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Micro Financing Implementation and Expansion Strategies of Grameen Bank in Bangladesh

By Professor Dr. Kazi Abdur Rouf
Nobel International University, Canada

Abstract- Grameen Bank (GB) is a micro lending organization in Bangladesh that was initiated by Professor Muhammed Yunus as a pilot project in Jobra village in 1976. It provides small loans to rural poor women, without collateral, following group lending peer support methodologies. It disburses $16.7 billion to 8.67 million borrowers through 2247 branches across Bangladesh. The loan repayment rate is 97%. It is a self-sufficient financial institution. GB's unique program implementation steps make it successful in achieving its goals of creating self-employment and creates choice among rural poor women; thereby increasing their income, empowering them, and promoting environmentalism in rural Bangladesh.

Keywords: *Empowerment, human capital, NGOs, self-employment, social capital, and sustainable development.*

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Micro Financing Implementation and Expansion Strategies of Grameen Bank in Bangladesh

Professor Dr. Kazi Abdur Rouf

Abstract- Grameen Bank (GB) is a micro lending organization in Bangladesh that was initiated by Professor Muhammed Yunus as a pilot project in Jobra village in 1976. It provides small loans to rural poor women, without collateral, following group lending peer support methodologies. It disburses $16.7 billion to 8.67 million borrowers through 2247 branches across Bangladesh. The loan repayment rate is 97%. It is a self-sufficient financial institution. GB's unique program implementation steps make it successful in achieving its goals of creating self-employment and creates choice among rural poor women; thereby increasing their income, empowering them, and promoting environmentalism in rural Bangladesh. Obvious loan disbursement policy, simplified record keeping arrangement, monitoring and evaluation system, accounting procedures, auditing, decentralization policy, two way flow of information and communication (bottom up approach) etc are the outstanding process that empowered GB borrowers. Moreover, location specific solution by field staffs strategy, prompt respond to field problems, active community participation, and staff rewards for outstanding jobs all together create competition and inspiration among employees to offer a high quality of services to its borrowers.

Guidance to field staffs by the executives, coordination with other stakeholders, bottom up decision makings, and the "learning by doing" approach are the core elements of the program. Regular audits and inspections with monitoring information systems (MIS) are fabulous elements of GB's credit execution. GB runs its costs from its own investment income. Grameen Bank does not hire foreign consultants for its program design, development, and implementation.

The sixteen decisions of the Grameen Bank that clients follow encourage them to develop their resource capital, human capital, social capital and others like economic sustainable development in the borrowers' life. GB has succeeded in achieving its goals/objectives because it works in the community as an insider not as an outsider. Above all, Professor Muhammed Yunus' dynamic leadership mobilizes staff to work hard for the betterment of the lives of clients. Now Grameen micro credit is recognized as a tool to eradicate poverty and to empower women. Its lending methodology has been replicating in 98 countries all over the world since 1993.

Keywords: *Empowerment, human capital, NGOs, self-employment, social capital, and sustainable development.*

I. Introduction

There were several rural development and poverty eradication projects initiated by various government and non-governmental agencies in Bangladesh at different times. For example, the Bangladesh Rural Development Board (BRDB), Integrated Rural Development Program (IRDP), Food for Work Program, CARE Bangladesh, Rangpur and Dinajpur Rural Services (RDRS), Village Aid, and Bangladesh Rural Rehabilitation Program (BRRP) etc. However, few projects focused exclusively on poor women in development and the feminization of poverty. Many of them were temporary relief, handout projects. In contrast the Grameen Bank (GB) micro financing program continued for more than three decades and is successful in sustainably addressing poverty and empowering rural women in Bangladesh. Now it is recognized as a model of development work in the world. This essay focuses on the implementation steps, features, policies and programs the Grameen Bank engages which has made it a successful national financial institution in Bangladesh and has resulted in its replication across the world. Its micro lending technology is replicating across the world because of its uniqueness.

Bangladesh has 165 million people within a 147,570 square kilometer area. (Bangladesh profile 2014). Half of the population is female. The majority of Bangladesh's people live in rural areas. The density of the population is 763 people per square kilometer. 67% of women live under the poverty line, which is significantly higher than the national average of 51% (Human Rights Report, 2000). Therefore, a majority of rural poor women are suffering from absolute poverty and miseries. The reasons for these sufferings may be found in the limited access to, voice and choice of state resources. Hence, policies, programs and projects which focus on income generation and rural poverty are urgently needed to fulfill their basic needs.

Four decades ago banking facilities were not favorable to the landless poor in Bangladesh. Collateral

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for loans were a requirement and this proved to be a strong barrier against the rural poor accessing institutional credit. Therefore, a specialized bank was needed where alternative credit facilities without collateral could be delivered. This need was filled by the Grameen Bank which was established in 1976 by Professor Muhamed Yunus. It delivers credit to the rural poor without collateral, giving priority to rural poor women.

Professor Muhamed Yunus started credit operation on a pilot basis in a village named Jobra in 1976. This initiative was a flashlight to the poor women of Jobra village with little credit. This pilot credit project was desired by other villages and there was a great demand from many rural women to get loans for starting their businesses (Yunus, 1994).

GB objectives are to involve extending banking facilities to the poor for their self-employment, to free them from exploitation by money lenders, and to empower women through providing them with collateral-free loans for doing businesses. GB introduced group-managed, peer support loan repayment system among borrowers in which they would repay loans in weekly installments at 2% of the principal amount, plus interest, within one year. GB has been introduced flexible loan and easy loan and these loans borrowers should repay within six months since 2000. After repaying the loans, borrowers can again withdraw loan for another six months. Now the six months loan cycle of Flexible loan and easy loan are very popular to borrowers of GB in Bangladesh. This credit program also included savings products which would help to develop better saving strategies among its borrowers. The whole mechanism of GB goes to the borrowers' doorsteps. They do not need to come to the bank office to repay their loans. The whole structure and operation of GB makes borrowing and repayment convenient and easy for its clients. There are no rigid structural policies and monitoring devices by outside consultants. The field staff of the GB is responsible for developing its loan operation policies, programs and operation strategies, and accounting and monitoring devices. Professor Yunus, its founder coordinates all staff activities, ideas and recommendations. He is the apex leader of GB loan operation.

This GB micro credit system has had a great impact on extreme poverty (Khondaker 2003). It can play a vital role in attaining Millennium Development Goals (MDGs). In the words of Kofi Anan, UN Secretary General, "microfinance has proved its value, in many countries, as a weapon against poverty and hunger. Now it is recognized as a development model for income generation self-employment and empowers disadvantaged women" (Grameen Dialouge-60, 2005).

II. Implementation Strategies of Grameen Bank

At the beginning Grameen Bank started as a pilot project, which had no formal organizational structure and procedures for delivering loans to poor people. The Grameen Bank project developed its implementation strategies, working methodology, and credit delivery mechanisms in the course of time. All credit delivery technologies were developed during its operation. GB has developed "learning by doing" strategy during its establishment. However, GB policies, implementation strategies, credit delivery and recovery mechanisms and other parameters are in a continual process of development and change to fulfill borrowers' needs and demands through situational analysis and a bottom up approach. It is obvious that rigidity in policies and guidelines have no place in GB.

III. Grameen Bank Client Development and Client Improving Services

Micro financing institutions are working for their supporting micro entrepreneurs to promote micro entrepreneurs micro enterprises. Grameen bank deals with GB borrowers' like GB customers through its different attractive products with quality service. GB developed strategies for reaching the clients more efficiently which enabled GB and its clients to make an adequate level of income. GB defines its clients as partner of the GB loan operations. It thinks clients success is the success of GB. GB looks for the origin of the demand of the poor people in the community and identifies related services for them. At the beginning, GB field staffs survey the area and survey the demographic segments of the poor people in the community, discern local physical infrastructures and social infrastructures in the community and analyses people's loans demands would be to GB. The next step is to find where the acute poverty sufferers target clients thrive and develop ways of relationships that could help poor people to be easy and comfortable to do banking with GB. Then field staffs started to provide unique simplified non-formal training in person to familiarize poor people about the GB products and services. Information previously gathered help field staffs in formulating the appropriate products (size of loans, types of loans, modes of repayments and service strategies).

IV. Benefits of Adapting the In-Person Client Services of GB

There are several benefits of adopting the in-person clients services that are stating below:

- Encourages the GB micro entrepreneurs to think of creative ways to serve its clients

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- Identifies and generates more loan receivers (clients) those can do business well by receiving loans from GB
- Allows the poor micro-entrepreneurs to grow staidly in profiting business, repay the loans and to empower them both economically and socially
- Enables the entrepreneurs to expand their businesses with new products and services
- GB in-person communication system helps GB clients to have direct relations and communications with GB. No need advertisement for GB to inform and expand GB in Bangladesh. GB has no advertisements on radio, TV, print media and in other social media.
- GB in-person services to its borrowers give GB an advantage over the competition with its uniqueness.
- The cliental relationships with GB has increased sustainable loan services to poor people in Bangladesh
- GB micro-entrepreneurs and GB relations improved continuously
- GB entrepreneurs' microenterprises put in the best competitive position because of entrepreneur-client relationship.
- Micro entrepreneurs easily obtain a competitive advantage over big enterprises by improving GB client's service and clients networking within the community.

V. Grameen Bank (GB) Monitoring and Information System (MIS)

GB is more concern with calculating its vision and maintaining its organizational culture. Its' management has some motivational devices to ensure targeted performances. GB monitors its loan services to borrowers intensively. It has an efficient MIS cell at its different stages of admin layers. It has developed its loan monitoring system that provides quick feedback to the field staffs by the GB executives. Grameen Bank uses its management information system (MIS) to generate information for decision making and to disseminate information back to lower level staff so that they can systematize their own performance. This MIS system has grown from field experience and that allows managers and field staffs to track its accomplishments.

VI. Best Practices Parameters of Grameen Bank

GB has developed some parameters that are keys to the success of its objectives. These parameters are properly included in the operational structure at all levels and can be readjusted to the various needs of the poor in order to eradicate poverty. The GB target group is exclusively rural poor women. Its loan operations follow group lending methodology. It places special attention to and adapts community participation approaches to empower women. Loan appraisals and planning are conducted in the weekly centre meetings through mutual discussions and observance; not by complicated paper work or complicated financial and marketing analysis. Groups are composed of five poor women of similar socio-economic backgrounds, from the same village. Six groups make one center in a neighborhood/village. Borrowers themselves select their group members, but GB staff screen and verify members' portfolio backgrounds to ensure that they are indeed the poorest of the poor. This group formation system helps to maintain a homogeneous setting, networking and solidarity, in which clients can interact freely with each other. Nonetheless, strict credit discipline and close supervision is in place to guide each borrower towards proper control of loans.

VII. Unique Practices of Grameen Bank

To maintain equal opportunity and to address issues of participatory management, democracy and empowerment to all members of Grameen Bank, the positions of Centre Chief, Group Chairman, and Group Secretary change every year. By this process all members of the center get a chance to be Center Chief, Group Chairman, and Group Secretary by rotation. This practice helps to enhance leadership qualities and decision making skills in all members. In addition, this practice of rotating leaders adds to a decentralized power structure and holds each member accountable to the other within the center. These tools are essential to the efficient operation of the credit program including avoiding inequalities and maintaining corruption free loan transactions. These unique practices of the Grameen Bank start from making annual action plans at the field level. Branch managers set up some performance indicators like loan disbursements, loan repayment, group savings, and attendance in the centre meetings of borrowers and borrowers' wealth creation by loan utilization etc. These parameters track the viability of the branch performances. The Branch maintains all loans and other such related documents. Its performance is ensured by GB internal audit department. This internal auditing process enhances the leakage free credit delivery system.

The entire GB credit operation operates through a system of close supervision. There is an in-service training program in GB for its staff training. This practical training helps staff to be committed and to work for the poor as a cohesive team. There are no intermediaries between clients and the bank at the grass roots level. GB charges 20% interest on its general loans and 5% interest on its housing loans and student loans. There is no subsidy at any stage of the credit operation.

The simple, straight-forward program designed for loan proposals through mutual discussions among center members ensures diversified loan disbursements

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to its clients. All transactions are conducted within centre meetings and are intensively monitored. It ensures mutual accountability through a peer support mechanism. No information is kept secret, so there is no scope for corruption, misappropriation or irregularities. These strategies further contribute to the successful operations of the Grameen Bank.

VIII. Replication of Grameen Bank Model

The Grameen Bank credit program is widely accepted as a tool for poverty reduction. It attracts the attention of all development experts, researchers, universities, executives, policy makers and donors as a micro credit success story in Bangladesh for addressing poverty. Different countries have used Grameen Bank group-based credit experiences to replicate similar practices in their own cultural contexts. The Grameen micro credit model has been replicated worldwide since 1993. Now 98 countries follow GB group lending model, but they adjust their lending programs to their local culture, values and norms (Grameen Trust 2002, p.51).

The Global Micro Credit Summits of 1997, 2002, 2006 and 2011 helped to draw the attention of policy makers and practitioners' worldwide. Different international organizations like UNDP, UNHCR, UNICEF, ILO, CIDA, SIDA, USAID and several countries included the micro financing program in their policies to address poverty. All projects that were modeled on the GB reported loan repayment rates of more than 95%. These micro finance institution (MFI) initiators are trying to cover their cost of operation from their interest income. For example, Activist for Social Alternatives (ASA), Tamil Nadu, India, SHARE, Andrapradesh, India, CARD in the Philippines and NIRDHAN in Nepal, have their own banks to serve the poor (GT report 2006). The Grameen Bank Replication Program (GBRP) has set up a website that also helps people get information about its programs. The GB web site address is www.grameen.com/grameen/gtrust.

IX. Facilitating Factors for Implementation of Practice

The operational tools of GB which include projection meetings to plan for the program, direct contact with clients, mini meetings, rigorous training on group formation, weekly meetings, and group screenings ensures that all clients have equal opportunities to participate in decision making. These tools add to the successful implementation of the GB programs throughout Bangladesh.

GB is **not a centralized decision-making** organization. Management functions and decision-making powers are continuously being delegated to the branch offices to improve their managerial skills as well as to get grass roots information to hierarchal upper levels in area, zonal and head offices. This feedback loop involving head offices, zonal offices and branch offices enhances organizational management; decision making processes and improves program activities. Prompt responses to field problems by supervising officers are characteristic of Grameen administration.

GB mobilizes its staff to be enthusiastic to do their assigned GB jobs by awarding them star staff and five star branches. Those who achieve star criteria receive appreciation letters from Professor M. Yunus, monetary compensation, promotions, and opportunities to travel and conduct assignments abroad. A Grameen Bank Staff proudly displays his star on formal occasions. These awards encourage competition and help inspire field staff to be more active in their work for the poor.

Grameen Bank does not hire foreign consultants for its program design, development, and implementation. GB has taken experience directly from the field and looks at its needs. The GB borrowers' staff review problems and needs themselves. The solutions are based on local situations. The proposed solution is first tested in 2-3 branches for about 6 months on a pilot basis. Lessons are learned and then are extended to other areas served by the bank. However, all solutions do not produce positive results.

GB has faced many problems during its operation. These have come in the form of bureaucratic influence from the government, income disruption to borrowers as a result of natural disasters like flood, cyclones and river devastation. Overlapping with other credit institutions, opposition by religious leaders and local money lenders, and political crises are also hampers to loan operations. These problems have impacted upon borrowers' income as well as loan repayment. Delinquent loans portfolios increased. These problems are solved by the GB field staffs by their continuous polite patient and respectful behaviors to borrowers but strive to maintain credit discipline. GB staff may sometimes become disappointed, but are never disheartened about negative results. Both the head and zonal offices monitor field activities and lend constant support to their staff.

GB had served borrowers an approximate 2.54 million rural poor in 25 years in August, 2002; however, it has increased its client's services to about 6.7 million in September 2006 (GB report September 2006). This has been a huge increase within four years. This rapid expansion poses added challenges to GB to maintain quality service to its borrowers. GB offers loans to poor people for small businesses; however, it does not provide any training/orientation on small business management, marketing, loans management and book keepings that are very essential for businesses.

Although there have been many success stories of women who have been emancipated through Grameen micro-credit, Robin Isserles (2003) cautions

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that many women (16%) are still dominated by their husbands and do not actually enjoy the benefits from their financial gains or loan investments. In many cases, their husbands take the credit, and use the money for personal purposes (p., 43). GB gives loans to poor women for the improvement of their household economics as well as to generate social and human capital among them. However, GB has not put special implementation strategies to free women from patriarchal order. Rather, it believes that if women become earners, they can empower themselves, promoting their own welfare as well as that of their family.

Moreover, although GB is successful in addressing poverty, 58% of its borrowers cross the poverty line (Grameen Bank 2006). Many borrowers are still living below the poverty line. Its investment interest rate is 20% to its borrowers, which is similar to other commercial banks in Bangladesh. GB covers its costs from its investment income. However, it is too much for poor people.

X. Conclusions

Through working for the Grameen Bank since 1980, the author Kazi Rouf has observed that poor women are credit worthy and would have more self-confidence if they could earn money. Poor women could be more organized if they connect with institutions which support a bottom-up approach that respects poor people and their values. Grameen Bank does not use high level socio-economic implementation technology or development ideas are not imported from outside. GB has succeeded because it works in the community as an insider not as an outsider (Rouf, 2011). Top down policy contradicts with local values. There is a cross relation among program design, program objectives, friendly program implementation strategies, local culture and community participation.

However, leadership is very important to mobilize people into activity, to achieve project objectives and to implement the program successfully. In addition, the project activities should exclusively focus on disadvantaged people and strategies should be attentive to environmental sustainability. Poor people have less features and access to different public places, information, and resources; therefore, one stop information services to clients can help protect them from bureaucratic hazards. Moreover, guidance, coordination with other stakeholders, bottom up decision making approach, and "learning by doing" approach are the core elements of the program. Regular audits and inspection with monitoring information systems (MIS) altogether are very essential for micro financing institutions.

Feminization of poverty is increasing in Canada especially in single mothers. There are some NGOs involved in micro financing in Canada, but they are working in a limited scale. My dream is to initiate a micro financing project in Toronto using my experiences and use some implementation techniques of Grameen America in the project.

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Determinants of Capital Structure in Nigerian Quoted Composite insurance Companies

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Abstract- This study was carried out to examine the major determinant of capital structure of quoted composite insurance companies in Nigeria. A descriptive and explanatory research designed was adopted for this study and the secondary data extracted from the annual report of the purposeful composite insurance was analysed using panel data regression technique. The results revealed that tangibility, growth and Liquidity had a negative impact on the Leverage while Risk, Return on Asset and Size have a positive influenced on Leverage; it was discovered from this study that all the variables identified are statistically significant except Return on Asset and growth; the model was reliable and appropriate for determining capital structure of composite insurance companies; It can be concluded that fixed effect panel regression model was better than the random effect model in determining the capital structure of composite insurance in Nigeria.

Keywords: *composite insurance, tangibility, financial structure.*

GJMBR - C Classification : *JEL Code: G22*

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Determinants of Capital Structure in Nigerian Quoted Composite insurance Companies

Adaramola Anthony O [α] & Olarewaju Odunayo M [σ]

Abstract- This study was carried out to examine the major determinant of capital structure of quoted composite insurance companies in Nigeria. A descriptive and explanatory research designed was adopted for this study and the secondary data extracted from the annual report of the purposeful composite insurance was analysed using panel data regression technique. The results revealed that tangibility, growth and Liquidity had a negative impact on the Leverage while Risk, Return on Asset and Size have a positive influenced on Leverage; it was discovered from this study that all the variables identified are statistically significant except Return on Asset and growth; the model was reliable and appropriate for determining capital structure of composite insurance companies; It can be concluded that fixed effect panel regression model was better than the random effect model in determining the capital structure of composite insurance in Nigeria. Thus, the study recommended that management of insurance industry and the regulatory authority in Nigeria should set up a more favourable financial structure to enhance the sustainability of the industry.

Keywords: composite insurance, tangibility, financial structure.

I. Introduction

Business activity either profit or non-profit oriented has to be financed before it can exist. Without finance, either primary or secondary, the business cannot perform its functions effectively. A business activity has three main primary sources; the first is the sales of ordinary shares, the second is the proceeds from operating activities and the third is out-sourcing, that is borrowing from financial institutions either interest bearing or non- interest bearing. Irrespective of a business set-up, the managing team should reason together to conclude on the optimal mix of both in-source and out-source of funds. This reasoning together prompts the capital structure theory and according to Abor (2005), capital structure decisions plays a significant role in financial performance of a firm and to decide is always a problem for any company.

The inception of capital structure theory could be traced to the Modigliani and Miller (1958) in a seminar paper delivered. Since then, the capital structure of a company has received a great attention which has improved the performances of these companies. Capital structure simply means the ways by which a company finances its overall operations and growth by using diverse sources of funds. It is also a mix of debt (short term and long term) and equity (common and preferred). The level of risk in a company can be best measured by its capital structure. The nature of insurance business is to protect their clients or depositors as the need arises via minimisation of losses. Therefore, as it is established that capital structure plays a cogent role in performances of a firm, it is necessary to dig deep into the factors that actually determines the mixture of diverse sources of finance in an organisation, but for the purpose of this study, insurance business will be the pivot case study. An insurance business is a business that is characterised with trading with the deposits received from the clients but before they can start any business activity, there must be capital to start up with and this capital have to be properly structured. Capital structure is very important in insurance business because there must be proper combination of all the funds accruing to the company so as to avoid excessive debt in the company. Thus, this study will examine the firm-level factors determining the capital structure in the context of Nigerian insurance companies.

a) Gap In Literature

Quite a number of studies had been done on insurance business, most especially their capital structure from various dimensions. This includes: Velnampy and Niresh (2012) in Srilanka; Mehari and Aemiro (2013) in Ethiopia; Bayeh (2013) in Ethiopia; Kingsley (2013) in Ghana; Al bulena, Skender, Vlora and Edona (2014) in Kosovo; Ogbulu and Emeni (2012) in Nigeria to mention a few. Thus, this study stands different by examining the capital structure of selected composite insurance business listed on the Nigerian Stock Exchange focusing on only the endogenous (internal) factors and incorporate size as a variable which is measured differently in this study as a natural logarithm of total asset of these companies. Also, all these factors will be critically examined by pooling all the insurance companies together and a post estimation test will be conducted to establish the estimations in which the conclusions will be based.

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II. Review of Related Literatures

a) Brief History of Insurance Companies in Nigeria

Nigeria, a country endowed with both human and material resources of not less than 140 million populations is a former British colony which shares almost all its political and economic settings from its former colonial heritage. Nigerian society had some forms of social insurance before the introduction of the modern form of insurance. Until 1966, Nigeria copied British parliamentary system of government and up till now, British system still dominates some aspects of the country's socio-economic settings. For instance, the legal practice operating in Nigeria Financial institutions such banks and insurance companies practicing in Nigeria emulate the British style of running their activities. However, the country's progress since independence in 1960 has been undergoing the challenge of long years of military rule, political instability and systemic corruption. Not until 1999, there was an inception of a civilian government after a successful political transition process.

The origins of modern insurance can be traced to both the advent of British trading companies in the region and the subsequent increased inter-regional trade in Nigeria. According to Uche and Chikeleze (2001), increased trade and commerce led to increased activities in shipping and banking, and it later became necessary for some of the foreign firms to internally handle some of their risks. This led to trading companies subsequently granted insurance agency licences by foreign insurance companies, which made it possible for such firms to issue covers and assist in claims' supervision. The first insurance agency in Nigeria came up in 1918 when the Africa and East Trade Companies introduced the Royal Exchange Assurance Agency and it was noticed that there was an initial slow pace of the growth of the insurance industry in the country, particularly between 1921 and 1949 which was traced to adverse effect of the World War II on trading activities both in Nigeria and in the United Kingdom. As soon as the war ended, NICON (1994) concluded that business activities gradually picked up again, and insurance industry in Nigeria began to record tremendous growth and efficiency. In 1958, the first indigenous insurance company, the African Insurance Company Limited, was established. At independence, only four of the then existing 25 firms in existence were indigenous, but by 1976, the number of indigenous companies surpassed that of the foreign companies in Nigeria. Gradually, till date, insurance business in Nigeria has been well established and different reforms (recapitalisation and reconsolidation) have been made to solidify their activities.

b) Empirical Review

Bayeh (2013) employs panel regression model in the study of firm level factors on Capital Structure in Ethiopian Insurance Companies. The results revealed that growth, profitability and age of the firm have significant influence on Ethiopian insurance companies' capital structure while, liquidity and business risk were also significant for long term debt and total debt ratio respectively. Similarly, Kingsley (2013) employed panel regression model in examining the capital structure of insurance companies in Ghana with financial statements of twelve insurance companies covering the period, 2002-2007 and found that both the pecking order and static trade-off theories are important factors explaining the capital structure of Ghanaian insurance companies. Firm size, profitability and growth were the statistically significant factors and indicated that, large insurance companies tend to utilize more debt in building their capital structure. This can be traced to the fact that they can diversify and have minimal probability of bankruptcy. Negative relationship between profitability and leverage also indicates that profitable insurance companies prefer internal sources of finance to external sources, hence less debt in their capital structure. However, the positive relationship between growth and leverage shows that growing insurance companies mostly depend on debt to enhance their growth. Velnampy and Niresh (2012) attempted to investigate the relationship between capital structure and profitability or returns of ten quoted banks in Srilanka covering 2002 to 2009. The data was analyzed by using both descriptive and inferential statistics where correlation analysis was used to find out the association between the variables. They found out in their results of the analysis that, there is a negative association between capital structure and profitability except the association between debt to equity and return on equity. Similarly, Mehari and Aemiro (2013), investigated insurance companies in Ethiopia by examining the impact of firm-level characteristics (size, leverage, tangibility, Loss ratio (risk), growth in writing premium, liquidity and age) on their performances. Return on assets (ROA) was used as a key indicator of insurance company's performance and also used as dependent variable while age of company, size of the company, growth in writing premium, liquidity, leverage and loss ratio are independent variables. The study was specifically on 9 insurance companies for the period 2005- 2010. The results of regression analysis revealed that size, tangibility and leverage are statistically significant and positively related with return on asset; however, loss ratio (risk) is statistically significant and negatively related with ROA. Thus, size, Loss ratio (risk), tangibility and leverage are cogent determinants of performance of insurance companies in Ethiopia. But, growth in writing premium, insurers' age and liquidity have statistically insignificant relationship with ROA which stands as the performance measure.

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Al bulena, Skender, Vlora and Edona (2014), analyzed the determinants of capital structure among insurance companies in Kosovo, based on a data retrieved from 11 insurance companies during the years 2009-2012. Debt ratio was taken as a dependent variable whereas company size, growth, life, non-current assets and liquidity ratio were taken as independent variables. The result of the regression model shows that these variables are in direct relationship with the debt ratio. In the study of Naser and Krassimir (2011), the critical firm- specific factors that managers should consider when setting their "best" capital structure were analysed. Multiple linear regression analysis using SPSS was employed. Each explanatory variable along with the dependent variable is measured separately for a sample of insurance companies operating in Bahrain for the period of 2005-2009. A strong relationship was established between firm characteristics, such as; tangibility of assets, profitability, firm size, revenue growth, liquidity and debt ratio which is the observed capital structure, although not all variables are statistically significant. Contrarily, Sritharan (2014) employed a pooled ordinary least square regression to analyze the determinants of the capital structure of 28 quoted Banks, Finance & Insurance Companies in Colombo Stock Exchange for the period of 2008-2012 and further evidence of the capital structure theories. The results reflect the real nature of the Sri Lankan corporate environment. The study suggests that some of the insights from modern finance theory of capital structure are moveable to Sri Lanka meaning, certain firm-specific factors that are relevant for explaining capital structure in developed economies are also relevant in Sri Lanka, a less developed country. Statistical results showed that tangibility, profitability, growth, and liquidity are negatively related to the debt ratio, while size has a positive nexus. Non-debt tax shield is not significantly related to the debt ratio. Furthermore, these results are consistent with the predictions of the capital structure theory such as; trade-off theory, pecking order theory and agency theory. It thereby provides help in understanding of financing reactions of Sri Lankan firms.

Sharif, Naeem and Khan (2012), investigated that factors identified in developed countries which are attributed as imperative ones to attain optimal capital structure, provide compelling justifications for capital structure decisions in insurance companies of Pakistan. Empirical exploration of factors, that drives optimal capital structure apply on panel data of 31 insurance firms from 2004 to 2009. Two panel data estimation techniques; fixed effects and random effects were specifically used. Haussmann's post estimation test was performed in order to test appropriate model for the study. The outcomes of study affirm that, profitability, age and earnings volatility has indirect relationship with leverage and was significant. Liquidity also maintain inverse relationship with debt ratio but insignificant. Alternatively, size and growth opportunities have direct relationship with leverage but only size is significant. These outcomes are in line with theoretical theories such as pecking order theory and trade off theory. Likewise, a similar study in Nigeria by Ogbulu and Emeni (2012), hypothesized that there is no relationship between gearing (capital structure) and the size, growth, profitability, tangibility and age of a firm. Using a cross-sectional survey data from 110 firms listed on the Nigerian stock exchange and analysis of data by the OLS method, it was found that size has a positive and significant effect on capital structure while, age has a negative and significant influence. Tangibility, growth of a firm and profitability, on the other hand, do not have any significant impact on the capital structure of firms in Nigeria. Lastly, Naveed, Zulfqar and Ishfaq (2010) studied the life insurance sector of Pakistan and the result of OLS regression model indicates that size, profitability, risk, liquidity and age are important determinants of capital structure of life insurance companies.

III. Methodology

The data used for the study are secondary in nature. They are obtained from annual reports and accounts of the six (8) purposively selected composite insurance companies. A panel data of the total eight (8)quoted composite insurance companies covering a period of seven (7) years was employed due to the fluctuations in getting the data published accordingly.

a) Choice Of Explanatory Variables

i. *Profitability*

Firm's performance plays a crucial role in determining its capital structure. This can be better confirmed by the pecking order theory, which states that firms desires internal sources of finance to external sources of finance. Titman & Wessels (1988) concluded that holding all variables constant, firms with higher returns would maintain relatively lower debt ratio since they generate such funds from internal sources.

ii. *Size*

Size is also an important determinant of firm's capital structure. This study will measure size of insurance companies by the natural logarithm of their total asset. The larger firms tend to have lower variances of earning that enables them to tolerate high debt ratio due to their capacity to diversify. Smaller firms tend towards a lower debt ratio due to their costly asymmetric information from lenders. Therefore, a positive relationship is expected between size and capital structure of the selected firms under this study.

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iii. *Tangibility*

The tangibility of a firms' asset also plays a germane role in determining its capital structure and in this research paper, a positive relationship is expected between tangibility and capital structure. According to Harris & Raviv (1991), the tangibility of a firm's assets results from the firm's liquidation value. Therefore, firms that invest heavily in tangible assets tend to have higher leverage since they will borrow at lower interest rates if their debt is secured with such assets as commensurate collateral.

iv. *Growth*

Pecking order theory postulates that, growing firms usually search out for external funds to maintain their growth because as they are expanding, there is tendency for them to exhaust all their internally generated funds. Firms, whose larger proportion of their market value is accounted for by growth opportunity, will surely be involved in huge debt as a means of financing. Therefore, growth is expected to positively relate to firms' leverage.

v. *Risk*

The risk level of a firm can never be overlooked in examining the determinants of its capital structure. In this research paper, the risk of insurance firms will be measured by the proportion of claims paid from the net premium earned per time. Following Abor & Biekpe (2005), a positive relationship is expected to lie between risk level and leverage of insurance companies.

vi. *Liquidity*

There has been a discrepancy in the findings of various researchers who have worked on the link between liquidity and capital structure, while some find positive effect, others found a negative relationship. Liquidity is seen as the blood flowing through the living system of any organisation and insurance is not an exception. Following the trade of theory, liquid firms possess more equity and trade with less debt.

b) Model Specification

Generally, the model is;

$$Y_{it} = \beta_0 + \Sigma \beta_i Z_{it} + \epsilon_{it} \quad (1)$$

The functional form;

$$LEV = f(ROA, TANG, RISK, LIQ, SIZ, GRO) \quad (2)$$

Explicitly, the model is in the form;

$$LEV = {}_{it}\beta_0 + \beta_1 ROA_{it} + \beta_2 TANG_{it} + \beta_3 RISK_{it} + \beta_4 LIQ_{it} + \beta_5 SIZ_{it} + \beta_6 GRO_{it} + \epsilon_{it} \quad (3)$$

i = number of insurance companies = 8
t = number of years = 7

ROA: RETURN ON ASSET = $\frac{\text{Profit after Tax}}{\text{Total Asset}}$

TANG: TANGIBILITY = $\frac{\text{Fixed Asset}}{\text{Total Asset}}$

RISK: RISK LEVEL = $\frac{\text{Claims Paid}}{\text{Net Premium Earned}}$

LIQ: LIQUIDITY = $\frac{\text{Current Asset}}{\text{Current Liability}}$

SIZ: SIZE = Natural logarithm of total asset

GRO: GROWTH = $\frac{\text{Gross Written Premium}_{(t)} - \text{Gross Written Premium}_{(t-1)}}{\text{Gross Written Premium}_{(t-1)}}$

IV. Empirical Result

Table 4.1 Descriptive Anlysis

	LEV	RISK	TANG	ROA	LIQ	GROWTH	LOGTA
Mean	0.393982	0.269095	0.327386	0.043375	2.355102	0.313791	17.13390
Median	0.361450	0.250750	0.304750	0.035850	1.735300	0.225200	16.41432
Maximum	0.864100	0.574100	0.675900	0.207600	9.875700	2.834400	22.62004
Minimum	0.083100	-0.640400	0.084400	-0.022300	0.342100	-0.427500	14.91011
Std. Dev.	0.228929	0.182671	0.157102	0.042523	1.955264	0.484046	2.212623

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Skewness	0.369648	-1.983783	0.529438	1.596600	2.079059	3.121686	1.644955
Kurtosis	1.980476	12.03349	2.407352	6.367075	7.914484	15.39592	4.562143
Jarque- Bera	3.700635	227.1396	3.435719	50.24535	96.69822	449.4897	30.94887
Probability	0.157187	0.000000	0.179450	0.000000	0.000000	0.000000	0.000000
Sum	22.06300	15.06930	18.33360	2.429000	131.8857	17.57230	959.4983
Sum Sq. Dev.	2.882456	1.835278	1.357460	0.099449	210.2682	12.88652	269.2636
Observations	56	56	56	56	56	56	56
Crosssections	8	8	8	8	8	8	8

Source: Authors' computation (2015) using E-View 7 Statistical package.

The descriptive statistics of data provides information about sample statistics such as mean, median, maximum value and minimum value and the distribution of the sample measured by the skewness, kurtosis and the Jarque-Bera statistics. The Table above reports some descriptive statistics for the eight purposively selected composite insurance firms for a period of seven years covering 2008 - 2014 totalling 56 observations.

Table 4.1 above presents the descriptive statistics of all the variables used in an attempt to examine the determinants of composite insurance firm's capital structure. The Table reveals that the average value for LEV, RISK, TANG, ROA, LIQ, GROWTH, LOGTA of the pooled observations for the period and cross sectional unit covered in the study stood at 0.393982, 0.269095, 0.327386, 0.043375, 2.355102, 0.313791, and 17.13390 respectively. This result shows that LEV has the highest average growth and ROA has the least average growth as a determinant of capital structure in insurance companies. The minimum and maximum values stood at 0.0831 and 0.8641, -0.6404 and 0.5741, 0.0844 and 0.6759, -0.0223 and 0.2076, 0.3421 and 9.8757, -0.4275 and 2.8344, 14.9101 and 22.6200 for LEV, RISK, TANG, ROA, LIQ, GROWTH, LOGTA respectively. The standard deviation of the variables which shows the rate of deviation from the expected growth value for each variable of interest stood at 0.228929, 0.182671, 0.157102, 0.042523, 1.955264, 0.483046 and 2.212623 for LEV, RISK, TANG, ROA, LIQ, GROWTH, LOGTA respectively.

The skewness and kurtosis statistics provide useful information about the symmetry of the probability distribution of various data series as well as the thickness of the tails of these distributions respectively. These two statistics are particularly of great importance since they are used in the computation of Jarque-Bera statistic, which is used in testing for the normality or asymptotic property of a particular series. The statistics in Table 4.1 Clearly shows that LEV, TANG, ROA, LIQ, GROWTH, LOGTA are positively skewed (0.369648, 0.529438, 1.596600, 2.079059, 3.121686, 1.644955) meaning that the distribution have long right tail while RISK is negatively skewed (-1.983783) which implied that the data sets have long left-tails and hence, the risk level tend towards less than the median values (i.e. median > mean).

In terms of kurtosis, it measures how fat the tails of the distribution are. The kurtosis statistics obtained for RISK (12.03348), ROA (6.367075), LIQ (7.914484), GROWTH (15.39592) and LOGTA (4.562143) showed that the distribution series for each of the variables was peaked relative to the normal because the statistics were greater than 3.0. Being peaked implied very few observations within the region where the median resided. Whereas, LOGTA (4.562143) is the least peaked compared to GROWTH (15.39592).

On the other hand, Kurtosis statistics for LEV (1.980476) and TANG (2.403349) were less than 3.0, which indicated the extent of flatness (platy- kurtic) of the distribution of the data series relative to normal. Their Jarque-Bera statistics of RISK (227.1386), ROA (50.24535), LIQ (96.69822), GROWTH (449.4897), LOGTA (30.94887) with their probability values less than 0.01 suggested that the null hypothesis of normality in the distributions were rejected, while on the contrary, LEV (3.700635) and TANG (3.435719) have their probability greater than 0.01. Also the sums for the variables are 22.063, 15.069, 18.333, 2.429, 131.885, 17.572 and 959.498 respectively for all the variables examined.

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Table 4.2 : Corellation Analysis

	GROWTH	LEV	LIQ	LOG_TA	RISK	ROA	TANG
GROWTH	1.000000						
LEV	0.097093	1.000000					
LIQ	-0.137715	-0.750774	1.000000				
LOG-TA	0.046720	0.163281	-0.174266	1.000000			
RISK	-0.116640	0.354013	-0.234144	0.056897	1.000000		
ROA	-0.048883	-0.020610	-0.096513	-0.078073	0.031406	1.000000	
TANG	0.081121	-0.565190	0.103780	-0.177867	-0.199285	-0.060389	1.000000

Source: Authors' computation (2015) using E-View 7 Statistical package.

Tables 4.2 revealed the correlation between LEV and determinants of capital structure in insurance companies. From the Table, it was observed that there is a weak correlation between GROWTH, LEV, LIQ, LOGTA, RISK, ROA and TANG. However, it was discovered that a negative correlation exists between GROWTH, LIQ, RISK, with none showing evidence of a strong negative correlation. Finding from the result also show that a positive correlation exists between LEV, LOGTA and RISK. While negative relationship exists between LEV, LIQ, TANG and ROA. LIQ has negative relationship with LOGTA, RISK, ROA, but has a positive relationship with TANG. LOGTA shows a certain level a weak positive correlation with RISK, while a weak negative correlation exists between LOGTA, ROA and TANG. Findings further reveal that a weak positive correlation exists between RISK and ROA while a weak negative correlation was discovered between RISK and TANG. Finally, ROA has weak negative correlation with TANG. Thus, negative or positive correlation coefficients reported in Table 4.2 only depict the extent of the linear relationship between pairs of variables used in this paper.

a) Pooled Ols (Common Coefficient)

Table 4.3

Series: Risk Tang Roa Liq Growth Logta

Variable	Coefficient	Standard Error	T-Test Values	Probability
RISK	0.276557	0.106619	2.593871	0.0124*
TANG	-0.465111	0.115850	-4.014755	0.0002*
ROA	-0.122113	0.441646	-0.276496	0.7833
LIQ	-0.063571	0.009817	-6.475248	0.0000*
GROWTH	0.040668	0.040304	1.009024	0.3178
LOGTA	0.035252	0.003499	10.07416	0.0000*

Adjusted R-square= 0.618793, DW = 0.453105

(*) connote rejection at 5% level of significance

Source: Author's computation, 2015 using E-VIEW 7 statistical package.

This estimation places restrictions on the heterogeneity/uniqueness of the cross sectional units by assuming that both the regression coefficient and constant estimates are the same for all cross sectional subjects, over time. In other words, the estimator stacked all the observations without taking into account their cross sectional or time series features, as such; the subject and period related effects were neglected in the estimation.

Table 4.3 presents the result of OLS pooled regression conducted to investigate major determinants of capital structure in Insurance companies. The Table further reveals that, variables including Tangibility, Return on Asset and Liquidity exert negative impact on the Leverage as measured by the ratio of Debt to Equity while, Risk, Growth and Size have a positive influence on Leverage. However, attempt to investigate major determinants of capital structure lends credence to tracing which of the determinants exert significant impact. Hence, from Table 4.3 it was discovered that the impact of variables like Risk, Tangibility, Liquidity and log of total asset to be significant while, variables like Return on Asset and Growth. Thus, it could be narrowed down that Risk, Tangibility, Liquidity and Size in terms of logarithm of total asset are major determinants of capital structure in composite insurance firms.

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The result presented in Table 4.3 reports an R-square value of about 62%, which connote that about 62% of the systematic variation in Leverage (measured by the ratio of Debt to Total Equity) can be explained jointly by variation in variables such as Risk, Tangibility, Return on Asset, Liquidity, Growth and size.

b) Fixed Effect (Common Coefficient)

Table 4.4 : Series: Risk Tang Roa Liq Growth Logta

Variable	Coefficient	Standard Error	T-Test Values	Probability
C	-1.889525	0.723053	-2.613260	0.0124*
RISK	0.104640	0.052128	2.007362	0.0512*
TANG	-0.308536	0.095923	-3.216505	0.0025*
ROA	0.005965	0.259825	0.022960	0.9818
LIQ	-0.045190	0.009379	-4.818406	0.0000*
GROWTH	-0.016771	0.020638	-0.812598	0.4210
LOGTA	0.144030	0.040117	3.590222	0.0009*

Adjusted R-square= 0.934134, DW = 1.816601, F- Stat = 61.00219,
Prob (F- stat) = 0.000000. (*) connote rejection at 5% level of significance
Source: Author's computation, 2015 using E-VIEW 7 statistical package.

The result of fixed effect (at common coefficient) estimation presented in Table 4.4 reveals the coefficient of each determinant variable alongside the intercept term (heterogeneity effect) corresponding to each cross section. Table 4.4 reveals that, determinants including Tangibility, Liquidity and Growth have negative impact on capital structure of the selected insurance companies measured by leverage while, Risk, Return on Asset and Size have a positive impact on capital structure. Table 4.4 also reveal that, determinants such as Risk, Tangibility, Liquidity and size exert significant impact on Leverage of insurance companies and as such can be taken to be the major determinants of capital structure in the context of Nigeria Composite insurance companies. It is worthy to note that, some of the determinants do not agree with the a priori expectation by sign, for instance, determinants such as Return on Equity, Deposit, Liquidity and Gross Domestic Product contradict the a priori expectation by exerting negative effect on capital structure.

Table 4.4 reports an adjusted R-square value of 93%, F-statistics of 61.002 and probability value of 0.0000. It thus implies that, 93% of the systematic variation in capital structure of insurance companies can be explained by variations in variables such as Risk, Tangibility, Return on Asset, Liquidity, Growth and size. Also, all the explanatory variables are jointly and significantly determine capital structure of composite insurance companies in Nigeria.

c) Random Effect Estimation (Common Coefficient)

Table 4.5 : Series: Risk Tang Roa Liq Growth Logta

Variable	Coefficient	Standard Error	T-Test Values	Probability
C	0.915728	0.075310	12.15944	0.0000*
RISK	0.134610	0.045863	2.935032	0.0051*
TANG	-0.720081	0.052590	-13.69226	0.0000*
ROA	-0.655116	0.189315	-3.460457	0.0011*
LIQ	-0.080736	0.004333	-18.63303	0.0000*
GROWTH	0.024230	0.016838	1.439019	0.1565
LOGTA	-0.006494	0.003733	-1.739510	0.0882

Source: Author's computation, 2015 using E-VIEW 7 statistical package.
Adjusted R-square= 0.811818, DW = 0.876516, F- Stat = 40.54498,
Prob (F- stat) = 0.000000. (*) connote rejection at 5% level of significance

Because of problems inherent in the fixed effect model, such as, loss of degree of freedom as more dummy variables are added to the model, possibility of multi-collinearity, inability of the fixed effect model to track the impact of time-invariant variables, random effect assumes that the heterogeneity is random rather than fixed and that the random effect is incorporated into the error term thus forming a composite error term.

In this paper, random effect estimation result presented in Table 4.5 above reveals that determinants such as Liquidity, Tangibility, Return on Asset and log of total asset exert negative impact on leverage, while, only Risk and growth measure influence Leverage positively. The result shows that determinants such as Return on Asset, Risk, Tangibility and Liquidity significantly influence capital structure of insurance companies, though the direction of influence of the likes of Liquidity,

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Tangibility, Return on Asset and log of total asset contradicts the a priori expectation. The observed direction of causal-effect relationship between Leverage and the aforementioned determinants can be justified by reasons such as fluctuating economic situations and perpetual reforms in the operations of insurance companies in Nigeria.

Reported in Table 4.5 is an adjusted R-square value of about 81% alongside F-statistics of 40.54 and probability value of 0.0000. Thus, the result shows that about 81% of the systematic variation in capital structure as proxied by Leverage, that is, the ratio of Debt to Equity can be explained by variation in determinants such as Risk, Tangibility, Return on Asset, Liquidity, Growth, Logarithm of Total Asset. F-statistics reported and the corresponding probability value implies that all the included determinants in the model jointly and significantly influence capital structure model and that the model is of a good fit.

d) Post Estimation (Hausman Test)

In an attempt to know the most reliable estimation between the fixed effect estimation and the random effect estimation, Hausman test is conducted to test if there is a substantial difference between the estimates of the fixed effect estimator and that of the random effect estimator. The null hypothesis underlying the test is that, fixed effect estimates do not differ substantially from the random effect estimates. Notably, the test statistics developed by Hausman has an asymptotic chi-square distribution.

Table 4.6 : Hausman Test

Null hypothesis	Chi-square stat	Probability
Difference in coefficient not systematic	95.545258	0.0000*

Author's Computation 2015, using E- View 7 statistical package. denotes significance at 5%*

From the Table above, a chi-square value of 95.545258 alongside a probability value of 0.0000 were revealed. The result shows that there is enough evidence to reject the null hypothesis of no substantial difference between fixed effect and random effect estimates, which might be due to the presence of correlation between the random effects incorporated into the composite error term and one or more of the regressors. Hence, the random effect estimates become inconsistent and as such the fixed effect estimation is preferred and the recommendations and conclusions of this paper shall be based on the findings of Fixed Effect Estimations that is, the major determinants in Nigerian composite insurance firm capital structure are Risk level, Tangibility of asset, Liquidity and the introduced variable-Size, which is measured by the natural Logarithm of total asset.

V. Conclusion and Policy Recommendations

This been the last section of the paper and deals with conclusion and policy recommendation. Thus, four out of the five variables used to measure effect on debt ratio were found to be statistically significant when measuring the impact of companies' debt ratio on insurance industry in Nigeria. Based on the research results, the insurance companies should have a high consideration for asset increase because the size of company is an important factor that has a positive effect on leverage. Risk, Tangibility, Return on Asset, Liquidity, Growth and Size are drivers of optimal capital structure of various insurance companies in Nigeria. Insurance companies should pursue most important capital structure theories like pecking order theory and trade off theory. The study established that fixed effect model is more reliable, appropriate and acceptable for the financial leverage or capital structure of insurance companies in Nigeria. Thus, the study recommended that management of insurance industry and the regulatory authority in Nigeria should set up a more favourable financial structure to enhance their sustainability.

VI. Suggestion for Further Studies on Insurance Companies

This study can open the horizons for forthcoming studies to investigate capital structure theories and not only to critically examine the determinants alone. Also, upcoming studies may also increase the panel size of insurance sector by including more companies and more years' data not even composite insurance firms alone. Lastly, would- be researchers can extend the data to other countries and macroeconomic factors should be included as explanatory and control variables.

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Investments for a Bankruptcy as the Optimization of the Financial Architecture

By Dr. Kalinskaya Irina M

Introduction- The financial crisis tested insolvency frameworks around the world. In Western Europe corporate insolvency filings rose of 22% between 2008 and 2009, with the biggest increases in Ireland (81%) and Spain (77%).Western Europe is still far from returning to its pre-crisis numbers. At the end of 2011 corporate insolvency filings were still 17% higher than in 2008. Between 2008 and 2012 Spain recorded one of the biggest increases – 182%.

In 2012 alone the number of corporate insolvency filings in Spain shot up from 5,666 to 7,780. The increase in corporate insolvency filings in Ireland between 2008 and 2012 was nearly as staggering – 118%. However, Ireland has sho wn some improvement with only negligible increases between 2011 and 2012.

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I. Introduction

The financial crisis tested insolvency frameworks around the world. In Western Europe corporate insolvency filings rose of 22% between 2008 and 2009, with the biggest increases in Ireland (81%) and Spain (77%).Western Europe is still far from returning to its pre-crisis numbers. At the end of 2011 corporate insolvency filings were still 17% higher than in 2008. Between 2008 and 2012 Spain recorded one of the biggest increases – 182%.

In 2012 alone the number of corporate insolvency filings in Spain shot up from 5,666 to 7,780. The increase in corporate insolvency filings in Ireland between 2008 and 2012 was nearly as staggering – 118%. However, Ireland has shown some improvement with only negligible increases between 2011 and 2012.

Weaknesses of insolvency regimes become apparent during crises. When a weak insolvency framework does not provide effective formal and out-of-court mechanisms to address financial distress, more debts remain unresolved and more companies become unprofitable, with their assets unavailable to their creditors and little chance of turnaround. An insolvency framework that allows debtors and creditors to find solutions through fast, inexpensive, transparent procedures can facilitate debt repayment, encourage lending and lead to a higher survival rate for viable enterprises.

As it was mentioned in a new report by the World Bank Group, the regulatory reform rates remained high in Europe and Central Asia. 19 countries of the region made all together 65 reforms, aimed at improving the business regulation standards in the previous year.

The report "Doing Business in 2014: Understanding the regulation of activities of the small and medium-sized enterprises" notes that the efforts of the European and Central Asia countries to strengthen legal institutions, as well as to simplify the regulation procedures and to reduce the associated financial costs have borne fruit for the local entrepreneurs. Europe and Central Asia was ahead of East Asia and the Pacific Rim and took the second place in the world after the member countries of the Organization for Economic Cooperation and Development (OECD) with high-income by a degree of the most favored regulatory base for the business environment.

Considering this report, 92 % of the European and Central Asia countries have been simplifying the business registration procedures since 2009. It was the highest rate in comparison with the countries in the other regions of the world. Nowadays, as a result of these efforts, it is easier to establish a business in the countries of Europe and Central Asia than in any other region of the world, and is even easier than in the OECD high-income countries. During the same period, 73% of Europe and Central Asia the countries have made changes to the process of solving the problems of insolvency responding to challenges arising from the financial crisis, while 85% have simplified the process of taxation.

For example, Ukraine adopted a new insolvency framework that strengthened protections of secured creditors, introduced debt-equity swaps and streamlined the insolvency process. And Poland, having simplified the process of business registration and obtaining building permits for the last year, was ranked the 45th out of 189 in the world rankings on the favorable business conditions.

However, it should be noted that in spite of the half-year effect of innovations introduced in the bankruptcy regulatory procedures (promulgation of the LU "On Resumption of a Debtor's Solvency or Bankruptcy Declaration") in Ukraine, a position on the criterion of "bankruptcy procedure and resolving insolvency" could not be improved due to the persistence of significant time and financial costs associated with the solvency recovery procedures or insolvency of business entities, as well as a downward change in the recovery index in these procedures. For example, if you have about the same average duration of cases and bankruptcy procedure in Ukraine, Poland and Hungary (about 3 years), the average cost of judicial procedures (calculated as a percentage of value of the debtor's property) in Ukraine is significantly higher (42% against 15% in Poland and Hungary), and the collection rate is much lower than 8,2% (Poland - 54,8%, Hungary - 38,3%). Some data on resolving insolvency are given in Table 1.

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Table 1 : Resolving Insolvency Rank

1 The average time to close a business. Information is collected on the sequence of procedures and on whether any procedures can be carried out simultaneously. Time for creditors to recover their credit is recorded in calendar years

2 The average cost of bankruptcy proceedings. The cost of the proceedings is recorded as a percentage of the estate's value.

3 Whether business continues operating as a going concern or business assets are sold piecemeal (0 as piecemeal sale and 1 as going concern)

4 The recovery rate calculates how many cents on the dollar claimants (creditors, tax authorities, and employees) recover from an insolvent firm.

When analyzing this data we can generalize that despite problems being common to many countries and associated with the financial crisis impact the success of implementation of the procedures for resumption of solvency of companies or reorganization of really inefficient companies to a large extent is determined by ability of the company's management to find a way out of the current critical situation.

It should be clearly understood that any problem, faced by the company during its life cycle, is literally a matter requiring urgent solutions (in Greek). Thus, if a head of the company, being on the verge of bankruptcy, will not be able to reject his thoughts, associated with the fear of losing job/money due to removal from office, at such a critical moment then the company's prospects really loom quite unsightly. If the fear dominates over the rationality such scenarios can be implemented:

1. A head may agree to attract the required number of borrowed funds to cover debts at such interests that the company would be unable to pay in the future. A so-called "effect of mole" appears when the active involvement of additional debt leads to "deepening" into a debt pit.
2. First of all, the frightened head will engage unscrupulous partners as the investor-partners, who later will impose their vision of business development aimed at gaining the maximum short-term returns.
3. The head may unknowingly agree to known illegal schemes to raise funds at the attractive interest rates that may eventually cause criminal cases of money laundering.
4. The head-fear monger will agree to cooperate with the companies-"butterflies", which will provide overvaluation of the company's costs for a certain percentage in order to conceal income for the real taxation and payment of taxes and other obligatory payments to the budget. Despite the short-term improvement of health and well-being of the head, such an operation is often completed with the preparation of a report by a tax inspection and then transfer of the inspection report and decision of the tax inspection to the tax police, and then according to the Article 212 of the Criminal Code of Ukraine "Tax Evasion", "Bringing to Bankruptcy" etc.

Obviously, the above options for an owner of the company (or rational manager) are not attractive. From another perspective, a correct way out of insolvency (when the court has already accepted a statement of the creditors about initiation of bankruptcy proceedings) shall be optimization of the debtor's structural characteristics, which form the basis of his financial architecture and a key influence on the possibility of resuming its solvency.

The company's financial architecture concept has been proposed for use in the corporate finance sphere by S. Myers, an American economist, who identified financial architecture as a changing financial design or financial organization of the company, including such structural characteristics as the legal form of the company (public or private), ownership structure (concentrated or dispersed), capital structure (the ratio of funding sources) and corporate governance system. Different combinations of parameters of the financial architecture determines aspects of the operating, financing and investing activities of an entity and actively influence on the financial performance formation.

Considering that the aim of the debtor's financial architecture optimization is the renewal of its solvency and financial standing stabilization, the problems of organizational and financial restructuring of the company are:

- maximization of the potential financial resource level by sources with the minimal cost and minimal transaction costs of attraction;
- effective redistribution of property rights and monitoring of the company's activities in order to minimize the risks of a hostile takeover;
- optimization of the capital structure for rapid reduce in the debt burden;
- protection of the owners' property rights and resolution of a conflict of interests between them and other stakeholders (Fig. 1).

Figure 1 : Objectives of the organizational and financial reorganization of the debtor company

Considering directions of the debtor's financial architecture optimization by its individual components, one can undo the following methods of the process. Optimization of the organizational-legal form of the

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company and ownership structure involves the implementation of measures to change the legal status and structure of the company in the corporate reorganization context, namely:

1) attraction of new members to replenish the authorized capital to control the statutory limit for a number of members of the company;
2) splitting the company in order to separate those departments that operate inefficiently. Thus, the problems are clearly localized and way of their solution will be apparent (modernization, change of personnel, strengthening of security measures to prevent theft and embezzlement, etc.);
3) the most innovative ways of corporate reorganizations are:

– modification and / or improvement of the brand / company logo;
– change in the company's registered address in order to find the region with the most favorable tax climate;
– patenting a new technology that will change the range of products, modify the company's brand (up to the introduction of new clothes for the new production), modify the color scheme of corporate colors and present a major new advertising campaign at the market.

The company management can implement the following activities in the process of optimization the debtor's structure of capital and assets:

1) replacement of the morally obsolete equipment with the new one;
2) revaluation of all the company's assets not in accordance with the carrying amount and depreciation rate, but under the commercial prices for the equipment, buildings, etc., which, despite an increase in the tax burden, will provide cost increase and improve its creditworthiness potential and investment attractiveness in the future;
3) sale of all the unsold inventories of raw materials and uncompetitive finished products, which will provide additional cash flow and vacation of warehouse premises;
4) installation of the high-tech equipment of a whole production and / or service department of the company;
5) complete dismantling of obsolete equipment with termination of the old production of the old product range and full conversion of the company, operating with the old industrial areas, with a focus on high-tech equipment;
6) conduction of an unexpected inventory, selective and continuous audit that will help you to find unrealized sources for collection of accounts receivable;
7) optimization of the debt capital structure in order to identify those loans that require priority repayment;
8) increase in the share of equity capital through the issue of securities;
9) development and implementation of an absolutely new investment project with attraction of new investors.

Thereby, optimization of the system of corporate governance and control is designed to ensure the settlement of relations among the company's owners and managers, as well as decreasing the probability of a conflict of interests between other stakeholders that under unfavorable circumstances can lead to a deterioration of corporate security of the company.

It should be noted that the corporate governance is not only the organization of activities of the Supervisory Board (the Board of Directors) and system of relationships between the company and its owners to enforce their rights. Taking into consideration that the investors have increased their attention to the assessment of the company as an investee, the corporate governance system is an integrated approach to the construction of foundations and mechanisms for business administration, including strategic planning, risk management, compliance with the legislative requirements, which would allow it to overcome crises at the macro- and micro-level with minimal losses. Thus, improving quality of the corporate governance is an important task of organizational and financial reconstruction of the debtor, which involves the following activities:

1) change of management and publication of identification data on the top managers, general director, accountants, who unprofessionally perform their duties at the highest positions in the management bodies, causing financial crisis in the company;
2) provision of the staff turnover (excluding dismissal of senior officials), which will reveal unscrupulous members of the staff and will allow to find the staff, who will be ready for the minimum wage to deal with new responsibilities with a view to the subsequent salary increase;
3) to ensure independence of the internal financial audit by the members of the Supervisory Council through mandatory acceptance of independent directors with an impeccable reputation and experience to the Board of Directors and to withdraw working shareholders from the Board of Representatives;
4) to send the company's top managers for retraining, to organize the language courses at different levels of complexity and for different categories and to organize permanent computer literacy classes;

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5) to engage a life-coach to work with the top management, business and life coaching, as the removal of personal barriers in life of each of the top managers allow them to take a fresh look at the company's problems;
6) to hold a number of negotiations with creditors and debtors in the presence of a facilitator company (negotiator, mediator), who will teach techniques of negotiations, allowing to transform a conflict smoothly into a plane for the construction of both a debt repayment algorithm and to build long-term cooperation, being mutually beneficial to both the debtor and creditor;
7) to develop and implement a distance work system (working with freelancers), what will save money on maintenance and equipment of the work space and provide employment for certain categories of employees, who are due to certain circumstance in a remote access to the company (women on maternity leave and / or children of employees, who wish to earn money between classes in the higher educational institutions (being great on the new technologies), the people close to the retirement age and retired people, who are well aware of their responsibilities at the company, but which maintenance is economically inefficient for the company);
8) to establish a regular practice of corporate events (with family members, with departure out of the city, with the competitions, art contests, etc.) at the company and to equip rooms for catering and joint recreation at the company;
9) to improve / create standards and norms of corporate culture, starting with the meeting of the personnel together with the administration of the company for the revision of a collective agreement, particularly in terms of bonuses, cancellation of bonuses and the annual performance appraisal. To establish rules of conduct and approve them at the General Meeting as a part of the collective agreement.

Definitely, implementation of the above activities will take a lot of human efforts and financial costs, which is especially difficult under the threat of bankruptcy. However, at the time of financial crisis it is important to focus on implementation of the rational actions, throwing the panic and fear away. Moreover, it should be noted that any optimization measures do not give any effect if they are inadequate for an appropriate development stage. Therefore, when determining specific areas of organizational and financial reconstruction of the debtor company, the company's life cycle and its financial standing must be taken into account and foremost it is necessary to monitor implementation and economic benefits from the use of various optimization measures.

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Shock, Return and Volatility Spillovers among the us, Japan and European Monetary Union Stock Markets

By Jaghoubi Salma

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Abstract- This paper examines the return links and volatility spillovers between US, Japan and European stock markets over the turbulent period 2005-2012. We use a recent generalized VAR-GARCH model which allows for transmission in return and volatility. The results show that American stock market is mostly influenced by past shocks and volatilities. Besides, for all markets under investigation, the past own volatilities is stronger driver in determining future volatility. This implies that a market's fundamentals have more influence on volatility than shocks or news. Moreover, our results show the existence of shocks and volatility transmission between only US and EMU. For the Japanese market, only the past own conditional volatility and shocks are allowed to impact the future volatility.

Our findings have important implications for the presence of diversification opportunities for portfolios investors.

Keywords: *var-garch models; stock markets; volatility spillovers.*

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Abstract- This paper examines the return links and volatility spillovers between US, Japan and European stock markets over the turbulent period 2005-2012. We use a recent generalized VAR-GARCH model which allows for transmission in return and volatility. The results show that American stock market is mostly influenced by past shocks and volatilities. Besides, for all markets under investigation, the past own volatilities is stronger driver in determining future volatility. This implies that a market's fundamentals have more influence on volatility than shocks or news. Moreover, our results show the existence of shocks and volatility transmission between only US and EMU. For the Japanese market, only the past own conditional volatility and shocks are allowed to impact the future volatility.

Our findings have important implications for the presence of diversification opportunities for portfolios investors.

Keywords: var-garch models; stock markets; volatility spillovers.

I. Introduction

Since the eighties, the process of economic globalization has accelerated and radically transformed national economies as well as patterns of trade in goods, services or capital. This trend of globalization has been driven by a deregulation movement that gives market place in the financing of economies. Financial markets have been at the heart of this liberalization and are considered interdependent because of their revolution reflecting the combination of different factors such as the accelerating of the capital movements and the emergence of new financial products. However, measuring instruments to monitor the evolution of this relationship over time are often frustrated. Indeed, both models to measure and monitor changes in volatility are different, both approaches to assess the evolution of this interdependence between the markets are relatively rare. Moreover, the outbreak of several financial crises (Asian Crisis in 1997, 1998 Russian crisis, subprime crisis and more recently the Greek crisis in late 2009) were able to increase the risk of contagion between financial markets and, more specifically, between stock markets. Indeed, being inter dependent and with parallel evolutions, financial markets are transmitted as "bad events" and therefore accelerate the movement of contagion.

This issue is an important concern for policymakers, international investors, financial institutions, and governments for executing global hedging strategies and asset allocation decisions. Moreover, understanding the correlations and interactions among various financial markets as well as the behavior of return volatility between international financial markets is crucial for pricing domestic securities, portfolio diversification and risk management.

Early literature, such as Eun and Shim (1989), Hamao, Masulis and Ng (1990), King, Sentana and Wadhwani (1994) focused on the correlations among the financial markets of developed countries and show that developed financial markets are interconnected and that the volatility of the US stock market is transmitted to other developed markets.

Bekaert and Harvey (1995) estimated the degree of integration between major emerging markets and world equity markets from 1969 until 1992. Bekaert and Harvey (1997) found that capital market liberalization often leads to a higher correlation between local and international markets. Focusing on the volatility spillover researches, Ng (2000) showed that markets that are geographically and economically close tend to influence one another. Indeed, he studied volatility spillovers from Japan and U.S. market to pacific-basin stock markets and found that there are significant volatility spillovers from the US and Japanese equity markets to the stock markets of the Pacific Basin. Sharma and Wongbangpo (2002) study the relationships among different Asian stock markets by applying cointegration tests. Miyakoshi (2003), Liu and Pan (1997) found that there are return and volatility transmission from U.S. and Japanese stock markets to four Asian stock markets namely Hong Kong, Singapore, Taiwan, and Thailand. Moreover, these markets are influenced more by the U.S. than by the Japan. Besides, Wang and Firth (2004) examined return and volatility transmissions across four emerging markets namely Hong Kong, Taiwan, Shanghai A and Shenzhen A and three developed markets which are New York, London and Tokyo. Their empirical results

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show that there exists a unidirectional contemporaneous return dependence of emerging Chinese markets on these developed markets, and bi-directional volatility spillover effects between the developed and the emerging markets.

Using the BEKK parameterization of the multivariate GARCH model, Ewing and Malik (2005) studied the volatility transmission mechanism between large and small capitalization stocks. Lee (2009) used bivariate GARCH model and examined the volatility spillover effects among six Asian countries. His findings suggest that there are statistically significant volatility spillover effects across the stock markets of these six countries.

Boubaker, A., and Jaghoubi, S., (2011) employ the student-t- copula to model the dependence structure of among a sample of eight emerging and eight developed markets. Their results show that this new approach proves more appropriate to describe the non-linear and complex dynamics of the financial market returns than traditional modeling which imply a normality hypothesis. In addition, they confirm the contagious nature of the Subprime crisis between emerging and developed markets.

More recently, Wang, C.H and al (2015) investigate the relationship between short-term international capital inflows and asset markets in China using a structural vector auto-regressive (SVAR) model. Their empirical results demonstrate that the relationship between short-term international capital inflows and asset prices is self-fufilling and mutually reinforcing.

In European market context, many authors studied the effect of the introduction of the EURO on linkage between European markets each other and between European and U.S. stock markets. Most of the studies found that linkages between European markets increased after the introduction of the EURO. However, there is no definite evidence for linkage between European and U.S. markets.

Cheung and Westermann (2001) concluded that there is no volatility spillover between U.S and European market before and after the introduction of the EURO. However, Veiga and McAleer (2003) found that there is volatility spillover from UK to the U.S. and Japan and from the U.S. to UK. Using dynamic correlation framework, Savva, Osborn, and Gill (2004)examined the spillover among three developed markets namely U.S., German and UK and French markets. They found that only UK and German markets are affected by the U.S. market. Also, they concluded that the correlation between European markets has increased after the introduction of the EURO. Syriopoulos (2007) examined both the short-run and long-run linkages between emerging and developed European stock markets and found that emerging markets are well co-integrated with their developed counterparts.

Using copula model, Bartram, Stephen, and Wang (2007) investigated the impact of the introduction of the EURO on dependence of equity markets in Europe and found that market dependence within the EURO area increased as a likely result of increased European integration only for some countries, such as France, Germany, Italy, Netherlands and Spain.

Boubaker, A., and Jaghoubi, S., (2012) examine the extent of the current financial Greek crisis and the contagion effects it concludes toward the euro zone by conducting an empirical investigation of the dependence structure between seventeen European stock markets during the period 2007-2011. They found that the dependence between European stock returns is modeled by the copula Student which retains the correlation dependence and also has symmetric non-zero tail dependence. Moreover they conclude that there is existence of the financial contagion effect between Greek and these European countries: Italy, Portugal, Belgium and Slovenia, when the Greek financial crisis.

Boubaker, A., and Jaghoubi, S., (2014) examine the dynamic correlation and volatility transmission between the European Monetary Union and the FX returns and explore the dependence structure between daily stock returns, after the occurrence of the current financial Greek crisis. They used the VAR (1)-GARCH (1,1) model which allows for transmission in returns and volatility and two measures of dependence: correlations and copula to test the degree of the dependence between financial returns using functions. Their empirical results for the first objective suggest that past own volatilities matter more than past shocks (news) and there are moderate cross market volatility transmission and shocks between the markets. Moreover, the result on the second objective implies that, considering all the financial returns together, the Student-t copula seems the best fitting model, followed by the Normal copula, both for the two sub-period. The dependence structure is symmetric and has non-zero tail dependence.

Recent literature on Middle East and North Africa (MENA) market volatility uses univariate GARCH models to examine volatility behavior at the market index level. In this context, we notice the work of Hammoudeh and Li (2008) who examined sudden changes in volatility for five GCC stock. Their empirical results indicate that most of these stock markets are more sensitive to major global events than to local and regional factors.

Hammoudeh and al. (2009) examine the dynamic volatility and volatility transmission in a multivariate setting using the VAR(1) -GARCH(1,1) model for three major sectors, namely, Service, Banking and Industrial/or Insurance, in four Gulf Cooperation Council's economies (Kuwait, Qatar, Saudi Arabia and UAE). Their empirical results suggest that past own volatilities matter more than past shocks and there are

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moderate volatility spillovers between the sectors within the individual countries, with the exception of Qatar.

This paper extends from existing literature by using the recently multivariate technique that examines shock and volatility spillover among the US, Japan and the Euro zone stock markets. The technique is the vector autoregressive moving average GARCH (VAR-GARCH) model developed by Ling and McAleer (2003)[1]. This method allows for spillover effects in both returns and conditional volatilities to examine both own conditional volatility for each market and conditional cross market volatility transmission among US, Japan and European Monetary Union (EMU), over the Greek crisis period. It also provides meaningful estimates of the unknown parameters with less computational complication than several other multivariate specifications, such as the full-factor multivariate GARCH model (Hammoudeh and al., 2009). Besides, the specific aspect of this model is that allows us to observe the impact of Monetary European stock market events or news in Japan and U.S. equity index returns.

The interests of this study are twofold. First, the market correlation and their co-movement are the basis of any international diversification strategy (King, Sentana and Wadhawani, 1994). Second, the international diversification is based on low correlations between asset markets which are geographically apart. However, in the current context of increasing globalization and the global integration of stock markets, the existence of shocks and volatility transmissions reinforces the interdependence between stock markets and thus reduced earning of the international diversification.

The main purpose of this paper is to explore the joint evolution of conditional returns, volatility and correlation between the United States of America, the Japan and the European markets in the last turbulent years. To highlight the dynamic relationship between markets, we undertake an empirical study similar to that of the Hammoudeh and al., 2009. Thus, we estimate a developed multivariate econometric technique, Vector Autoregressive-Generalized Autoregressive Conditional Heteroskedasticity model (VAR-GARCH model).

Our empirical results suggest that past own volatilities matter more than past shocks (news) and there are moderate cross-market volatility transmission and shocks between American and European Monetary markets with the exception of the Japan.

The remainder of this paper proceeds as follows. Section 2 describes the data used in this study and presents some statistics on stock returns. Section 3 discusses the methodology for the estimation of models considered in this paper. Empirical findings for each model are reported in Section 4. Section 5 contains a summary of the paper and concluding remarks.

II. Data and Descriptive Statistics

The data used in this study cover the three weekly stock market indices, namely S&P 500 (United States of America), NIKKEI 225 (Japan) and the Euro Stoxx 50[2] (Euro Zone), over the period of January 4, 2005 to July 9, 2012. The stock market indices were obtained from Global Finance Data. We have chosen this period to investigate the impact of the 2009 Greek financial crisis on the rest of European monetary Union, the U.S. and the Japan countries. The total number of observations is 398 for the full sample. Weekly prices series data have been used to avoid non-synchronous trading and day-of-the week effects, as discussed in Rachmand and Susmel (1998), Aggarawal and al. (1999), Ng (2000). For each data series, continuously compounded weekly returns are calculated as $r_{i,t} =$ 100Ln $(\frac{P_{i,t}}{P_{i,t-1}})$, where $P_{i,t}$ is the weekly closing price for each country's indices I at time t.

[1]See Chan, Lim,& McAleer, 2005 for an early application of the model.

[2]Euro Stoxx 50 is a stock index of Eurozone stocks. This index represents 50 of the largest companies in the Eurozone based on market capitalization and it is reconstituted at the end of each month of August. The Euro Stoxx stock index includes 50blue chip stocks across 12 Eurozone countries.

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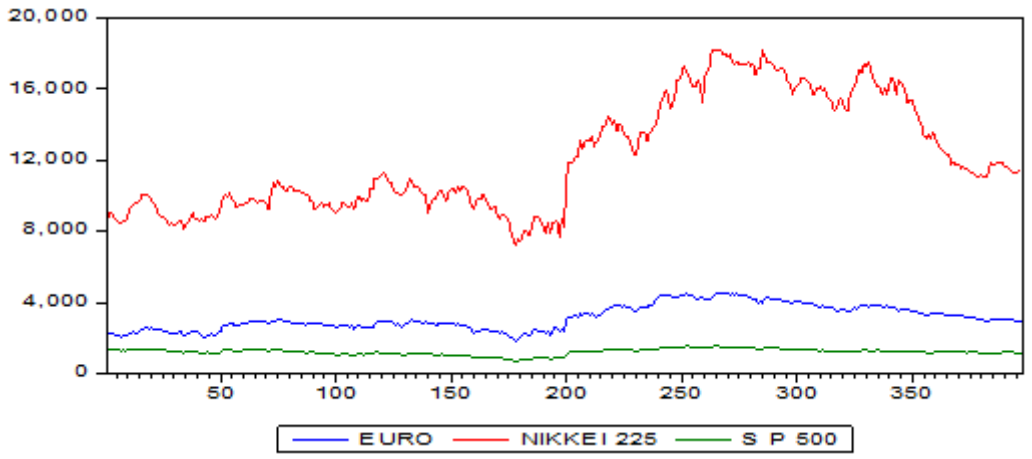

Fig 1: Dynamics of US, Japan and Euro zone stock prices over the period 4 January, 2005 to 9 July 2012

Fig 1 illustrates the variation of stock prices in these three markets. From the graph, we can see how the Japanese, the US and the European Monetary Union markets are interrelated over the period 2005-2012. However, both the US and the euro zone market indices commove together during all the period. In addition, it is apparent that the financial Greek crisis in the period 2009-2010 was accompanied by decreases both in the US and the European monetary union. These decreases are dramatic for the Japan.

The descriptive statistics for daily returns shown in Table 1 suggest that all the data series are negatively skewed implying that these distributions are skewed to the left and have long left tails. Furthermore, the Kurtosis value of all returns is large than three times the value of Normal distribution. This means that all these financial returns have peaks relative to the normal distribution. Hence, these financial returns show the properties of asymmetry, leptokurtosis, and tail dependence; indicating that the normality assumption has been severely challenged. The Jarque-Bera statistics are highly significant for all return series and just confirm that an assumption of normality is unrealistic.

Table 1: Descriptive statistics for each weekly return series

	EURO STOXX 50	NIKKEI 225	S&P 500
Mean	-0.029199	-0.029659	0.014541
Median	0.103064	0.080502	0.043832
Maximum	5.002127	4.972519	4.931805
Minimum	-10.91427	-12.11004	-8.722261
Std. Dev.	1.463870	1.398568	1.215377
Skewness	-1.295690	-1.850975	-0.910500
Kurtosis	11.56496	17.36755	10.94124
Jarque-Bera	1321.218	3632.163	1095.258
Probability	0.000000	0.000000	0.000000
Observations	398	398	398

The returns are in national currencies. The sample contains weekly market returns from January 4, 2005 to July 9, 2012

Correlations are the most familiar measures of dependence in finance. Although most studies have focused on measuring the dependence between financial markets have used the Pearson correlation, this coefficient is only reliable when the random variables are jointly Gaussian. Therefore, we consider two other measures of dependence: the Kendall's tau and the Spearman's Rho, which are measures of concordance and generalize the linear correlation.

Tables 2(a,b,c) bellow report the linear correlations, the Kendall's tau and the Spearman's rho rank correlations, between the stock market returns, over the period. We observe that all the correlations are positive indicating that the increase (decrease) of the one stock market is associated with the increase (decrease) of the other market. The Kendal's Taus for our stock market returns are all positive showing that the probability of concordance is significantly higher than the probability of discordance. The Spearman's Rhos are also positive. From these results, we can conclude that there are strong linear and rank correlations. The higher correlation is between the American and the European Monetary Union markets. However, the lowest one is between the American and the Japanese markets.

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Table 2 (a) : Pearson correlations

Stock markets	EURO STOXX 50	NIKKEI 225	S&P 500
EURO STOXX 50	1.000000	0.601517	0.866087
NIKKEI 225		1.000000	0.578225
S&P 500			1.000000

Table 2 (b) : Spearman rank correlations

Stock markets	EURO STOXX 50	NIKKEI 225	S&P 500
EURO STOXX 50	1.000000	0.416738	0.838083
NIKKEI 225		1.000000	0.364676
S&P 500			1.000000

Table 2 (c) : Kendall's Tau rank correlation

Stock markets	EURO STOXX 50	NIKKEI 225	S&P 500
EURO STOXX 50	1.000000	0.288593	0.659719
NIKKEI 225		1.000000	0.250972
SS&P 500			1.000000

III. Empirical Model

Our objective is to apply recent techniques in modeling volatility in the general indices of the US, Japan and Euro zone stock markets to upgrade the use of the univariate GARCH approach to a multivariate system. We choose the VAR-GARCH model, developed by Ling and McAleer (2003) which allows for spillover effects in both returns and conditional volatilities to examine both own conditional volatility for each market and conditional cross market volatility transmission among these financial markets.

The conditional mean equation of the VAR (1)-GARCH (1,1) system is giving by:

$$\begin{cases} \boldsymbol{y_t = c + \emptyset y_{t-1} + \varepsilon_t} \\ \boldsymbol{\varepsilon_t = h_t^{1/2} \eta_t} \end{cases}$$

Where

- $y_t = (R_t^{EMU}, R_t^{US}, R_t^{Japan})$; R_t^{EMU}, R_t^{US}, R_t^{Japan} are the returns on the EMU, US and Japan market indices at time t, respectively.
- $\varepsilon_t = (\varepsilon_t^{EMU}, \varepsilon_t^{US}, \varepsilon_t^{Japan})$; ε_t^{EMU}, ε_t^{US} and ε_t^{Japan} are the residual of the mean equations for the EMU, US and Japan markets returns, respectively.
- $\eta_t = (\eta_t^{EMU}, \eta_t^{US}, \eta_t^{Japan})$, refers to the innovation and is an i.i.d distributed random vectors.
- $h_t^{1/2}$ = diag ($\sqrt{h_t^{EMU}}$, $\sqrt{h_t^{US}}$, $\sqrt{h_t^{Japan}}$,); with h_t^{EMU}, h_t^{US} and h_t^{Japan} being the conditional variances of R_t^{EMU}, R_t^{US} and R_t^{Japan} respectively given by:

$$h_t^{EMU} = c_{EMU} + \alpha_{EMU} (\varepsilon_{t-1}^{EMU})^2 + \beta_{EMU} h_{t-1}^{EMU} + \alpha_{US} (\varepsilon_{t-1}^{US})^2 + \beta_{US} h_{t-1}^{US} + \alpha_{Japan} (\varepsilon_{t-1}^{Japan})^2 + \beta_{Japan} h_{t-1}^{Japan}$$

$$h_t^{US} = c_{US} + \alpha_{US} (\varepsilon_{t-1}^{US})^2 + \beta_{US} h_{t-1}^{US} + \alpha_{EMU} (\varepsilon_{t-1}^{EMU})^2 + \beta_{EMU} h_{t-1}^{EMU} + \alpha_{Japan} (\varepsilon_{t-1}^{Japan})^2 + \beta_{Japan} h_{t-1}^{Japan}$$

$$h_t^{Japan} = c_{Japan} + \alpha_{Japan} (\varepsilon_{t-1}^{Japan})^2 + \beta_{Japan} h_{t-1}^{Japan} + \alpha_{US} (\varepsilon_{t-1}^{US})^2 + \beta_{US} h_{t-1}^{US} + \alpha_{EMU} (\varepsilon_{t-1}^{EMU})^2 + \beta_{EMU} h_{t-1}^{EMU}$$

From these equations above, we can see how volatility is transmitted over time across the EMU, the US and the Japanese markets. Thus, the past shock and volatility of one market are allowed to impact the future volatility not only of itself but also of all other markets in the system.

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IV. Empirical Results

Our objective is to examine both own conditional volatility and shocks and conditional cross-market volatility transmission and shocks between the Euro zone, the American and the Japanese stock returns. We experiment on GARCH terms up to p=1 and q=1. The optimal lag order for the VAR model is selected using the AIC and SIC information criteria. The estimation of the VAR (1)-GARCH (1,1) for the two sub-period, is presented in table 3.

Table 3 : Estimates of VAR-GARCH (1,1) model for EMU, US and Japanese markets

Variables	EMU	US	Japan
Mean equation			
c	0.116968 (0.0170)	0.146933 (0.0015)	0.173781 (0.0106)
AR(1)	-0.182215*** (0.0038)	-0.166096*** (0.0014)	0.032489 (0.5491)
Variance equation			
c	-0.258747 (0.0937)	-0.405163 (0.0044)	1.101118 (0.0000)
$\varepsilon^2_{EMU}(t-1)$	0.204352** (0.0187)	-0.133764*** (0.0011)	-0.110622 (0.2075)
$\varepsilon^2_{US}(t-1)$	0.049152 (0.5497)	-0.046632 (0.3812)	-0.109637 (0.2976)
$\varepsilon^2_{Japan}(t-1)$	-0.051923 (0.4400)	0.117125*** (0.0021)	0.091325*** (0.0000)
h_{EMU}(t-1)	0.358387** (0.0455)	0.743436*** (0.0000)	0.413702 (0.1424)
h_{US}(t-1)	0.623554** (0.0231)	-0.378193** (0.0537)	0.483706 (0.2233)
h_{Japan}(t-1)	0.209215** (0.0809)	0.442608*** (0.0032)	-0.620153*** (0.0002)
Log-likelihood	-622.9006	-543.9374	-634.1763
AIC	3.199497	2.799683	3.256589
H-Q	3.235416	2.835603	3.292508

*Notes: $\varepsilon_j^2(t-1)$ represents the past unconditional shocks of the j^{th} market in the short run, or news.h_j(t-1) denotes the past conditional volatility dependency. J= EMU, FX. *, **, ***indicate statistical significance level at the 10%, 5% and 1%.*

We will discuss the empirical results of VAR(1)-GARCH(1,1) models in terms of own volatility and shock dependence, cross market volatility and shock spillover for the Euro zone, the US and the Japanese stock markets during the period 2005-2012.

For the EMU, the sensitivity to past own conditional volatility and past own shocks or news are significant. We find the same result for cross-market volatility transmission; showing that future volatility can be target by the past own conditional volatility in the long run. However, the sensitivity to own volatility is much better than the sensitivity to own shocks implying that the fundamental in the euro zone matter more than news. We find the same result for the conditional cross-market volatility transmission showing that future volatility in the euro zone can be predicted, in the long run, by conditional American and Japanese volatilities.

However, for the Japanese stock market, only the past own conditional volatility is significant at the level of 1% but has a negative coefficient. We find the same result for the past own shock or news, displaying that, in Japan, both cross market volatility transmission and shocks are not allowed to impact the future volatility.

Considering now the American stock market, both own conditional volatility and conditional cross-market volatility transmission and shocks are important in predicting future volatility. This implies that the American market is very sensitive to the Economic Monetary Union and Japan.

V. Conclusion

In this paper, we investigate the dynamics relationship between European Monetary Union, Japan and American stock market, over the period 2005-2012. We use a VAR-GARCH model which allows for spillover effects in both returns and conditional volatilities. Our empirical results show that there are moderate cross-market volatility transmissions and shocks between American and European Monetary markets due may be

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to the inter-connection with these financial markets. Indeed, for the euro zone, we find that the sensitivity to past own conditional volatility and past own shocks or news and cross-market volatility transmission are positive and significant indicating the existence of long run and short run persistence. The American market shows also cross-market volatility transmission and shocks dependence and past own conditional volatility sensitivity. In contrast, the Japan market shows cross-market volatility and shocks independence.

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Crude Oil Price Uncertainty and Stock Markets in Gulf Corporation Countries: A Var-Garch Copula Model

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Abstract- The main objectives of this study are twofold. The first objective is to examine the volatility spillover between the GCC stock markets and Oil prices, over the period 2005-2012, in a multivariate setting, using the VAR (1)-GARCH (1,1) model which allows for transmission in returns and volatility. The second is to investigate the dependence structure and to test the degree of the dependence between financial returns using copula functions. Five candidates, the Gaussian, the Student's t, the Frank, the Clayton and the Gumbel copulas, are compared. Our empirical results for the first objective suggest that there exist moderate cross market volatility transmission and shocks between the markets, indicating that the past innovation in stock market have great effect on future volatility in oil market and vice versa. 0

Keywords: subprime financial crisis, return spillover, volatility spillover; oil market, var-garch (1,1)-copula model.

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Jaghoubbi Salma

Abstract- The main objectives of this study are twofold. The first objective is to examine the volatility spillover between the GCC stock markets and Oil prices, over the period 2005-2012, in a multivariate setting, using the VAR (1)-GARCH (1,1) model which allows for transmission in returns and volatility. The second is to investigate the dependence structure and to test the degree of the dependence between financial returns using copula functions. Five candidates, the Gaussian, the Student's *t*, the Frank, the Clayton and the Gumbel copulas, are compared. Our empirical results for the first objective suggest that there exist moderate cross market volatility transmission and shocks between the markets, indicating that the past innovation in stock market have great effect on future volatility in oil market and vice versa. 0

Moreover, the result on the second objective implies that, during the pre-crisis period, the dependence structure is asymmetric with asymmetric upper and lower tail dependence. However, the degree of the dependence becomes stronger when the financial crisis occurs. Moreover, both of the degree of the dependence and the dependence structure vary when the financial crisis occurs. Our findings have important implications for global investment risk management by taking into account joint tail risk.

Keywords: subprime financial crisis, return spillover, volatility spillover; oil market, var-garch (1,1)-copula model.

I. Introduction

Today, crude oil is the most important commodities and is regarded as one of the single most important driving forces of the global economy. Changes in the oil prices have significant effects on economic growth and welfare around the world; hence, crude oil prices have received considerable attention from both finance practitioners and market participants.

Several researches on crude oil price dynamics found that crude oil prices experienced very large fluctuations and could suffer increasingly drastic fluctuations in the future.

Shocks in oil price have continuously augmented in size and frequency. First, the greater instability in the oil prices initially appeared during the world oil crises of 1973 and 1979. Then, after 2003, oil prices began to increase very sharply, hitting a record high of 147 UD$/barrel in July 2008. Affected by the global financial crisis in late 2008, oil prices plummeted to 34 UD$/barrel in February 2009, which have recently started to rise again. During June 2014, the world market price of crude oil declined from $115 per barrel to its low point of approximately $43pb in January 2015.

In this context, understanding the possibly shock transmission and the relationship between oil prices and stock market of the emerging countries is of crucial importance for policy making and risk management.

In recent decades, numerous researches have been devoted to the study of the relationship between oil prices and economic activity. Essentially, these studies have established that shocks in oil prices have significant effects on macroeconomic variables in most developed and emerging countries [Cunado and Perez Garcia de (2005), Balaz and Londarev (2006), Gronwald (2008), Cologni and Manera (2008), Kilian (2008) and Lardic et Mignon (2006, 2008)]. However, relatively little attention has been given to the relationship between oil prices and stock markets. In particular, previous empirical investigations of the relationship between crude oil and stock returns are mainly devoted to developed markets, and sometimes to Pacific Basin countries and very few studies have focused on the stock markets in some emerging markets of the GCC countries. These studies have mainly examined the interaction between short-term impact of oil prices and stock returns.

Giving the increasing role of the GCC countries in the global oil market, studying the effects of oil prices on the stock markets of the GCC is interesting for several reasons. First, the GCC countries are major participants in the global oil market, their stock markets are may be impacted by changes in oil prices. Second, the GCC markets differ from markets often covered by previous empirical studies by the fact that they are relatively poorly integrated into the global financial market and are extremely sensitive to regional political events. Finally, GCC markets are very promising for international portfolio diversification. Thus, studying the influence of oil price shocks on the returns of financial assets in the GCC allows both investors and authorities to understand the evolution of stock markets in response to changing oil prices.

The purpose of this paper is to examine the dynamic correlation and volatility transmission between

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the GCC and the crude oil returns and to explore the dependence structure between each pair of market indexes (OIL/GCC). We combine two models which are the VAR- GARCH model and the Copula approach to have a joint VAR- GARCH-Copula model with possibly skewed, fat tailed return innovations and non-linear property. The Vector Autoregressive–Generalized Autoregressive Conditional Heteroskedasticity model (VAR-GARCH) was introduced by Ling and McAleer (2003) and later used by Arouri et al. (2011, 2012). One of the main advantages of this model is that is allows us to investigate the shocks transmission, the dynamics of conditional volatility and the volatility spillovers between series. It also provides meaningful estimates of the unknown parameters with less computational complication than several other multivariate specifications. The specific aspect of this model allows us to observe the impact of crude oil events or news in the GCC equity index returns and vice versa. Besides, to take into account the stylized facts observed on financial markets such as non-linear dependency, asymmetry and heavy tails, the multivariate dependence structure between markets is modeled by several copulas which are perfectly suitable for non-normal distributions and nonlinear dependencies.

The paper is organized as follow. Section 2 reviews the relationship between the crude oil and stock markets. Section 3 outlines the methodology used. Section 4 presents the data and discusses the empirical results. The final section concludes.

II. Literature Review

The literature on the subject is quite rich in the developed countries. One of the first studies to investigate the exposure of stock returns to oil price movements was Chen et al. (1986), who find that oil price have no significant effect on US stock returns for the period 1958 to 1984. [Bredin D, Elder, J. (2011)].

Recent research by Aloui and Jammazi (2009) applied a univariate regime-switching EGARCH model to examine the relationship between crude oil shocks and UK, French and Japanese stock markets. They concluded that there exist some nonlinearity in the relationship between oil prices and the stock market financial returns. In the same line, Odusami (2009) shows that unexpected shocks in oil prices have nonlinear and asymmetric effects on stock returns.

Miller and Ratti (2009) investigate the existence of different regimes in the long term relationship between oil and the stock market in OECD countries over the past four decades.

Kilian and Park (2009) employ a structural VAR to decompose the oil price shocks into aggregate demand shocks and supply shocks. In their model, the response of the stock market to these two types of shocks is very different, with the aggregate demand shock leading to a reduction in stock returns, while the aggregate supply shock (representing better global economic conditions) leads to an increase in returns.

More recently, Jammazi and Aloui (2010) combine wavelet analysis and models change regime Markov-type (MS-VAR) and find that the reaction of the stock markets of these three countries to shocks in oil prices is rather asymmetric.

Chang et al. (2010) employ a symmetric DCC-GARCH model to investigate the conditional correlations and volatility spillovers between crude oil (WTI and Brent markets) and FTSE100, NYSE, Dow Jones and S&P500 stock indices.

Some recent studies have focused on the case of European, Asian and Latin American emerging stock markets. The results of these studies suggest a significant link between short-term changes in oil prices and returns in emerging equity markets.

Using a VAR model, Papapetrou (2001) established the existence of a significant relationship between changes in oil prices and stock markets in Greece.

Basher and Sadorsky (2006) use a multifactorial asset pricing model and find the same results for other emerging stock markets.

In contrast to the work done on developed markets, relatively little attention has been given to smaller emerging markets, particularly in the GCC countries, where the creation of stock markets is relatively recent. Recent work in this area includes Hamoudeh et Eleisa (2004), Zarour (2006) and Onour (2008).

Hamoudeh et Eleisa (2004) estimate a vector autoregression model to study the relationship between oil prices and stock prices for five members (Bahrain, Kuwait, Oman, Saudi Arabia, and the United Arab Emirates) of the Gulf Cooperation Council (GCC). They find that there is bidirectional causality between the Saudi stock market and oil prices. Their results suggest also that the other GCC markets are not directly affected by oil prices.

In the same line, Zarour (2006) uses a VAR model to study the relationship between Oil prices and GCC stock markets and suggests that only the Saudi and Omani markets have predictive power of the increase in oil prices.

More recently, onour (2008) use more recent data and shows that long-term oil prices significantly affect stock prices in the GCC countries.

This paper concentrates on modeling the joint evolution of conditional returns, volatility and correlation between crude oil and GCC countries.

III. Methodology

It is often argued that the information flow across markets through returns (correlation in first

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moment) might not be significant and visible; however they may have strong effect through volatility (correlation in second moment). Volatility has been argued to be a better proxy of information by Clark (1973), Tauchen and Pitts (1983) and Ross (1983). The ARCH model developed by Engle (1982), and later generalized by Bollerslev (1986), is one of the most popular method used for modeling volatility of high-frequency financial time series data (See Engle (2002) for a detailed recent survey). Multivariate GARCH (MGARCH) models such as BEEK (full parameterization), CCC (constant conditional correlation) or DCC (dynamic conditional correlation) models with dynamic covariances and conditional correlation have been found to be very useful in studying volatility spillover effects than univariate models. These models are subject to a major delinquent that their estimation becomes extremely difficult, especially when the number of variables considered is important owing to the rapid proliferation of parameters to be estimated (see McALeer (2005) for more details). The other failure of these models is that they do not allow for cross market volatility spillovers effect, while the latter are likely to occur with the increasing integration between financial markets. The VAR(1)-GARCH(1,1) model introduced by Ling and McAleer (2003) and later applied by several authors such as Chan et al. (2005), Hammoudeh et al. (2009) and Arouri et al., (2011, 2012), includes the multivariate CCC-GARCH of Bollerslev (1990) as a special case where correlations between system shocks are assumed to be constant to ease the estimation and inference procedure (see Engle (2002) and McAleer et al. (2008) for more details about the CCC model). In this paper, we use a bivariate VAR(1)-GARCH(1,1) copula model to explore the joint evolution of conditional returns, volatility and dependency among GCC and the crude oil markets simultaneously.

The conditional mean equation of the VAR(1)-GARCH(1,1) system is giving by:

$$\begin{cases} y_t = c + \emptyset y_{t-1} + \varepsilon_t \\ \varepsilon_t = h_t^{1/2}\eta_t \end{cases}$$

Where

- $y_t = (R_t^{GCC}, R_t^{WTI})$; R_t^{GCC} and R_t^{WTI} are the returns on the GCC and WTI market indices at time t, respectively.
- $\varepsilon_t = (\varepsilon_t^{GCC}, \varepsilon_t^{WTI})$; ε_t^{GCC} and ε_t^{WTI} are the residual of the mean equations for the GCC and WTI markets returns, respectively.
- $\eta_t = (\eta_t^{GCC}, \eta_t^{WTI})$, refers to the innovation and is an i.i.d distributed random vectors.
- $h_t^{1/2} =$ diag $(\sqrt{h_t^{GCC}}, \sqrt{h_t^{WTI}})$; with h_t^{GCC} and h_t^{WTI} being the conditional variances of R_t^{GCC} and R_t^{WTI}, respectively given by:

$$h_t^{GCC} = c_{GCC} + \alpha_{GCC}\,(\varepsilon_{t-1}^{GCC})^2 + \beta_{CCG} h_{t-1}^{GCC} + \alpha_{FX}\,(\varepsilon_{t-1}^{WTI})^2 + \beta_{WTI} h_{t-1}^{WTI}$$

$$h_t^{WTI} = c_{WTI} + \alpha_{WTI}\,(\varepsilon_{t-1}^{WTI})^2 + \beta_{WTI} h_{t-1}^{WTI} + \alpha_{GCC}\,(\varepsilon_{t-1}^{GCC})^2 + \beta_{GCC} h_{t-1}^{GCC}$$

Copulas are multivariate distribution functions with standard uniform marginal distributions. Am-dimensional copula is represented as follows:

$$C(u) = C(u_1, \ldots, u_m)$$

Where $u_1, \ldots, u_m$ are standard uniform marginal distributions.In such a context, copulas can be used to link margins into a multivariate distribution function. The copula function extends the concept of multivariate distribution for random variables which are defined over [0,1]. This is possible due to the Sklar (1959) theorem which states that copulas may be constructed in conjunction with univariate distribution functions to build multivariate distribution functions.

Sklar's Theorem: Let F_{XY} be a joint distribution function with margins F_X and F_Y. Then there exists a copula C such that for all x, y in R,

$$C(u_x, u_y) = C(F_x(x), F_y(y))$$

$$= F(F_x^{-1}(u_x), F_y^{-1}(u_y))$$

$$C(u_x, u_y) = F(x, y)$$

If F_X and F_Y are continuous, then C is unique; otherwise, C is uniquely determined on Ran $F_X \times$ Ran F_Y and C is invariant under strictly increasing transformations of the random variables.

Here we study five copulas with different dependence structure: the Gaussian copula, the Student-t copula, the Frank copula, the Clayton and the

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Gumbel copula. From them, the Gaussian copula is the most popular in finance and used as the benchmark.

- The Gaussian copula

The multivariate Gaussian copula applied to a joint distribution function with correlation matrix R, is defined by:

$$C_R(u_1, \dots \dots . u_m) = \emptyset_R\left(\emptyset^{-1}(u_1), \dots \dots \dots, \emptyset^{-1}(u_m)\right)$$

Where C_R is the distribution function of joint variables, these variables are normal, standardized and have a correlation matrix R.

- The Student- t copula

The Student-t copula is defined by:

$$C_T(u_1, \dots, u_m) = T_{v,m,\sum} \left(T_v^{-1}(u_1), \dots, T_v^{-1}(u_m)\right)$$

Where $T_{v,m,\sum}$is the multivariate student distribution function with a degree of freedom v and variance-covariance matrix $\sum$.

- Archimedean copula

We present as follow the characteristics of the best known models. The variables u and v are cumulative distribution functions. The parameter θ measures the degree of dependence between risks.

– The Clayton Copula:

$$C\ (u, v,\theta) = (u^{-\theta} + v^{-\theta} - 1)^{\frac{-1}{\theta}} \quad \text{where } \theta > 0$$

– The Gumbel Copula:

$$C\ (u, v,\theta) = \exp\left[-[(-\text{Ln}\ (u))^{\theta} + (-\text{Ln}\ (v))^{\theta}]\right]^{\frac{1}{\theta}} \quad \text{where } \theta \geq 1$$

– The Frank Copula:

$$C\ (u, v,\theta) = -\frac{1}{\theta}\ \text{Ln}\ [1+ \frac{(\exp(-\theta_u)^{-1})(\exp(-\theta_v)^{-1})}{\exp(-\theta)-1}] \quad \text{where } \theta \neq 0$$

According to the VAR-GARCH-Copula model that we consider, return, volatility and dependence are jointly modeled to explore the possibly spillover effects and the dependence structure between each pair of indexes (oil/CCG). Thus, the past shock and volatility of one market are allowed to affect the future volatility not only of itself but also of all other markets in the system.

IV. Empirical Results and Discussion

a) Data And Descriptive Statistics

We use daily market data from sex equity indices for the GCC countries, for a sample period of January 1, 2005 to December 31, 2012. We choose this period to investigate the impact of the 2007 Subprime crisis on the six emerging countries of the GCC. The countries used in our sample are Bahrain (BHRALSH), United Arab Emirates (ABUGNRL), Kuwait (KWSEIDX), Oman (OMANMSN), Qatar (QTRMRKT) and Saudi Arabia (TDWTASI). The total number of observations is 2013 for the full sample. We briefly overview summary statistics, then discuss the correlation.

The descriptive statistics for daily returns shown in Table 1 suggest that the mean daily stock returns range between -0.003107 and 0.028438 and the standard deviation between 0.275243 and 1.133865. Jarque-Bera tests on log returns data indicate that the normality hypothesis cannot be accepted for these stocks, Furthermore, the GCC stock market returns and oil prices show the properties of asymmetry, leptokurtosis, and tail dependence; hence, the normality assumption has been severely challenged.

Panel B of Table 1 presents the obtained results of the ADF, PP, and KPSS stationary tests. Both ADF and PP tests reject hypothesis of unit root for all the daily returns. For the KPSS, the null hypothesis of stationnarity cannot be rejected at the 1% level. Therefore, the investigation of ARCH behavior in crude oil market, indicated by Engl's LM test, shows evidence of the presence of ARCH effect.

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Table 1 : Summary descriptive statistics

Panel A : Basic descriptive statistics

	BAHRAIN	UNITED ARAB EMIRATES	KUWAIT	OMAN	QATAR	SAUDI ARABIA	WTI
Mean	-0.010879	-0.004532	0.028438	0.010812	0.005668	0.003107	0.018158
Median	0.000000	0.000000	0.029395	0.000000	0.003921	0.026456	0.052244
Maximum	1.569186	17.29288	2.191839	3.491220	4.091916	7.122213	6.468785
Minimum	-2.136727	-15.84828	2.173059	3.777923	4.064657	5.073236	-8.338475
Std. Dev.	0.275243	0.790156	0.319612	0.515664	0.714071	0.805843	1.133865
Skewness	-0.428670	1.151009	0.353775	0.845992	0.366285	0.560769	-0.244939
Kurtosis	8.922078	198.2145	10.60509	16.14789	8.851391	12.54510	8.322310
Jarque-Bera	3001.739	3195222.	4890.668	14732.01	2915.341	7743.414	2303.212
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	-21.88872	-9.118705	57.21761	21.75308	11.40492	6.251929	35.13568
Sum Sq. Dev.	152.3504	1255.560	205.4279	534.7430	1025.403	1305.908	2486.449

Panel B : Unit root and stationarity tests

	BAHRAIN	UNITED ARAB EMIRATES	KUWAIT	OMAN	QATAR	SAUDI ARABIA	WTI
ADF	-21.123*	-20.108*	-21.315*	-23.0007*	-20.360*	-23.149*	-18.598*
PP	-631.93*	-1008.406*	-369.65*	-427.04*	-405.46*	-470.48*	-655.09*
KPSS	0.2606	0.081	0.0311	0.0506	0.0346	0.0428	0.0598

Panel C : ARCH-LM test

	BAHRAIN	UNITED ARAB EMIRATES	KUWAIT	OMAN	QATAR	SAUDI ARABIA	WTI
F-statistic	0.312	0.319	13.134	0.98	6.159	0.088	5.014
LM-statistic	0.242	0.319	13.062	0.016	6.146	0.0885	5.006

ADF, PP, and KPSS are the acronym of Augmented Dickey-Fuller (1979) unit root test statistic, Phillips-Perron (1988) unit root test statistic, and Kwiatkowski, Phillips, Schmidt, Shin (1992) stationarity test statistic, respectively.
** denotes the rejection of the null hypothesis of normality, unit root, stationarity, and homoscedasticity at 10% level.*

b) Return And Volatility Dependecy

Our objective is to examine both own conditional volatility and shocks and conditional cross-market volatility transmission and shocks between the GCC stock returns and the oil returns. We experiment on GARCH terms up to p=1 and q=1. The optimal lag order for the VAR model is selected using the AIC and SIC information criteria. The estimations of the bivariate VAR (1)-GARCH (1,1) for the two sub-period, are presented as follows.

Table 2 : Estimates of VAR(1)–GARCH(1.1) for BAHRAIN

Variables	BHRALSH		WTI	
Meanequation	Pre-crisis	Post-crisis	Pre-crisis	Post-crisis
C	0.0081[0.5088]	-0.016**[0.0260]	0.0697**[0.0243]	0.026[0.2296]
AR(1)	0.1924*[0.0000]	0.104*[0.0003]	-0.0857**[0.0415]	-0.087*[0.0048]
Variance equation				
C	0.0065[0.2066]	0.0016*[0.0000]	0.0952**[0.0192]	0.018***[0.0909]
$\varepsilon^2_{BHRALSH}(t-1)$	0.2590*[0.0000]	0.109*[0.0000]	-0.0748[0.3479]	0.14*[0.0030]
$\varepsilon^2_{WTI}(t-1)$	0.0032[0.2015]	0.0003***[0.0663]	0.1021*[0.0000]	0.107*[0.0000]
$h_{BHRALSH}$(t-1)	0.4250*[0.0000]	0.866*[0.000]	0.0047[0.9896]	0.172***[0.0680]
h_{WTI}(t-1)	0.0201*[0.0008]	0.0004[0.4433]	0.7942*[0.0000]	0.869*[0.0000]

*Notes: $\varepsilon_j^2(t-1)$ represents the past unconditional shocks of the j^{th} market in the short run, or news.h_j(t-1) denotes the past conditional volatility dependency. J= BHRALSH, WTI. *, **, ***indicate statistical significance level at the 1%, 5% and 10%.*

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Table 3 : Estimates of VAR(1)–GARCH1.1) for UNITED ARAB EMIRATES

Variables	ABUGNRL		WTI	
Meanequation	Pre-crisis	Post-crisis	Pre-crisis	Post-crisis
c	0.0028[0.9354]	-0.014[0.1961]	0.0758**[0.0195]	0.024[0.2795]
AR(1)	0.1790*[0.0005]	0.241*[0.0000]	-0.089**[0.0318]	-0.088*[0.0038]
Variance equation				
c	0.2572*[0.0000]	-0.002*[0.0003]	0.0845**[0.0129]	0.020*[0.0030]
$\boldsymbol{\varepsilon^2_{ABUGNRL}(t-1)}$	0.2666*[0.0000]	0.296*[0.0000]	0.038[0.1429]	0.050**[0.0283]
$\boldsymbol{\varepsilon^2_{WTI}(t-1)}$	0.0746*[0.0000]	0.002*[0.0005]	0.095*[0.0000]	0.093*[0.0000]
$\boldsymbol{h_{ABUGNRL}}$(t-1)	0.3833*[0.0000]	0.76*[0.0000]	-0.0116[0.3322]	0.002[0.7012]
$\boldsymbol{h_{WTI}}$(t-1)	-0.055*[0.0000]	0.009*[0.0000]	0.8188*[0.0000]	0.888*[0.0000]

*Notes: $\varepsilon_j^2(t-1)$ represents the past unconditional shocks of the j^{th} market in the short run, or news.h_j(t-1) denotes the past conditional volatility dependency. J= ABUGNRL, WTI. *, **, ***indicate statistical significance level at the 1%, 5% and 10%.*

Table 4 : Estimates of VAR(1)–GARCH(1.1) for KUWAIT

Variables	KWSEIDX		WTI	
Meanequation	Pre-crisis	Post-crisis	Pre-crisis	Post-crisis
c	0.0731*[0.0000]	0.026*[0.0000]	0.0699**[0.0251]	0.024[0.2725]
AR(1)	0.1842*[0.0000]	0.234*[0.0000]	-0.0830***[0.0527]	-0.09*[0.0030]
Variance equation				
c	0.0044*[0.0227]	0.012*[0.0000]	0.1017*[0.0035]	0.022*[0.0022]
$\boldsymbol{\varepsilon^2_{KWSEIDX}(t-1)}$	0.2231*[0.0000]	0.49*[0.0000]	-0.1021[0.1065]	-0.058[0.1023]
$\boldsymbol{\varepsilon^2_{WTI}(t-1)}$	0.0026*[0.2253]	-0.0005[0.6308]	0.1079*[0.0000]	0.095*[0.0000]
$\boldsymbol{h_{KWSEIDX}}$(t-1)	0.7757*0.0000]	0.209*[0.0000]	0.0339[0.6264]	0.004[0.9114]
$\boldsymbol{h_{WTI}}$(t-1)	-0.0013[0.2778]	0.006*[0.0000]	0.7804*[0.0000]	0.886*[0.0000]

*Notes: $\varepsilon_j^2(t-1)$ represents the past unconditional shocks of the j^{th} market in the short run, or news.h_j(t-1) denotes the past conditional volatility dependency. J= KWSEIDX, WTI. *, **, ***indicate statistical significance level at the 1%, 5% and 10%.*

Table 5 : Estimates of VAR(1)–GARCH (1.1) for OMAN

Variables	OMANMSN		WTI	
Meanequation	Pre-crisis	Post-crisis	Pre-crisis	Post-crisis
c	0.0284***[0.0767]	0.008[0.4123]	0.068**[0.0368]	0.021[0.3360]
AR(1)	0.1480*[0.0003]	0.265*[0.0000]	-0.105*[0.0075]	-0.086*[0.0049]
Variance equation				
c	0.006*[0.0002]	0.001***[0.0542]	0.0518*[0.0070]	0.022*[0.0017]
$\boldsymbol{\varepsilon^2_{OMANMSN}(t-1)}$	0.0426*[0.0000]	0.228*[0.0000]	0.108*[0.0051]	0.053***[0.0587]
$\boldsymbol{\varepsilon^2_{WTI}(t-1)}$	0.0026[0.1794]	-0.0006[0.5239]	0.0573*[0.0002]	0.099*[0.0000]
$\boldsymbol{h_{OMAMSN}}$(t-1)	0.9351*[0.0000]	0.801*[0.0000]	-0.115[0.1028]	0.022[0.1520]
$\boldsymbol{h_{WTI}}$(t-1)	-0.0032*[0.0039]	0.0014**[0.0102]	0.899*[0.0000]	0.874*[0.0000]

*Notes: $\varepsilon_j^2(t-1)$ represents the past unconditional shocks of the j^{th} market in the short run, or news.h_j(t-1) denotes the past conditional volatility dependency. J= OMANMSN, WTI. *, **, ***indicate statistical significance level at the 1%, 5% and 10%.*

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Table 6 : Estimates of VAR(1)–GARCH (1.1) for QATAR

Variables	QTRMRKT		WTI	
Meanequation	Pre-crisis	Post-crisis	Pre-crisis	Post-crisis
c	0.0198[0.4867]	0.016[0.2538]	0.073**[0.0190]	0.024[0.2905]
AR(1)	0.307*[0.0000]	0.149*[0.0000]	-0.085**[0.0465]	-0.087*[0.0049]
Variance equation				
c	-0.004[0.7211]	0.004*[0.0001]	0.128*[0.0081]	0.024*[0.0030]
$\boldsymbol{\varepsilon^2_{QTRMRKT}(t-1)}$	0.4959*[0.0000]	0.154*[0.0000]	-0.057[0.1059]	0.009[0.6717]
$\boldsymbol{\varepsilon^2_{WTI}(t-1)}$	-0.008[0.2697]	0.001[0.4534]	0.099*[0.0001]	0.104*[0.0000]
$\boldsymbol{h_{QTRMRKT}}$(t-1)	0.527*[0.0000]	0.849*[0.0000]	-0.0009[0.6914]	0.015[0.1241]
$\boldsymbol{h_{WTI}}$(t-1)	0.045*[0.0021]	0.001[0.1531]	0.757*[0.0000]	0.867*[0.0000]

*Notes: $\varepsilon_j^2(t-1)$ represents the past unconditional shocks of the j^{th} market in the short run, or news.h_j(t-1) denotes the past conditional volatility dependency. J= QTRMRKT, WTI. *, **, ***indicate statistical significance level at the 1%, 5% and 10%.*

Table 7 : Estimates of VAR(1)–GARCH (1.1) for SAUDI ARABIA

Variables	TDWTASI		WTI	
Meanequation	Pre-crisis	Post-crisis	Pre-crisis	Post-crisis
c	0.091*[0.0012]	0.036**[0.0278]	0.074**[0.0183]	0.024[0.2842]
AR(1)	0.065[0.1397]	0.089**[0.0161]	-0.089**[0.0332]	-0.089*[0.0040]
Variance equation				
c	-0.014[0.1046]	0.005*[0.0000]	0.087**[0.0108]	0.025*[0.0008]
$\boldsymbol{\varepsilon^2_{TDWTASI}(t-1)}$	0.119*[0.0000]	0.104*[0.0000]	0.034**[0.0269]	-0.028[0.1423]
$\boldsymbol{\varepsilon^2_{WTI}(t-1)}$	0.016***[0.0564]	-0.002[0.2999]	0.095*[0.0000]	0.102*[0.0000]
$\boldsymbol{h_{TDWTASI}}$(t-1)	0.870*[0.0000]	0.877*[0.0000]	-0.007[0.1933]	-0.005[0.6246]
$\boldsymbol{h_{WTI}}$(t-1)	0.029*[0.0054]	0.003*[0.0022]	0.816*[0.0000]	0.879*[0.0000]

*Notes: $\varepsilon_j^2(t-1)$ represents the past unconditional shocks of the j^{th} market in the short run, or news.h_j(t-1) denotes the past conditional volatility dependency. J= TDWTASI, WTI. *, **, ***indicate statistical significance level at the 1%, 5% and 10%.*

We will discuss the empirical results of bivariate VAR(1)-GARCH(1,11) models in terms of own volatility and shock dependence, cross market volatility and shock spillover for the GCC stock returns and the Oil index, both for the pre-crisis and the post-crisis.

During the pre-crisis period and for the Bahrain, the sensitivity to past own conditional volatility and cross market volatility transmission are significant at the level of 1%, showing that future volatility can be predicted by both the past own conditional volatility in the long run and the cross market volatility spillover. We found the same result for the rest of the GCC returns (United Arab Emirates, Oman, Qatar and Saudi Arabia) with exception for Kuwait. In addition, only own shocks or news are significant for these returns, exception for the United Arabe Emirates and the Saudi Arabia which the impact of the past shocks is significant indicating a short run persistence.

Considering now the WTI return, only the past own volatility and the past own news are significant, exception for the Oman and the Saudi Arabia, displaying that cross market volatility transmission and shocks cannot be used to predict either the future volatility in the long run and the short run persistence.

After the occurrence of the Subprime crisis, the behavior of these markets changes considerably. Indeed, both the own past volatility and shocks remain significant but their persistence diverge. Moreover, own volatility and shock dependence and cross market volatility and shock spillover for the United Arab Emirates remain significant at level of 1% however the effect of past volatility is bigger than the effect of past shocks. This implies that fundamentals matter more than news.

For the oil market, cross shocks (or spillover) are more widespread inter-markets after the crisis.

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For the oil market, cross shocks (or spillover) are more widespread inter-markets after the crisis. Indeed, cross market volatility and shock transmission become significant after the crisis, for the Bahrain stock market return with the oil market. This implies that past own shocks and volatility and cross market volatility and shock dependence can be used to predicting future volatility and news.

We show the same results for the Emirates Arab Unis/oil market returns which indicates significant cross volatility. Besides, the WTI stock market becomes more sensitive to past volatility of the Emirates Arab Unis than past shocks related to changes in news or noise. However, the shock spillover of the Saudi Arabia becomes non-significant after the crisis. For the rest of the GCC-OIL market returns, the past own volatility and news remain significant.

c) Estimates Copula Parameters

We now present results from our copula estimation. We consider five bivariate copulas, the bivariate normal, biivariate Student-t, bivariate Gumbel, bivariate Clayton and the bivariate Frank. We will examine the relationship between each pair of stock-oil return separately, for the two sub period.

Table 8.A bellow, reports parameters estimates of bivariate copulas for each pair, before the occurrence of the financial subprime crisis. We note that the parameters θ and ρ measure the degree of dependence between returns and DoF is the degree of freedom in the Student-t copula.

Table 8.A : Estimation of copula parameters for the pre-crisis period

Pairs	Copula models	Parameters			Information criteria		
		ρ	DoF	Θ	SIC	AIC	HQIC
BHRALSH/WTI	Student	-0.021	40		-13.29	-4.29	-7.76
ABUGNRL/WTI	Student	-0.020	40		-13.82	-4.82	-8.29
KWSEIDX/WTI	Clayton			0.05	-13.32	-4.32	-7.80
OMANMSN/WTI	Gumbel			1.01	-13.46	-4.46	-7.93
QTRMRKT/WTI	Frank			0.31	-11.27	-2.27	-5.74
TDWTASI/WTI	Student	-0.043	40		-12.40	-3.40	-6.87

The correlation coefficient ρ in Student-t copulas are negative for these pairs: BHRALSH/WTI, ABUGNRL/WTI and KWSEIDX/WTI. The DoF of the Student-t copulas are 40, indicating the presence of strongly extreme co-movements and tail dependence. These market returns have elliptical symmetric dependence structure (the case of the Student-t copulas) with the oil return.

However, we observe asymmetric tail dependence for the rest of the GCC-Oil market returns. Indeed, the asymmetric dependence parameter θ in the Clayton, Gumbel and Frank copulas are positive. The Oman-WTI pair has the highest tail dependence, followed by the Qatar-WTI pair and the Kuwait-WTI pair.

In order to appreciate both, the dependence structure and the degree of this dependence, after the Subprime crisis; we estimate the copula parameters in the post-crisis period.

Table 8.B : Estimation of copula parameters for the post-crisis period

Pairs	Copula models	Parameters			Information criteria		
		ρ	DoF	Θ	SIC	AIC	HQIC
BHRALSH/WTI	Gumbel			1.01	-14.24	-3.96	-7.82
ABUGNRL/WTI	Student	0.012	6		7.98	18.25	14.40
KWSEIDX/WTI	Frank			0.189	-12.95	-2.63	-6.53
OMANMSN/WTI	Student	0.052	6		10.88	21.15	17.30
QTRMRKT/WTI	Student	0.062	9		5.28	15.55	11.70
TDWTASI/WTI	Student	0.011	9		0.28	10.56	6.70

For all pairs, the dependence parameters; the correlation coefficient ρ in both Gaussian and Student-t copulas, the degree of freedom DoF in the Student-t copula and the asymmetric dependence parameter θ in the Clayton, Gumbel and Frank copulas are positive.

The Qatar / WTI pair returns has the highest correlation coefficient with $\rho = 0.062$. The DoF of the Student-t copulas are 6, indicating the presence of extreme co-movements and tail dependence. The tail dependence parameter θ for post crisis period, are from

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1.01 to 0.189. The Bahrain / WTI pair has the highest tail dependence after the crisis, followed by the Kuwait pair. Moreover, the dependence structure between each stock index returns and exchange rate returns is largely changed from a symmetric structure with or not symmetric tail dependence to an asymmetric structure with non-zero and asymmetric upper and lower tail dependence.

From our results, we find The Gumbel copula which is limited to the description of a positive dependence structure. Thus, it allows only positive dependence structures or upper tail dependence, for which the parameter belongs to the interval $[1,+\infty)$.We find also the Frank copula. Consequently, the degree of the dependence varies when the financial Subprime crisis occurs. Indeed, as we see in tables above, it increased after the crisis, expect of ABUGNRL/WTI and TDWTASI/WTI pairs which remain symmetric, with zero tail dependence. The degree of the dependence becomes stronger and moves from a negative to a positive one.

Our findings may have important implications in the risk management. First, symmetric dependence structure with zero tail dependence can specify different levels of correlation between the marginal; however, it must possess radial symmetry which doesn't allow to extreme values correlation. Thus, in this case, the dependence has the linear correlation coefficient as measure of dependence. Second, asymmetric dependence structure can have upper tail dependence, lower tail dependence, or both; as such, they can better describe the reality of the behavior of financial markets. Additionally, it indicates the potential of simultaneous extreme events in both the stock and foreign exchange market. This property of dependence structure is important to international investors who invest in foreign stock markets.

V. Conclusion

This paper examines the dynamics relationship between the GCC and the oil stock market returns after the occurrence of the financial subprime crisis, using daily data from January 2005 to December 2012. Based on the VAR(1)-GARCH(1,1) model, the results show that there exist moderate cross market volatility transmission and shocks between the markets, indicating that the past innovation in stock market have great effect on future volatility in oil market and vice versa.

Copula models are used to specify the dependence structure and to examine the degree of the dependence between these two financial markets when the Subprime crisis takes place. We employ five bivariate copulas; the bivariate normal, bivariate Student-t, bivariate Gumbel, bivariate Clayton and the bivariate Frank to directly model the underlying dependence structure. We find that, during the pre-crisis period, the major of stock-oil market returns have asymmetric dependence structure with asymmetric upper and lower tail dependence.. However, the degree of the dependence become stronger and moves from a negative to a positive one when the financial crisis occurs.

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Risk Perception and Adoption of Joint Versus Individual Liability: The Case of Selected Tribes in Tanzania

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Abstract- Perceive risk is an important factor that influences the adoption intention. Perceived risk associated with the use of microfinance institutions lending model may adversely affect borrowers. Researchers had applied the concept of perceived risk with Technology Acceptance Model (TAM) to measure the use of information technology, but overlooked the use of TAM on microfinance institutions lending models. This study integrates TAM with the adoption of joint vs. individual liability. To address these challenges, a study was conducted from four ethnic groups namely, Gogo, Zaramo, Chagga and Kinga borrowed from PRIDE (T) and FINCA (T). Questionnaires were used to collect information. The Structural Equation Modeling was used to perform the analysis.

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Abstract- Perceive risk is an important factor that influences the adoption intention. Perceived risk associated with the use of microfinance institutions lending model may adversely affect borrowers. Researchers had applied the concept of perceived risk with Technology Acceptance Model (TAM) to measure the use of information technology, but overlooked the use of TAM on microfinance institutions lending models. This study integrates TAM with the adoption of joint vs. individual liability. To address these challenges, a study was conducted from four ethnic groups namely, Gogo, Zaramo, Chagga and Kinga borrowed from PRIDE (T) and FINCA (T). Questionnaires were used to collect information. The Structural Equation Modeling was used to perform the analysis. The findings have shown that the high perceived risk associated with borrowing incurring joint liability, especially the risk of non-payers causes the joint liability borrowers to devalue perceived usefulness and the ease of use of the joint liability lending model. The results provides evidence on the appropriateness of measuring the adoption of microfinance institutions lending model using TAM. It is recommended that more emphasis should be put on the strategies that improve the microfinance institutions lending models so as to ease the perceived risks especially the risk associated with partners' failure to repay the loans. These might encourage households to come forward and use credit, hence achieve the goal toward poverty reduction.

Keywords: risk perception, adoption, joint liability, individual liability, tribes, tanzania.

I. Introduction

The microfinance lending models that currently dominate the microfinance industry are joint and the individual lending models (Attanasio *et al.,* 2013). Following the success of the Grameen Bank in Bangladesh, a large number of microfinance institutions all over the world have replicated the "Grameen model" of joint liability lending (Kono, 2006). Therefore, joint liability model is the main lending model used by microfinance institutions to lend to poor people who lack conventional collateral (Maurya, 2011). This lending model allows the poor people to 2 access credit by substituting social capital for physical capital because the joint liability acts as collateral (Barboni *et al.,* 2013). However, despite the many celebrated facets of joint liability lending, some research reveals that joint liability creates excessive social pressure on group members and discourages good clients from borrowing (Giné and Karlan, 2011; Attanasio *et al.,* 2013).

When an individual borrow incurring joint liability, there is spreading of risk i.e. risk is shared amongst a group"s members (Sugden and William, 1983). Therefore, group members are jointly liable for repayment of the loan for each group member (Armendáriz and Morduch, 2010). However, some research reveals that in joint liability borrowing other borrowers does not repay the loan because she believes that another client will pay it for her, and the microfinance institutions are indifferent because they still get their money back (Barboni *et al.,* 2013; Giné and Karlan, 2010). This discourages good clients from borrowing (Wydick *et al.,* 2007). According to Giné and Karlan (2010), the majority of joint borrowers dislike the tension caused by the joint liability model. However, in other cultures, joint liability has been found to be more successful, where a borrower found borrowing partners whom s/he personally trusted (Wydick *et al.,* 2007).

Theorists like Rogers (1983), Meyer and Allen (1997) state that innovations that have a clear and unambiguous advantage or have cost-effectiveness are more easily adopted. Nevertheless, relative advantage alone does not guarantee widespread adoption (Hassan *et al.,* 2010). Some innovations are never adopted at all; others are adopted and subsequently abandoned (Vannoy and Palvia, 2010). In many cases the reason is that there is an issue of perceived risk that influences adoption intention (Davis *et al.,* 1989). Every technology has some inherent risk (Davis, 1989). Although there are inherent risks in a technology, nonetheless individuals adopt technology when they feel that the benefits provided by the technology outweigh the costs involved in adopting the technology (Ibid). Davis (1989) using Technology Acceptance Model (TAM) found that risk associated with the use of technology may adversely affect the users. TAM has been considered as an excellent model in understanding individual"s perception on the use of the particular technology (Davis *et al.,* 1989; Featherman and Pavlou, 2002; Pavlou, 2003)

Researchers had applied TAM in other areas such as e-banking (Moga *et al.,* 2012), consumer

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electronic commerce (Lui Kit and Jamieson, 2010), mobile banking services (Li and Yeh, 2010; Zhihong, 2010) etc. However, researchers have overlooked the use of TAM on microfinance institutions lending models. This study integrates Technology Acceptance Model (TAM) variables by Davis (1989) i.e. perceived usefulness, and perceived ease of use into the perceived risk, to examine their influence on borrowing decisions incurring joint vs. individual liability. There is theoretically an empirical support for integrating perceived risk with TAM variables. Pavlou (2003) integrated perceived risk with the TAM model. Featherman and Pavlou (2002) integrated perceived risk with TAM variables.

According to Gaskell *et al.* (2004) perceptions for the usefulness and ease of use reduce perceived risk and influence positively the adoption intention. Similarly, Pavlou (2003) found that perceived risk cause potential users to devalue perceived usefulness and perceived ease of use and affects negatively the adoption intention Therefore, this paper seeks to establish the relationship of the coefficient of the explanatory variable, whether the perceived risk associated with borrowing incurring joint liability has a negative effect on the decisions to borrow incurring joint liability or not.

II. Literature Review

a) Perceived Risk

It appears that there is no universally accepted definition of perceived risk (Jacoby and Kaplan, 1972; Mitchell, 1999). Perceived risk seems to emerge within two areas which are;

i. Risk and uncertainty (Bauer, 1960) and
ii. Consequences (Weber and Bottom, 1989).

Perceived risk has been defined differently according to the context of the study. The concept of perceived risk was originally introduced by Bauer in 1960. Thus, Bauer (1960) claims that consumer behavior involves risk, because the consequences of the product usage cannot be anticipated with certainty, and that some consequences of the product usage are likely to be unpleasant. Therefore, he defined perceived risk as the combination of uncertainty plus consequence of outcome. Similarly, Peter and Ryan (1976) conceived perceived risk as an influence on choice decisions and may be defined as the expectation of losses, associated with purchase and acts as an inhibitor to purchase behavior. They also conceptualized perceived risk as composed of two distinct components, the probability of loss and consequence or importance of that loss.

According to Gewald *et al.* (2006), perceived risk is generally defined as the undesired consequence outcome due to uncertainty about the future. As for Bauer (1960), risk is dissimilar to uncertainty because risk has a known probability while uncertainty does not. Similarly, Peter and Ryan (1976) recognized that uncertainty is different from perceived risk. However, Cunningham (1967) and Mitchell (1999) suggest that risk and uncertainty should be perceived as similar and should be acknowledged as risk rather than uncertainty, because buyers are unable to realize the exact probability of consequences.

On one hand, other studies suggest that perceived risk should be defined in terms of positive consequences (Arrow, 1965; Stone and Gronhaug, 1993). On the other hand, other studies argue that perceived risk should be defined as an aspect of negative consequences (Kogen and Wallack, 1964; Cox, 1967; Peter and Ryan, 1976). However, others studies defined perceived risk as a combination of positive and negative consequences (Weber and Bottom, 1989).

For instance, using the case study of the possibility of a win or loss in a lottery draw, perceived risk is defined as an alternative solution involving both positive (winning) and negative consequences (not winning) (Weber and Bottom, 1989). Defining perceived risk as a combination of positive and negative consequences appears to correspond with a borrower"s perception toward risk in general. However, for the purpose of this study, perceived risk can be considered as a negative consequences resulting from borrowing incurring joint liability.

i. The Facets of Perceived Risk

Perceived risk has been typified as having six dimensions: (1) performance risk, (2) financial risk, (3) time risk, (4) privacy risk, (5) social risk, and (6) psychological risk (Cunningham, 1967). Performance risk is the possibility of unavailable service or the service that cannot satisfy users or services that cannot function as expected (Zhihong, 2010). Financial risk refers to the possibility that the product will not be worth the financial price and would have 4 been available cheaper elsewhere (Azmi and Kamarulzaman, 2010). Furthermore, time risk is the possibility of the loss of time such as long period of transaction processing etc. (Zhihong, 2010). Privacy risk is the potential loss of control over personal information, such as when information about you is used without your knowledge or permission (Gewald *et al.,* 2006). Social risk is the possibility of users who are not accepted or acknowledged by other people (Zhihong, 2010). Also Azmi and Kamarulzaman (2010) define social risk as an individual"s ego and the effect that adoption will have on the opinions of reference groups. Psychological risk is the possibility of mental stress of the users. This spirit pressure may come from the outside world such as the non-recognition of their friends and family, and may also come from themselves such as the irritable mood of financial losses when the response time of a certain type is too long (Azmi and Kamarulzaman, 2010). Overall risk is a measure of perceived risk when all criteria are

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evaluated together (Featherman and Pavlou, 2002). This study adopted five facets as antecedents of perceived risk in the research model (Figure 2.2) integrated by TAM variables to examine their influence in the adoption of joint vs. individual liability. Social risk was not adopted; the reason is explained in section 3.3

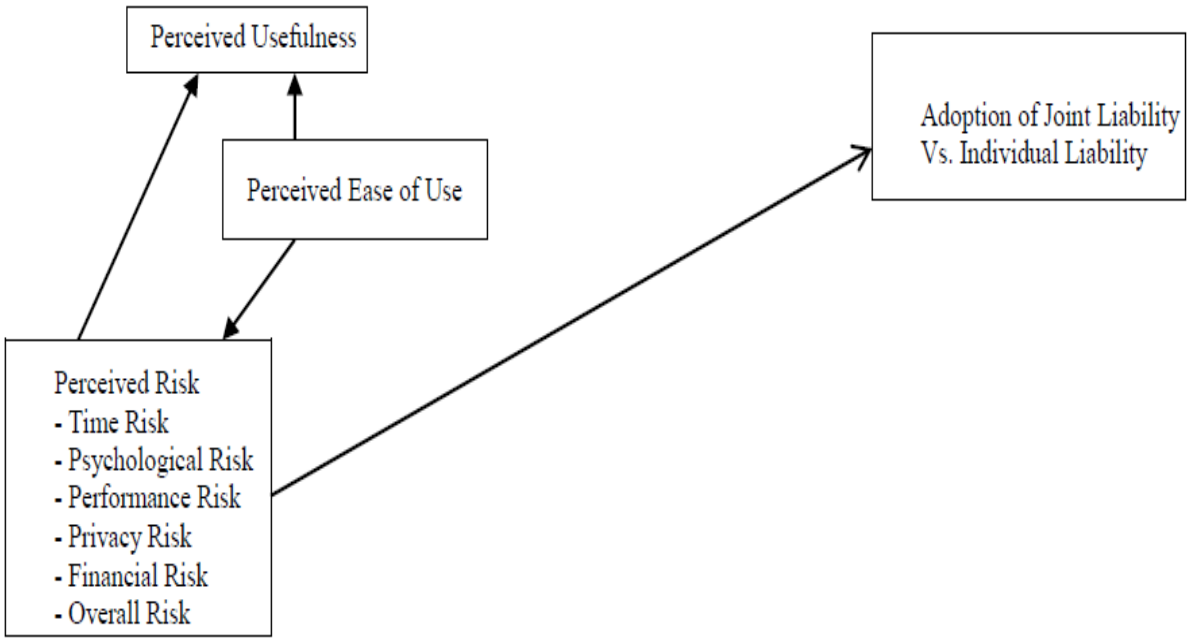

Figure 2.2 : Relationships between TAM variables, Perceived Risk Facets and Borrowing Incurring Joint Liability vs. Individual Liability

b) Theoretical Framework

This study use Technology Acceptance Model (TAM) variables by Davis (1989) i.e. perceived usefulness, and perceived ease of use integrated by perceived risk and its facets as a base theory. TAM has been applied in a more general context to a variety of (acceptance) decisions (Bartholomaus and Mayer, 2010). TAM as illustrated in Figure 2.1 includes the following concepts [Davis *et al.,* 1989; Malhotra and Galletta, 1999]:

- External variables (*EV*): External variables (including issues like training, technology features, how the technology was developed, etc.) are typically thought to influence the use 5 of a technology (Featherman and Fuller, 2003). External variables influence perceived usefulness (*PU*) and perceived ease of use (*PEU*).
- Perceived usefulness (*PU*): Perceived usefulness is defined as the extent to which a person believes the innovation developed is useful and will enhance his or her job performance.
- Perceived ease of use (*PEU*): Perceived ease of use is the extent to which a person believes that the developed technology will be free of effort.
- Attitudes towards use (*A*): Attitude towards use is defined as the user**'**s desirability of using the technology developed.
- Perceived usefulness (*PU*) and perceived ease of use (*PEU*) are the sole determinants of attitude (*A*) towards an adoption. Perceived usefulness and perceived ease of use is determined by external variables (EV) and attitudes toward use (A) can therefore be defined as:
- $A = PU + PEU + EV$
- Behavioral intention (*BI*): Attitude (*A*) combined with perceived usefulness (PU) predicts behavioral intention (*BI*):
- $BI = A + PU$
- Actual use: Behavioral intention (*BI*) in turn predicts actual use.

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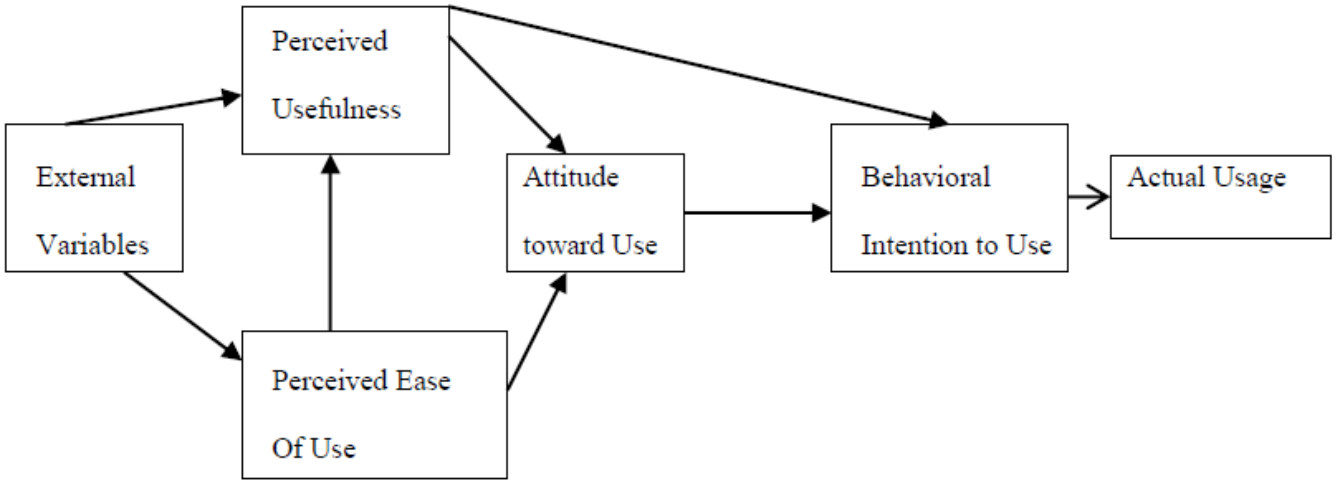

Figure 2.1 : Technology Acceptance Model (TAM) (Davis *et al.,* 1989)

The theory claims that perceived risk cause potential users to devalue perceived usefulness and perceived ease of use and affects negatively the adoption intention (Pavlou, 2003). TAM has been applied in many other areas (Li and Yeh, 2010; Lui Kit and Jamieson, 2010; Zhihong, 2010; Moga *et al.,* 2012). The question is whether TAM can also be applied in the area of microfinance institutions lending models. Thus the working hypothesis states that:

Perceived risk in joint liability mediated by (a) perceived usefulness, (b) perceived ease of use influences negatively the decision to borrow as a group and positively as an individual. 6

III. Methodology

a) Study Area Selection Criteria

The study was conducted in four tribes within the country, the Chaga from Kilimanjaro Region, the Zaramo from Coast Region, the Kinga from Njombe Region and the Gogo from Dodoma Region borrowed from PRIDE (T) and FINCA (T). The selection of tribes, microfinance institutions and respondents were based on specific characteristics they possess, that are relevant to the purpose of this study. Therefore, sampling was guided by theoretical statistical sampling. Theoretical sampling means selecting a sample based on a certain characteristics they possess (Strauss and Cobin, 1998; Thompson, 1999).

These tribes were selected for two reasons. The first consideration was the ethnic group where cooperation exists and secondly, the ethnic group where aggressiveness in business exist. Within the literature, the main factor in order for the joint liability model to operate well is the existence of trust associated with cooperation (Bohnet and Frey, 1999). Most of the loans from microfinance institutions are borrowed for business purposes (Moore, 1997). Therefore, differences in cultural values that exist among ethnic groups were the main reason for the selection of these ethnic groups.

Kilimanjaro Region which covers an area of 13,250 square kilometres is located in the North Eastern part of Tanzania Mainland. The region had a total population of 1,640,087 (URT, 2012). The first rationale for selecting the Chaga tribe from Kilimanjaro Region is that, the literature search shows that „Chaga people have the culture of cooperation (Conzales, 2005). The second rationale is its aggressiveness in business, as many of them are entrepreneurs (Ibid).

The Coast Region is located in the Eastern part of mainland Tanzania, and a large part of it is situated along the Indian Ocean costal belt. The region covers an area of 32,547 square kilometres. The region had a total population of 1,098,688 (URT, 2012). The first rationale for selecting the Zaramo tribe from the Coast Region is cooperation (Mazrui and Shariff, 1994). Zaramo culture has been influenced by the Arab culture which emphasizes safety of the group, (Bryceson, 2010). The second rationale is that the majority are not aggressive in business (Velten, 2002).

The Njombe Region which covers an area of 21,347 square kilometres is located in the South Western part of Tanzania Mainland. The region had a total population of 702,097 (URT, 2012). The rationale for selecting the Kinga tribe from Njombe Region is that they are known for their good business skills and cooperation among themselves (Iliffe, 2008).

Dodoma Region is located in the Central part of mainland Tanzania. The region covers an area of 41,311 square kilometres. The region had a total population of 2,083,588 (URT, 2012). The rationale for selecting the Gogo tribe from Dodoma Region is that business is less conducted by the majority of Gogo people and cooperation is less among themselves (Narayan, 1997).

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The study examines whether cooperation still exists for those tribes which have the culture of cooperation and does it make the joint liability an appropriate lending model. For the tribe which literature search shows that cooperation does not exists, the study examines whether joint liability is an appropriate lending model in accordance to their specific cultural settings.

PRIDE (T) and FINCA (T) were selected for two reasons; first, they are microfinance institutions which have a wide outreach throughout the country as compared to other 7 microfinance institutions. Secondly, they are among the microfinance institutions whose methodology of lending, is based on both group and an individual lending.

b) Data Collection

The researcher met the respondents who borrowed using joint liability lending model at PRIDE (T) and FINCA (T). The selection of respondents, who participated in this study, was conducted using systematic sampling without replacement. The sample size for the study was 480 participants. This study used Structural Equation Modeling for the analysis (SEM). SEM requires a minimum sample size of 200 and above (Joreskog and Sorbom, 1993). A cross-sectional survey approach was employed through self-administered questionnaire. Before the actual survey, pre-testing of the questionnaire was done to check its relevance and appropriate modifications were made accordingly.

c) Quantification of the Variables

Perceived risk is the independent variables for this study. Perceived risk was measured in terms of the general risk toward borrowing incurring joint liability with the scale suggested by Miyazaki and Fernandez (2001). Cunningham (1967) typified perceived risk as having six dimensions: (1) performance risk, (2) financial risk, (3) time risk, (4) privacy risk, (5) social risk, and (6) psychological risk. The study used five risk facets to evaluate how perceived risk influenced borrowing decisions of incurring joint vs. an individual liability. The study did not use social risk because in the context of this study, social risk would have been based on people who did not borrow from microfinance institutions because they were unaccepted to join the group.

Perceived usefulness and perceived ease of use were the moderating variables for perceived risk measured from the scale adopted from Davis *et al.,* (1989). Perceived usefulness contained questions measuring beliefs that using a particular system, may improve their business performances. Perceived ease of use contained questions which measured users‟ beliefs whether joint liability or individual liability was easier to use without difficulty. Joint vs. an individual liability are the dependent variables for this study. These were quantified by asking a question regarding borrowers‟ willingness to borrow incurring joint vs. an individual liability. Lehmann and Hulbert (1972) point out that if the focus is on individual behavior, five to seven point scales are used. Accordingly, these variables were measured using seven point Likert scale with end points of “strongly agree” (7) and “strongly disagree” (1).

d) Data Analysis

The preliminary data analysis was performed before testing the hypotheses of the study. Preliminary analysis involved factor analysis and models fit test.

The final data analysis tested the hypothesis of the study by the use of Structural Equation Modeling (SEM). In estimating the parameters under SEM, AMOS version 20 was used. AMOS was used because it is user friendly in terms of creating the structural models and defining the required statistics (Ame, 2005).

Therefore, once the model had attained an acceptable fit to the observed data, the causal path analysis or relationships among variables were determined. Path analysis was employed for studying the relationship between perceived risk and its facets moderating by perceived ease of 8 use and perceived usefulness and the decision to borrow incurring joint vs. an individual liability (see Figure 3.1 and Figure 3.2).

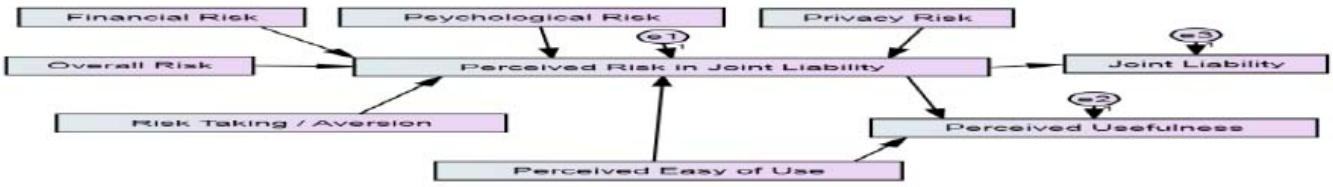

Figure 3.1 : Path Analyses for Perceived Risk and Borrowing Incurring Joint Liability

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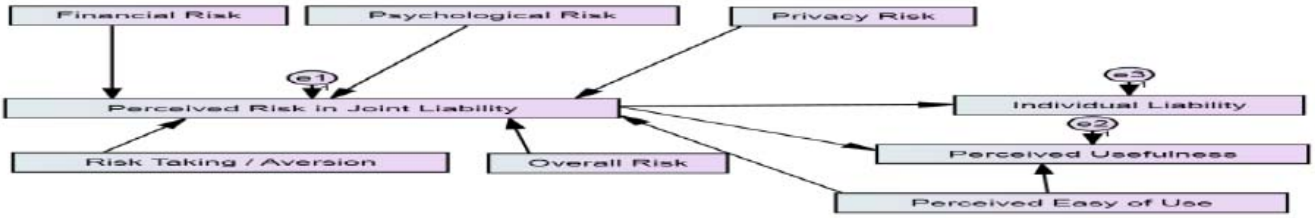

Figure 3.2 : Path Analyses for Perceived Risk and Borrowing Individual Liability

e) Validity and Reliability Improvement

The validity and reliability of all the measures in the study instrument were improved qualitatively. This was done by employing a seven point Likert scale as suggested by Churchill and Peter (1984). Furthermore, the improvement was done by pre-testing the questionnaire and adoption of methods and instruments from past studies.

IV. Results and Discussion

a) Respondents' Characteristics

The summary of respondents‟ features is given in Table 1. According to the results, some of the Chagga and Kinga ethnic groups prefer to borrow incurring joint liability, whereby from PRIDE (T), Chagga and Kinga ethnic groups were found to be 27% and 29% out of 93 and 85 9 respondents respectively. For the FINCA (T), Chagga ethnic group were found to be 17% out of 48 respondents while Kinga ethnic group were found to be 29% out of 51 respondents. However, for the Zaramo ethnic group none of them prefer to borrow incurring joint liability, from both PRIDE (T) and FINCA (T). For the Gogo ethnic group, out of 56 respondents, only 2% from PRIDE (T) prefers joint liability while for the FINCA (T), all of them prefer an individual liability. This is the challenge to the microfinance institutions because all of these borrowers borrow incurring joint liability. However, the majority of them prefer an individual liability. These findings suggest that joint borrowers perceived borrowing incurring joint liability as risky.

Table 1 : Respondents Characteristics and Preference for Joint versus Individual Liability

		PRIDE (T)					FINCA (T)				
		Joint Liability (JL)		Individual Liability (IL)		JL+ IL	Joint Liability (JL)		Individual Liability (IL)		JL+ IL
		Freq.	%	Freq.	%	Freq.	Freq.	%	Freq.	%	Freq.
Tribe	Chagga	25	27	68	73	93	8	17	40	83	48
	Zaramo	0	0	46	100	46	0	0	50	100	50
	Kinga	25	29	60	71	85	15	29	36	71	51
	Gogo	1	2	55	98	56	0	0	51	100	51
	Total	**51**		**229**		**280**	**23**		**177**		**200**
Sex	Male	4	8	44	92	48	3	20	12	80	15
	Female	47	20	185	80	232	20	11	165	89	185
	Total	**51**		**229**		**280**	**23**		**177**		**200**
Age	26-35	6	11	51	89	57	4	9	42	91	46
	36-45	30	20	120	80	150	14	12	99	88	113
	Greater than 45 years	15	21	58	79	73	5	12	36	88	41
	Total	**51**		**229**			**23**		**177**		**200**
Highest Education Attained	None	3	13	20	87	23	3	15	17	85	20
	Primary School	48	20	192	80	240	20	11	158	89	178
	O' Level	0	0	17	100	17	0	0	2	100	2
	Total	**51**		**229**		**280**	**23**		**177**		**200**
Marital Status	Married	44	18	207	82	251	18	10	159	90	177
	Divorced	2	22	7	78	9	3	33	6	67	9
	Widowed	0	0	0	0	0	2	33	4	67	6
	Cohabiting	5	25	15	75	20	0	0	8	100	8
	Total	**51**		**229**		**280**	**23**		**177**		**200**

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Other Training Received	Vocational	22	18	97	82	119	9	13	59	87	68
	None	29	18	132	82	161	14	11	117	89	131
	Professional	0	0	0	0	0	0	0	1	100	1
	Total	**51**		**229**		**280**	**23**		**177**		**200**
Main Occupation	Business	51	100	229	100	280	23	100	177	100	200
	Total	**51**		**229**		**280**	**23**		**177**		**200**

With respect to sex of the respondents, from PRIDE (T), out of 48 male respondents, 8% prefer joint liability while 92% prefer an individual liability. On the other hand, out of 232 female respondents, 20% prefer joint liability while 80% prefer an individual liability. From FINCA (T), out of 15 male respondents, 20% prefer joint liability while 80% prefer an individual liability. Likewise, out of 185 female respondents, 11% prefer joint liability while 89% prefer an individual liability. These findings indicate that regardless of whether the borrower is male or female, the majority prefer borrowing incurring an individual liability. These findings also suggest that the majority of the borrowers from microfinance institutions are women.

With respect to the ages of the respondents, from PRIDE (T), for the age group of 26 to 35, out of 57 respondents, 11% prefer joint liability while 89% prefer an individual liability. For the age group of 36 to 45, out of 150 respondents, 20% prefer joint liability while 80% prefer an individual liability. For the age group greater than 45 years, out of 73 respondents, 21% prefer joint liability while 79% prefer an individual liability. From FINCA (T), for the age group of 26 to 35, out of 46 respondents, 9% prefer joint liability while 91% prefer an individual liability. For the age group of 36 to 45, out of 113 respondents, 12% prefer joint liability while 88% prefer an individual liability. For the age group greater than 45 years, out of 41 respondents, 12% prefer joint liability while 88% prefer an individual liability. These findings indicate that despite of their differences in the age groups, the majority of the respondents prefer borrowing incurring an individual liability. These findings also suggest that the majority of the borrowers from microfinance institutions were in the 36 to 45 years range. These findings imply that the age groups of 36 to 45 years were dominant participants in the microfinance institutions, since they have reached maturity and have responsibilities in their families and society as a whole.

With regard to the level of education attained, from PRIDE (T), out of 23 respondents who have not attained any education, 13% prefer joint liability while 87% prefer an individual liability. For the respondents who have attained primary education, out of 240 respondents, 20% prefer joint liability while 80% prefer an individual liability. For the respondents who have attained O" level education, out of 17 respondents, 100% prefer an individual liability. From FINCA (T), out of 20 respondents who have not attained any education, 15% prefer joint liability while 85% prefer an individual liability. For the respondents who have attained primary education, out of 178 respondents, 11% prefer joint liability while 89% prefer an individual liability. For the respondents who have attained O" level education, out of 2 respondents, 100% prefer an individual liability. These findings suggest that despite of their differences in the level of education attained, the majority of the respondents from microfinance institutions prefer borrowing incurring an individual liability. These findings also suggest that the majority of the respondents were less educated people having attended primary school. The results therefore suggest that it was the poorer part of the targeted population that benefited from the microfinance institutions.

With respect to marital status, from PRIDE (T), Table 1 has shown out that out of 251 married respondents, 18% prefer joint liability while 82% prefer an individual liability. For the divorced, out of 9 respondents, 22% prefer joint liability while 78% prefer an individual liability. For the cohabiting respondents, out of 20 respondents, 25% prefer joint liability while 75% prefer an individual liability. From FINCA (T), out of 177 married respondents, 10% prefer joint liability while 90% prefer an individual liability. For the divorced, out of 9 respondents, 33% prefer joint liability while 67% prefer an individual liability. For the widowed, out of 6 respondents, 33% prefer joint liability while 67% prefer an individual liability. For the cohabiting, out of 8 respondents, 100% prefer an individual liability. These findings suggest that 11 despite of their differences in marital status, i.e. whether the borrower is married, divorced, widowed or cohabiting, the majority of the respondents from microfinance institutions prefer an individual liability. These findings also suggest that the majority of the respondents were married people, because they have responsibilities in their families and society as a whole.

With regards to other training received, from PRIDE (T), out of 119 respondents who have received vocational training, 18% prefer joint liability while 82% prefer an individual liability. For the respondents who have not received any training, out of 161 respondents, 18% prefer joint liability while 82% prefer an individual liability. From FINCA (T), out of 68 respondents who have received vocational training, 13% prefer joint liability while 87% prefer an individual liability. For the respondents who have not received any training, out of

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131 respondents, 11% prefer joint liability while 89% prefer an individual liability. In addition, only one respondent from FINCA (T) has received professional training and prefers an individual liability. These findings imply that regardless of whether the respondents have received training or not, the majority of the borrowers prefer an individual liability. Moreover, these findings also suggest that the majority of the respondents had not received any training. This is the challenge to the microfinance institutions, because poor people need business skills in order to be effective in expanding their business.

As far as the main occupation of the respondents was concerned, all of them were business people (100%). These findings imply that microfinance institutions targeted borrowers who are already engaged in business.

b) Preliminary Analysis

i. *Factor Analysis*

For factor analysis, Tinsley and Tinsley (1987) suggest that, the larger the sample, the better. Comrey and Lee (1992) consider a sample of n ≥ 200 as appropriate for the factor analysis. Hence, n=280 from PRIDE (T) and n=200 from FINCA (T) were suitable for the analysis. To perform the factor analysis, principal components subjected to Oblimin rotation was used to allow for possible correlations between factors. The number of factors retained were those with initial Eigenvalues >1 (Bryman and Cramer, 2001). The results of the factor loading for PRIDE (T) and FINCA (T) reveal that most of the factors have high values of loadings ranging from 0.6 – 0.9 suggesting that it is a well-defined structure Hair and colleagues (2005) as shown in Table 2 below.

Table 2 : Factor Loadings Using OBLIMIN Rotation with Kaiser Normalization

S/NO.	Dimensions	PRIDE (T)		FINCA (T)	
		Component			
		1	2	1	2
1	Perceived Risk	**-0.707**	0.344	**-0.723**	0.224
2	Time Risk	-0.030	**0.803**	-0.313	**0.628**
3	Financial Risk	**-0.896**	0.135	**-0.939**	0.076
4	Performance Risk	**0.922**	0.113	**-0.948**	0.030
5	Psychological Risk	**-0.912**	0.085	**-0.941**	0.008
6	Privacy Risk	0.103	**0.781**	-0.130	**0.756**
7	Perceived Usefulness	0.258	**0.695**	0.463	**-0.60**
8	Perceived Ease of Use	**0.857**	-0.080	**0.912**	-0.025
9	Overall Risk	**-0.894**	0.144	**-0.924**	0.068

ii. *Model Fit Test*

A Confirmatory factor analysis that is in the SEM was performed to test whether the data fit the hypothesized models. The intention is to confirm if the models are adequate enough to be used as the basis for testing the research hypotheses. For the findings to indicate that the predicted model is congruent with the observed data, it is recommended for the χ2 to be non-significant (p > 0.05), (Hoyle and Panter, 1995), CMIN/DF in the range of 2 to 1 or 3 to 1 indicate acceptable fit between the hypothetical model and the sample data (Kenny, 2012). Furthermore, for the hypothetical model to indicate acceptable fit to the sample data, the fit indices should be as follow; GFI>0.90, AGFI>0.90, CFI>0.90, TLI>0.90, NFI>0.90, IFI>0.90, RFI>0.90, RMR<0.05, RMSEA; good fit (0.00–0.05), fair fit (0.05–0.08), mediocre fit (0.08–0.10), and poor fit (over 0.10), PCLOSE should be > 0.05 to conclude close fit of RMSEA (Ibid). The models fit summaries- CMIN, CMIN/DF, RMSEA, GFI, AGFI, RMR, NFI, RFI, IFI, TLI and CFI, all indicate that the models serve as a good fit. The overall results of the models fit are as shown in Table 3 to 6 below.

Table 3 : Fit Indices for PRIDE (T): Perceived Risk and Borrowing Incurring Joint Liability

Model	CMIN	RMR	GFI	AGFI	NFI	RFI	IFI	TLI	CFI	RMSEA
Modified Model	13.335 DF 8, P = 0.101 χ^2/df = 1.667	0.049	0.990	0.941	0.995	0.976	0.998	0.990	0.998	0.049 PCLOSE = 0. 460

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Table 4 : Fit Indices for FINCA (T): Perceived Risk and Borrowing Incurring Joint Liability

Model	CMIN	RMR	GFI	AGFI	NFI	RFI	IFI	TLI	CFI	RMSEA
Modified Model	8.460 DF 8, P = 0.390 χ^2/df = 1.058	0.059	0.991	0.948	0.995	0.979	1.000	0.999	1.000	0.017 PCLOSE = 0.704

Table 5 : Fit Indices for PRIDE (T): Perceived Risk and Borrowing Incurring an Individual Liability

Model	CMIN	RMR	GFI	AGFI	NFI	RFI	IFI	TLI	CFI	RMSEA
Modified Model	13.601 DF 9, P = 0.137 χ^2/df = 1.511	0.053	0.989	0.947	0.994	0.976	0.998	0.992	0.998	0.043 PCLOSE = 0.551

Table 6 : Fit Indices for FINCA (T): The Influence of Perceived Risk on the Decision to Borrow by Incurring an Individual Liability

Model	CMIN	RMR	GFI	AGFI	NFI	RFI	IFI	TLI	CFI	RMSEA
Modified Model	9.864 DF 8, P = 0.275 χ^2/df = 1.233	0.057	0.989	0.939	0.994	0.974	0.999	0.995	0.999	0.034 PCLOSE = 0.596

c) Final Analysis

The summaries of the results of testing hypothesis for PRIDE (T) and FINCA (T) with the decision to borrow incurring joint liability are presented in Tables 7 and 8. This study has found out that the path coefficients for perceived risk were negative and significant ($p \leq 0.05$), stronger in magnitude with $\beta = -1.09$ for PRIDE (T) and $\beta = -0.71$ for FINCA (T). These findings support the hypothesis that perceived risk in joint liability influenced negatively borrowing as a group. These findings imply that high perceived risk associated with borrowing incurring joint liability, drives borrowers negatively to prefer borrowing incurring joint liability. Likewise, the results reveal significance path coefficients for perceived risk and their measured variables ($p \leq 0.05$) for both PRIDE (T) and FINCA (T), supporting the hypothesis that they influence negatively borrowing incurring joint liability. However, the path coefficients between perceived risk and time risk were not significant ($p > 0.05$) for both PRIDE (T) and FINCA (T) implying that time risk is not a problem to the borrowing incurring joint liability.

According to Pavlou (2003) perceived risk drives an individual negatively in their adoption intention. These findings are in contrast to a major assumption in theoretical work that emphasize on aggregate welfare gains in microfinance, that potential borrowers are risk neutral and optimize over their expected income regardless of contractual risk associated with joint liability (Ghatak and Guinnane, 1999). The findings of this study suggest that the perceived risk associated with borrowing incurring joint liability matter to the microfinance institutions borrowers.

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Table 7 : Results of Testing Hypothesis (Joint Liability) for Pride (T)

	Standardized Regression Weight	Standard Error (S.E)	Critical Ratio (C.R)	P
Perceived Risk <--- Perceived Ease of Use	-0.079	0.018	4.389	***
Perceived Risk <--- Overall Risk	-0.217	0.017	12.765	***
Perceived Risk <--- Financial Risk	-0.169	0.020	8.450	***
Perceived Risk <--- Psychological Risk	-0.118	0.016	7.375	***
Perceived Risk <--- Performance Risk	-0.167	0.055	3.036	***
Perceived Risk <--- Time Risk	0.052	0.032	1.625	0.104
Perceived Risk <--- Privacy Risk	-0.148	0.033	4.510	***
Perceived Usefulness <--- Perceived Ease of Use	-0.062	0.026	2.407	0.016
Perceived Usefulness <--- Perceived Risk	-0.351	0.058	6.052	***
Standardized Indirect Effect with Joint Liability: Perceived Risk = -1.09*** Perceived usefulness = -0.31*** Perceived Ease of Use = -0.64*** Financial Risk = -0.46** Overall Risk = -0.71*** Psychological Risk = -0.24** Privacy Risk = -0.06*** Time Risk = 0.03 Performance Risk = -0.48*** R^2 = 0.71 F Value = 172.459***				

*Note: ** p<0.05, ***p=0.000*

Table 8 : Results of Testing Hypothesis (Joint Liability) for FINCA (T)

	Standardized Regression Weight	Standard Error (S.E)	Critical Ratio (C.R)	P
Perceived Risk <--- Perceived Ease of Use	-0.061	0.024	2.542	0.012
Perceived Risk <--- Overall Risk	-0.256	0.025	10.240	***
Perceived Risk <--- Financial Risk	-0.162	0.026	6.231	***
Perceived Risk <--- Psychological Risk	-0.292	0.024	12.167	***
Perceived Risk <--- Performance Risk	-1.739	0.032	54.344	***
Perceived Risk <--- Time Risk	-0.086	0.045	1.911	0.074
Perceived Risk <--- Privacy Risk	-0.086	0.027	3.185	0.002
Perceived Usefulness <--- Perceived Ease of Use of Joint liability	-0.151	0.035	4.314	***
Perceived Usefulness <--- Perceived Risk	-0.184	0.066	2.788	0.005
Standardized Indirect Effect with Joint Liability: Perceived Risk = -0.71***				

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Perceived usefulness = -0.80**
Perceived Ease of Use = -0.66***
Financial Risk = -0.35**
Overall Risk = -0.80***
Psychological Risk = -0.64***
Privacy Risk = -0.05***
Time Risk = 0.07
Performance Risk = -0.45***
$R^2 = 0.78$
F Value = 179.228***

*Note: ** p<0.05, ***p=0.000*

With respect to the perceived ease of use as a moderator of a perceived risk and borrowing incurring joint liability, the findings reveal that the path coefficients were significant ($p \leq 0.05$) with $\beta = -0.64$ for PRIDE (T) and $\beta = -0.66$ for FINCA (T). The findings support the hypothesis that perceived risk moderated by perceived ease of use influence negatively borrowing as a group. These findings imply that high perceive risk associated with borrowing incurring joint liability, cause the potential users to perceive joint liability lending model as not easy to use, which influences negatively the decision to borrow incurring joint liability. These findings are in line with the theory of TAM (Davis *et al.,* 1989). They found out that high perceived risk causes the potential users to devalue perceived ease of use, which affects negatively the adoption intention as in this case the joint liability lending model.

With respect to the perceived usefulness and borrowing incurring joint liability, the path coefficients for perceived usefulness were negative and significant ($p \leq 0.05$), with $\beta = -0.31$ for PRIDE (T) and $\beta = -0.80$ for FINCA (T). These findings support the hypothesis that perceived risk of joint liability moderated by perceived usefulness influenced negatively the decision to borrow incurring joint liability. These findings imply that high perceived risk associated with borrowing incurring joint liability, caused borrowers to perceive the loans obtained incurring joint liability as not useful in helping them, to expand their business and meet other consumption needs.

With respect to the financial risk as a facet of perceived risk and its influence in borrowing incurring joint liability, the path were significant ($p \leq 0.05$) and negative with $\beta = -0.46$ from PRIDE (T) and $\beta = -0.35$ from FINCA (T). These findings imply that risk of paying for the defaulters increase the financial risk associated with borrowing incurring joint liability.

With respect to psychological risk as a facet of perceived risk and its influence in borrowing incurring joint liability, the path were significant ($p \leq 0.05$) and negative with $\beta = -0.24$ for PRIDE (T) and $\beta = -0.64$ for FINCA (T). Psychological risk in this study encompasses a mental stress to the joint borrowers because of partners" failure to repay the loans and a mental stress, caused by losing future access to credit in case group members fail to repay the defaulted loans of other group members. These findings suggest that the high risk of non-payers in joint liability, associated with not able to access future loans in case the group members failed to pay the defaulted loans, psychologically influences negatively borrowing incurring joint liability.

With respect to performance risk as facet of perceived risk and its influence in borrowing incurring joint liability, the path coefficients were significant ($p \leq 0.05$) with a $\beta = -0.48$ for PRIDE (T) and $\beta = -0.45$ for FINCA (T). According to Barboni *et al.* (2013), joint liability lending model has diminished its popularity because, some joint borrowers" free ride on their partners to bear their costs in case they fail to repay their loans. These findings imply that because of the high risk associated with borrowing incurring joint liability, especially the risk of partners" failure to repay the loans, borrowers perceive that joint liability lending model may not perform well in future.

With respect to privacy risk as facet of perceived risk and its influence in borrowing incurring joint liability, the path coefficients were found to be negative and significant ($p \leq 0.05$) but weaker in magnitude with $\beta = -0.06$ for PRIDE (T) and $\beta = -0.05$ for FINCA (T). These findings indicate that privacy risk had a little influence on the decision to borrow incurring joint liability. The weak magnitude for privacy risk suggests that privacy risk to the joint liability borrowers was not a big issue. These findings are inconsistent with the study conducted by Harper (2007) who reveals that joint borrowers may suffer from reduced privacy. Thus, it is possible to say that different cultures perceive risk associated with borrowing incurring joint liability differently.

With respect to time risk as facet of perceived risk and its influence in borrowing incurring joint liability, the path coefficients were found to have insignificant influence on borrowing incurring joint liability ($p > 0.05$) for both PRIDE (T) and FINCA (T). These findings imply that joint borrowers perceive that time spent on attending group meetings, pressuring group members

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to repay the loans and finding a partner is not a problem. These findings are inconsistent with other studies which found that borrowers incur some disutility such as time spent on attending group meetings, repayment pressure and finding a partner (Montgomery, 1996; Zeitinger, 1996; Armendáriz and Morduch, 2000).

With respect to the overall risk and borrowing incurring joint liability, the path coefficients were negative, stronger in magnitude and significant ($p \leq 0.05$) with $\beta = -0.71$ for PRIDE (T) and $\beta = -0.80$ for FINCA (T). These findings indicate that in overall, the perceived risk of joint liability influenced negatively borrowing incurring joint liability.

With regards to the perceived risk associated with joint liability and the decision to borrow incurring individual liability, the summaries of the results of testing hypothesis for PRIDE (T) and FINCA (T) are presented in Tables 9 and 10. The path coefficients for perceived risk were positive, stronger in magnitude and significant ($p \leq 0.05$) with $\beta = 0.87$ for PRIDE (T) and $\beta = 1.05$ for FINCA (T). These findings support the hypothesis that perceived risk associated with joint liability influenced positively borrowing as an individual. Likewise, the results reveal significance path coefficients for perceived risk of joint liability and their measured variables ($p \leq 0.05$) for both PRIDE (T) and FINCA (T), supporting the hypothesis that they influence positively borrowing incurring individual liability. However, the path coefficients between perceived risk and time risk were also not significant ($p > 0.05$) for both PRIDE (T) and FINCA (T).

Table 9 : Results of Testing Hypothesis (Individual Liability) for PRIDE (T)

	Standardized Regression Weight	**Standard Error (S.E)**	**Critical Ratio (C.R)**	**P**
Perceived Risk <--- Perceived Ease of Use	0.148	0.036	-4.111	***
Perceived Risk <--- Overall Risk	0.206	0.044	-4.682	***
Perceived Risk <--- Financial Risk	0.178	0.045	-3.956	***
Perceived Risk <--- Psychological Risk	0.224	0.059	-3.797	***
Perceived Risk <--- Performance Risk	0.166	0.053	-3.132	***
Perceived Risk <--- Time Risk	0.034	0.045	0.756	0.453
Perceived Risk <--- Privacy Risk	0.208	0.028	7.429	***
Perceived Usefulness <--- Perceived Ease of Use	0.214	0.045	-4.756	0.012
Perceived Usefulness <--- Perceived Risk	0.401	0.105	-3.820	***
Standardized Indirect Effect with Individual Liability: Perceived Risk = 0.87*** Perceived usefulness = 0.25*** Perceived Ease of Use = 0.34*** Financial Risk = 0.35*** Overall Risk = 0.37*** Psychological Risk = 0.17** Privacy Risk = 0.12*** Time Risk = 0.06 Performance Risk = 0.39*** $R^2 = 0.71$ F Value = 172.459***				

*Note: ** p<0.05, ***p=0.000*

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Table 10 : Results of Testing Hypothesis (Individual Liability) for FINCA (T)

	Standardized Regression Weight	Standard Error (S.E)	Critical Ratio (C.R)	P
Perceived Risk <--- Perceived Ease of Use	0.071	0.024	-2.958	0.03
Perceived Risk <--- Overall Risk	0.236	0.025	-9.437	***
Perceived Risk <--- Financial Risk	0.074	0.027	-2.741	0.007
Perceived Risk <--- Psychological Risk	0.198	0.024	-8.252	***
Perceived Risk <--- Performance Risk	0.153	0.042	-3.643	***
Perceived Risk <--- Time Risk	0.044	0.028	1.571	0.142
Perceived Risk <--- Privacy Risk	0.074	0.013	5.692	***
Perceived Usefulness <--- Perceived Ease of Use	0.151	0.035	-4.314	***
Perceived Usefulness <--- Perceived Risk	0.184	0.076	-2.421	0.016
Standardized Indirect Effect with Individual Liability: Perceived Risk = 1.05*** Perceived usefulness = 0.27** Perceived Ease of Use = 0.21*** Financial Risk = 0.22** Overall Risk = 0.46*** Psychological Risk = 0.37** Privacy Risk = 0.06** Time Risk = 0.08 Performance Risk = 0.37*** $R^2 = 0.70$ F Value = 179.228***				

*Note: ** p<0.05, ***p=0.000*

Similarly, the path coefficients for the perceived ease of use and the decision to borrow incurring an individual liability were positive and significant ($p \leq 0.05$) with $\beta = 0.34$ for PRIDE (T) and $\beta = 0.21$ for FINCA (T). These findings suggest that the high perceive risk associated with borrowing incurring joint liability, cause joint borrowers to prefer borrowing incurring an individual liability.

Likewise, the path coefficients for perceived usefulness and the decision to borrow incurring an individual liability were found to be positive and significant ($p \leq 0.05$) with $\beta = 0.25$ for PRIDE (T) and $\beta = 0.27$ for FINCA (T). These findings suggest that borrowers perceive the loans obtained incurring an individual liability, as useful in helping them to expand their businesses and meet other consumption needs.

The findings also reveal that the path coefficients for financial risk and the decision to borrow incurring an individual liability were positive and significant ($p \leq 0.05$) with $\beta = 0.35$ for PRIDE (T) and $\beta = 0.22$ for FINCA (T). These findings imply that the risk of paying for the defaulters drives joint borrowers to prefer borrowing incurring an individual liability.

In addition, the path coefficients for the psychological risk and the decision to borrow incurring an individual liability were positive and significant ($p \leq 0.05$) with $\beta = 0.17$ for PRIDE (T) and $\beta = 0.37$ for FINCA (T). These findings suggest that the high risk of non-payers in joint liability, associated with not able to access future loans in case the group members failed to pay the defaulted loans, psychologically influences positively preference for an individual liability.

With respect to performance risk and the decision to borrow incurring an individual liability, the path coefficients were positive and significant ($p \leq 0.05$) with $\beta = 0.39$ for PRIDE (T) and $\beta = 0.37$ for FINCA (T). These findings suggest that because of the high risk especially the risk of partners" failure to repay the loans

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influences positively preference for borrowing incurring an individual liability.

With regards to privacy risk and the decision to borrow incurring an individual liability, the path coefficients were positive and significant ($p \leq 0.05$) but weaker in magnitude with $\beta = 0.12$ for PRIDE (T) and $\beta = 0.06$ for FINCA (T). These findings imply that privacy risk had a little influence in borrowing decision between incurring joint vs. an individual liability.

With respect to overall risk and the decision to borrow incurring an individual liability, the path coefficients were positive and significant ($p \leq 0.05$) with $\beta = 0.37$ for PRIDE (T) and $\beta = 0.46$ for FINCA (T). These findings imply that when all measures of perceived risk were evaluated together, the microfinance institutions borrowers perceive borrowing incurring joint liability as very risky and prefer borrowing incurring an individual liability.

V. Conclusion and Recommendations

Based on the findings of this study it is concluded that the high perceived risk associated with borrowing incurring joint liability, especially the risk of non-payers causes the joint liability borrowers to devalue perceived usefulness and the ease of use of the joint liability lending model. As a consequence, borrowers perceive borrowing incurring joint liability as not useful in helping them to expand their businesses. This paper bridges the gap between theory and empirical studies particularly, by integrating TAM and borrowing decisions incurring joint versus an individual liability. The findings of this study provides evidence, on the appropriateness of measuring the adoption of microfinance institutions lending model using TAM. The findings of this study suggest emphasis should be put on developing risk reduction strategies and improving the microfinance institutions lending models in order to encourage the majority of low income people to borrow from microfinance institutions, thereby improving the chances for the achievement of the goal of poverty alleviation.

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(b) A brief Summary, "Abstract" (less than 150 words) containing the major results and conclusions.

(c) Up to ten keywords, that precisely identifies the paper's subject, purpose, and focus.

(d) An Introduction, giving necessary background excluding subheadings; objectives must be clearly declared.

(e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition; sources of information must be given and numerical methods must be specified by reference, unless non-standard.

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(g) Discussion should cover the implications and consequences, not just recapitulating the results; conclusions should be summarizing.

(h) Brief Acknowledgements.

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References

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Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
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Approach

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- If you desire, you may place your figures and tables properly within the text of your results part.

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- In spite of position, each table must be titled, numbered one after the other and complete with heading
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References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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