influencing shopping behavior of customers in retail stores, an exploratory factor analysis of principal components was employed. The respondents were asked to rate 12 shopping variables using 5-point Likert scale, which ranged from 'strongly disagree' to 'strongly agree'. The inter-item consistency reliability of these 12 variables was tested before factor analysis was carried out. The result of Cronbach's Alpha test was 0.964, which is considered to be good. The

closer the value of Alpha goes to 1.0; the better is the reliability test (Cronbach's, 1951). In order to test whether it was appropriate to apply the exploratory factor analysis technique to this dataset, we used Kaiser-Meyer-Olkin test as a measure of sample adequacy, the results are shown in Table 2, is equal to 0.891 which is greater than the accepted value of 0.5, similarly Bartlett's test of sphericity has a high Chi-square value of 9139.59 and the significance is 0.000, which is less than 0.05, hence the null hypothesis is rejected and H_1 is accepted.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		*0.891*
Bartlett's Test of Sphericity	Approx.Chi-Square	9139.159
	df	66
	Sig.	0.000

Table 3 shows the factor analysis of the 12 variables which would be considered as key drivers influencing the shopping behavior of the customer's in retail stores.

Table 3: Factor Analysis

	Component		
	1	2	3
Employee Nature	0.848		
Merchandise Display	0.921		
Store Atmospheric	0.924		
Store Opening	0.834		
Employee Merchandise Knowledge	0.902		
Store Cleanliness	0.823		
Store Checkout Time	0.821		
Store Merchandise Quality		0.836	
Store Location		0.844	
Store Return Policy		0.830	
Price			0.912
Promotion			0.826

Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization; Rotation converged in 6 iterations

Table 4: Rotated Component Matrix

	Factor Loading			Communality
	Factor 1	Factor 2	Factor 3	
Factor 1: Shopping Experience				
Employee Nature	0.848			0.962
Merchandise Display	0.921			0.996
Store Atmospheric	0.924			0.959

Store Opening	0.834		0.964
Employee Merchandise Knowledge	0.902		0.968
Store Cleanliness	0.823		0.963
Store Checkout Time	0.821		0.932
Factor 2: Store Image			
Store Merchandise Quality		0.836	0.991
Store Location		0.844	0.996
Store Return Policy		0.830	0.987
Factor 3: Value For Money			
Price		0.912	0.948
Promotion		0.826	0.928
Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization; Rotation converged in 6 iterations			

These three factors account for 96.36% of the variation in the 12 variables (Table 5).

Table 5: Total Variance

	INITIAL EIGEN VALUES			EXTRACTION SUM OF SQUARED LOADINGS			ROTATION SUMS OF SQUARED LOADINGS		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.479	78.989	78.989	9.479	78.989	78.989	5.571	46.422	46.422
2	1.1440	12.000	90.989	1.1440	12.000	90.989	3.586	29.880	76.302
3	1.01	5.374	98.362	1.01	5.374	98.362	2.407	20.060	96.362
Extraction Method: Principal Component Analysis									

Further the internal consistency was found to be good for three attributes, the results of Cronbach's Alpha for the three attributes were 0.990,.0.995 and 0.903 respectively, which is well above the permissible value of 0.5.The closer the reliability coefficient gets to the value of 1.0,the better is the reliability of the measure(Cronbach 1951). This scale can be considered good.

Table 6: Reliability Statistics

	Cronbach's Alpha	No. of Items
Factor 1:Shopping Experience	0.995	7
Factor 2:Store Image	0.990	3
Factor 3:Value For Money	0.903	2

7.1   Scree Plot

A scree plot is a plot of eigenvalues against the number of factors in order of extraction. As shown in Figure 1, it indicates that there are three factors which have eigenvalues greater than one based on 12 variables.
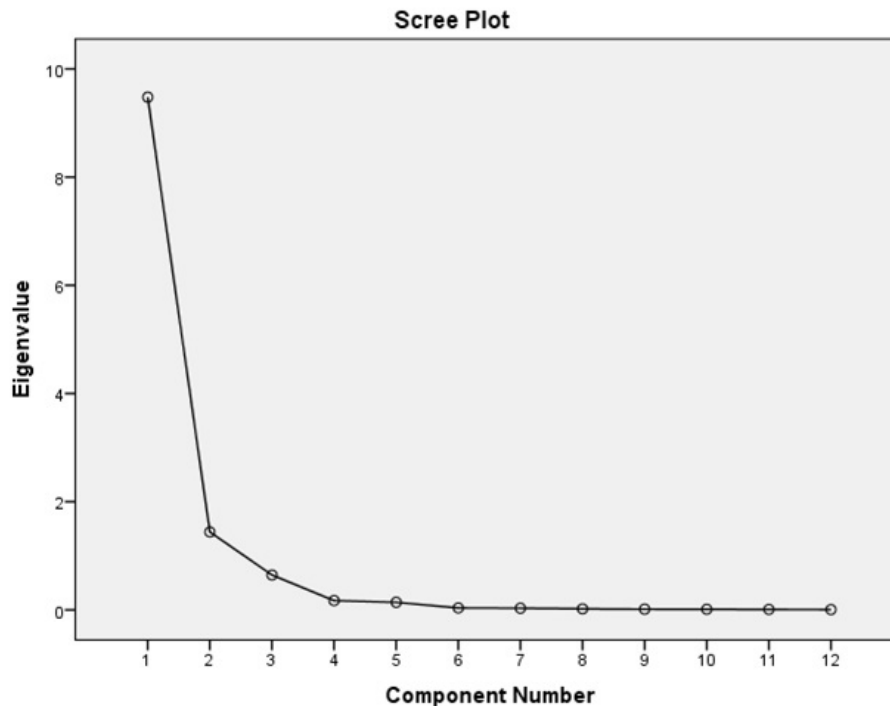
Figure 1: Scree Plot

8. Testing Hypothesis 2

H_2: There is no significant relationship between factors influencing shopping behavior of customer in retail store and different types of buyers.

- There is no significant relationship between shopping experience of customer in retail store and different types of buyers.
- There is no significant relationship between store image of the retail store and different types of buyers.
- There is no significant relationship between perception of value for money that a retail store offers to the customers and different types of buyers.

H_3: There is a significant relationship between factors influencing shopping behavior of customer in retail store and different types of buyers.

- There is a significant relationship between shopping experience of customer in retail store and different types of buyers.
- There is a significant relationship between store image of the retail store and different types of buyers.
- There is a significant relationship between perception of value for money that a retail store offers to the customer and different types of buyers.

9. Models and Analysis of Results

In order to test the hypothesis a parametric linear regression and one way ANOVA test were conducted .Table 7, 8 and 9 shows the values of the coefficient of determination of R^2 that quantifies the proportion of variation explained by the model. Regarding the total sample of customers it shows that 74.9% of the variation of the shopping experience of the customers shopping in retail store is explained by this model (Table 7).

Table 7: Model Summary Shopping Experience

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate
1	0.865	0.749	0.744	0.50616710

Table 8: Model Summary Store Image

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate
1	0.564	0.318	0.304	0.83451877

Table 9: Model Summary Value for Money

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate
1	0.367	0.135	0.117	0.93958115

ANOVA test was also conducted to test the hypothesis and the results are shown in table 10

Table 10: ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Shopping Experience	Between Groups	192.012	2	96.006	266.514	0.000
	Within Groups	106.988	297	0.360		
	Total	299.000	299			
Store Image	Between Groups	55.668	2	27.834	33.973	0.000
	Within Groups	243.332	297	0.819		
	Total	299.00	299			
Value For Money	Between Groups	20.685	2	10.343	11.037	0.000
	Within Groups	278.315	297	0.937		
	Total	299.00	299			

9.1   Interpretation

All the three factors have significance value of 0.000 respectively which is less than 0.05 and therefore the H_2 hypothesis is rejected and H_3 is accepted as which states that their exist a relationship between shopping experience, store image, value for money with different types of buyers i.e. buyers of different age groups, gender, marital status, income, education level and occupation.

Analysis of descriptive statistics of shopping experience (Table 11) indicates that the people who are below 30, single and whose monthly income is more than Rs. 40,000 do enjoy shopping more as an experience, similarly males enjoy shopping more as an experience as compared to females. The study also indicates that people who are above 50 years don't enjoy shopping as an experience.

Table 11: Descriptive Statistics for Shopping Experience

	N	Mean	SD	Std Error	5% Confidence Level Mean		Min	Max
					Lower Bound	Upper Bound		
Shopping Experience Descriptive Statistics								
Age								
Less than 30	105	0.80	0.33	0.32	0.73	0.86	0.51	1.2
31-40	114	0.27	0.53	0.49	0.17	0.37	-1.5	1.2
41-50	54	-.1.63	0.19	0.02	-1.69	-1.58	-2.1	-1.5
Above 50	27	-1.0	0.43	0.08	-1.17	-0.83	-1.9	-0.4
Marital Status								
Single	163	0.70	0.38	0.02	0.64	0.76	0.29	1.2
Married	137	-0.84	0.84	0.07	-0.98	-0.69	-2.1	0.29
Education Level								
Graduate	131	0.80	0.35	0.03	0.74	0.86	0.29	1.20
Post Graduate	115	-0.29	0.85	0.07	-0.43	-1.41	-1.53	0.29
Others	54	-1.33	0.55	0.07	-1.49	-1.87	-2.14	0.29
Gender								
Male	155	0.72	0.37	0.03	0.06	0.07	0.29	1.20
Female	145	-0.77	0.86	0.07	-0.91	-0.63	-2.1	0.29
Occupation								
Student	69	0.58	0.19	0.02	0.54	0.63	0.51	1.20
Working Professional	116	0.69	0.45	0.04	0.61	0.78	0.29	1.20
Unemployed	21	0.25	0.14	0.03	0.18	0.37	-0.31	0.29
Self Employed	94	-1.35	0.45	0.04	-1.44	-1.25	-0.21	-0.31
Income Level								
20,0001-30,000	83	0.99	0.31	0.03	0.19	0.28	-0.92	0.29
30,0001-40,000	88	0.23	0.21	0.02	0.19	0.28	-.92	0.29
Above 40,000	89	1.3	0.41	0.04	1.4	1.3	2.1	0.40

Analysis of descriptive statistics of store image (Table 12) indicates that the people who are of above 50 years and who earn more than Rs.40,000, while shopping keep in mind the store image or rather shop more where they perceive the store image to be better in comparison to the other stores.

Table 12: Descriptive Statistics for Store Image

	N	Mean	SD	Std Error	5% Confidence Level Mean		Min	Max
					Lower Bound	Upper Bound		
Store Image Descriptive Statistics								
Age								
Less than 30	105	0.53	0.98	0.09	0.34	0.72	-0.67	1.36
31-40	114	-0.23	0.25	0.02	-0.27	-0.18	-0.67	0.62
41-50	54	0.50	0.40	0.05	0.39	0.61	-1.3	0.91
Above 50	27	2.0	0.72	0.14	2.3	1.80	3.2	0.90
Marital Status								
Single	163	0.21	0.90	0.07	0.07	0.35	-0.67	1.36
Married	137	-0.25	1.04	0.08	-0.43	-0.08	-3.2	0.91
Education Level								
Graduate	131	0.32	0.97	0.08	0.15	0.49	-0.67	1.36
Post Graduate	115	0.03	0.38	0.03	-0.03	0.10	-3.2	0.91
Others	54	-0.87	1.39	0.18	-1.25	-0.49	-3.2	0.91
Gender								
Male	155	0.24	0.92	0.07	0.09	0.38	-0.67	1.38
Female	145	-0.25	1.01	0.08	0.42	0.08	-3.2	0.91
Occupation								
Student	69	1.16	0.56	0.06	1.02	1.29	-0.67	1.36
Working Professional	116	-0.43	0.21	0.01	-0.47	-0.39	-0.67	-0.24
Unemployed	21	-0.21	0.06	0.01	-0.25	-0.18	-.024	0.47
Self Employed	94	-0.27	1.26	0.13	-0.53	-0.10	-3.2	0.91
Income Level								
20,0001-30,000	83	-0.11	0.86	0.09	-0.30	0.07	-0.67	1.36
30,0001-40,000	88	-0.21	0.10	0.01	-0.23	-0.19	-0.24	0.33
Above 40,000	89	0.29	1.29	0.13	0.56	0.02	3.29	0.91

Analysis of descriptive statistics of value for money (Table 13) indicates that the people who are in the age group of 41-50, unemployed and whose monthly income is in between 20, 0001-30,000 tend to shop more in stores where they perceive that the stores offer them a better value of their money. The study also indicates that people who earn more than Rs.40,000 don't consider the value for money factor while shopping.

Table 13: Descriptive Statistics for Value for Money

	N	Mean	SD	Std Error	5% Confidence Level Mean		Min	Max
					Lower Bound	Upper Bound		
Value For Money Descriptive Statistics								
Age								
Less than 30	105	-0.10	0.35	0.34	-0.17	-0.03	-0.4	0.33
31-40	114	0.28	0.02	0.002	0.28	0.28	0.19	0.33
41-50	54	0.29	0.26	0.03	0.22	0.38	0.17	1.38
Above 50	27	-1.38	2.87	0.55	-2.52	-0.24	-5.4	1.77
Marital Status								

Single	163	0.03	0.34	0.02	-0.01	0.09	-0.40	0.33
Married	137	-0.44	1.43	0.12	-0.28	0.19	-5.4	1.77
Education Level								
Graduate	131	-0.02	0.36	0.03	-0.08	0.03	-0.40	0.33
Post Graduate	115	0.25	0.03	0.003	0.24	0.26	0.19	0.28
Others	54	-0.49	2.22	0.30	-1.09	0.11	-5.4	1.77
Gender								
Male	155	0.024	0.34	0.02	-o.03	0.08	-0.04	0.33
Female	145	-0.026	0.34	0.02	-0.03	0.08	-0.40	0.33
Occupation								
Student	69	-0.33	0.20	0.02	-0.38	-0.28	-0.40	0.33
Working Professional	116	0.30	0.02	0.002	0.301	0.309	0.28	0.33
Unemployed	21	0.28	0.005	0.001	0.281	0.286	0.26	0.28
Self Employed	94	-0.19	1.71	0.17	-0.54	0.15	-5.4	1.77
Income Level								
20,0001-30,000	83	0.13	0.31	0.03	0.06	0.20	-0.40	0.33
30,0001-40,000	88	0.28	0.009	0.001	0.282	0.280	0.22	0.28
Above 40,000	89	-0.22	1.75	0.18	-0.59	0.14	-5.4	1.77

10. Conclusion

A great portion of the competitive advantage of retailer directly depends on the amount of information obtained from the customers. The information obtained from the customers enables the retailer to know the key drivers which would influence the shopping behavior of the customers in the retail store. The customers who have different consumption habits with different income levels want something in common, to enjoy their shopping in a decent environment. Customers while going through the purchase cycle, experiences some attitude/behavior changes based on the stimulus in the environment ,which leads to formation of certain judgments about the store, These judgments in turn influences how customer behaves.

This research primarily helps to identify the key drivers which influence the shopping behavior of the customers in the retail stores The finding shows that shopping experience, store image and value for money had a significant impact on shopping behavior of the customer in both hypermarkets and supermarkets. Focusing on the drivers which are of greatest importance and have highest share in influencing the shopping behavior of the customers in the retail store, which would enable the retail store to identify their strength and weakness, while also identify the opportunities and the threats of the external environment. It is inferred from the results that better display of merchandise, keeping the store clean, reducing the billing time, and a positive store atmosphere can lead to more satisfying buying experience.

11. Limitations of the Study

Due to lack of time and resources the study was limited to the survey of customers in Hypermarkets and Supermarkets of Lucknow district. Although, Lucknow district is a two tier city and capital city of Uttar Pradesh, the findings may not entirely reflect the views of customers of entire country in general and the results may vary in case the survey is conducted in other parts of the country. Hence, research in other cities and other customers

is required to examine the validity and reliability of the identified store attributes. The researchers found it very difficult to make the respondents answer for lengthy questions as they were in shopping mood and neglect to answer the questions.

12. Future Research

A possible direction for future research is to review and conduct a similar study in other districts, or states to discover similarities and differences. Another possible direction for future research is to examine the other factors such as shopping frequency, the ticket size of the purchase and compare different types of retail stores such as discount stores may explain other key drivers which would influence the shopping behavior of customers in retail store.

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14. Appendix

Questionnaire: Key Drivers Influencing Shopping Behavior in Retail Stores

Personal Information of the Respondent
Name: _____

Age (in years) :   <30 [ ]   31-40 [ ]   41-50 [ ]   >50 [ ]

Gender: Male [ ]   Female [ ]

Marital Status: Single [ ]   Married [ ]

Highest Educational Qualification:
Graduate [ ]   Post Graduation [ ] Others   [ ]

Occupation:
Student [ ] Working Professional [ ]   Unemployed [ ]   Self Employed [ ]

Monthly Income (Rs):
Below 15,000 [ ]   15, 0001-20,000 20[ ]1-30,000 30, 0001-40,[ ]   [ ]
Above 40,000 [ ]

Do you disagree or agree with the following statements?

1.	Extending opening hours of the store can enhance the reputation of the store	1	2	3	4	5
2.	Location of store is convenient with good network of transportation	1	2	3	4	5
3.	Compared to other stores the prices of this store are low	1	2	3	4	5
4.	Is the merchandise available in the store is of good quality	1	2	3	4	5
5.	Do you prefer to shop in stores where the employees are friendly and pleasant	1	2	3	4	5
6.	Do you prefer to shop in stores where employees of have product knowledge	1	2	3	4	5
7.	Do you prefer to shop in stores where merchandise display and assortment is good with enough space between display area	1	2	3	4	5
8.	The store is clean and tidy	1	2	3	4	5
9.	The special offers that are available are well advertised	1	2	3	4	5
10.	The return policy of the store is fair	1	2	3	4	5
11.	Your Shopping is influenced by the Store atmospherics and the decor of the store	1	2	3	4	5
12.	Do you prefer to shop in stores where there are sufficient checkouts	1	2	3	4	5

Note: 1-Stongly Disagree   2-Disagee   3-Neutral(Neither Agree or Disagree)   4-Agree
5- Strongly Agree

FACTOR ANALYSIS OF ONLINE CLOTHES FASHION PURCHASE ON SOCIAL MEDIA INSTAGRAM

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A B S T R A C T

An activity of online buying and selling products causes many online shops on social media. One of social media being used for buying and selling products in society is *Instagram*. Factors in influencing online purchasing need to be considered by online shops in order to meet the needs and desires of customers. This study aims to determine the factors that influence the online clothes fashion product purchasing on *Instagram* and other social media to find out the most dominant variables of each factor. This study employs a descriptive quantitative method and factor analysis in SPSS 20:00 in windows seven. The variables analyzed in this study is the impulse purchase orientation, attitude to online shopping, service quality, perceived risk, informativeness, online trust, specific holdup cost, perceived ease of use, and purchase intention. Data collection techniques are on students of Faculty of Economics and Business (FEB) and students of Faculty of Communication and Business (FKB) of Telkom University done by interviews and questionnaires. The sample in this study is using proportionate stratified random sampling of 100 people with a confidence level of 95% and an error of 5%. The results showed that the newly formed five factors that influence online purchase. The fifth factor is the perceived ease of use, online trust, informativeness, attitude to online shopping, and impulse purchase orientation. Online shopping businesses today are expected to pay attention to these factors in order to improve the service. Future studies are expected to use other variables such as enjoyment, perceived usefulness, and innovativeness while also able to use other analytical techniques such as Structural Equation Modelling (SEM).

1. INTRODUCTION

In this modern era, internet is inevitably used by the society to access information. Internet service today has been existed in some regions with the big total of users. Based on the official site of Internet World Stats, it is said that from the internet user side, Indonesia is the eighth rank of all countries in 2012 (Internet World Stats). Ministry of Communication and Informatics says that Indonesian internet users in 2012 reach 63 million people and 95 percent of them use the internet to access the social media (*TI* newspaper, 2013). Social network in Indonesia is also significantly used by the users as a medium to sell their products as well as their product selling and buying activities. John Kerr, Head of Zeno Asia argues that the businessmen nowadays start to look at the social media to sell their products. According to John, there are 27% promotion media that use the social media, 21% use mobile marketing, 15% use television, 10% use advertising in networking, and the rest of it use other media (Andarningtyas, 2013). Shopping and advertising with using internet becomes a trend today. The innovation in softwares

enable the advertiser to determine the costumer who will online purchase, to determine how many customers are, and what margins in each selling (Mullins and walker 2013:356).

The phenomenon of online selling and buying occurs in some social media. In this research, the writer chooses Instagram as the research object since Instagram is one of big ten social media in the world in 2012 based on Silverpop survey result (Prihadi, 2012). The official site of SumAll which is an analyis agency in its newest year-end report in 2013 says that Instagram is the effective social media platform in increasing the business (SumAll, 2013). The phenomenon of online selling and buying is also experienced by the students of Economics and Business Faculty (FEB) as well as Communication and Business Faculty (FKB) of Telkom Univeristy. Instagram is accessed by many students as a medium to buy various types of good like clothes, accessories, foods, shoes, and electronically stuffs. The Instagram application provides easiness for the students to do shopping in everywhere and everytime. The products they desire can be searched only by opening the explore feature and inputing the keyword of the products. The information related to the products which will be searched will be displayed in pictures as well as video. FEB and FKB students of Telkom University also use Instagram as a medium to sell. Instagram eases the students who have desire in business without spending money for the place rent. They just open the online shop by creating an account in Instagram and then posting the products they want to sell.

(Laohapensang, 2009) says that with the development of information search engine in internet since last 20 years, it cannot be denied that the online shopping system will be an alternative way in purchasing products. The online shopping system has undergone a development in relation to various things such as the service, efficiency, security, and popularity. However, the marketing of online media needs to be contionusly fixed if we want to meet the change and development accordance with the needs and expectations of the costumers. Hence, the research about factors which influence the students so that they do online clothes fashion shopping on Instagram as one of trending social media needs to be conducted. Based on the background explained before, this research aims to find out what factors influencing the purchase of online clothes fashion among students of Faculty of Economics and Business as well as Faculty of Communication and Business of Telkom University.

2. THEORETICAL FOUNDATION/RESEARCH METHODOLOGY

2.1 Marketing
Marketing is a social process which involves an activity that is needed to enable an individual and an organization to gain what they need and desire by exchanging with others and developing the relation of ongoing exchange (Mullins and Walker, 2013).

2.2. Mixed Marketing
Mixed marketing is a combination of controled marketing variable which uses a manager to conduct a marketing strategy in pursuing the company goal in particular market target (Mullins and Walker, 2013). McCarthy classifies the marketing activities as the means of mixed marketing from four broad types, namley four P in arketing: product, price, place, and promotion.

2.3. Customers' Attitude
The American Marketing Association in (Peter and Olso, 2010) say that Costumer Behaviour is a dynamic interaction between affection and cognition, behaviour, as well as envioerement where people do the aspects exchange in their lives. The online community and social network users are interesting for some people for some reasons. (Hawkins and Mothersbaugh, 2013) say that the reasons of social network usage by some people are:

1. The customers' usage in accessing social network is high and it increases in every time.

2. The majority of costumer uses the network social sites to share information, including the information about a brand and a product.

3. The potency of customers' acquisition tends to be high.

4. The costumer who interacts about a brand through social media are more potential to remember the brand, tends to share information related to the brand to others, tends to feel connected with the brand, and then tends to buy that brand.

Nine Attributes which Influence Online Buying

Based on some previous studies, (Park and Kim, 2003), (Broekhuizen, 2006), (Bigne Alcan iz, et al, 2008), (Lin an Sun, 2009)⸴ (Lim, 2013), (Thamizhvanan & Xavier, 2013), there are some variables which influence the online buying. Nine of them are Impulse Purchase Orientation, Attitude to Online Shopping, Service Quality, Perceived Risk, Informativeness, Online Trust, Specific Holdup Cost, Perceived Ease of Used, and Purchase Intention.

2.2 Framework

In this research, the writer used nine variables which influence online purchasing, namely impulse purchase orientation, attitude to online shopping, service quality, perceived risk, informativeness, online trust, specific holdup cost, perceived ease of used, purchase intention.
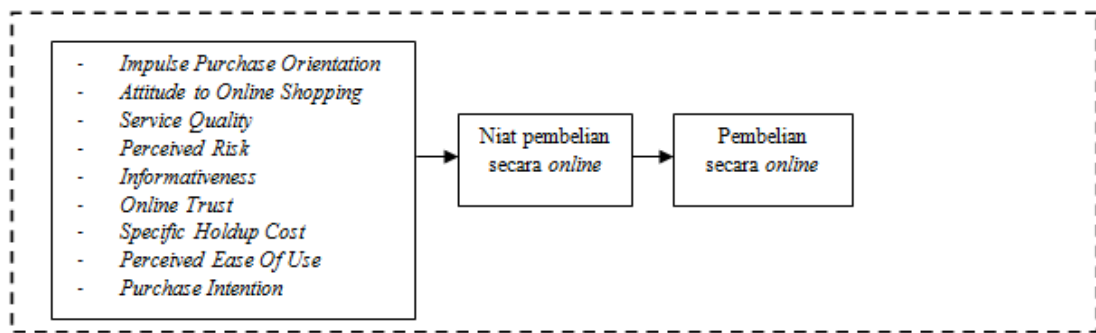

Figure 1: Framework

2.3 Data and Data Analysis

This research employed descriptive research using quantitative approach. The data are from the quisionnaires. The respondents of this reseach are Instagram users among the students of Faculty of Economics and Business and Faculty Communication and Business of Telkom University. The data are form 100 respondents. The data are analysed by using factor analysis.

3. Discussion

Pre-test of the quisionnaire are conducted. The result is showed in Table 1.1.

Table 1: Data Realiability

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.936	.937	26

Since the result of reliability shows 0,937, so the items on this research are reliable with the value > 0.6 (Sugiyonno 2011:184)[15] so that the questionnaires can be used in this research. Table 2 presents the descriptive analysis from the sample of the research.

Table 2: Descriptive Analysis

Item	Category	Sample Size	Percentage (%)
Amount of time in online purchasing	> 2 times	44	44%
	2 times	31	31%
	1 time	25	25%
Sex	Female	89	89%
	Male	11	11%
Age	18-20 years old	42	42%
	21-23 years old	58	58%
	24 years old	0	0%
Study Program	Business Administration	23	23%
	Acoounting	19	19%
	Communication	20	20%
	MBTI	35	35%
	International MBTI	3	3%
Income per month	< Rp. 1,000.000	18	18%
	Rp 1,000,000 until. Rp. 3,000,000	76	76%
	> Rp. 3,000,000	6	6%
Pengeluaran Untuk Berbelanja *Online* Perbulan	< Rp. 100,000	25	25%
	Rp. 100000 unti Rp. 300,000	62	62%
	> Rp. 300,000	13	13%

The descriptive analysis in this reseach is conducted to find out the percentage of each variable which is the most dominant in accordance with the repsondent based on the answers of the quisionnaire. The grouping category is divided into four which is conducted with using the same range.

Table 3: Percentage Grouping Category

Range Value	Category
25% - 43,75%	Very bad
43,75% - 62,5%	Bad
62,5% - 81,25%	Good
81,25% - 100%	Very good

Table 4: Respondent Respons

Variable	Average of Total Score Percentage (%)	Category Description
Impuls Purchase Orientation	70,08%	Good
Attitude to Online Shopping	69,25%	Good
Variable	**Average of Total Score Percentage (%)**	**Category Description**
Service Quality	64,5%	Good
Perceived Risk	67,37%	Good
Informativeness	78,08%	Good
Online Trust	68,25%	Good
Specific Holdup Cost	73,5%	Good
Perceived Ease of Use	77,8%	Good
Purchase Intention	71,5%	Good

3.1 Factor Analysis

The result of factor analysis done on the fifth data processing reaches 0,763 (0,763>0.5) of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy number and 0.000(0.000<0.05) of the significance

number so that the existing indicator can be further analsyed. The MSA number is around zero until one. A variable can be predicted and further analysed if it has >0.5 of MSA (Santoso 2010:66) [14]. The result of anti-image correlation on the table of Anti Image Matrices indicates that all analysed indicators have >0.5 MSA value so the further analysis can be conducted.

Table 5: KMO and Bartlett's Test of Sphericity (Fifth Test)

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.763
Bartlett's Test of Sphericity	Approx. Chi-Square	1300.398
	Df	231
	Sig.	.000

On the first KMO and Barlett's Test of Sphericity Test, the analysed indicatot amount is 26. After the fifth test is conducted, it remains 22 indicators since there are four issued indicators on the previous test, they are IPO1, SQ9, SQ7, and IPO2.

Table 6: Total Variance Explained

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.176	37.165	37.165	8.176	37.165	37.165
2	2.085	9.477	46.642	2.085	9.477	46.642
3	1.588	7.216	53.858	1.588	7.216	53.858
4	1.473	6.696	60.554	1.473	6.696	60.554
5	1.249	5.679	66.233	1.249	5.679	66.233
6	.975	4.434	70.667			
7	.850	3.866	74.533			
8	.838	3.808	78.341			
9	.718	3.264	81.605			
10	.656	2.982	84.587			
11	.596	2.710	87.297			
12	.479	2.178	89.475			
13	.449	2.041	91.516			
14	.342	1.553	93.069			
15	.303	1.378	94.447			
16	.284	1.289	95.736			
17	.238	1.081	96.817			
18	.201	.914	97.732			
19	.170	.775	98.506			
20	.147	.666	99.172			
21	.097	.441	99.613			

22	.085	.387	100.000

Extraction Method: Principal Component Analysis.

The SPP processing result on the table 6 shows that if 22 variants from nine variables are summarised in a single factor so the variants which can be explained by that single factor will be 8.176/22 x 100% = 37.165%. Hence, a single factor can explain 37.165% from the variability of the nine variables. If the nine variables are extracted into five factors, the five total factors can explain the variability of the nine original variables, which are 37,165% + 9,477% + 7,216% + 6,696% + 5,679% = 66.233% . Eigen values show the relative importance of each factor in counting the anlysed variants (Santoso 2010:83) [14]. The criteria in determining the formed factor is by using the amounts of eigenvalue that are worth more than one. The eige value which is less than one can not be used as the formed factor. In the table 6, it is obtained that the eigenvalues which is still worth more than one exists in the first until fifth factor. It can be concluded that it can form five new factors.

Table 7: Rotated Component Matrix

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
IPO3	.192	-.021	.224	.078	.734
AOS4	.598	.260	-.048	.534	.182
AOS5	.007	.161	.446	.687	-.235
AOS6	.720	.148	.345	.050	-.217
SQ8	.320	.560	.057	.230	-.359
PR10	.492	.448	.089	.198	.222
PR11	.148	.488	-.031	-.112	.402
I12	.423	.170	.592	.282	.062
I13	.182	.098	.796	.346	.096
I14	.193	.174	.792	.208	.121
OT15	.158	.665	.031	.428	.127
OT16	.003	.800	.230	.162	.148
OT17	.130	.787	.193	-.154	-.042
SHC18	.385	-.143	.278	.553	.098
SHC19	-.019	.206	.242	.421	.520
SHC20	.117	.503	.117	.270	.534
EOU21	.720	-.066	.365	-.194	.130
EOU22	.216	.137	.709	.009	.333
EOU23	.110	.110	.209	.672	.314
PI24	.709	.287	.121	.215	.363
PI25	.563	.266	.162	.365	.120
PI26	.508	.118	.392	.419	.388

The result from the data processing in the table 7 shows there are 22 analsyed indicators but not all indicators gives the contribution on the five newly formed factors. There are 17 indicators which gives the contribution on the five newly formed factors and five other indicators do not have contribution since they have <0.55 factor loading. The indicators which have <0.55 factor loading are PR10 for 0.492, PR11 for 0.4888, SHC19 for 0.520, SHC20 for 0.534, and PI26 for 0.508.

Based on the analysis factor, there are five newly formed factors within new indicators. The grouping is done in accordance with the factor loading value. Factor loading is the correlation amount between one variable and a newly formed factor   (Santoso 2010:85) [14]. These are the newly formed factors:

1. Perceived Ease of Use. The first factor has 8.176 Eigen value and 37.165% contribution in percentage. This factor covers five variables: the customers can visit the online shops easily (0.720), the customers need online shop to buy products they need (0.720), the customers prefer to choose shopping in inline shop (0.709), the customers feel comfortable when they are purchasing in online shops (0.598), and the customers will recommend others to do online shopping (0.563). These factors are called Perceived Ease of Use since the largest factor loading is from the Perceived Ease of Use factor, which is the customers can visit the online shop easily on media social *Instagram* (0.720).

2. Online Trust. The second factor has 2.085 Eigen value and 9.477% contribution in percentage. This factor covers four variables: the online shops keep personal data safely (0.787), the online shops have a good reputation (0.665), and the online shops consistenly deliver on the promise (0.560). These factors are called Online Trust since the largest factor loading is from the Online Trust variable which is the online shops on social media *Instagram* are trusted to sell with honest (0.800).

3. Informativeness. The third factor has 1.5888 Eigen value and 7.216% contribution in percentage. This factor covers four variables: the customers can access information they need (0.769), the customers can plan the purchases with the existing information on the online shop (0.792), the customers can easily find the products they desire on the online shops (0.709), and the customers can access the newest information about the available products on the online shops (0.592). These factors are called Informativeness which is the customers can find the information about the clothes they need (0.796).

4. Online Attitude to Online Shopping. The fourth factor has 1.473 Eigen value and 6.696% contribution in percentage. This factor covers three variables: the customers think that online clothes shopping on social media *Instagram* is very interesting (0.687), the payment is easy on online shops (0.672), and the customers are accostumed to visit online shops (0.553). These factors are called Online Attitude to Online Shopping since the largest factor loading is from Attitude to Online Shopping variable which is the customers think that online clothes shoppings on social media *Instagram* are very interesting (0.687).

5. Impuls Purchase Orientation. The fifth factor has 1.249 Eigen value and 5.679% contribution in percentage. This factor is called Impuls Purchase Orientation since it only covers one variable so that the largest factor loading is when the customers visit the online shop which sells clothes on social emdia *Instagram*, there is possibility that they will do the purchasing (0.734).

4. Conclusion

Result of this research shows that there are five newly formed factors. Those factors have the addition and subtraction of indicators which are from the different variables. The five newly formed factors are:

1. Perceived Ease Of Use,
2. Online Trust,
3. Informativeness,
4. Attitude To Online Shopping,
5. Impuls Purchase Orientation.

The businessmen today are expected to concern those factors so that they can increase the service quality. The further research is expected to use other variables such as enjoyment, perceived usefulness, and innovativeness or to use another analysis technique like Structural Modelling (SEM).

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Service Quality Provided To Non-European High Net Worth Individuals (HNWIS) By Banks, Legal And Accounting Offices In Cyprus

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A B S T R A C T

Service quality leads to customers' satisfaction and gives a competitive advantage to the firms/organisations against their rivals. Furthermore, service quality by firms in a country gives a competitive advantage to the country against rival countries as well. The global financial crisis has affected Cyprus too. The National Strategy plan for economy recovery is included as a main point the attracting of direct foreign investments by non-European High Net Worth Individuals in the island. Banks, Accounting and Legal offices in Cyprus cooperate together in providing full services to them for their corporate and wealth management needs. The aim of this research is to investigate if Banks, Legal and Accounting firms in Cyprus concern about providing a high level of service quality to non-EU HNWIs and examines the ways of implementation based on the five dimensions of SERVQUAL model.It also researches the impact of different ethnicities on service quality expectations and illustrates how this matter is treated by the firms examined. The study also investigates the priority of importance of the different service quality dimensions and emits new service quality dimensions found important for this industry in Cyprus. After studying different service quality models and different ways of research through literature review and academic resources, this research adopted a qualitative methodology. It was conducted through face-to face semistructured interviews with the managers of ten firms and organisations involved. The conclusions of the study confirm that Banks, Legal and Accounting offices in Cyprus do concern about offering high level of service quality to non-EU HNWIs however the whole infrastructure of the industry has been built mostly on Russian speaking customers' needs. The firms are performing well in the five dimensions of SERVQUAL and ethnicity matters are taken into consideration with a different approach treatment. Responsiveness is found to be the most important dimension after reliability based again on Russians' demand for quick service while flexibility and transparency emitted to be new important dimensions apart of pricing.

1. INTRODUCTION AND BACKGROUND

5.1. Aim and research objectives

This research investigates, corporate and wealth management services offered to HNWIs from the angle of "service quality" in an attempt to find out any existing gaps and give suggestions

for improvements. It is globally known, that HNWIs have the opportunity to travel around the world and being served by a large number of firms and organisations which are seeking to offer to them high quality of service. There is no doubt, that HNWIs are highly educated, sophisticated and they maintain high expectations. Therefore, service quality is a dimension which influences their buying behaviour. The aim of this research is to investigate whether Banks, Legal and Accounting firms in Cyprus are concerned with providing high level of service quality to non-Europeans HNWIs. This research is crucial for Cyprus as it seems that direct investments from non-EU HNWIs are crucial for the recovery of the Cyprus economy recovery. Research questions arise from this research: Do banks legal and accounting offices in Cyprus recognise that service quality, customers' satisfaction and business performance are interrelated concepts and that service quality offers a competitive advantage not only to their firms but to Cyprus as a whole country as well? How do these firms/organisations perform service quality for their HNWIS' customers? Do these firms/organisations have a strategy regarding service quality?

5.1. HNWIS' profile

HNWIs, are defined as persons or households with financial net assets (excluding the primary residential property) to at least US$1 million (Investopedia, 2014) .Statistics show that despite the global economy recession, HNWIs numbers are constantly increasing worldwide (Treenor, 2011). According to the World Wealth Report of 201 0, 9 million persons in 2010 were classified as HNWIs (Highnetworthindividualts.org, 2014). All HNWIs are seeking to increase their wealth through different kind of investments like stock markets, deposits, real estate investments and they are active all around the world, while at the same time they seek to protect their existing assets (Accenture, 2012). Americans prefer to invest in their country region while Asians and Europeans are attracted by international investments too .They have a talent in catching opportunities and have a good awareness of their strengths and weaknesses. They seek to cover their weaknesses by hiring qualified employees and experts with experience and knowledge in areas they lack. For their financial decisions they hire financial advisors who manage their wealth. Beyond financial advisors, due to the complexity of their investments and their strange residency situation, HNWIs need legal advisors too regarding mostly tax law. A lot of European countries offer residency incentives so called "golden visas" to encourage and attract investment in their countries. Most attractive incentives for "buying a European golden visa or even a passport" are being announced by Malta, Portugal, Cyprus and Greece in an attempt to raise funds for their countries. (Barrow, 2014).

5.1. Cyprus Competitive Advantage

Cyprus provides an easy access to Europe, Africa and Asia and is a gateway for European Union and its twenty eight member countries. Cyprus is located on a perfect geopolitical point in the world. It offers a wide range of high quality diverse services for non-EU HNWIs and it is an International Business Centre with all necessary infrastructure in corporate services such as Financial, Legal and Accounting Services. Moreover, there is a double taxation agreement with forty eight countries, including China, United Arab Emirates and Russia (CIPA, 2014). It offers an attractive and transparent tax system which is compliant with European Union regulations. Profits from the sale of securities and share dividends are not taxable. Furthermore, Cyprus does not implement withholding tax on interests and dividends arising from domestic sources. In addition, VAT is not implemented to most international transactions. Cyprus Workforce is highly educated as up to 39, 2% of Cypriots have tertiary education (CIPA, 2014).

Cyprus in order to give more incentives to foreign investors offers Corporate and Wealth Management Services in high quality and relatively low cost. Cyprus within its new strategy in attracting Direct Foreign Investments, gives incentives to non-EU HNWIs through a permit of permanent residence status and/or through the acquisition of Cypriot citizenship. All relevant conditions follow. Cyprus citizenship has been acquired by more than 400 non-EU millionaires over the past few years. At the beginning of the scheme the citizenship was acquired mostly from the Russians and the Ukrainians but recently the Cyprus Citizenship was granted to Chinese millionaire entrepreneurs as well (Hadjistylianou, 2014).

ongoing construction projects.

2. LITERATURE REVIEW

It is commonly accepted that service quality is a matter of a big concern for temporary firms and organisations which seek to satisfy their customers (Kummari & Rani, 2011). It is found out that service quality and customers' satisfaction are interrelated concepts (Cronin & Taylor, 1992). Service quality and customers' satisfaction give a competitive advantage to the firms against their rivals and finally it has been proved that all these lead to higher business performance (Kaur et al, 2012). The buyers' behaviour is affected by the levels of service quality delivered to them, and their intention for re-buying is a result of service quality too (Kotler, 1991). Furthermore, all firms and organisation are seeking for higher performance and maximization of profits and it seems that service quality is the key to success. Moreover, HNWIs all over the world are used to a high standard of service quality, while at the same they

do not have much time for being served. Therefore, they are seeking for a special clients' service experience, which makes the matter more important for this research. Additionally, service quality should include ethnicity matters as firms have to produce na optimal experience for clients with diverse cultural backgrounds who have different service quality expectations and different perceptions (Snow et al, 1996)

5.1. Service quality and competitive advantage

Service companies from small businesses to large multinational corporations are continuously seeking to create competitive advantage through differentiation for their services offered (Johnson & Sikirit 2002). Service quality is a tool for competitive advantage, which distinguishes organisations from others (Kaur et al, 2012). Recent researches are focusing on measuring quality service in order to understand customers' perceptions in order to achieve a competitive advantage (Palmer & Cole, 1995). Parasuraman et al (1985) stated that quality service is a strategy which brings profits and attracts new customers and new business from existing customers. Thus companies which offer service quality are more profitable and they sustain competitive advantage against their competitors (Hampton, 1993). The comparison with rivals is helping companies to establish a strategy for service quality improvement. Furthermore, this comparison is helping companies to understand in which service quality dimension they should give more attention in order to enhance competitive advantage. (Johnson & Sikirit 2002). Finally , as it is stated by Seth et al, (2005) organisations maintain competitive advantage by gathering data through technology for the purpose of improving service quality and customers' satisfaction.

5.1. Service quality and Consumer behaviour

Hartl (2006) pointed that customers' behaviour cannot be predicted as customers' preferences are differentiated through the years. Customers are never the same and they perceive service quality in different ways (Smith, 2009). Two factors that influence customers' behaviour are culture and social factors (Wilson et al 1992). A subculture variation according to Wilson et al (1992) are the ethnic taste, religion and geographical region. Furthermore, Kotler and Keller (2006) state that social class defines a customer segment with the same values, attitudes and behaviour. Wilson et al (1992); Solomon et al (1999) indicated that factors which determine social class are income, power, prestige and wealth. All these attributes characterise HNWIs who have the same influence from their social class point of view who will be considered as one customer segment for the purposes of the present research. However, ethnicity is one

attribute which still distinguishes HNWIs who come from different places of the planet and maintain different ethnicity culture background.

5.1. Service quality and ethnicity

It seems that researches only recently began to assess service quality according to clients' ethnicity attributes in organisations including service providing sector. Due to the fact that non-EU HNWIs are coming to Cyprus from countries with different cultures and different ethnic background, ethnicity should be taken in consideration in service quality. As being observed by Snow et al, (1996) cultural factors arising from ethnicity is one of the factors affecting service quality expectations. Furthermore, recent studies found that people coming from different cultures have different perceptions of service quality. This is because either they have different expectations or because they weigh differently the criteria of service quality (Donthu et al, 1998; Mattila, 1999). Furrer et al (2000) added to this by finding out that consumers coming from different cultures weigh differently the importance of the five dimensions of SERVQUAL model (Parasuraman et al 1988). However, it is important to say that if service providers do not meet the expectations of customers based on their different culture background, this will lead to their dissatisfaction (Strauss & Mang, 1999). Furthermore cultural factors are fundamental factors formatting a person's perceptual lens and influence consumers buying behaviour (Furrer et al, 2000). Therefore firms and organisations dealing with different ethnicity customers and with particular ethnic segments, should identify these different expectations and design their services in order to match expectations with service delivery. This will lead to their competitive position (Snow et al, 1996).

5.1. Customer's satisfaction and the Financial Service Sector

Rust & Zahorik (1993); Trubik & Smith (2000) declared that high customer satisfaction has as a result high customer retention especially in financial industry sector which is a high competitive and saturated industry. In our days organisations in financial industry more or less offer similar products in similar prices. The only way for differentiation is the providing of high service quality (Seonmee and Brian, 1996; Barnes and Howlett, 1998; Naser et al., 1999; Wang et al., 2003). Service quality improvement in financial services organisations is very crucial for their business success (Allred & Addams, 2000) .The major benefits of delivering service quality in financial and corporate services are noticed by a lot of authors (Crosby, 1991; Adil 2012; Reichfeld & Sasser, 1990) and are summarised as

1. Cross selling opportunities

2. Loyalty of customers

3. Customers' relationships enhancement

4. Increase of market share

5. Attraction of new customers

6. Increase of profit margins.

Because of the importance of service quality which is apparent that leads to higher business performance for the services sector industry and especially for the financial sector, managers are seeking to measure service quality from their customers' point of view and find ways to meet their expectations and fulfil their perceptions by using service quality measurement instruments/models.

5.1. Service quality models, SERVQUAL

Due to the importance of service quality, there is a substantial and continuous creation of service quality measurement models or better saying an updating of the existing ones. Gronroos (1984), noticed that (WOM) word of mouth has a big impact on potential customers' buying decision and pointed out that research should take in consideration potential customers' perceptions too. Later, Parasuraman et al (1985; 1988; 1991) designed the SERVQUAL model which assesses the differences between prior consumers' expectations and final performance perceptions as a guide for service quality. The same SERVQUAL model was used as a base by Cronin and Taylor (1992), in the creation of the SERVPERF model which used the same five dimensions of SERVQUAL with a difference in assessing consumers' perceptions only on service delivery. SERVQUAL was once again used as a base by Frost and Kumar (2000) to support their internal service quality model. However later, Brogowicz et al (1990) used attributes from both SERVQUAL and Technical and functional quality model (Gronroos, 1984) in developing their synthesised model. SERVQUAL gives more details in its results for service quality, measuring both expectations and performance perceived and determines the gap between them by trying to reach customers' expectations and satisfying them. According to Cronin et al (2000) service quality perceptions influence feelings regarding satisfaction which in turn affects purchasing behaviour in the future. Moreover, feelings are aligned with expectations. Finally, Asubonteng et al, (1996) gives a definition for service quality: ''the difference between customers' expectation for service prior to the service encounter and the perception of the service received'' which definitely leads to SERVQUAL. Despite the fact that there are a lot of criticisms for the SERVQUAL, it is still very useful in measuring service quality (Ladhari, 2009). The

SERVQUAL has been used by a lot of researches for different kind of organisations including financial services and banking (Nyeck et al ,2009). One of the purposes of SERVQUAL is to determine the level of service quality according to its five key dimensions and to recognise if there are any gaps in service and to what extend (Kaur et al, 2012). The SERVQUAL model separates the concept of service quality into five dimensions which derived after five years of service quality research using qualitative and quantitative data (Parasuraman et al, 1991). According to Parasuraman et al (1991), reliability is more concerned with the outcome of service while the rest dimensions (responsiveness, assurance, tangibles and empathy) are more concerned with the service process. Furthermore, the developers of SERVQUAL, found out that reliability is the most important dimension for meeting customers' expectations while the rest dimensions are more important in helping companies exceeding those expectations. However, the weighting of importance of the five dimensions varies between the different kinds of services (Chowdhary & Chowdhary, 2005). According to Chowdhary and Prakash (2007) ,Tangibles are more important at services with bigger action in tangibles. Reliability is more important to services dealing with the possessions of customers while Assurance is more important to services involved with clients rather that their possessions. Responsiveness is the least important for all kind of services while empathy is more important to services dealing with people and information. Finally, researches have added an extra dimension, the one of the price which is important more to customers with possessions.

5.1. Literature Summary

Through a study of the existing literature in regards to service quality it is obvious that this is of great concern for managers and researches. In recent years, service quality became of major importance for managers and organizations. Customers can never be the same and their expectations and perceptions are subjective and vary among them. Customers' satisfaction is the outcome of a high level of service quality which meets or exceeds their expectations. Customer' satisfaction leads to customers' loyalty, re-buying decisions and high returns for organisations. Conclusively service quality allows high business performance for firms and organisations adopting a service quality strategy. Service quality gives to the firms a competitive advantage against their rivals and through this, they attract new customers and keep existing ones while at the same time high service quality may give opportunities for higher margins as well. There is no doubt that service quality finally leads to business performance. Business performance is one of the main tasks that should concern all organisations and firms, all around the world even for those which are non-profit organisations. Business performance

is compatible with the traditional theory of the firm which indicates that a firms exists in order to maximise profits and its value (Salvatore, 2012). And because of the importance of business performance which is positively affected by the service quality, a lot of instruments/models have been developed for measuring customers' expectations and perceptions around service quality. In conclusion, despite the fact that there are a lot of such models, basically there are only two schools of thought about service quality measurement: Measuring the gap between customers' expectations and customers' perceptions based on SERVQUAL model. Measuring the customers' performance perceptions only, based on SERVPERF model. Both schools of thought try to identify the problem and suggest ways for improvement. Nevertheless, SERVQUAL model is the most widely used model measuring service quality in the service sector industry. This model, using the five gaps, examines five dimensions. These are responsiveness, reliability, tangibles, assurance and empathy. Furthermore , despite the fact that HNWIs may be concerned as one market segment based on their wealth ,ethnicity matters will be examined too as there is no doubt that people's expectations and or perceptions are influenced by their different cultural background as well.

3. RESEARCH METHODOLOGY

3.1 Research aim and research questions

To investigate whether banks, legal and accounting offices in Cyprus are providing high level of service quality to non-Europeans HNWIs. This investigation matters as this kind of firms and organisations are the backbone of the corporate and wealth management services industry in Cyprus which provide services to non-EU HNWIs. Furthermore, direct investments by these customers seems to be the key for Cyprus' economy recovery. In conclusion providing high level of service quality by these firms/organisations to non-EU HNWIs is crucial for Cyprus as it gives to the country a competitive advantage supporting economic recovery. Research questions arise from this research aims and objectives in combination with what has been found in the literature review in chapter two, regarding what is important in service quality, what dimensions are measured in service quality models and where does high level of service quality lead: Do banks, legal and accounting offices in Cyprus realise that high level of service quality gives a competitive advantage not only to them but to their country as well? Do banks legal and accounting offices in Cyprus recognise that service quality, customers' satisfaction and business performance are interrelated concepts? How do they perform in the five dimensions of Service Quality as described by SERVQUAL model? What do they do to satisfy Non-EU HNWIs regarding their different ethnicity/culture background? In order to answer the

aforementioned questions we need to follow a research approach and a research collection of data method.

3.2 Research Approach

This research conducts interviewees with a semi-structured interview method through a mixture of closed structured questions and open ones while flexibility characterise conversations, allowing interviewees to apply their feelings, opinions and thoughts. Closed questions include a small selection of possible answers making the data analysis easier. Furthermore, questions are based on the five dimensions of SERVQUAL model, reliability, responsiveness, tangibles, assurance and empathy. Ethnicity is added as sixth dimension of service quality in our case as the research concerns service quality to HNWIs coming from all over the world other than Europe, whose perceptions on service quality are influenced by different culture background (Donthu et al, 1998; Mattila, 1999). As stated by Kumar (2005), interviews have advantages and disadvantages. As listed by Saunders et al (2007); Denscombe (2004) one of the most important advantage of interviews is that an interviewer may collect comprehensive detailed and relevant primary data which can be analysed immediately. Although, face-to-face interviews are very difficult to be arranged and they take time to be conducted, the fact that they include the possibility for the interviewer to control the flow of primary data collection process in order to cover the research issues in-depth, overshadows its disadvantages. Furthermore, Bryman & Bell (2011) argue that interviews are more appropriate for complex researches and can be used by collecting indepth information while on the other hand some of the disadvantages are that they are time-consuming and that interviewer may be biased. Interviewees are managers of Banks, Legal and Accounting offices in Cyprus servicing Non-EU HNWIs. All managers are highly educated with extensive experience. All speak fluent English and all are familiar with the present research problem.

3.3 Limitations

Because of confidentiality and limitations on access it is understandable that the author could not collect data directly from customers (service receivers) apart from data collected by the providers of the services and therefore triangulation is not possible to be achieved in order to have a clearer comparison of the results. Managers of the service providing firms are the only who have been interviewed for primary data. In the opening of the interview there is always a reassurance that all the procedure and information selected are treated as confidential, the interviewees remain anonymous and there would be no connection between data collected and

interviewees. It is also clarified that collected data will be used only for the academic research. The interviewees are told that their participation is voluntary, they have the right not to answer a question and they can withdraw any time if they feel uncomfortable.

ANALYSIS AND FINDINGS

4.1 General Findings

A whole industry has been emerged in Cyprus around corporate and wealth management services, servicing mostly Russian speaking HNWIs (Russians and Ukrainians) over the last decades. Most firms maintain representative offices in Russia and Ukraine and some maintain just associates through which they "fish" customers. When they are asked or referred to non-EU HNWIs everybody's mind goes to Russians and Ukrainians. Among the managers who have been interviewed, seven of them were men and three women, which makes the percentage of women interviewed in managerial positions to 33% which exceeds the international average of 25% (Grant Thornton, 2013). Two of them were aged between 30-35, three of them were aged 40-45, two of them 50-55 and the remaining three were aged between 50-60. It is observed that managers in this kind of firms and organisations are in their late fifties. These firms and organisations serve non-Eu HNWIs for a period between 10 to 25 years. It is found that 9, 93% on average of non-Eu HNWIs being served by these firms/organisations come from Russia and Ukraine, 5% on average from Arab countries while only 2% come from Asia and more specific from China. As one interviewee explained: "Our non-Eu HNW customers come mostly from Russia and Ukraine. Over the last two years customers started to come from Saudi Arabia and United Emirates too. Nevertheless Russian speaking customers prefer Cyprus for the following reasons: For tax incentives, For the corporate services infrastructure development, For service quality, For the sun and warm weather .They combine business with holidays, For the strict political situation of their countries, For the opportunity of acquiring Cyprus citizenship and enter freely in all European Union member countries for residency or business purposes. On the other hand Arabs prefer Cyprus: For its geopolitical position. Cyprus is the nearest European Country to their countries, For the feeling of safety. They acquire Cypriot citizenship or the right for permanent residency in order to have an option to move with their family in a safe place to avoid possible hostilities in or near their countries due to the so called "Arab Spring".

4.2 Findings around SERVQUAL model five dimensions and ethnicity

All the managers strongly agreed that service quality is associated with Reliability, Responsiveness, Assurance, Empathy and Tangibles, dimensions which are firstly referred by Parasuraman et al (1985) in the development of their SERVQUAL model. All managers declared that their firm/organisation performs well or very well regarding Reliability for this kind of customers. All the managers agreed with Parasuraman et al (1988) about reliability concepts and all declared that they provide services as promised and they are dependable on the handling of customers' service problems. They all try to provide services in specific time and they get customers informed about when the services will be performed. They try to perform services right from the first time and they try hard for error free records. All the aforementioned are compatible with the guides of SERVQUAL model. All managers declared that their firm/organisation perform well regarding Responsiveness as they provide quick service , their staff shows willingness to help customers and they are always ready to respond to HNW customers' requests. All the firms respond to their HNW customers' emails within 24 hours. All these are compatible with what was reported as Responsiveness by Parasuraman et al (1988) in their SERVQUAL model. All managers answered that they perform well in Assurance too in the way that Parasuraman et al (1988) indicated. They try to instil confidence to customers, they make customers feel safe for their transactions, are courteous and their staff are able to answer customer' questions. All the firms declared that they respond well in Empathy. They identify and understand customers' needs, they provide personalized service to them and they show caring attention. These dimensions for empathy have been instructed by Parasuraman et al (1988), in the development of their SERVQUAL model. Tangibles are important for this kind of firms and I can be a witness that they all perform well. They have a dress code for staff and all employees are dressed professionally. Their buildings are modern, very well equipped and all of them maintain a conference room where they meet and serve HNWIs. They also have convenient business hours for serving HNW customers. At a later stage managers beyond the dimensions of SERVQUAL, were asked if their firm/organisation takes into consideration the different ethnicity of HNWIs in their service quality strategy to them. As conclusion in different ethnicities matters it is obvious that firms and organisations servicing non-Eu HNWIs in Cyprus take much into consideration different habits, different cultures and different religion habits. It has also been proved that, as being observed by Snow et al, (1996) cultural factors arising from ethnicity is one of the factors affecting service quality expectations and they weigh differently the criteria of service quality (Donthu et al ,1998; Mattila, 1999). As observed by the developers of SERVQUAL model, reliability is the most important dimension for meeting customers' expectations (Parasuraman et al, 1991). The same results have been observed by Chowdhary

and Prakash (2007) who found out that reliability is quite significant to services dealing with the possessions of customers. As far as responsiveness is concerned Chowdhary and Prakash (2007), found out that it is the less important dimension while in the present research it is found out that responsiveness comes second after reliability. It could be argued that responsiveness is important in servicing HNWIs in Cyprus due to the fact that the whole industry is based on Russians for whom timing of service is very important. Assurance is the most important according to a firm's manager interviewed, who argued that assurance is very important for customers after the economic crisis and the bail in of the biggest bank in Cyprus in 2013. This is also observed in the WORLD WEALTH REPORT (2013) which reported that trust and transparency are important for HNWIs at a time of ongoing economic uncertainty. Empathy is also important for one firm whose manager argued that HNWIs need a personalised and customized service and it is compatible with the notion saying that HNWIs still find great importance on direct contact and personalised service (WORLD WEALTH REPORT 2013). In the next stage managers were asked to identify a service quality dimension beyond reliability, responsiveness, assurance, empathy, tangibles and ethnicity which is perceived as important. There were different answers. Pricing is also found as a dimension of service quality by Chowdhary and Prakash (2007). The remaining five argued that pricing is not a matter of concern for this segment of customers as they choose the biggest firms/organisations and/or with global presentation in Cyprus regardless pricing. However, they asserted that there were new findings according to which flexibility and transparency are dimensions which influence service quality for this kind of customers and they connected them with the prompt service and assurance respectively.

5. CONCLUSIONS AND IMPLICATIONS

The firms/organisations in Cyprus servicing HNWIs do concern for service quality and they realise that service quality leads to customer's satisfaction and business performance. They all declare that they perform well in the five dimensions of SERVQUAL model and they referred to several ways and procedures supporting their sayings. It is important to say that they take much into consideration the different ethnicity of HNWIs in service quality and they act accordingly while it is found out that the infrastructure of this industry is mostly based on Russian speaking HNW customers. Following reliability, responsiveness is found out as the most important dimension of service quality in Cyprus regarding HNWIs while pricing, lexibility and transparency have been identified as further important dimensions of service

quality to HNWIs. Personal meetings at the start point of cooperation is the way to identify customers' expectations while perceptions on final performance are mostly derived through the long term relations with customers' feedback requested from them, and through customers' complaints evaluation . There is always an ongoing procedure for improving service quality leading to filling the gap between expectations and perception on final performance based on customers' after sale feedback and complaints. This research is important for Cyprus because since the economy collapsed in 2013 the Government has been focusing on direct investments by Non-EU HNWIs in the island for recovery. These three kind of firms/organisations co-operate in providing full corporate and wealth management services to these customers. Service quality on the other hand has been proven through literature review as a tool for a competitive advantage (Kaur et al, 2012). This study has identified the level of concern of these firms and organisations in providing high level of service quality to HNWIs and furthermore identifies their performance through the five dimensions of SERVQUAL model which are reliability, responsiveness, assurance, empathy and tangibles (Parasuraman et al, 1988). In addition, this study has also sought to find out whether firms/organisations take into consideration the different ethnicities of customers in their strategy for providing service quality. The dimension of ethnicity was perceived as very important because HNWIs are coming to Cyprus from different countries. The study also puts in priority the importance of SERVQUAL dimensions for this industry in Cyprus and furthermore identifies new dimensions of service quality which are perceived as important for HNWIs. It has also outlined the strategies applied by these firms/organisations in finding out their customers' expectations and perceptions regarding service quality in order to proceed to improvements for their customers' satisfaction. A crucial research question was whether these firms/organisations treat different ethnicity HNWIs in a different way in an attempt to offer to them the maximum satisfaction. The results were a surprise. Even smaller firms do recognise this need and they understand that they show respect to their customers by having knowledge about their habits and beliefs. Furthermore, they do understand that HNWIs with different culture background have different expectations and/or perception regarding service quality and they act accordingly. As being observed by Snow et al, (1996) the culture factor arising from ethnicity is one of the factors affecting service quality expectations. This is because either they have different expectations or because they weigh differently the criteria of service quality (Donthu et al, 1998; Mattila, 1999). However, it is important to say that if service providers do not meet the expectations of customers based on their different culture background, this will lead to their dissatisfaction (Strauss & Mang, 1999). An additional research question was seeking to find out how these firms and organisations

perform in the five dimensions of SERVQUAL model which are reliability, responsiveness, assurance, empathy and tangibles. They all declared that they do perform well or they try to perform well in all dimensions as analysed by Parasuraman et al (1988). There was a limitation regarding comparing declarations with what customers believe as non-Eu HNWIs were inaccessible for this research. This research also showed that the infrastructure of this industry in Cyprus is based on Russian speaking HNWIs for whom quick timing of service is very important. For this reason despite the fact that responsiveness according to Chowdhary and Prakash (2007) is the least important dimension, in this case is found to be the second in importance following reliability. Reliability on the other hand in both observations, by Parasuraman et al, (1991) and by this research, is found to be the first in importance dimension. However, apart from the five dimensions of SERVQUAL and ethnicity new dimensions beyond pricing appeared to be important for HNWIs in Cyprus. Some of these are transparency and flexibility which match with Russians' expectations and demands for personalized, customised and tailored services.

Recommendations for Further Research

Cyprus is not the only country in Europe offering incentives to non-EU HNWIs to transfer their business or residential base. The main competitor country is Malta. A further research comparing the relative government incentives and service quality provided to non-Eu HNWIs by Malta and Cyprus would be useful to both State and firms such as Banks, accounting and legal offices involved. This recommended research would benefit Cyprus Economy as a whole, as the State and involved firms would have knowledge of what leads non-EU HNWIs to Malta instead of Cyprus. This would give the opportunity and the" know how" to the State and the Cyprus firms to attract more non-EU HNWIs.

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Regional Innovation Systems and Revolutionized Sectors: the Mobile Gaming and Digital Music

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A B S T R A C T

Mobile gaming and digital music industries' dynamics and growth show high potential of value network and induce new ways of designing and developing competitive value propositions throughout disruptive innovation processes. These innovative processes have the potential to lead to design and development of new products and services, by combining games with music contents and revolutionizing the current media entertainment sector. In view of that, mobile gaming sector and market analysis were conducted throughout competitive analysis frameworks, analysis of regional innovation systems and online surveys to support the blue ocean opportunities and corroborates its market potential. Hence, the analysis involved the study of the competitive environment and technological convergence of both industries and the impact of this new game in industry dynamics. Moreover, the key drivers and trends influencing the business environment were analysed and competitive strategies were discussed as new trends for the sector, as well as new value chain rearrangements and potential players' competition models. Finally, there were discussed vertical and horizontal integration processes, industrial clustering and agglomeration economics to lead regional innovation systems, higher knowledge investments and R&D spillovers to support blue ocean opportunities benefiting customers through new and innovative value propositions. Major sectorial changes and societal impacts for the future are also discussed.

1. INTRODUCTION

The mobile gaming and digital music industries has been increasing its innovation potential and technological convergence which has been adding value and potential growth to the market at global level. These technology industry changes show high potential of value network, while leading to new ways of designing and developing competitive value propositions throughout innovative processes and business models. Hence, there is huge potential in developing and launching innovative products and services, by combining games with music contents and revolutionizing the current media entertainment sector. On the other hand, network based innovation models supported by both technology convergence and social capital network factors are generating knowledge spillover mechanisms, while leading to

additional collaborative advantages and knowledge transference and acquisition within the new sector, in result of vertical and horizontal integration processes, industrial clustering and economies agglomeration throughout the major industries stakeholders.

These sectorial changes and societal impacts are potentially leading to global trends, while influencing the evolution of emerging countries, like China and India, which is of the most importance as these markets are expected to become market leaders in the near future.

Hence, the overarching research question is centred in what is the market potential and the environmental context for the development and implementation of a blue ocean opportunity within the mobile-gaming and music sector? Subsequently, in order to completely answer this question, other sub-questions were analysed, namely: what is the current state of mobile-casual games and digital music industries?; how did these industries evolved and in which aspects there are common links?; what is the market potential in geographical terms?; which are the major trends expected in both industries?; what are the general characteristics of mobile gamers?; who are the main players of industry?; how will the mobile games industry be affected by the music integration?; and finally, which are the critical success factors for this innovation?

2. LITERATURE REVIEW

The innovative mobile-casual games [1] (Casual Games Association (2007) "Casual Games Market Report" (casualconnect.org)) are leading to the emergence of a new sector, mostly because of the convergence of innovative technologies that induces new consumer "wants". In regarding to the ecosystem and industry outlook the evolution of mobile-casual games industry arose in the early 1990s when calculator producers, like Texas Instruments, decided to include the well-known "Snake" game in their devices. The game had such a success among consumers that Nokia decided to introduce it in its devices, opening a new window of opportunity for mobile companies and game developers. (Entertainment Software Association (2012) "The Evolution of Mobile Games" (www.theESA.com)). Still, it was only in 2002, when operators began to sell devices capable of downloading games from their own portals, that these games became a world phenomenon. (Feijoo et al., 2012).

Until 2007, game developers were limited in the design and complexity of the game due to the restricted graphic and processing capabilities of mobile devices. (Feijoo et al., 2012) However, in 2007, the possibilities changed and once again a new window of opportunity arose with the creation of the smartphone and the widespread of broadband connections. Once more, Nokia was the first mover to this new market but it was only the introduction of the iPhone that radically changed the mobile gaming

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[1] Mobile[a]-casual[b] games are: (a) games designed to be played in mobile devices, such as smartphones, PDAs, portable media players and tablets and (b) games developed for a mass audience, which are easy to learn and require no previous game expertise neither a time commitment to play. See Exhibit 3 (Appendices Section).

industry. (Feijoo et al., 2012) The combination of new possibilities in the device and the global connection to the network allowed many innovations. The main creations were the application stores and social platforms that became new channels of distribution, widening the possibilities for both consumers and publishers. Nowadays, these games are an important component of entertainment for the generation of connected consumers and downloading from different app stores or browsing from mobile devices is now the standard behaviour of a mobile gamer (Feijoo et al., 2012).

The mobile-gaming ecosystem follows the three-stage model for digital mass consumption[2], composed by (1) content creation, (2) distribution and (3) consumption and interaction. Thus, this industry is constituted by three main groups: the content creators, divided in developers and publishers, the distributors and the gamers (Feijoo et al., 2012). The developers are responsible for game concept design, optimization and maintenance whereas the publishers are responsible for the process of distribution, negotiating with the diverse group distributors. The latter is divided in three segments: application stores, portals and aggregation platforms. In addition, aggregators and middleware companies are also involved in the ecosystem. The first are intermediaries between developers, publishers and distributors whereas the middleware companies are the ones providing the resources for the process of game development, distribution and monetization Roland Berger (2012) "Casual Games are for everyone and everywhere" Think: Act Content (www.think-act.com).

Throughout the years, the mobile gaming ecosystem has evolved. The early ecosystem was very operator-focused with developers mainly working with publishers and aggregators, which in turn had relationships with mobile operators. These represented the main distribution channel but, with the appearance of apps stores and the social networks, the importance of operators decreased and new distributors emerged. Moreover, the role of developers and publishers also changed, specifically in recent years, due to the trend of vertical integration. On one hand, developers started to acquire publishing capabilities and to work directly with manufacturers and independent stores for the distribution. Simultaneously, many publishers begun to acquire development capabilities to have a higher control over the value chain and to improve their cost structure. Global digital media marketing and digital consumer experience behaviour is leading Entertainment and Media sector outlook as was recently published by PwC (Pricewaterhouse Coopers 2013 "Global Entertainment and Media Outlook 2013-2017" (http://www.pwc.com/gx/en/global-entertainment-media-outlook/index.jhtml)).

Throughout the product life cycle, market pressure, competitors and even the product change, thus, identifying the different phases of the cycle is crucial for the elaboration of effective positioning and differentiation strategies (Kotler et al., 2012).

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[2] See Exhibit 4 for Graphical Representation of the Ecosystem (Appendices Section).

In the case of mobile games, the life cycle follows a typical bell-shaped curve. Usually, the introduction phase is short and if the game has the predisposition to become a hit, it will reach the growth phase extremely fast (Partanen, 2001). The first phase is constituted by innovators and early adopters while the growth phase is already composed by the majority of mobile gamers. Afterwards, when the game reaches the maturity phase, the early adopters and a relevant part of the majority already started to shift to new games. Hence, when the game moves to the decline phase, there is only the group of "laggards" (J. Partanen, 2001). In conclusion, on average the life cycle of a mobile game is very short and it may take only one to two months until new games start to replace the old ones. Typically, even though, when a game reaches the maturity point, it is possible to prolong this phase with the release of new features[3] (J. Partanen 2001).

Moreover, it is probable that the integration of music contents to mobile casual games may has an impact to prolong maturity phase. Thus, the access to an unlimited catalogue will be a significant motivation for consumers to keep playing, even if the features related to the game play do not change immediately. Subsequently, the prediction is that music integration not only fosters consumers' engagement and loyalty to games but also increases the time span for development.

Moreover, regarding the industry, researchers and business consultants defend that it is still at the growth phase. On the one hand, despite the popularity of the casual games, game companies continue to struggle to generate profits. At the same time, the industry is extremely crowded and distributors are more demanding regarding their share. Hence, the industry has not matured yet. [Exhibit 5], (Roland Berger 2012 "Casual Games are for everyone and everywhere" Think: Act Content (www.think-act.com)).

The literature suggests that mobile gaming and music streaming will be influenced by open innovation models and network value autocorrelation. In first, technology convergence results in the creation of new knowledge that through filtering processes (Acs et al., 2003) is converted into economic knowledge or commercialized knowledge (Arrow, 1962), ultimately leading to new ways of increasing value to both industries and collaborative network based advantages focused on differentiation. Open innovation models and network value autocorrelation draw into "soft factors", embedded in social capital available through regions and spatial agglomeration (Tappeiner et al., 2008), generating economic impact on the innovation of a sector or a region. Hence, the Hypothesis is "the regional Innovation Systems and Mobile Gaming and Digital Music technological convergence, along with the possibility of innovative design value propositions being offered to customers is likely to seen as pioneering, and may lead to full

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[3] See the Graphical Representation of Mobile Game Life-cycle in Exhibit 5 (Appendices Section).

exploitation blue ocean opportunity." The empirical evidence supporting the Knowledge Spillover Theory of Entrepreneurship shows that there are potentially higher economic growth rates, higher level of investment and innovation across different industries, as result of bridging different explicit and implicit knowledge contexts throughout a variety of players (Audretsch and Lehmann, 2005), while increasing activities integration and coordination, as well as communication and decision-making, ultimately leading to network-based collaborative advantages.

3. METHODOLOGY

Methodology is based on a set of methods and analytical tools. Besides Literature Review, in first, it focus on Secondary Research, analyzing information and secondary data over the (i) contextual and environment, as well as (ii) the market size, (ii) market value, (iii) potential growth rates and (iv) market trends for both mobile-casual games and digital music industries. These were fundamental to answer to the following research questions: a) what is the current state of mobile-casual games and digital music industries?; b) how did these industries evolved and in which aspects there are common links?; c) what is the market potential in geographical terms?; and d) which are the major trends expected in both industries? Benchmark studies, e.g., (Roland Berger (2012) "Casual Games are for everyone and everywhere" Think: Act Content (www.think-act.com); CGA and Newzoo (2013) "Smartphones & Tablets Gaming 2013" (casualconnect.org)) and Pricewaterhouse Coopers (2014) "New star emerging in global media market" China daily Hong Kong edition, 4 June, pp 1)) were considered.

In Second, to discuss and answer to questions like what are the general characteristics of mobile gamers?; who are the main players of industry and how did they compete? Analytical tools were applied to focus on (v) gamers needs and wants and on (vi) the competitive aspects of the industry, covering its current state and also key drivers.

Thirdly, methods to analyze (vii) regional innovation systems and (viii) value chain network were discussed in order to support the view on how mobile games industry will be affected by music integration and to provide explanation on regional innovation black-box, vertical and horizontal integrations and new changes for the structure of industry and its value chain, focusing on new ways of generating profit margin, value and innovation.

Last, but not least, Primary Research was also conducted through Qualitative Research, which includes in-depth interviews to Celestino Alves, the CEO of NMusic;[4] and numerically-oriented Quantitative research, which includes online survey research.

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[4] Nmusic was founded in 2010, by Celestino Alves, as part of Diligence Capital SGPS Group, which is the most important shareholder. Its purpose was to develop an innovative solution for digital content distribution that could please consumers, music entities and partners. MusicaOnline, the former startup project, was sold to PT Telecom to be integrated in the Sapo brand, starting

In overall, the methodology followed the interpretive perspective which it advocates the use of multiple methods and tools for conducting research. The significance of the interpretive research model lies by adopting the principles of interpretive thought and methodological pluralism, still examining potential limitations and assumptions that might be relevant for future research.

4. ANALYSIS OF RESULTS

a. Market Potential

The total video game market will grow at a CAGR of 6.7% to 86.1$ billion in 2016 and by that year, the number of gamers is expected to increase to 1.55 billion. From the total market, mobile gaming is expected to detain the first position in terms of growth, being the fastest-growing segment over the next five years, with a CAGR of 27.3% (Pricewaterhouse Coopers (2013) "Global Entertainment and Media Outlook 2013-2017" (http://www.pwc.com/gx/en/global-entertainment-media-outlook/index.jhtml)). This growth, and consequently the increased demand for mobile games, will be mainly driven by smartphones and tablets as they will become the device of choice for gamers. In quantitative terms, mobile gaming is expected to grow at an average annual rate of 19% for smartphones and 48% for tablets. In addition, the MMO's segment is also expected to grow over the next years but all the others tend to stagnate or present a negative growth (Newzoo (2013) "Mobile Games Trend Report" and "The Global Games Market: Key Facts & Insights" (http://www.newzoo.com/category/trend-reports/). Nonetheless, regarding income share, the segments' ranking is slightly different given that consoles keep the first position, with a 43% income share. Then, MMO's and mobile, with 21% and 18%, keep the second and third position. Lastly, casual/social and PC boxed download segments represent each 9% of the market (Newzoo (2013) "Mobile Games Trend Report" and "The Global Games Market: Key Facts & Insights" (http://www.newzoo.com/category/trend-reports/).

On the subject of monetization, the current statistic is that 38% of global mobile gamers are "payers" and spend a monthly average of 2.78$ on or in mobile games. By 2016, these numbers are expected to increase as analysts predict that half of the total global gamers will become "payers" and that the average monthly spend will increase for 3.07$ (Newzoo (2013) "Mobile Games Trend Report" and "The Global Games Market: Key Facts & Insights" (http://www.newzoo.com/category/trend-reports/)).

The market segmentation presented above has been the general standard for researchers but Newzoo developed a new model - the Screen Segmentation - dividing the market in types of screen used to play rather than genre and defined four segments: TV, computer, floating and personal . Thus, according to Newzoo, the computer segment is the leader with 39% of global game revenues, followed by TV with

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the partnership between Nmusic and PT, the Portuguese leading telecom company. Thus, in 2010, with PT as a partner, musicbox was launched, which is a streaming multi-platform system that allows users to listen to millions of songs on the computer, mobile phone, tablet and television, without advertising and free of charge. In 2011, Pathena SGPS became one of Nmusic's investors, currently one of its greatest partners. Also, in 2012 the company was invited to join the Startup Lisboa project, a Portuguese Business Incubator, and started its expansion process lead by Celestino Alves and his team [Exhibit 1] (Appendices Section).

36%, floating with 13% and personal with 12%. Nonetheless, Newzoo predicts that the growth of global revenues in the next years will affect positively the differences between the segments, tending to an equal division amongst them (Newzoo (2013) "Mobile Games Trend Report" and "The Global Games Market: Key Facts & Insights" (http://www.newzoo.com/category/trend-reports/). Globally, there are demographics unbalances between West and East countries, which of course reflects in the human resources' availability and valuation and in economic growth. Hence, the 21 countries of Asia-Pacific Economic Cooperation (APEC)[5] seeks to promote free trade and economic cooperation throughout the Asia-Pacific region dominate economic activity and establish new markets for innovative products and raw materials beyond Europe, where demand had been declining in the last years. APEC countries account for approximately 40% of the world's population, approximately 54% of the world's GDP and about 44% of world trade.[6]

In particular, China has been closing the innovation gap to Europe continuously in the last few years and it should be keeping the same trend in the future. This fact is supported mainly by three different factors. In first, due to a source of competitive advantage based on cost leadership, grounded by the economies of scale and economies of scope, by cost efficient business processes and sector value chain activities integration. Secondly, the regional innovation system China is developing is based on resources access spatial location and network synergies that potentiate value, following the design, the management and the implementation of "cross-boundary cooperative development plans", namely "cooperation plans for the adjoining areas" and the "cooperation plans for the non-adjoining areas".[7]

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[5] APEC is the forum for 21 Pacific Rim countries (formally Member Economies) that seeks to promote free trade and economic cooperation throughout the Asia-Pacific region. It was established in 1989 in response to the growing interdependence of Asia-Pacific economies and the advent of regional trade blocs in other parts of the world. APEC works to raise living standards and education levels through sustainable economic growth and to foster a sense of community and an appreciation of shared interests among Asia-Pacific countries. APEC includes newly industrialized economies, although the agenda of free trade was a sensitive issue for the developing NIEs at the time APEC founded, and aims to enable "ASEAN economies" to explore new export market opportunities for natural resources such as natural gas, as well as to seek regional economic integration (industrial integration) by means of foreign direct investment. Available from: (http://www.apec.org/) [Accessed 20 April 2013]. See Table 1 (Appendices Section).

[6] Available from: (http://www.apec.org), referring to APEC Secretariat website. [Accessed 20 April 2013]. Available from: (http://publications.apec.org/file-download.php?id=1284&filename=2012_psu_econ-trend-05-12r.pdf) referring to APEC Economic Trends Analysis in 2012. [Accessed 20 April 2013].

[7] The main purpose of the "cross-boundary cooperative development plans" detailed is to support the "master spatial coordination plans", "transportation cooperative development plans" and "ecological/environmental protection plans" in the land use and development aspects (*Planning Study on the Coordinated Development of the Great Pearl River Delta Townships Honk Kong Government Plan, 2011 -2015* (p.117)). In this study, "cross-boundary areas" cover the "adjoining areas" which are located along the boundaries among Guangdong, Hong Kong and Macao as well as the "non-adjoining areas" which do not adjoin the boundaries but have the potential for cooperative development or management by Guangdong, Hong Kong and Macao. Hong Kong's economic integration with the Pearl River Delta (PRD) has been highly beneficial for all parties. It is expected to further expand economic ties and help improve cooperation among Hong Kong, Macao and mainland China. In According to this plan, Guangdong, one of the country's economic "powerhouses", is in alignment in terms of policy making and strategic guidelines and implementation for the expansion of ties with Hong Kong, which is playing an increasingly important role in Guangdong's economic infrastructures area, representing about 75 percent of Guangdong's overseas investment, and Hong Kong is the province's biggest trading partner. The Hong Kong

Besides the general positive side effects as result of Regional Innovation Systems in the regions' capacity of learning, the specifics of mobile gaming and digital music Geographical Assessment 8 shows Asia Pacific, with 48% of global revenue and a CAGR of 11.5 %, has the highest score. Thirdly, in Asia, China is emerging as the new star in the global digital media market, as it will overtake Japan to become the world's second-largest entertainment and media market by the end of 2018, next only to the United States, according to Global Entertainment and Media Outlook 2014-18 (Pricewaterhouse Coopers (2014) "New star emerging in global media market" China daily Hong Kong edition, June, 4th of 2014, pp.1). In addition, overall spending in the E&M segments in China is forecast to grow at 10,9% CAGR through 2018, including an 11,8% CAGR in overall advertising spending, vis-à-vis the global E&M industry to grow by an overall 5% CAGR in the same period. This trend is very favourable to China for the next coming years (Pricewaterhouse Coopers (2014) "New star emerging in global media market" China daily Hong Kong edition, June, 4th of 2014, pp.1) in general, and in regards to Gaming, 7,0% CAGR for China compared to 6,2% globally and Music, 8,6% for China compared to 1,2% globally.

North America and Europe are basically at the same level. North America is the second biggest region in terms of revenues and the first in terms of monetization potential, with a 44% share of payers. Finally, Western Europe also presents a CAGR of 11,5 % and has the highest average spend.

In conclusion, Asia Pacific, North America and Europe, mainly Western Europe, are the regions with highest potential and market attractiveness for mobile gaming (CGA and Newzoo (2013) "Smartphones & Tablets Gaming 2013" (casualconnect.org)).

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section of the massive bridge linking Hong Kong, Zhuhai and Macao (the world's longest cross-sea bridge) includes three major projects, which are the Hong Kong boundary crossing facilities, the Hong Kong Link Road as well as the detailed design of Tuen Mun-Chek Lap Kok Link and Tuen Mun Western Bypass. In total, the three projects are expected to cost 48.5 billion HK dollars ($ USD 6.2 billion). According to this plan a 150-hectare artificial island would be built in the waters northeast of Hong Kong International Airport to house the boundary crossing facilities. The bridge is to be operational in 2016 which will be strategically important and would further facilitate the economic integration and development of Hong Kong, Macao and the mainland, reducing significantly reduce transportation time by 60 percent to 80 percent for travelers and goods, as well as reduce the costs, according to official statistics. The PRD Regional Innovation System will permit that important cities will fall within a three-hour radius of Hong Kong and will attract Hong Kong and International investors to access innovative business opportunities in the western Pearl River Delta, which is rich in human and land resources. Universities are also being engaged to participate in the project, namely the University of Hong Kong. In the long run, the bridge is set to create a new era in transportation link between Hong Kong and the mainland, inject new impetus to Hong Kong's long-term economic development, and generate new opportunities for Hong Kong's main industries such as tourism, finance, communication, trade, commerce, logistics and airspace industry. This regional Chinese example is aligned with Horizon 2020 view, as it fosters macro-economic competitiveness, by investing in regional environments where knowledge-communities and innovation can increase and disseminate, although focusing on differentiation through innovation, and on cost leadership at a regional scope.

8 See Exhibit 6 for graphical representation of regional differences (Appendices Section).

4.2. **Market Outlook**

The market trends within the next few years, the mobile games business environment will be affected by four major trends and key drivers.[9] First of all, the increased importance of the emerging markets. The mobile gaming market has evolved for a global market place, becoming a "global playground" for game companies and gamers. This progression has been accompanied by the evolution of the emerging countries, like China and India. In the near future, given these markets are expected to become market leaders in this industry, thus, should be considered in the expansion plans of game companies (Newzoo (2013) "Mobile Games Trend Report" and "The Global Games Market: Key Facts & Insights" (http://www.newzoo.com/category/trend-reports/)).

Secondly, the market has been witnessing the evolution of gaming analytics and their increased importance in game development and publishing. As a result of the increasing competition and the consequent high pressure for gamer retention, developers and publishers realized the potential of gaming analytics to better predict and test their ideas. The existence of more and improved analytics transformed the way game companies operate as they are becoming more professional and analytical in their business decisions (Newzoo (2013) "Mobile Games Trend Report" and "The Global Games Market: Key Facts & Insights" (http://www.newzoo.com/category/trend-reports/)).

Thirdly, gamers have now access to more screens to play and to a diverse offer of mobile games. Consequently, consumers are increasingly more demanding regarding multi-screens mobility and innovation. Mobile gamers expect devices' interactivity and define it as a crucial decision factor. Moreover, in its majority, gamers are not willing to commit in financial terms with a game, especially if they are not able to try it first. Thus, they demand for innovation not only in game design and respective features but also in the monetization system. This increases the risk for game companies given that it is harder to convince consumers to spend money in games and it implies it will be difficult to ensure game monetization and sustainability in the near future (Newzoo (2013) "Mobile Games Trend Report" and "The Global Games Market: Key Facts & Insights" (http://www.newzoo.com/category/trend-reports/)). The fourth trend is closely related to monetization. In order to sustain the "in-game spending model", companies have to keep their gamers engaged as long as possible and this engagement is only possible through the continuous introduction of new game content. Consequently, analysts predict that mobile games will evolve from a product to a service, fostered by technology and creative content (Newzoo (2013) "Mobile Games Trend Report" and "The Global Games Market: Key Facts & Insights" (http://www.newzoo.com/category/trend-reports/)). This means that innovation will be centered not only in products and services, but also in processes and business models.

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[9] See Exhibit 12 (Appendices Section).

4.3. **Consumer Profile**

The consumer characterization shows that interest in mobile-casual games has been increasing for several years due to its fit into consumers' fast-moving lifestyles as they offer a time-efficient source of leisure. Though, the most recent phenomenon is the evidence that mobile gamers no longer fit the traditional profile of recurring to these games only as "time fillers". On the contrary, although many of them have game consoles, most gamers are now playing mobile games at home and several times a day (Comviva (2009) "Realizing Potential of Mobile Gaming" White Paper).[10] Accordingly, mobile gamers are now divided in three key segments:[11] core, mid-core and casual. The "core gamers" are the consumers for which gaming is an important activity of their life, they usually spend a large amount of their time playing and enjoy competing as well as interacting with other players. The "mid-core gamers" are the consumers that play regularly but not spend much time neither money on games. Finally, "casual gamers" are the ones with limited time and interest are not willing to commit financially with the games (CGA and Newzoo (2013) "Smartphones & Tablets Gaming 2013" (casualconnect.org)).These types of games appeal to people of all genders, ages, income ranges and nationalities. In North America, Europe and Asia,[12] male players are the majority but the split between women and men is very close due to the significant increase of female gamers, noticed in recent years. Still, this close split does not sustain in the case of "payers", as men are more willing to pay for the gaming experience.[13] In addition, in these regions, smartphones have the biggest share of players and the 20-35 age range is the most significant group with shares of around 40%. Yet, in terms of growth, in the US and Europe, the group above 50 years old is the fastest segment (CGA and Newzoo (2013) "Smartphones & Tablets Gaming 2013" (casualconnect.org)).[14] Finally, studies about the motivations for playing mobile games. The Casual Games Association revealed that for casual gamers the main reasons for playing are for fun, relaxation and escapism while for the core gamers, the top reasons are exploitation, adrenaline rush and stimulation (Casual Games Association (2007) "Casual Games Market Report" (casualconnect.org)). In addition, in a study conducted by Sorrent,[15] the ability to multi-task while playing has also been considered an important motivation. Most users stated that they enjoy playing while they are listening to music,

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[10] PopCap revealed that the frequency of mobile game play has been increasing each year. In 2011, 84% of gamers were playing at least once a week, compared to only 40% in 2009. In addition, daily play has more than doubled from 13% in 2009 to 35% in 2011. [PopCap Games 2011].

[11] Segmentation adopted by Newzoo and the Casual Games Association.

[12] See Graphical representation of Players Metrics in Exhibit 7 (Appendices Section).

[13] Ex: 61% of all US payers are men. Additionally, in emerging markets like Poland and Turkey, 70% of payers are male.

[14] The YoY growth rates (mid 2012 vs mid 2013) were: +148% in the US and +66% in Western Europe.

[15] Game Publisher.

watching TV or even sending texts (Comviva (2009) "Realizing Potential of Mobile Gaming" White Paper).

As for the competitive industry assessment, the key vendors in the market are Rovio,[16] Electronic Arts Inc., Gameloft, Supercell, Zynga Inc., Disney, Activision Blizzard, Cellufun, PopCap Games, amongst others.[17] In the light of regional innovation systems dynamics and vertical and horizontal integration within players of both industries, companies will tend to reinforce their brand awareness throughout wider customer base and larger business diversification, namely in the media and entertainment sector, including in music, games and movies creation and management, throughout a revolution that will lead to the emergence of a innovative and highly competitive sector.

4.4. **Industry Analysis and Value Chain Network**

The music industry is composed by two segments - live and recorded – which can be divided in physical and digital music. Considering technological convergence and consumers "wants" the segment of recorded digital music is considered to be of the most relevant as it has many similarities with mobile-casual games. Firstly, the life cycle of a song usually follows a bell-shaped curve and is extremely short given that it only takes a few months to pass through all the phases.[18] Secondly, the evolution of this sector was also driven by the emergence of new technologies and most of the events that affected the course of mobile gaming also had a relevant impact in digital music, like the creation of the iPhone in 2007[19] (Leurdijk et al, 2012). Thirdly, the digital music ecosystem also follows the conventional three-stage model for digital mass consumption. The first stage, corresponding to content creation, is divided between two groups. On one hand, there are the artists, producers and the copyright owners. On the other hand, there are the digital aggregators, the publishers and the record companies, all of which are responsible for the publishing activities. Then, in the second stage, there are distributors, namely the mobile and online music services, online download and retailers, music in the cloud, online radio, social music sites and the multi-channel networks. Finally, in the third stage there are the consumers, reached directly or through other companies with a B2B2C model [20] (Siemer 2013). Nowadays, the industry is characterized by the dominance of a small number of very large music firms and a large number of medium and small companies, known as independent or indie labels. Moreover, in what concerns copyright ownership, there are across the world several music licensing companies and intellectual

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[16] See Exhibit 3 in Appendices Section.

[17] Given the wide variety of rivals, the comparison amongst companies can be based on: (i) awareness, in terms of games popularity and (ii) business diversification, specifically links to the music industry.

[18] A given music may reach the top charts very quickly but may also reach the decline phase in an instant, especially with the continuous release of new music every day.

[19] Overview of the evolution of digital music industry is presented in Exhibit 8 (Appendices Section).

[20] See Graphical Representation in Exhibit 9 (Appendices Section).

property management entities[21] (Leurdijk et al, 2012). The Value Chain analysis for music and mobile gaming industries shows relevant synergies and activities in common, especially the support activities. If one conceptualizes the primary activities for an organization competing in this market, then should focus on R&D, Content Management and Game Development and Design, Negotiation and Contract Management, Marketing, Sales and Customer Service (for music and mobile platforms). The secondary activities would be Human Resources Management, Financial Management and Technological Infrastructure, since these are the activities that, although are not directly linked to the finished product and/or service, are necessary to achieve it. Moreover, the value chain network includes aggregating factors resulting from attracting multiple customers, intermediates and suppliers to specific regional scope, which generates efficiency, efficacy and regional learning gains. The value chain network' structure in regarding to regional innovation systems is reinforced on the assumption that not all but specific company-internal value chain information can be shared with customers, intermediates and suppliers, generating activity collaboration and synergies focused on value and volume as key drivers [Exhibit 13 – Value Chain] (Porter, 1985). The digital music value chain network will generate additional sources of competitive advantages, which will impact in new ways of content creation and profit margins generation, for instance, in regarding to integration of gaming and music providers; the potential close collaboration between developers and publishers and also technology integrators; additional synergies between providers and distributors; co-creation and design processes throughout customers' participation in new product and service development, among others. These alliances and rearrangements in the value chain networks will affect the industry structure and its forces in the near future, as well as supply and demand.

4.5. Market Analysis

The data collected by IFPI[22] showed that the digital music industry will continue its rapid development with the global expansion of digital music services.[23] [IFPI 2013] Analysts predict that by 2017, digital music revenues will exceed physical music sales. Moreover, in 2012 the number of global digital music users was 1.2bn but by 2016 it is expect to reach the 1.8bn, with a CAGR of 10.4%. [Siemer 2013] Simultaneously, the income from the different distributors[24] are all showing a continuous growth, with subscription services taking the lead. [IFPI 2013] Concerning a more geographical analysis, similarly to mobile gaming, North America, Europe and Asia are the most important and attractive regions as each holds approximately a third of global music sales (Leurdijk et al., 2012). Europe is expected to be the future leader in revenues, mainly due to the contributions of the UK, France and Germany. Still, the

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[21] Many artists and performers do not have the means to pursue the legal enforcement of their rights thus they join specific organizations that help in the management of legal issues.
[22] International Federation of the Phonographic Industry – represents the interests of the recording industry worldwide.
[23] In 2011, the major international services were present in 23 counties but nowadays are in more than 100 countries.

[24] Such as downloads, music video streaming, subscription services, digital radio or music in the cloud.

fastest growth will come from unexpected regions, namely the BRIC [25] countries and Sweden (Pricewaterhouse Coopers (2013) "Global Entertainment and Media Outlook 2013-2017" (http://www.pwc.com/gx/en/global-entertainment-media-outlook/index.jhtml)). In conclusion, it is important to refer the significant role of digital music in the development of the digital economy. According to the IFPI, music has been one of the main drivers of technology and innovation. It has been creating economic value in other types of business, helping to sell end equipments and technological devices, driving online search and social networking and even contributing for the increasing demand for fast broadband connections (IFPI (2013) "Digital Music Report 2013" (www.ifpi.org)). As it refers to market trends, in first, multi-screens mobility and interactivity will become more and more a crucial decision factor. Consumers embraced a "whenever, wherever and on whatever" premise for music consumption, thus it is expected an increasing mobile adoption for accessing music. This is already evident in many countries as mobile music apps are considered the second-fastest growing app. [26] Secondly, innovation will be increasingly important in two main areas: music players' commoditization and business models development. Similarly to mobile games, the real problem in the digital music business is to guarantee the sustainability of business models. Consumers have access to the most innovative players and features in the market but the difficulty in translating use into money still exist for music providers. [27] Thirdly, given the increase of music services offers and the availability of several platforms to access music, the tendency for the next few years is the implementation of a more rigid monitoring in order to guarantee license authentication and maximize the monetization of rights (IFPI (2013) "Digital Music Report 2013" (www.ifpi.org)). Fourthly, current analysis predicts the intensification of artists' power due to an increased proximity between them and consumers. It is projected that artists will start selling the music on their own. This decision has been mainly fostered by the increasing role of social media that gave artists a direct channel to consumers and allowed them to intensively promote their music with nearly no cost associated. [28] Summing up, the future of digital music will be determined by three factors: innovation, mobility and the improvement of consumers' experience.

As for the online survey analysis of the results, [29] showed there is an alignment between the information provided cross validation insights and perceptions by considering participants' feedback, the market trends and consumers' profile analyzed previously. Moreover, the survey results and complementary contextual and competitive analysis are interpreted as a change from red ocean to the potential of a blue ocean business opportunity within the sector transformation and a new paradigm for four main reasons:

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[25] Brazil, Russia, India and China.

[26] In 2012, mobile music revenues were $18 billion and are predicted to reach $25 billion in 2014. See http://blog.mobileroadie.com/2013/02/state-mobile-music-industry-infographic/).

[27] See http://www.musicthinktank.com/blog/4-emerging-trends-in-social-media-how-theyll-impact-the-musi.html.

[28] See http://www.lexisagency.com/news_and_views/digital-music-trends-discussed-at-smwldn.php.

[29] The main results of the survey are presented in Exhibit 10 (Appendices Section).

(i) the fact that many consumers valued the combination of games with music, (ii) the fact that curiosity and brand loyalty were selected as important motivation for trying new versions (iii) the small value attributed by participants to mobile games soundtrack and (iv) the potential (and predicted) change in terms of revenue process through all the industry intermediates, namely the Content Labels and Publishing companies. All in all, these factors are key indicators that the role of music in mobile games is still at an initial phase and there is room for improvement and innovation, corroborating the window of a blue opportunity predicted.

5. DISCUSSION

By considering de Porter Five Forces Analysis (i) it is notorious that "Supplier Power" is high in relation to the structure of the industry. The middleware companies, OEMs and distributors have a core role in this industry because they impose restrictions on developers and influence consumers' perception and behavior. Moreover, the integration of music will reinforce the supplier power as the music providers will have a decisive role in content creation. Even though, it is important to refer that in the long-term there is the possibility for the minimization of this power due to the recurring trend for vertical integration of developers and publishers.[30] Additionally, this new business opportunity will motivate the formation of new alliances and collaborative arrangement between industry players and may even lead to the emergence of a new player type – the integrators – that fostered by technology convergence will merge the know-how of digital music and mobile gaming industries to develop integrated solutions. These alliances and the appearance of integrators may also contribute for the long-term minimization of the supplier power. Nevertheless, in the near future, music providers and distributors will continue to have a significant influence on developers and publishers.[31] Secondly, "Buyer Power" can be classified as moderate-high, as consumers have a high bargaining power as they are price sensitive, have almost no switching costs and are increasingly demanding in terms of game quality and efficiency. However, as previously mentioned, the music contents will be a mechanism of engagement and customer retention. Moreover, the high differentiation of new game types will lower the sensitivity to other factors, like price in favour to experience. Thus, with the music integration, the buyer power will have the tendency to decrease over time. Thirdly, "Internal Rivalry" can be defined as moderate. There are several players in the current mobile gaming market and innovative new games will not only compete with mobile games but also with music streaming services, eliminating direct competition to current offer due to lack of differentiation.[32] Moreover, most game companies, especially new entrants, are focusing on their

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[30] The integration will enhance the power of developers and publishers and allows costs reduction, through the resultant economies of scale. However, may lead to resources dispersion, especially in the short term, which may negatively affect games' design and quality processes.

[31] Example: Even with the creation of its own portal, Zynga was not able to break completely its dependency on Facebook since that the majority of players prefer to play Zynga's game in Facebook and not in its portal.

[32] As the game differentiation increases, categorization and comparisons with rivals become more difficult.

priorities to generate profits, which limit their ability to replicate first movers, as well as on return on investment, instead of incurring in additional costs. Finally, the competitive environment in the new sector will be very different from the current one. Hence, the competition rules and boundaries will be distorted and undefined which may affect the performance of rivals and their current competitive advantages. Fourthly, the "Threat of Entry" is increasingly low as the barriers of entry increase over time. When compared with other game genres, the capital requirement of a mobile-casual game is considered low. However, the transaction and customization costs of these games are increasing due to the diverse technical requirements that have to be fulfilled to ensure mobility across all types of devices and platforms. Furthermore, the integration of music will increase significantly the costs of development given that legal music rights tend to be extremely high and volatile.[33] Finally, the "Threat of Substitutes" is moderate-high. Mobile-casual games have numerous substitutes as they are only one of the diverse entertainment activities consumers have access. Moreover, although the "time filler" image has been changing, it is still a direct association of mobile games, restricting consumers' willingness to commit their time and money. Nevertheless, the differentiated features and improved value proposition[34] of the new games as well as the fact that music will no longer be a substitute, contribute for the minimization of this threat. To conclude, it is been predicted by current research that the music integration will radically change the dynamics of mobile games industry. On one hand, it will positively affect the majority of the forces, such as the buyer power and the threat of entry but, on the other hand, it will also aggravate one of the most significant forces – supplier power. In addition, as a result of the combination of games and music, the industry will be increasingly crowded as the number of industry players will increase.[35] Considering the research studies on both industries there were identified and discussed eight critical success factors influencing the sector (ii): a) early technology convergence focus on games, music and media content, devices and platforms; b) design and innovation in game-play and music features; c) customer know how and monetization systems of value propositions in alignment with products (and services) life cycle; d) access to distribution channels and platforms to increase efficiency and efficacy in distributing media contents and increasing mobility and interactivity; e) concept, design and customer focus; and f) customer analytics and customer service, including revenue process. Competitive strategy (iii) is typically focusing on three-stage market launch[36] targeting cultural and regional common features, where customization requirement is not needed, but do not pose the possibility of global launch.[37]

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[33] The costs of the music contents depends on the negotiations with music providers and copyright entities and can change over time depending on how the negotiation is conducted and the offers made.

[34] Having a product that combines music and games is much more valuable than two separate products, especially because in some devices it is not possible to play a game and use a streaming service at the same time.

[35] See Industry Mapping presented in Exhibit 11 (Appendices Section).

[36] By making the launch in stages, the companies will have the chance to spread their costs over time and to make phased, thus smaller, investments.

[37] Music and games integration depends on substantial geographical and cultural differences in terms of music consumption habits and tastes and the only way to ensure gamers' satisfaction is to provide a customized offer.

It was concluded that Asia Pacific region is the most attractive region for mobile gaming, specifically if one considers mobile gaming potential as the relevant factor for product launching decisions. On the other hand, because of high level of cultural and social habits diversity there are culture aspects and market adoption's factors to be considered, so it reasonable targeting Europe and North America is based on four other factors. Firstly, Europe and North America have the highest monetization potential, hence, have the highest probability for profit generation, which is essential for the sustainability of these types of new games.[38] Secondly, in Europe and North America, despite some small local differences, the music tastes are very similar. On the contrary, in Asia there is a need for a greater customization given that within the region the music tastes are very disperse. Moreover, it is harder to ensure customized products and services offerings because of the wider variety of tastes and the music rights system is more complex and fragmented.[39] Thirdly, the gaming distribution channels to be used in Europe and North America are few and practically the same, whereas in Asia it will be necessary to have a larger group of distributors to reach the majority of mobile gamers.[40] Finally, in Europe and North America there is a favourable technological and copyright environment once there has been a consistent effort from national and private entities to, not only implement more restrictive protection rules, but also to create a harmonized system. At the same time, both regions are considered research leaders, having several entities very interested in investing and supporting R&D, especially for mobile applications. Gaming Analytics (iv) is key for the development of innovative games and even after their launch process, as continuous investment is required in game analytics in order to ensure key insights for game development and for the implementation of effective social marketing strategies as they give relevant information about consumers' habits, needs and patterns of consumption. Mobility and Interactivity (v) both in digital music and mobile gaming industries are increasingly important for consumers. The existence of more screens is not only beneficial for consumers but also for the game companies given that there is an expansion of the access to consumers which may lead to an increase of the customer base. Additionally, it boosts the time spent on gaming, since that it is possible to start a game in a given screen and then continue it in another, and this fosters customer retention, brand loyalty and may ultimately lead to an increase in revenues. Therefore, when making decisions regarding the distribution channels, the vast number of devices and platforms available in the market, specifically the new technologies, have to be considered. Investment in R&D and Game Optimization Experience (vi) are reflecting consumers behaviour, being extremely demanding regarding the quality, efficiency and innovation. Hence, it is a source of competitive advantage to invest more in R&D to ensure the

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[38] European gamers have the highest average spend in mobile games and North America has the biggest share of payers and are more willing to pay for this type of products and services, which lead to higher probability of profit generation.

[39] Contrary to Europe and North America, in Asia there are several small independent music owners, being harder and usually more expensive to negotiate the music rights.

[40] As long as the new game is available in devices with iOS or Android, it will reach the majority of Europeans and North Americans. However, in Asia, these will not be enough once Asian gamers have a dispersed preference of operating systems so Rovio will have to have contracts with more distributors, increasing costs and development complexity.

continuous innovation required by consumers. Moreover, there should also be a higher investment and focus on game optimization and maintenance, especially taking in consideration that more design and innovation will pulse more technical requirements and consequently a higher risk of technical problems. Market Research (vii) is corroborating the identification of the blue ocean opportunity, although market analysis that was developed within this research has three major limitations. Firstly, there is a restricted access to market reports and industry statistics due to the fact that many researchers constrain the public audience's access to their studies, especially in what comes to digital music and mobile gaming. Secondly, there is a lack of highly specialized literature on the relationship between mobile gaming and digital music. Finally, the online survey was a complementary and positive approach to generalize the findings to the broader mobile gamers' community and validates the market potential. Regional Innovation Systems (RIS) (viii) play an important role for three main reasons. The first one is that the usage of new technologies, like software, digital content and e-commerce has reduced the importance of scale economies in many sectors (Piore and Sabel, 1984; Carlsson, 1989; Norman, 2002; Audretsch et al., 2012). The role of new firms in technological development is enhanced by economies of scale reduction and by the increasing degree of uncertainty in world economy (Mata and Machado, 1996; Audretsch et al., 2000; Audretsch and Thurik, 2001) startups rely on their regional contexts to access knowledge sources and to develop innovative and marketable products (Audretsch and Lehmann, 2005; Audretsch et al., 2005; Audretsch et al., 2008). The second motive consists in the increasing pace of innovation[41] and the shortening of product and technology life-cycles (Klepper, 1996; Agarwal, 1998; Agarwal and Gort, 2002; Adner and Levinthal, 2001; Klepper and Sleeper, 2005; Fritsch, 2008; Dinlersoz and MacDonald, 2009; Auerswald, 2010) that seem to favour new entrants and knowledge-based startups, that have greater flexibility to cope with time-to-market shortness and with radical change rather than large corporations (Zenger, 1994; Baumol, 2004). Thirdly, because of the impact of geographical labor mobility, transport costs and communication costs as the knowledge spillovers that drive economic growth are likely to be regionalized, ensuring sufficient resources are available for both knowledge creation and knowledge commercialization (Acs and Sanders, 2008).[42] This implies contextual dynamic conditions in promoting innovation and value to the ecosystem, while in the one hand accessing and sharing capabilities and resources among different key stakeholders which operate

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[41] Adner and Levinthal (2001) developed a demand-based explanation for the technological change. Demand heterogeneity is considered to be the key driver of the technology life cycle instead "endogenous innovation". In this sense, firms innovate to fulfill consumer needs that are continuously evolving and to achieve a bigger market-share, through targeting or keeping broader market segments. Later in life cycle, progressive decreasing of the marginal utility coming from performance improvements (i.e. product upgrades) empowers "customer satisfaction" with technological features, making companies develop new technologies with improved performance at constant prices in order to address "market needs". This explanation looks coherent with the "supply-side" Moore's Law which says that the processing capacity doubles in each 18 months, with the same costs.

[42] Acs and Sanders (2007) developed evidences and assumptions at aggregate level for innovation,entrepreneurship and the search for knowledge spillovers, which support the claim that knowledge spillovers are important for regional economic growth. The underlying assumptions require further empirical research to test and validate modellation predictions.

along the sector's value chain and regions; and on the other hand, attracting customers worldwide, globalizing the value proposition and promoting economic growth.

6. CONCLUSION

In conclusion, there is a contextual opportunity for the development of a technological convergence innovation and business opportunity supported by the diverse resemblances between the industries and their high potential of growth via value network. The design and innovation of introduction of this new game will dramatically change the current state of mobile gaming and digital music, as it will lead to the emergence of a new sector, with unidentified characteristics, mainly driven by technology convergence. At this moment in time the analysis of Regional Innovation Systems and Mobile Gaming and Digital Music technological convergence, along with the possibility of innovative design value propositions being offered to customers is seen as pioneering, and may lead to full exploitation but also protect this first mover opportunity. Once the industry players realize the potential of the convergence and integration of the two digital components, there will be a rapid movement into this new sector accompanied by the formation of several alliances. Accordingly, the rivalry intensity in the new sector will increase and the business environment will be altered, along with new sources of competitive advantages creation.

Overall, the success of alliances will rely on: the proper alignment of their resources, the ability to understand and rapidly adapt to future changes in the industry and the capacity to keep up with consumers' demands and sustain a continuous innovation of the product offer. New regional innovation systems within revolutionizing sectors will lead to innovative business models and value networks capable of generating additional sources of competitive advantages, learning opportunities for improvement, sector competitiveness and consumer benefits maximization. Finally, there are potentially new sources of collaboration among the different players of both industries throughout exchanges of strategic insights and visions, strategic plans and knowledge, co-creation and innovation, technical know-how, collaborative design, production and distribution, which will flow and disseminate around the ecosystem and support the core value chain. Ultimately, exchanges of value and benefits that go beyond business and economics, generating societal impacts and enhance value for customers and community.

7. LIMITATIONS AND FUTURE RESEARCH

In first, limitations of the present piece of work are linked to the opportunity of developing future research focused on customer view, that along with technological convergence may lead to complementary approach in terms of new product design, development and manufacturing. This approach will allow the discussion and validation on ways how to organize and value customer needs and aggregate features in order to generate innovative product concepts and impacts in industry competitiveness on the future. Secondly, the blue ocean business opportunity that emerges from the

present research, leading to an innovative breakthrough in regional innovation systems of mobile gaming and digital music industries, can be also discussed from a conceptual cross-cultural perspective, leading to further studies which potentially contribute to innovation research in cross-regional and cross-industry interstices.

Acknowledgement

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APPENDICES

Exhibit 1 – Nmusic Team

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Ricardo Ferro
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David Benasulin
| Digital |
david[at]nmusic.pt
(+351) 91 980 7412

Source: Nmusic website

Exhibit 2 – Rovio Management Team

MIKAEL HED
Chief Executive Officer

NIKLAS HED
Co-Founder

PETER VESTERBACKA
Mighty Eagle, Chief Marketing Officer

TEEMU SUILA
Chief Operations Officer

HERKKO SOININEN
Chief Financial Officer

KATI LEVORANTA
Chief Legal Officer

JAMI LAES
Executive Vice President, Games

SAARA BERGSTRÖM
Vice President, Marketing & Communications

RACHEL WEBBER
Vice President, Video

NAZ CUEVAS
Senior Vice President, Global Consumer Products Licensing

Source: Rovio website

Exhibit 3 – Rovio Products

GAMES

Birds & Piggies

Others

Rovio Stars Collection

BOOKS AND MERCHANDISING

ANIMATION

ATTRACTIONS

Source: Rovio website

Exhibit 4 – Mobile Games Ecosystem (Structure and main activities)

Source: C. Feijoo et al. (2012) Journal of Telecommunications Policy

Exhibit 5 – Mobile game life-cycle

Source: Gaptime Century Lda. (Partanen, J. 2001)

Exhibit 6 – Mobile Gaming Metrics per region

North America
146M

48% Female   52% Male

EU
212M

46% Female   54% Male

Korea / Japan / China
224M

43% Female   57% Male

10% / 25% / 10-20 / 20-35

8% / 24% / 27% / 41% / 10-20 / 20-35 / 35-50 / 50

24% / 27% / 10-20 / 20-35 / 35-50 / 50

Tablet 38%   71%

Tablet 28%

Smartphone 70%   Tablet 45%   Smartphone 86%

Sources: Newzoo

Exhibit 8 - Evolution of Digital Music Industry (Part 1/2)

Over the years, the music industry has experienced a number of modifications that dramatically changed the music business environment and consumers' perception towards music. The main drivers of these changes were the digital revolution and the introduction of new technologies in the industry. In the early 1980s, with the introduction of the CD, the first change in the industry occurred. The market penetration started slowly due to the extra expenses required to start using CDs and the fear of decreased quality. Even so, it did not took long until consumers understood that the sound quality was not affected and by the late 80s, listening music on CD was already the general standard. The appearance of CDs opened new opportunities for record companies, creating a new revenue stream. Then, in 1989, another creation was introduced – the MP3 compression technology – offering the possibility to convert CDs into digital files and to storage them in the computer. The portable MP3 player was only introduced in the end of the 90s but it rapidly took over the market and ranked ahead the CDs. In 1999, 17 million MP3 files were download every day whereas only 846 million CDs were sold in a year. The MP3 technology led to a detachment between the music and the devices, attributing more value to the music itself rather than to the object for listening. Thus, the introduction of this technology accompanied by the evolution of internet connections caused a positive disruption in the ways of listening music.
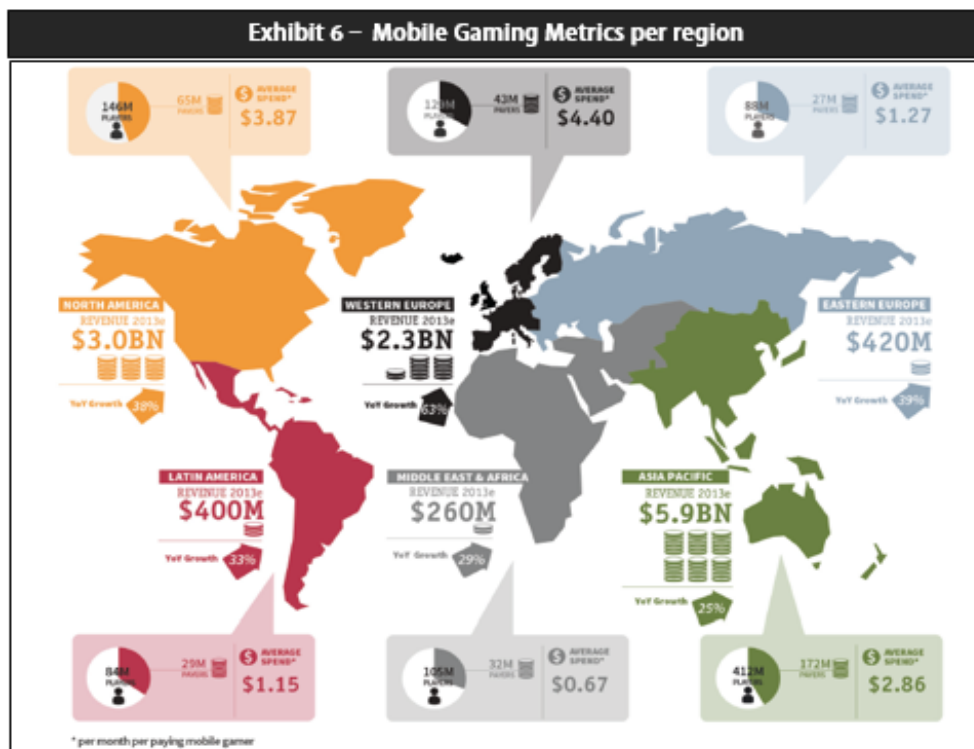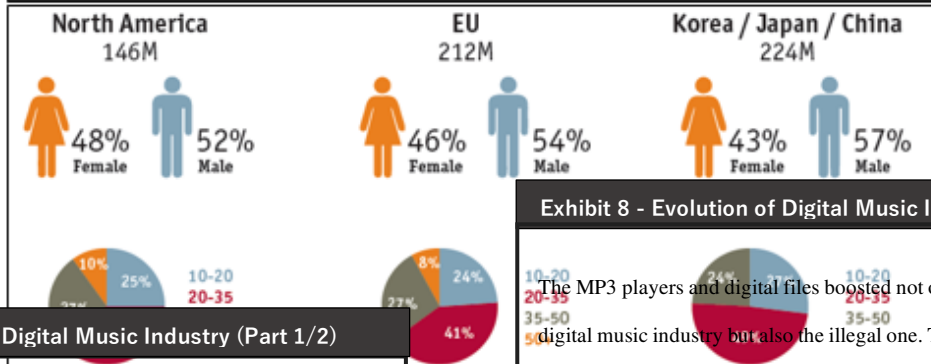
Exhibit 8 - Evolution of Digital Music Industry (Part 2/2)

The MP3 players and digital files boosted not only the legal sector of digital music industry but also the illegal one. The introduction of the iPod in 2002 and the iTunes Store in 2003 helped at some extent to manage this situation once that with these new offers consumers had the opportunity to legally buy songs and transfer them across several devices. Even though, the levels of piracy in digital music increased drastically over the years, negatively affecting the music revenues.

In 2007, the creation of the iPhone and the beginning of the "smartphones era" led to another significant change. With the introduction of music contents in mobile devices, consumers no longer needed different devices to perform different activities. It was possible to listen music, play games, send texts and make calls all with the same device. Consequently, similarly to what happened with mobile games, the concepts of portability and mobility emerged as important decisions factors for consumers in the digital music industry.

Furthermore, in the next years, the concept of accessibility also became an important factor. In 2008, data from the IFPI revealed that 95% whenever they wanted, without the need to own the music files. This service was provided for a specific fee and was available of music downloads were illegal. This was when music companies realized there was the need for a new business model, able to satisfy consumers and to fight back the piracy levels. Hence, in the same year, the music subscription model and the streaming music services appeared as the most sustainable solution. Consumers had access to a diverse and unlimited catalogue of songs, anywhere and in different devices. Afterwards, several companies entered the market offering this and other type of services such as music in the cloud, mobile services, ad-supported services and social media services. Subsequently, consumers' perspective towards music changed and accessibility became much more important than ownership. In fact, several studies developed by Ipsos indicate that consumers see music

as a central part of the mobile experience, they expect this easy access to music contents and consider listening music on the move a core
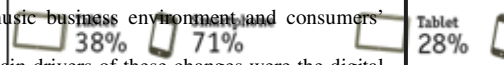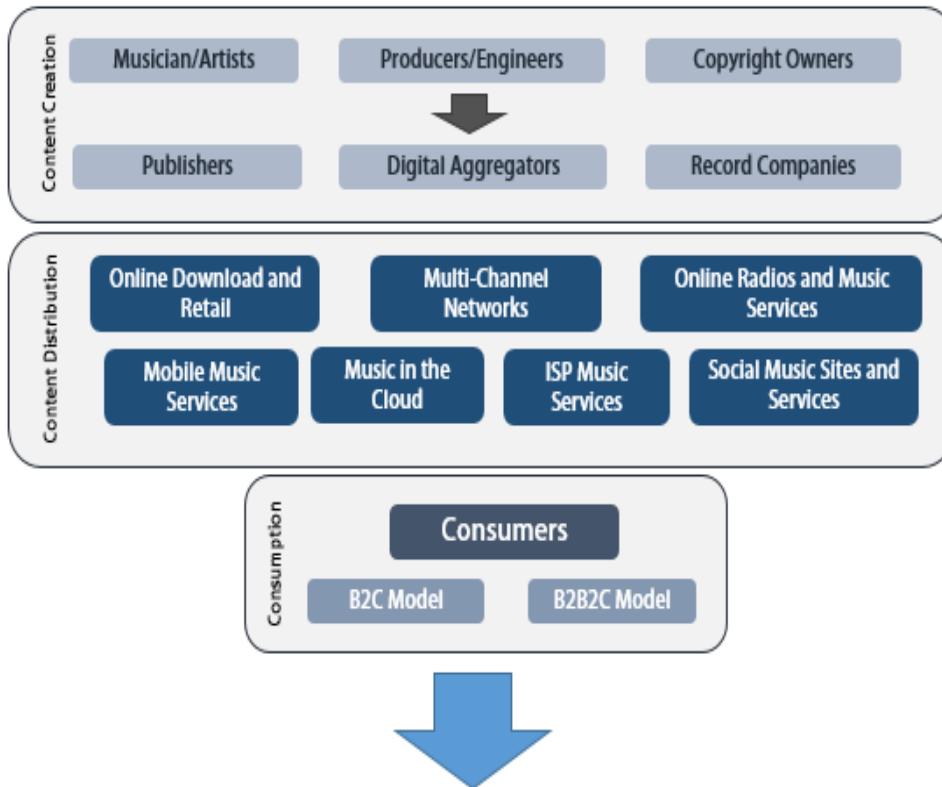
Exhibit 9 – Digital Music Ecosystem

Source: Siemer & Associates

Exhibit 10 – Survey Results

39% / 61%

Current Players (53%)
Past Players (31%)
Non- Players (16%)

<18 (3%)
18-25 (71%)
26-35 (14%)
36-45 (5%)
>45 (7%)

Income
- <500€ (58%)
- 500-1000€ (25%)
- 1001-2000€ (7%)
- >2000€ (10%)

Portuguese (82%)
Other Europeans (11%)
North American (2%)
Latin American (2%)
Asian (1%)

Devices / Platforms Preferred
- Smartphones (46%)
- PCs (38%)
- Tablets (34%)
- Game Apps (64%)
- Social Platforms (32%)

Other Important Facts:

- Majority do not spend money in games, playing only free games or demos. But, from the group that spend money, 70% spend less than 5€.

- 55% play new versions, motivated by curiosity (76%), addictiveness (16%) and brand loyalty (18%).

- 56% played at least once Angry Birds and 34% played one of its spin-offs confirming their interest in new versions.

- 75% of current players affirmed to play at least once a weak and 26% play daily, whereas 83% listen to music more than once a day

- Only 10% stated to listen to the music of the game normally; 5% declared they don't pay attention, 34% turns down the volume, 33% turns it off as soon as the game begins and 18% turns it off to listen to a personal player.

- 56% value the possibility of selecting the soundtrack of a game and 71% value the option of having an unlimited list of music.

- Still, 56% showed concerns regarding des-contextualization and its impact on game performance.

Source: Google Forms (Summary of Responses)

Exhibit 11 – Industry Map (with games and music)

INVESTORS
EX:
Felicis Ventures
AccelPartners
Pathena

MUSIC COMPETITORS
EX:
Spotify
Deezer
rdio

MUSIC SUPPLIERS
EX:
- Record Labels (EMI, Warner Music..)
- Digital Music Agregator (In Groove or AWAL)

Integrators

FUTURE

REGULATORY ENTITIES
EX:
European Union
Music Licensing Institutions

ROVIO / nmusic

GAME COMPETITORS
EX:
Disney
Gameloft
Electronic Arts
Activision

DISTRIBUTORS
EX:
Apple App Store
Facebook
Google Play
Samsung Apps

GAME SUPPLIERS
EX:
- Mobile Platforms (iOS, Android, Windows Phone)
- Middleware Companies (software development)

MANUFACTURERS AND OEMS
EX:
Asus
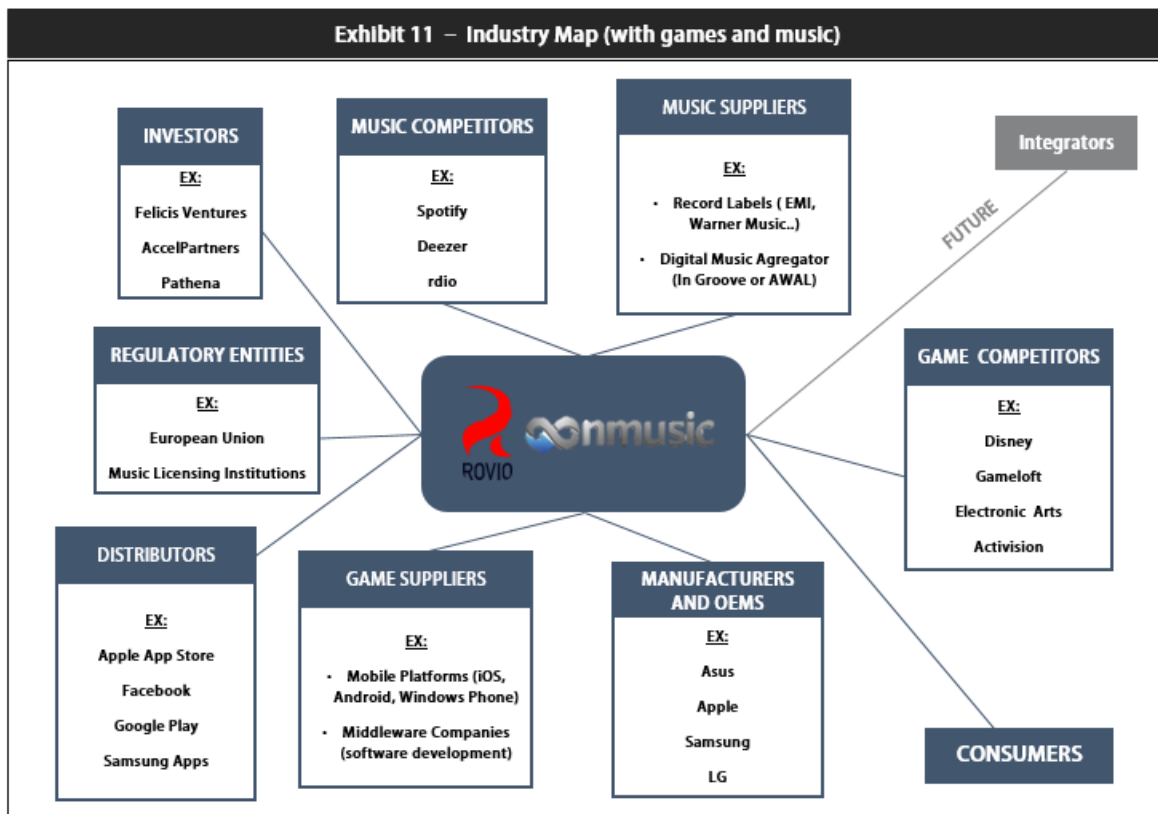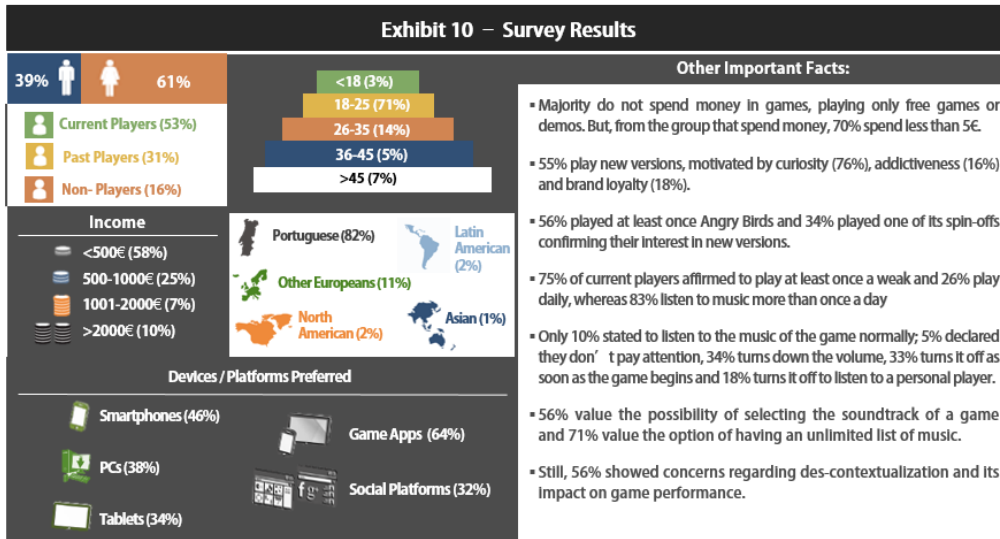Apple
Samsung
LG

CONSUMERS

Exhibit 12 – PEST Analysis (Mobile Games and Digital Music in Europe and North America)

Political Factors
- The Fragmentation of copyright laws and technology protection represent high legal obstacle for many media products (including music and games). However, the European Union has been working to implement more restrictive and harmonized rules.
- There is also fragmentation of copyright ownership that affects particularly the digital music sector. But, there is a progressive licensing on the part of major and independent record companies (implementation of structures to issuing licences to digital services at different levels – national and global)

Economic
- Downturn of the economy reduces considerably the purchasing power of consumers, especially for leisure activities. (monetization issues)
- The low purchasing power is mitigated by the offer of competitive prices and of

[Exhibit 13 – Value Chain]
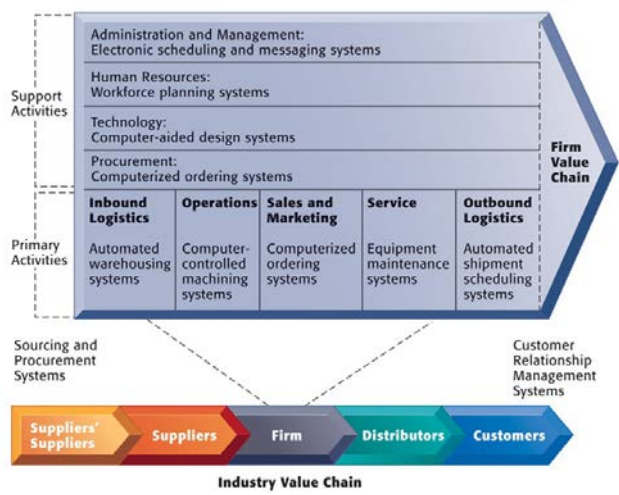
Source: [Porter, M., 1985, Competitive Advantage: Creating and Sustaining Superior Performance]

Table 1

Table 1 - Regional Markets Attractiveness and Potential						
	North America	**Latin America**	**Western Europe**	**Eastern Europe**	**Middle East & Africa**	**Asia Pacific**
MARKET SIZE	Revenues: $3.0 b.n (YoY Growth: 38%)	Revenues: $400 m (YoY Growth: 33%)	Revenues: $2.3 b.n (YoY Growth: 63%)	Revenues: $420 m (YoY Growth: 39%)	Revenues: $260 m (YoY Growth: 29%)	Revenues: $5.9 b.n (YoY Growth: 25%)
Score:	4	2	3	2	1	5
MONETIZATION POTENTIAL	Payers: 65m of 146m gamers Avg.Spend: $3.87	Payers: 29m of 84m gamers Avg.Spend: $1.15	Payers: 43m of 129m gamers Avg.Spend: $4.40	Payers: 27m of 88m gamers Avg.Spend: $1.27	Payers: 32m of 105m gamers Avg.Spend: $0.67	Payers: 172m of 412m gamers Avg.Spend: $2.86
Score:	5	3	4	2	1	4
GROWTH POTENTIAL	CAGR: 7.1%	CAGR: 11.5%	CAGR: 8.6%	CAGR: 7.5%	CAGR: 6.8%	CAGR: 11,5%
Score:	3	5	4	3	2	5
GLOBAL SCORE	4	3	4	3	2	5

Legend: b.n = billion | m = million | Avg.Spend = average spend   Sources: Data from PWC and Newzoo