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FOREWORD

Small and Medium-sized Enterprises (SMEs) are important players in the global economy. This is especially true in the case of emerging countries. For this reason, it is quite important to understand how this type of firms can respond to the strategic challenges that markets demand. The dynamic process of internationalization of economies around the world contests the existing understanding of the role of SMEs further. This context demands dedicated attention to understand how entrepreneurial actions and innovation contribute to enhance the growth in emerging countries.

In order to discuss these issues, the intelligence for innovation (iN4iN) network developed an international conference in Ho Chi Minh City, Vietnam. The title of the conference was “Entrepreneurship and Innovation for Competitiveness”. In this event, academicians, practitioners, policy makers, and entrepreneurs from around the world met to share their research, ideas, and experiences related to the challenges that SMEs face around the globe by discussing in-depth the implications of entrepreneurship and innovation in the current economic global competition. The Vietnamese-German University in Ho Chi Minh City and Leipzig University organized this International Network Event.

This conference was a unique event, which brought together both Asian and other international researchers in the field of management and economics to discuss current challenges, projects, and new approaches about entrepreneurship and innovation research. As result, this conference also contributes to promote the development of SMEs and innovation through strategy generation, development of best practices and policy-level guidelines in the relevant areas. This E-book is the result of the valuable contribution of the participants. Divided into two parts – Innovation and Entrepreneurship – the E-book’s purpose is to communicate to the international community the insights produce by the iN4iN conference.

Prof. Dr. Utz Dornberger
Conference Chair

INNOVATION TRACK

1 Organizational Climate for Innovation: A Study in Vietnam.

Francoise Contreras^{1*}, Utz Dornberger², Juan Carlos Espinosa³, Yonni Angel Cuero Acosta⁴

ABSTRACT

This paper is devoted to studying the organizational climate for innovation (OCI) within the context of Vietnam. In this regard, we started by reviewing the organizational capabilities which can have a greater influence in the OCI within the firm. As result of this review, we establish absorptive capacity (AC) as a primer capability in terms of enhancing innovation within companies. In this work, we test the relationship between OCI and AC. By doing so, we applied a survey to managers within Vietnamese companies. Our sample is composed of 48 Vietnamese employees (83% with manager position). The data analysis used the regression analysis as a technique to test the significance of the relationships between AC and OCI dimensions. The main finding in this research is that in order to foster innovation the most important factor is the support that companies can generate for the innovation. It means that the availability of resources or the supply of financing advantages are not as fundamental factors as the climate of the company to foster innovation. This study contributes to the extant AC literature by empirically testing the AC relationship with organizational climate.

Keywords: Absorptive Capacity, Organizational Climate for Innovation, Innovation.

1.1 Introduction

The current conditions for competition within a globalized world demands from companies differentiate themselves by innovating. Innovation – in this point of view – is a key element to answer the market's needs. It is important to understand innovation as a phenomenon, which has at its core knowledge and the processing and, combination of that knowledge between various sources. It is at the firm level in which authors have identified absorptive capacity (AC) as a milestone. Since the seminal work of Cohen and Levinthal (1990) AC is defined as “the ability of a firm to recognize the value of new external information, assimilate it, and apply it to commercial ends” (p.128). Zahra and George (2002) proposed a model that includes two dimensions of AC: Potential (acquisition and assimilation of new external knowledge) and Realized (Transformation and exploitation) absorptive capacity. According to these authors, both of them are required to reach high standards of performance, allowing the companies to respond appropriately to the current unpredictable and changing business environment.

Empirical evidence about the role of organizational climate in order to strengthen AC is needed (Lane, Koka, & Pathak, 2002). In other words, whether AC is crucial for achieving innovation within a firm, it can be understood by analyzing how the climate – within that organization – facilitates the work performances by AC. Organizational climate for innovation (OCI) is characterized by organizational practices that encourage and reward the changes and innovative initiatives (Scott & Bruce, 1994). Recently, Kim and Yoon (2015) expanded the concept by adding that the climate for innovation includes a general sense of flexibility to change, recognizing the creativity and providing supplies of resources and time for innovation. The aim of this study is to explore how Organizational Climate for Innovation (OCI) affects the absorptive capacity (AC). This research will shed new light in the interplay between the climate of a firm and the way how this firm is able to encourage AC and how managers can improve the managerial skills related to such a capability (Jansen, Van den Bosch, & Volberda, 2005).

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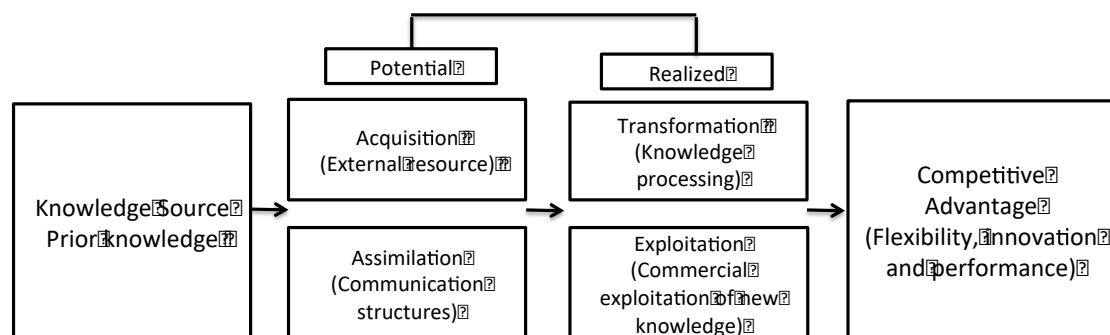
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1.2 Theoretical Overview and Hypotheses

1.2.1 Absorptive Capacity

The Absorptive Capacity contributes to the creation of value and develops competitive advantages through the management of external knowledge (Camisón & Forés, 2010; Teece, Pisano, & Shuen, 1997). This is crucial in the business environment of today when knowledge is the main resource (Teece, et al., 1997). Cohen and Levinthal (1990), who conceptualized AC as the organizational ability to identify, assimilate, and exploit knowledge from external sources, which in turn depends on previous related knowledge in the company, introduced the term absorptive capacity. Subsequently, Zahra and George (2002) define AC as the group of strategic organizational processes that facilitates the acquisition, assimilation, transformation and exploitation of knowledge by companies. All these processes are included in two dimensions: potential and realized absorptive capacity (Figure 1).

Figure 1. Model of absorptive capacity proposed by Zahra & George (2002)



According to Zahra & George, (2002), Acquisition involves the capacity to recognize and acquire the relevant external knowledge. Assimilation requires the ability to integrate external knowledge, understanding, analyzing, processing and interpreting. Transformation includes the development and refining of routines that allow the combination of existing knowledge and the acquired and the assimilation of this new knowledge. Finally, Exploitation is understood as the capability to use new external knowledge towards achieving the organizational goals. These authors asserted that, beyond the organizational capacity, AC is a dynamic capability, something that links this concept to the organizational learning. A dynamic capability refers to the ability to integrate, build and reconfigure competences, both internal and external, allowing the organizational adaptation to a changing environment (Teece et al., 1997). Thus, this capability allows companies to create knowledge and to develop strategic alliances (Eisenhardt & Martin, 2000).

1.2.2 Organizational Climate for Innovation

Organizational climate involves behavioral patterns, feelings and attitudes that characterize an organization. They become some sort of shared perceptions (Isaksen & Lauer, 2001) influencing the organizational processes as a whole and affecting their results (Björkadhil & Börjesson, 2011). Thus, organizational climate permeates the way that decisions are made, how the groups solve their problems, the quality of systems of communication and control, among others. Scott & Bruce (1994), assert that climate for innovation is characterized by organizational practices that value and encourage changes, innovative initiatives, and creative ideas (Scott & Bruce, 1994). Later, Organizational Climate for Innovation (OCI) is defined as the employees' perception of the organizational environment, regarding the flexibility to change, support to creativity and providing supplies (resources and time) for innovation (Kim & Yoon, 2015).

Recently, Zhou & Zhang (2017) and Shanker, Bhanugopan, Van-der-Heijden, and Farrell, (2017) found that organizational climate exerts an important influence on innovation. Übius, Alas, & Elenurm (2013) affirm that an innovative climate is a good predictor of innovation within companies. These results are in accord with those of Amabile, Schatzel, Monetaa, and Kramer, (2004). In their research they found that when employees

perceive their organization as supportive of innovation, they feel more motivated, increasing the innovation in the organization.

Organizational climate is composed of variables as follows:

- Quality of communication and employees' possibility of open expression (Lloréns, Ruiz, & Molina, 2004)
- Low hierarchical system, to avoid limiting the flow of innovative ideas (Damanpour, 1991)
- Positive socio-emotional climate (De Rivera & Páez, 2007)
- Autonomy, security and positive relationships among the organizational members, (Da Costa, Páez, Sánchez, Gondim, & Rodríguez, 2014; Thakur, Hsu, & Fontenot, 2012)
- Recognition of superior performance and encouragement of employees to experiment new ideas, tolerance for diversity (Siegel & Kaemmerer, 1978; Martins & Terblanche, 2003)
- Acceptance of autonomous work, provision of feedback (Hartmann, 2006)
- Fostering of work teams and open communication, (Dombrowski, et al., 2007).

According to the above, we put forth the following hypotheses:

Hypothesis 1: Absorptive Capacity is positively related to Organizational Climate for Innovation.

Hypothesis 2: Support for innovation as a dimension of Organizational Climate for Innovation, can predict the Absorptive Capacity.

Hypothesis 3: Resource Supply as a dimension of Organizational Climate for Innovation, can predict the Absorptive Capacity.

1.3 Method

1.3.1 Sample Characteristics

Absorptive capacity and Organizational Climate for Innovation were assessed in a sample of 48 workers from Vietnam. Participants belonged to different economic sectors and different size companies, more than half of the sample were males (52%), in the middle age characteristics of the sample can be seen in Table 1.

Table 1.
Descriptive information about participants

	<i>f</i>	<i>%</i>		<i>f</i>	<i>%</i>
Gender			Organizational Size		
Female	23	47.9	0 - 9 employees	4	8.3
Male	25	52.1	10 - 19 employees	4	8.3
			20 - 49 employees	8	16.7
Age range			50 - 249 employees	9	18.8
20 - 29 years old	5	10.4	250 employees or more	23	47.9
30 - 39 years old	30	62.5			
40 - 49 years old	13	27.1	Economic sector		
Position in organization			Primary	3	6.3
Without management position	8	16.7	Secondary	16	33.3
Supervisors	10	20.8	Tertiary	22	45.8
Middle Management	25	52.1	Government	5	10.4
CEO or General Manager	5	10.4	NGO's	2	4.2

The data was collected in a school of business located in Vietnam. Questionnaires were distributed in paper or electronic format. Respondents accepted to participate voluntarily once they were informed about the aim of

the study. They were informed about the anonymity and confidentiality of their responses (Individual data will not be disclosed).

1.3.2 Measurements

Absorptive Capacity Scale (ACAP): This scale was developed by Flatten, et al. (2011) and is composed of 14 items to evaluate the four dimensions of AC proposed by Zahra and George (2002): 1) Acquisition, 2) Assimilation, 3) Transformation and 4) Exploitation. This scale has shown high reliability in its dimensions. The Cronbach's alpha reliability coefficient for the whole scale was .96 (Guimaraes, Thielman, Guimaraes & Cornick, 2016).

Climate for innovation Scale: To assess the organizational climate for innovation, we used the scale developed by Scott and Bruce (1994), which is composed of 22 items and evaluates two dimensions: Support for innovation (SI), and Resource supply (RS). The first dimension estimates the individuals' perception about their organization, regarding its openness to change, support of new ideas from collaborators and tolerance to diversity. The second dimension evaluates the employee's perception of the organizational resources. This scale has shown high reliability (Cronbach's alpha for the first dimension was .92 and for the second one, .77).

1.4 Results

The means, standard deviations, reliabilities, and correlations between Absorptive Capacity (AC) and Organizational climate for innovation (OCI) are presented in Table 2. Absorptive Capacity showed significant positive correlations with both dimensions of organizational climate for innovation (OCI); Support for Innovation (SI) ($r=0.50$), Resource supply (RS) ($r=0.43$). Likewise, AC and OCI globally are significantly related ($r=0.52$). Likewise, Potential Absorptive Capacity as a whole construct is related to support for innovation and resource supply (0.43 and 0.39, respectively). Similarly, Realized Absorptive Capacity also showed a significant correlation with support for innovation and resource supply (0.51 and 0.42 respectively).

Table 2.

Means, Standard Deviations, Correlations, and Cronbach's Alpha for Absorptive Capacity and Organizational Climate for Innovation.

N	Variable	M	SD	1	2	3	4	5	6	7	8	9	10
1	OCI-SI	3.06	0.47	.78									
2	OCI-RS	3.09	0.67	.51**	.70								
3	OCI Total	3.08	0.49	.81**	.91**	.83							
4	AC-AC	4.70	1.28	.36*	.34*	.40**	.83						
5	AC-AS	4.68	1.37	.42**	.37*	.45**	.69**	.94					
6	AC-TR	4.47	1.26	.39**	.33*	.40**	.64**	.60**	.94				
7	AC-EX	4.67	1.38	.56**	.45**	.56**	.68**	.82**	.63**	.90			
8	AC-PO	4.69	1.23	.43**	.39**	.46**	.89**	.95**	.67**	.82**	.92		
9	AC-RE	4.55	1.18	.51**	.42**	.53**	.72**	.77**	.92**	.88**	.82**	.92	
10	AC Total	4.63	1.15	.50**	.43**	.52**	.86**	.90**	.82**	.90**	.96**	.95**	.95

* $p < 0.05$ two-tailed significance. ** $p < 0.01$ two-tailed significance.

Note:

OCI-SI: Support for Innovation; OCI-RS: Resource Supply; OCI Total: Organizational Climate for Innovation

AC-AC: Acquisition; AC-AS: Assimilation; AC-TR: Transformation; AC-EX: Exploitation
 AC-PO: Potential Absorptive Capacity; AC-RE: Realized Absorptive Capacity AC Total: Absorptive Capacity

Table 3 presents the results of the hierarchical regression analysis. The hierarchical regression involved two steps: First, control variables predicted the absorptive capacity neither potential nor realized (Step 1). Second, the direct effects of organizational climate for innovation are significant (Step 2.) Support for innovation significantly predicts both potential and realized absorption capacity. However, Resource Supply, the second dimension of organizational climate, does not.

Table 3.
Results of Hierarchical Regression Analyses

	Dependent variable: Potential Absorptive Capacity				Dependent variable: Realized Absorptive Capacity			
	Step 1		Step 2		Step 1		Step 2	
	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>
<i>Controls</i>								
Gender	0.137	0.372	0.032	0.821	0.251	0.103	0.144	0.277
Age	-0.087	0.613	-0.301	0.081	-0.060	0.725	-0.281	0.081
Organizational size	-0.130	0.396	0.116	0.446	-0.113	0.456	0.173	0.226
Economic sector	-0.004	0.977	0.028	0.842	-0.005	0.975	0.042	0.746
Position in organization	-0.190	0.284	-0.027	0.877	-0.182	0.302	-0.023	0.887
<i>Direct effect</i>								
Support for Innovation			0.367	0.031			0.481	0.003
Resource Supply			0.291	0.105			0.254	0.129
Adjusted R-square	-0.025		0.197		-0.008		0.299	
F-value	0.767	0.579	2.643	0.024	0.927	0.473	3.868	0.003
R-square Change	0.084		0.233		0.099		0.304	
F Change	0.767	0.579	6.803	0.003	0.927	0.473	10.205	0.000

* $p < 0.05$ two-tailed significance. ** $p < 0.01$ two-tailed significance.

In sum, the H1 is accepted; AC and OCI dimensions are significantly related. On the other hand, the regression analysis demonstrated that support for Innovation but not resource supply can significantly predict both, the potential ($R^2 = 0.233$) and realized ($R^2 = 0.304$) absorptive capacity. This means that H2 is accepted whereas H3 is rejected.

1.5 Discussion

In this paper, we tested the relationship between the absorptive capacity (AC) and organizational climate for Innovation (OCI). These constructs are highly related, the whole dimensions of each construct have shown a significant relationship. This means that organizational climate is a crucial variable to foster the absorptive capacity at the firm level in order to achieve innovation (Zhou & Zhang, 2017; Shanker, et al., 2017). From the respondent's point of view, in the Vietnamese context, organizational climate requires the better practices such as to reward changes and innovative initiatives as suggested Scott & Bruce (1994) and to be more flexible to change, as proposed by Kim and Yoon (2015). These authors affirm that an organizational climate for innovation is characterized by recognizing the creativity and providing resources for innovation. However, in this paper we demonstrate that better than providing resources, the intensity in giving support for innovation is more important.

In the case of the Vietnamese respondents, their companies have an acceptable absorptive capacity and average organizational climate for innovation. Nevertheless, the effect of OCI on AC found in this study indicates that

this capacity could be increased through the organizational climate, mainly through support of innovation. It is suggested to continue the study of organizational climate in these companies and to identify other organizational variables related to climate, mainly those that are linked to perceived support such as leadership practices. Leadership styles influence other variables related to organizational climate and these have demonstrated to have a relationship with organizational climate for innovation, in particular, hierarchical system (Damanpour, 1991), positive socio-emotional climate (De Rivera & Páez, 2007), autonomy, positive relationships (Da Costa et al., 2014; Thakur, et al., 2012; Hartmann, 2006) and tolerance for diversity (Siegel & Kaemmerer, 1978; Martins & Terblanche, 2003), among others.

This study allows us to state that the model proposed by Zahra and George (2002) is used to evaluate absorptive capacity, and its dimensions are clearly differentiated. In the same way, the model proposed by Scott & Bruce, (1994) is still appropriate to evaluate organizational climate for innovation, and its dimensions are finely demarcated as well. On the other hand, it is important to point out that both scales demonstrated their reliability, both in their dimensions (alphas above 0.7) and in their total concept (alphas above 0.83).

We suggest that future research analyzes empirically the organizational climate in the Vietnam companies, but with a larger sample. Our study included only 48 companies, this is an important limitation of this research. The results of this exploratory analysis indicate the importance of having an adequate organizational environment in order to increase the potential and realized absorptive capacity, mainly through the support for innovation. The organizational climate influences both dimensions of AC which is needed to reach high standards of performance (Scoth & Bruce, 1994). Insofar as organizational climate is considered a good predictor of innovation (Übius, et al., 2013; Amabile, et al., 2004), these results should be confirmed in further studies, given that innovation is crucial for companies to be able to respond appropriately to challenges of the current business environment.

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2 Improving Financial Literacy in SMEs: A Global Trend in Innovative Financial Instruments⁵.

Shirin Imanbaeva⁶, Claudia Nelly Berrones-Flemmig⁷, and Utz Dornberger⁸

ABSTRACT

The access to finance for SMEs is considered in the scientific literature as the main obstacle for growth (Beck et. al., 2005a; Beck et. al., 2005; Beck, Demirguc-Kunt, 2006; Ayyagari et. al., 2007; Beck et. al., 2008). Though the relevance of SMEs in general, there is still a high finance gap between the SMEs and the bigger established enterprises, varying from 20% to as high as 80% on a country-to-country basis (Berger and Udell, 2006; Cull et. al., 2006). Paralelly, there is a failure of conventional financial institutions to meet SMEs needs that led to the development of innovative ways to finance them, but also to improve the financial literacy in SMEs. Therefore, it is relevant to explore emerging innovative financing models, instruments and channels applied in the area of SME finance (Imanbaeva, 2016). According to this context, the main research question of this paper is which innovative financial instruments do exist presently in the global landscape for improving financial literacy in SMEs?

The main contribution of this paper is to show and explain a present global trend in innovative financial instruments for improving financial literacy in SMEs: the trend of capacity building (financial literacy campaigns, financing blended with technical assistance and financial literacy apps). This trend shows that digital apps and conventional financial institutions improve the financial literacy of SMEs. These institutions are interested in the long-term capacity building of the demand side.

Keywords: Financial Literacy, Financial Inclusion, Innovative Financial Instruments, SME Finance, Development, Digitalization

2.1 Introduction and Rationale of the Research

In many SMEs around the world, it is common that only one person (or a few persons) usually manage different areas of the enterprise. Since not all SME managers have a financial education background, it is of outstanding importance to promote the financial literacy of every person, not only for professionals in the sector of investment and banking. This is relevant especially in times of economic crisis and the problems faced by the financial sector: mis-selling, unethical market prices and underestimation of financial risk (Davies, 2015). The ability to deal effectively with money and financial matters is known under the term “financial literacy” (Aprea et al., 2016).

The financial literacy of an individual and/or a company can conduct a higher level of formal financial management and therefore, to more financial inclusion. The degree of financial development has a direct influence on financial accessibility. It is also important to keep in mind that financial inclusion and financial accessibility are not the same. As defined by the WBG (2014) financial inclusion “is the proportion of individuals and firms that use financial services”, however, if those financial services are provided for the unaffordable price, there is an obvious problem with access to those services. In this sense, the SMEs segment is the one that suffers from access to finance problem the most. Figure 1 provides an overview of the formal SMEs’ access to finance by region and around the globe. The figures show that there is a correlation between

⁵ This paper is an extended version of the paper published with the title: “*Innovative financial instruments for financial literacy in SMEs*“ for the proceedings of the 6th International Conference on Emerging Challenges Strategic Integration 2017 in Hanoi, Vietnam. Bach Khoa Publishing House.

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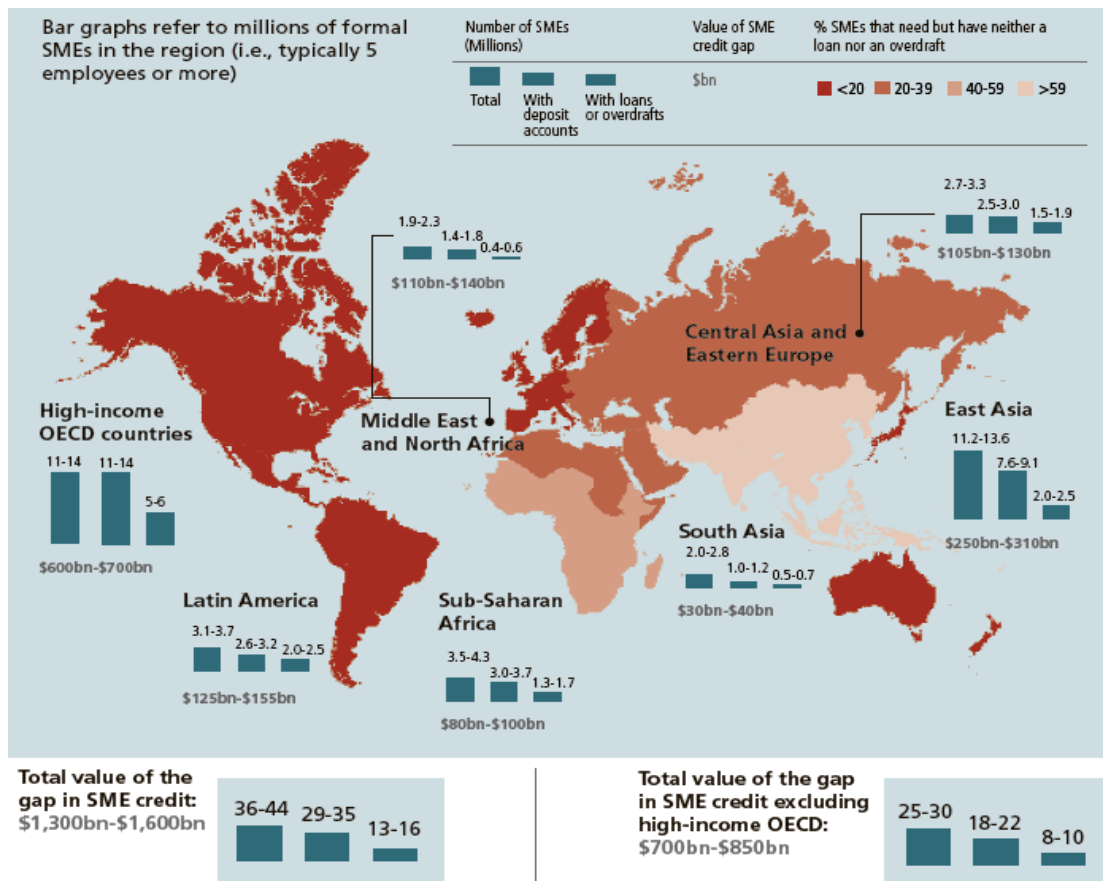
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financial development in a given region and access to finance degree. Sub-Saharan Africa scoring the lowest on financial development matrix also shows credit gap on average of 40 to 60% of SMEs that are either underserved or unserved at all. Whereas, countries of North Atlantic Core show results of less than 20% of SMEs that experience problems with access to external financing.

Figure 1: Overview of formal SMEs' access to finance by region



Source: IFC, Advisory Services, Access to Finance (2010)

2.2 Scientific Definition of the Problem

The access to finance for SMEs is considered in the scientific literature as the main obstacle for growth (Beck et. al., 2005a; Beck et. al., 2005; Beck, Demirguc-Kunt, 2006; Ayyagari et. al., 2007; Beck et. al., 2008). Though the relevance of SMEs in general, there is still a high finance gap between the SMEs and the bigger established enterprises, varying from 20% to as high as 80% on a country-to-country basis (Berger and Udell, 2006; Cull et. al., 2006).

Furthermore, from the demand side, there is a lack of formal financial management in SME's, which could cause in the short, medium and long-term a weakness in internal financial control and other problems related to the limitation of possibilities of funding for the SMEs (Berrones, 2011). Several studies about the reasons for small business failure show a poor or careless financial management and management inefficiency as the most important causes of failure in small firms (Miller, 1977; Berryman, 1983; Bruno and Tyebjee, 1985; McMahan and Holmes, 1991; Gemünden, Brinckmann and Salomo, 2009).

Paralelly, from the supply side there is a failure of conventional financial institutions to meet SMEs needs that led to the development of innovative ways to finance them, but also to improve the financial literacy in SMEs. Therefore, it is relevant to explore emerging innovative financing models, instruments and channels applied in the area of SME finance (Imanbaeva, 2016).

In this context, the main research question of this paper is:

Which main innovative financial instruments do exist presently in the global landscape for improving financial literacy in SMEs?

The main contribution of this paper is to show and explain a present global trend in innovative financial instruments to improve the financial literacy in SMEs: the trend of capacity building (financial literacy campaigns, financing blended with technical assistance and financial literacy apps). This trend means that the financial literacy of SMEs is improved by digital apps and from conventional financial institutions, which are interested in a long-term high capacity of the demand side.

2.3 Methodology

The topic regarding emerging innovative ways in SME Finance landscape has been examined in a scientific research study from the International SEPT Program at Leipzig University (Imanbaeva, 2016). In order to answer the central research question of this paper, it has been selected a small part of this study.

The data collection methodology employed in the present research includes a systematic and exploratory approach, where secondary information about the topic, i.e. innovation in SMEs finance, was gathered through desktop research and then mapped. First, the innovative financing instruments, models and channels were identified, and then each of them was given a descriptive case, based on which major trends were built through textual analysis of the cases.

The sources of the secondary information include reports of various international development organizations and commercial banks, which are engaged in the area of access to finance. However, the main literature used for the research comes from the IFIs (international finance institutions) because they possess a vast amount of quantifiable and empirical data in the area of access to finance by SMEs.

Other sources of secondary information included SME finance related blogs and forums on LinkedIn, as well as consulting companies' hubs such as FIC Advisors Inc. specially designed platforms, dedicated to the topic, such as SME Finance Forum and Small Business Banking Network.

2.3.1 Data Analysis

The collected data was analyzed through application of the Delphi Technique, which provides an “ability to make effective decisions in situations where there is contradictory or insufficient information” (Hasson, Keeney, McKenna, 2000) on the research topic. Due to the fact that the main outcome of the given research is the mapping of innovative ways to finance SMEs, relatively under-explored area, the Delphi Technique fits the research objective the most. With a provision that given survey research method implies the cross-sectional approach, in which various segment of a population is sampled at a single point in time. This entails consultations with experts in the field of SMEs finance.

Choice of the Delphi Technique for an analysis of the data in the given research is also justified from the following perspectives. Apart from providing a systemized way of assessing a problem that had little investigation, the given technique as pointed out by Ono and Wedemeyer (1994) has been called the “cornerstone of futures research” and is “an iterative multistage process, designed to transform opinion into group consensus” (Hasson, Keeney, McKenna, 2000), which makes it qualifies for the objective of the proposed research.

Delphi is also defined as “a method of structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem” (Linstone, Turoff, 1975). Therefore, the main purpose of this group facilitation technique is to obtain a consensus of experts' opinion on complex issues (Dunham, 1996), in this case, the mapping of innovative ways to finance SMEs. Another significant advantage of the method is anonymity, which allows avoidance of conflict of interest and direct confrontation of experts.

As stated by Linstone and Turoff (1975) implementation of the Delphi Technique is suggested if one or more of the following conditions are present:

1. No or little applicable quantitative data is available.
2. Existing information on the topic is scant to deal with the issue.
3. Geographically experts are located on unreachable distance for face-to-face communication.
4. Existence of probability that one or several experts with stronger personalities would directly influence the discussion (the bandwagon effect), not giving opportunity for others to fully attend and contribute to it
5. The anonymity of participants is preferred.

The given research fits into all five conditions listed above.

Due to the fact that the main objective of Delphi is to have a group consensus on a certain issue, it is crucial to ensure a proper selection of the panel, as Taylor and Judd stated (1989, p.95), “without question the most important step in the Delphi method is the selection of the panel members”. On one hand, healthy heterogeneity of the panel is highly recommended, this leads to a more exhaustive assessment of an issue, on the other hand, it may also lead to a lower level of consensus. An estimated average number of experts needed for application of the technique varies from 8 to 18 people.

There are four major sub-categories of experts in the global field of SMEs finance: IFIs, such as commercial banks operating on international basis, DFOs, such as World Bank Group that are engaged more on a policy level, NGOs that in many cases cover the capacity building side of SMEs finance, and consulting agencies also working worldwide and on a commercial basis.

The following criteria for selection of panellists have been established:

- Experts should have relevant experience of not less than 15 years
- Experts should have knowledge about SMEs finance market both in developing and developed countries
- Experts are required to have at least one publication in the topic related area

Out of 12 interviewed experts, 4 are based in Germany, 1 in Switzerland, 2 in Kyrgyzstan and Tajikistan, 2 in Turkey and the rest 3 in the USA. All of the interviewed experts occupy managerial positions and are responsible for either access to finance or SMEs banking sectors in their respective regions. 10 interviewed experts cover the mentioned topics globally and are based in either headquarters or regional hubs of their respective organizations.

2.4 Results and Discussion

According to the World Bank survey (Torre, Martínez, Schmukler, 2010) conducted in Argentina, Chile, Colombia and Serbia, roughly 50% of surveyed banks point at SMEs specific factors⁹ as one of the main obstacles to serve the sector. One of the ways to mitigate that obstacle is to build the capacity of the SMEs sector itself. The *capacity* is the ability of individuals, institutions, and societies to perform functions, solve problems, and set and achieve objectives in a sustainable manner. **Capacity building** is the process through which the abilities to do so are, strengthened, adapted and maintained over time (UNDP, 2006).

- Financial literacy campaigns* are campaigns that aim to increase financial education of a person or a firm. In this case, SME in particular. This can be done through training, seminars and workshops, as well as through publication of educational materials.

Case 12. “After the overindebtedness crisis of 2011, both regulatory bodies and non-bank financial institutions of the Kyrgyz Republic started admitting the importance of financial literacy of local SMEs and individuals. Shortly after the *CJSC FINCA Bank* launched its Financial Literacy project, which is a multiple level program that includes various directions, channels and instruments of distribution. Within the program, series of educational materials and training has been prepared and disseminated through training events, which were

⁹ These factors mostly refer to low quality balance sheets and/or lack of quality information in overall. In Colombia, this percentage goes up to 88% (Torre, Martínez, Schmukler, 2010).

conducted jointly with the National Bank of the Kyrgyz Republic. In 2015 the CJSC FINCA Bank published the electronic version of the manual on financial literacy prepared in cooperation with the Kyrgyz-Russian Slavic University. This edition is a basic course, combining 101 theoretical foundations and practical experience.”¹⁰

□ *Financing blended with technical assistance* in the form of financing supported by a technical assistance, which is defined as transfer or adaptation of ideas, knowledge, practices, technologies, or skills to foster development (GSDRC, 2009). Usually, an external consultant who is being placed within the SME performs the knowledge transfer.

Case 13. “SMEs form an important strategic sector in promoting economic growth, social development and reducing poverty, especially in the region. *DFCC Bank*’s long-term commitment to help this sector extends well beyond financing. The bank launched entrepreneurial skill development programs coupled with continuous monitoring and guidance of SMEs in 2002. These programs are conducted through the SME units of the bank upon identifying the most critical training need of each district targeting entrepreneurs who have the potential to grow. The attendance is free of charge and cover areas such as: fundamentals of entrepreneurship, their practical application in business development and experience sharing, organizational and financial management training (budgeting, cost control, pricing strategies, analyzing financial statements), customer care, human resource management, marketing in a competitive environment, selling skills, etc. The latest SME training drive commenced in 2012 utilizing funds under SMEDef credit line granted by the World Bank for the development of the country. Of these training, to date, 29 training programmes have been conducted benefiting 2,202 clients. Each program designed to benefit 50% existing customers and 50% potential customers.”¹¹

Case 13.1. “*The Medical Credit Fund (MCF)* is a non-profit health investment fund that provides capital, business advice, and clinical guidance for private African health providers to improve their accessibility and quality of care. It is an initiative of the PharmAccess Group, a Dutch non-profit organization that works with private and public partners to strengthen health systems in sub-Saharan Africa. MCF aspires to increase the creditworthiness, access to capital, and ultimately the quality of health providers. It starts by building trust in the services provided by the sector by setting clinical standards in order to make quality improvement measurable (SafeCare™ label). It then provides two different but related approaches to enhance quality: The Technical Assistance program (TA), and the Loan program. This process allows clinics to accomplish quality improvements with investment funds that they would not be able to access otherwise, and it helps to attract a higher number of patients per clinic as the quality of healthcare improves.”¹²

Case 13.2. “*Sembrar Sartawi IFD* is a Bolivian development finance institution providing a variety of financial services to micro and small agricultural producers since 1989. There is a need to increase production and productivity of agriculture, particular for net food importing countries like Bolivia. Furthermore, agriculture is the most important source of income for millions of smallholder farmers with no access to technology, credit and markets. Here, the partnership Sembrar Sartawi IFD and Sembrar have developed the ATF model (Technical Assistance and Financing). This innovation works on a platform of these two institutions. They were created to deliver services to smallholder farmers through a comprehensive approach. One institution specializes in the transfer of knowledge and builds productive capacities, and the other provides customized financial products to small agricultural units. The value for the small-holder farmers consists in (1) Technical assistance (TA) provides best practices and the farmer can increase yields, (2) TA helps the producer to mitigate risks, contributing to reduce the probability of a failure in his crops and falling in credit default, and (3) Information and initiatives to reach markets allow farmers to find more stable demand paths.”¹³

□ *Financial literacy apps* are online electronic applications, designed to provide an increase financial education of a person or an entity.

¹⁰ <http://www.finca.kg/>

¹¹ <http://www.dfcc.lk/>

¹² <http://www.medicalcreditfund.org/>

¹³ <http://www.sembrarsartawi.org/>

Case 14. “Xero is a cloud-based accounting solution tailored to the needs of small to mid-size businesses. Features include account management, billing, invoices, expense reporting, and payroll (this last is currently limited to the U.K., Australia, New Zealand, and 20 US states). Xero also integrates with over 400 other applications which facilitate nearly all aspects of business operation, including inventory management, CRM, and POS. Prices range from £9 a month for the starter version to £30 a month for a sophisticated, multi-currency option.”¹⁴

Case 14.1. “ClearBooks gives users a clear and simple snapshot of their business finance with a variety of handy reports. It also generates stores and submits VAT returns directly to HMRC. The system offers a multi-currency option and the facility to receive payments via direct debit. Price plans start from £7.20 a month.”¹⁵

The cases above show that the digital disruption is radically transforming conventional fundamentals in a variety of unexpected areas from the way data is collected and analyzed to combat spread of pandemic diseases and regional conflicts (Tschan, Lopez, 2016) to the way this data perceived and further applied in such fields as for instance hiring practices (Romrée, Fecheyr-Lippens, Schaninger, 2016). The financial sector is not an exception.

The table below (Table 1) is matching one of the main obstacles to SMEs finance (Zavatta, 2008) where innovative financial instruments related with the trend „capacity building“ could help to overcome them.

Table 1: Matchmaking matrix

Obstacle to SMEs finance	Innovative approach	Innovative model/instrument/channel
Informational asymmetries	Capacity building of the demand side as an effort to streamline poor bookkeeping and increase financial literacy, main reasons for informational asymmetry problem.	1.- Financial literacy campaigns 2.- Financial literacy apps

Source: Author’s own compilation (2016)

According to Hubbard (1990) the informational asymmetries between “borrowers” and “lenders” complicate the development of financial contracts. The dimensions of information asymmetries studied by several authors rely mainly on the following issues: one party has information that the other party lacks and cannot easily acquire (Smith, 2004). It also refers to the quality of information in the following dimensions:

- ❖ Lack of quality of financial information (Miller and Bahnson, 2002).
- ❖ Weaknesses in internal control over financial reporting (Doyle and McVay, 2007).
- ❖ The difficulty of getting access to the companies’ information (publicly traded vs. not publicly traded companies) (Denis, 2004).
- ❖ Private information obtained by lenders leads to borrower capture to the extent that such information cannot be communicated credibly to outsiders (Dell’Ariccia and Marquez, 2004).

The instruments applied to overcome the obstacle of informational asymmetries contrast greatly with SME finance obstacles related to higher risk and institutional and legal factors. This could be explained by SMEs sector’s intrinsic specificity, as formal financial institutions still perceive the sector quite risky to work with, and by the complexity of the latter obstacle, which is consequent with the finding of Torre et al., 2010.

This is especially the case in a list of non-OECD (developing or less developed) countries, which respond that 70% of local SMEs are underserved or not served at all, in contrast with 30% of such SMEs in OECD countries (IFC, Advisory Services, Access to Finance, 2010). There is also a certain correlation between the level of development of national financial and legal systems and access to finance in the given country.

¹⁴ <https://www.xero.com/>

¹⁵ <https://www.clearbooks.co.uk/>

This could also be one of the major reasons as to why, for instance, those innovative approaches that require stronger and more developed legal and institutional systems are not as widely used in less developed countries.

In general, the commonality of the digitalization component in almost each identified trend and wide global penetration of identified innovative approaches prove their major and growing importance not only for the demand side but undoubtedly first and foremost for the supply side, particularly, conventional financial institutions. It is suggested that there are two ways of perception of the digital disruption – consider it as a threat or as an opportunity. McKinsey (Dawson, Hirt, Scanlan, 2016) proposes to look at the change of the supply and demand in order to understand the nature of reasons for disruption and to spot opportunities to further adapt to it.

Accenture (2016) suggests that incumbents of the financial sector, i.e. conventional financial institutions, could still manage to catch up with FinTechs through co-competition - partnering up with existing players in the ecosystem of traditional banking – and distinguishing two kind of FinTechs, competitive and collaborative ones, as seen in the Figure 2, based on the number of deals made across product segment.

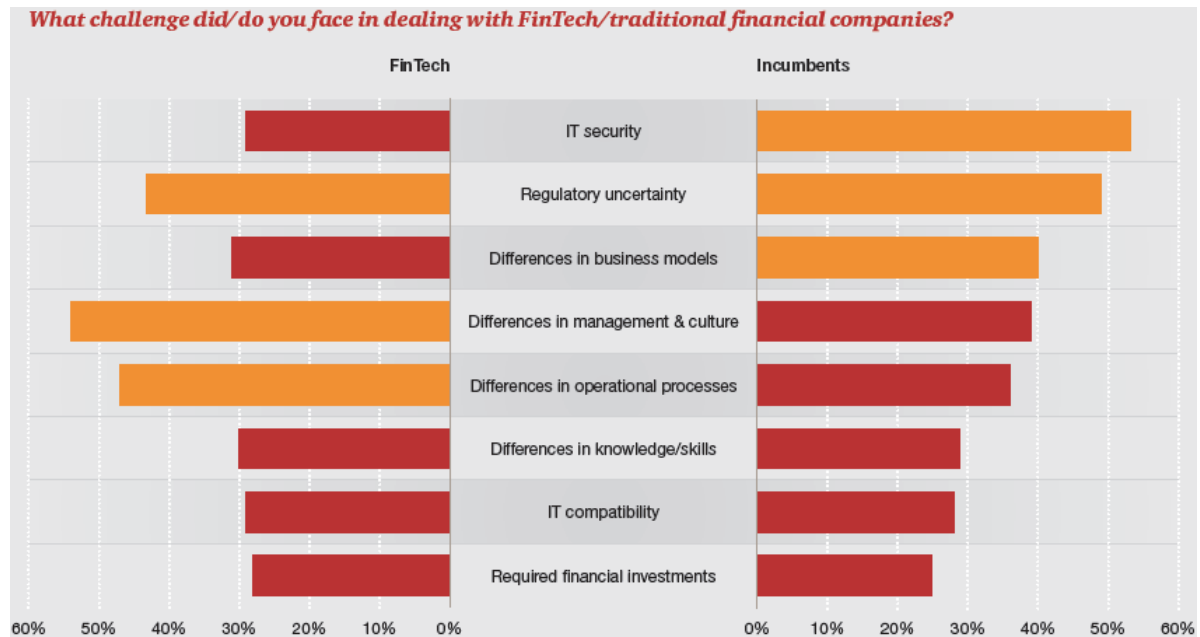
In addition to this with a reference to the survey conducted among 25 innovation-focused senior banking executives from the banks that represent 40% of the top 10 global banks by market capitalization, including two of the world's top five banks, Accenture (2015) highlights three critical behaviors, that the conventional banking sector's representatives are advised to follow in order to successfully grab the opportunities presented by the digitalization:

- Act open and nurture open and collaborative innovation;
- Collaborate with emerging disruptors to find areas of mutual partnership (case of partnership between mBank, which is a part of Commerzbank Group, and telco Orange Polska that began offering a joint banking service for phones and tablets in 2014);
- Invest (case of American Express, BBVA, HSBC, Santander and Sberbank, which are increasingly looking at crosscutting investments into FinTechs with long-term returns).

On the contrary, despite the provided successful examples of co-competition both FinTechs and conventional financial institutions indicate at least five major challenges for partnership. According to the PwC Global FinTech Survey, conducted in 2016, 86% of respondents indicated their concern about the impact of regulation and/or overregulation on the growth potential of their companies.

The most common challenges named by both parties are indicated in Figure 2. Interestingly that FinTechs indicate such challenges as “Differences in management and culture” and “Differences in operational processes” as highest, pointing out at incumbents' intrinsic factors, which are lagging them from innovation and further development.

Figure 2: Challenges faced during competition between FinTechs and conventional financial institutions



Source: PwC (2016)

This is consistent with BCG’s (2016) call to “radically simplify” in order for incumbents to catch up with disruption. As the standards of operational and digital excellence are getting higher, it is crucial to adjust accordingly and make transformation within the whole organization through dedicated programs of “culture change”.

Innovation in SMEs finance is becoming a global movement, reaching underserved not only in countries with more developed financial systems like UK and US but also making a considerable change in less developed countries of East Africa, for instance. However, adoption of identified innovative approaches needs the involvement of stakeholders on all levels. The regulatory environment is proven to be crucial for further development of innovative approaches and list of countries have already started working in this direction (case of Singapore and China). At the same time, the conventional supply-side still plays an essential role in the provision of access to finance to SMEs, and innovation is also taking place within the banks. Nevertheless, it is important to keep in mind that adoption of these approaches needs to be done in an environment of strong financial and legal systems, as digitalized (or alternative or innovative) component needs to have a culture of trust for further wider usage of identified financing approaches. This, in turn, implies that innovation in SMEs finance in countries with lower levels of development of financial and legal systems will take longer for further spread.

2.5 Conclusion

The topic of financial innovation is quite a controversial one. It has many opponents, as well as allies. However, whatever the outcomes of the innovation in the financial sector are, it is very clear that there is an obvious need for it. One of the arguments for this statement is the existence of a financing gap and a high global percentage of unserved individuals and SMEs, even in countries of the North Atlantic Core, as was discussed in the introduction.

The variety of identified innovative financing approaches, as a current effort to overcome the problem of access to finance by SMEs and individuals, proves a long-awaited and needed demand-side oriented shift in the area of financial services, particularly considering the digitalization component that leads to further empowerment of the demand side and crystallization of the demand, which progressively shapes the area of SMEs financing, as supply side is trying to adjust to sector’s needs.

The FinTech companies, true disruptors of the financial sector, are at the leading centre of the innovation movement. Nonetheless, the conventional players, i.e. banks, still dominate the sector. According to the Economist (2015), the “Lending Club has arranged \$9 billion in loans through its marketplace, small change compared with \$885 billion of total credit-card debt in America”. However, as seen from the cases provided, banks are also stepping into the field of innovation by the creation of tailored products, adoption of new financing instruments, and competition with emerging innovators.

It can also be suggested that the SMEs’ financing niche is narrowing down thanks to:

- Emerging innovative financing instruments applied in the given area by various players in the existing ecosystem of financial services;
- Growing understanding of the importance of domestic SMEs’ basis for the economic growth of a given country.

Although availability and application of those instruments vary greatly on a country-to-country basis. This can be explained by the influence of different factors, where the degree of development of financial and legal systems is among the major ones. In overall, the identified innovative financing approaches and build upon them trends majorly contain the digitalization component, which in turn implies that their further adoption needs a holistic approach with involvement of actors at all levels of systemic competitiveness, especially those at macro level, a challenge of regulatory uncertainty could serve as either an impediment or facilitator of innovation in the overall area of finance.

2.5.1 Limitations of the Study

The given research provides only a mapping of the emerging innovative approaches towards SMEs financing; however, it does not make an in-depth analysis of each instrument, model or channel, also not regarding the impact of these instruments. The Delphi Technique applied to analyze the mapping is limited to validation of the data with no further analysis of it. One of the complications of the given study is its global scale, which makes it challenging to gather, process, compare and analyze the vast amount of information. Also, heterogeneity of spread and adoption of those approaches adds another challenge to analysis part. In addition to this, specificity of the topic of innovation with constant change and evolution requires constant update and track of secondary data on the topic.

2.5.2 Main Contribution

In summary, this exploratory study reveals the impact of the digitalization in financial services in the area of capacity building for SMEs as an innovative way to improve the financial literacy in SMEs. The growth of financial literacy of SMEs is fuelled by digital apps and conventional financial institutions, which are interested in a long-term high capacity of the demand side.

The main contribution of this paper is to show and explain a present global trend in innovative financial instruments to improve the financial literacy in SMEs: the trend of capacity building (financial literacy campaigns, financing blended with technical assistance and financial literacy apps). This trend means that the financial literacy of SMEs can be improved by digital apps and conventional financial institutions, which are interested in a long-term high capacity of the demand side. Nevertheless, in this paper, it is not analyzed the relationship between the use of this digital app and their impact on the financial literacy and formal financial management in SME’s. This aspect should be analyzed in further research.

The results show the present trends in capacity building in the global landscape. The data analysis reveals that growing digitalization of financial services (particularly digital apps to improve financial literacy) leads to empowerment of the demand side, which progressively develops the financial literacy in SMEs. In this way, the supply side is trying to adjust to sector’s needs.

2.5.3 Implications for Further Research

This research is identifying the emerging innovative financing approaches and further maps them, but it is not providing an in-depth view on how those approaches could be adopted by the supply side. Another direction for further research is to consider a benchmarking of consequent regulation of innovation in the area of SMEs financing and its implication on the innovation, whether it serves as impediment or facilitator. In addition to this, the correlation between cultural background and rates of spread and use of innovative financing approaches could be investigated.

The trend of capacity building is present in the global landscape. Nevertheless, future research should examine the real effects of this trend in the financial literacy of SMEs around the world, as well as the quality of the improvement in their financial information (formal financial management) and the corresponding decision making. The results of this research need to be further analyzed through application of quantitative analysis tools in order to measure the impact of the financial literacy campaigns in the financial literacy of the managers in the SMEs and hence, in the SME as an organization.

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3 Training in Innovation Tools Using Games – An Experience.

Guillermo Solano^{16*}

ABSTRACT

Helping firms to adopt innovation methodologies has been one of the main challenges of policymakers and support institutions. Any program intended to help a group of firms to increase their competitiveness through the incorporation of innovation strategies and tools, will face several challenges. Some of them are the high heterogeneity, limited availability of people to put in charge of a dedicated innovation process, variable level of knowledge of concepts and language related to management, innovation and diversity of economic or strategic interests of participants. The difficulty of those challenges is increased by the usual need to impact a big quantity of firms with a limited budget. New tools and strategies, based on the application of game principles and mechanics, have been developed to accelerate the training processes and help participants to understand and apply the innovation practices more easily.

The present work is intended to be used as an experience of how a new kind of program to help firms to adopt innovation practices can be designed. The “Alianzas para la innovación” (Alliances for innovation) program that helped more than 1000 firms from Colombia to adopt innovation methodologies in a 4 months training is used as an example of the real application of the game and emotionally based tools presented.

This experience will be useful to policymakers, SME support program designers and researchers.

Keywords: Innovation, SME, WakeUpBrain, MACROS, Training, Colombia, Play to Innovate

3.1 Governments Interested in Accelerate Corporate Innovation

Good amounts of research works have demonstrated the direct relationship between the use of innovation activities in firms and their economic results. As a result, during the last decade, several government institutions over the world, have been designing and offering programs to help firms to adopt innovation practices as a way to increase their economic impact (Barboza, Fonseca, & de Freitas Ramalheiro, 2017); (Steiner & Víctor Traverso, 2010); (Adeyeye, Egbetokun, Opele, Oluwatope, & Sanni, 2017).

3.2 Alliances for Innovation Program

In this scenario, Colciencias, the government innovation agency of Colombia and the Chambers of Commerce Council launched the “Alianzas para la Innovación” (Alliances for innovation) program in 2014¹⁷. The training program wanted to take the participants from strategic goal settings for their business to low-level prototypes of new products, services or processes in a learning-by-doing experience of 4 months.

The objectives of the program, whose operation was in charge of “Centro de innovación“, was to cover more than 1000 firms. Each one must finish a complete process from identifying strategic innovation opportunities, to build a structured concept of a new product, service or process after a basic validation through light prototyping. In the meanwhile, the participants must grow interested in innovation and adopt tools to repeat the process afterwards.

The firms were distributed in 14 different Colombian cities, each having one or two groups of about 30 firms.

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¹⁷ (“Alianzas para la innovación | COLCIENCIAS,” n.d.)

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The program was focused on training owners and managers as a way to increase the likelihood of making the innovation practices permanent and sustainable in each firm (Bourke & Crowley, 2017)

3.3 Challenges Faced by Programs Designed to Help SMEs to Adopt Innovation Practices in Developing Countries

Transforming traditional firms into innovative organizations have proved to be a hard endeavor. Several situations explain this level of difficulty:

- **Amount of firms.** To achieve significant impact in regional economies, big quantities of firms must be covered. This fact usually implies some challenges in the program delivery, e.g., to work with big groups when doing training activities or to give personalized support to participants.
- **The diversity of interests.** Firms show a big diversity of cultural styles and business interests, and therefore, deep differences about their own development objectives and expectations about what innovation practices can bring to them (Tavares, Antonialli, Calegario, de Castro, & de Freiras Carvalho Lima, 2015). This increases the difficulty for designing programs attractive enough for all of them.
- **Low budget.** Usually, public funds to be invested in support programs are short. This fact adds restrictions to the type of tools to be used, the amount and level of experts to be involved in the delivery of the activities and the length of the program.
- **Short term vision.** Short term vision in some regional government supporters adds pressure for getting short-term results. They expect to see clear increases in sales or generated jobs. This approach makes difficult to spend enough time in cultural transformation, which normally requires longer intervention times and is more difficult to measure.

3.4 Particular Needs to Be Fulfilled by the Program

To ensure a high level of impact, the design team of Centro de Innovación focused the first phase of the work, to develop strategies and tools that, besides overcoming the identified challenges, allow:

- To follow closely the progress of each participant
- To maintain the motivation and diminish desertion
- To speed the process in order to observe the deadlines
- To have participants working without demanding too much time from facilitators
- To work in a big group of participants, with heterogeneous interests and characteristics.

3.5 The Macros Pro Program

3.5.1 Program characteristics

Because of the work in the designing phase, the MACROS Pro model was developed. Its main characteristics are:

1. Focus on results. Although we were conscious about the weaknesses that this kind of approach can have, e.g., bias towards incremental innovations, we relied on the emotion that getting real results produces, as a way to motivate the participants to finish the program and to search for deep knowledge on their own. As a result, neither the guidebook nor the work sessions put any priority on helping the participants to explicitly learn innovation related concepts.
2. The six steps MACROS model was used as the main workframe, and the particular tools built adapting both widely adopted innovation tools (as the Business Model Canvas) and WakeUpBrain

tools¹⁸. The game approach of the WakeUpBrain tools helped to speed some of the steps, mainly because its benefits limiting discussions inside the group, and increasing originality and flexibility in the mental performance of the participants.

3. The work with the participants was based on three 2-day long group working sessions separated by 2 weeks of stand-alone work.
4. A unique main facilitator was assigned to each group. As the same facilitator accompanied the SMEs all the process, it was easy for her/him to understand the challenges of each one and give a personalized help every time. The facilitators were all WakeUpBrain graduates and were trained not just in the use of the tools developed, but in the language and way to address to SME owners.
5. A unique workbook, called the *Guidebook to produce innovations* was built using the defined tools and diagrammed using an appealing design. The role of the guidebook was to facilitate the following of the advances of the work done by the participants and to become a record and guide for them to repeat the process later.
6. To complement the guidebook, an online platform was developed to facilitate permanent following of the advances of each SME by the facilitators and the contracting parties (Colciencias and the Chambers of commerce of each region). The platform enabled the firms to receive feedback. Feedback is one of the most important resources the games use to increase motivation.
7. Gamification was used as one main resource to maintain the commitment and motivation of the participants.

Figure 1. WakeUpBrain Book and Game

¹⁸ WakeUpBrain is a set of tools to accelerate innovation using game mechanics. www.wakeupbrain.com

3.6 Macros

To assure that every group will meet the deadlines and every firm get real results, the methodology was based on an easy to follow the process with only six steps, closely connected. The process used the MACROS model, an adaptation of the Design Thinking methodology made by “Centro de Innovación“ and used for several years to guide innovation processes in different types of organizations.

3.6.1 The Six Steps

MACROS, the model applied, is a mainframe for training and helping SMEs to adopt innovative practices and develop new innovative products, services or processes. MACROS involves a flexible but structured sequence of steps that participants can apply directly to their reality. In MACROS, each letter stands for a step as follows:

M: Explore the Map of innovation. In this step, the participant explores the different routes to grow and defines innovation priorities.

A: Add Knowledge. In this step, activities are done to get a deeper understanding of the problem or the user needs.

C: Comprehend and concrete the innovation opportunity. In this step, the participants identify the specific cause of the problem or the unmet need with the highest potential.

R: Re-design, Re-imagine. This is the step where the ideation activities are done.
O: Optimize. In this step, the selected idea is prototyped.

S: Show. In this step, the participants test the idea with real customers.

For each step of the MACROS process, some tools were selected and re-designed following the visual design guidelines.

3.6.2 The Guidebook to Produce Innovations

The guidebook became a powerful tool to ease the process to all participants and facilitators. As a recording tool, the guidebook let the participants review the previous steps and understand the importance of the outputs of each activity. Not just the specially designed tools, but the language and visual style helped to make the guidebook a protagonist in the program. The guidebook was prototyped and validated in two programs before using it in the Alliances program.

3.6.3 Language

Taking into account the high diversity in education levels, age, previous experience, etc. of the participants, the language to be used was one of the focus of work in the process of designing the working material. The strategy around the language to be used relied on two focus:

- The less the better. To make the guidebook less intimidating, the amount of text was strongly limited. The strategy was to rely on the intuitive design, group support and facilitator guidelines during the sessions to make the tool easily workable. The first pages of the guide acted as an “onboarding” activity in order to give participants confidence.
- No management jargon. The typical sophisticated language used in innovation training was not used here. As the strategy was not to teach innovation concepts but lead the participants in a real innovation experience, we found that, at this level, there was no need to introduce them to the management lexicon. Instead, the guidebook used plain language to take the participant from an

activity into the other, not worrying about if she/he was aware of the name of the tool or the concept. This approach not just make the learning process easier and speed the work progress, but also eliminated the problems associated with the differences between the level of innovation-related knowledge of the participants.

3.6.4 Visual Design

To accomplish the goal of maintaining the interest of the participants, making the use of the guidebook easier and helping the involvement not just of the direct participants but also of their collaborators in their organizations, a good effort was put into the visual design of the tool. Some of the elements used were:

- Icons
- Comic-type illustrations
- 2 colors: blue and black
- Non-standard size
- Minimalist style
- Big spaces to write or draw











Figure 2. One of the pages of the guidebook

PUNTUACIÓN FINAL

Asigne los puntos según la posición obtenida. Los puntos obtenidos por cada marco según el lugar que haya obtenido son:

EL MEJOR MARCO DE INNOVACIÓN

INNOVACIONES
Entrar a la Plataforma

				
				
5 puntos	4 puntos	3 puntos	2 puntos	1 punto

	MARCO	PUNTOS EN LA PRIMERA RONDA	PUNTOS EN LA SEGUNDA RONDA	TOTAL DE PUNTOS
1				
2				
3				
4				
5				

Nota: En caso de empate, gana el Marco con mejor puntuación en atractivo emocional

The visual design helped to clearly differentiate the guidebook from the traditional material used in standard business training, making it more an “I want to have” tool.

3.6.5 Gamification

Several elements of Gamification were included:

- Points for finishing activities and getting results. Stars showing the number of points to win were placed into most of the pages of the guidebook.
- Progress scale showing the different levels, from Learner to Innovation Master, that each participant could reach. The participants add the points awarded in every finished activity and identify the actual level of progress. As a feedback system, this tool helps to encourage the participants to continue working (Chou, 2015).

Figure 3. Progress scale



These gamification elements complement the other important component of the motivation strategy of the program, the fraternities.

3.6.6 Fraternities

In order to maintain a high motivation level, a fraternities strategy was included in the program. The objective was to increase the sense of community and commitment to the program. For this purpose, all the participant firms were divided into three fraternities: FCD (Awoken brains fraternity), Illuminati and Fenix. Several channels of communication and collaborative work were provided in order to allow the fraternities to grow a shared set of values and to provide and obtain cross support. Furthermore, the fraternities enabled new gamification dynamics as many of the activities provide points not just for the individual participant but for the fraternities too. The fraternities initiative enabled a mechanism of shared responsibility and auto-regulation on the participants. Additionally, to have a set of shared values gave the fraternities a sense of higher purpose during the process.

3.7 Results of the Program

The program run between February and July of 2017 with the training phase going between March and June of 2017.

- More than 1000 SME completed the process.
- More than 1000 innovation projects (new products, services, processes or business model) with 1000 basic prototypes.
- More than 30 projects funded for advanced prototyping.
- More than 1500 business owners and staff trained in innovation tools
- 42 local facilitators trained in innovation methodologies and consultancy capabilities

Figure 4. Group of participants of the Alliances for innovation program in Pereira, Colombia, holding the fraternities flags



3.8 Conclusions

Having a highly demanding scenario, the regional programs designed to help firms to adopt innovative practices and tools can take advantage of some strategies to increase the impact. Particularly, the inclusion of gamification dynamics can increase the motivation and reduce the desertion. The use of game-based tools helps to speed the progress as diminish the time spent in discussions and increase creativity and mental flexibility. Use of ordered sequences of steps helps the SMEs to understand the process and see the importance of the outcomes of each activity. Appealing design and plain language lower the usual resistance that some participants can have to learn the use of new tools, especially when they are not used to formal training programs.

3.9 Acknowledgments

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4 An Analysis of Relationship between Product Innovation and Performance of Safaricom Limited and Airtel Kenya Limited.

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ABSTRACT

The purpose of this study was to establish the influence of innovation strategies on performance of firms within the telecommunication industry in Kenya, with special focus on Safaricom Limited and Airtel Kenya Limited. The specific objectives of the study are to investigate the effects of disruptive innovations, new market innovations, breakthrough innovations and sustainable innovations on firm performance of Safaricom Ltd and Airtel Kenya Ltd. This study utilized exploratory research design in studying the cause-effect analysis. The study target respondents were the Senior Managers from the 28 staffs from Safaricom Ltd and 24 staffs from Airtel Kenya Ltd. Data for the study was collected using questionnaires that were administered directly. Quantitative and quantitative data was collected. The data was analyzed using means, frequencies and standard deviations, and multiple regression analysis. The study established that disruptive innovations, new market innovations, breakthrough innovations and sustainable innovations influenced firm performance of Safaricom Ltd and Airtel Kenya Ltd. The study recommended that firms should ensure that their products should be identified by the initiation of a new technology and should address a recognized demand but instead create a demand previously unrecognized by the consumer. Firms should have products that evolve into new product lines and evolve into new markets with existing technology. Firms should develop new products that rely on technology never used in the industry before that can cause significant changes in the whole industry.

Keywords: Product Innovation, Technology Innovation, Telecommunication Performance, Customer Retention.

4.1 Background Information

The mobile telephony sector in Kenya is composed of four licensed mobile operators namely Safaricom, Airtel, Telkom Kenya's Orange and Essar Kenya's Yu (Communication Commission of Kenya (CCK), 2012). The mobile sector continues to grow increasingly competitive; this is shown with the steady growth in subscriptions to over 29 Million subscribers as at July 2015 (CCK, 2016). The telecommunication industry in Kenya is highly competitive and characterized by aggressive pricing, marketing and rapid deployment of new technologies.

Mobile telecommunications operators compete for customers principally on the basis of services offered, price, marketing skills, quality, reliability and coverage area. As market saturation approaches, the focus of competition will likely shift from customer acquisition and customer retention to innovations in products and services offered. The subsequent shifts in consumer needs and expectations have compelled aggressive network rollout and infrastructure upgrades using technologies that support high capacity services. Increased competition among the operators has also contributed to the high level of product innovations as a means of customer acquisition and customer retention.

Understanding sources of competitive advantage have become a major area of research in the field of strategic management. Not only must managers be aware of environmental forces and changes, they must also manage the organization resources to take advantage of opportunities and counter threats (Thompson, 2011).

Several studies have concluded that innovative organizations are more profitable than their non-innovative counterparts that are less profitable, perhaps due to benefits derived from the development of products, process and other aspects of organizations operations (Goh, 2011; Roehm & Sternthal, 2010). Specifically, Mitchell (2010) posits that organization's low performance is due to the fact that, rather than maximizing profits, they respond to a social mandate. This does not give room for technological or innovative advancements thus low or no profits. Castellion and Markham (2013) observe that systematic evaluation rarely occurs within

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organizations. Making causal connections between investment in innovation, and future management performance and organization success is extremely difficult.

Worldwide network providers firms have at some point undertaken some form of incremental innovative initiatives. Some of them consider that the cumulative gains in efficiency are much greater over time than those, which come from irregular radical changes (Chao, Reid & Mavondo, 2013). However, many of these short- and medium-term gains are quickly eroded and absorbed into the industry standard (Hamel, 2008) and therefore cannot be depended upon as a prerequisite for survival and growth.

Telecommunication innovation pioneer Qiu and Qu (2010) suggests that companies, practice both incremental and radical innovation. In these periods of incremental innovation, are interspersed when necessary radical and transformational change. Despite the competitive environment that network providers in Kenya are operating in, they have consistently experienced trajectory growth in terms of branch network, a number of customer and asset base. It is therefore expected that for them to thrive in this competitive environment they must ensure product innovation that responds and adapt to the changes and challenges in their operating environment. The outcome of this study is useful for researchers who are interested in product innovation research and would like to select reliable practices to fit appropriate organizational research settings.

In today's rapidly changing and highly competitive environment, firms require resources and capabilities to drive success and performance in order to sustain competitive advantage. According to Thongpravati (2014), the Marketing Science Institute (MSI) has considered the topic of Connecting Innovation with performance as a top-tier research priority for almost a decade. Innovation is viewed as "the prime engine of growth" in economies. New product development (NPD) and product innovation are viewed as one of the most important, value-creating activities required for a firm to succeed, or even survive, in the competitive and dynamic business environment.

According to Wolfe (2014), studies on innovation have used the resource-based view (RBV) to investigate the role of a firm's resources in addressing the dynamic business environment. The RBV of the firm, as proposed in the dynamic capabilities literature, provides an overall theoretical perspective (Akgün, Kerskina & Byrne, 2014). The RBV focuses on a firm's internal resources that are valuable, rare, inimitable and non-substitutable. Importantly, these resources need to be modified, integrated and reconfigured to adapt to the changing environment. This is the dynamic nature of the capability of a firm to alter its internal resources in advantageous ways to improve firm performance. Internal resources, particularly the intangible resources (skills and knowledge) and an entrepreneurial orientation (pro-activeness and innovativeness), are essential for creating a sustainable advantage (Bakar & Ahmad, 2010).

Artz, Norman, Hatfield and Cardinal (2010) argued that the link between RBV and product innovation can strengthen RBV and its empirical grounding. Cast in RBV, product innovation has been regarded as an engine of corporate renewal and is a dynamic capability of the firm. The abilities of a firm to exploit its existing resources and skills and to change the routines for product development can enhance new product performance and firm performance and are therefore important for scholarly examination (De Clercq, Thongpapanl & Dimov, 2011).

Product innovation is also related to being market-focused or market leading. Beverland, Napoli and Farrelly (2010) suggested that firms can be market driving (driving markets) or market driven. Being market driving means that firms challenge the status quo to discover latent or unarticulated needs of customers to develop breakthrough innovations in a new (unpredictable) market (Varadarajan, 2009). Zortea-Johnston, Darroch & Matear (2012) advocate that driving markets innovations drive the market and are considered to be radical or breakthrough in nature (that is new to the world innovations or those innovations that either change consumer behavior or market structures). These types of innovations enable firms to "renew their competitive position and delay eventual firm decline".

Innovative products that are new to both dimensions necessitate more learning/unlearning and organizational changes. In this regard, radical innovations require a greater variety of resources, new skills, learning/unlearning, flexibility and capabilities quite apart from existing technology and practices (McDermott & O'Connor, 2002). Radical innovations, therefore, involve more uncertainty and a higher proportion of experimentation than incremental innovations that involve only extensions, refinements or adaptations of established product designs. Castellion and Markham (2013) considered that "breakthrough (radical)

innovations are so different that they cannot be compared to any existing practices or perceptions. They employ new technologies and create new markets. Breakthroughs are conceptual shifts that make history”.

4.1.1 Telecommunication Sector Performance

The debate on performance is unconcluded. A number of studies focus on financial while others focus on non-financial performance. Studies that used traditional performance measurements were based on traditional accounting systems that were criticized for lack of objectivity, consistency and open to internal manipulations. Indeed, in recent performance research, there has been a drift from exclusive use of financial performance measures to the inclusion of non-financial performance measures. This approach is practically valuable and in line with the multidimensionality of performance construct (Akgün et al., 2014).

Hubbard, (2009) argued that measuring performance play an important role in translating strategy into results. However, as noted by Artz et al., (2010) measuring performance is difficult, especially when what has to be measured keeps changing and is multifaceted. The need for organizations to align their performance measures with goals are well documented in the literature. The complexities of managing the organizations today require that managers analyze different dimensions of performance because performance itself is multidimensional. Performance measurements are not ends in themselves but are useful tools through which managerial purposes are achieved.

Castellion and Markham (2013) outlined eight managerial purposes achieved through performance. He observed that performance is used in evaluation, control, motivation, promotion, celebration, learning and improvement of different processes. Therefore, no single performance measure is adequate in capturing all the eight performance uses hence the adoption multidimensional measures of performance defined by the balanced scorecard between adoption and multidimensional. The balanced scorecard gives a holistic view of the organization by simultaneously looking at the four important perspectives of financial, market, internal processes, learning and growth. It is based on the stakeholder theory where a firm is seen as having a responsibility to wider sets of stakeholders. Stakeholder theory assesses the organization performance against the expectations of variety of stakeholder groups with specific interests in the organization. Lines (2004) argued that to ensure the long-term survival and growth of a business there has to be a balance between the four performance perspectives. Therefore, company survival depends on how well it can position itself based on the four perspectives and optimization of its efforts.

Innovation in telecommunication sector is a necessity and not an option. The telecommunication sector has been a key sector of the economy since the introduction of modern communication and its importance has been vastly magnified by the global entry of information age. Telecommunication in its wired form started with data communication as telegraph services. Innovations evolved into voice communication, where it remained stranded for a long time. Present day environment is forcing companies to create a culture of innovation and new ideas. The mobile service providers have been involved in reinventing various strategies which include data dominant mode with the convergence of voice video and data. The mobile phone market is relatively young and evolving fast (Chong, 2010a).

The mobile phone sub-sector is the most vibrant of all Information Communication Technology (ICT) activities in Kenya. Of the industry’s contribution of United States Dollars (USD) 1.56 billion to Kenya’s gross national Index (GNI), mobile phone activities constitute USD 1,090 million, which equals 70 percent (Bourreau & Dogan, 2010). Turbulent industry conditions are accompanied by many attempts to radically change the organizational structure. This runs from hiring a new Chief Executive Officer (CEO) and a top management team to product innovation, business process re-engineering, and Total Quality Management (TQM) / Continuous improvement. Many efforts are strategic in nature and driven from the top of the firm (Canals2011).

Competition within the mobile service providers has resulted in a significant consolidation of market power with a consequent shift of monopoly power from government to the private sector. The telecommunication market structure is dynamic responding to changing technologies and business practices. The change has brought new technologies and business practices with significant implication on the long-term market structure and survival of operators (CCK, 2012).

In Kenya, the telecommunication industry is highly competitive and characterized by aggressive pricing and marketing strategies and rapid deployment of new technologies. Cuilenburg and Slaa (2010) indicate that

mobile service providers compete for customers principally on the basis of services offered, price, marketing skills, quality, reliability and coverage area. As market saturation approaches, the focus of competition will likely shift from customer acquisition and customer retention to innovations in products and services offered. Understanding sources of competitive advantage have become a major area of research in the field of strategic management. Not only must managers be aware of environmental forces and changes but they must also manage the organization resources to take advantage of opportunities and counter threats (Alam, 2011). The telecommunications industry in Kenya currently exists in a state of monopoly as the market share amongst the four operators is skewed in favor of one operator with a market share of 64%. The other players share the remaining 36%. The two newest entrants that are Essar and Orange are still struggling to find their niche experiencing numerous challenges in the competitive environment that has made it difficult for new entrants to penetrate the market effectively. According to the CCK's report (2012) Safaricom leads the market with 19 million (64%), followed by Airtel Kenya with 4.9 million (16.5%), Orange with 3.4 million (10.5%) and Yu 2.7 million (9.0%) market share.

The mobile telecommunication operators are competing for customers principally based on services offered, price, marketing skills, quality, reliability and coverage area. As market saturation approaches, the focus of the competition is now shifting from customer acquisition and customer retention to innovations in products and services offered. It is against this background that this study attempts to investigate innovation strategies adopted by firms and how they influence the competitiveness of the firms within the telecommunication sector. To date, research interest in the role of innovation strategies in the telecommunication sector is surprisingly sparse and underdeveloped (Xiao Ling, Liyin, Yuzhe & Peng, 2010). The outcome of this study is useful for researchers who are interested in innovation strategies research and would like to select reliable practices to fit appropriate organizational research settings. This study is also important to policymakers in the telecommunication industry as they will be able to know what environmental factors play a bigger role in shaping their operations and how they affect performance and what strategies to use in order to remain competitive.

4.1.2 New Innovations and Organizational Performance

Although they comprise the majority of innovations, it is surprising that the moderately innovative class of innovations that lie in between radical and incremental has had so little attention in the literature in the last twenty years. Kleinschmidt and Cooper (1991) define moderately innovative products as “consisting of lines to the firm, but where the products were not as innovative (that is not new to the market) and new items in existing product lines for the firm” [p. 243]. We will term the moderately innovative product a ‘really new’ innovation. On a macro level, a really new product will result in a market discontinuity or a technological discontinuity but will not incorporate both. (If both do occur, it should be classified as a radical innovation, if no discontinuity occurs at the macro level, it should be classified as an incremental innovation.) On a micro level, any combination of marketing and/or technological discontinuity can occur in the firm. Really new innovations are easily identifiable by the criteria that a discontinuity must occur on either a marketing or technological macro basis in combination with a micro level discontinuity. They can evolve into new product lines (e.g., Sony Walkman), product line extensions with new technology (e.g., Canon, LaserJet), or new markets with existing technology (e.g., early fax machines).

Frequently ‘really new’ products are misclassified as ‘radical innovations’ and ‘radical innovations’ are misclassified as ‘really new’ products. A case in point is the recent research by Kessler and Chakrabarti (1999). They empirically investigated the array of factors that affect the speed of the innovation process. They sorted 75 projects into ‘degree of change undertaken’ identifying 33 incremental innovations and 42 radical innovations. Since less than 20% of innovations develop into radically new products, it is unlikely that these 42 innovations were ‘radical’. Evaluating the innovation’s technology and market S-curves is an easy test to determine the appropriate classification.

Likewise, the research by Atuahene-Gima (1995) on market orientation uses ‘degree of product newness’ to classify 103 incremental innovations and 119 radical innovations. The groups were split into product improvements and line extensions (incremental innovations) and new product lines and new to the world products (radical innovations). As radical innovations do not occur more frequently than incremental innovations, Atuahene-Gima’s (1995) radical innovations may more likely have been really new products.

New product lines rarely result in both new marketing and technical infrastructures. With this reclassification from radical innovation to really new product innovations, one must question whether the destructive radical innovation process is accelerated by concept clarity, champion presence, and colocations as reported in the Kessler and Chakrabarti (1999) findings or is it the really new product innovation process that is sped to market by these factors? Song & Montoya-Weiss (1998) classify really new innovations as “as an entirely new product category and/or production and delivery system. A really new product is one that: (1) relies on technology never used in the industry before; (2) has an impact on or causes significant changes in the whole industry; and (3) is the first of its kind and totally new to the market” (pg. 126). By this definition, it is likely that a portion of Song & Montoya-Weiss (1998), 163 really new innovations may have been radical innovations. (Their sample split was 163 really new innovations and 169 incremental innovations). This classification for radical and really new innovation now allows us to differentiate these two types of innovations from discontinuous innovations.

4.1.3 Breakthrough Innovations and Organizational Performance

As Noori and colleagues acknowledge, consumers are ‘generally not aware of the needs revolutionary products will meet’. Furthermore, ‘substantial customer learning is often a prerequisite for use’. Specific techniques have been developed to cope with these issues, such as information acceleration or lead-user analysis, methods which may be useful but which fail to address the problem of managing the process as a whole. In addition, the success of breakthrough products/services often depends upon the existence of an enabling infrastructure (e.g. ‘the existence of regulations that permit and/or encourage the use of the product and the development of social values consistent with market acceptance’). This means that firms must develop an ‘awareness ... to changes in the environment’ and even take a ‘more proactive approach’ to ‘control the evolution of their environment’. This leads Noori et. al. to conclude that project timing should be developed ‘in accordance with the evolution of environmental factors’ and not ‘according to an absolute time schedule with a goal of reducing time to market as is customary’.

In response to problems of this kind, Cooper (2000) proposes a ‘planning process’ which provides ‘a place to start, a direction for improvement and a way to update continually a dynamic planning document’. In this account, the place to start is an ‘extensive situation analysis’ that ‘pays particular attention to environmental change that comes from political, behavioral, economic, sociological and technological sources’ at three complementary levels, those of ‘the firm, the business ecosystem and the infrastructure’. The objective is to ‘help planners to stay divergent enough in their thinking (so) that the major potential threats and opportunities are more likely to be identified’, and ‘fundamental issues elicited’. This helps in building a ‘critical-issues grid’ which ‘provides a framework that takes some of the randomnesses out of the process, or at least widens the scope for potential conclusions’.

Cooper considers that such an approach represents a partial answer to the challenges identified by Arthur (1988). It does so provide ‘the stakeholders and factors identified are woven into economic webs surrounding the new product’. Cooper suggests using Bayesian networks ‘in which the arcs connecting nodes reflect the conditional probabilities of outcomes’.

For Cooper, the value of using Bayesian networks is that it forces ‘consistency and completeness’ of storytelling. To build a complete Bayesian network ‘involves a combination of knowledge engineering (i.e. a process of translating existing expertise into conditional probabilities) and specification of focused research projects to develop estimates for the unknown arcs’. The latter helps identify directions for improvement. For Cooper, this approach makes it possible to permanently adjust the ‘economic web’. He writes that: ‘at first, numbers can be crude’, only ‘directional approximations of the underlying processes’ can be mapped but concludes that the accuracy of networks (will) improve ‘as the experience and expertise (of the planning team) grows’ and ‘as events unfold’.

Studies of breakthrough innovation all insist upon the need for dynamic monitoring. However, the strategies put forward remain very much in line with recommendations that also apply to non-breakthrough innovations. As a result, they do not address the central ‘hierarchical’ issue of how judgements are to be made, priorities determined and funds allocated in advance.

As we have seen, one key characteristic of breakthrough innovations is that the outcome of the innovation process cannot be calculated. For the most part, methods of evaluation suppose that ‘getting it right’ is a matter of correctly anticipating events and responding accordingly. Such an interpretation places much weight on the

skills of individuals blessed with intuition and a capacity for (more or less systematic) foresight. From a management point of view, it is risky to rely so much on the insights of just one or two individuals.

Callon (1998) and Jolivet (1999) drew three major lessons from the sociology of science and technology: First, the innovation process can be seen as a process by which a very unique and local phenomenon is transformed into a stable, predictable, calculable product — in our words, robust - something that a firm can manage and invest in according to conventional criteria. Second, breakthrough innovation process cannot be calculated, but they can be described (Latour et al 1998). Eliciting the learning steps through which managers seek to provide their innovation with stability, predictability and calculability help determine a route for managing breakthrough innovations and for evaluating the quality of their management. Third, innovative proposals embody visions/assumptions about the future world in which the innovation will be used (De Laat, 1996). These scripts, or scenarios, made by the project manager, will be more or less widely shared by other people concerned about product diffusion and use (users, shareholders, stakeholders).

4.1.4 Sustainable Innovations and Organizational Performance

Sustainable innovations can easily be defined as products that provide new features, benefits, or improvements to the existing technology in the existing market. “An incremental new product involves the adaptation, refinement, and enhancement of existing products and/or production and delivery systems”. Sustainable innovations will occur only from a micro perspective affecting either the marketing and/or technology S-curve(s). Sustainable innovations will not result in macro discontinuities, which are only seen in radical or really new innovations. “Incremental innovations are important on two main counts: first as a competitive weapon in a technologically mature market; and second, because streamlined procedures based on existing technology can help alert a business in good times to threats and opportunities associated with the shift to a new technological plateau”. For many firms, incremental innovations are the lifeblood of the organization.

Sustainable innovations evolve from the iterative nature of the process of innovation previously discussed. Rothwell and Gardiner (1998) show that incremental innovations can occur at all stages of the new product development process. At the conceptualization stage, R&D may use existing technology to improve an existing product design. At the mature stage of a product’s life, line extensions may result in incremental innovations. Rothwell and Gardiner (1998) point out that a ‘borrowed’ technology from a different industry may be new to a different market. If it does not alter on a macro level either the technology or marketing S-curves or on a micro level both curves, this borrowed technology would be considered a sustainable innovation.

4.1.5 Statement of the Problem

It is the desire of every country to grow every sector and telecommunication sector is one key section that drives an economy. In Kenya, many players in this sector include Safaricom Ltd, Airtel Kenya Ltd, Orange Telecom Ltd and Equitel. Each of these has been able to achieve some level of performance in Profit, Market share, customer base and new products.

According to a report by CCK (2016), Kenya's leading telco service provider has registered a decline in its majority market share, Communications Authority of Kenya (CA) has indicated. In the sector's statistics report for the first quarter of 2015/2016, CA stated that Safaricom Limited recorded a market share of 66.3 percent which is a 1.7 percent decline. This was the same case with Safaricom's immediate rival Airtel that also lost its market share by 0.3 percent to stand at 19.1 percent. The decline was despite an upward trend in the market with the quarter under review recording 4.7 percent increase in subscriptions to stand at 37.8 million up from 36.1. "Subsequently, mobile penetration grew from 83.9 percent recorded last quarter to 88.1 percent during the period under review," read part of the report. Airtel gained subscriptions to stand at 7.2 million up from 6.8." However, despite losing its market share, Safaricom gained 3.8 percent in the number of mobile subscriptions to stand at 25.1 million with pre-paid subscribers growing from 23.3 to 25.1 million. This was exhibited by Safaricom's largest market share of 64.1 percent (13.8 million subscriptions) for mobile data. Airtel registered 3.7. The same was replicated in voice traffic with Safaricom gaining 7.1 percent to stand at 75.9 percent with its total traffic volume standing at 8.2 from 6.3 billion minutes. "Airtel experienced a decline in local mobile voice traffic to post 1.7 billion minutes from 1.8. Subsequently, its market share dropped by four percent to stand at 16.2," explained the report.

The researcher sought to understand if the innovation strategies that have been displayed by Safaricom Ltd has anything to do with their high level of performance and also if innovation strategies have contributed negatively to the performance of Airtel Kenya Ltd. It is against this background that this study embarked to establish the influence of innovation strategies on the organizational performance of Safaricom and Airtel Kenya.

4.1.6 Purpose of the Study

The purpose of this study was to establish the influence of innovation strategies on the organizational performance of Safaricom Limited and Airtel Kenya Limited.

4.1.6.1 General Objective

The study sought to establish the influence of innovation strategies on the firm performance of Safaricom Limited and Airtel Kenya limited.

4.1.6.2 Specific Objectives of the Study

The specific objectives of the study were:

- i. To investigate the effect of disruptive innovation on firm performance in the telecommunication sector in Kenya.
- ii. To establish the effect of new market innovation on firm performance in the telecommunication sector in Kenya.
- iii. To assess the effect of breakthrough innovation on firm performance in the telecommunication sector in Kenya.
- iv. To ascertain the effect of sustainable innovations on firm performance in the telecommunication sector in Kenya.

4.1.7 Significance of the Study

This study would be important to the policymakers in the telecommunication industry as they would be able to know what product innovation play a bigger role in shaping their operations and how they affect performance and what innovation to use in order to remain competitive.

Further, the study would be important to the firms' managers as it would help them understand the various product innovations and how their understanding can help different firms enhance their performance.

The study would highlight other important relationships that require further research; this would be in the areas of relationships between firms' resources and the innovations to impact on their performance. The results of this study would also be invaluable to researchers and scholars, as it would form a basis for further research. The students and academics would use this study as a basis for discussions on innovation and firm performance. The study would be a source of reference material for future researchers on other related topics; it would also help other academicians who undertake the same topic in their studies.

4.1.8 Scope of the Study

The study sought to establish the influence of innovation strategies on the firm performance of Safaricom Limited and Airtel Kenya limited. Special focus was on the head offices in Nairobi. This involved collecting information from the management staff on the product innovations in relation to overall organizational performance. This was relevant in collecting the data required as finance and distance were the limiting factors that inhibited collecting the data from each firm branch across the country.

4.2 Literature Review

4.2.1 Theoretical Literature

Rogers Innovation Diffusion Theory, Resource-Based View, guided this study.

4.2.1.1 Rogers Innovation Diffusion Theory

Rogers (2010) seeks to explain how new ideas or innovations were adopted, and this theory proposes that there are five attributes of an innovation that affect adoption: relative advantage, compatibility, complexity, trainability, and observability. Relative advantage is the degree to which an innovation is perceived as being better than the idea it supersedes. Rogers' theory suggests that innovations that have a clear, unambiguous advantage over the previous approach will be more easily adopted and implemented. Current research evidence indicated that if a potential user saw no relative advantage in using the innovation, it would not be adopted (Rogers & Kim, 2010). Compatibility was the degree to which an innovation fit with the existing values, past experiences, and needs of potential adopters. There is strong direct research evidence suggesting that the more compatible the innovation is, the greater the likelihood of adoption (Rogers and Kim, 2010). Complexity is the degree to which an innovation is perceived as difficult to understand and use.

Furthermore, Rogers suggested that new innovations may be categorized on a complexity-simplicity continuum with a qualification that the meaning (and therefore the relevance) of the innovation may not be clearly understood by potential adopters. When key players perceive innovations as being simple to use the innovations will be more easily adopted (Rogers & Kim, 2010). Trialability is the degree to which an innovation may be experimented with on a limited basis. Because new innovations require investing time, energy and resources, innovations that can be tried before being fully implemented are more readily adopted. Finally, observability is the degree to which the results of an innovation are visible to the adopters. If there are observable positive outcomes from the implementation of the innovation then the innovation is more adaptable.

4.2.1.2 Resource Based View Theory

The popularity of the resource-based view (RBV) of the firm has turned our focus on the black box of the firm. Theoretically, the central premise of RBV addresses the fundamental question of why firms are different and how firms achieve and sustain competitive advantage by deploying their resources. Clearly, these ideas are not new. During the last 50 years, many management academics have contributed to the development of this topic. For example, Selznick's (1957) idea of an organization's 'distinctive competence' is directed related to the RBV. In addition, Chandler's (1962) notion of 'structure follows strategy', as well as Andrews' (2013) proposal of an internal appraisal of strengths and weaknesses, led to the identification of distinctive competencies.

However, the founding idea of viewing a firm as a bundle of resources was pioneered by Penrose in 1959. Penrose argued that it is the heterogeneity, not the homogeneity, of the productive services available from its resources that give each firm its unique character. The notion of firm's resources heterogeneity is the basis of the RBV. The significance of the resource perspective as a new direction in the field of strategic management was broadly recognized with the path-breaking article by Wernerfelt (1984). Wernerfelt (1984) suggested that evaluating firms in terms of their resources could lead to insights that differ from traditional perspectives.

In 1991, Barney presented a more concrete and comprehensive framework to identify the needed characteristics of firm resources in order to generate sustainable competitive advantage. These characteristics include whether resources are: valuable (in the sense that they exploit opportunities and/or neutralize threats in a firm's environment), are among a firm's current and potential competitors, inimitable, and non-substitutable (Barney, 1991). In this respect, many authors (Amit & Schoemaker, 2010) have adopted and even expanded Barney's view to include: resource durability, non-traceability, and idiosyncratic nature of resources.

Over the last decade, much of the strategy literature has emphasized resources internal to the firm as the principal driver of firm profitability and strategic advantage. This transition in academic and managerial attention from an Industrial Organization (IO) economic view towards a resource-based view of strategy has occurred for several reasons. First, the rate of change in terms of new products, new technology, and shifts in customer preferences has increased dramatically. Obviously, a static snapshot of a moving industry was not an adequate means for formulating strategy in an increasingly dynamic environment. Secondly, traditional

industry boundaries are blurring as many industries converge or overlap, especially in information technology-related industries. Yet, traditional IO strategic thinking is based on stable industry, as are many strategic analysis tools, including competitor analysis, strategic groups, and diversification typologies. Finally, the increasing rate of change has put increasing pressure on firms to react more quickly, as time is often seen as a source of competitive advantage (Stalk & Hout, 2010). All these reasons suggest that firms may look inwardly for product innovations, while, at the same time, must reconceptualize how they think of industries and define competitors. This RBV theory is relevant to the current study in that it sees the firm as a basis for competitive advantage and attempts to understand how the firm can achieve this through the combining of its capabilities and resources. It would appear that firms operating under an RBV perspective would tend to see themselves as market differentiators (Storey & Easingwood, 2008).

4.2.1.3 Innovator's Solution Theory

Christensen and Raynor's book, *The Innovator's Solution*, is a brilliant analysis of why companies fail to innovate. It explains convincingly why corporate managements do not learn about good ideas, and why managers succumb to inherent pressures to run away from the challenge of disruptive competition rather than stand and fight. The decisions made because of these pressures make sense in the short run to the individuals involved, but in due course, they send the organization into an inexorable death spiral (Storey and Easingwood, 2008).

But while their analysis of the causes of failure to undertake disruptive innovation is effective, their proposal for solving the dilemma of disruptive innovation is less helpful. The central premise of their thesis – the innovator's solution – is to accept the grim reality that big companies are inherently and constitutionally disinclined to tackle disruptive innovation. A modern organization will crush disruptive new ideas, because they represent a threat to management, to careers, to power structures, to customary ways of things, to client bases, to brands, to corporate culture. The authors' solution is to protect genuine innovators and their disruptive change ideas from these hostile forces.

According to Storey and Easingwood, (2008) corporate leaders should put up a wall between the innovation and the existing hierarchy. Leadership should create an independent business unit, which will provide a safe and protected environment for innovation. There the innovation can flourish without having to fight off the interferences and intrusions and anti-innovation attitudes of the hierarchy. Separate organizations do not work – or at least not for long. Allowing a different culture to flourish in separate organization eventually leads to repeated power struggles and culture clashes, which members of the mainstream organization invariably win. Interest in the new ventures tends to be cyclical. Brief surges of enthusiasm, triggered by abundant resources and the desire to diversify, are followed by sharp declines. The life spans of both internal venture units and corporate venture capital funds, therefore, tend to be short – on average, only four to five years (Storey and Easingwood, 2008).

That is the risk with this approach. It is not really “the innovator's solution” as Christensen and Raynor call it. It is actually “deferring the innovator's solution,” because, at some point, someone has to persuade the parent organization to accept the change.

Moreover, this is not merely a one-time challenge of convincing the organization to pursue disruptive innovation. Change advocates have to continue winning the decisions over a multi-year period, as the innovation and its promoters come under attack from sceptics, critics, and everyone with stakes in the status quo. Christensen and Raynor's “solution” rests on the hope that if you can build enough commercial success in the marketplace, you have a better chance of eventually winning that battle of persuasion. Surely, their argument goes, the hard numbers will win the war. Unfortunately, the track record shows that even with strong commercial success, numbers and reason are not enough to dislodge the forces of stasis and inertia.

4.2.2 Empirical Literature

An empirical literature review is a directed search of published works, including periodicals and books that discuss theory and presents empirical results that are relevant to the topic at hand. A literature review is a comprehensive survey of previous inquiries related to a research question. Although it can often be wide in

scope, covering decades, perhaps even centuries of material, it should also be narrowly tailored, addressing only the scholarship that is directly related to the research question. Through the use of a systematic approach to previous scholarship, literature review allows a researcher to place his or her research into an intellectual and historical context. In other words, literature review helps the author declare why their research matters.

4.2.2.1 Disruptive Innovation and Organizational Performance

The term disruptive innovation according to Christensen (1997; 2003) is applied to the type of innovations that initially underperform along performance dimensions that the company's mainstream or established customer segments historically value. Even if such products provide other features that a few fringe customers or new customers value, they do not initially address the needs of the incumbent firms' best customers and often promise lower profit margin. This results in incumbent firms' lack of interest in pursuing or commercializing these types of innovation until it is too late to exploit and benefit from it.

Many scholars have discussed why incumbents usually fail to embrace disruptive innovations where the reasons given range from smaller perceived incentives (Hendersen, 1993), lack of foresight and organizational inertia (Hill & Rothaermel, 2003) to lack of adequate commitment and underinvestment (Christensen & Bower 1996; Gilbert 2005). Particularly, Chandy and Tellis (2000) have termed these arguments as —*The Incumbent's curse* since such thinking proposes that incumbents are found to be so “enamored with their success or hampered by their bureaucracy” that they eventually fail to introduce the next generation of radically new products (p.2). These explanations take an “inside-out” approach as they focus on locating impediments to adoption of disruptive innovation within the companies themselves.

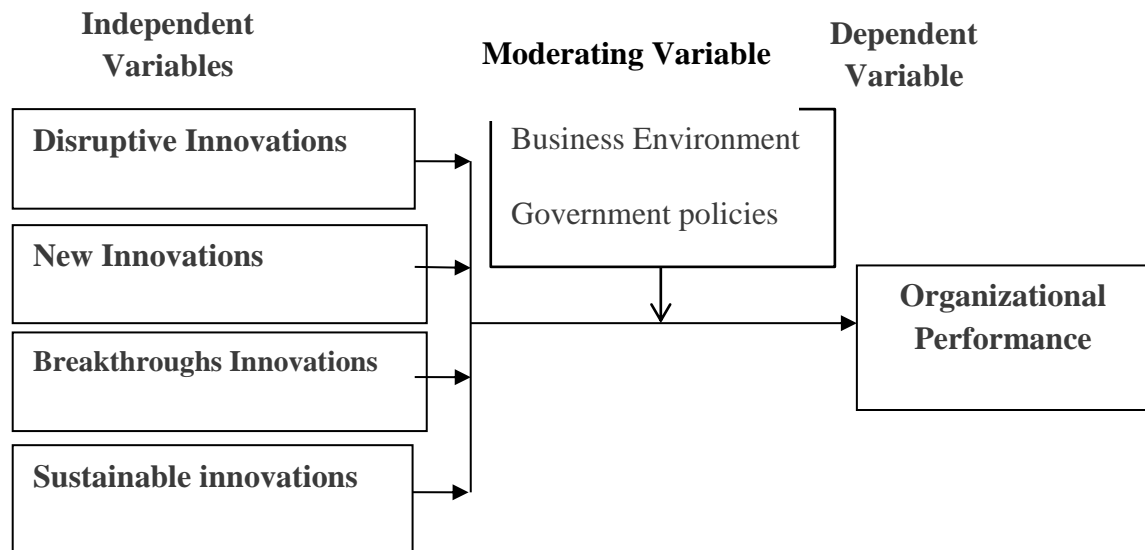
Based on his definition of disruptive innovation, Christensen, on the other hand, provides the concept of value network to explain why incumbent firms fail to introduce disruptive innovation. Christensen (1997) defines value network as “the context within which a firm identifies and responds to customers' needs, solves problems, procures input, reacts to competitors and strives for profit”(p.32). The author explains that the value network and particularly its mainstream customers, which are part of the value network in which the firm is embedded, place insufficient value on the disruptive innovation and hence constrain the pursuit of this technology by the firm. This explanation, on the other hand, takes an “outside-in” approach, as what constraints incumbent firms from introducing or embracing disruptive innovation is the value network, which is something that exists outside the firms.

While the theory of disruptive innovation and the concept of value network are very interesting and informative, the explanations and examples given by the author mostly focus on the relationship between the focal firm and its customers. Thus, further research about incumbent firms' failure by taking a comprehensive perspective in looking at the phenomenon from not only the relationship between the firm and its customers but also other players in the network like its suppliers and complements is needed. This study seeks to establish whether disruptive innovation influences the organizational performance of firms with the telecommunication sector in Kenya.

4.3 Conceptual Framework

According to Pak et al., (2014), a conceptual framework is a diagrammatical representation that shows the relationship between dependent variable and independent variables. This study adopts the following conceptual framework derived from the objectives of the study. The independent variable is innovation while the dependent variable is organizational performance.

Figure 1: Conceptual Framework



Source: Own elaboration

4.4 Research Methodology

The explanatory research design was used in the undertaking of this research because it usually provides rich detail about cases of a predominantly qualitative in nature (Wernefelt, 2013). According to Wolfe (2014), this is a comprehensive study of a social unit, e.g. an individual, a group, social institution, district or a community. Efforts are made to study each and every aspect of the subject in minute details and then case data generalization and inferences are drawn.

Explanatory research design depends on the researchers' perception and gives a clearer insight because it is direct and not indirect and abstract in its approach. The researcher can obtain a real record of personal experiences, which can reveal the motivations of the subjects that drive one to action along with the forces that direct to the adoption of certain patterns of behavior.

4.4.1 Target Population

The target population in statistics is the specific population about which information is desired. According to Zortea-Johnston, Darroch and Matear (2012), a population is a well-defined or set of people, services, elements, and events, group of things or households that are being investigated. The target population of this study was the 28 staffs from Safaricom Ltd and 24 staffs from Airtel Kenya Ltd since they directly dealt with the day to day management of the companies and are the ones conversant with the effects of innovations on the performance of their respective firms. The population characteristic was as summarized in Table 1 below.

Table 1: Target Population

Company	Sales & Marketing	IT	R&D	Finance & Accounting	HR	Logistics	Totals
Safaricom Ltd	6	5	4	4	4	5	28
Airtel Kenya Ltd	4	3	4	4	5	4	24
Total	10	8	8	8	9	9	52

Source: Own elaboration

4.4.1.1 Sample Size

Wolfe (2014) argues that if well chosen, samples of about 50% of a population can often give good reliability. However, because of the small size of the population, the study adopted census method and involve the entire population of 52 target respondents to participate in the study.

4.4.1.2 Research Instruments

A questionnaire was used to collect primary data. The structured questions will be combined with open questions. The questions were developed to capture the respondents' knowledge of the product innovations influence on organizational performance, while the open-ended questions provided room for the respondents to provide additional information. The questionnaire comprised of five (5) sections. Section A included the demographic and operational characteristics meant to determine key issues such as the demographic characteristics of the respondent while the section B to E each concentrated on seeking answers to the questions relating to study specific objectives.

4.4.2 Validity of the Research Instrument

Validity is the extent to which the sample of test items signified the content the test is meant to measure. Expert opinion was requested to comment on the significance and appropriateness of questions and give suggestions for corrections that need to be made to the makeup of the research tools. This helped to develop and better the content validity of the data to be collected (Parry & Kawakami, 2015).

4.4.3 Reliability of the Research Instrument

Internal consistency method was determined using Cronbach's Alpha. The alpha value ranges between 0 and 1 with reliability increasing with the increase in the alpha value. Coefficients between 0.6 and 0.7 are generally accepted that shows acceptable reliability and 0.8 or higher said to be good reliability (Parry & Kawakami, 2015). In this study coefficients value above 0.7 were recommended.

4.4.4 Data Collection Methods and Procedures

The researcher sought a permit from the National Council for Science and Technology and thereafter paid a courtesy call to the County Commissioner and DEO of Nairobi County. The researcher then booked appointments with human resource managers of the sampled companies. The selected company was visited and the questionnaires administered to the respondents as the researcher wait. The respondents were assured that strict confidentiality would be maintained in dealing with their identities. The completed questionnaires were collected the same day they were administered.

4.4.4.1 Data Analysis and Presentation

Descriptive statistics were applied to analyze quantitative data in order to generate percentages, means, median, mode, standard deviation and variance of both dependent and independent variables.

In addition, the study sought to ascertain the causal effect of a dependent variable upon the independent variables that are: the relationship between product innovations and organizational performance. To explore such, the investigator assembled data on the underlying variables of interest and employ regression to estimate the quantitative effect of the causal variables upon the variables that they influence. The investigator also

typically assessed the statistical significance of the estimated relationship. The statistical test included F-test and ANOVA. Data were presented in frequency tables, pie charts and graphs. To quantify the strength of the relationship between the variables, the researcher used the model:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \text{ Where;}$$

Y= the dependent variable (organizational performance)

α - Is a constant and it's the Y value when all the predictor values (X_1 , X_2 , X_3 and X_4) are zero, β_1 , β_2 , β_3 and β_4 - Are constants regression coefficients representing the condition of the independent variables to the dependent variables. X_1 = Disruptive Innovation; X_2 = new innovation; X_3 = breakthrough innovation, X_4 = sustainable innovation and ε - (Extraneous) Error term explaining the variability as a result of other factors not accounted for.

4.5 Data Analysis and Presentation

This study investigated the influence of innovation strategies on the firm performance of Safaricom Limited and Airtel Kenya limited. Specifically the study sought to investigate the effect of disruptive innovation on firm performance in the telecommunication sector in Kenya; To establish the effect of new market innovation on firm performance in the telecommunication sector in Kenya; To assess the effect of breakthrough innovation on firm performance in the telecommunication sector in Kenya and to ascertain the effect of sustainable innovations on firm performance in the telecommunication sector in Kenya. This chapter contains details of response rate, sample characteristics, presentation of data analysis, interpretation and discussion of findings. Data presentation is organized based on the specific objectives of the study. the response rate from respondents stood at 87.77%

4.5.1 Descriptive Analysis

4.5.2 Disruptive Innovation

The responses were captured via Likert scale ranging from 1 –“strongly disagree” with a score of 1 point to the upper end of the scale as 5 – “Strongly agree” with a score of 5 points. In order to investigate the influence of disruptive innovation on firm performance, the respondents were asked to give their opinion and the finding are captured in Table 2.

On whether their firm's product was identified by the initiation of a new technology, 9 (21.4%) disagreed, another 9 (21.4%) strongly disagreed. Eight (19.0%) strongly agreed and another 8 (19.0%) agreed with the sentiment. On whether the products addressed a recognized demand, 14 (33.3%) agreed that their products often did not address a recognized demand but instead created a demand previously unrecognized by the consumer, 13 (31.0%) disagreed while a few 3(7.1%) did not give any opinion. Regarding the question on the cultivation of new distribution channels and new marketing activities, most 20(47.6%) agreed that their products cultivated new distribution channels, and new marketing activities while 10 (23.8%) disagreed with the sentiment. Eleven (26.2%) of the respondents strongly agreed that their products technology acted as the catalyst for the emergence of new markets and/or new industries while 10 (23.8%) did not give any opinion.

All the measures of Disruptive analysis scored means ranging between 2.9 and 3.5 thus emphasizing the variations in the extent to which firms' sought disruptive innovations. Looking at the mean, the study infers that “Our products cultivate new distribution channels, and new marketing activities” (mean of 3.5) and “Our products cultivate new industries with new competitors and firms, distribution channels, and new marketing activities” (mean of 3.3). These findings imply that the firms under study have put emphasis on the development of new distribution channels and new ways of reaching their customers to enhance their performance.

Table 2: Descriptive Analysis of Disruptive Innovations

Disruptive Innovations Constructs		1	2	3	4	5	Mean	Std dev
In this organization, a product is identified by the initiation of a new technology	n	9	9	8	8	8	2.9	1.44
	%	21.4	21.4	19.0	19.0	19.0		
Our products often do not address a recognized demand but instead create a demand previously unrecognized by the consumer	n	7	13	3	14	5	2.9	1.35
	%	16.7	31.0	7.1	33.3	11.9		
Our products cultivate new industries with new competitors and firms, distribution channels, and new marketing activities	n	4	5	10	15	8	3.3	1.11
	%	9.5	11.9	23.8	35.7	19.0		
Our products cultivates new distribution channels, and new marketing activities	n	0	10	7	20	5	3.5	0.99
	%	0.0	23.8	16.7	47.6	11.9		
Our products technology acts as the catalyst for the emergence of new markets and/or new industries	n	8	5	10	8	11	3.2	1.46
	%	19.0	11.9	23.8	19.0	26.2		
Average							3.2	1.27

4.5.2.1 New Innovations

The study sought to establish the respondents' level of agreement with a statement about new innovations in their organizations. A scale of 1 to 5 was used where 1 strongly disagreed, 2 disagreed, 3 was neutral, 4 agreed and 5 strongly agreed.

The respondents were asked whether a really new products result in a market discontinuity or a technological discontinuity 13(31.0%) agreed that in their organization a really new products resulted in a market discontinuity or a technological discontinuity but did not incorporate both, 12 (28.6) disagreed while 9 (21.4%) strongly disagreed with the sentiment. As to whether there were products that evolved into new product lines, 13 (31.0%) agreed, 12 (28.6%) did not give any opinion while 6 (14.3%) strongly agreed and disagreed respectively with the sentiment. Regarding product growth into product line extension, 16 (38.1%) agreed that they had products that evolved into product line extensions with new technology, 10 (23.8%) were neutral, 10 (23.8%) disagreed while a few 2 (4.8%) strongly agreed with the sentiment, 14 (33.3%) agreed that new product lines resulted in both new marketing and technical infrastructures, 11(26.2%) strongly agreed while 8(19.0%) disagreed with the sentiment. Lastly, 19 (45.2%) of the respondents agreed that their products impact caused significant changes in the whole industry.

All the measures of new innovations scored means ranging between 2.9 and 3.5 thus emphasizing the variations in the extent to which the firms under study focused on new innovations. Looking at the mean, the study infers that "New product lines result in both new marketing and technical infrastructures" (mean of 3.5), "Our products have an impact causes significant changes in the whole industry" (Mean 3.5) and "We have products that have evolved into new markets with existing technology" (mean of 3.0). These findings imply that Safaricom ltd and Airtel Kenya Ltd seek to create new technological products with an aim of growing their market share.

Table 3: Descriptive Analysis of New Innovations

		1	2	3	4	5	Mean	Std dev
In this organization really new products result in a market discontinuity or a technological discontinuity but will not incorporate both.	n	9	12	2	13	6	2.9	1.43
	%	21.4	28.6	4.8	31.0	14.3		
We have products that have evolved into new product lines	n	5	6	12	13	6	3.2	1.22
	%	11.9	14.3	28.6	31.0	14.3		
We have products that have evolved into product line extensions with new technology	n	4	10	10	16	2	3.0	1.10
	%	9.5	23.8	23.8	38.1	4.8		
We have products that have evolved into new markets with existing technology	n	4	5	10	15	8	3.4	1.21
	%	9.5	11.9	23.8	35.7	19.0		
New product lines result in both new marketing and technical infrastructures	n	4	8	5	14	11	3.5	1.33
	%	9.5	19.0	11.9	33.3	26.2		
Our new products rely on technology never used in the industry before	n	8	4	11	10	9	3.2	1.40
	%	19.0	9.5	26.2	23.8	21.4		
Our products have an impact causes significant changes in the whole industry	n	0	12	5	19	6	3.5	1.06
	%	0.0	28.6	11.9	45.2	14.3		
Our products are the first of its kind and totally new to the market	n	6	2	13	16	5	3.3	1.20
	%	14.3	4.8	31.0	38.1	11.9		

4.5.2.2 Breakthrough Innovations

The study sought to establish the respondents' level of agreement with a statement about breakthrough innovations in their organizations. A scale of 1 to 5 was used where 1 strongly disagreed, 2 disagreed, 3 was neutral, 4 agreed and 5 strongly agreed. The respondents were asked whether their organizations had products that provided new features, benefits, or improvements to the existing technology in the existing market, 16 (38.1%) agreed, 14 (33.3%) disagreed, 6 (14.3%) did not give any opinion while 2 (4.8%) strongly agreed with the sentiment. On the question "Our products involve the adaptation, refinement, and enhancement of existing products and/or production and delivery systems" 13 (31.0%) were neutral, 9 (21.4%) strongly disagreed, 6 (14.3%) disagreed while 8 (19.0%) strongly agreed with the sentiment. Fourteen (33.3%) of the respondents strongly agreed that their products are a competitive weapon in the technologically mature market, 13 (31.0%) disagreed while 2 (4.8%) strongly agreed over the same statement.

All the measures of breakthrough innovation scored means ranging between 2.8 and 3.3 thus emphasizing the variations in the extent to which the firms viewed breakthrough innovations. Looking at the mean, the study infers that "We have products that are the lifeblood of the organization" (Mean 3.3), "Our products involve the adaptation, refinement, and enhancement of existing products and/or production and delivery systems" (Mean 3.0) and "In this organization we have products that provide new features, benefits, or improvements to the existing technology in the existing market" (Mean 3.1). These findings imply that Safaricom Ltd and Airtel Kenya Ltd have products that are the lifeblood of the organizations and the products involve the adaptation, refinement, and enhancement of existing products and/or production and delivery systems.

Table 4: Descriptive Analysis for Breakthrough Innovations

		1	2	3	4	5	Mean	Std dev
In this organization, we have products that provide new features, benefits, or improvements to the existing technology in the existing market	n	2	14	6	16	4	3.1	1.14
	%	4.8	33.3	14.3	38.1	9.5		
Our products involve the adaptation, refinement, and enhancement of existing products and/or production and delivery systems	n	9	6	13	6	8	3.0	1.40
	%	21.4	14.3	31.0	14.3	19.0		
Our products are a competitive weapon in the technologically mature market	n	6	13	7	14	2	2.8	1.19
	%	14.3	31.0	16.7	33.3	4.8		
We have products that are the lifeblood of the organization	n	5	4	13	14	6	3.3	1.20
	%	11.9	9.5	31.0	33.3	14.3		

4.5.2.3 Sustainable Innovations

The study sought to establish the respondents' level of agreement with a statement about sustainable innovations in their organizations. A scale of 1 to 5 was used where 1 strongly disagreed, 2 disagreed, 3 was neutral, 4 agreed and 5 strongly agreed.

The respondents were asked whether their organization's adapted products originally developed by other enterprises or institutions, 18 (42.9%) agreed, 11 (26.2%) disagreed while 8 (19.0%) were neutral over the same statement. Regarding modification of products, 14 (33.3%) agreed that their organization's modified products originally developed by other enterprises or institutions, 11(26.2%) were neutral while 6(14.3%) strongly agreed with the sentiment. Concerning the newness of the products, 14(33.3%) agreed that their products were frequently new to the organization and new to the market while 13(31.0%) were neutral over the same statement. Lastly, 16 (38.1%) agreed that their products significantly altered the market direction, 11 (26.2%) were neutral while 12 (28.6%) disagreed with the sentiment.

Table 5: Descriptive Analysis for Sustainable innovations

		1	2	3	4	5	Mean	Std dev
This organization adapts products originally developed by other enterprises or institutions.	n	0	11	8	18	5	3.4	1.01
	%	0	26.2	19.0	42.9	11.9		
This organization modifies products originally developed by other enterprises or institutions	n	6	2	11	14	9	3.4	1.29
	%	14.3	4.8	26.2	33.3	21.4		
Our products are frequently new to the organization and new to the market	n	2	13	4	14	9	3.4	1.27
	%	4.8	31.0	9.5	33.3	21.4		
Our products usually have high technological innovativeness and high market innovativeness	n	5	8	13	11	5	3.1	1.20
	%	11.9	19.0	31.0	26.2	11.9		
Our products significantly alter the market direction	n	3	12	11	16	0	3.0	0.99
	%	7.1	28.6	26.2	38.1	0.0		

4.5.2.4 Firm Performance

The study sought to establish the respondents' level of agreement with a statement about firm performance in relation to product innovations in their organizations. A scale of 1 to 5 was used where 1 strongly disagreed, 2 disagreed, 3 was neutral, 4 agreed and 5 strongly agreed.

Eleven (26.2%) of the respondents agreed that their firms grew their revenue base from product innovations, 12 (28.6%) were neutral while 6 (14.3%) strongly agreed with the sentiment. Regarding cost reduction, 18 (42.9%) of the respondents agreed that their firms had reduced cost from product-related innovations while 9 (21.4%) disagreed with the sentiment. Regarding market share growth, 9 (21.4%) of the respondents strongly

agreed that their firms grew their market share from product innovations while 11 (26.2%) did not give any opinion.

All the measures of market share scored means ranging between 3.0 and 3.2. Looking at the means, the study infers that product innovations led to slight growth in revenue reduced cost and growth in market share of the firms under study.

Table 6: Descriptive Analysis of Firm Performance

		1	2	3	4	5	Mean	Std dev
Grown its revenue base from product innovations.	n	5	8	12	11	6	3.1	1.23
	%	11.9	19	28.6	26.2	14.3		
Reduced cost from product related innovations.	n	6	9	3	18	6	3.2	1.34
	%	14.3	21.4	7.1	42.9	14.3		
Grown its market share from product innovations.	n	7	8	11	7	9	3.1	1.39
	%	16.7	19.0	26.2	16.7	21.4		
The highest product range in the industry.	n	3	13	9	15	2	3.0	1.08
	%	7.1	31.0	21.4	35.7	4.8		

4.5.3 Inferential Analysis

4.5.3.1 ANOVA Analysis of the Overall Model

The ANOVA analysis in Table 7 presents the influence of all the independent variables on firm performance. The results presented a p-value of 0.000 that was less than 0.05. This indicated that the model was statistically significant in explaining the impact of the independent variables on the performance of Safaricom Ltd and Airtel Kenya Ltd. It is therefore concluded that the independent variables had significant combined effects on the firm performance. The model was for the estimation of the contributions of the independent variables on firm performance.

Table 7: ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.512	4	8.378	7.836	.000(a)
	Residual	39.559	37	1.069		
	Total	73.071	41			

a Predictors: (Constant), Disruptive innovations, new innovations, breakthrough innovations and sustainable innovations

b Dependent Variable: Firm Performance

4.5.3.2 Goodness of Fit Model Summary

The significance of the model was reaffirmed by the goodness of fit tests in Table 8, whereby the coefficient of determination (R square) of 0.893 confirmed that the model explained 89.3% of the variation or change in the dependent variables. The adjusted R square of 0.785 did not make a significant difference since the model now explained 78.5% of the variations. The standard error of estimate was .57765. The goodness of fit test in Table 8 presents the goodness of fit of the model:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Being the linear model involving independent variables; Y = Firm performance, X1 = disruptive innovations, X2 = New innovations, X3 = Breakthrough innovations, and X4 = Sustainable Innovations. The coefficient of determination (R square) of 0.893 indicated that the model explained 89.3% of the variations in the dependent

variable. This meant that the linear model was a good fit in explaining the relationship between the dependent and independent variables. A further 10.7% of Firm performance is attributed to other factors not investigated in this study.

Table 8: Fitness Test for the Overall Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.893(a)	.797	.785	.57765

4.5.3.3 Coefficient of Determination

The study conducted a multiple regression analysis and from the above regression model, holding (Disruptive innovations, new innovations, breakthrough innovations and sustainable innovations) constant at zero, firm performance of Safaricom Ltd and Airtel Kenya Ltd will be 1.147. A one percent (1%) change in disruptive innovations adopted will lead to zero point four eight eight percent (0.488%) variation in firm performance; also a one percent (1%) change in new innovations adopted will lead to zero point two six nine percent (0.269%) variation in firm performance. Further, a one percent (1%) change in breakthrough innovations adopted will lead to zero point three eight four percent (0.384%) variation in firm performance and lastly a one percent (1%) change in sustainable innovations adopted will lead to zero point two two one percent (0.221%) variations in firm performance. This shows that there is a positive relationship between (Disruptive innovations, new innovations, breakthrough innovations and sustainable innovations) and firm performance.

Table 9: Regression Analysis Results

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.147	3.93		2.915	.000
Disruptive innovations	.488	.255	.663	1.908	.001
Breakthrough innovations	.384	.106	.397	3.608	.001
Sustainable innovations	.221	.115	.192	1.917	.003
New innovations	.269	.135	.387	1.991	.003

a Dependent Variable: Firm Performance

The Unstandardized beta coefficients column in Table 9 below were used to obtain the overall equation as suggested in the conceptual framework. When these beta coefficients are substituted in the equation, the model becomes:

$$Y = 1.147 + 0.488X_1 + 0.384 X_2 + 0.221 X_3 + 0.269X_4 + \varepsilon \text{ where}$$

Y = Firm performance, X1 = Disruptive innovations, X2 = Breakthrough innovations, X3 = Sustainable innovations, and X4 = New innovations

The results also show the unique contribution to the explaining of the independent variable. The standardized coefficients assess the contribution of each independent variable towards the prediction of the dependent variable since they have been converted in the same scale to show comparison. The t-test statistic shows that all the B coefficients of disruptive innovations, new innovations, breakthrough innovations and sustainable innovations are significant (since $p < 0.05$).

4.6 Summary, Conclusion and Recommendations

4.6.1 Disruptive Innovation and Firm Performance

The study established that disruptive innovations influenced the firm performance of Safaricom Ltd and Airtel Kenya Ltd since one percent (1%) change in disruptive innovations adopted led to zero point four eight eight percent (0.488%) variation in their performance. The firms' products cultivated new distribution channels, and new marketing activities and new industries with new competitors and firms.

4.6.2 New Innovations and Firm Performance

The study established that new innovations influenced the performance of Safaricom Ltd and Airtel Kenya Ltd since one percent (1%) change in new innovations adopted will lead to zero point two six nine percent (0.269%) variation in firm performance. The study found that really new products partially resulted in a market discontinuity or a technological discontinuity but did not incorporate both. The two firms under study had products that evolved into product line extensions with new technology and new product lines resulted in both new marketing and technical infrastructures.

4.6.3 Breakthrough and Firm Performance

The study established that breakthrough innovations influenced the market share of Safaricom Ltd and Airtel Kenya Ltd since one percent (1%) change in breakthrough innovations adopted will lead to zero point three eight four percent (0.384%) variation in firm performance. The study showed that both firms had products that provided new features, benefits, or improvements to the existing technology in the existing market, the products involved the adaptation, refinement, and enhancement of existing products and/or production and delivery systems and that the products were a competitive weapon in the technologically mature market.

4.6.4 Sustainable Innovations and Firm Performance

The study revealed that sustainable innovations influenced the firm performance of Safaricom Ltd and Airtel Kenya Ltd since one percent (1%) change in sustainable innovations adopted led to zero point two two one percent (0.221%) variations in firm performance. The two firms under study adapted products originally developed by other enterprises or institutions, they also modified products originally developed by other enterprises or institutions, the products were frequently new to the organization and new to the market.

4.7 Conclusions

The study concludes that disruptive innovations influenced the firm performance of Safaricom Ltd and Airtel Kenya Ltd since one percent (1%) change in disruptive innovations adopted led to zero point four eight eight percent (0.488%) variation in their performance. The firms' products cultivated new distribution channels, and new marketing activities and new industries with new competitors and firms.

The study concludes that new innovations influenced the performance of Safaricom Ltd and Airtel Kenya Ltd since one percent (1%) change in new innovations adopted led to zero point two six nine percent (0.269%) variation in firm performance. Really new products partially resulted in a market discontinuity or a technological discontinuity but did not incorporate both. The two firms under study had products that evolved into product line extensions with new technology and new product lines resulted in both new marketing and technical infrastructures.

The study concludes that breakthrough innovations influenced the market share of Safaricom Ltd and Airtel Kenya Ltd since a one percent (1%) change in breakthrough innovations adopted will lead to zero point three eight four percent (0.384%) variation in firm performance, both firms had products that provided new features, benefits, or improvements to the existing technology in the existing market, the products involved the adaptation, refinement, and enhancement of existing products and/or production and delivery systems and that the products were a competitive weapon in the technologically mature market.

The study concludes that sustainable innovations influenced the firm performance of Safaricom Ltd and Airtel Kenya Ltd since one percent (1%) change in sustainable innovations adopted led to zero point two two one

percent (0.221%) variations in firm performance. The two firms under study adapted products originally developed by other enterprises or institutions, they also modified products originally developed by other enterprises or institutions, the products were frequently new to the organization and new to the market.

4.7.1 Recommendations

The study confirmed that disruptive innovations influenced the firm performance of Safaricom Ltd and Airtel Kenya Ltd. The study recommends that firms should ensure that their products should be identified by the initiation of a new technology and should address a recognized demand but instead create a demand previously unrecognized by the consumer. The product's technology should act as the catalyst for the emergence of new markets and/or new industries.

The study established that new innovations influenced the performance of Safaricom Ltd and Airtel Kenya Ltd. The study recommends firms to have products that evolve into new product lines and evolve into new markets with existing technology. Firms should develop new products that rely on technology never used in the industry before that can cause significant changes in the whole industry.

The study showed that breakthrough innovations influenced the market share of Safaricom Ltd and Airtel Kenya Ltd. The study recommends that to enhance performance, organizations should have products that provide new features, benefits, or improvements to the existing technology in the existing market. The products should be a competitive weapon in the technologically mature market and the lifeblood of the organization.

The study revealed that sustainable innovations influenced the firm performance of Safaricom Ltd and Airtel Kenya Ltd. The study recommends that to enhance the firm performance, firms should adapt and modify products originally developed by other enterprises or institutions, and ensure they have high technological innovativeness and high market innovativeness.

4.7.2 Suggestion for Further Study

While this study successfully examines the variables, it also presents rich prospects for several other areas to be researched in future. The present study was only confined to a specific industry. It would, however, be useful to carry out a similar study across heterogeneous industries such as construction, banking among others. This study focused on the telecommunication firms in Kenya. It would be useful to carry out the same type of research across East Africa and beyond and see whether the same results would be replicated.

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Appendices

Appendix I: Factor Analysis Results

Component Matrix (a)

	Component					
	1	2	3	4	5	6
DI1	.767	.113	.050	-.434	-.197	-.037
DI2	.539	.391	.397	-.322	-.190	-.350
DI3	-.007	.769	.449	-.040	.004	-.130
DI4	-.634	.395	.421	-.166	.373	-.020
DI5	-.782	-.147	.024	.524	.164	.079
NI1	.504	-.414	-.611	-.081	.139	.172
NI2	.040	.792	.155	.210	.053	.151
NI3	.571	-.527	.131	-.120	-.181	.292
NI4	.747	.040	.277	-.101	-.226	.431
NI5	.325	.379	.205	.512	-.417	.345
NI6	-.076	.801	-.353	.052	.059	.105
NI7	-.621	.513	.214	.110	.186	.263
NI8	-.850	-.123	.310	-.013	.170	.078
BI1	-.442	-.573	.447	-.262	.212	-.109
BI2	.075	-.775	.280	.417	-.016	-.204
BI3	.566	-.433	-.327	.037	.181	-.338
BI4	.843	.076	.214	.122	.312	.101
SI1	.476	.690	.064	.023	.387	-.085
SI2	-.069	.801	.225	-.154	.164	.183
SI3	-.625	.502	.298	.124	-.235	-.063
SI4	-.814	-.059	.167	.030	-.429	-.146
SI5	-.493	-.613	.376	-.163	-.277	-.091
FP1	.140	-.809	.336	-.073	.164	.005
FP2	.588	-.464	.321	-.100	.347	.224
FP3	.663	-.059	.259	.638	.075	-.134
FP4	.421	.451	.024	.416	.013	-.325

Extraction Method: Principal Component Analysis.

6 components extracted.

5 How Micro and Small Business Improve their Capabilities: Analyzing the Role of Absorptive Capacity.

Yonni Angel Cuero Acosta²²

ABSTRACT

Micro, small and medium-sized enterprises (MSMEs) are fundamental to the progress of any economy. Presently, it is crucial to understand how this type of companies is able to improve their competitiveness. In this regard, this paper conceptually discusses how MSMEs improve their organizational capabilities and what it is the role of Absorptive capacity (AC) in doing that improvement. From our point of view, the organizational capabilities require a starting point, major capabilities which pave the path of development from the other capabilities. AC performs this role at the firm level. In this regard, for further developing the conceptual understanding about the management of MSMEs, it is relevant to conceptualize the organizational capabilities in terms of which are appropriate for MSMEs in order to manage knowledge. Thus, the main theoretical implication of this paper is the analysis of dynamic capabilities within MSMEs.

Keywords: Small Business, Absorptive Capacity.

5.1 Introduction

The most noted influence of micro, small and medium-sized enterprises (MSMEs) is observed in the economic context where results are tangible. For example, these types of firms are essential for the generation of jobs and employment (Curran, 2000; Davidsson & Delmar, 1997; Garg & Walia, 2012; Gibb, 2000; Gupta et al., 2013; Hamilton & Dana, 2003; Reeg, 2013; Robbins, Pantuosco, Parker, & Fuller, 2000; Smallbone & Wyer, 2000; Tonge, Larsen, & Roberts, 2000; Westhead & Birley, 1995). Simultaneously, MSMEs foster exports and economic expansion (Tambunan, 2006). Because of this, the contributions of small and medium enterprises are fundamental to structuring the economic path of a country. This is especially true regarding the role of MSMEs in developing countries (Altenburg & Eckhardt, 2006; OECD & ECLAC, 2012). The performance of MSMEs has an overwhelming impact on a country's economic growth and technological development. Additionally, authors also highlight the significance of MSMEs' impact on economic development because they are the vast majority of firms and the major driver of growth (Ayyagari, Demircuc-kunt, & Maksimovic, 2013; Bartelsman, Haltiwanger, & Scarpetta, 2004; Farouk & Saleh, 2011; Ferraro, 2011; Reeg, 2013; Tambunan, 2006). In this line of thinking, authors recognize that MSMEs are not only the backbone of the economy (Amini, 2004; Gupta, Guha, & Krishnaswami, 2013; Khalique, Isa, Nassir, & Ageel, 2011; Peters & Waterman, 1982; Radam, Abu, & Abdullah, 2008; World Bank, 2013) but also a fundamental factor for social development (Alvarez & Duran, 2009; Gupta et al., 2013).

At the same time, innovation is currently playing a decisive role between developed and developing countries in terms of industrial production and socioeconomic conditions. While small businesses play a role in the level of innovation of a country, it is important to observe the factors that can facilitate or constraint the role of SMEs in this matter. In this regard, Morales et al. (2010) added that the deficiency of dynamic capabilities has played an imperative role in the constraining of innovation. Therefore, the limitations in innovation within MSMEs can be seen as a consequence of the presence of other fundamental challenges such as the ability to manage technology (Khalique et al., 2011), the development of entrepreneurial capabilities (Teoh & Chong, 2008) and the need of trained human resources (Cornell et al., 2013; OECD & ECLAC, 2012). For this reason, it is important to pay attention to previous stages to achieve innovation. In other words, the acquisition and improvement of capabilities will bring a solid base to create new ways of doing things and develop technology (Oxford Economies, 2013).

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5.2 Literature Review

A country's development process takes time and is dynamic (Ortiz & Vasquez, 2007). Within the process of economic development, the enhancement of capabilities really matters. For this reason, it is also very important to understand the composition of capabilities at the firm level and how these capabilities interact.

5.2.1 Hierarchy of Capabilities

Various authors have used the terms competence and capability interchangeably. As an illustration, Danneels (2008) defines a competence as a set of resources that enables a firm to accomplish a particular task. By contrast, a capability is "a high-level routine (or collection of routines) that, together with its implementing input flows, confers upon an organization's management a set of decision options for producing significant outputs of a particular type" (Winter, 2003, pp.991). To put it simply, the capability is the use of a firm's resources in response to market pressures. It is also necessary to clarify the term resource. An organizational resource "includes tangible, intangible, and human assets (or resources) as well as capabilities which the organization owns, controls, or has access to on a preferential basis" (Helfat C. E., 2003, pp.1).

Although the accumulation of capabilities can take place at various levels, it is at the firm level that this accumulation can have the most significant impact on economic development. Rooted in knowledge, capabilities play a fundamental role in a firm's competitiveness. The interaction between capabilities and resources is the factor, which differentiates successful firms from unsuccessful ones. Within firms, capabilities interplay in a hierarchical way. This hierarchy is composed of three levels and is well known within the literature as operational capabilities, dynamic capabilities and higher-order capabilities (Laperriere, 2013).

5.2.2 Operational Capabilities

The lowest level of capabilities is those "which reflect an ability to perform the basic functional activities of the firm (e.g. plant layout, distribution logistics and marketing campaigns)" (Vera et al., 2011, pp. 159). This level characterizes how firms are currently performing. Operational capabilities refer to "how a company earns a living now" (Winter, 2003, pp.992). Therefore, the term operational capabilities refer only to the capabilities that allow firms to perform their daily operative activities. Obviously, firms cannot focus only on the acquisition or improvement of operational capabilities. Firms doing that would be at a disadvantage against competitors that have invested in higher-order capabilities. Although operational capabilities are indispensable for the day-to-day operations of a firm, they are not decisive in terms of the ability to react to new requirements in the markets. To boost competitiveness, companies have to apply dynamic capabilities to change or to improve operational capabilities. Figure 1 above presents the activities at the operational level, which include the routine processes used to market, sell and deliver a firm's products or services.

5.2.3 Dynamic Capabilities

The discussion in the literature about dynamic capabilities is based on the Evolutionary Theory of the Firm (Nelson & Winter, 1982). Dynamic capabilities have been defined as "the firm's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments" (Teece et al., 1997, p.516). Simplifying this definition, "a dynamic capability is the capacity of an organization to purposefully create, extend, or modify its resource base" (Helfat, et al., 2009, pp.4). Firms seek to be more competitive by improving their routines (Zollo & Winter, 2002). Dynamic capabilities become embedded within a firm's processes (Ambrosini, Bowman, & Collier, 2009) and support the firm's response to market pressures (Danneels, 2008). Further, an important feature of dynamic capabilities is that they are guided by the entrepreneur's vision or perception about the opportunities for change within a firm (Zahra, Sapienza, & Davidsson, 2006). Table 1 presents the evolution of the definition of dynamic capabilities based on the work of Zahra et al. (2006).

Table 1. Key Definitions of Dynamic Capabilities

Author	Definition
(Helfat C. E., 1997)	The subset of the competencies/capabilities which allow a firm to create new products and processes and to respond to changing market circumstances
(Teece et al., 1997)	A firm's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments
(Eisenhardt & Martin, 2000)	The processes in a firm that use resources - specifically the processes to integrate, reconfigure, gain and release resources - to match or even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve and die
(Griffith & Harvey, 2001)	A global dynamic capability is the creation of difficult-to-imitate combinations of resources, including effective coordination of inter-organizational relationships, on a global basis that can provide a firm a competitive advantage
(Lee, Lee, & Rho, 2002)	A newer source of competitive advantage in conceptualizing how firms are able to cope with environmental changes
(Rindova & Taylor, 2002)	Dynamic capabilities evolve at two levels: a micro-evolution through "upgrading the management capabilities of the firm" and a macro-evolution associated with "reconfiguring market competencies"
(Zahra & George, 2002)	Dynamic capabilities are essentially change-oriented capabilities that help firms redeploy and reconfigure their resource base to meet evolving customer demands and competitor strategies
(Zollo & Winter, 2002)	A dynamic capability is a learned and stable pattern of collective action through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness
(Winter, 2003)	Those that operate to extend, modify or create ordinary (substantive) capabilities

Source: (Zahra et al., 2006)

Table 1 shows that throughout its evolution the definition of dynamic capabilities has always been related to the competitiveness of firms, the reconfiguration of resources and operational capabilities. Dynamic capabilities include changes in the organizational culture. Firms need dynamic capabilities to survive in markets because dynamic capabilities are a key element to boosting a firm's performance. A firm's dynamic capabilities can be observed in the strategic processes, which allow the firm to develop products, network strategy and new market strategies. Despite the relevant role of dynamic capabilities, they alone cannot determine a firm's competitiveness (Eisenhardt & Martin, 2000; Winter, 2003). Figure 1 presents as dynamic capabilities those activities related to the development of new products and services, the diversification of the market and products, knowledge management and alliancing or networking with other firms.

5.2.4 Higher-order Capabilities

The conceptualization of higher-order capabilities represents how firms invest in order to acquire and to use knowledge. At the same time, it is important to discuss the interaction between the three levels of capabilities is hierarchical. First, higher-order capabilities affect dynamic capabilities. Second, dynamic capabilities have an impact on the operational capabilities. At the higher-order capabilities level, strategic decisions are made which deal with the management of knowledge by the firm. Higher-order capabilities represent the learning mechanisms that a firm applies in order to be able to accumulate, articulate, transfer and create knowledge, which then becomes the fundamental mode of improving dynamic capabilities. Hence, higher-order capabilities guide and strengthen dynamic capabilities. Danneels (2007) conceptualizes higher-order

capabilities as the ability to learn within firms; it is at this level that organizations generate all of the mechanisms, which energize their performance. Higher-order capabilities become the ultimate capabilities, which guide all the processes that firms establish in order to transform dynamic capabilities (Vera et al., 2011).

5.2.5 Dynamic Capabilities as Influential Factor in Firms' Management

Teece (2011) argues that the ability that dynamic capabilities have to reconfigure the firm's resource base can be seen in the skills and processes within the organization's structure. If it is argued that, a capability is the ability to execute a determined activity within a firm (Amit & Schoemaker, 1993; Helfat et al., 2009; Helfat & Peteraf, 2002; Helfat & Winter, 2011), so it is that a capability must have an impact on the operational level of the firms. For example, if firms require using knowledge from various sources, dynamic capabilities contribute to managing that knowledge (Laperriere, 2013), the complementary effect of dynamic capabilities should be the strengthening of the firm's competitiveness as Eisenhardt and Martin (2000) claimed.

Capron and Mitchell (2009) report the use of capabilities which can support obtaining knowledge from internal as well as external sources to reconfiguring the firm's basic capabilities. This reconfiguration of a firm's capabilities is a strategic activity (Easterby-Smith & Prieto, 2008). Dynamic capabilities can be classified the organizational processes related to alliancing and strategic decision making (Eisenhardt & Martin, 2000). I understand the firm's need to deal with external sources of knowledge and be able to advance the internal processes of the firm in terms of competitiveness. Likewise, the literature highlights the areas in which firms have to have specific dynamic capabilities in order to advance the internal process of management knowledge. In terms of internal sources, I point out the capacity of firms to assimilate, transform and apply knowledge internally. Strategic processes such as the acquisition of knowledge from external sources. Likewise, the implementation of mechanisms is required to combine external knowledge with the internal knowledge that personnel and entrepreneurs have. Regarding this combination process, this paper analyzes the impact of absorptive capacity (AC).

5.2.5.1 Absorptive Capacity (AC)

Various authors argue that absorptive capacity (AC) is a major dynamic capability (Barreto, 2010; Engelen et al., 2014) and could effectively influence other capabilities (Teece, 2011). Cohen and Levinthal (1989) define absorptive capacity as the ability to learn from external knowledge through processes of knowledge identification, assimilation and exploitation. The same authors redefine the absorptive capacity construct as the capacity of a firm to value, assimilate and apply – for commercial ends – knowledge from external sources (Cohen & Levinthal, 1990). Modern economies are not based on capital and labour as much as they are based on knowledge, which has become the key factor for development (Davenport & Prusak, 1998). Firms need to acquire knowledge from external sources and apply it in different levels of the organization, especially for MSMEs (González-Campo & Hurtado Ayala, 2014). For instance, Moilanen, Østbye and Woll (2014) point out that external knowledge supports small businesses in order to innovate. In dynamic and turbulent environments, knowledge represents a crucial resource for creating value as well as developing and sustaining competitive advantages (Teece et al., 1997). Thus, AC contributes to the creation and development of competitive advantages through the management of external knowledge (Camison & Forés, 2010). The AC concept shows sufficient flexibility that it can be applied to different units of analysis and in a variety of research fields such as industrial organization, organizational learning, strategic management and innovation management (Zahra & George, 2002). Additionally, Zahra and George (2002) link the construct to a set of organizational routines and strategic processes through which firms acquire, assimilate, transform and apply knowledge with the aim of creating a dynamic organizational capacity. "An organization's absorptive capacity will depend on the absorptive capacity of its individual members, A firm's absorptive capacity is not, however, simply the sum of the absorptive capacities of its employees" (Cohen & Levinthal, 1990, p.131).

5.3 Conceptualizing AC within MSMEs

This ability is related to the tactics firms use to acquire knowledge from external sources and combine it with the knowledge that their personnel have developed. Then, the knowledge possessed by individuals has to be applied at the organizational level. The capability to absorb knowledge is vital in current economic approaches

in order for firms to compete. Many authors use this construct to understand how firms can manage and mix knowledge within firms' activities. Table 2 shows the definitions and dimensions used in the literature to measure AC.

Table 2. Definitions and Dimensions of AC

Definition	Dimensions
The ability to value, assimilate, and apply new knowledge (Cohen & Levinthal 1990)	Ability to value knowledge through past experience and investment Ability to assimilate: based on known characteristics; based on organizational or alliance dyad characteristics; based on technological overlap. Ability to apply: based on technological opportunity (amount of external relevant knowledge); based on appropriability (ability to protect innovation).
A broad array of skills reflecting the need to deal with the tacit components of transferred technology, as well as the frequent need to modify a foreign-source technology for domestic applications (Mowery & Oxley, 1995)	Human capital: Skill level of personnel: trained R&D personnel as percent of population; trained engineering graduates; R&D spending
AC requires learning capability and develops problem-solving skills; learning capability is the capacity to assimilate knowledge-for imitation- and problem-solving skills to create new knowledge-for- innovation (Kim, 1998).	Prior knowledge base; the intensity of effort.

Source: Zahra & George (2002)

Table 2 shows the dimensions of AC, which represents the abilities to assimilate, to apply and to transform knowledge. Because MSMEs have simple organizational structure and some components are not easy to measure in these types of firms. However, these firms possess all these characteristics as the large firms. For instance, managers of MSMEs try to combine the obtaining of knowledge with formal training. Managers look for training in specific technical areas, which can have a direct impact on their firm's performance. In this sense, firms can assimilate, transform and apply knowledge and develop it in order to become a more dynamic organization in terms of responding to changes in their markets.

5.3.1 AC as a Dynamic Capability

In the particular case of AC, Conversely, my research is not the only research that inquiry into the role played by AC inside MSMEs in developing countries (González-Campo & Hurtado Ayala, 2014; Monge González, Rodríguez Álvarez, & Leiva, 2015). Specifically, my approach answers Kocoglu, Akgun, and Keskin, (2015) who stated that there is a need to understand how AC impacts the development of new processes as well as how AC is used to achieve innovation. What is clear from the literature is that AC requires the mediation of other capabilities to impact new products or processes (Leal-Rodríguez, Ariza-Montes, Roldan & Leal-Millan, 2014). As I previously discussed, the hierarchical structure of capabilities within firms places AC at the second level, which is dynamic capabilities. AC as a dynamic capability (Kocoglu et al., 2015) contributes to generating a mix of external and internal knowledge. AC brings into firms the necessary dynamism to respond to the demands of the market. Taking knowledge and applying it to the production processes makes micro firms competitive and productive. In the dynamic capabilities literature, MSMEs are very rarely the research area. Nevertheless, the various dimensions of AC contribute to creating advantages within MSMEs to compete. Different authors (Camison & Forés, 2010; Camison & Forés, 2014; Zahra & George, 2002) also argue this. If markets are dynamic and firms can follow that dynamism, it means that a firm's capabilities have been applied effectively. Hence, AC – that organizational ability within firms which facilitates the acquisition and application of knowledge in responding to the market's demands at the operational level of the firm – is crucial for a company's success (Valentim, Lisboa, & Franco, 2015). As demonstrated by technology-intensive suppliers located in Colombia, AC has a relationship with the operational level of the firms (Cuero et al., 2014)

– which is the level that allows the achievement of better outcomes. I argue that AC is a dynamic capability that influences a firm’s performance through its influence on the operational level. This is supported by similar findings in the literature (Camison & Forés, 2014). Camison and Forés (2014) report that among various outcomes involving these constructs, the most important are the following: technological innovative performance (Cepeda-Carrión, Cegarra-Navarro, & Jimenez, 2012); innovation in products (George, Zahra, Wheatley, & Khan, 2001; Kostopoulos, Papalexandris, Papachroni, & Ioan-nou, 2011; Murovec & Prodan, 2009; Stock, Greis, & Fischer, 2001; Hervás-Oliver, Albors Garrigos, & Gil-Pechuan, 2011; Hervás-Oliver, & Albors-Garrigós, 2008); and innovation in processes (Murovec & Prodan, 2009). As observed, AC is a key factor at the firm level in establishing a technological path as well as innovative performance. Accordingly, in the case of MSMEs AC facilitates the ability of these firms to use the market (Meeus, Oerlemans, & Hage, 2001; Thérin, 2007).

5.4 Final Remarks

How MSMEs process internal as well as external knowledge is crucial. This is why AC is the most influential capability in the improvement of firms’ performance. AC rely heavily on the knowledge accumulated by their employees (Valetim et al., 2015). For instance, knowledge-intensive firms focus on managing knowledge to change their production. Likewise, AC demonstrates how dynamic capabilities contribute to upgrading production. This implies that entrepreneurs apply organizational capabilities (Fernández-Mesa, & Alegre-Vidal, 2013; Swoboda, & Olejnik, 2014) by identifying and using each hierarchical form of the capabilities efficiently within the firm’s production. Indeed, managers can better maximize their limited financial resources by leveraging external as well as internal knowledge through employing AC to increase possibilities that may lead to production that is more competitive. I argue that MSMEs are able to manage technical knowledge in ways that establish a technological path, which produces the ability to upgrade their performance (Engelen et al., 2016).

AC is a key dynamic capability regardless of the size of the firm (Valentim et al., 2015). This paper reaffirms that AC in MSMEs acts as a facilitator for the firm’s internal activities (González-Campo, & Hurtado Ayala, 2014). Furthermore, AC is quite important for anticipating changes and opportunities in the markets (Cuero et al., 2014; Kocoglu et al., 2015), especially for those knowledge-based firms that are providers of technology. These firms operate by constantly using and transforming knowledge. This supports the dynamics that MSMEs possess (Torres, 2014). The activities located within a firm to share knowledge among entrepreneur, employees, or external sources are crucial from the managerial point of view as well as to the operational one. This is even more relevant today when the market environment is highly competitive (Camison & Forés, 2014). Following these arguments, Inan and Bititci (2015) state that the differences between large and small firms are based on of involvement of managers within strategic and operational activities. This involvement reflects the level of capabilities. These different involvements are presented in Table 3.

Table 3 Firms' Involvement in Activities

Discussion	Conceptual Discussion		Empirical Evidence
	Large	Small	Micro
Leadership	High level of involvement in strategic activities	Major involvement in operational than in strategic activities	Focus exclusively on operational strategic
Management	Participative management	Mixture of empowered supervision and command and control	Command and control
Strategic Planning	Short and long-term planning	Short term planning	Fire-fighting to survive

Source: (Inan & Bititci, 2015)

According to Table 3, small and micro companies are devoted to the operational activities, which can be seen because of problems with the accumulation or the development of AC. In other words, the lack of this capability makes difficult for micro companies to develop strategic thinking.

The main theoretical implication of this conceptual paper is the application of dynamic capabilities as an approach to reconfiguring the operational capability within the context of MSMEs. The framework of dynamic capabilities has been developed under the idea of large organizations being able to finance departments to process and keep knowledge, as it needed. This means that the approaches that currently exist within the literature are related to large firms, leaving small firms outside of the literature. In the case of micro and small firms, the conceptualization of how to develop, improve, and implement capabilities has to be contextualized within the challenges that these firms face. This sheds new light on the composition of the hierarchy of organizational capabilities. From the managerial point of view, thinking in a hierarchical way – with the internal interactions of this hierarchy – managers can find out which managerial activities are more suitable for their own needs. In other words, the role played by the information that comes from customers and how it is processed through capabilities such as AC that allows entrepreneurs and managers to gain greater benefits of technical functioning within their firms by combining that information with operational capabilities. However, from the purely theoretical dimension, the clarity of how dynamic capabilities and operational capabilities are related to MSMEs contributes to consolidating an empirical approach for the investigation of these kinds of firms. The capabilities literature should take into account MSMEs as research objects. It is not only that there are a significant number of firms of this size that gives them relevance, it is that they have the same capacity to perform innovative activities as large firms and this can boost the economic growth of industries, regions, and countries. It is true that there is a need to develop methodological approaches that capture the entire dimensions of micro and small firms. At the same time, the organizational capabilities theories are enriched by the results of this paper through the supply of evidence of the existing small firms' abilities to shift their own activities. For instance, financial capacity allows large firms to create an R&D department which will be in charge of adjustments to products and processes; however, in MSMEs one person is in charge of the R&D function (e.g. entrepreneur, owner, or manager) and guides the sharing of knowledge as well as the output of that knowledge. Even though the literature differentiates between dynamic and operational capabilities, it is until now that these both types of capabilities are analyzed in the light of firms' ability to innovate.

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6 Commercialization of Technological Inventions: Investigating the Relationship between the Legal Protection and the Method of Conversion of Inventions to Commercial Use in Vietnam.

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ABSTRACT

This paper explores what methods of commercializing invention the Vietnamese inventors carry out: establishment of technology-based firms or technology transfer. A picture of technological invention and the legal protection over it is drawn. The research described in the paper bases theoretically mainly on the business models provided by Pries and Guild (2010). The empirical evidence is taken on the basis of quantitative data collected through a questionnaire survey by the phone, mail, e-mail and face-to-face meeting which yielded 128 responses from Vietnamese inventors living in Vietnam for 2 tries (from June to September 2015 and from November 2015 to March 2016). Besides, some in-depth interviews reveal difficulties in commercializing inventions. Descriptive statistics and Chi-square test are used for the analysis of the relationship between legal protection over invention and methods of commercialization. The evidence shows a limited number of inventions patented and the hesitance of inventors in seeking a legal protection. The empirical evidence demonstrates that there is no association between the 2 categories tested, that inventors have a prominent trend to established technology-based firms to commercialize their research products. However, the entrepreneurial inventors usually find difficult in gaining profit, especially when the situation of immature technology prevented inventors to get their invention patented. The value of the present study lies in the better understanding of the situation of conversion of inventions to commercial use in Vietnam. Finally, the awareness of inventors on factors that affect the commercialization of inventions suggests that the policies of improving invention protection, supporting technology-based firms and technology transfer should be implemented.

Keywords: Entrepreneurship, Innovation, Technology, Intention.

6.1 Introduction

It is widely agreed that innovation creates economic growth (Schumpeter, 1982). As a process which starts with the invention of a new element (Roger, 1962), innovation requires the practical development of commercial use to make a profit (Sundbo, 1999). The introduction of new invented elements can be of a new product or a new service, a new production process, a new organizational or management structure, a new type of marketing or overall behavior on the market (Schumpeter, 1982; Sundbo, 1999). Rosenberg (1996), Dosi et al. (1988) and many other authors emphasize the analysis of new technology which plays a seminal role in stimulating innovation (Webster & Jensen). Technology can be input or output of innovation process.

When a new technology is generated, it is expected to be commercialized through activities of technology transfer or of creating a technology-based firm to produce a product or service. The decision-making process from creating an invention to choosing what way to commercialize the invention is affected by many factors. Rothaermel et al. (2007), Shane (2004), Auerswald and Branscomb (2003), Teece (1986), Pisano (2006), Pries and Guild (2011) investigated the characteristics of technologies such as the strength of legal protection, the nature of technology, the commercial uncertainty of technology and the dynamism of technology.

In Vietnam, innovation has recently gained the attention of firms and has been promoted by the government with many activities including launching laws, policy enhancing innovation and raising awareness about

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intellectual properties. The Constitution adopted in 2013 states that science and technology development is a top national policy and plays a key role in the socio-economic development of the country. In addition to activities of the National Office of Intellectual Properties, Vietnam Inventor Association was established to contribute to the exploitation of inventions.

This paper investigates the descriptive data of inventors and inventions as well as methods of commercializing the technological invention, Vietnamese inventors carry out. Furthermore, this paper will report the association between legal protection and methods of commercializing the invention. The paper also seeks to answer the questions: What are the barriers preventing the commercialization of technological inventions? and What are the factors encouraging it?

6.2 Situation of Technological Invention in Vietnam

In Vietnam, technology depicts a modest and monotone picture of innovation. Following the data of MOST, Vietnamese firms have used the technology of 2 to 3 generations older than the global average level and the investment rate for innovation comprised below 0.05% of revenue. Meanwhile, the rate of investment in R&D/GDP is far higher at 3.57% in South Korea, 1.7% in China and 0.76 in India (MOST, 2012). The government has recently applied some methods to stimulate innovation by launching relevant laws, policies of prioritizing the technology-based firms, establish technology incubators and technology market. In fact, having a look on the list of technology-based firms (as science and technology-based firms that are defined in law of science and technology dated in 2013), we find a very modest number of firms (30 firms from 2010 to 2015) being allowed to be established to do manufacturing, business and to provide a service of science and technology, based on research and development. Moreover, the technological market (Techmarkt, Techfest, floors of technologies) that is considered as a method of commercializing inventions, linking the S&T research and production hasn't met the need of firms that include FDI firms using the same technologies as mother holding and about 60,000 domestic firms that focus on complete and process technologies with machinery and equipment. In the technology market, merchandise is generally technologies in company with equipment, assembly lines imported (30.6% of importation value in 2010) or domestically manufactured.

Despite recent efforts of the government, the number of patents or non-patented technological inventions being able to be successful commercial use is much less than the number of results of research for many reasons. Following the statistics of NOIP (Annual report, 2016), regarding the inventions and utility solutions that are considered the main resource of innovation, the number of filed applications have recently grown significantly. The total of applications for invention patents and for utility solution patents was accumulated up to 5,301 from 1981 to 2016 and 3,096 from 1989 to 2016 respectively (*Table 1*). So, domestically there is a not very optimistic picture that the application for patents of Vietnamese inventors account only for 10% of applicators in National office of IP (90% of application forms belong to foreigners from US, Japan, South Korea, China...).

The big number of applications filed does not mean the big number of patents granted. The patents were granted to only a seventh of applicators (737 granted invention patents on 5,301 filed invention applications). The similarity happened to the registration of utility solutions (3,096 applicants) with 975 utility solutions patents granted (*Table 2*). There is not the official data of successfully transferred patents to the business environment but following the Program 68 for supporting the development of intellectual properties by MOST, the commercialization of patents is so limited, at about less than 10% of patents granted to Vietnamese inventors.

Table 1: Filed invention applications and granted invention patents

(Summarized from Annual report of NOIP in 2016)

Year	Filed invention applications	Granted invention patents
1981-1989	506	74
1990-2009	1,733	315
2010	306	29
2011	301	40
2012	382	45
2013	443	59
2014	487	36
2015	583	63
2016	560	76
Total	5,301	737

Table 2: Filed utility solution applications and granted utility solution patents (Summarized from Annual report of NOIP in 2016)

Year	Filed utility solution applications	Granted utility solution patents
1989-2009	1,381	495
2010	215	35
2011	193	46
2012	198	59
2013	227	74
2014	246	66
2015	310	86
2016	326	114
Total	3,096	975

6.3 Methodology

6.3.1 Operational Definition

6.3.1.1 Conceptualization of Technological Invention and Legal Protection

Over time, technology has been developed formally in radical innovation and related strictly to research and development activities/systems. It has been developed more informally in incremental innovation by the production of engineers, technicians and the shop floor (Freeman, 1995). It is defined as "creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications" (OECD, 2008). As defined by Massachusetts Institute of Technology, the technological invention is the process of devising and producing - by independent investigation, experimentation, and mental activity - something that is useful and was not previously known or existing. Therefore, the invention is a new technology that involves advances in the art and science of creatively applying knowledge for use in non-routine problem solving or new opportunity creation. Similarly, WIPO (2008) states that an invention is a solution to a specific technological problem and it is either a product or a process.

Invention or technological innovation is also an important legal concept and central to patent law systems worldwide, but this concept varies in different continent patent laws. In general, to be patentable, an invention must be novel, have utility, and be non-obvious to others skilled in the same field. An innovation can be protected if an innovator is granted invention patent or utility solution patent (for less novel invention). The patent holder has exclusive rights to use the invention for a limited period. In Vietnam, the law of Intellectual property rights promulgated in November 2005 by the National Assembly of Vietnam. This gives the definition that invention is a technical solution in the form of product or process to solve an identified problem by applying

natural laws. The invention is patentable if it meets the three requirements including the novelty, the inventive step and the industrial application (Article 58). The invention can be introduced to an innovation process (put differently, be commercialized) if it is replicable at an economic cost, and can satisfy a specific need. In fact, only a few inventions which lead to innovations. Due to the reason that not all of them are economically feasible. In this paper, invention and the technological invention can be used reciprocally.

The invention can be legally protected and also be a self-guarded mechanism of protection. Teece (1986) argued that the commercialization of an invention "requires that the know-how in question be utilized in conjunction with other capabilities or assets" including a regime of appropriability and complementary assets. A regime of appropriability is defined as the environmental factors, excluding firm and market structure, that govern an innovator's ability to get returns from commercialization of the invention. (Teece, 1986). Conceicao et al. (2012) Considered appropriability as the possibility to protect innovations from imitation. Regimes of appropriability are composed of two main dimensions including legal mechanism of protection and the nature of technology. Obtaining a patent would give the owners greater confidence in their ability to appropriate profits and will, therefore, lead them to more commercialization. (Webster & Jensen). Ceccagnoli and Rothaermel (2008) stated that in addition to legal protection system, nature of technology such as the degree of codification, complexity, and the ease of reverse engineering determine the height of barriers to imitation. According to Teece (1986), the degree to which knowledge is tacit or codified also affects ease of imitation. Codified knowledge is easier to transmit and receive, and is more exposed to industrial espionage and the imitation. On the contrary, it is hard to transfer tacit knowledge (which is defined as knowledge difficult to articulate) unless those who possess the know-how in question can show it to others.

6.3.1.2 Method of Commercializing Inventions

Authors have research on methods of commercialization that are referred to as business models (Pries and Guild, 2010). In the work of WIPO (1996), the analysts stated that from the viewpoint of the inventor or invention owner there exists a few possible ways for commercializing inventions, including starting own manufacturing and marketing the product based on the invention, licensing the rights in the invention, selling the patent rights, or any combination of the above. Pisano (2006), as well as Pries and Guild (2011), identified three main business models as WIPO (1996) does: i) Creation of a new firm to produce goods or services based on technology; ii) Transfer of substantially all of rights of the technology to an existing firm (technology sale) and iii) Retaining ownership of the technology and transferring limited rights to use the technology to existing firm (license broadly). In this paper, we distinguish the method of creating a new business that can be a firm or a household workshop or business from the method of transferring technology including licensing the technology and selling technology.

6.4 Research Methodology

The research approach is a mixture of the quantitative and qualitative method where the information is collected through a survey with a questionnaire for primary data on inventors and some follow up in-depth interviews. The data was collected by the phone, mail, e-mail and face-to-face meeting which yielded 128 responses from Vietnamese inventors living in Vietnam for 2 tries (from June to September 2015 and from November 2015 to March 2016). The sampling frame is the lists of approximately 250 inventors regrouped from lists of inventors in the invention contest organized by MOST (NOIP) in 2013, 2014 and 2015. The inventors are composed of patent holders, patent applicants and non-patented inventors. The inventions in the sample of survey respondents covered a broad cross-section of different technology areas including Mechanics, Agricultural Mechanics, Environmental Technology, Biotechnology, Information Technology, Civil Technology, Electricity and Electronics, Electronic and Telecommunication Engineering, Traffic and Transportation, Chemistry, Industrial equipment, Electrical equipment, Educational Equipment, Medical Equipment, Informatics, New Materials and Medicine and Pharmacy.

To develop the questionnaire, we based it on our goal to understand the situation of commercialization of inventions in Vietnam and the relationship between the legal protection of invention and its commercialization. The questionnaire was built following the suggestions for pre-testing questions given by Dillman (2000) It includes a review by a group of experts, interviews with professors of entrepreneurship and innovation, observation and Pilot tests with a group of inventors and final check before the large-scale survey. The questionnaire was written in English and translated into Vietnamese for pre-test and survey.

Regarding the data analysis, the result of the survey was developed through SPSS program for Windows. After getting all the questionnaire filled out and gathered, data examination was required by checking questionnaire for completeness and interviewing quality, screening questionnaires to identify illegible, incomplete, inconsistent, or ambiguous responses, then treating unsatisfactory responses. Getting the database already

cleaned and statistically adjusted, the techniques of descriptive analysis and Chi-square were implemented. The data was evaluated in comparison with prior studies to have the research answers to the Vietnam context of commercializing inventions.

6.5 Results and Discussion

6.5.1 Descriptive Analysis of Inventors

The current age for most of the respondents fell within the age-range from 21 to 60, only 2.3% of them were younger than 21 and 5.5% were older than 60. Within the working age-range in Vietnam (The retiring age is 55 for women and 60 for men), the percentage of inventors are proportioned fairly even from 17.2% to 28.1%. It makes sense that the ratio of 31 to 40-year old's is slightly higher to 41- 50 age range. As the ranges of age coincide the mature and profitable period of people.

The results have shown that the ratio of female to male among inventors is 3.91% (5 inventors) to 96.09% (123 inventors). The comparatively is a much smaller percentage for females, as it reflects the different perception on career orientation on technology and engineering areas between male and female in Vietnam. There is no data on the ratio of women and men working in the science, technology, engineering and math field (STEM). But according to the Census Bureau's 2009 American Community Survey (ACS), women account for 48% of the U.S workforce but just 24% of STEM workers. The percentage is estimated much lower in Vietnam because of culture and gender discrimination.

The data collected reveals the inventions generated from private firms and household business are dominant with 35.1%, followed by inventions created from universities and school (21.8%). Meanwhile, factory, public firm and public research organization own a modest ratio of the invention respectively 1.6%, 3.9% and 7.8%.

The results showed that approximately half of the inventors were regrouped in 2 biggest cities of Hanoi and Hochiminh city (23.4% and 18.8% of 121/128 inventors respectively) while the remaining 52.3% of respondents came from 27 cities or provinces along the S-shaped Vietnam.

Regarding inventor's career, many inventors have experiences in management with 32.8% of them as directors or vice directors (42 inventors), 5.5% owners of their own business (not having a legal status of the company) and 5.5% managers while staff represent 10.2% of the sample. Researchers and lecturers who usually get involved more or less in R&D account for 17.2%. Results also show that 15.6% of the sample did not answer the question or do not have a fixed job. The group of farmers, workers and one of the students represent the lowest ratio of 2.3% and 3.1% in the sample.

The results present the educational level that the sample was attained by. Among 124 respondents, 91 inventors they accounted for 71.1% of having a bachelor or engineering degrees. (Bachelor degree takes 4 years while an engineering degree takes 5 years) While those with a master's degree or even PhD degree accounted for 45.3%, 15.6% and 10.2% respectively. The inventors that were trained in terms of vocational training represent a high proportion of 17.2%. They are usually workers who have jobs directly related to practice, understanding problems or innovation needs generated from daily works. A small percentage of respondents are secondary graduates (4.7%), secondary non-graduates (1.6%) and students (1.6%), which suggested that educational attainment does not matter for innovation. Following the survey on labor forces and jobs in Vietnam that was conducted by The Department of Statistics in 2010 found out that from the 15-year-old population, 5.67% have a higher education level, while 9.01% got vocational training (including some kinds of training from several months to 3 years), and 12.78% are secondary graduates. In general, the investigation shows that inventors have a higher level of education than the general population in Vietnam.

The *Table 3* shows that most of the inventions (75.8%) have been created for 5 years with 44.5% from 2013 to 2015 and 31.3% from 2010 to 2012. A small ratio of inventions was made from 2005 to 2009 (11.7%) and even before 2005 (7.8%), which suggests that inventors have sought to commercialize consistently and long.

Table 3: Year of invention created

		Number	Percentage	Valid Percentage
Valid	N/A	3	2.3	2.4
	2013-2015	57	44.5	45.6
	2010-2012	40	31.3	32.0
	2005-2009	15	11.7	12.0
	Before 2005	10	7.8	8.0
	Total	125	97.7	100.0
Missing		3	2.3	
Total		128	100.0	

The results show that the ratio of inventors having invention patented or in process of application for patent accounts only for 61% of respondents while the inventors who refused or have not got intention to file for patent comprise 33.6%. This fact is partly caused by the immaturity of the technologies that are less applicable to industry. They have been encouraged to participate in governmental activities of promoting innovation in Vietnam and seeking for opportunities to commercialize the inventions.

6.5.2 Methods of Commercializing Inventions

The results of data collection reveal that the ratio of inventions commercialized and non-commercialized are 42.2% (54 inventions) and 51.6% (66 inventions) respectively. Inventors were asked to indicate how they transformed inventions into service or products for the market. The answer is presented in the following table. Among 66 inventions that were or are being commercialized, 34 inventors created new venture (private firms including limited companies and joint-stock companies and household workshops) to produce a new service or products, exploiting the invention or reduced into practice in their own established firm. Meanwhile, 16 inventors (12,5%) choose technology transfers as a method to bring an invention to the growing market. In addition, 12 inventions (4.5%) were materialized in both two methods which are mentioned above. So, the number of inventors commercialized invention by creating a new venture (by themselves or as shareholders) and by transferring technology is 46/66 cases and 28/66 respectively. Only 4 inventors are still seeking the way to benefit from the invention. (Table 4)

Table 4: Method of commercialization of invention

Status of commercialization	No. of inventions	Percentage
No commercialization	54	42.2
Being commercialized	66	51.6
Creating a company	28	21.9
Creating a household workshop	6	4.7
Transferring technology	16	12.5
Creating a company and Transferring technology	12	9.4
Looking for appropriate method	4	3.1
Missing	8	6.3
Total	128	100.0

6.5.3 Relationship between the Legal Protection and The Methods of Commercializing Inventions

Among 66 cases of inventors who have converted their inventions to commercial use, 52 cases have invention patented or in process of filing for patent or utility solution certificate. While only 13 cases have not sought the protection against the imitation of their invention. The different status of legal protection towards invention results in the different rate of commercialized inventions (Table 5), which suggests the test of the relationship between the two variables.

Table 5: Legal protection and Method of commercialization

Legal protection	Method of commercialization						Total
	Creating a company	Creating a household venture	Licensing technology	Selling technology	Creating a company and licensing technology	Looking for appropriate method	
No	3	4	2	1	3	0	13
Yes	19	1	8	2	5	1	36
In process of application	6	1	2	1	4	2	16
N/A	0	0	0	0	0	1	1
Total	28	6	12	4	12	4	66

This study uses a chi-square independence test to evaluate if the two status of legal protection and the method of commercialized are associated in the population of inventors in Vietnam. The null hypothesis is proposed that the two categorical variables are perfectly independent. However, before this test, in order to guarantee no relationship between the subjects in each group, we regrouped the two categories into: creating a company and creating a household venture to one category of creating business venture, recorded two categories of licensing technology and selling technology to one category of transferring technology, doubled and divided category of creating a company and licensing technology to two remaining categories, deleted cases still looking for methods and not giving answer as follows:

Table 6: Legal protection and Method of commercialization (after recording data)

Legal protection	Method of commercialisation		Total
	Creating business venture	Transferring technology	
No	10	6	16
Yes	25	15	40
In process of application	11	7	18
Total	46	28	74

With a new set of data, we ran the Chi-Square test (Table 7). The results showed that no cells had an expected count less than 5, so this assumption was met. But since the p-value (0.994) is greater than our chosen significance level ($\alpha = 0.05$), we cannot reject the null hypothesis. Rather, we conclude that no association was found between the status of legal protection and the method of commercializing an invention.

Table 7: Chi-Square Test

	Value	of	Asymp. Sig. (2-sided)
Pearson Chi-Square	.011 ^a	2	.994
Likelihood Ratio	.011	2	.994
Linear-by-Linear Association	.007	1	.932
N of Valid Cases	74		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.05.			

The result of the test differs from the works according to some authors. Shane (2002) stated that when patents are effective, the new technology is likely to be commercialized by licensing. The author also found that when patents are not effective, technologies are likely to be commercialized by creating a new firm to develop new products or services based on the technology. While Fries and Guild (2011) found evidence that greater patent or other legal protection for the technology was associated with a greater likelihood that the technology was commercialized by transferring limited rights to the technology to existing firms. The non-relatedness between the status of legal protection and the method of commercializing inventions in Vietnam can be explained by the fact that the awareness of the importance of intellectual properties is still low. Therefore, inventors have

not used effectively the negotiation power by using the rights of patent or utility solution holders in transferring technology.

6.5.4 Accelerators and Barriers to Commercialization of Invention

In the questionnaire used to obtain results for the research, included is a section on the factors influencing the decision of inventors in making a profit of invention. The respondents appreciated the creation of legal environment and legal protection over intellectual properties to accelerate commercialization of the invention. This result is similar to the statement of Webster & Jensen who explained that obtaining a patent should give the owners greater confidence in their ability to appropriate profits and will, therefore, lead to more commercialization. Incubators that is one effort of the government are likely effective to a certain group of inventors that have patents. (Table 8).

Table 8: Accelerators of commercialization of invention

Accelerators		Degree	Agree	Total
Legal environment (laws, regulations and norms of technology transfer)	Number	38	83	121
	Percentage	32.4	68.6	100
Incubators creates opportunities for start-ups	Number	67	54	121
	Percentage	55.4	44.6	100
Financial institutions (bank, venture capital)	Number	53	68	121
	Percentage	43.8	56.2	100
Technology intermediaries (trading floor of technology, company Technology intermediaries, ...)	Number	55	66	121
	Percentage	45.5	54.5	100
Patents and other legal protection	Number	24	97	121
	Percentage	19.8	80.2	100

In addition to accelerators, inventors expressed their opinion about the negative factors that put an impact on the exploitation of inventions. They are the lack of understanding regarding laws, regulations and norms of technology transfer; insufficient resources devoted to commercializing inventions by technology intermediaries; Poor marketing, technical and negotiating skills of technology intermediaries; the mentality of their innovation being stolen; unrealistic expectations regarding the value of technologies; the embarrassment of patent protection procedure... Insufficient rewards for inventors and bureaucracy and inflexible administrative organizations are the most agreed by innovators as the obstacles for the commercialization of inventions. All of which can contribute to the fears inventors have and explain why inventors have the tendency to create new technology-based venture by themselves rather than transfer technology to an established firm. Inventors show their hesitance to work with administrative authorities, which suggest the better management for the government.

Table 9: Barriers to commercialization of invention

Barriers		Degree	Agree	Total
Lack of understanding regarding laws, regulations and norms of technology transfer	Number	48	67	115
	Percentage	41.7	58.3	100
Insufficient rewards for inventors	Number	35	78	113
	Percentage	31	69	100
Bureaucracy and inflexibility of administrative organizations	Number	37	79	116
	Percentage	31.9	68.1	100
Insufficient resources devoted to commercializing inventions by technology intermediaries	Number	56	57	113
	Percentage	49.6	50.4	100
Poor marketing/technical/negotiating skills of technology intermediaries	Number	70	40	110
	Percentage	63.6	36.4	100
Mentality of being afraid of getting stolen the invention	Number	52	61	113
	Percentage	46.0	54.0	100
Unrealistic expectations regarding the value of technologies	Number	70	42	112
	Percentage	62.5	37.5	100
Embarrassment of patent protection procedure	Number	59	52	111
	Percentage	53.2	46.8	100

While interviewing some of the inventors about the process of exploiting the invention, we found a common mistake that is noticed by WIPO (2000). This was, that many inventors try to sell their invention without taking the necessary steps to file a patent application, to develop their invention this is sometimes only an inventive concept into something more tangible, e.g. working prototype before trying to commercialize it. As a result, this causes the loss of negotiation power when licensing or selling invention and the risk of imitation.

6.6 Conclusion

This research is subject to several limitations. One being, the small sample size. This limits the ability of the analysis and requires the extension of time to do the investigation. As the sample was drawn from the list of inventors in 2013, 2014 and 2015 which was supplied by the Ministry of Science and Technology. While the second limitation of this research is the limitation of the non-homogeneity of inventions. Some are mature technologies that are embodied intangible asset. Others are only inventive ideas without prototype applicable to commercialization. The non-homogeneity influences differ to the stage of the participation of technology in the innovation process. However, this situation reveals partly the picture of inventions in Vietnam. Additionally, the data of the national office of intellectual properties, governmental institutions. A third limitation of this study results from different locations of inventors, which prevented us to carry out some case studies to have a deeper look on the commercialization process. We interviewed some inventors via the telephone and received their story via email.

Despite efforts made by the government, the current mechanism of management is not likely to promote effectively the exploitation of inventions and the development of technology-based firms. The scientific research results are still potential. They need to be encouraged to be disclosed and to get the legal protection. The relationship between the legal protection and the methods of commercialization of invention was tested but we did not find a statistically significant result. It may be that the sample is too small and the awareness of inventors on the legal protection is not relevant. This suggests the policymakers to make inventors be aware of the advantages of patents and another kind of protection over their invention, e.g. industrial design or trademark so that they can accomplish their invention for patentability and for availability to be commercialized. Future research can address this issue by doing an investigation on a larger sample of inventors.

The empirical evidence shows the perception of inventions about negative and positive factors affecting the exploitation of inventions. The results also demonstrate the prominent trend of establishing technology-based firms to commercialize their research products. This can be explained by the immaturity of the invention, which prevents the legal protection and the licensing to established firms as an asset of intellectual properties. The value of the present study lies in the better understanding of entrepreneurship by technology in Vietnam; this suggests that the policies of improving invention protection, supporting technology-based firms should be implemented.

6.7 Acknowledgments

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ENTREPRENEURSHIP TRACK

1 Internationalization Strategies of Artiste Managers in Ghana.

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ABSTRACT

It is argued that one way through which artiste managers project their artistes is to bring their music to the international scene. Yet literature on the internationalization strategies of artiste managers from a Sub-Saharan African context is largely unavailable, as the academic interest in the international music business on the continent remains low. In this paper, we seek to assess the internationalization strategies adopted by artiste managers in projecting artistes. In this regard, three main internationalization theories were employed to understand artiste managers in Ghana. They include the Uppsala Model, Network Model and the theory of International New Ventures. We used a qualitative approach to investigate the internationalization strategies of artiste managers in the Ghanaian music industry. Our data was qualitatively collected through semi-structured interviews that engaged two artiste managers between one and two hours. The findings of the data collection are cases that are presented in this paper. These cases show that there is no clear-cut distinction as to whether artiste managers follow a full-blown internationalization model based on all the characteristics of the Uppsala, network or international new venture models. The internationalization strategy of each artiste manager relates to aspects of the internationalization theories when placed in the context of three main variables: length of operation, knowledge acquisition and market strategy. On one hand, the cases presented in this paper should be interpreted with caution, due to the small sample size. The research has a policy implication to stimulate professional training for artiste managers interested in actively projecting artiste on the international scene.

Keywords: Artiste Managers, Internationalization, Music Industry, Ghana

1.1 Introduction

The literature on artiste management is gradually gaining momentum, as authors have directed attention to understanding the role artiste managers play to projects their artistes (See Shuaibu, 2014; Murrow, 2013; Allen, 2011; Watson, 2002). Music from Sub-Saharan Africa is not exempted, as searches on YouTube shows that music from this region is consumed in different parts of the world. It is argued here that one way through which artiste managers project their artistes is to bring their music to the international scene. Yet literature on the internationalization strategies of artiste managers from a Sub-Saharan African context is largely unavailable, as academic interest in international music business remains low. In this paper, we seek to assess the internationalization strategies adopted by artiste managers in projecting their artistes.

Music from Sub-Saharan Africa (SSA), like music from other parts of the world, has an international appeal. In other words, their music has travelled far and wide beyond borders by courtesy of entrepreneurial artiste managers who identify and exploit music business opportunities in both domestic and international contexts (Cuero Acosta *et al.*, 2017). In essence, internationalization presents an opportunity or means through which music crosses national borders. The literature on internationalization from an international business perspective generally approach the unit of analysis from the firm (Morgan and Katsikeas, 1997). The international music business in SSA, when placed akin to a general international business, have similarities and differences. The similarity is found in the cross-border element of both. The difference lies in the unit of analysis. The entrepreneur is the unit to observe in the international music business in SSA, as the firm is too general international business. As earlier stated in this paragraph, artiste managers are entrepreneurial and therefore play the role of the entrepreneur in bringing the artiste to the international market. In this sense, our unit of analysis is the artiste manager who doubles as an entrepreneur. Nowadays, technology has disrupted the way

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through which music consumers and listeners access music. The internet offers opportunities to access all kinds from different national backgrounds. In seeking to analyze the internationalization strategies of artiste managers internationalize, we draw our analysis from the case of Ghana by referring to the types of artiste managers as proposed by Nyadu-Addo *et al.* (2017).

The internationalization literature in international business is well established and extensive. In this paper, we will draw on established internationalization theories of the firm and apply it to the case of the entrepreneurial artiste manager to assess similar and dissimilar characteristics. Such an analysis, as we contend, contributes to illuminating our understanding of the intersection between artiste management and internationalization.

1.2 Literature Review

Artiste management and internationalization: a theoretical view

Indeed artiste management that crosses borders lends itself to a number of disciplines including strategic management, international entrepreneurship and international business. Artiste management as understood from a management perspective reflects the role they strategically play in planning, organizing, controlling and directing (Allen, 2011) the artiste for a cross-border business (e.g. live show performance, music sales etc). From an international entrepreneurship perspective, the artiste manager identifies and exploits opportunities that project the artiste to an international audience. As Wach and Werhmann (2014a) rightly intimate “international entrepreneurship stresses the ‘human factor’ and not the ‘planning factor’” (p.13). From an international business perspective, the artiste manager is part of the artiste’s team that facilitates the temporal and spatial expansion of the artiste on the international scene. Thus, the internationalization of the artiste is because of the internationalization strategy of the artiste manager. Internationalization or conducting international activities lies at the core of the aforementioned disciplines. Therefore, any theoretical understanding of artiste management in an international setting require internationalization theories that help to explain artiste management across borders.

First and foremost, our understanding of artiste management is anchored in the knowledge-based view of the firm, in which the firm generates knowledge and applies it for its benefit (Grant, 1996; Nickerson and Zenger, 2004; Kogut and Zander, 1992). The firm, in one way explained, is an embodiment of individuals; therefore, the individual is an important entity of the firm. The artiste manager is the embodiment of a team put up by himself or the artiste. In this connection, we have a premise to assume the artiste manager (individual) as the unit of analysis within the knowledge-based view. As Kogut and Zander (1992) point out, an individual who is capable of generating (Nickerson and Zenger, 2004) or creating (Kogut and Zander, 1992) and applying (Grant, 1996) it holds knowledge. Accordingly, knowledge could be tacit or explicit (Nonaka, 1994). Tacit knowledge being is gained through experience (Sørensen *et al.*, 2007), thus not easily communicated at a goal (Grant, 1996). It is also characterized by cost, time and uncertainty (Kogut and Zander, 1992). Explicit knowledge denotes that which can be documented, giving it formal outlook (Sørensen *et al.*, 2007) and is easily communicated (Grant, 1996).

In the quest to internationalize the artiste, we take the stance that the artiste manager may combine tacit and/or explicit knowledge generated, stored and/or received in a way that keeps the artiste internationally competitive. We must admit that the artiste manager can only technically advance the artiste (e.g. through refined music production, marketing and sales) but quite limited in the enhancing the natural or raw talent of the artiste (e.g. voice in a live show performance). Nevertheless, where the artiste manager is able to internationalize the artiste, we find it relevant to review some theories of internationalization to guide our direction.

Indeed the internationalization literature is rich with various concepts and theories that explain why and how firms are able to internationalize. Well-established internationalization theories include the stages model (Uppsala Model) (Johanson and Vahlne, 1977; Johanson and Wiedersheim-Paul, 1975; Johanson and Vahlne, 2009), network model (Johanson and Mattson, 1988) and the relatively new theory of international new venture or born global (Phillips McDougall *et al.*, 1994). These three theories of internationalization have been selected for discussion because they have gained wider currency in academic research. More so, they present an evolutionary perspective of internationalization, which makes internationalization a dynamic process.

Uppsala model of internationalization

The Uppsala model follows a step-wise approach, which has temporal and spatial dimensions to entering foreign markets. Taking a cue from the empirical evidence based on four Swedish automobile companies, Johanson and Wiedersheim-Paul (1975) temporarily show that firms consolidate their market position in local markets. After consolidation, they begin to gradually export first by non-regular and later regular exports. This stage is followed by engaging sale representatives in host markets. After gaining experiential knowledge about the foreign markets, firms move to establish subsidiaries through foreign direct investment. In a spatial sense, firms first collect knowledge about foreign markets that close before they commit to operationalize their activities in the new market (Forsgren, 2002). Closer markets relate to geographic, institutional and psychic proximity (Forsgren, 2002). A recent revision of the Uppsala Model integrates the concept of the network with the old model (Johanson and Vahlne, 2009). That is to say that the firm internationalizes based on the network a firm possesses. This further leads us to the network model of internationalization.

Network model of internationalization

The network model of internationalization is based on a firm's available network (Johanson and Mattsson, 1988) and the position of the firm in the network. Articulating further, two key elements are crucial to understanding this model – degree of firm internationalization and the extent to which the network (market) is internationalized (See also Hosseini and Dadfar, 2012). Based on these two elements, four categories of firms are presented name the early starter, lonely international, late starter and the international among others (Johanson and Mattson, 1988). The *early starter* does not have access to information about the international market because it has little or no international relationships with, for instance, suppliers, competitors and other companies it could cooperate with (Johanson and Mattson, 1988; Hosseini and Dadfar, 2012). The *lonely international* has acquired some degree of internationalization by itself but its network members, for instance, suppliers, competitors and other cooperation entities are less experienced in the international market (Johanson and Mattson, 1988; Hosseini and Dadfar, 2012). The *late starter* has little or no experiential knowledge about the international market but its suppliers, competitors and other cooperation entities have the experiential knowledge, which makes it difficult for the late starter to build a strong network, given the disparity in knowledge (Johanson and Mattson, 1988; Hosseini and Dadfar, 2012). The *international among others* possess enough experience about international markets. Therefore they are able to venture into foreign markets through strategies of cooperation (Johanson and Mattson, 1988; Hosseini and Dadfar, 2012). In summary, the network model of internationalization avers that firms acquire knowledge from its network to internationalize.

International new venture/born global

Another theory of internationalization that purports a radical worldwide entry of the firm is the international new venture or born global (Phillips McDougall *et al.*, 1994; Oviatt *et al.*, 1995). The theory posits that entrepreneurs appears on the international scene right from the start-up phase of a business or immediately after formation, with resources garnered from multiple countries (Phillips McDougall *et al.*, 1994). Unlike the Uppsala and networking models, the emphasis lies in the age at the time of internationalization and not the size (Oviatt and McDougall, 1994). To be circumspect, international new ventures are highly driven by entrepreneurs. As intimated “(a)n internationally experienced person who can attract moderate amount of capital can conduct business anywhere in time it takes to press the buttons of a telephone, and, when required, he or she can travel virtually anywhere on the globe in no more than a day” (Oviatt and McDougall, 1994, p.29). More so, the theory gives more prominence to the internationalization of small and medium-sized enterprises (SMEs) as opposed to a large firm that has characterised the international business literature. Thus international new ventures unlock the intersection point between entrepreneurship, international business and strategic management (Oviatt and McDougall, 1994; Wach and Werhmann, 2014b). Variants of international new ventures are theorised by Oviatt and McDougall (1994) as new international market makers, geographically focused start-ups and the global start-ups. *New international market makers* are further categorised as export/import start-ups and multinational traders (Oviatt and McDougall, 1994). Common elements between them are based on four key elements: “(1) organizational formation through internalization of some transactions, (2) strong reliance on alternative governance structures to access resources, (3) establishment of foreign location advantages, and (4) control over unique resources” (Oviatt and McDougall, 1994, p.29).

Thus far, we have provided knowledge about the internationalization theories that involve the firm or the entrepreneur. To relate to these theories first requires an understanding of artiste management in order to relate to the theories as described.

1.2.1 Artiste Management

Artiste management is embedded in the core functions of management namely planning, organizing, directing and controlling (Allen, 2011; Nyadu-Addo *et al.*, 2017). Allen (2011) contextualizes that the artiste manager should be able to execute these functions in order to better manage the artiste. From a Ghanaian context, Nyadu-Addo *et al.* (2017) theorized three types of artiste managers which provide us with a foreknowledge about artiste management. They are labelled as Type 1, Type 2 and Type 3 managers.²⁸

Type 1: Lean managers

They received no formal training in artiste management, yet they are dynamic enough to understand the changes that occur in the music industry. They developed their role as managers through learning by doing. They play at least one more role in addition to their role as artiste manager. They solicit for deals on behalf of the artiste only a show is impending. Type 1 managers are usually locally based though they feature sporadically in foreign events.

Type 2: Transition managers

They also received no formal training in artiste management but have worked in the entertainment industry to understand the dynamics in the music industry. Unlike Type 1 managers, they play more roles that are diverse in the music industry. Type 2 managers are able to stage their own events to project their artiste to consumers. They normally have a strong working team of more than five people in which there are proper planning and organization. Type 2 managers own companies and are usually based locally with the potential to extend their services outside the country.

Type 3: Multi managers

These managers have been artistes themselves. Due to this, they understand the process of music making in order to guide other artistes. Like the transition managers, they play multiple roles aside being an artiste manager. They received no formal training but learnt through the process, as they were artistes. Other people sometimes manage them especially when they are still artistes. In other words, they do not manage themselves though they manage other artistes. They have an international exposure and travelled wide. When they play the role of artistes outside the country, they rely on their managers in these countries for performances. Type 3 managers have a working team.

Operationalizing internationalization theories and artiste management

The international theories as discussed can be related to artiste management from three main variables; Length of operation (age), knowledge generation/acquisition and market strategy. As seen from the three internationalization theories described in this paper, the age of a firm in a business informs whether the firm will undertake a gradual or radical approach to internationalization. While the Uppsala and network models purport that firms consolidate their business domestically before they internationalize, the international new venture starts already servicing multiple markets internationally. Thus, age is a key variable to help us understand what model of internationalization will be adopted. In the context of the artiste management, we intend to investigate whether the length of operation as an artiste manager has any influence in internationalization. We must point out that our reference to age means the length of operation as pertaining to the period an entrepreneur acts as an artiste manager and not necessarily the age of the artiste manager.

²⁸ The entire description of the types of artiste managers was taken from Nyadu-Addo *et al.* (2017)

With respect to knowledge generation/acquisition, the Uppsala and network models of internationalization espouse experiential learning of foreign markets. Thus, knowledge of foreign markets is acquired over a period either directly from the foreign market or from the general network base of the firm. The international new ventures emerge based on already generated and acquired knowledge of foreign markets. In this light, knowledge generation/acquisition may help to understand the speed of internationalization. Contextualizing this from the perspective of the artiste management, he/she may on the one hand project the artiste after considerable exposure to the local market. In this connection, any internationalization efforts build on the consolidated home market. In other words, he/she may internationalize based on gradual knowledge gathered from the foreign market or from a general network base. On the one hand, the artiste manager may immediately place the artiste on the international market without recourse to establishing a local market base.

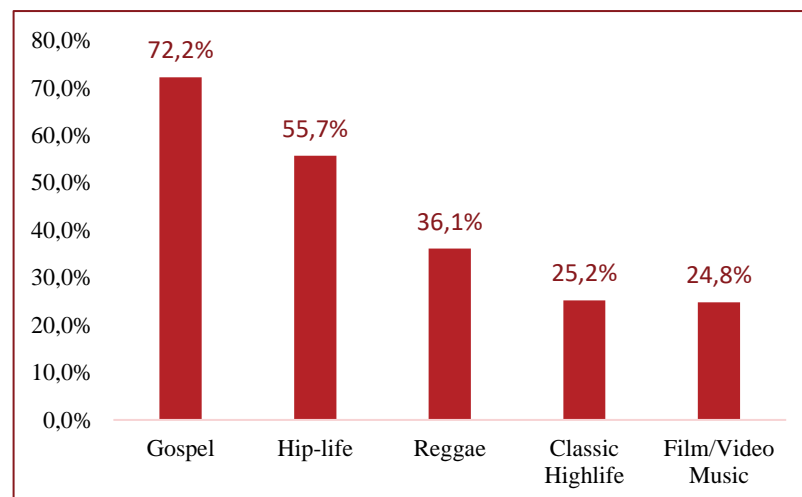
Another key variable is the market strategy *vis á vis* the model of internationalization. While the Uppsala and network models internationalize based on single foreign market entry expansion, the international new venture model embarks on internationalization to multiple countries from the start-up phase. When the market strategy is operationalized in artiste management, the artiste manager may project the artiste according to the single country basis or multiple countries at the onset.

Given that our observation relating to artiste management and internationalization in this research, we place emphasis on Type 2 (Transition managers) and Type 3 (Multi managers) because they belong to a firm or team and have some level of international exposure. We do not proceed to work with Type 1 (lean managers) because they are mainly locally based. To verify, we argue that an empirical investigation of real artiste managers will enable us to juxtapose their internationalization strategies in accordance with the narrative on internationalization theories. In relation to this, we chose Ghana as the empirical place of research. Our choice is premised on the fact that Ghanaian music has attained international acclaim. Many artiste managers have emerged to project various artistes on the international music stage.

*Internationalization of Ghanaian Music*²⁹

Ghanaian music involves quite a number of genres. According to a report by KPMG, gospel and hip-life are the two most preferred genres amidst brass band, choral, jazz, art music, folklore, reggae etc. (KPMG, 2014). This preference is based on production and consumption. Collins (2001) estimated that the Ghanaian music industry has the potential to generate US\$53 million a year from just the world music market if supporting structures were put in place to support creativity. The amount may not be huge enough but it points to the direction that the creative industry, specifically music has the potential to speed up the rapid development of the country and the continent at large.

Fig. 1: Five most preferred music genre in Ghana (Derived from KPMG, 2014)

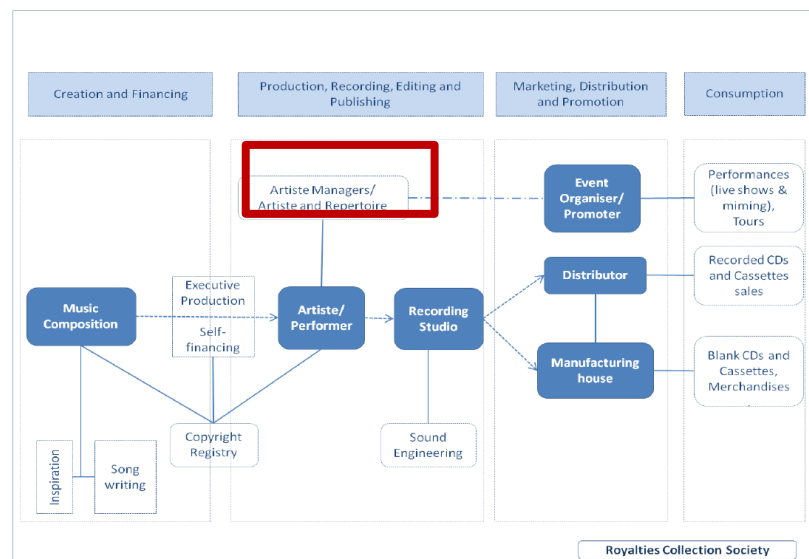


²⁹ The literature on the internationalization of Ghanaian music is taken from Nyadu-Addo *et al.* (2017).

Highlife, one of the most popular music genre in Ghana, dates as far back as the 1920s. Ghanaian music has never been immune to external influence. Arthur (2014) and Collins (1996) narrated that economic discomfort in the 1970s, coupled with simple visa procedure to Western countries contributed to bringing Ghanaian music to the international scene. For instance, the authors narrated that the famous Osibisa – a music group of Ghanaians – exported Ghana’s most popular genre to the UK and rebranded it the afro-rock. Others (e.g. Kofi Ghanaba or Guy Warren) arrived in the United States and practised a brand of highlife later known as afro-jazz. On the international scene but particular to the African continent, veteran musicians like Okukuseku, Snr. Eddie Donkor, Amakye Dede advanced the Ghanaian highlife to Nigeria. Migrant Ghanaian musicians came back to Ghana influenced by Western and Nigerian rhythms. Instances of Nigerian infused rhythm and language (pidgin) are found in Okukuseku’s “Yallo Sisi” and Snr. Eddie Donkor’s “Na Who cause am” (Arthur, 2014; Collins, 1996).

In the mid-sixties, there were visible traits of artiste managers of Ghanaian artistes of global fame (Wellington, 2015). During this period and subsequent years, music production was largely based on cassettes, compact discs and live performances. This structure of the music value chain varies in some aspects from the current structure in terms of music consumption. Since there are many streams of income other than through cassettes, CDs and live performances, a new crop of artiste managers are on the rise who work in various ways to bring the artiste to the consumer through the internet. Thus, internationalization strategies of artiste managers have taken on a technology (virtual dimension). Yet few outlets provide useful information about the specific activities of artiste managers as to their geographic internationalization strategies. In other words, the foreign markets in which artiste managers’ project their artiste is largely anecdotal. Our research seeks to bridge the gap by providing empirical cases as to how artiste managers embark on internationalization.

Fig. 2: Ghanaian Music Value Chain: Position of the Artiste Manager (KPMG, 2014)



1.3 Research Methodology

This paper used a qualitative approach to investigate the nature of internationalization of the artiste managers in the Ghanaian music industry. We employed a qualitative approach because it allowed us to ask “how” as argued by Yin (1995-2001). To buttress the use of a qualitative approach, we concur with Denzin and Lincoln (1998) and Robson (2007) that qualitative research exposes real-life scenarios and the events within. A semi-structured in-depth interview was used to solicit for the nature of internationalization as conducted by artiste managers. Thus, we sought to seek new insights (Robson, 2007; Silverman, 2010, Easterby-Smith *et al.*, 2013;

Jankowicz, 2005, Friedrichs, 1990) from a developing country perspective. McBurney (1994) points out that enquiries for a personal interview could reach a response rate high as 90 percent, but the Ghanaian music industry is a difficult target group to gain easy access. Therefore, interviews are based on interactions made with stakeholders that attended the National Roadshow on the new Creative Arts Bill in 2017. Interviews of fifteen (15) unknown artistes managers were conducted in Koforidua, Cape-Coast, Sunyani, Kumasi and Takoradi. Stakeholders form part of different groups in the music and creative industry. The National Roadshow took place under the courtesy of the Ministry of Tourism, Culture and Creative Arts. This paper is therefore placed in a larger research project about the music industry in Ghana

Interviews included in this paper are two artiste managers who freely and willingly took part in this research. A semi-structured interview approach was conducted, lasting between one and two hours. This was deemed to be the most appropriate way to achieve close interaction with interviewees in a way that leads to exploring and developing new topics that might arise during the interviewing phase (Friedrichs, 1990). Our interview was guided by three main variables: Length of operation, knowledge generation/acquisition and market strategy. The two artiste managers have been labelled as Manager 1(M1) and Manager 2 (M2).

Before the actual interview, participants were given a short description of the purpose of the interview and the nature of the questions, in order to ensure a certain degree of preparation. The research approach and analysis followed an inductive approach. Our way of checking response reliability was to repeat the same questions in different sentences. This was aimed at improving the analytical rigour of the interviewed cases. Text and quotes characterised our data analysis. For the larger research project, data has been collected from UNCTAD, UNDP, WIPO, IFPI reports; KPMG's (2014) baseline study in the Ghanaian music industry (2014); World Bank reports and publications, related literature, Acts of Parliament, technical reports, bills, etc.; sector associations' reports, etc. Other sources of information were gathered from online media publication (news, magazines, industry related publications, bloggers, radio & television).

1.3.1 Research Results: Cases of Artiste Managers in Ghana³⁰

Case 1- Manager (M1)

M1 is an artist manager who plays multiple roles in the music industry as a promoter, event organizer, producer and chief executive officer of a major media network and an award-winning Entertainment company. The network comprises a number of radio, television and print companies. Our interview with M1 revealed the following;

I started from Radio Universe on campus at the University of Ghana and also did some event management training along the line by getting some formal training from a [Professor in Communication Studies], a touch of media studies and also learnt from other great giants when it comes to event organization, some training here and there and on-the-job as well.

M1 became an artiste manager while still practising in the media. The media work started as far back as 1999. In 2004, AM1 conceived the idea to manage some Ghanaian artistes (e.g., Tic Tac, Krontihene, T Blaze) who had gained recognition in hip-life music. He narrated accordingly;

My Entertainment Company was set up in the same year when the idea of artiste management was conceived. The company had no office until 2007. Later in time, event management (i.e., organizing concerts) was included as a function of My Entertainment Company.

M1 has been a key player in organizing major concerts where top artistes from Ghana and Nigeria come together on stage for live performances. These shows are held annually in both Ghana and Nigeria. This year (2017), the show was exported to London, UK. When asked in an interview how M1 is able to combine many roles together, he attributed them to management principles he follows;

I think it is planning. I mean as a good manager or leader, you have to identify talents you can leave your company to in your absence...For instance, I have about 30 young full-time people and women who are doing a marvellous job. I have an oversized responsibility so twice every week, I organize a meeting and they brief me on how things are going.

³⁰ The cases of all artiste managers in this paper are taken from Nyadu-Addo *et al.* (2017)

M1 acknowledged that there have been changes in revenue streams for the artiste. He confirmed that the “new school” artistes use social media, WhatsApp, Facebook etc. to reach their target market in addition to the sale of CDs.

Case 2 – Manager 2 (M2)

M2 started as an artiste who commands respect in the Ghanaian music industry. He holds a degree in linguistics and recently completed his MBA in Marketing. He began with poetry, which he learnt from his father. At a tender age, he knew that music could help him to convey his poetry through rap music. He became an apprentice to seasoned musicians. He also studied music under the tutelage of Agya Koo Nimo, one of the successful African guitarist worldwide. Apart from academic training, he built rap knowledge by listening to rap artistes such as Big Daddy, Jay Z, Eric B; highlife artiste such as KK Kabobo and hip-life artiste such as Reggie Rockstone. He has recorded eight studio albums to his own credit, produced about 6 singles with a new album in the offing. He has also featured in 219 songs between 2003 and 2012 with renowned highlife and hip-life artistes.

M2 also has a company for a talent agency and a record label, which has supported top local artistes. M2 has also branched into advertising, designing, writing, producing, directing for the company, which also has an online marketing outfit. M2 is an artiste manager who is also managed. In his own words, he narrated the following;

I have my manager who is also my wife (MBA Marketing, Law). Very smart and not just that...she is my brand's manager, I have my IT and social media manager, I have my graphics manager who is in charge of the image, I have an events manager who makes sure I get booked and whether when not booked, I put out my image...I have a road manager who is with me all the time making sure that everything, we are selling, making sure that we arrive on time.

In addition, M2 has other managers in other countries with whom they collaborate to shoot videos and make live performances. According to him, apart from being dominantly present in Ghana, he also performs in Europe, USA and other African countries. These are not managed by his artiste manager in Ghana but rather through agents who act as artiste managers. According to M2;

We have one person in charge of PR and marketing at all these areas and apart from that, that person will find a booking agent who knows about the festivals, knows about the private parties. That person will give us information on what type of songs to produce that will work in that geographical setting, what their culture is, and their worldview and so on. Once we have a product that is vibrant, we shoot a video and do the music, send the video to that person.

M2 acts also act a brands ambassador for telecommunication companies and health institutions in Ghana. He holds the key to a city in the USA because of his charity projects. As an artiste, he has 500,000 followers on Facebook and 100,000 on Twitter.

1.4 Discussion

The cases as presented show us interesting findings with respect to artiste management and internationalization. Indeed, there is no clear-cut distinction as to whether artiste managers internationalize based on all the characteristics of the Uppsala, network or international new venture models. Each internationalization pattern relates to the internationalization in a particular way when placed in the context of the length of operation, knowledge acquisition and market strategy.

About the length of operation, all artiste managers have operated in the Ghanaian market for a considerable length of time. Thus, we consolidated their role in the local market before embarking on international assignments. Operating for a considerable period of time in the Ghanaian market is similar to Johanson and Vahlne's (1977) point that firms establish themselves in the local market before they begin internationalization. Much the same, this relates to the *early starter* description put forward by Johanson and Mattson (1988) with respect to the network model of internationalization. Not all artiste managers had international stronghold as they began as artiste managers. Thus, they can neither be classified as lonely international, late starters nor international among others (See text above on Johanson and Mattson, 1988). When the length of operation as artiste managers is placed under the lens of international new ventures, the cases do not fit. As Oviatt and

McDougall (1994) posit, international new ventures go international immediately they are formed, but the cases where artiste managers consolidated their stance in the Ghanaian market proved otherwise. Therefore, at the time of formation, artiste managers do not fit as international new ventures or entrepreneurs.

Pertaining to knowledge acquisition, the cases show a gradual acquisition of knowledge by artiste managers. In other words, they gather knowledge about foreign markets through their networks to enable them to project their artiste on the international scene. This gradual knowledge acquisition of foreign markets corroborates with Johanson and Mattson's (1988) network model of internationalization. The internationalization strategy of the cases also underscores that knowledge is sometimes acquired based on tacit means (Grant, 1996; Kogut and Zander, 1992; Nonaka, 1994) with no laid down procedure. Moreover, the cases show that knowledge needed to enter international markets can be gathered from single and multiple sources. This knowledge acquisition from multiple sources corroborates with the network model of internationalization and the theory of the international new venture. The difference between the cases and what the theory of the international new venture posit lies in the mode of knowledge quest. In the cases presented, knowledge is only acquired about the international market while the theory of international new venture implicitly posits knowledge acquisition, creation or generation.

When the market strategy is put into perspective, we gather that the cases substantiate the Uppsala model of internationalization based on geographic and physic distance. We find that artiste managers internationalize to neighbouring countries and countries with similar language characteristics. At the same time, the case (M2) also shows that an artiste manager internationalizes not based on geographic nor physic distance. It may follow an agreed arrangement when geographic and physic distance is still wide. Furthermore, the market strategy is based on few countries where networks are strong based on social ties. In effect, the network model is also substantiated. This market strategy as shown by the cases does not reflect the internationalization pattern of the international new venture. Therefore, there are no similarities between the market strategy of artiste managers and what the international new venture posits.

1.5 Conclusion

In this paper, we observed artiste managers in Ghana and their pattern of internationalization. Based on three internationalization theories – Uppsala, Network and the International New Venture, we examined how artiste managers in Ghana project their artiste to the international music scene. Based on our findings we make the following contribution to literature.

Our paper contributes to the internationalization literature by validating the various aspects of Uppsala and the network model. For the theory of international new venture, its characteristics were largely absent in the internationalization strategies of artiste managers. Using the music industry, as the unit of analysis need a thorough investigating of the internationalization process artiste managers go through. This will throw lighter artiste management and internationalization. A step-wise process as to how artiste managers project artiste will provide an insightful discovery into artiste management and internationalization.

We recommend a quantitative investigation to validate or nullify the internationalization strategies of artiste managers. This, as we argue, will allow for generalizing the results as opposed to the cases used in this paper. In fact, our paper only points to the direction as to how some artiste managers internationalize, therefore the results should be treated with caution. Since music is a lucrative profession, we join Nyadu-Addo *et al.* (2017) to intimate that proper training is given to artiste managers in order to understand modern business trends and how other markets respond to such trends. These, we believe, will assist artiste managers to gather the right intelligence that will position their artiste on the international scene.

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2 SMEs in the Age of Digital Transformation: How Predictive Marketing Can Boost Competitiveness of Enterprises

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Abstract

In the golden age of digitalization, customers are generating more data than ever before. Almost all activities of the customers like searching, choosing, or buying are tracked digitally by manufacturers and service providers. On the other hand, the customers have also bombarded with a huge amount of advertising media on daily basis. They interact through a wide range of marketing channels such as websites, emails, social media, mobile apps, television or print media. As a result, they only pay attention to those things that are relevant to their individual needs, at the right time, through the right channel. This trend is completely changing the way most companies do business, especially when they are in the stage of changing their business model by cutting costs, reducing their direct sales force, shifting huge amounts of their budgets to digital advertising and putting customers as centric. For maintaining the competitiveness in this current era of digital transformation, companies have been applying highly complicated methodologies of information technology and computer science in both managing their daily operational activities as well as making strategic decisions, which in most cases have an essential effect on the overall financial performance. In this article, we discuss and present the use of analytical, quantitative methods in building predictive models for marketing activities. In fact, many industries are increasingly using predictive marketing to recognize the hidden patterns in vast amounts of customer data. With mathematical and statistical techniques, they can transform data about what is into what can be to predict future customer behavior, optimize marketing campaigns and budget. The main research issue of this article is to discuss the question how predictive analytics can optimize the marketing effectiveness of enterprises. We apply methods of predictive analytics that are Naïve Bayes, Random Forest, Neural Network and Logistic Regressive to solve a problem of pharmaceutical marketing. We present an understandable example from the real world to demonstrate our purpose.

Keywords: Marketing, Advertising media, Digital transformation, predictive analytics, Decision Support System

2.1 Introduction

The purpose of this paper is to provide a framework for applying predictive analytics in marketing in enterprises. As a special case, we focus on an example from the pharmaceutical industry. Any other industry or company can apply this framework and adapt the detailed requirements to fit into their business.

It begins with identifying business requirements, collecting all the necessary data and preparing them, then examining the relationships between customer's responses and their characteristics or demographic information. Using four different predictive models, Naïve Bayes, Random Forest, Neural Network and Logistic Regressive, we can predict the probability a customer will stay with a product of our company or switch to a product of a competitor. Using this result, marketers and customer services department in the company can react to optimize their marketing programs, such as increasing the use of marketing channels that have the greatest impact on customer decision-making, or increasing the satisfaction of the customers who are going to leave.

Simplification and interconnection among these concepts were performed using information from the literature review. They were implemented in a real enterprise and have been very successful. Through the initial and final assessments, we could evaluate the method that can provide the best predictive results in terms of quality. This characterizes the importance of the proposed method. We use R programming language to illustrate this

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research, to process data and provide predictions with four different predictive models. We focus on predicting how customer response to marketing channels and optimize loyalty. With this insight, it will help to optimize the marketing campaigns and investments.

2.2 Literature Review

2.2.1 The Pharmaceutical Industry

The pharmaceutical industry has some certain characteristics that differentiate it very much from other industry sectors in term of product marketing. Normally, pharmaceutical companies are not allowed to market their products to the end customers, namely the patients. Although patients are the one who actually in need of and pays for the drug, the decision which brand the patient should buy is the choice of the doctors. Thus, doctors are the most important customer of the pharmaceutical industry.

To compete in the market and increase the transparencies, pharmaceutical companies have changed their business model by reducing their personal sale forces, applying a multichannel marketing approach to reach their customers with the help of many digital channels like a webinar, email, SMS and medical websites to reach their customers.

In this context, the companies usually are overwhelmed when trying to choose the right channel to interact with customers. To overcome the difficulty, it is necessary to measure which channels produced the most engagement or the highest conversions. In addition, based on this, marketing budget can be correctly allocated to programs that have the highest success rates, to gain the highest return on investment.

2.2.2 Predictive Models

When discussing predictive analytics, we have several fields of research that apply various types of techniques. Through a number of publications, it is clear that predictive analytics has been long used in the improvement of enterprise processes. For example, in a famous publication in 1986, Papelu applied binary state prediction models with a skewed distribution of the two states of interest to predict takeover targets. He studied the possibility of using models and public data to claim that acquisition targets can be accurately predicted and pointed out a number of methodological flaws which bias the results of these models. Although not directly relevant to our work, the publication of Papelu is highly recommended to provide an understanding how important it is to apply predictive analytics.

As described by Pinder, predictive analytics are often used to forecast cash flows, sales, demand, and other business metrics. These forecasting results again will be the input for financial, marketing, and operations planning and decision-making in daily business. In his book, Pinder showed how to create and compare forecasts with regression, and forecasting the trend and seasonality components.

From a more technical aspect, Zhang et al analyze online advertising and its performance. Online advertising delivers promotional marketing messages to consumers through online media. Very similar to our research question, they consider the fact that advertisers often want to optimize their advertising spending strategies in order to gain the highest return on investment and, furthermore, maximize key performance indicator. They focus on a data pattern shift problem and state that with sparse data, an online change-point detection method that can quickly and accurately identify the change-points in sparse and noisy time series. Their method is using simulation studies as well as real data experiments to justify the effectiveness in detecting change-points in sparse time series and improve the accuracy of predictive models.

2.2.3 Naïve Bayes

Naïve Bayes is an algorithm of classification based on the basic probabilistic analysis. For instance, we have a bag contains 10 balls, 7 blue balls and 3 red. The probability that we get a red one without looking at the bag is 3 divided by 10. Bayes' Theorem calculates the probability based on prior knowledge, considered as evidence.

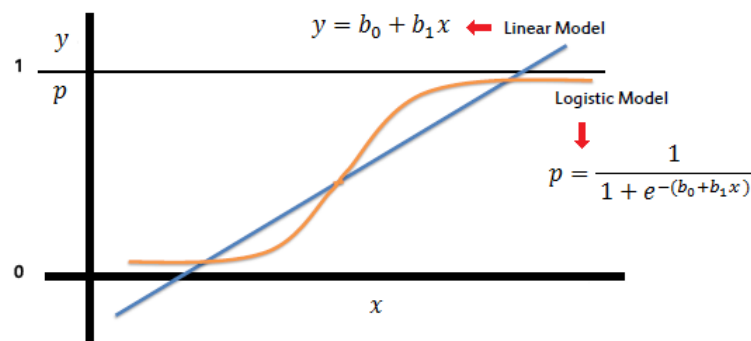
Table 1: An example of Naïve Bayes algorithm

Doctor ID	Specialist or general doctor? (SG)	Number of patients per month (NP)	Sentiment analytics (Attended the webinar, search product on web...) (SA)	Prescribed similar drug (SD)
112	Specialist	High	Positive	Yes
113	General	Low	Neutral	No
114	Specialist	Low	Negative	No
115	Specialist	Fair	Positive	Yes
116	General	High	Negative	Yes

2.2.3.1 Logistic Regression

One of the most popular and widely-used classification algorithms is a logistic regression. It is used to predict the probability of an outcome which can only have two values, Yes or No (0, 1). For example, the probability a customer will come back after a first purchase, or they will respond to our marketing campaign or not. The logistic regression likes a linear regression, but it constructs a logistic curve with value limited between zero and one.

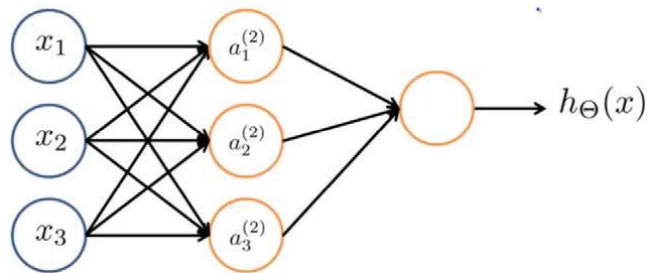
Fig. 1: Logistic Regression



2.2.3.2 Neural Network

Neural Networks is an algorithm that tries to simulate the networks of neurons in the brain. It is built from a large number of interconnected nodes, known as neurons and arranged into an input layer, one or more hidden layers and an output layer. The input nodes are the number of variances that we want to feed into the neural network and the number of output nodes is exactly to the number of outcomes we need to predict. The picture below has three inputs: x_1 , x_2 and x_3 , a hidden layer with three nodes and one output node at the end.

Fig. 2: The neural network process



Each node uses a mathematical function, a Sigmoid or logistic activation function, to output a result determined by the function and the parameters it receives. We connect these nodes together to build a very complex function can learn and calculate.

2.2.3.3 Random Forest

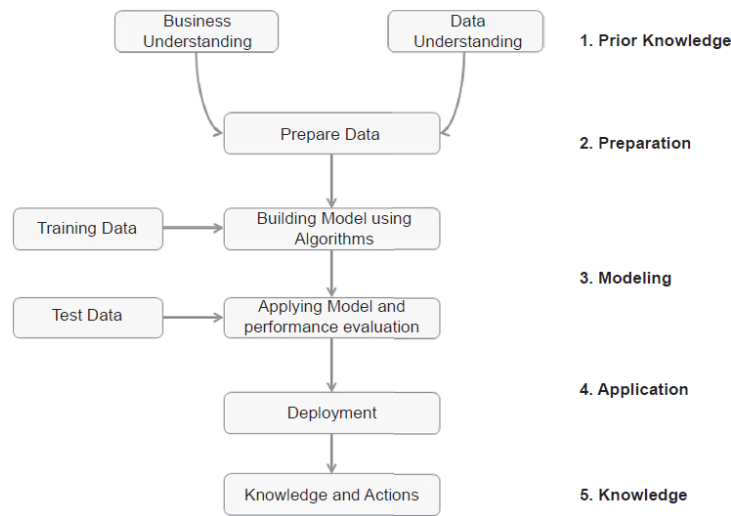
Random forest is an algorithm for classification or clustering based on decision tree method. Clusters can be described with K-means using the Random forest. K is an input, an integer number that tells the algorithm how many groups or clusters need to be extracted from the dataset, while means are outputs. The process is as follows:

- 1) Randomly pick k items from the dataset and consider them as cluster's representatives
- 2) Each remaining item is connected with the closest cluster representative, utilizing a Euclidean distance, computed by a similarity function
- 3) Recalculate these new clusters' representatives
- 4) Loop steps 2 and 3 until the clusters do not change

2.2.4 Data Mining

Following the Cross-Industry Standard Process Model for Data Mining (CRISP-DM), the process should include these most following steps as below picture.

Fig. 3: Cross-Industry Standard Process Model for Data Mining process



Source: Abbott (2014) Applied Predictive Analytics - principles and techniques for the professional data analyst.

We have two kinds of information in the CRM system. Firstly, customer profile provides data about characteristics of the healthcare providers and their environments like gender, location, specialist, title, size of the hospital. Secondly, customer experience gives us information about contacts between the companies and the doctors such as face-to-face meetings with doctors by the sales forces (at pharmaceutical organization this is described as “call visit”)

2.3 The Business Case

2.3.1 The Given Situation

We consider an example of a business case in 2016 when a vaccine C was launched to the market. One year later, the vaccine G was launch by a different company to compete with vaccine C. At that time, the customers had a choice if they could stay with vaccine C or move to vaccine G for some reasons.

We have a dataset which has information about marketing channels how the company is interacting with its customers, together with some demographic information of the doctors such as gender, speciality, city and furthermore. These properties are called explanatory variables for predictive models. The following table below includes the first 5 rows of this dataset.

Table 2: Data for the predictive model

	CUSTOMER_CHOICE	APPROACHED_VIA_F2F	APPROACHED_VIA_WEBINAR	APPROACHED_VIA_EMAIL	APPROACHED_VIA_SMS	GENDER	SPECIALTY	CITY
1	VACCINE C	YES	NO	YES	NO	F	Preventative Healthcare	HA NOI
2	VACCINE C	YES	YES	YES	YES	F	Preventative Healthcare	HA NOI
3	VACCINE C	YES	NO	YES	NO	F	Preventative Healthcare	HA NOI
4	VACCINE C	YES	NO	YES	YES	F	Preventative Healthcare	HA NOI
5	VACCINE C	YES	NO	YES	NO	F	Preventative Healthcare	HA NOI

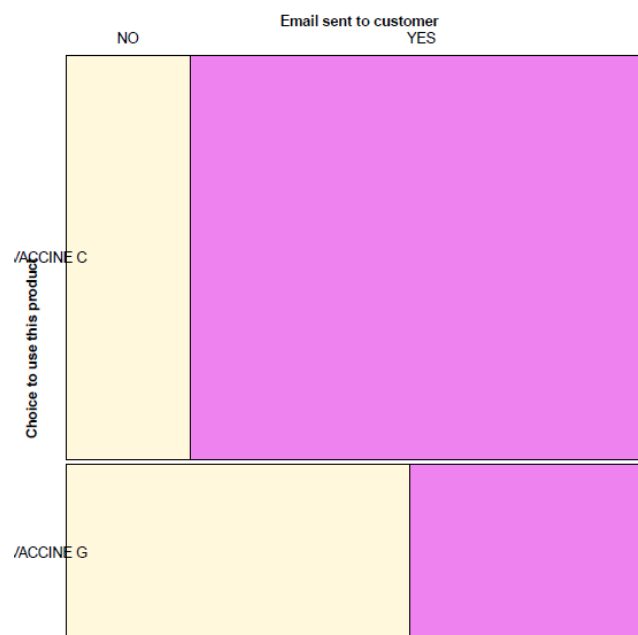
In this Table, column “APPROACHED_VIA_F2F” means that the company has been approached by this customer via the face-to-face channel. We define the same for the remaining columns: APPROACHED_VIA_WEBINAR, APPROACHED_VIA_EMAIL and APPROACHED_VIA_SMS.

We will predict the ability of customer switching to competitor's product, vaccine G by using the well-known Cross-Industry Standard Process Model for Data Mining (CRISP-DM) framework and four different predictive models: Naïve Bayes, Random Forest, Neural Network and Logistic Regressive. They are the most popular and classification algorithms that predict response variable with two classes: Yes or No (1 or 0).

2.3.2 Relationship between the Ability of Switching and Explanatory Variables

Before applying different predictive models, we need to examine the relationship between the ability to switch (CUSTOMER_CHOICE) with all explanatory variables in the table mentioned above. For example, we check the relationship between the ability of a customer switching to competitor's product and whether the company has approached the customer via email channel.

Fig. 4: Relationship between the ability of a customer switching and whether the customer has been approached via email



The graph shows that if the company send email marketing to customers, the capability these customers will stay with the company, with vaccine C, is significantly higher than not. This also can be interpreted that the email marketing program has a significant impact and a good return on investment rate. Similarly, we examine the relationships for the other variables: APPROVED_VIA_F2F, APPROACHED_VIA_SMS, APPROACHED_VIA_WEBINAR, GENDER, SPECIALTY, and CITY. Finally, we choose the variables that are most closely related to the customer's choice.

2.3.3 Models for Prediction

We apply different models mentioned above to predict the likelihood a customer will stay with the products of our company or switch to the competitor. The predictive process includes the following steps:

- The data is split into train and test sets.
- The training dataset will be used to put into fours, various predictive models.
- To estimate how well the model has been trained and model properties, the test set will be used
- Finally, we use the area under the ROC curve (Receiver Operation Characteristic) to measure the performance of each predictive model to choose the model works best.

2.3.3.1 Splitting the Dataset

Now, we split our dataset into train and test subset for our predictive models as below tables. This is the preparation step before applying predictive models to analyze the results.

Fig. 5: Train set

	CUSTOMER_CHOICE	APPROACHED_VIA_EMAIL	APPROACHED_VIA_SMS	CITY
2	VACCINE C	YES	YES	HA NOI
6	VACCINE C	YES	NO	HA NOI
7	VACCINE C	YES	YES	HA NOI
9	VACCINE C	YES	NO	HA NOI
10	VACCINE C	YES	NO	HA NOI

Fig. 6: Test set

	CUSTOMER_CHOICE	APPROACHED_VIA_EMAIL	APPROACHED_VIA_SMS	CITY
1	VACCINE C	YES	NO	HA NOI
3	VACCINE C	YES	NO	HA NOI
4	VACCINE C	YES	YES	HA NOI
5	VACCINE C	YES	NO	HA NOI
8	VACCINE C	YES	NO	HA NOI

2.3.3.2 Applying Predictive Models

Using Naïve Bayes model, we can predict the ability of switching, for train and test set at column naive_predict_prob as the following tables

Fig. 7: Train set with Naïve Bayes prediction

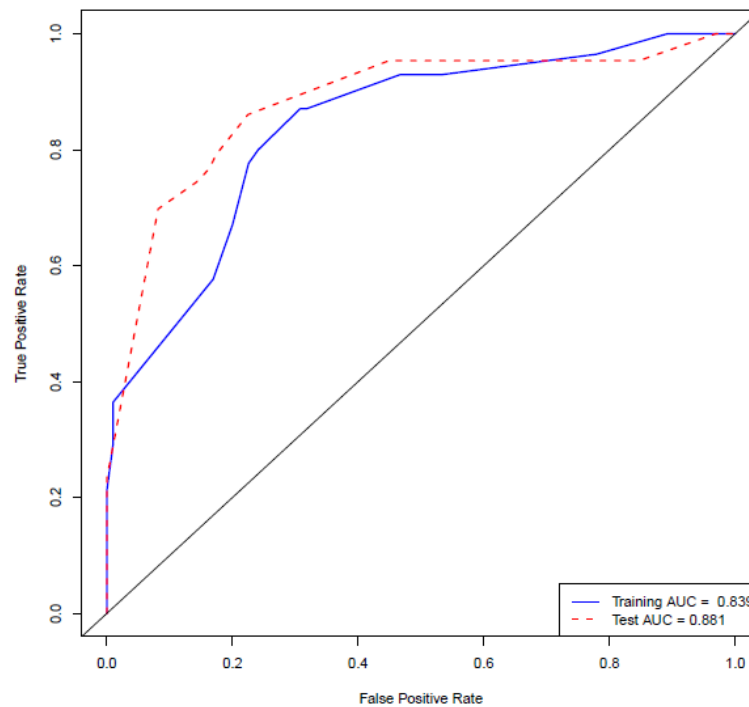
	CUSTOMER_CHOICE	APPROACHED_VIA_EMAIL	APPROACHED_VIA_SMS	CITY	naive_predict_prob
2	VACCINE C	YES	YES	HA NOI	0.066972886
6	VACCINE C	YES	NO	HA NOI	0.206290632
7	VACCINE C	YES	YES	HA NOI	0.066972886
9	VACCINE C	YES	NO	HA NOI	0.206290632
10	VACCINE C	YES	NO	HA NOI	0.206290632

Fig. 8: Test set with Naïve Bayes prediction

	CUSTOMER_CHOICE	APPROACHED_VIA_EMAIL	APPROACHED_VIA_SMS	CITY	naive_predict_prob
1	VACCINE C	YES	NO	HA NOI	0.206290632
3	VACCINE C	YES	NO	HA NOI	0.206290632
4	VACCINE C	YES	YES	HA NOI	0.066972886
5	VACCINE C	YES	NO	HA NOI	0.206290632
8	VACCINE C	YES	NO	HA NOI	0.206290632

To evaluate the model performance, we generated the ROC curve as below. A ROC curve is the most popular way to evaluate the performance of a binary classifier. It is created by plotting the true positive rate (TPR) against the false positive rate (FPR), considering for all possible threshold. Both the TPR and the FPR have a value from 0 to 1. For Naïve Bayes model, the area under the curve for test set is 0.881. We can be seen that this model works very well to predict the ability of a customer will stay with the company or switch to the product of the competitor.

Fig. 9: ROC of Naïve Bayes prediction



Similarly, we conduct the same for the other predictive models: Logistic Regression, Random Forest and Neural Network.

2.3.3.3 Evaluating the Results

The results of different predictive models will be compared in terms of effectiveness. The most successful model will be chosen to apply for each business objective. The table below provides a summary of the results across four alternative models. Regarding the performance of the test set, Naïve Bayes and Random forest methods have the better performances compared to other methods.

Table 3: Evaluation of Classification Models for predicting churn

	Area under ROC Curve	
	Training	Testing
Logistic regression	0.858	0.852
Naive Bayes	0.839	0.881
Random forest	0.786	0.816
Neural Network	0.867	0.854

With the results shown, we can see that Naive Bayes works best to predict the capability. We will use Naive Bayes to predict the likelihood a customer will join our webinar or not before we send invitations to them. This helps marketing to increase the customer's satisfaction and saving marketing costs.

2.4 Conclusion

When face-to-face meetings with physicians become increasingly difficult and the business is changing to a new model by reduction of their sales forces, the pharmaceutical industry is increasingly using a multichannel approach to interact with their customers, mostly via doctors. Reducing direct sale force and moving to digital marketing, it means that the ability to get customer insights manually has been reduced while a more complicated and tremendous amount of customer data from various marketing channels has to be dealt with. In this changing context, the companies must have a new approach to data and marketing, to get valuable insights from this increasing customer data in real time.

The main research issue of this article is to discuss the question how predictive analytics can optimize the marketing effectiveness of enterprises. This task is a mix of applying techniques of Data Mining, Business Intelligence and Decision Support System to combine models and data to solve related search and decision problems with extensive user involvement. Data Mining is about enabled the learning from historical data, even with incomplete information, whereas Business Intelligence helps to gather and use a large amount of data for analysis. The overall objective is to build a framework for using predictive analytics to optimize marketing, shifting funds from oversaturated and underperforming activities to those with higher Return On Investment potential. The research follows the well-known Cross-Industry Standard Process Model for Data Mining (CRISP-DM) framework, started by clearly clarifying the objective for each business request. We concentrate on the application of predictive marketing in the pharmaceutical industry. The reason for choosing this industry is that while other industries, especially technical-driven companies, have gained essential profits from instant, personalized product recommendations using predictive analytics, the pharmaceutical companies are still falling behind in their use of predictive marketing. As an example, we present and analyze a real-world case study in the pharmaceutical industry that illustrates how a company can not only face with huge challenges and but also profit from the opportunities in the digital market and its rapidly changing environment.

Also in our study, we find out that the biggest difficulty to apply predictive analytics in marketing is that there are many silos in the organization. Typically there are two types: silo in the organization, where departments or management groups do not share information, goals, tools, priorities; and silo in data systems where each application store data in different place, different format. Another difficulty for a pharmaceutical company is that there is a lack of resource, knowledge or expertise to apply predictive analytics. For a very long time, the regulatory pressures have made them lack of creativity, innovation in term of product marketing. Employees are too focused on how to strictly comply with company's policies, standard process and in addition, have a fear that innovation will adversely affect their compliances.

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3 Developing Country Stays at Home or Goes Abroad. Domestic Investment versus Outward Foreign Direct Investment. Evidence from Vietnam.

Hoang Nguyen^{34*}, Thu Pham³⁵

ABSTRACT

This paper seeks evidence to identify whether an outward foreign direct investment (OFDI) from Vietnam, a developing country, crowds out its domestic investment. By utilizing econometric specifications in the period of 1988-2015, the findings confirm that OFDI slightly affects domestic investment in a negative manner. In addition, domestic investment is supported by Gross national income, General gross government debt, Credit to the private sector, and Trade flow; while Cost of business start-up procedures is a barrier. The findings contribute a scientific perspective to governmental policy in terms of promoting or restraining the OFDI.

Keyword: Domestic Investment, Outward FDI, Vietnamese OFDI

3.1 Introduction

Despite academic findings that the increase in outward foreign direct investment (OFDI) causes the decrease in domestic investment (DI) in both developed and developing countries (Feldstein, 1995; Herzer & Schrooten, 2007; Goh & Wong, 2012; Al-Sadig, 2013), the outward FDI is still large, in which developing economies occupies 35 percent per global FDI in 2014, increases 23 percent compared to the previous year. Among developing economies, Asia becomes the world's largest investors (WIR, 2015). Why does this disparity exist? Does OFDI affect but not strongly harm the DI? Does OFDI's influence differ among specific economies? Is DI further shaped by other factors?

In Vietnam, there are two points of view: promoting or limiting the OFDI. People who say "No" have asked for OFDI to be strictly managed because Vietnam is not a capital abundant country. Vietnam needs capital investment to develop. Heckscher (1919) and Ohlin (1933) stated that capital flows are attracted from capital abundant to capital-scarce countries. Therefore, there is no reason for Vietnam to bring a little amount of capital to another country. OFDI stimulation must be considered carefully. Vice versa, people who say "Yes" strongly support the FDI outflows. During the worldwide economic crisis (2008-2012), the demand for (Vietnamese-made products) Vietnamese-produced goods dropped due to the decrease in both international and internal purchasing power. According to the National Financial Supervisory Commission of Vietnam (NFSC, 2013), the weak market demand had caused a reduction in business scale and an escalation in inventory, which reached to 36.5% in 2012. In case the total domestic demand is shrunk and weak, increasing OFDI is an option to replace the export. At the same time, Vietnamese people have tightened their purse strings which leads to low credit growth and the decrease in local private investment, threatening Vietnam's GDP. During this period, GDP was regularly below 7%, even fell to 5.03% in 2012, less than two-thirds of the pre-crisis level (Huyen Thu, 2013). From these two points of view, this paper aims to find out whether Vietnamese OFDI crowds out the DI and whether Vietnamese enterprises should stay at home to save capital for internal investment?

Some studies about the relationship between OFDI and DI were conducted in developing countries (Girma et al., 2010; Goh & Wong, 2012; Al-Sadig, 2013). However, a specific study for Vietnam has not been conducted yet. Recently, an article by Forbes (2016) titled "Viet Nam: The quiet economic success story of Asia" gave some positive evidence on overcoming the negative effects of the global economic crisis in 2008. Thus, Vietnam is an interesting case to study. This paper aims to contribute to the empirical literature of a particular developing economy.

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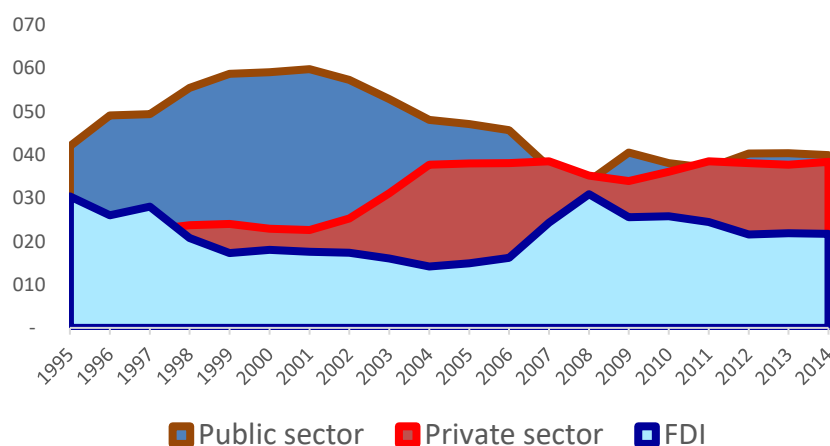
The next section gives a glance at DI and OFDI in Vietnam. The third section reviews the literature on DI and OFDI relationship. The fourth one presents research methodology and data. The fifth and the sixth sections present the discussion, the findings and the conclusion.

3.2 Statistical Glance at Domestic Investment and OFDI in Vietnam

Vietnam is located on Indochina Peninsula in Southeast Asia. It is bordered by Laos to the northwest, Cambodia to the southwest and China to the north. Its eastern border has a long coastline with the East Sea (South China Sea). This geographical location gives Vietnam trading advantages with countries in the region and with seaports around the world. The official name of the country is the Socialist Republic of Vietnam with a single-party, communist state political system. It is a socialist-oriented market economy.

In Vietnam's economy, the state economic sector includes all state-owned companies, enterprises, businesses, manufacturers, and technology-science institutions. Most of these properties are publically owned except one cooperative part (state-owned companies holding a controlling role). The public directors of the state economic sector are the driving force that Vietnamese government relies on to manage their economy. The state economic sector controlled the most important industries and retained the most profitable commercial entities under its control. The non-state sector includes the collectives, the privately held firms and households sectors. The collective economic sector is mainly comprised of consolidated agricultural units, handicraft productions, trading and services which plays an important role in maintaining and stabilizing Vietnam's socio-economic growth. The private economic sector was revived especially in agriculture, forestry and aquaculture, light, the small and medium scale of the industry, trading, and services areas. A household economy which describes collective economic activities of one or many people sharing a common family dwelling contains a wide variety of commercial activities, such as small-scale industry, construction, services, artisan crafts, agriculture, forestry, and aquaculture. They play an important role in generating income and employment opportunities. Figure 1 demonstrates the total investment structure between the three economic sectors. The public sector is decreasing; the private sector is enlarging; while the foreign-owned sector is almost unchanged.

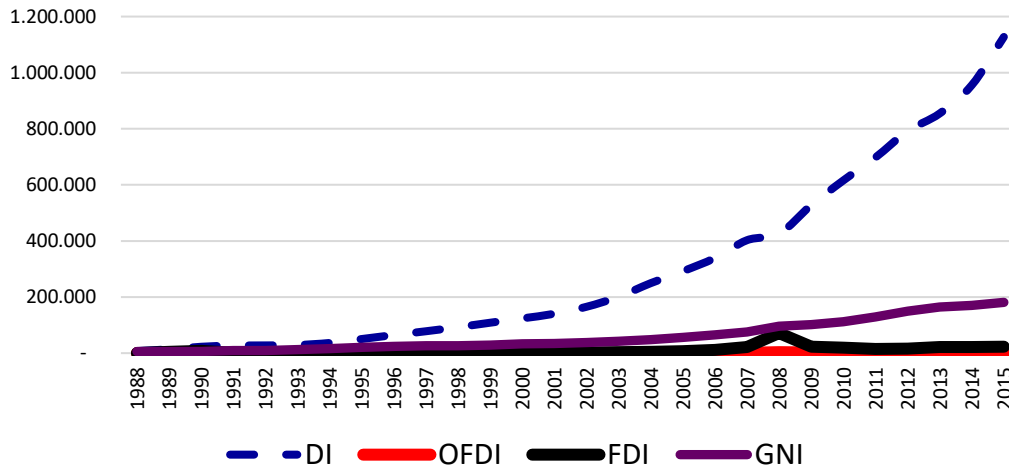
Figure 1. Total investment structure



Regarding the outward FDI from Vietnam, the enterprises have been gradually going out and achieving initial success. In 1988, there was only one project with the value of 0.6 USD million. However, the number of projects increased to 962 with the total value of 15 USD billion in April 2015. Most of the projects invested in neighbouring countries such as Laos and Cambodia, and countries with a historical relationship like Russia and the United States. Recently, a large number of investments have poured to African countries. The key investment form is 100% of FDI and the major motive is natural resource seeking³⁶. However, comparing to the DI, the OFDI amount is a humble undersized. The comparison is shown in Figure 2. FDI dramatically grows up; Gross National Income is slightly increasing; while FDI and OFDI flow still remain very low.

³⁶ Generating from website of Ministry of Planning and Investment

Figure 2. The trend of Domestic Investment and GNI-FDI-OFDI



3.3 Literature Review on the Relationship between OFDI and Domestic Investment

The literature is reviewed in two parts: Empirical evidence in both developed and developing countries, and Effects of other factors on DI.

3.3.1 Empirical Evidence

The empirical research about OFDI and DI varies from developed countries to developing ones. *In terms of OFDI from developed countries*, its impact on DI can be observed in the group of countries or individuals. Studying the OFDI from OECD countries, researchers give quite similar findings that there is a one-by-one relationship between OFDI and DI. Feldstein (1995) studies the effects of OFDI on DI in OECD countries for the time point of the 1970s (15 countries) and 1980s (18 countries). In the first specification, the dependent variable is the ratio of Gross DI to GDP; the independent variables are the ratio of Gross national saving to GDP, the ratio of FDI outflow to GDP, and the ratio of FDI inflow to GDP. The result shows evidence that OFDI negatively influences DI with a coefficient of -1.73 in the 1970s and -1.65 in the 1980s. In the later specifications with more explanation variables added, namely population, inflation rate, the growth rate of GDP, and short-term interest rate, the evidence is the same that each dollar of cross-border investment reduces DI by one dollar on average. Testing for the effects of FDI on DI for the United States, Japan, Germany and the United Kingdom, Andersen and Hainaut (1998) find the same result as Feldstein (1995) that DI has a tendency to be reduced by FDI outflows. The highest impact is for Germany (-1.72), then Japan (-1.32), the USA and UK are -1.08 and -0.41, respectively. Applying Feldstein (1995) pattern, by using a larger sample of OECD countries in the 1980s (20 countries) and the 1990s (26 countries), Desai et al (2005) observes the implications of the FDI outflows (OFDI/GDP) for DI (National gross capital formation to GDP) and finds the same conclusion with Feldstein (1995) with the coefficient of -1.33 for the sample of the 1980s and -1.07 for the 1990s sample. Thus, the authors reach the conclusion that “higher outbound FDI is associated with lower domestic investment” (p.07). In addition, the authors did another study, which focused on testing the relationship between domestic (as DI) and foreign capital expenditures (as OFDI) in firm-level using American multinationals within the USA country. The coefficient of 3.5 demonstrates a positive influence that American multinationals spend an additional dollar of foreign capital expenditure (as OFDI) will stimulate 3.5 dollars of domestic capital expenditure (as DI).

For the specific country, Herzer and Schrooten (2007) apply a similar equation as Desai et al. (2005) to estimate the association between DI (gross capital formation to GDP) and OFDI (net outward direct investment to GDP). The observation is carried out in the United States (1970-2003) and Germany (1971-2004). In the case of USA, the coefficient of 4.05 states a positive link between OFDI and DI; the result is quite comparable to the Desai

et al. (2005)'s finding. In the case of Germany, the result is a contrast. The coefficient of -1.4 pieces of evidence that the increase in OFDI, the decreasing in DI. Regarding the correlation between OFDI and DI in the Netherlands in the period of 1996-2000, Goedegebuure (2006) divides the sample into R&D intensive industries and traditional industries (with low R&D-intensity) with 02 types of DI: capital investments and R&D investment. The result indicates that OFDI crowds in both capital and R&D investment in R&D-intensity industries; while OFDI crowds out the capital investment and is not significant to R&D investment. Before the Desai et al (2005)'s testing for the micro-level, Hejazi and Pauly (2003) take Canadian industry-level data in the period 1983 - 1995 to investigate whether both outflow and inflow FDI affect Gross Fixed Capital Formation (GFCF) in Canada. The result reflects a non-significant relation between OFDI and DI. Moreover, show the different consequence of Canadian FDI outflows related to the countries where firms export to; the authors test the connection between Canadian OFDI to the USA, UK, and the rest countries of the world. Supplement occurs when the importer is the US; the net impact was no significant in case of the UK; whereas a substitution effect to the rest of the world.

In terms of OFDI from developing countries, the overall and particular analysis indicate its concrete impact on DI in these countries. Using system-GMM estimator with panel data of various factors including FDI outflows and inflows, Savings, Inflation, Openness, Real GDP growth, Broad money supply (M2), Credit to private sector... for 121 developing countries over the period 1990–2010, Al-Sadig (2013) finds that one percentage point growth in OFDI leads to a reduction of about 29 percent in DI. Evaluating the relationship between OFDI and domestic capital formation in BRIC including Russia, China, India and Brazil by Unit Root test, DOLS regression method, Dasgupta (2014) reaches the conclusion that the impact of OFDI on DI is not only positive but also significant and substantial, both in the short-run and the long-run. For a specific country, Goh and Wong (2012) attempt to estimate the interdependence of FDI outflows and home country's economic growth in Malaysia (1999-2008) and reveal a substitutional impact of OFDI on DI in long-run based on Granger causality tests. While in India, Girma et al (2010) indicate the different impacts of OFDI by investment level based on Indian Multinationals data from 2000 to 2003. Low-level OFDI leads to a positive result for DI because it brings more business to firms in the home country, who in turn make more investments at home. However, high-level OFDI is associated with a negative result for DI. The lower growth in the domestic asset is associated with higher level of foreign investment.

In summary, the above empirical literature suggests that there is a difference in the impact of outward FDI on DI in developed and developing countries. Developing countries showed a relatively negative result but also positive one in several situations.

3.4 The Effects of other Factors on Domestic Investment

While testing the influence of OFDI and DI; the previous studies applied some explanation factors such as GDP, savings, expenditures, and cost. In this paper, those factors are categorized into 04 groups of economics, finance, institution, and business condition.

(1) Economics: According to World Bank, Economic factors with data can help policy-makers to understand their countries' economic circumstances better and find the best way for development. Andersen (1998) and Al-Sadig (2013) mention GDP as a plus point for DI, but some studies find that per capita GDP growth is not obvious. Ndikumana (2000) illustrates an optimistic correlation. Domestic Savings and Capital Stock have a completely optimistic impact because these factors can transfer directly to Investment Stock, financing a large share of DI in both developed and developing countries (Feldstein and Horioka, 1980; Feldstein, 1995; Andersen, 1998; Desai; 2005; Goh, 2012; Al Sadig, 2013). Inward FDI is considered to be a relatively positive factor (Feldstein, 1995; Goh, 2012; Al-Sadig, 2013), although Desai's result (2005) is neutral. Expenditures for R&D and Capital in host countries and investment are also highly positively correlated. According to Desai (2005), an additional dollar of foreign capital expenditures results in an increase of 3.9 dollars of domestic capital expenditures, while Hejazi (2003) find that R&D expenditures have a good effect on Gross fixed capital formation of Canada.

(2) Finance: Financial market plays a vital role in overall development in common and DI in particular. In a study for Sub-Sahara African countries, Ndikumana (2000) provides some indicators supplementing to DI such as Credit to the private sector, Total liquid liabilities of the financial system, Credit provided by banks, and an index combining these three indicators. Conversely, External debt, Black market premium and Government

domestic borrowing do not contribute to national investment growth. The relationship between Treasury bill rate and FDI was well correlated (Hejazi, 2003). Interest rate and Broad money supply (M2) both show a positive impact, with a respective growth of 0.16 and 0.2 of investment Stock for a unit increase of these factors (Dasgupta, 2014; Al-Sadig, 2013).

(3) Institution: According to Scott (2001): “Institution is multifaceted, durable social structures, made up of symbolic elements, social activities, and material resources” that supplies guidelines and resources or prohibitions and constraints on actions. One of the institutional factors is International trade flows, which measure the balance of trade by the gap between exports and imports, tend to supplement DI (Ndikumana, 2000). In Al-Sadig’s study (2013), policy factors are observed to check the robustness of OFDI’s negative implication on investment, including Political risk, Law and Order and Corruption level. The results show that all of them are negative, associating with market distortion, which makes FDI capital flows outward.

(4) Business Condition: Business conditions, evaluated in the scale of country, region or city, are one of the most crucial factors to attract investment for a country. Property taxes, Income taxes, Wage rates, Workforce, Transportation can influence the decision on investing abroad and change domestic savings stock. One of the important advantages of investing abroad is labour cost. Low labour cost in host countries attracts investors to transfer their capital to their foreign affiliates for-profit motivation. Andersen and Hainaut (2003) prove that in developed countries, high labour costs encourage outflows and discourage inflows, so it is not a beneficial element for domestic capital stock. The price index for hours worked, which is correlated with labour costs, is negative, according to Hejazi (2003). Hejazi also defines domestic taxes issues, in specific, cooperate taxes paid can reduce investment.

The implication of OFDI on DI varies from negative, neutral to positive effects. From an overall view, the impact of FDI outflows on developed countries is ambiguous but quite pessimistic in developing countries. Beside outward FDI, economics finance, institution and business condition factors are demonstrated to have an impact on DI.

3.5 Data and Methodology

Following the above literature, OFDI’s influence on DI can either be positive or negatively. In addition, different country-specific factors might have a different impact on DI. This study employs a time-series data for DI and explanation variables with annual observations for the period of 1988-2015. The sample time-series data is complete for the Vietnamese OFDI flows which started in 1988. The data is supplied by General Statistics Office of Vietnam (GSO), World Bank database (WB), and International Monetary Fund (IMF).

The empirical model starts with a generic model, which is expanded to allow the other country-specific factors. This basic model is borrowed from Feldstein (1995) including DI, OFDI, FDI, and Gross National Income (GNI). The second specification expands the basic model by adding more home country characteristics to explain DI. The third specification is similar to the second specification but in logarithm, while the fourth specification examines dependent variable in lagged for one year. The nature logarithm is applied to control a non-linear relationship (Benoit, 2011). In addition, a one-year lag is to reduce the risk of simultaneity biases (Andersen and Hainaut, 1998). By re-testing the specification with the logarithm transformation and the time lag, the study adds more standpoints to investigate the OFDI and DI link.

The dependent variable is the annual amount of DI which involves only the investment from Vietnamese state and private sectors in period t excluding investment from the foreign area is to test the internal capacity of the Vietnamese. For independent variables, certain explanatory variables that are proxies for country-specific factors are used. Detailed data descriptions and sources can be found in Table A1 in the appendix.

In the first baseline model, the dependent variable is DI_t standing for annual amount of DI during period t ; the independent variables are outward FDI from Vietnam ($OFDI_t$), inward FDI to Vietnam (FDI_t), and Gross national income (GNI_t)

Most literature state that both increasing FDI and growth rate of GDP/ GDP per capital supplemented DI (Feldstein, 1995; Ndikumana, 2000; Goh & Wong, 2012). Therefore, it is hypothesized that OFDI depresses DI, while FDI and GNI encourage DI. The simplest empirical specification is:

$$DI_t = \beta_0 + \beta_1 OFDI_t + \beta_2 FDI_t + \beta_3 GNI_t + \varepsilon_t \quad (1)$$

This specification ignores the influence of country characteristics on DI flows. Therefore, in the second step, the study tries to identify the specific country factors affecting DI. Commonly, factors help to increase “Savings” will promote DI; vice versus, factors relates to “Expenditure” will reduce DI. The paper takes into account the influence of Gross national saving (GNS_{*t*}) on DI as a proxy for its potential increased revenue development. This rate measures recent dynamics of its economy; thus, high growth is often associated with high dynamics in the future (Frenkel et al., 2004). It is expected a positive and significant influence on DI. In opposite, Gross national expenditure (GNE) will give a negative sign to DI. Both factors embody the economic aspect. Symbolizing the financial aspects, previous studies use some explanatory factors such as external debt and government domestic borrowing (Ndikumana, 2000) which confer a negative impact on DI; whilst broad Money supply (M2) and Credit to private sector present a positive sign (Al-Sadig, 2013). In this study, Gross national expenditure (GNE_{*t*}); General government gross debt (DEBT-G_{*t*}), Credit to government and state-owned enterprises (CRE-G_{*t*}), Domestic credit to private sector (CRE-P_{*t*}), and Military expenditure (MLT-E_{*t*}) are representative. Trade flows (TRADE_{*t*}) and Cost of business start-up procedures (CDB_{*t*}) stand for institutional and business conditions aspects, respectively. In this study, MLT-E is given as an explanatory factor because of dramatically increasing of this occupation portion in the national budget. According to SIPRI (Kien thus, 2016), Vietnamese military budget in 2015 was around 4.4 billion USD, four times more than the year of 2005; approximate 5 billion USD in 2016; and might reach 6.2 billion USD in 2020. This trend is similar to other countries, due to escalating conflicts in some areas, including East Sea between Vietnam and China. For the CDB, this factor reflects a barrier that a business has to face for getting permission to do abroad investment. Enterprises that want to complete the procedures for obtaining investment licenses must go through 11 focal points of the management agencies (VnEconomy, 2008). However, according to World Bank, Vietnam is one of the countries got the increase in newly established enterprises under the influence of administrative reform in the period of 2009-2010 (MPI, 2014). In this paper, it is assumed that increasing in MIL-E and CDB will reduce DI. Additionally, Ndikumana (2000) finds that trade flows positively impact on DI; whereas, labor cost and tax paid to give an opposed indication (Andersen & Hainaut, 1998; Hejazi & Pauly, 2003). The second specification (2) is:

$$DI_t = \beta_0 + \beta_1 OFDI_t + \beta_2 FDI_t + \beta_3 GNI_t + \sum_{k=1}^{n-1} \beta_k X_{kt} + \varepsilon_t \quad (2)$$

t is the year, *n* is a number of additional specific country predictors, *k* is additional factors.

In this third step, natural logarithm is applied based on the equation (2). According to Benoit (2011), there are three possible combinations: the linear-log model (log of independent variables), the log-linear model (log of dependent variables), and the log-log model (log of both dependent and independent variables). In the equation (3.1), the only dependent variable is made with log (LN of DI); the independent variables are at the normal level. Reversely, the equation (3.2) makes a log of independent variables (LN of GNI, LN of GNS, LN of GNE, LN of GGGD, LN of CRE-G, LN of CRE-P, LN of MILE, LN of TRADE, LN of CDB).

$$LN.DI_t = \beta_0 + \beta_1 OFDI_t + \beta_2 FDI_t + \beta_3 GNI_t + \sum_{k=1}^{n-1} \beta_k X_{kt} + \varepsilon_t$$

(3.1)

$$DI_t = \beta_0 + \beta_1 LN.OFDI_t + \beta_2 LN.FDI_t + \beta_3 LN.GNI_t + LN.\sum_{k=1}^{n-1} \beta_k X_{kt} + \varepsilon_t$$

(3.2)

In the fourth specification (4), the study makes the independent variable in 01-year lagged to control for heterogeneity as the previous mention:

$$DI_t = \beta_0 + \beta_1 OFDI_{t-1} + \beta_2 FDI_{t-1} + \beta_3 GNI_{t-1} + \sum_{k=1}^{n-1} \beta_k X_{kt-1} + \varepsilon_t$$

(4)

3.6 Results and Discussion

Generally, the results in Table 1 confirm that the OFDI does not support the DI in Vietnam. In the basic model (1) which borrowed from Feldstein (1995), the -0.09 coefficient on OFDI is consistent with Feldstein (1995) and Desai et al. (2005)’s findings, but the effect is less than 100 times. In their studies, the relationship between

OFDI and DI was in an inverse ratio to one-to-one. Looking at the specification (4) with lagged one year, the coefficient is still small with -0.07. However, in the specification (2 and 3) with adding control variables, the coefficient goes up slightly to -0.15. This means the Vietnamese OFDI does not strongly cause the shrink of DI. In fact, the size of OFDI is little relative to that of DI. OFDI occupies only 0.91% per total GDP compared to 24.26% of DI portion in 2014 (GSO). In comparison with ASEAN countries, OFDI from Vietnam is smaller than that of Singapore, Malaysia and Thailand. While Singapore is the largest source; Malaysian OFDI exceeded FDI and was expanding rapidly, Vietnamese OFDI has just become noticeable since 2009 (ASEAN Investment Report, 2012).

Natural resource seeking, efficiency-seeking and strategic asset-seeking motivations, the impact of OFDI on DI tends to be neutral or positive. Through market-seeking purpose, there are two different possible outcomes: the effect can be neutral or positive or negative, depending on the kinds of OFDI (service, non-service) and export situation when firms invest abroad.

Besides, the above-mentioned literature state that the effect of OFDI on DI depends on the motives of OFDI. For the motive of natural resource-seeking, efficiency-seeking, and strategic-asset seeking, OFDI probability is either non-significant or brings returns and the benefits back home country to support DI; while the motive of market-seeking might cause a decrease of DI in the case of non-services sectors. In case of Vietnam, OFDI is mainly in the motive of natural resource-seeking with 43% of investing in mining and quarrying (VNR, 2015). This is a type of long-term investment; therefore, the capital has been brought out the country in the short-run; then slightly negatively affects DI. However, there might be returns in the long-run. In the other aspects, Vietnamese companies also invest in some services such as banking, real-estate; especially the information and communication supply which accounted for 8% of total OFDI capital. The successful case is Viettel. Viettel recently has operations in 10 countries, with a market of 270 million people (03 times bigger than Vietnam's population). After 10 years, Viettel started achieving fruitful outcomes. The revenue growth reaches about 25% (QDND, 2016). As a result, the returns will get back to Vietnam to support DI. At the end of 2012, the returns which mainly come from telecommunication, oil and gas exploration, and rubber plant was 430 million USD, approximate 11.31% of ROI (TheSaigontimes, 2013). Moreover, the regression reports that DI is positively affected by other factors such as Gross national income, General gross government debt, Credit to the private sector, and Trade; while Cost of business start-up procedures has a negative relationship with DI. Gross national income or GDP represents the wealth of the nation; therefore, the wealthier a nation is, the more money for investing is spent. In a research, Mofrad (2012) finds a positive long-term relationship between GDP and DI. Recently, Vietnam has become a low middle-income country due to the increase in GDP/ GNI and DP per capita. It is understandable why GNI is directly ratio one-to-one to DI. Similarly, the +0.2 coefficient of General gross government debt (DEBT-G) shows the direct proportion to DI. The result of data analysis is in Appendix.

Table 1. Summary of Results

<i>Independent variables</i>		<i>Dependent variable: Annual Domestic Investment</i>				
		Baseline	Specific Country factors			
		1	2	3.1	3.2	4
β_0	Constant	-55921.9 (0.00)	-414624.3 (0.00)	14.2 (0.00)	1960144.8.2 (0.00)	-0.388148.4 (0.00)
β_1	OFDI _t	-0.090 (0.00)	-0.146 (0.00)	-0.152 (0.00)	-0.111 (0.00)	-0.067 (0.01)
β_2	FDI _t	<i>Ns</i>	<i>ns</i>	<i>Ns</i>	<i>Ns</i>	<i>Ns</i>
β_3	GNI _t	1.062 (0.00)	0.712 (0.00)	<i>Ns</i>	<i>Ns</i>	0.765 (0.00)
β_4	GNS _t		<i>ns</i>	<i>Ns</i>	<i>Ns</i>	<i>Ns</i>
β_5	GNE _t		<i>ns</i>	<i>Ns</i>	<i>Ns</i>	<i>Ns</i>
β_6	DEBT-G _t		0.269 (0.00)	<i>Ns</i>	<i>Ns</i>	0.190 (0.01)
β_7	CRE-G _t		<i>ns</i>	<i>Ns</i>	<i>Ns</i>	<i>Ns</i>
β_8	CRE-P _t		0.118 (0.00)	<i>Ns</i>	<i>Ns</i>	<i>Ns</i>
β_9	MLT-E _t		<i>ns</i>	<i>Ns</i>	<i>Ns</i>	<i>Ns</i>
β_{10}	TRADE _t		<i>ns</i>	<i>Ns</i>	<i>Ns</i>	0.089 (0.04)
β_{11}	CDB _t		<i>ns</i>	-1.084 (0.00)	-1.062 (0.00)	<i>Ns</i>
	R ²	0.991	0.997	0.989	0.987	0.998
	Observations	27	27	27	27	26

Significance at 10%; P-values are shown in parentheses. A reported p-value of 0 is of course actually greater than zero.

Since most of the debt is to develop infrastructure and public projects (Pham and Truong, 2012). For the Credit to the private sector (CRE-P), the coefficient is +0.1, which illustrates that CRE-P marginally supports DI. This result meets the Luca and Spatafora (2012)'s conclusion that private capital inflows and domestic credit support investment. Regarding the +0.01 coefficient of Trade, it mirrors a positive relation to DI, although the relationship is not strong. Finally yet importantly, Cost of business start-up procedures (CDB) is expected to crowd out the DI. The complicated and blurred procedure is one of the barriers to start-up local business. The estimated -1 coefficient presents a decrease of 1% for each additional 1% of CBP. In addition, some explanation factors were expected to have either positive or negative relationship to DI; but they were not statistically significant. Those factors are the change of inward FDI, Gross national saving, Gross national expenditure, Credit to government and state-owned enterprises, and Military expenditure.

3.7 Conclusion, Recommendation and Further research

There is existing evidence that OFDI negatively affects DI in Vietnam. However, the effect is too small to be extremely concerned. The increase in OFDI is not a crucial problem to decrease DI. In terms of financial market, OFDI from Vietnam leads the movement of capital outside the country in order to invest in long-term projects such as mining, quarrying, hydro-electricity. However, there is evidence that OFDI brings back not only returns but also some other benefits as well. Mr Bui Duc Thu, Member of Finance Committee - Budget said that OFDI by Vietnamese enterprises does not only help to expand the market but also create more opportunities for closing to the modern science and technology; thereby enhancing competitive capacity. The flow of investment abroad also confirmed the growth of Vietnam economy, maintaining political and foreign relations with traditional friends (Vietnam Finance Magazine, 2015). The most traditional market of Vietnamese OFDI is Laos and Cambodia, the two close friends and neighbours with special diplomatic relationships, "Helping others, helping ourselves" (Vietnamese proverb). The stimulation of OFDI should be considered in terms of promoting such motives for expanding market, getting efficiency and strategic assets. On the other hand, to enhance DI, the government should enlarge Gross national income, increase Credit to the private sector, as well as improve General government gross debt' structure.

Although the result shows that an increase in OFDI from a specific developing country like Vietnam can lead to a decrease in DI. This is not a good sign to some extent. However, the OFDI trend is gradually increasing from both developed and developing countries. It means OFDI must bring some benefits beyond the physical returns. These could be the national position in the world, the international relations, the grow-up of domestic enterprises, the market expandability, the development of technological level, and so on. Studying OFDI in a specific developing country can help the government to issue the policy which either promotes or restrict OFDI. The small amount of OFDI from Vietnam might be a limitation to an established significant relationship with DI. Thus, the study should be re-tested with longer time series data. For further study, it is necessary to identify which motives of investing abroad will match and stimulate DI; to pinpoint the characteristics of Vietnamese OFDI, and its role in economic performance. A study about OFDI from ASEAN is interesting to do to look at individual country characteristics in relations to a general region characteristics.

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Appendix

A1. Description of factors use

Factors	Label	Description	Unit	Source
Dependent:				
Domestic Investment	DI	Investment from Public+Private sector, without FDI sector	USD Mil.	GSO
Independent:				
<i>Basic factor:</i>				
Outward FDI	OFDI	FDI outflow to Vietnam	USD Mil.	GSO
Inward FDI	FDI	FDI inflows to Vietnam	USD Mil.	GSO
<i>Additional factors:</i>				
Gross National Income	GNI	Gross National Income	USD Mil.	GSO
Gross National Saving	GNS	Gross National Saving	% of GDP	IMF
Gross National Expenditure	GNE	Gross National Expenditure	% of GDP	WB
General government gross debt	DEBT-G	General government gross debt	% of GDP	IMF
Credit to government and state-owned enterprises	CRE-G	Credit to government and state-owned enterprises	% of GDP	WB
Domestic credit to the private sector	CRE-P	Domestic credit to private sector	% of GDP	WB
TRADE	TRADE	Trade flows	% of GDP	WB
Military expenditure	MLT-E	Military expenditure	% of GDP	WB
Cost of business start-up procedures	CDB	Cost of business start-up procedures	% of GNI per capita	WB

A2. Regression Results

Model 1. Baseline

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
2	.996 ^b	.992	.991	3.040606E4		
a. Predictors: (Constant), GNI						
b. Predictors: (Constant), GNI, OFDI						
Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	-55921.972	8742.906		-6.396	.000
	GNI	6.250	.161	1.062	38.929	.000
	OFDI	-25.202	7.606	-.090	-3.313	.003
a. Dependent Variable: DI						

Model 2. Baseline + specific country factors

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
4	.999 ^d	.997	.996	1.899242E4		
d. Predictors: (Constant), GNI, GGGD, OFDI, CREP						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
4	(Constant)	-414624.290	72259.869		-5.738	.000
	GNI	4.294	.437	.712	9.828	.000
	GGGD	9862.453	2652.753	.269	3.718	.006
	OFDI	-33.216	8.686	-.146	-3.824	.005
	CREP	1596.292	639.343	.118	2.497	.037
a. Dependent Variable: DI						

Model 3.1. Baseline + specific country factors: log of dependent variable

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
2	.995 ^b	.989	.987	.061887967		
b. Predictors: (Constant), CDB, OFDI						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	14.253	.064		222.450	.000
	CDB	-.062	.002	-1.084	-25.559	.000
	OFDI	-6.429	.000	-.152	-3.586	.005
a. Dependent Variable: LN of DI						

Model 3.2. Baseline + specific country factors: log of independent variable

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
2	.993 ^b	.987	.984	3.690535E4		
b. Predictors: (Constant), LN of CDB, LN of OFDI						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	1.960	96813.751		20.247	.000
	LN of CDB	-484635.560	21850.928	-1.062	-22.179	.000
	LN of OFDI	-17169.672	7427.702	-.111	-2.312	.043
a. Dependent Variable: DI						

Model 4. Baseline + specific country factors: 01 year lagged of dependent variable

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
4	.999 ^d	.998	.997	1.414539		
d. Predictors: (Constant), Lagged GNI, Lagged OFDI, Lagged GGGD, Lagged Trade						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
4	(Constant)	-388148.437	86978.205		-4.463	.002
	Lagged GNI	4.126	.398	.765	10.356	.000
	Lagged OFDI	-13.517	4.085	-.067	-3.309	.011
	Lagged GGGD	6236.749	1863.938	.190	3.346	.010
	Lagged Trade	1251.771	527.478	.089	2.373	.045
a. Dependent Variable: DI						

4 Risk Management at Mobile World Corporation. *Le Thai Phong³⁷, Le Do Thien Truc³⁸, Dinh Hai Dung^{39*}*

ABSTRACT

This study applies the financial risk measurement by using financial ratios and Default risk model (Edward I. Altman's Z-Score model) and operational risk measurement by measuring the quantity of operational risks and quality of risk management. The results are consistent with the explanations of the measurement by financial ratios and default risk model and quantity method of operational risks and quality of risk management that there is a Good comment for the financial status of Mobile World Corporation and Operational risk figured out as Event risk. As a result, TOWS method is used to reach the solutions for the risk finding out.

Keywords: Risk Assessment, Financial Risk, Operational Risk, Risk Management Assessment, Mobile World Corporation.

4.1 Introduction

Risks can come from various sources including uncertainty in financial markets, threats from project failures (at any phase in design, development, production, or sustainment life-cycles), legal liabilities, credit risk, accidents, natural causes and disasters, deliberate attack from an adversary, or events of uncertain or unpredictable root-cause. Risk management is the identification, assessment, and prioritization of risks (defined in ISO 31000:2009 as the effect of uncertainty on objectives) followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities. Risk management's objective is to assure uncertainty does not deflect the endeavour from the business goals. It is important in an organization because, without it, a firm cannot possibly define its objectives for the future. If a company defines objectives without taking the risks into consideration, chances are that they will lose direction once any of these risks hit home.

Mobile World Investment Corporation operates under two distribution formats: the thegioididong.com which means Mobile World, and "dismay" which means Consumer Electronics. Over the past years, the Company has been continuously growing despite the not favorable macroeconomic conditions. Mobile World has been awarded several international prizes by prestigious organizations, including The Global Growth Enterprise by the World Economic Forum, the Top 5 Fastest Growth Retailer in Asia – Pacific 2010 by Euro monitor International, and the Top 500 Retailers in Asia-Pacific by Retail Asia magazine for 6 consecutive years (2010-2015). Besides, Mobile World's success story has been taught in many leading American business schools such as Harvard University, UC Berkeley, and Tuck School of Business.

As a result, the risk assessment and management of Mobile World Corporation shall be an important part for investors, and company owners, regulatory authorities as well as other stakeholders to understand the big success story of the big this company.

In this study, we especially focus on one type of risk, namely the risk of bankruptcy of the company. As a tool of measurement, we apply the Altman Z-score. The Altman Z-score is a formula that was developed in 1967 by Prof. Edward I. Altman. With this score, which is based on five different categories of financial ratios that can be calculated using data from a company's annual report, we can make a prediction about the credit-strength of the analyzed company, it means whether the company underlies a high probability of being insolvent. This is crucial for any decision making the process of stakeholders.

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4.2 Literature Review

4.2.1 Concept of Risk and Risk Management

Risk, according to ISO 31000:2009 is defined as the “effect of uncertainty on objectives”. There are two types of risk as financial risk (risks associated with financing, including financial transactions and loans in risk of default) and operational risk (the risk of indirect or indirect loss due to inadequate or failed internal processes, people, and systems or from external events).

Risk management is the identification, assessment, and prioritization of risks (defined in ISO 31000 as the effect of uncertainty on objectives) followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities. Risk management’s objective is to assure uncertainty does not deflect the endeavor from the business goals.

In the next section, we explain financial risk and how calculation can be made to assess the profitability, leverage, liquidity, solvency and activity of companies. Based on that, the Altman Z-score is introduced for further use of risk measurement.

4.3 Risk Measurement

4.3.1 Financial Risk Measurement

- Activity ratios: Measure the efficiency of a company’s operations. Major activity ratios include inventory turnover, days of inventory on hand, receivables turnover, days of sales outstanding, payables turnover, number of days payables, working capital turnover.

- Liquidity ratios: Measure the ability of a company to meet short-term obligations. Major liquidity ratios include the current ratio, quick ratio.

- Solvency Ratio: Assess a company’s ability to fulfil its long-term obligations. Major solvency ratios include debt ratios and coverage ratios.

- Profitability ratios: Net profit margin, ROA, ROE

- Cash flow analysis (CFO, CFI, CFF): Cash flow to revenue, Cash to income, Debt coverage.

Using the ratios we get to the Default risk model or also called Edward I. Altman’s Z-Score model

$$Z=1.2x1+1.4x2+3.3x3+0.6x4+1.0x5$$

Where: x1=Working capital/Total assets (%); x2= Retained earnings/Total assets (%); x3= Earnings before interest and taxes/ Total assets (%); x4=Market value of equity/Total liabilities (%); x5=Sales/Total assets (number of times).

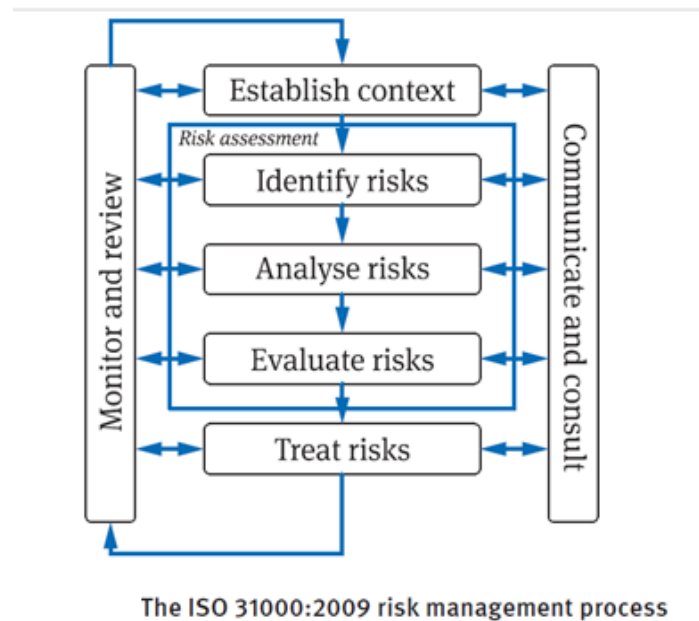
In a general context, the lower the Z-Score, the higher risk of bankruptcy a company has, and vice visa. Scores below 1.81 signify serious credit problems and can mean that the company is probably headed for bankruptcy, whereas a score above 3.0 indicates a healthy firm. Scores in the ranges between 1.81 and 3.0 signify firm’s conditions needed to be investigated. For investors in the stock market, the value of Altman Z-score can have a great influence on their decision whether to buy or sell a stock. When the Altman Z-Score value is closer to 3, investors may consider purchasing a stock because they expect that the value of the firm will rise in the future due to its healthy financial condition. On the other hand, there is a tendency for investors to consider selling or short selling a stock if the value is closer to 1.8 because it is supposed that the company is going to face credit problems in foreseeable time and thus decrease in value.

4.3.2 Operational Risk Measurement

- The quantity of risk: According to “Sound Practices for the Management & Supervision of Operational Risk”, Basel, the operational risk could be defined as “the risk of direct or indirect loss due to inadequate or failed internal processes, people, and systems, or from external events”. The quantity of risks could be measured based on People, Process, Systems, Events and Overall. Based on World Bank assessment criteria, these risks could be assessed at a HIGH, MODERATE and LOW degree.

- Quality of risk management: Based on recent researchers such as ISO 31000 for SME, Risk Management Standard from Institute of Risk management (IRM) and other updates, risk management process has a process as follow.

Fig. 1: The ISO 31000:2009 risk management process

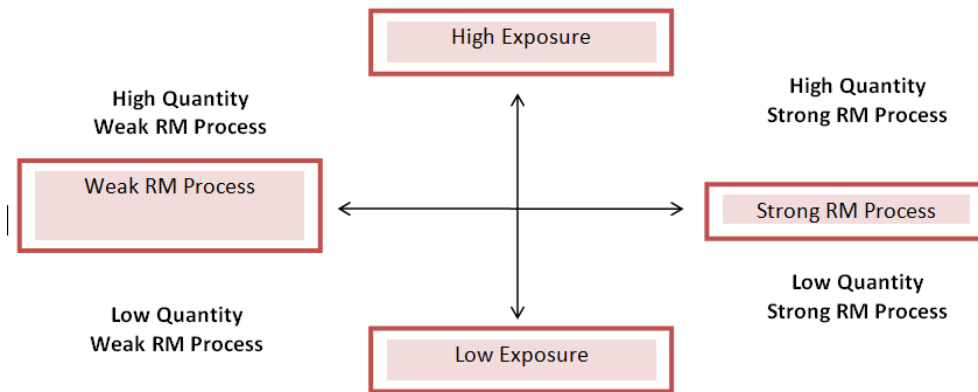


Throughout this guide, the term risk is used describe an uncertainty that has positive or negative consequences; or both positive and negative consequences. Many risks have both positive and negative consequences. The term “risk treatment” is defined as “a process to modify risk”. The standard includes the following note: risk treatments that deal with negative consequences are sometimes referred to as “risk mitigation”, “risk elimination”, “risk prevention” or “risk reduction”. The definition of “risk attitude” is defined as “an organization’s approach to assessing, and eventually pursue, retain, take or turn away from risk”. When a risk has a positive consequence the “pursuit” of the risk is a logical course of action in order to enhance the achievement of objectives. Based on World Bank assessment criteria, the Quality of Risk Management is assessed based on:

- Board and Senior Management Oversight
- Policies, Procedures and Limits
- Measurement, Monitoring, and MIS
- Internal Controls and Internal Audit.

The degree of quality of risk management could be assessed as STRONG, ACCEPTABLE, WEAK scale.

Fig. 2: A combination of quantity of risk and quality of risk management



Source: World Bank

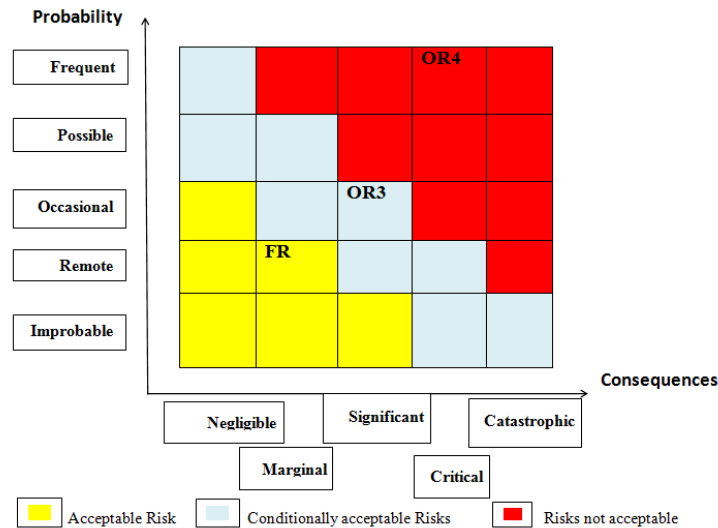
Fig.3: Examination Scope Based on Hypothesis

High Quantity – Weak Management	High Quantity – Strong Management
<ul style="list-style-type: none"> - Confirm risk assessment - Low reliance internal measures - Full on-site procedures 	<ul style="list-style-type: none"> - Confirm risk assessment - Rely on internal measures - Modified on-site procedures targeting specific areas
Low Quantity – Weak Management	Low Quantity – Strong Management
<ul style="list-style-type: none"> - Confirm risk assessment - Low reliance internal measures - Target “Management” section of on-site procedures 	<ul style="list-style-type: none"> - Confirm risk assessment - Rely on internal measures - Minimal on-site procedures

4.3.3 Risk Occurrence and Assessment

The following figure shows a whole reflection of every risk occurrence and assessment

Fig. 4: Reflection of risk occurrence and assessment



Source: Corporate Risk Management

4.3.4 Managing Risks

Based on the effects of risk factors on possible outcomes, we select the most concerned risk to find the solution by using TOWS analysis of the company.

4.4 Risk Management at Mobile World Corp.

4.4.1 Company Introduction

Mobile World Corporation has its full name as Mobile World Investment Corporation with the stock code like MWG. The company was established under Business Registration License No.4103012275 issued by Planning and Investment Department in Ho Chi Minh City as of the date of 16 January 2009 and other documents with chartered capital at 1,119,567,790,000 VND and invested capital is 1,474,956,147,637 VND. In 2004, thegoididong.com was established and now become the top No.1 retailer in Vietnam with 960 supermarkets (each has an area from 100-200 m²) nationwide. In May 2015, dienmay.com (created in the end of 2010) was officially changed into Dien may Xanh Supermarket, which specializes in electrical appliances and digital products and have 250 supermarkets nationwide in 2016. In the end of 2015, the very first store named Bach Hoa Xanh appeared. Till the end of 2016, Bach hoa Xanh has completed the first trial period with more than 40 supermarkets majoring in Tan Phu, Binh Tan, Ho Chi Minh City areas and achieved positive revenue and good feedbacks from customers. Vuivui.com – the first B2C electronic commercial website was built in the beginning of 2016 and official went into work in delivery in Ho Chi Minh City in Oct 2016.

4.5 Company Risk Status

4.5.1 Financial Risk Measurement

In this section, we consider the values of financial ratios calculated based on the annual report of the company and provide insights into how these figures can be used for meaningful interpretations.

Firstly, it is about activity ratios.

- Receivables (Debtor) turnover in 2016 is 278.51 times; shorter than in 2015 with 416.07 times. As a result, Days of Sales outstanding in 2016 is 1.31 days and in 2015 is 0.88 day, with 1.07 days in 2014 and 1.2 days in 2013 (quite constant during years). This proves a stable maintenance of ability to collect receivables. Besides, the number of sales outstanding of MWG is lower than its average peers indeed. (With 15 days in 2016 and 14 days in 2015). This comparison could lead to the implications that MWG is applying strict credit policy which may hamper sales.

- Inventory (Stock) turnover in 2016 is 5.23 times lower than in 2015 with 5.98 times. Consequently, numbers of day inventory on hand in 2016 is 69.8 days higher than 60.99 days in 2015. (low development in inventory management system). However, the average inventory turnover of industry peers in 2016 is 5 times and 6 times higher than the figure of MWG; as a result, the average number of inventory on hand of industry peers in 2016 is 69 days lower than 69.8 days. In respect of numbers of day inventory on hand, MWG's operation is quite good and inventory management system of MWG is at a good rate.

- Payables (Creditor) turnover in 2016 is 11.25 times shorter than in 2015 with 14.45 times. As a consequence, a number of day payables in 2016 is 32.46 days higher than 25.27 days of 2015. This trend proves the improvement in cash flow management of MWG and better financial condition. Besides, in comparison with the average figures of industry peers (38 days in 2016 and 31 days in 2015), MWG's working capital management is in good condition.

- Cash Conversion Cycle= Days of sales outstanding + Days of inventory on hand – Number of days of payables.

As a result, cash conversion cycle of MWG in 2016 is 38.65 days, higher than 36.6 days in 2015. This shows a downturn in the speed that MWG could convert its products into cash through sales. Moreover, in comparison with the average industry peers (46 days in 2016 and in 2015 with 44 days), cash conversion cycle of MWG is in good condition as well.

Working capital turnover of MWG in 2016 is 35 times, higher than 18.1 times in 2015, which shows an improvement in the working capital management system of MWG. Besides, in comparison with average industry peers (at 17.86 days in 2016 and 24.42 days in 2015), working capital management system of MWG is still far beyond the expectation.

Overall, activity ratios of MWG imply that the credit policy MWG applying is quite strict, which may hamper sales. Besides, although numbers of day inventory on hand of the company are quite good, and inventory management system of MWG is at a good rate. MWG's working capital management is in good condition. As a result, cash conversion cycle of MWG is in good condition as well. Furthermore, working capital management of MWG is superior.

Secondly, it is liquidity ratio.

- Current Ratio of MWG in 2016 is 1.12 times; lower than in 2015 with 1.29 times. This trend proves the downturn in the firm's market liquidity and ability to meet creditor's demands although the ratios are quite good. (Higher than 1). However, compared with the average industry peers (with 1.13 times in 2016 and 1.26 times in 2015), the short-term liquidity condition of MWG is good and acceptable, which proves a healthy business.

- A quick ratio of MWG in 2016 is 0.26 times, same as in 2015 with 0.26 times. A stability in liquidity was marked from 2015 to 2016. Moreover, in comparison with the average industry peers (with 0.47 times in 2016

and 0.47 times in 2015), liquidity situation of MWG is still far below; however; it could be acceptable albeit for lower than 1 values.

In general, liquidity ratios of the company reflect the good and acceptable liquidity condition of MWG which proves a healthy business.

Third, it is about solvency ratios.

- The debt-to-equity ratio in 2016 of MWG is 124.67% strongly higher than in 2015 with 82.66%; which signifies that in 2015, a large majority of debt used to finance its assets mostly occupied 124.67% of the shareholders' equity, higher than in 2015. The figure is extremely as same as the average industry peers (at 130% in 2016), which may imply a normal solvency status for MWG.

- Interest coverage in 2016 of MWG is 17.77 times; lower than 36.63 times in 2015, which show a decrease in debt management system of MWG. However, in comparison with the average industry peer figures in 2016 (at 9.85 times) and 17.33 times in 2015, the debt management system of MWG is still in good condition.

Overall, MWG could have the potential solvency risk albeit for the current good debt management system.

Fourth it is profitability ratios.

- The net profit margin of MWG in 2016 is 3.54%, lower than 4.26% in 2015. Compared with the average industry peers (at 3.707% in 2015 and 3.53% in 2016), the MWG's figures are positive, which marks a strong profitability of MWG in the industry.

- ROA of MWG in 2016 is 14.26%, lower than 20.09% in 2015. However, when compared with the peers (at -10.02% in 2016 and -7.83% in 2015), the MWG's figures are still very high.

- Return on Equity of MWG in 2016 is 49.88%, lower than 54.16% in 2015. However, when compared with the peers (at 25.27% in 2016 and 26.9% in 2015), the MWG's figures are still very high, which marks a substantial profitability condition of the company.

Above all, MWG's profitability ratios are still very high, which marks a substantial profitability condition of the company.

The final assessment is cash flow analysis.

- Cash Flow to revenue of MWG in 2016 -1.31%; lower than 2015 to -2.54%, which indicates that operating cash flow generated from revenue in 2016 is negative. From this fact, we could understand that MWG lacks money for operations per revenue received. However, in comparison with average industry peers (at 2.22% in 2016 and -0.72% in 2015), the figures of MWG is quite not good and below the industry requirements.

- Cash to income in 2016 is -29.22%, higher than in 2015 with -47.09%. As well as cash flow to revenue, the ratio of cash to income in 2016 of MWG is still negative albeit for the strong improvement from the previous year, which indicates that the cash generating ability of operations is low. Besides, when compared with peers (at -111% in 2016 and -181.71% in 2015), the cash generating ability of operations of MWG is quite acceptable.

- Debt coverage in 2016 is -5.33%, higher than in 2015 with -13.41%, which shows an improvement in debt situation of the company. However, in comparison with the peer figures (2.52% in 2016 and -6.583% in 2015), the figure in 2016 shows that the company is in the rear of financial risk and financial leverage for the cash flow from operations per total debt.

To sum up, cash generating ability of operations of MWG is currently in the problem. Having a look on the cash flow statement of MWG in 2016, we could easily recognize the negative value of cash flow from operations and the positive net cash flow due to the appearance of positive financing cash flow, which majorly comes from money from loans (at approximately 19,961.55 billion VND) (an increase than 8,129.262 billion VND in 2015).

Based on the financial analysis of MWG as above, we could figure out the company is still under the investigation of financial risk and financial leverage owing to the cash flow from operations per total debt value and should be investigated more clearly.

Default risk model:

As a result, we go deeper by measuring the health of the firm. And it is recommended to apply Edward I. Altman's Z-score model with $Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5$

Based on the figure calculation from financial statement, X1 (Working Capital /Total assets) is at 0.09; X2 (Retained Earnings/Total assets) is at 0.15; X3 (EBIT/Total assets) is at 0.14; X4(Market value of equity/Total liabilities) is at 3.00 and X5 (Sales/Total assets) is at 3.00. As a result, total Z-score is at 5.56.

With the final Z-score result at 5.56 scores (>3.0 scores), we could infer from the value that the firm is currently at healthy status, albeit it is in the question of financial risk and financial leverage of the operating cash flows.

4.5.2 Operational Risk Measurement

4.5.2.1 Quantity of Risk

- People

The number of staff by the end of 2016 is more than 26,000 employees, higher than in 2015 with 15183 persons. Among that, the number of staffs in supermarkets accounts for the largest percentage (88%). Stood second is the staffs of Business Development department with 1183 in 2016 versus 336 in 2015. Third is of Logistics – Supply chain with more than 500 persons during 2 years.

Bonus or rewarding system: Apart from contractual salary, MWG implements a wide range of salary and bonus policies to recognize and motivate employees to stay engaged and work more productively. Finally, MWG is committed to providing employees with a FRIENDLY, ENGAGING, PROFESSIONAL, STABLE working environment and a fair opportunity for advancement.

Training: MWG regularly organizes training courses such as the New Staff Training Program, Combined Field Training, Professional Development, Soft Skills Training for Call Centers, Customer Care, TCC, E-learning as well as special courses training for the management team, the office block.

- Processes (Execution, Delivery & Process Management)

Store Openings: Area Managers shall cooperate with Ground Development Department to look for a potential place to open a store. Based on detailed analysis, Ground Development Department shall decide to select the place and continue on the upcoming procedures and transfer the place to Sales Department (handled by Area managers) to inform and work with Brand Department (in charge of goods selection, purchasing, and dealing at best prices..) and other related parties such as Human resources (training staffs), Marketing (in charge of shop image management, incentive programs), Accounting (in charge of cashier), Administration to complete all necessary processes to open a store at an agreed/fixed date.

The core store supervising department: Sales Department (with the structure as 1.Lowest: Store manager/2. Area Manager/3.Regional Sales Manager/4.Highest: Senior Regional Sales Manager). All departments work collaboratively in mutual support.

Delivery system: Brand department shall appoint its inferior named Logistics dept. to do the time calculations. Central warehouses shall delivery goods nationwide. Inventory is managed and handled within 30 days dictated by ERP system.

Sales and marketing campaigns: MWG apply the same campaigns (banners, loudspeakers, standees, TVs, newspaper, online advertisings, etc) nationwide for every shop at the agreed time.

- Systems (Business Disruption & Systems Failure)

Modern IT system is used to control the business systems such as ERP system for controlling inventory management system (Accounting). For fresh products, the system is being built, Goods – prices - incentives (Marketing), Employee Appraisal Program for Sale point ticking after work hours (Human resources); Hotline for receiving prompt feedbacks from customers (Sales & Customer services).

- External events (Clients, Products, and Business Practices; Damage to Physical Assets)

There are macroeconomics risk, competitive rivalry, loss of goods at the supermarket and risk of inventory price decrease.

Risk assessment:

- People: There are currently 26000 people in MWG at the end of 2016. Personnel in the storage system are suitably recruited, well-trained and familiar with job requirements. Besides, they are well-supported, got a promotion or considered for rotation every 6 months by the human resource and reward policy of the company. QUANTITY OF RISK: LOW

- Processes (Execution, Delivery & Process Management): The activity consists of few control points; simple, easy to understand activities and a relatively non-specialized knowledge base. Moreover, extensive use of straight-through processing with little or no manual intervention.(ERP system). Besides, branches, operation centres and personnel operate smoothly within a local geographic area (nationwide in Vietnam). QUANTITY OF RISK: LOW

- Systems (Business Disruption & Systems Failure): The organization’s business operations utilize industry standard networks. Moreover, MWG retains a non-stop level of technological innovation and selectively implements emerging technologies that are consistent with its business plan. QUANTITY OF RISK: MODERATE

- External events (Clients, Products, and Business Practices; Damage to Physical Assets): MWG is facing the macroeconomics risk of the unstable exchange rate, high unemployment rate, high inflation rate, a decrease of consumer trust in the future. Besides, strong competitions with other retailers are very fiercely. Furthermore, the risk of inventory price decrease has been hampered the operation process of the company quite far. Apart from that, the fear of losing goods at the supermarket has been another issue of MWG. QUANTITY OF RISK: HIGH

4.5.2.2 Company’s Risk Management Status

Board & Senior Management Oversight & Policies, Procedures and Limits: Based on the Annual report of MWG 2016, Boards of Directors and Managers are strictly controlled and supervised by Supervisory Board. The year 2016 is the year MWG finishes expanding dienmayxanh chain throughout 63/63 provinces, completes the trial of mini grocery supermarket model “Bach hoa Xanh” and with the plan as above, Boards of Directors and Managers have performed all the rules and requirements of the company’s business plans and regulations.

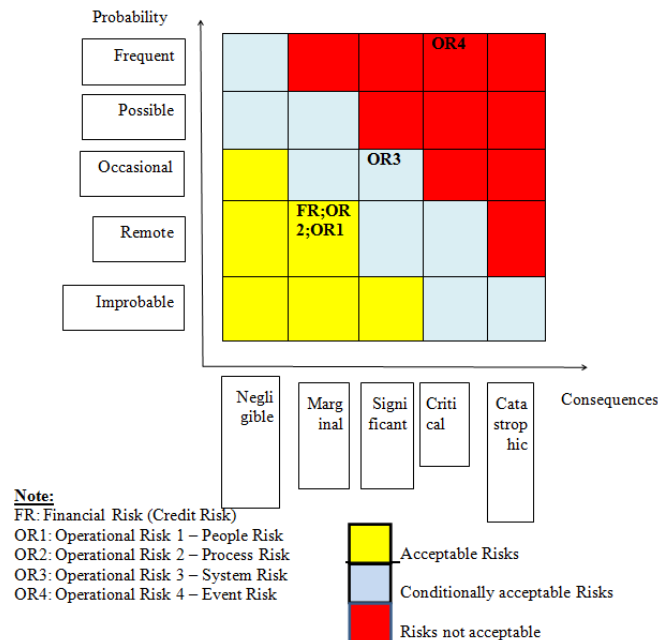
Monitoring and Management Information System & Internal Control, Audit: Assumptions, data resources, and procedures used for monitoring are appropriate, adequately documented, and tested for reliability. Operational risk is systematically identified and assessed, impeded at least annually by the supervisory board. Supervising and evaluating commitments of all departments to the supermarkets/stores are conducted (including promotional expense management procedures, business cost management procedures, store management procedures, business process management at supermarkets, inventory and cash control at supermarkets, cost of renting business premises control process, the procedure to control the use of loans). Supporting and consulting in building up IT and monitoring systems of the company are implemented. Besides, External Audit Company’s team has already been assessed for education levels, skills and resources and effectiveness to be chosen as Ernst & Young Vietnam Co., Ltd by Supervisory Board.

QUANTITY OF RISK: STRONG

4.5.3 Whole Reflection of every Risk Occurrence and Assessment

Based on the different risk measurement results as above, we would like to put them on the one table with different measurement levels for every risk measured.

Fig. 5: a Whole reflection of every risk occurrence and assessment for MWG

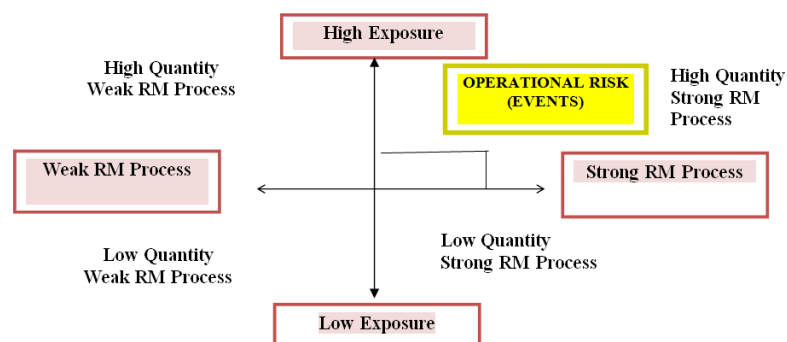


Based on the analysis above of Financial Risk and Operational Risks, we assess and select Operational Risk 4 – Event Risk for the impact of macroeconomics on the current operation of MWG and its competitive rivalry to go deeper and look for recommendations to soften this issue.

4.6 Solutions and Suggestions to Improve Risk Management at the Firm

In this section, we present suggested solutions for the risk management based on our findings.

Fig. 6: A combination of quantity of risk and quality of risk management for MWG



Since the risk is assessed as high exposure but under the controlling status of strong risk management, the strategies to suggest recommendations should be as follows: Confirm risk assessment - Rely on internal measures - Modified on-site procedures targeting specific areas.

Due to the fact that we have already realised the risk of the economy's macroeconomics (unstable exchange risk, high unemployment rate, high inflation rate, a decrease of consumer trust in the future), fierce

competitions with other retailers, fear of inventory price decrease, losing goods at supermarket, it is a must that MWG should follow the above recommendations. More apparently, MWG should set up its strategies by maintaining the current growth of thegioididong.com chain, focusing on Dienmayxanh.com in 2017 -2018 and switching to Bach hoa xanh from 2018 and developing Vuivui.com in the long-term.

- Maintaining the current growth of thegioididong.com chain

Reasonable strategy has generated strong growth over the past period. By the end of 2016, the thegioididong.com chain has reached 951 stores, increasing its market share in mobile phones from 31% in 2015 to 36% in 2016, the market share in the laptop segment has increased sharply from 9.1% in 2015 to 23.3% in 2016. It can be seen that the strategy of MWG to gain market share from small retailers is completely reasonable, market share of MWG continues to increase year by year, while the market share of small shops has been shrinking. However, growth began to slow down. Revenue per store of thegioididong is on the downward trend, which results in lower revenue growth compared to the growth of the number of stores. In 2016, thegioididong's sales increased 49% while the number of stores increased to 69%.

- Focusing on Dienmayxanh.com in 2017 -2018

The electronics market now has many similarities with the mobile market about three years ago, with retail stores accounting for more than 50%. At present, the market share of the electronics retail sector is still largely in traditional stores with the habit of buying traditional electronic appliances of Vietnamese people, so MWG continues its strategy to exploit the market share of electrical appliances from the traditional stores with Dien May Xanh chain. Dien May Xanh.com steps into the thriving phase with a strategy of gaining market share from traditional retail stores. The chain started operating in 2011, but it is not until 2015 that this supermarket chain will really begin to focus on development investment. A Dien May Xanh shop is smaller than other electronics centres (800-1,000 m² per store) because the MWG's strategy is to break down and distribute the entire market instead of focusing on super Big market. With the presence of the mini green line (300-400m² / store), the MWG wants to penetrate more deeply into residential areas and expand to other areas outside the centres. Dien May Xanh is more advantageous than the main competitors are traditional stores for reasonable price , service quality and scale advantages. In the long run this strategy will create a brand in consumer perception and change the habit of buying traditional electronics and currently replace thegioididong.com to become the head of growth for 2017-2018.

- Foster Bach hoa xanh from 2018

Bach Hoa Xanh is developed under the model of the successful Alfamart supermarket chain in Indonesia. The segment that the model targets is the acquisition of market share from traditional markets and grocery stores (including large and small retailers), which account for 76% of Vietnam's \$ 70 billion retail market share. This is a smart and reasonable choice because this segment has no major competitors yet. As a result, Bach hoa xanh is compatible with the MWG's small business and extensive business intelligence capabilities. Bach Hoa Xanh model is being tested and showing initial results. According to the plan, the MWG will only open 20 stores in 2016, but by November 2016 the number of stores has opened up to 40 stores. The average monthly revenue per store has reached \$ 1.2 billion by November 2016, exceeding the average revenue plan. By 2017, plans to develop Bach Hoa Xanh will continue as planned. MWG will build a warehouse system to manage the goods flow with the management system to manage the cost of the chain. Profit margins along with EBITDA will be the key indicators MWG needs to assess with Bach Hoa Xanh in 2017. By 2018, the model will be replicated and deployed across the country.

- Long-term prospect – develop Vuivui.com

Vuivui.com is an online shopping/shopping site developed entirely by MWG to direct access to the online sales segment. Accordingly, Vuivui.com is being further developed in parallel with the current operation. This will be the next strategy of MWG following the development of Bach Hoa Xanh. Accordingly, it will take at least 2 or 3 years for the new online trading segment to really see significant changes and gradually shape into the MWG business model. However, when compared to other service websites, MWG is also in a similar position, firmly with 16 million hits per month for Thegioididong, second only to Lazada in terms of traffic. Therefore, MWG is fully experienced in the field of online sales as well as website development and operation and logistical development for these activities.

4.7 Conclusion

The study has shown the operational risk (event risk), which reveals the current difficulties of MWG. MWG is now facing the downturn of macroeconomics, competitive rivalry, a decrease in inventory price and loss of goods in supermarkets. As a result, we propose the suggested solutions for the risk above as:

- Maintaining the current growth of thegioididong.com chain
- Focusing on Dienmayxanh.com in 2017 -2018
- Foster Bach hoa xanh from 2018
- Long-term prospect – develop Vuivui.com

To sum up, although Mobile World Corporation has big risks, methods to solve the issues of the company always prove its outstanding operations and performances to make preparations for handling unexpected events in the short-term and long-term future. And this story should be learned for any companies from now on.

4.8 Acknowledgement

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