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TABLE OF CONTENTS

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Entrepreneurship and poverty reduction in Cameroon A Vector Autoregressive approach

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ABSTRACT

This paper investigates the effect of entrepreneurship on poverty alleviation in Cameroon and determines the nature of the causality that exists between them using the vector autoregressive approach. The study uses data from the Cameroon National Institute of statistics and World Bank Development Indicators for the period 1980-2013. The results show that entrepreneurship has a significant negative impact on poverty in Cameroon and that there exists a significant bi-directional positive causality between entrepreneurship and poverty reduction. From a policy perspective, the study concludes that training and retraining of entrepreneurs as well as organizing entrepreneurship skills acquisition programmes are vital to boost entrepreneurship in order to reduce poverty in the country.

JEL Classification: E23, F2, F21, F43
Keywords: Entrepreneurship, Poverty reduction, Vector Autoregressive Approach

BACKGROUND AND INTRODUCTION

The Central problem of poverty is the unavailability of work [Vandenberg (2006)]. Work enables individuals to produce for themselves (i.e. food) and earned money which they could use it for exchange. It is also from work that wealth is created which, through taxation, allows governments to fund pro-poor services such as health care, clean water and education. Work is central to poverty reduction but 'working out of poverty' provides only general guidance on how to achieve that ultimate goal (Vandenberg, 2006)

There is an emerging consensus on poverty reduction and small enterprises that is comprised of two central elements. The first is that much of the population in poor countries operates or works for micro and small enterprises (MSE) and that even in richer countries, a substantial portion of the population is employed in small and medium enterprises (SMEs). In poor countries, MSEs are where the poor are working – either out of choice or out of necessity. The second element of the consensus is that the general functional areas of how to support private sector development in general and Small Enterprise Development (SED) in particular, are being established. These have been set out in a recent report of the UNDP's Commission on the Private Sector and Development, Unleashing Entrepreneurship, and in a number of similar documents (OECD, 2004).

The issue of poverty has been an age-old problem with humanity. The striking significant difference it poses in each generation is the group of people it affects and the intensity with which it affects them (Ofori, 2003). As pointed out by Angaye (2005), poverty is engulfing more and more of the world's human population. According to him, the number of the poor in the world stood at about 1 billion in 1994, 1.3 billion in 1995, 1.74 billion in 1999, 2.04 billion in 2000, 2.56 billion in 2002, and has continued to increase despite all developmental efforts put in place by both the government and non-governmental organizations (NGOs) to eradicate poverty. Olu (2003) observes that while the numbers of poor in the advanced countries of the world has reduced considerably over the years, the reverse is the case with the developing countries. Based on World Bank (2008b), nearly more than 1.4 billion people live in conditions of poverty in developing countries, with the most complex case being Sub Saharan Africa, where poverty reduction since 1990 has lagged far behind the other regions (Chen and Ravallion, 2008; World Bank, 2008a).

Poverty is reflected in developing countries in various forms including low nutritional status, low level of education, decline in spending on social services by the government, high percentage of household income spent on food, high infant mortality rate, low level of savings, low level of investment, low absorption capacity, poor stage of quality and quantity of infrastructural development and low level of productivity.

In Cameroon right from the colonial era, the economic performance of the economy was encouraging because of increase foreign revenue from the exportation of petroleum and other agricultural products whereas in the later parts of 1975, 1980, and the early 2000s the economy was not performing well and the incidence of poverty was exacerbated. In this connection, World Bank Development Indicators in 2013 shows that based on head count index, 24.88% of Cameroonians lived below the poverty line in 1996, 10.77% in 2001 and 9.56% in 2007. If this trend has to continue, it means that about 75 percent of Cameroonians by 2020 will fall below the poverty line. This is contrary to the case of other African countries like in Somalia where approximately, 43% of Somalia's population lives below the poverty line (Sarah Robinson, 2011). Entrepreneurship is one the measures embraced by the government of many African countries to reduce mass poverty and unemployment in their countries. The government of Cameroon has however embarked on a number of measures like the on-going Poverty alleviation programme which was accompanied by the National Good Governance Program (NGP) launched in 2000 to alleviate poverty.

Several studies on entrepreneurship (Slivinski ,2012; Yanya ,2012; Abdala, ,1997; Amar, 2003; Shaeikh Ali and Hafiez Ali ,2013; and Gielnik and Frese ,2013) concentrate on the contribution of entrepreneurship to sustainable economic development, job creation, innovation and resource allocation, neglecting the effect of entrepreneurship on poverty alleviation, especially in Cameroon. While some of the above studies have adopted a descriptive approach to the study of entrepreneurship some have employed quantitative approach of single equation. Therefore our expected outcome is unique because we are going to employ the Vector Autoregressive technique. In situations where such studies have been carried out in other developing countries they used techniques like OLS, Pair wise correlation and panel data of which Cameroon was not included. With this, the dynamics expected from entrepreneurship and poverty reduction have not actually been examined in Cameroon. Also, most of the government's efforts to reduce poverty in the country have quite often not been tailored towards promoting entrepreneurship for the unemployed people in the society. These problems therefore prompt the need for a current study.

It is on the basis of this that this study is designed to investigate the effect of entrepreneurship on poverty alleviation in Cameroon and to determine the nature of the causality that exists between them. The rest of the paper is structured as follows: Section two situates the paper in its proper perspective by reviewing both theoretical and empirical literature on entrepreneurship, poverty alleviation and growth. Section three discusses the method of analysis. Empirical evidence of the impact of entrepreneurship on poverty reduction in Cameroon amongst other variables is reported in section four. Section five then concludes the paper with some policy issues.

LITERATURE REVIEW

Empirical literature on entrepreneurship and poverty reduction

The literature provides several definitions of entrepreneurship. However, the similarity between them is that entrepreneurship derives from human ingenuity. Hill and McGowan (1999), entrepreneurship is seen as a process which involves the effort of an individual (or individuals) in identifying viable business opportunities in an environment and obtaining and managing the resources needed to exploit those opportunities. Aina and Salako (2008) described entrepreneurship as the willingness and ability of an individual to seek out investment opportunities and takes advantage of scarce resources to exploit the opportunities profitably. All in all, entrepreneurship is the process of creating something new with value by devoting the necessary time and efforts, assuming the accompanying financial social risks at the end receiving resulting reward.

The concept of poverty is broad and relative because everybody addresses poverty from his or her perspective. For this reason, attempts at poverty alleviation and eradication have been misplaced right from the conception stage as a result of the lack of a precise definition. For this reason Nweze and Ojowu (2002) categorized poverty into three namely: absolute poverty, relative poverty and subjective poverty. While absolute poverty is a situation where an individual or household is faced with limited financial resources and as a result, unable to meet his/her or its basic necessities of life such as food, clothes, shelter and health is the nucleus of our study, whereas relative poverty is a situation where an individual's or a household's income is less than the average income of the population in the society being considered. The implication is that the individual or household has goods and services which are lower than those of other persons or households in the society (Garuba, 2010). In this work we will consider poverty as a state where an individual is not able to cater adequately for his/her basic needs for food, clothing and shelter; is unable to meet social and economic obligations, lacks gainful employment; and has limited access to social and economic infrastructure such as education, health, portable water and sanitation. In sum, poverty will be captured by public expenditure on health and education.

Khandker (2006) in a study of microfinance institutions shows that, indirectly, entrepreneurship is the key to poverty reduction not just for the beneficiaries, but also through positive externalities to the rest of the society. The works of Coleman (2006) and Hulme (1999), shows that the ability of microcredit facilities to eradicate poverty is dependent upon the socioeconomic environment of the household in context. This implies that the application of finance to entrepreneurial activities is a more permanent and reliable way of eradicating poverty in an economy.

Ogundele observes that entrepreneurship can significantly contribute to reducing poverty if youth empowerment through the provision of social welfare services is promoted at all levels in the community. Equally, Ohize and Muhammed (2009) hold that Non-governmental Organisations can play a similar role in poverty alleviation. For example, these organizations

enable the youths to acquire skills and to benefit from counseling services to improve their living conditions. Akpama et al (2011) also hold the position that when young adults acquire vocational skills, they are more likely to be employed and consequently to escape from poverty. In this connection, Abdullah (2012) actually observes that a high proportion of youths actually reported a high level of acquisition of vocational skills.

From the above empirical literature, it can be observed that there is a wide disparity in terms of the definition and measurement of poverty and entrepreneurship which accounts for their complex findings. Furthermore, in order to provide solutions in eradicating poverty in Cameroon and developing countries as whole most studies concentrated on micro aspects whereas this study is going to closed the gap to this poverty issue by looking at it from a different angle. That is the macro level.

Theoretical Literature

As concerns the theoretical literature we are going to look at the Classical theory of entrepreneurship, the Schultz Approach to entrepreneurship, Schumpeter's theory of economic development through entrepreneurship, power theory of poverty and the personal income distribution theory of poverty.

The classical theory of entrepreneurship holds that the entrepreneur is pivotal in the exchange and circulation of goods/income in the economy. Kirzner (1973) observes that to the classicals, entrepreneurs bring to equilibrium demand and supply through pure arbitrage. They are motivated by profit to take risk to buy at certain prices and to sell at uncertain prices. In the distribution sector, income obtained from the sale of products is distributed to the other inputs of production -labour, capital and land thereby reducing poverty in the country. In the classical framework, entrepreneurs are considered as agents of economic development through the introduction and implementation of innovations. These innovations usually relate to the nature of products produced, the production technique, and marketing of the products and organization of work in the firm. The effective introduction and implementation of these innovations culminate in the satisfaction of new consumer wants and the establishment of new businesses which increase the employment of material and human resources and finally reduce poverty. Really, the newly created firms stimulate growth through the supply of jobs to the working population. In this way, entrepreneurs are credited for their contribution of the growth of the economy as they stimulate both the product market and the labour market. From the foregoing in the classical economy, the entrepreneur in the face of uncertainty has the responsibility to direct and control as well as to exercise judgment effectively as a decision maker.

Schultz Approach (Schultz, 1975) to entrepreneurship is closely link to situations of disequilibria and that entrepreneurship is the ability to deal with these situations of disequilibrium. In disequilibrium, agents are acting sub-optimally and can reallocate their resources to achieve a higher level of satisfaction. Entrepreneurship is the ability to coordinate this reallocation efficiently, and it follows that agents have different degrees of entrepreneurial ability. Schultz argues that, in disequilibrium, individuals know that opportunities to increase satisfaction exist but the reallocating process requires time. A better allocation of resources can be achieved either by experimenting (trial and error) or by investing in human capital. Schultz (1975) further argues that entrepreneurship exists in all aspects of life and as a result of this; housewives and students are entrepreneurs when reallocating their time for housework or student activities. Furthermore, since entrepreneurship is an ability that can be augmented by investment, Schultz argues that a market for entrepreneurship exists and that it

is possible to analyze entrepreneurship within the conventional supply and demand framework

Schumpeter (1949) considers entrepreneurship as innovation and not imitation. Since Schumpeter see entrepreneurship as an innovator he does not care much about economic profits but only joy he obtains from being an innovator and being a server to his society. For this reason, we say that Schumpeter's entrepreneur is an innovator in the entrepreneurship arena. In the Schumpeterian theory, the entrepreneur moves the economy out of the static equilibrium. Marz (1991), states that "Schumpeter hardly denied that the process of accumulation is the ladder to social power and social prestige; but he thought the very mainspring of the exercise of the entrepreneurial function is the powerful will to assert economic leadership. The joy of carrying through innovations is the primary motive, the acquisition of social power a subsidiary to it. The entrepreneur is not (necessarily) the one who invents new combinations but the one who identifies how these new combinations can be applied in production. This line of reasoning implies that a business owner is considered an entrepreneur only if he is carrying out new combinations. "Hence Schumpeter argues that it is the entrepreneur that moves the economic out from the static equilibrium by creating new products or production methods thereby rendering others obsolete. This refers to the process of "creative destruction"(creating uncertainty) which Schumpeter saw as the driving force behind economic development (Schumpeter, 1949)

Elsewhere, Folbre. (1982) shows that the power theory explains better the poverty situation in Less Developed Countries (LDC) since it places poverty within the structure of political power in the society. This theory holds that poverty is obvious in an economy where a few have the political power to allocate productive resources to benefit them most. To this Marxian theory, the ruling class uses the state machinery to monopolise wealth acquisition and decision making while a majority of the population continues to live in poverty. This means that poverty reduction would be a far-fetched goal except the majority of the population resists this exploitation through a revolution. Forgha (2006) shows that this has been the case in the Nigerian civil war (1967-1970), Burundian political revolution of 1991, Malian revolution of 1992 and Cameroon ghost town operation of 1992. In the case of Cameroon, only two heads of states have ruled the country from independence in 1960 till date. Even the creation of more than 100 opposition political parties to counter the exploitative forces of the ruling government has not yielded significant results. This shows that the power theory has failed to contribute to reducing poverty in Cameroon.

Also, the theory of personal income distribution and poverty alleviation alternatively known as the marginal productivity theory of poverty alleviation provides a microeconomic foundation of income inequality. It lays the bases to determine the mechanisms through which macroeconomic variables influence changes in poverty rates. This theory focuses its attention in the labour market and the determinants of labour incomes based on the demand and supply of labour under competitive market conditions. In a more specific case, this theory sees productivity as the driving engine for poverty reduction in any economy. It explains that firms will hire workers up to the point where the value of the marginal product equals real wage rate.

$$\text{That is } MPN = W/P \qquad (1.1)$$

Where, W= nominal wage rate, MPN = marginal product of labour, W/P= real wage rate and P = price. This theory also affirms that since majority of the households rely on labour market earning for most of their incomes, a rise in unemployment may result in a large decline in income particularly with those whose incomes are low to start with. Hence, the theory predicts

a positive relationship between unemployment and poverty. However, this relationship maybe mitigated by government transfer payments, which reduces the role of earned income. With respect to inflation, the theory is not clear but it is a well-known fact that during periods of inflation, fixed income earners suffer. Thus, we find that households are driven into poverty when inflation rises. Hence, this phenomenon consists of the positive relationship predicted between unemployment and poverty rate. The theory suggests that policies to eradicate poverty should reduce inflation, reduce income inequality and reduce or deal with the problems of unemployment.

METHODOLOGY

This study covered a period of 34 years (1980 to 2013) because it is within this period that data for the study are available and also because this period has witnessed a lot of policies implemented to reduce poverty in the country in the face of the increase in hardship caused by the economic crisis. This paper used secondary data from the national institute of statistics and was complemented by data from World Bank Development indicators to capture the existing cause-effect relationship between the variables; hence a casual research design is adopted for the study. In order to investigate the impact of entrepreneurship on poverty reduction we used the following model and the variables selected in the model are guided by theories and empirical literature. Ogundele, Akingbade and Akinlabi, (2012) observed that acquisition of vocational skills and entrepreneurship training lead to a significant reduction of poverty. This is also in line with the classical theory of entrepreneurship. Again the marginal efficiency theory of poverty explains the fact that macroeconomic variables like foreign aid reduce poverty in the country when invested in the real sector of the economy (like education, health and transport). This is the same situation with per capita income where an increase in the average income of the individuals makes it possible for them to obtain basic necessity of life. Therefore our equation is given as;

$$POV = f(ENT, FA, PCI).$$

Where; POV is poverty (life expectancy at birth, infant mortality and primary school enrolment), ENT is entrepreneurship (value added in the primary, secondary and tertiary sectors), FA is net official development assistance received per capita and PCI is per capita income.

This implies that our model is specified as $POV = \lambda_0 + \lambda_1 ENT + \lambda_2 FA + \lambda_3 PCI + \varepsilon$
and the a prior $\lambda_0 \neq 0$ $\lambda_1 < 0$, $\lambda_2 < 0$, $\lambda_3 < 0$

The Vector Autoregressive (VAR) Model was used, which is an extension of the Granger Causality test and allows one to go beyond the bi-variate framework. This approach allowed us to perform a regression for a system of equations to examine the interrelationship that exist between economic variables using minimal assumption about the underlying structure of the economy. The VAR equation contains lagged values of all the variables in the system where all the variables are predetermined (no exogenous variables). The aim was to provide good statistical representation of the past interaction between the variables. This technique of estimation was introduced by Sim (1980) and is advantageous in that it avoids the imposition of potentially spurious a prior constraints that are employed in the specification of structural models and also there is no issue of simultaneity since only lagged values of the endogenous variables appear on the right hand side of the equation. The VAR approach is also unique in fitting the values of entrepreneurship and poverty in Cameroon since one can estimate the dynamic aspects between these variables without having specified a full structural model. The approach also has the advantage of being easy to understand, and easily extended to non-linear specifications model (Forgha amd Mbella, 2013). Since the VAR involves a series of equations,

we can assume that each equation contains K lagged values where we can estimate the equation using the Ordinary Least Squares approach. Based on the specification above the VAR could be presented thus:

$$POV_t = \beta + \sum_{j-1}^{K} \beta j\, POV_{t-1} \sum_{J-1}^{K} \beta J ENT_{t-1} + \sum_{J-1}^{K} \beta J\, FA_{t-1} + \sum_{J-1}^{K} \beta J\, PCI_{t-1} + \varepsilon_{1t}$$

$$ENT_t = \beta + \sum_{j-1}^{K} \beta j\, ENT_{t-1} \sum_{J-1}^{K} \beta J POV_{t-1} + \sum_{J-1}^{K} \beta J\, FA_{t-1} + \sum_{J-1}^{K} \beta J\, PCI_{t-1} + \varepsilon_{2t}$$

$$FA_t = \beta + \sum_{j-1}^{K} \beta j\, FA_{t-1} \sum_{J-1}^{K} \beta J POV_{t-1} + \sum_{J-1}^{K} \beta J\, ENT_{t-1} + \sum_{J-1}^{K} \beta J\, PCI_{t-1} + \varepsilon_{3t}$$

$$PCI_t = \beta + \sum_{j-1}^{K} \beta j\, PCI_{t-1} \sum_{J-1}^{K} \beta J POV_{t-1} + \sum_{J-1}^{K} \beta J\, ENT_{t-1} + \sum_{J-1}^{K} \beta J\, FA_{t-1} + \varepsilon_{4t}$$

From the above, the estimated Ɛ's are the stochastic error terms also called impulse or shock elements. This helps to provide a clear distinction between correlation and causality as the impulse responds function. We also logged the variables for direct estimation and interpretation of the coefficients as degree of responsiveness or elasticity. From the VAR models, the estimated εs are a vector of residuals. The residuals, εs, represent the unexplained movement of the variables reflecting the influence of exogenous shock. It also represents a composite of the various exogenous shocks affecting the endogenous variables in the model. However, the standard VAR used in this work is limited to two lagged as explained by the Lagged Distributive Model.

Before our estimation, we tested for stationarity of the variables using Augmented Dickey Fuller and the Phillip Peron test, the NG peron e.t.c to check level of stationarity of the included variables and to avoid spurious results. The granger causality test like the Jurgenson Co-integration test was conducted to enable the result show the level of causality between the variables used in the model given that the variables were stationary at the same level. The Akiake Information Criteria and the Schwarz Criteria were employed in determining the number of lags used. More so, because of the fact that serial correlation is a major problem when using the VAR technique, this study used the Braisch LM statistics and the Portmanteau tests, to test for the existence of serial correlation.

PRESENTATION OF RESULTS

The stationarity tests of the variables used in the model was conducted. This was done by examining the graphs of the variables to determine the nature of the trend and if such trend shows random walk with drift or without drift. The graphs indicate that the variables in the model show no particular trend over the period of study, as they are stochastic with drift. They are not presented here because of space since they are too many. This therefore implies that the variables are non-stationary at level, never the less, the Augmented Dickey Fuller (ADF) and the Phillip Perron (PP) tests denote that they achieve stationarity after their first difference. The Unit Circle test not presented here due to space connotes that the residuals of the various models are integrated of the order one 1(1). Hence, long run equilibrium relationships exist between our variables since they are co-integrated. The VAR results for our models are presented and discussed below.

Table 1: Vector Autoregressive Result for the Four Models

VARIABLES	LOG(POV)	LOG(ENT)	LOG(FA)	LOG(PCI)
LOG(POV(-1))	0.82798 (4.46641)*	0.040746 (0.74285)	-0.74393 (-1.2086)	-0.51554 (-0.6971)
LOG(POV(-2))	0.32578 (1.5062)	-0.03180 (-0.4969)	1.49262 (2.0784)**	-0.02544 (-0.2949)
LOG(ENT(-1))	-2.62143 (-3.3110)*	0.74349 (3.1737)*	-4.01144 (-1.5259)	0.09232 (0.2923)
LOG(ENT(-2))	0.40587 (0.5906)	0.00096 (0.0047)	-1.32707 (-0.5816)	0.44743 (1.6322)***
LOG(FA(-1))	-0.01737 (-0.2983)	0.00079 (0.0459)	0.34747 (1.7967)***	0.04042 (1.7397)***
LOG(FA(-2))	-0.05567 (-0.9190)	0.03006 (1.6882)***	-0.14768 (-0.7342)	0.02069 (0.8561)
LOG(PCI(-1))	0.91893 (1.7938)***	-0.00796 (-0.0646)	1.26319 (0.7426)	1.38434 (6.7743)*
LOG(PCI(-2))	-0.95017 (-2.0870)**	-0.0087 (-0.0646)	-0.74980 (-0.4960)	-0.49177 (-2.7077)**
Ajusted R^2	0.90098	0.64085	0.49512	0.98014
F-Statistics	26.1601	5.13020	2.8194	141.936
VAR residual Portmanteau coef	2 lagged	2 lagged	2 lagged	2 lagged
Constant term	9.51686 (3.5263)*	1.16873 (1.4635)	16.19717 (1.8075)***	-0.83717 (-0.7776)

Source: Computed by the authors from the date set. Note that the values in the parentheses are the t-statistics. Where * = significant at 1%; ** = significant at 5%; *** = significant at 10%.

The VAR estimates presented on Table 1 above denote that there exist several other shocks that disturb the poverty level in Cameroon. This includes unemployment, government revenue and taxes and broad money supply which aggregately influence poverty in Cameroon. Looking at the poverty equation, the one year lagged of poverty has a significant positive influence on current poverty level in Cameroon. Also, the poverty equation reveals that the one year lagged of entrepreneurship has a negative significant impact on current level of poverty in Cameroon. This is in line with our aprior expectation and it supports the works of Shaeikh Ali and Hafiez Ali (2013), Akpama et al (2011), and Khandker (2006). On the other hand, the two year lagged of entrepreneurship show an insignificant impact on the current level of poverty in Cameroon. More so, the one and two year lagged of per capita income shows a significant positive and negative impact on current poverty level in Cameroon.

The poverty model shows that more than 90 percent variation of the current poverty level is accounted for by the lagged and current values of the variables included in the model. The F-statistic justifies that the result is more than 99 percent reliable. A portmanteau coefficient of 2, implies that our result is free from serial correlation up to two lagged.

From table 1 we observe that entrepreneurship of the previous years affects current year entrepreneurship. While that of one year lagged is significant, that of two year lagged is insignificant. Precisely, the results predict that a percentage increase in last year ENT [ENT(-1)] or ENT for the year before last [ENT(-2)] increases current ENT by 0.7434% and 0.0009 % respectively. Furthermore, a percentage increase in the two year lagged of official development assistance [FA(-2)] results in 0.030 percent increase in current level of entrepreneurship. This denotes that lagged value for the year before last for FA helps to increase the current level of entrepreneurial activities in the country. Given that the adjusted R2 for entrepreneurship is 0.640, it implies that the variables included in the model jointly explained 64 percent variation of entrepreneurship in Cameroon. More so, the model is

validated by the F-ratio with coefficient 5.1302 meaning that the results are more than 99% reliable.

In terms of official development assistance (FA) model, the one year lagged value of FA shows that it significantly affects current FA positively. Specifically, a percentage increase in previous lagged value of FA will increase current FA by 0.3474 percent. The two year lagged of FA indicates a negative but insignificant effect on current FA. Also, the two year lagged of poverty connotes that it significantly and positively impacts on current FA at 5 percent over the period of study. The coefficient of multiple determinations is low indicating that the explanatory variables included in the FA model have approximately 50 percent ability to predict the behaviour of FA in Cameroon.

The VAR estimates for per capita income (PCI), shows that the one year and two year lagged values of PCI significantly affects current PCI in the country. While the one year lagged shows a positive and significant impact at 1 percent two tail test. The two year lagged indicates a significant negative impact at 5 percent two tail test on current PCI. More so, the two year lagged for entrepreneurship denotes that it positively impacts on current PCI. With a coefficient of 0.4474, it implies that a percentage increase in ENT(-2) will increase current PCI by 0.4474 percent. The previous year lagged for FA shows that it positively affects PCI significantly. The adjusted R2 indicates that about 98 percent variation of PCI is explained by the variables in the model. This is further validated by the F-ratio with a coefficient of 141.93 which shows that the result is more than 99 percent reliable. The Variance Inflation Factor (VIF) test for multicollinearity with a mean VIF value of 1.16, indicates that the results are free from multicollinearity between the variables. The Breusch-Pagan test for heteroskedasticity also indicates that the results are homoskedastic. These results are not presented here because of spaced.

Based on the VAR causality result not presented here because of space, a positive bi-directional causality between POV and ENT was observed. This implies that, in Cameroon the poverty level of an individual will force him or her to involve in entrepreneurial activities which increase entrepreneurship in the country. Likewise the case of entrepreneurship causing poverty in Cameroon is as a result of the fact that most of the entrepreneurs are classified as unproductive entrepreneurs, since in undertaking an investment project they create contracts to overcome institutional shortcomings (that is by bending the rules to favour of them), they also carryout lobbying to receive contracts in their favour even though they are not qualified. In the country it is common to see that lobbying also creates a bureaucratic body where rents are earned by selling licenses or granting unsubsidized loans. All these activities increase the level of entrepreneurship in the country but do not reduce the poverty level of the citizens in the country. This is in line with the study of Douhan and Henrekson (2008). The results also show that there exists a unidirectional relationship between ENT and PCI. This implies that entrepreneurship influences per capita income and not the other way round.

In Cameroon, administrative barriers serve as a major barrier to successful entrepreneurship coupled with increasing political involvement in entrepreneurial activities. This makes most would-be investors to either delay registering their businesses or not registering them at all. In light of the above, most of these entrepreneurs turn elsewhere to invest and the few that are left in the country are the unproductive entrepreneurs. This negatively impacts the smooth functioning of the economy. As a result of this, Potential employment opportunities are lost and consequently poverty is not significantly reduced.

SUMMARY, RECOMMENDATION AND CONCLUSION

This study attempted to capture the causality between entrepreneurship and poverty in Cameroon for period of 34 years (1980-2013). Using the value added in each sector as a measure of entrepreneurship as presented by the Cameroon National Institute of Statistics, the VAR results shows that entrepreneurship has a significant negative impact on poverty in Cameroon. The VAR causality test shows that there exists a significant bi-directional positive causality between entrepreneurship and poverty reduction. The implication of this is that the entrepreneurs in Cameroon are classified as unproductive entrepreneurs who create contracts to overcome institutional shortcomings. Emphasis should be made to encourage productive entrepreneurs who increase an economy's ability to adapt and to increase its innovativeness (Kirzner, 1992). These groups of entrepreneurs pursue business opportunities within the prevailing institution. For instance, in times of rapid change, driven for example by a high rate of technological progress or new supply of resources, adaptability becomes more important.

The possible solution to the bureaucratic processes is to bring all stakeholders involved in business registration under one umbrella (one stop shop already being implemented in Cameroon).This practice should be extended to all regions of the country. This would ensure that the registration of businesses is accomplished in a short period under one roof.

As entrepreneurship has been seen to alleviate poverty, since the result of the study shows that it increased the per capita income of the citizens; the government should embarked on training and retraining of entrepreneurs and making credit facility easily accessible to them to invest in innovations and technology that help expand businesses. More so, the government of Cameroon should organized entrepreneurship skills acquisitions programme since the skill acquisition programme can help alleviate poverty which is believed to be the major cause of most the social vices in the society. Such progammes should be concentrated on the youths who are the leaders of tomorrow and also to ensure that they can provide for themselves and family in future will help break the vicious cycle of poverty.

References

Akpama, S.I., Esang, O.U. Asor, L.J and Osang, W.O. (2011), Non-formal Education Programmes and Poverty Reduction among Young Adults in Southern District,

Cross River State, Nigeria. Journal of Education and Development Psychology Vol.1 No1.

Aina, B.S and Salako, H.A. (2008). Determinants of foreign direct investment in Nigeria: an empirical investigation. CBN Economic and Financial Review vol. 39, No. 1 March.

Amadi, O.B. and Abdullah, H. (2012), Perception of Capacity Building among Youths Involved in Vocational Skills Development. Journal of Social and Development Sciences Vol. 3 No. 6. 214-221.

Angaye, G.S 2005, "Poverty amid Plenty in Nigeria" Rivers Journal of the Social Sciences, Vol.No. 1 and 2, pp.13-46.

Bula H. O (2012) "Evolution and Theories of Entrepreneurship: A Critical Review on the Keyan Perspective", International Journal of Business and Commerce, Vol. 1 No. 11, pp 81-96.

Chen, S. and M. Ravallion (2008). 'The Developing World Is Poorer Than We Thought, but No Less Successful in the Fight Against Poverty'. Policy Research Working Paper 4703. Washington, DC: World Bank

Coleman, Brett E. (2006) "Microfinance in Northeast Thailand: Who Benefits and How Much?" World Development, 34(9): 1612-1638.

Douhan R. and Henrekson M (2008) "Productive and Destructive Entrepreneurship in a Political economy Framework", IFN Working Paper No. 761, Stockholm.

Folbre. N. (1982). Exploitation comes home: a critique of the Marxian theory of family labour, *Cambridge Journal of Economics*; Vol. 6, No. 4, pp. 317-329, Oxford University Press.

Forgah F.N and Mbella E.M. (2013)"Public Expenditure and Private Investment in Cameroon a Vector Autoregressive Approach", *Journal of Emerging Issues in Economic Finance and Banking (JEIEFB*), Vol, 2. No. 4.

Forgha N.G (2006) "Econometric Model of Poverty in Cameroon: A Sysrem Estimation Approach" International Review of Business Research Papers, Vol. 2 No. 2. Pp 30-46

Garuba, A. (2010) Adult education and Poverty Alleviation Programmes in Nigeria: A case for harmonization, Yola, Nigeria.

Gielnik M. And Frese M.(2013) Entrepreneurship and Poverty Reduction: Applying I-O Psychology to Microbusiness and Entrepreneurship in Developing Countries. New York.

Hill, J & McGowan, P (1999) A qualitative approach to developing small firm marketing planning competences, Qualitative Market Research: An international Journal, Vol.2, No.3.

Hulme, David (1999) "The Impact Assessment Methodologies for Microfinance: Theory, Experience and Better Practice," Finance and Development Research Programme Working Paper, No.1, IDPM, University of Manchester.

Khandker, Shahidur R. (2006) "Microfinance and Poverty – Evidence Using Panel Data from Bangladesh," Vol. 1, Policy Research Working Paper 2945, The World Bank.

Kirzner, Israel M. (1992), The Meaning of the Market Process – Essays in the Development of Modern Austrian Economics. Routledge: New York.

Kirzner, I.M. (1973), *Competition and Entrepreneurship*, University of Chicago Press, Chicago.

Nweze, N.J & Ojowu, O (2002) Poverty, well-being and wealth Generation in Benue State of Nigeria, Unpublished Material.

OECD (2004): Policy statement by the DAC (OECD) High Level Meeting on endorsement of the DAC guidelines on Poverty Reduction (Paris).

Ofori F (2003): Entrepreneurship as a Key to Poverty Eradication and how the Government of Ghana Treats Entrepreneur, Accra, Ghana. Pp 2.

Ogundele, O.J.K., Akingbade, W.A. and Akinlabi, H.B. (2012), Entrepreneurship Training and Education as Strategic Tools for Poverty Alleviation in Nigeria. America International Journal of Contemporary Research Vol. 2 No.1. 148-156

Ohize, E.J. and Muhammed, J.A. (2009), A Study of Youth Empowerment Scheme Of Niger State, Nigeria in Poverty Alleviation. AU J.T., Vol.13 No.1. 47-52

Schumpeter, Joseph. 1989. "Economic Theory and Entrepreneurial History." Reprinted from Change and the Entrepreneur. Cambridge: Harvard University Press, 1949. In Essays on Entrepreneurs, Innovations, Business Cycles, and the Evolution of Capitalism, edited by Richard Clemence. New Brunswick: Transaction Publishers.

Sims, C.A (1980) "Macroeconomics and Reality", Retrieved August 24, 2006 from JSTOR General Science Collection Database, Journal of Economic Perspective, Vol. 15(4), pp 101-115.

Shaeikh Ali and Hafiez Ali (2013) "Entrepreneurship Development and Poverty Reduction: Empirical Survey from Somalia" American International Journal of Social Science Vol, 3. No. 3.

Vandenberg P.(2006) Poverty Reduction Through Small Enterprises: Emerging Consensus, Unresolved Issues and ILO Activities. International Labour Office, Geneva, Switzerland, Pp 1.

World Bank (2008a). Global Monitoring Report 2008. Washington DC: The International Bank for Reconstruction and Development / The World Bank.

World Bank. (2008b). World Development indicators: Poverty data. Washington DC: The International Bank for Reconstruction and Development / The World Bank.

Yanya M. (2012), Causal Relationship between Entrepreneurship, Poverty and Income Inequality in Thailand," International Journal of Trade Economics and Finance, Vol. 3, No. 6.

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Sustainable Development and Water Resource Scarcity

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ABSTRACT

Herein, we focus on the critical relationship between climate change and sustainable development with a focus on the availability and usage of water resources, especially in China, India, and the United States. Scores of countries are over-pumping aquifers as they struggle to satisfy their growing water needs, including each of the top three grain producers—China, India, and the United States. These three, along with a number of other countries where water tables are falling, are home to more than half the world's people. After reviewing climate policy in each of these three countries, we review the depletion of water resources in each country. Finally, recommendations are made to slow the depletion of water aquifers in these countries.

INTRODUCTION

The defining issue of the twenty-first century may well be the control of water resources. While water supplies are dwindling because of groundwater depletion, waste, and pollution, demand is rising. Consumption of groundwater id increasing faster than it is naturally replenished and causing water tables to decline unremittingly (Rodell et al., 2009). Currently, 338 million people are sometimes subject to severe water shortages and by 2025 this number is projected to increase to about 3 billion (Rosegrant, 1997). In India, the water challenge is already grave and could get graver. By 2050, for instance, it is estimated that demand would go up to 1,180 million cubic metres, 1.65 times the current levels, a situation that would be made worse by fast dwindling fresh water resources (Vijayakumar, 2012).

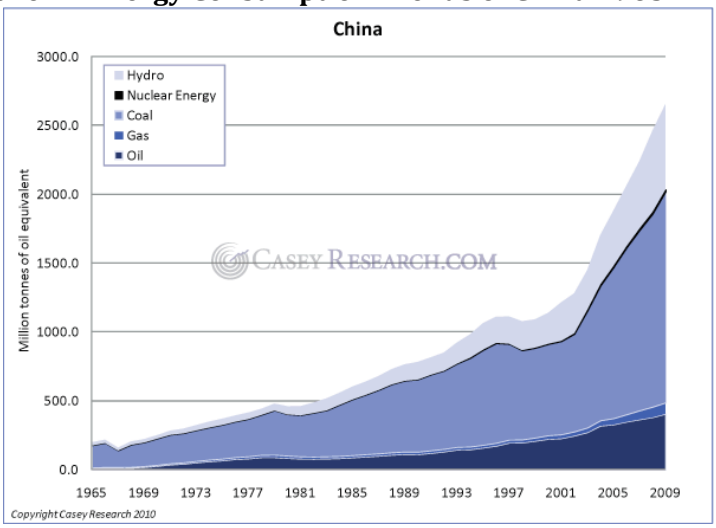
This paper focuses on the critical relationship between climate change and sustainable development with a focus on the availability and usage of water resources, especially in China, India, and the United States. Scores of countries are over-pumping aquifers as they struggle to satisfy their growing water needs, including each of the top three grain producers—China, India, and the United States. These three, along with a number of other countries where water tables are falling, are home to more than half the world's people (Brown et al., 2012). Energy availability may limit the ability of countries to continue their economic advancement, made critically evident in the 2011 Japan earthquake and tsunami. Nuclear energy was considered their means of achieving development goals by reducing their need to import oil and coal. This and other nuclear disasters, e.g. Chernobyl and Three Mile Island, have threatened the availability of clean water. Alternatives such as natural gas hydraulic fracturing, coal mining, and off-shore oil drilling also threaten water resources (Flynn, 2011). Recommendations will be made to achieve a sustainable world economy to prevent further climate change and to increase the efficiency of water usage.

A sustainable economy must limit withdrawals from, and produce investments in all forms of capital (human, social, and natural) to ensure that no form of capital is diminished in order to increase short-term output of marketable goods and service (Lant, 2004:22). "Sustainability of human activities (predominantly production and consumption) is a growing concern among

businesses, customers, governments, international bodies and non-governmental organizations. These concerns are often linked to energy efficiency, reduction of environmentally harmful emissions, ecosystem preservation and other conservation efforts. They are becoming a part of a "triple bottom line" for business accounting: financial, social and environmental" (Hermanowicz, 2005).

At the fifteenth United Nations Framework Convention on Climate Change (UNFCCC) in Copenhagen in December 2009, developed countries pledged to raise $100 billion dollars over the next decade to help the developing world respond to climate change. However, according to Boder (2010), very little money has been given to the developing world. Over 100 heads of state attended the conference. However, the meeting was less than successful because of the friction between rich and poor countries. For example, the wealthy countries insisted upon verifiable cuts in emissions from major developing countries like India and China (Boder, 2010). China relies on coal for approximately 75% of its energy needs, but it consumes twice as much energy as it generates according to the State Grid Corporation of China (see Figure #1).

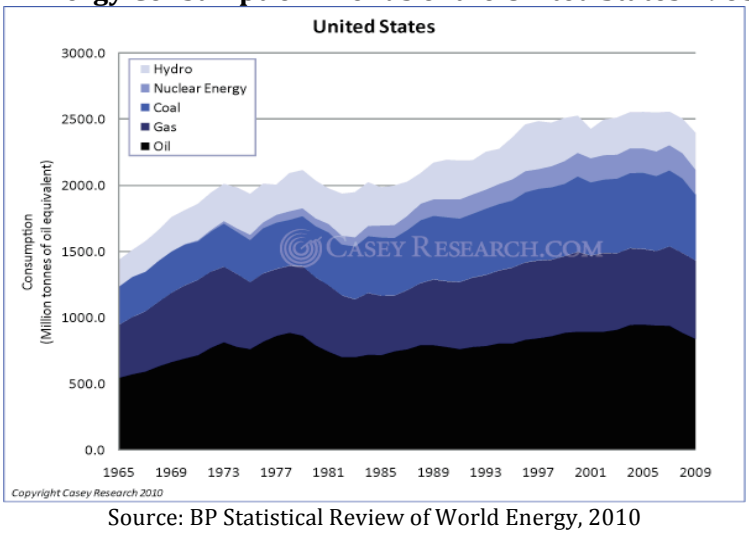
Figure #1 Energy Consumption Trends of China 1965 – 2009



Source: BP Statistical Review of World Energy, 2010

Back in 1999, it generated more than it consumed. The United States energy consumption relies mostly on oil (37%), gas (25%) and coal (21%) with nuclear power accounting for 9% and renewable energy representing 8% (see Figure #2) (Ball, 2011).

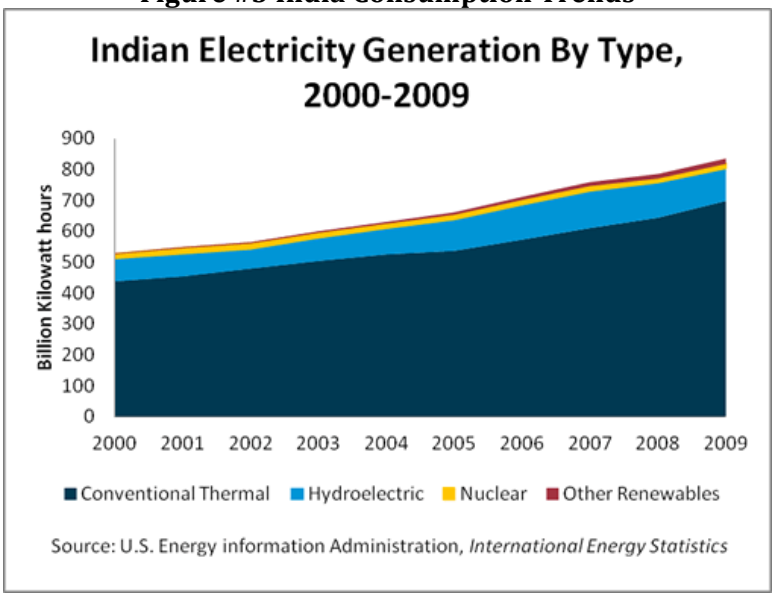
Figure #2 Energy Consumption Trends of the United States 1965 – 2009



Source: BP Statistical Review of World Energy, 2010

India relies on geothermal energy for the 80% of its energy, similar to the United States (see Figure #3).

Figure #3 India Consumption Trends



Source: Energy Information Administration, 2011.

Recently, according to a study by Chen et al. (2011:2014)" the movement of 2,000 animals and plants over the past decade away from the equator, from increasing heat, is three times faster than expected. In particular, the distributions of many terrestrial organisms are currently shifting in latitude or elevation in response to changing climate. Using a meta-analysis, we estimated that the distributions of species have recently shifted to higher elevations at a median rate of 11.0 meters per decade, and to higher latitudes at a median rate of 16.9 kilometers per decade. These rates are approximately two and three times faster than previously reported. The distances moved by species are greatest in studies showing the highest levels of warming, with average latitudinal shifts being generally sufficient to track temperature changes. However, individual species vary greatly in their rates of change, suggesting that the range shift of each species depends on multiple internal species traits and external drivers of change. Rapid average shifts derive from a wide diversity of responses by individual species." Another disturbing event associated with climate change is the severe decline in the numbers of migrating monarch butterflies. Last year there was an all-time low of approximately 60 million (Robbins, 2013). This year, estimates suggest that perhaps 35 million monarch butterflies have migrated to Mexico (Wines, 2014a:A16). Insects including honey bees stich together the web of life with essential services, breaking plants down into organic matter, dispersing seeds, and pollinating crops (Robbins, 2014).

CLIMATE CHANGE AND WATER RESOURCES

Water resources are critical for long-term sustainability of a country and region. It serves to critically provide daily personal and food needs of its people. According to the Ministry of Water Resources (MWR). China has two of the world's longest rivers, the Yangtze and the Yellow, with water reserves totaling 2.81 trillion cubic meters, making it the fifth richest in the world after Brazil, Russia, Canada and the United States. China supports 21% of the world's population with only 7% of the world's water. The country's per capita share of water is less than 2,200 cubic meters, only one-quarter of the global average (MWR). Also, the amount of water wasted in industrial production in China is quite high. In 2004, for every 10,000 yuan ($1,538 approximately) in value-added industrial output, China used 196 cubic meters of water, while that figure in advanced countries was less than 50 cubic meters. Water recycling

in industrial production was just 60-65% in China, compared with 80-85% in advanced countries (Wu, 2007). After 100 days without precipitation in Henan and six other provinces in the northern and central region of China, the central government declared a "Level 1" emergency. This lack of rainfall caused the worst drought in 50 years with 300m *yuan* ($50 million) extra being committed to drought-relief (Economist, 2009). Furthermore, this northern region grows three-fifths of China's crops and houses two-fifths of the population (Wines, 2009). Please see Table 1:

Table 1: Comparative Selected Aggregate Data from China, India, and U.S.

	China	India	United States
Size	*total:* 9,596,960 sq km *land:* 9,326,410 sq km *water:* 270,550 sq km	*total:* 3,287,590 sq km *land:* 2,973,190 sq km *water:* 314,400 sq km	*total:* 9,631,418 sq km *land:* 9,161,923 sq km *water:* 469,495 sq km (note: includes only the 50 states and District of Columbia)
Population:	1,343,239,923 (July 2012 est.)	1,205,073,612 (July 2012 est.)	313,847,465 (July 2012 est.)
GINI Index	48 (2009)	36.4 (2006)	45 (2007)
Water Poverty Index Ranking (WPI):	103rd	97th	32nd
Falkenmark Index: (kcm)	2.2 (thousands of cubic meters of water per capita	1.9 kcm	8.9 kcm

Source: CIA World Factbook, 2012.

Even though China and the United States are of similar physical size, the U.S. population is 22.6% of China's. More critically, the U.S has almost twice the amount of water. Measured on a per capita basis, there is .000207 square kilometers (sq. km.) versus .001587 sq. km. of water in China and the U.S., respectively approximately 13%. Admittedly, this is a rough measure of availability since the water is measured by surface area and not on a cubic meter basis. Arguably, an improvement on this was a study by Lawrence et al. (2002) that yields an index called the Water Poverty Index (WPI). On this WPI list the U.S. is ranked 32nd, India is 97th, and China is 103rd. A component of the WPI, the Falkenmark water stress index measures per capita water availability and considers that a per capita water availability measured by thousands of cubic meters per capita (kcm) (Falkenmark & Widstrand, 1992). The Falkenmark index in 2002 was 8.9 kcm for the U.S., 1.9 kcm for India, and 2.2 kcm for China (please see Table 2). India (13%), China (12%) and the USA (9%) are the largest consumers of the global water resources (Hoekstra & Chapagain, 2006).

Table 2: CO2 Emissions by Selected Country.

Rank	Amount (per 1000 people)	Rank	Amount (per 1000 people)
1	Qatar: 40.6735	34	Norway:7.68826
5	United States:19.4839	35	Italy:7.68629
6	Luxembourg:17.977	36	Spain:7.55763
8	Australia:16.5444	37	Iceland:7.5208
9	Canada:15.8941	44	Portugal:6.1342
12	Belgium:12.0632	46	France:5.99255
15	Finland:10.8403	50	Switzerland:5.5801
16	Russia:10.7402	51	Sweden:5.41667
17	Ireland:10.6612	66	Mexico:3.62584
18	Netherlands:10.6545	67	Argentina:3.51517
20	Germany:10.1591	68	Chile:3.42842
22	Israel:9.99186	71	Turkey:3.21359
23	Japan:9.61204	80	China:2.65908
24	Denmark:9.44788	90	Panama:1.81812
25	United Kingdom:9.23587	91	Brazil:1.76161
27	Greece:8.63801	113	India:0.933086
30	New Zealand:8.08758	176	Congo, The Democratic Republic of:0.0123428
31	Poland:7.87846		
32	32 Austria:7.8658		

Definition: CO2: Total Emissions (excluding land-use) Units: thousand metric tons of carbon dioxide.
Source: World Resources Institute. 2003. Carbon Emissions from energy use and cement manufacturing, 1850 to 2000. Available on-line through the Climate Analysis Indicators Tool (CAIT) at Washington, DC: World Resources Institute via Nation Master.

Climate change will impact water supplies, exacerbating existing pressures on water resources caused by population and economic growth. Given the combination of these stressors, the sustainability of water resources in future decades is a concern in many parts of the world. Groundwater depletion is not limited to dry climates: pollution and mismanagement of surface waters can cause over-reliance on groundwater in regions where annual rainfall is abundant (Rodell et al., 2009)“ Many challenges, including climate change, face the Nation’s water managers. The Intergovernmental Panel on Climate Change (IPCC) has provided estimates of how climate may change, but more understanding of the processes driving the changes, the sequences of the changes, and the manifestation of these global changes at different scales could be beneficial. Since the changes will likely affect fundamental drivers of the hydrological cycle, climate change may have a large impact on water resources and water resources managers” (Brekke et al., 2009).

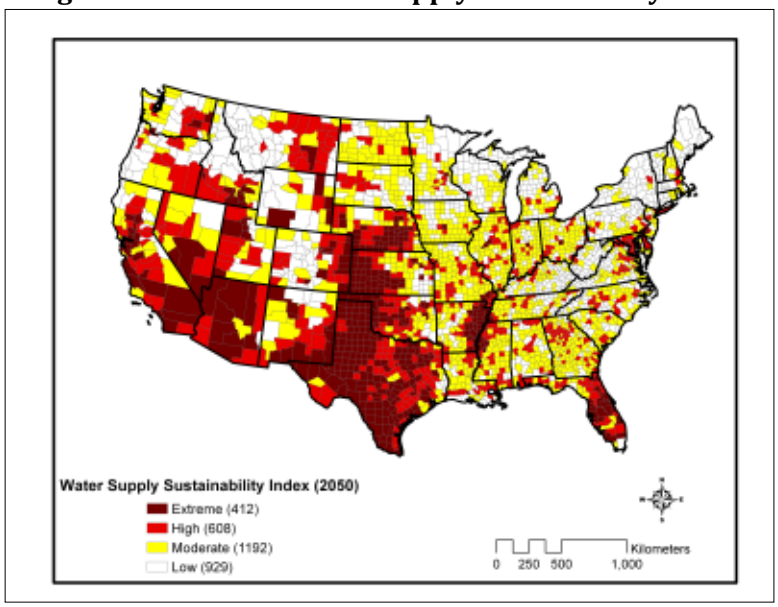
As part of the analysis undertaken by Tetra Tech (Brekke et al., 2009), for the Natural Resources Defense Council (2010), a water supply sustainability index composed of five attributes of water use and growth was developed, and used to compare impacts across regions. Those factors are:

1) Projected water demand as a share of available precipitation;
2) Groundwater us as a share of projected available precipitation;
3) Susceptibility to drought; 4) projected increase in freshwater withdrawals; and
5) Projected increase in summer water deficit.

Brekke et al. (2009) found that, “under the business-as-usual scenario of demand growth, water supplies in 70% of counties in the US may be at risk to climate change, and

approximately one-third of counties may be at high or extreme risk. The geographic extent of potential risk to water supplies is greatly increased when climate change is considered (see Figure #4).

Figure #4 National Water Supply Sustainability Index



Source: Climate Change: Risks to U.S. Water Supplies Will Increase (2010)

This calculation indicates the increase in risk that affected counties face that water demand will outstrip supplies, if no other remedial actions are taken."

Another effect climate change has on water resources is the shrinking of sea ice at the north and south poles. Recently there is some evidence that there is a growth of sea ice in Antarctica driven by winds in a more exposed south pole (Hotz, 2012:A8) However, as the Arctic snow and ice melt, darker land and ocean surface open up and absorb more of the sun's energy. Therefore, the temperature increases faster – referred to as Arctic amplification. According to simulations conducted by the Intergovernmental Panel on Climate Change (IPCC) the Arctic will warm between 7 and 13 degrees Farenheit (F) over the next 100 years (Cullen, 2010:167-171)

As sea levels rise, it may have some devastating effects on island nations, especially "in the Pacific, where the sea level is projected to rise three feet or more by the end of the century. Already, Nauru's coast, the only habitable area, is steadily eroding, and communities in Papua New Guinea and the Solomon Islands have been forced to flee their homes to escape record tides. The low-lying nations of Tuvalu, Kiribati, the Maldives and the Marshall Islands may vanish entirely within our grandchildren's lifetimes. In 2009, an initiative by the Pacific Small Island Developing States, prompted the United Nations General Assembly to recognize the link between climate change and security. But two years later, no concrete action has been taken" (Stephen, 2011). If the international community cannot or will not slow global warming, the least it can do is help those states prepare for life after land by recognizing a new category of state — the deterritorialized state (Rayfuse, 2011). Furthermore, recently we have seen the devastating effects of rising flood levels as a result of Hurricane Sandy that created an estimated $60 billion of devastation to homes, office buildings, power stations, transportation systems (Klinenberg, 2013).

United States and Climate Policy

The Obama administration has said that United States is committed to reduce their energy consumption by 17% by 2020 (Boder, 2010). For example, proposals for the first large solar plants ever built in on federal lands won final approval on October 6th, 2010. It reflects the Obama administration's commitment to promote renewable energy. Two solar plants will be built in Imperial and Lucerne Valleys in California – 754 megawatts will eventually be generated by these two plants (Barringer, 2010). On another front, the U.S. military has taken the initiative to decrease its dependence on fossil fuels, and switching to renewable sources of energy. For example, the Air Force has been testing a 50-50 mix of plant based bio-fuels and jet fuels. Further they have targeted 2011 as when the entire fleet will fly on bio-fuels (Rosenthal, 2010).

The Obama administration hopes to achieve energy savings of up to $2 billion per year, as well as a reduction in emissions of carbon dioxide and other gases blamed for global warming. According to the congressional officials, the presidential orders will require vehicle manufacturers to speed efforts to make and sell cars and trucks that get higher mileage than the national standard. President Obama also will direct the Department of Transportation to begin drafting automobile fuel-economy regulations to comply with a law enacted in December 2007 according to the Alternative Fuels Data Center. President Bush delayed implementing the law and left office saying there was not sufficient time to write the rules. However, the EPA'a January 2010 proposal, to tighten air-quality standard below those of George W. Bush and even further below what most states adhere to was withdrawn by President Obama as he bowed to industry and Republican pressures citing the importance of "reducing regulatory burdens and regulatory uncertainty, particularly as our economy continues to recover" (Solomon & Tracy, 2011:B5).

However, the complexity of the process involves legislation, regulation, and research and development. Recognizing this fact, a joint proposal by the conservative American Enterprise Institute (AEI) and the liberal Brookings Institute calls for the U.S. government to increase federal spending on clean energy from $4 billion to $25 billion a year (Leondardt, 2010). To put this amount in context, the National Institute of Health (NIH) receives $36 billion a year. The proposal also suggests a cap and trade program, charging about one third of what the defunct Senate bill would have charged to raise some of the $25 billion (Leonhardt, 2010). The United States ranks the highest among developed countries at 5th in the world in carbon emissions per capita (please see Table 2).

China and Climate Change

A joint report by the World Bank and the State Environmental Protection Administration, the Peoples Republic of China, pollution in China has either directly or indirectly caused the death of as many as 750,000 people a year (World Bank and the State Environmental Protection Administration, 2007). In India, it is estimated that one-eighth of its premature deaths are caused by air pollution and several hundred of thousand children die every year from polluted water (Luce, 2007: 343). Furthermore, it has been argued that 80 percent of surface water in China and 75 percent in India are polluted beyond use (Royte, 2008). Globally, the availability of freshwater is steadily decreasing, and that trend is expected to continue as the world's population grows to nine billion, emerging economies increase consumption levels, and climate change continues (WBSCD, 2008). Now, we are able to talk about our "water footprint" just as we talk about our "carbon footprint" (Gertner, 2007). Seven global groups, including the World Business Council for Sustainable Development (WBCSD), setup the Water Footprint Network, with the aim of working towards a common approach to water footprint measurement, accounting and reporting (WBCSD, 2008).

An interesting construct is the water footprint indicating water consumption per capita. Specifically, the four major direct factors determining the water footprint of a country are: volume of consumption (related to gross national product); consumption patterns (e.g., high versus low meat consumption); climate (growth conditions); and, agriculture practices (water use efficiency). The global average water footprint is 1240 m3/per capita/per year. However, the differences in the global water footprint among countries are large. For example, the USA has an average water footprint of 2480m3/capita/year whereas China has an average water footprint of 700m3/capita/year (Hoekstra & Chapagain, 2006).

Sustainable development is critical to China for the two most significant regions of economic development in China, the Pearl and Yangtze River Deltas. China's economy has been growing at 8-10% for more than a decade. However, China's trade surplus narrowed in August of 2010 as imports picked up at a faster pace and exports slowed although not drastically. "The General Administration of Customs said exports were up 34.4% in August 2010 compared to the same month a year ago, slowing from July's 38.1% rise. Imports jumped 35.2%, faster than the 22.7% increase in July. China's trade surplus dropped to $20 billion in August from an 18-month high of $28.7 billion in the previous month. In the January to August period, exports increased 35.5% from the same period a year ago, while imports rose 45.5%. A cumulative trade surplus of $103.9 billion was registered" (TradingEconomics.com, 2010). However, critically, air and water quality in Chinese cities are worsening. According to a survey by the Environmental Protection Administration, 38% of 585 cities enjoyed air quality that reached minimal national standards, down from 45% in a 2005 survey (French, 2007:A6).

Arguably, the Olympics Games in 2008 made a start at recasting China, usually identified as an extreme environmental polluter, in a new eco-light. Beijing invested some US$12 billion in environmental projects between 2001, when it won the bid to host the Olympics, and 2008. Dozens of polluting factories were relocated from the city to its outskirts and forest cover increased by several times, thanks in part to a 680-hectare Olympic Forest Park, the largest public green space in the country (Aiyar, 2010).

Bradsher (2007) identifies the dilemma of increasing energy needs for development and the resulting pollution, especially in the villages of India and inner China. Alternative energy sources are being sought in both countries to satisfy increasing demand. For example, farmers in China are using cheap rooftop solar water heaters. However, the heaters need to be installed on flat concrete roofs that are less prevalent than the sloped tile roofs. Further, it was reported that China planed on deriving 10% of its electricity from renewable sources, not counting hydroelectric projects, by 2010 (Wald, 2007:C7). Perhaps unrealistically, meeting that goal of six gigawatts of electricity would require a two year output from all solar panel makers in the world. In India and China, biomass furnaces are being used to supplement the use of more polluting diesel and coal generators, respectively. In 2008, leaders of the G8 group of nations called for the development of 20 large-scale projects demonstrating technologies for carbon capture and storage (CCS) by 2010, but countries have been slow to embrace the costly plants (Tollofson & Van Noorden, 2012). China, in particular, announced that they plannned to open the most high-tech coal fired plant in the world in 2011, so-called Green-Gen (Osnos, 2009). Although it was a year later, in the Spring of 2012, China opened it first Green-Gen coal plant that captures its carbon dioxide in Tianjin by China's state-owned Huaneng Group with Peabody Energy of St Louis, Missouri (Tollofson & Van Noorden, 2012).

China is emerging as the surprise leader in green technologies. The country's vast market and economies of scale are bringing down the cost of solar and wind energy; the "China price"—the

combination of cheap labor and capital that revolutionized global manufacturing—is being replicated in clean technologies. China has emerged as one of the world's largest makers of wind turbines in the matter of a few years, and the country has a 30 percent share of the global market for photovoltaic solar panels used to generate electricity (Aiyar, 2010).

"The Chinese government is considering plans to subsidize the use of energy-efficient materials and renewable energy technologies in new buildings and is encouraging provincial and municipal governments to impose stricter efficiency standards than the national minimums. With 13 million to 21 million rural people in China migrating to cities each year — a number comparable to the 18.9 million people in metropolitan New York — the real estate industry has been putting up office towers and apartment buildings at a brisk pace but often with little regard for energy efficiency" (Bradsher, 2011).

Further, as Bradsher (2011) pointed out, the Chinese government has been holding down electricity prices as an anti-inflation measure even as spot prices for coal, the country's dominant fuel for power generation, have doubled in the last five years. Chinese electricity companies have responded by limiting the operating hours of coal-fired plants in the last two years and slowing construction of new power plants, causing blackouts that have focused more public attention on the energy efficiency of buildings. Residential electricity rates in China are half to two-thirds of rates in the United States. Industrial electricity rates in China are officially higher than those in the United States.

India and Climate Change

India, the second-biggest producer of rice, wheat and sugar, is the most vulnerable among the world's leading industrial and emerging economies to future water stress, according to HSBC. India exhibits the most worrying trends among the Group of 20 nations with the resource "hovering dangerously near extreme scarcity levels" by 2030, HSBC said in a report today that forecast the group's water consumption against supply (Sunday Morning Herald, 2012).

India exhibits the most worrying trends among the Group of 20 nations with the resource "hovering dangerously near extreme scarcity levels" by 2030, HSBC said in a report today that forecast the group's water consumption against supply. The worst U.S. drought in a half-century drove corn and soybeans to records in August. Agriculture is the biggest consumer of water and India, the most dependent on farming among the G-20 nations, uses 25 percent of all water consumed globally by the industry, HSBC found.

Companies are unlikely today to disclose information on local water scarcity that can affect farms, plants and operations, it said. Investors will increasingly demand more disclosure to assess potential disruption to earnings. According to United Nation definitions, India is already officially water-stressed while Saudi Arabia, South Africa and South Korea are water-scarce. Historical trends are no longer a reliable way to assess future availability as climate change affects rain patterns and glacial melt, it said. Changing water patterns have already forced the closure of power, oil and gas and textile facilities in India this year (Sunday Moring Herald, 2012).

THE DEPLETION OF AQUIFERS

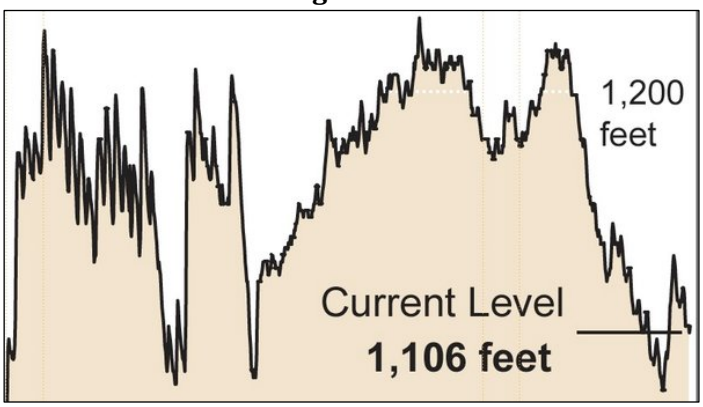
United States

"America is, on average, a damp nation -- the lower 48 states see 4,200 billion gallons of rainfall every day. But averages deceive; water is in short supply in the Southwest, where growth is fastest and rivers are already over-tapped. The Ipswich River near Boston now "runs dry about every other year or so," according to Sandra Postel, director of the Global Water Policy Project.

"Why? Heavy pumping of groundwater for irrigation of big green lawns." In drought years like 1999 or 2003, Maryland, Virginia and the District have begun to fight over the Potomac - on hot summer days combining to suck up 85 percent of the river's flow" (Washington Post, 2006).

A report by the National Academies on the Colorado River basin had concluded that the combination of limited Colorado River water supplies, increasing demands, warmer temperatures and the prospect of recurrent droughts "point to a future in which the potential for conflict" among those who use the river will be ever-present. Over the past few decades, the driest states in the United States have become some of the fastest growing; meanwhile, an ongoing drought has brought the flow of the Colorado to its lowest levels since measurements at Lee's Ferry began 85 years ago. At the Senate hearing, Udall stated that the Colorado River basin is already two degrees warmer than it was in 1976 and that it is foolhardy to imagine that the next 50 years will resemble the last 50. Lake Mead, the enormous reservoir in Arizona and Nevada that supplies nearly all the water for Las Vegas, is half-empty, and statistical models indicate that it will never be full again (Gertner, 2007). Lake Mead dropped to its lowest point since it was first filled in the 1930s (Barringer & Henriques, 2010). After 14 years of drought, nearly unrivaled in 1,250 years, federal authorities will for the first time decrease the amount of water that flows into Lake Mead from Lake Powell 180 miles upstream. Furthermore, if Lake Mead drops below 1,000 feet above sea level, millions of people will lose their source of water (Wines, 2014b: A1) (please see Figure #5).

Figure #5



Source: Wines (2014)

Studies of tree rings in the United States, core samples from the oldest Ponderosa pines or Douglas firs used to determine moisture levels hundreds of years ago, indicate that the dry times of the 1950s were mild and brief compared with other historical droughts. The latest research effort, published in the journal Geophysical Research Letters in late May 2007, identified the existence of an epochal Southwestern mega-drought that, if it recurred, would prove calamitous (Gertner, 2007).

China

A century or so ago, the North China Plain was a healthy ecosystem, scientists say. Farmers digging wells could strike water within eight feet. Streams and creeks meandered through the region. Swamps, natural springs and wetlands were common. Today, the region, comparable in size to New Mexico, is parched. Roughly five-sixths of the wetlands have dried up, according to one study. Scientists say that most natural streams or creeks have disappeared. Several rivers that once were navigable are now mostly dust and brush. The largest natural freshwater lake in northern China, Lake Baiyangdian, is steadily contracting and besieged with pollution.

The causes includes misguided policies, unintended consequences, a population explosion, climate change and, most of all, relentless economic growth. In 1963, a flood paralyzed the region, prompting Mao to construct a flood-control system of dams, reservoirs and concrete spillways. Flood control improved but the ecological balance was altered as the dams began choking off rivers that once flowed eastward into the North China Plain.

The new reservoirs gradually became major water suppliers for growing cities like Shijiazhuang. Farmers, the region's biggest water users, began depending almost exclusively on wells. Rainfall steadily declined in what some scientists now believe is a consequence of climate change. Before, farmers had compensated for the region's limited annual rainfall by planting only three crops every two years. But underground water seemed limitless and government policies pushed for higher production, so farmers began planting a second annual crop, usually winter wheat, which requires a lot of water. Around 1900, Shijiazhuang was a collection of farming villages. By 1950, the population had reached 335,000. This year, the city has roughly 2.3 million people with a metropolitan area population of 9 million.

"More people meant more demand for water, and the city now heavily pumps groundwater. The water table is falling more than a meter a year. Today, some city wells must descend more than 600 feet to reach clean water. In the deepest drilling areas, steep downward funnels have formed in the water table that are known as "cones of depression" (Yardley, 2007). Similarly, the water table in India has dropped from just 40 feet in 1960 to more than 600 feet in the early 21st century (Luce, 2007:85).

The North China Plain undoubtedly needs any water it can get. An economic powerhouse with more than 200 million people, it has limited rainfall and depends on groundwater for 60 percent of its supply. Other countries, like Yemen, India, Mexico and the United States, have aquifers that are being drained to dangerously low levels. But scientists say those below the North China Plain may be drained within 30 years.

"There's no uncertainty," said Richard Evans, a hydrologist who has worked in China for two decades and has served as a consultant to the World Bank and China's Ministry of Water Resources (MWR). "The rate of decline is very clear, very well documented. They will run out of groundwater if the current rate continues" (Yardley, 2007). "The problems are the result of both scarcity and pollution. Many parts of the north and north-east - home to more than 500m people - face persistent and sometimes severe water shortages. Three of the country's main industrial cities - Shanghai, Beijing and Tianjin - all have fewer per capita freshwater resources than Israel or Jordan" (Dyer, 2007).

In the past, the Communist Party has often turned to engineering projects to address water problems, and now it is reaching back to one of Mao's unrealized plans: the $62 billion South-to-North Water Transfer Project to funnel more than 12 trillion gallons northward every year along three routes from the Yangtze River basin, where water is more abundant. The project is projected to be built in 2050. The eastern and central lines are already under construction; the western line, the most disputed because of environmental concerns, remains in the planning stages (Yardley, 2007).

India

The nation's average annual rainfall is extremely abundant by global standards, yet much of this rain falls in relatively brief deluges during the monsoon and there is great disparity across different regions. The combination of these climatic conditions with a range of man-made pressures has driven India's farmers, households, and industry to increasingly depend on

groundwater rather than surface water in rivers and lakes. But this dependence is leading to a rapid and very worrying deterioration in the nation's groundwater resources (Wyrwoll, 2012). During the period of August 2002 to October 2008, groundwater depletion was equivalent to a net loss of 109km3 of water, which is the double the capacity of India's largest surface water reservoir (Rodell et al., 2009).

India's declining groundwater resources are the product of a number of drivers. Utilization of groundwater facilitates irrigated agriculture in areas far from rivers; in fact, this was key to the agricultural "green revolution" that occurred from the mid 1960s. In places where surface water is available but unsafe for drinking or farming—more than 70% of India's surface water resources are polluted by human waste or toxic chemicals—groundwater has often been seen as a safe alternative. Urban water supply infrastructure is often poor and unreliable: well drilling is typically the most economical means of obtaining household water. In Delhi, the local government estimates that 40% of the water transmitted through the mains system is lost through leakages; for many, the only other alternative to bores are expensive supplies purchased from water-trucks (Wyrwoll, 2012).

In rural areas, electricity subsidies allowing farmers to pump groundwater cheaply have become entrenched in the political landscape. They are likely to become even more so as energy requirements increase to extract water from greater depths. Low cost encourages excess water withdrawal, an inefficient usage pattern commonly exacerbated by ineffective application methods and the wastage of agricultural produce between farm and market. In order to feed a growing and wealthier population, it is projected that agricultural water demand in the India of 2030 would need double to 1,200 billion m^3 if these inefficient practices continued. The problems are only going to get worse unless urgent changes occur (Wyrwoll,2012).

RECOMMENDATIONS TO SLOW CLIMATE CHANGE

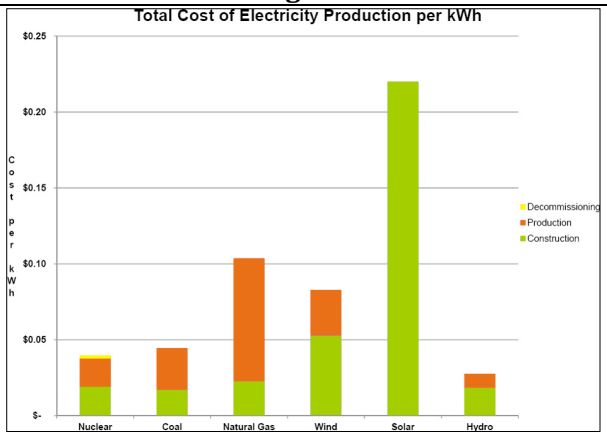
IBM has arguably taken a leadership role in using technology to create a more sustainable urban environment in their "Smarter Cities" initiative (IBM, 2011). In particular, "as centers of business, culture and life, cities are logical places to integrate many of the Smarter Planet principles and innovations in public safety, transportation, water, building, social services and agencies. A new kind of solution, the IBM Intelligent Operations Center for Smarter Cities, synchronizes and analyzes efforts among sectors and agencies as they happen, giving decision makers consolidated information that helps them anticipate—rather than just react to—problems. By using these tested approaches, cities can manage growth and development in a sustainable way that minimizes disruptions and helps increase prosperity for everyone." Included in this comprehensive program are greater efficiencies in government, public safety, healthcare, energy, and traffic. These solutions were recently discussed as a means of reducing the debilitating effects on the power grid by isolating more vulnerable areas in developing smart grids (Klinenberg, 2012). In this article, Klaus Jacob of Columbia University identifies Singapore and Rotterdam (Netherlands) successful efforts of developing proactive solutions to the threats of major flooding. He argues that these solutions can be replicated in the northeastern United States shown to be vulnerable to the deluge brought by Hurricane Sandy (Klinenber, 2013:33-34). Regarding the water shortage in California, a water-cleaning technology is being used to desalinate water using solar panels to separate the salts, selenium and other metals from the water. The start-up called WaterFX is tapping billions of contaminated water that lies just below the ground in the Central Valley of California. The plant, located in Firebaugh, California, is able to purify water using half as much energy as conventional desalinization (Woody, 2014:B1 & B3).

Totty (2011) also provides a wide range of activities for a more sustainable city. He suggested that "urban populations around the world are expected to soar in the next 20 years, to five billion from more than three billion today. If the current rate of urbanization holds steady, cities will account for nearly three-quarters of the world's energy demand by 2030. Most of the increase will come in rapidly developing countries like China and India; China's cities alone will have to deliver water, housing, transportation and other services to 400 million additional urban dwellers by 2030" (Trotty, 2011:R4). Some of the recommendations by Totty (2011) include the use of micro wind turbines, pumped hydro storage and micro hydropower, pneumatic garbage collection, and green rooftops. Another proposed change by the China's National Development and Reform Commission is the use of a three-tiered pricing system for water usage where the top 5% of household users will pay three times the base rate, the second tier 1.5 times the base rate and the lowest tier (80% of urban households) will not be affected (Spegele & Kazer, 2014:A6).

"Rooftops, which take up a fifth of urban surface area, can be used to support solar panels or wind turbines, but they're otherwise underutilized. Covering the tops of buildings with grasses, shrubs and other plants can deliver a host of benefits. Though often more costly than traditional coverings, green roofs can provide insulation and trim a building's heating and cooling needs. They absorb rainwater, reducing the load on storm-water systems, and filter what water does run off so it can be used for many domestic needs. They also filter air pollutants" (Totty, 2011, R5).

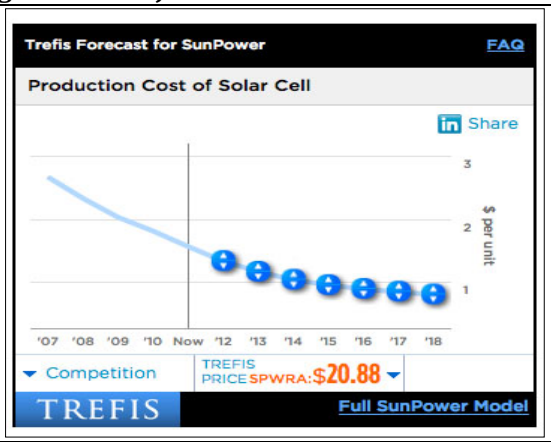
Solar panel installations in cities will greatly reduce reliance on fossil fuels for energy (although the most expensive, see Figure #6). Especially with the projected continued reduction in the cost of solar cells (see Figure #7).

Figure #6



Source: Morgan (2010)

Figure #7 Projected Production of Solar Cells



Source: Trefis (2011)

For example, "two-thirds of New York City's rooftops are suitable for solar panels and could jointly generate enough energy to meet half the city's demand for electricity at peak periods, according to a new, highly detailed interactive map. Specifically, 66.4 percent of the city's buildings have roof space suitable for solar panels, said the CUNY team, which developed the map in partnership with the city and the federal Department of Energy. The rooftops could generate up to 5,847 megawatts from hundreds of thousands of buildings, the team said, compared with the negligible 6.5 megawatts yielded now from about 400 installations. Nationwide, the installed solar capacity is just 2,300 megawatts, less than half the rooftop potential of New York City. In San Francisco, the number of solar installations on private roofs rose to more than 2,300 this year, from 551 in 2007, when the solar map was introduced along with financial incentives like tax credits and rebates" (Navarro, 2011).

CONCLUSION

An Inuit elder in Igloolik (Canadian Arctic) described the weather as uggianaqtuq, meaning unexpected, unfamiliar, and/or unreasonable (Cullen, 2010: 154-5). Redoubling the efforts of many (or all) nations' efforts to prevent further climate change are essential. Also, it is critical for countries to cooperate in reducing global warming as well as increasing the efficiency of water usage although the meeting in Cancun (2010) did not result in any significant agreement among participating countries.

There are immense opportunities to reduce both consumptive and non-consumptive demand for water. These include installing more low-flow home appliances, adopting more efficient irrigation methods, "green architecture" such as agriculture on roofs in cities, and recycling of rainwater. Economic tools have also reduced consumption by making water more expensive, i.e. the more you use, the higher your per-gallon rate. The United States uses less water than it did 25 years ago (Gertner, 2007). Also, while desalination has been increasingly used in India, it is more than twice as expensive as waste water recycling. Europe recycles about 60% of the domestic sewage generated and it is consumed for non-potable applications such as boiler feed water, cooling tower, landscaping, gardening and flushing (Vijayakumar, 2012). Further, China has begun building desalination plants in Tianjin and east of Beijing. The desalination plant in Tianjin supplies 10,000 tons of desalted water per day. It plans to expand the production to 180,000 tons a day. The Beijing desalination project is expected to be completed by 2019 and to provide one million tons of fresh water per day which would account for one-third of Beijing's water needs for 22 million people (Wong, 2014:A8).

Furthermore, corporations are recognizing the economic costs of a changing climate. For example, Coca-Cola now uses water-conservation technologies after they lost a operating license in India because of a serious water shortage there in 2004. Nike, which has more than 700 factories in 49 countries, many in Southeast Asia, has faced shortages of cotton due to rising droughts. As a result, Nike is using more synthetic fibers that are less dependent on weather conditions (Davenport, 2014: A1 & A19).

Recently, the Campbell Soup Company was named to the Global 100 Most Sustainable Corporations in the World list by the Corporate Knights recognized for its innovative energy and water conservation programs. Over the past four years, Campbell's capital investments in energy and water conservation have yielded a cumulative savings of more than $53.9 million. Additional environmental stewardship achievements include: saving more than 1 billion gallons of water annually; reducing greenhouse gas emissions by more than 280,000 metric tons of CO2, the equivalent to emissions from nearly 60,000 cars; reducing waste sent to landfills by almost 7 percent and attaining an overall 85 percent recycle rate; and saving more than 2.4 million pounds of packaging through light weigh package redesign (Business Wire, 2014).

Since coal represents a significant portion of the China, India, and the United States energy, lower sulfur producing coals, such as bituminous, should be mined. Also, as mentioned earlier coal plants should be offered incentives to capture and bury carbon dioxide as was started at the American Electric Power plant in Mountaineer, West Virginia (Wald & Broder, 2011: A1).

Water management is essential to lessen the depletion of water resources. However, arguably, it cannot be expected to counter the effects of a warming environment. Without radically reducing the use of fossil fuels, world temperatures may rise 2.4 to 6.4 degrees centigrade by 2100. If climate warming continues to increase, we can expect water shortages to increase with it.

References

Aiyar, P. (2010). "From 2008 to 2010: Big-Ticket Spectacles in China and India." *The Journal of Asian Studies,* 69, No. 3: 683–685.

Alternative Fuels Data Center (http://www.afdc.energy.gov/laws/key_legislation)

Ball, J. (2011). "Wind Power hits a Trough." *Wall Street Journal*, 5 April.

http://online.wsj.com/article/SB10001424052748704629104576190812458488694.html?KEYWORDS=jeffrey+ball

Barringer, F. (2010). "Solar Power Plants to Rise on U. S. Land." *New York Times,* October 6: A16.

Barringer, F. & Henriques, D.B. (2010). "Water Scarcity A Bond Risk, Study Warns." *New York Times,* October 21: A1 & A4.

Boder, J. M. (2010). "Poor Prospects for New Climate Meeting." *New York Times,* October 8: A9.

Bradsher, K. (2011). "China Weighs Incentives To Aid Energy Efficiency." *New York Times*, 16 June 2011: B4.

Bradsher, K. (2007). "CleanAir or TV: Paying in Pollution for Energy Hunger." New York Times, *9 January: C1 & C7.*

Brekke, L.D., Kiang, J.E., Olsen, J.R., Pulwarty, R.S., Raff, D.A., Turnipseed, D.P., Webb, R.S., and White, K.D., 2009, *Climate change and water resources management—A federal perspective*: U.S. Geological Survey Circular 1331, 65 p. (http://pubs.usgs.gov/circ/1331/.)

Brown, L., Black, B., Hassan, G., & Hussein, G. (2012) "Aquifer depletion," in Encyclopedia of Earth. Cleveland, C.J. (ed.) (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment). [First published in the Encyclopedia of Earth January 23, 2010; Last revised Date May 3, 2012; Retrieved January 16, 2013.

Businee Wire (2014). "Campbell Soup Company Named to Global 100 Sustainability Index." http://online.wsj.com/article/PR-CO-20140122-907086.html

Chen, C., Hill, J.K., Ohlemüller, R., Roy, D.B., & Thomas, C.D. "Rapid Range Shifts of Species Associated with High Levels of Climate Warming." Science, 333, #6045, 19 August: 1024-1026.

Climate Change: Risks to U.S. Water Supplies Will Increase (2010). http://blog.nature.org/2010/07/climate-change-water-supply/

Davenport, C. (2014). "Industry Awakens to Threat of Climate Change." *New York Times*, 24 January, A1 & A19.

Dyer, G. (2007). "Business and Water: Pollution adds to a daunting resource shortage." *Financial Times*, 22 March. http://www.ft.com/cms/s/1/4b684464-d6e5-11db-98da-000b5df10621.html#axzz1urEyxsdv

Cullen, H. (2010). The Weather of the Future: Heat Waves, Extreme Storms, and Other Scenes From a Climate Changes Planet. New York: Harper.

Energy Information Administration (2011). "Country Analysis Briefs: India." 21 November. http://www.eia.gov/cabs/india/Full.html

Encyclopedia of Earth (2012). http://www.eoearth.org/article/Aquifer_depletion

Flynn, D. (2011). "Sustainable Development and Climate Change." *Proceedings*, Pan-Pacific Conference XXVIII, Daejeon, Korea: 66-68.

French, H.W. (2007). "China: Cities Suffer More Pollution." *New York Times*, 13 June: A6.

Gertner, J. (2007). "The Future is Drying Up." *New York Times Magazine,* 21 October. http://www.nytimes.com/2007/10/21/magazine/21water-t.html?pagewanted=all&_r=0

Gold, R. (2011). "Overrun by Chinese Rivals, U.S. Solar Company Falters." *Wall Street Journal*, 17 August: B1 & B4.

Goodyear, D. (2011). "Grub: Eating Bugs to Save the Planet." New Yorker, 15 & 22 August: 38-46.

Hart, S.L. & Milstein, M.B. (2003). "Creating Sustainable Value." *Academy of Management Executive,* 17 (2): 56-69.

Hermanowicz, S.W. (2005). "Entropy and Energy: Toward a Definition of Physical Sustainability." Working Paper, (http://repositories.cdlib.org/wrca/wp/swr v2).

Hoekstra, A.Y. & Chapagain, A.K. (2006). "Water footprints of nations: Water use by people as a function of their consumption pattern." *Water Resources Management,*(DOI 10.1007/s11269-006-9039-x).

Hotz, R.L. (2012). "Winds Drive Growth in Antarcic Sea Ice." *Wall Street Journal*, 12 November: A8.

IBM (2011) www.ibm.com/smarterplanet/us/en/smarter_cities/overview/index.html

Klieneberg, E. (2013). "ADAPTATION: How can cities be "climate-proofed"?" *New Yorker,* 7 January: 32-37

Lant, C. (2004). "Water Resources Sustainability: An Ecological Economics Perspective." *Water Resources Update*, 127: 20-30.

Lawrence, P., Meigh, J., & Sullivan, C. (2002). "The Water Poverty Index: an International Comparison." *Keele Economic Research Reports*, 19.

Leonhardt, D. (2010). "Next Step On Policy For Climate." *New York Times,* October 13: B1 & B9.

Luce, E. (2007). *In Spite of the Gods: The Strange Rise of Modern India.* New York: Doubleday.

Morgan, J. (2010). "Comparing Energy Costs of Nuclear, Coal, Gas, Wind and Solar." http://nuclearfissionary.com/2010/04/02/comparing-energy-costs-of-nuclear-coal-gas-wind-and-solar/

Ministry of Water Resources (http://www.mwr.gov.cn/english/)

Natural Resources Defense Council (NRDC) (2010). "Climate Change, Water, and Risk: Current Water Demands Are Not Sustainable." July. (www.nrdc.org/global-warming/watersustainability/)

Navarro, M. (2011). "Interactive Map Shows, Rooftop by Rooftop, City's Great Potential for Solar Power." *New York Times*, 16 June 2011: A31.

New York Times (2010a). "Nagoya Has to Do Better" 20 October: A28

New York Times (2010b). "A Conditional Go-Ahead." 13 October: A24.

New York Times (2010c). "Science Foundation Backs Climate-Change Play." 4 October: C3.

Prager, S.C. (2011). "How Seawater Can Power the World." *New York Times,* 11 July 2011: A19.

Osnos, E. (2009). "Green Giant: Beijing's crash program for clean energy." *New Yorker*, 21 & 28 December: 54-62.

Rayfuse, R. (2011). "Life After Land." *New York Times,* 19 July: A23.

Robbins, J. (2013). "The Year the Monarch Didn't Appear." *New York Times, Sunday Review*, 22 November.

Rodell, M., Velicogna, I. & Famiglietti, J.S. (2009). "Satellite-based estimates of groundwater depletion in India." *Nature*, 460, August: 999-1003.

Rosegrant, M.W. (1997). "Water Resources in the Twenty-First Century: Challenges and Implications for Action." *Food, Agriculture, and the Environment Discussion Paper 20*, 1-32.

Rosenthal, E. (2010). "Military Orders Less Dependence on Fossil Fuels." *New York Times,* 5 October: A1 & A13.

Royte, E. (2008). *Bottlemania: How Water Went on Sale and Why We Bought It.* Bloomsberry.

Solomon, D. & Tracy, T. (2011). "Obama Asks EPA to Pull Ozone Rule." *Wall Street Journal*, September 3-4: A5.

Spegele, B. & Kazer, W. (2014). "To Conserve ater, China Raises Prices for Top Users." *Wall Street Journal*, 4-5 January: A6.

State Grid Corporation of China (http://www.sgcc.com.cn/ywlm/gsgk-e/gsgk-e/gsgk-e1.shtm)

Stephen, M. (2011). "On Nauru, a Sinking Feeling." *New York Times,* 19 July: A23.

Sunday Morning Herald (2012). "India most vulnerable to water shortages, report finds." 20 September.

http://www.smh.com.au/environment/climate-change/india-most-vulnerable-to-water-shortages-report-finds-20120920-267o9.html

Sunday Times Online (1/09/2009).

http://www.timesonline.co.uk/tol/news/environment/article5588346.ece

Tollefson, J. & Van Noorden, R. (2012). "Slow Progress to Cleaner Coal." http://www.nature.com/news/slow-progress-to-cleaner-coal-1.10411

Totty, M. (2011). "How to Build a Greener City." *Wall Street Journal*, September 12: R4 & R5.

Trefis (2011). "Suntech Stock Highly Sensitive to Production Cost of Solar Cells." http://www.trefis.com/stock/stp/articles/44628/suntech-stock-highly-sensitive-to-production-cost-of-solar-cells/2011-03-21

Vijayakumar, S. (2012). "Simple & cheap solution to India's grave water crisis: Waste water recycling." *Economic Times*, September 23.

http://articles.economictimes.indiatimes.com/2012-09-23/news/34022987_1_desalination-plant-water-resources-waste-water

Wald, M.L. (2007). "Venture Capital Rushes Into Alternative Energy." *New York Times,* 30 April: C7.

Wald, M.L. & Broder, J.M. (2011). Utility Shelves Ambitious Plan to Limit Carbon." *New York Times*, 14 July: A1 & A3.

Washington Post (2009). "Getting Resourceful About Resources." 1 January. http://www.washingtonpost.com/wp-dyn/content/article/2005/12/31/AR2005123100307.html

Wines, M. (2014a). "Migration of Monarch Butterflies Shrinks Again Under Inhospitable Conditions." *New York Times*, 30 January, A14.

Wines, M. (2014b). "Colorado River Forces A Painful Reckoning for States." *New York Times,* 6 January: A1 & A10.

Wines, M. (2009). "Worst Drought in Half Century Shrivels the Wheat Belt of China." *New York Times*, 25 February: A5 & A8.

Wong, E. (2014). "Desalination Plant Said to Be Planned for Thirsty Beijing." *New York Times*, 16 April: A8.

Woody, T. (2014). "Water-Cleaning Technology Could Help Farmers." *New York Times*, 17 February, B1 & B3.

World Bank and the State Environmental Protection Administration (2007). *Cost of Pollution in China: Economic Effects of Physical Damage*. March.

World Business Council for Sustainable Development (WBCSD) (2008). "Business Takes Lead on Water by Joining the Water Footprint Network." 16 October (http://www.wbcsd.org/plugins/DocSearch/details.asp?type=DocDet&ObjectId=MzIwNzk)

World Commission on Environment and Development (1987). *Our Common Future.* Oxford: Oxford University Press.

Wu, Zhong (2007). "Sun Wukong: China's going down the drain." 7 March.
http://www.atimes.com/atimes/China_Business/IC07Cb03.html
Wyrwoll, P. (2012). "India's Groundwater Crisis."

http://www.globalwaterforum.org/2012/07/30/indias-groundwater-crisis/

Yardley, J. (2007). "Under China's Booming North, the Future is drying up." *New York Times,* 28 September:A1 & A16.

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Social Elites and New Communication Methods/Information Technologies: The Digital Divide

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ABSTRACT

The aim of this article is to examine the directions taken by not only social but transnational inequalities too, in the framework of information society, where trough the internet new means of communication and provision of information that have entered our lives in a determinative way, are developed. The main issue at stake is to define whether the opinion of technological determinism about the effect of new technologies in improving the position of societies through its universal use is verified in practice or if a new elite is created, that with more and better use of the new technologies maintains – if not deepens – social inequalities. In relation to the aforementioned and in this particular proposal, apart from the broadened accessibility chances and the increase of the percentage of new technology users in general, especially the distinct character of digital goods and the determining character, both of the way of using them and the quality of these goods in combination with the purpose and the environment of use, is examined.

Keywords: Social and geographical inequalities, technological determinism, internet, Social elites, digital divide.

INTRODUCTION

The most widespread and appropriate research-wise examination of the social consequences regarding the extended and almost massive use of modern technologies that are in favor of the new forms of communication are the correlation of the internet with open democracy and e-Governance. It is indicative that most researches that have been conducted towards that direction attempt to explain and interpret even matters of social or geographical exclusion, social differentiation and marginalization mainly through the preconditions of a massive, free and unhindered access and usage of the new media. In this framework as well as by the possibilities provided for lifting possible restrictions in the usage, the matters of social inequalities are also examined.

It is thus ascertained that the interests of most existing researches focus on examining the assumption that the same possibility of free access and usage is a necessary and meanwhile sufficient condition of eliminating social or other inequalities. In particular these approaches attempt, in a broader sense, to interpret social inequality through unhindered freedom of access, without penetrating into the quality of usage itself and if through various differentiations, new forms of inequalities emerge.

This particular article initially aims at examining the content that social and geographical inequalities obtain in the framework of information society, where through the internet nowadays new means of technology and provision of information are developed, which decisively effect aspects of every day social life. On the basis thereof, the question is raised, whether internet usage contributes to social cohesion or if in the end to the increase of social-peripheral inequalities?

Furthermore, regarding the more complex question and the inclusion of qualitative parameters, the approach that is attempted here is based on the secondary analysis of large scale researches regarding the restriction or the increase of social and peripheral inequalities between a) different groups of countries across Europe, b) citizens with different socio-economic characteristics and c) enterprises that present a different size.

THE CONNECTION BETWEEN MASS INTERNET USAGE AND THE INTENSITY OF THE OCCURRENCE OF SOCIAL INEQUALITIES

According to the questions posed, the initial approach attempts to examine if the opinion of technological determinism regarding the effect of new technology – especially through universal usage– on the improvement of the position of societies is verified in practice or if the emergence of a new elite that with more and better use of the new technologies maintains, if not deepens, the existing social inequalities is apparent.

The first opinion is founded on the argument of the no longer expensive use of the new technologies and the fact that the youth familiarizes with them from a young age. This argument is strengthened by the ascertainment that in an open democracy, in which the freedom of expression is an integral good, internet usage is mainly described by its neutrality (as was typography in the past), that is the non-distinctive or non-privileged and monopoly relation that certain groups can maintain. In short, the possibility of unhindered access itself is a dominant prerequisite of freedom of expression.

In that sense on a political level the internet itself, thus the medium itself, becomes a symbol of opposition to the regime, whereas governments are unable to control the massive use and set restrictions or utilize it exclusively for their own purposes. For example, the attempts to create a black list of addresses and prohibit access to sites with oppositional or insulting, according to the cultural morals of those countries, content, are not unusual.

Nevertheless, in periods of financial crisis, during which even survival and the maintenance of health of a large part of the population cannot be assured, the financial capacity to afford the cost of purchasing and using these new technological means for receiving information is not self-evident. As a consequence, not only the unhindered distribution of information but the existing preconditions for utilization of possibilities to gain access to them are important questions to be researched too. On the other hand, the possibility for the withdrawal of

inequalities through the restriction of the digital divide incurred by the mass access to the internet is disputed [1].

To this direction, the ease regarding the time of use is one more parameter that defines the equality or inequality produced by using the new technologies. Those who work hard and for many hours, even though they have the financial means, seem not to possess the time to use the internet in a productive way in comparison to economically higher classes.

The issue of the way of using the new technologies remains important as well, given that using them for educational, informative or professional purposes and professional development and the productive use in general requires a higher social and cultural capital as well as a higher educational level and specialization, that in the end are not necessarily obtained by everyone in modern societies. Thus, the lower social classes seem to use the internet and its tools (Facebook, twitter, etc) mainly for recreation or digital social interaction, so the "quality" in use creates a second level of researching inequalities that is connected to the possibility of creating a new social elite, one that has the "Wealth of technologies" and had the ease to use it appropriately and most importantly productively.

NEW FORMS OF INEQUALITIES AND DIFFERENTIATION REGARDING USAGE AND UTILITY

In relation to the aforementioned and as for the second level of initial questions it is apparent that, apart from the extended opportunities for access and in general increase of the percentage of users of new technologies, the character of digital goods is particularly distinguishable, whereas the factor regarding the way of usage as well as the quality of those goods in combination with the purposes and the usage environment is particularly defining.

In particular, it is interesting a) to be determined if there is a new form of inequalities that are not only located on a level of digital divide, that is accompanied by the possibilities or lack thereof to access the digital goods, but mainly b) to be revealed differences on the quality and the purposes of usage. Regarding those lines of action the relevant argumentation claims that the inequalities are particularly obvious in relation to their quality and the purposes of usage, [2, 3] as well as that the characteristics of these new inequalities are mainly detected in the distance that appears between the usage as a necessary utilization of knowledge in an environment of productive or entrepreneurial activity, or even in the formulation and the control of this usage [4] and the one that is restricted, through a relation that does not depend on the broader knowledge, to the simple access skills [5]. The latter, even if they are not utilized in multiple levels of usage, remain outside of the environment of labor performance and utility [6] and also they do not obtain participation in the formulation of a pole of power through the simple utilization of technological means.

Following this argument the characteristics of a new social elite are revealed that does not identify itself as much through the separate ability of using new technologies, but mainly from the continuous and cumulative utility and innovation in a productive and entrepreneurial environment, that increases the inequalities, or highlights new ones [7] as it creates new local and supralocal power networks [4] through the possibilities the utilization of digital goods itself offers towards that direction.

Thus, summarizing these two questions we ascertain that the initial question, that is, if in the framework of information society and the explosive expansion of the number of internet users,

social but also geographical/peripheral inequalities are reduced, is based on arguments and findings that regard:

- *the unhindered and universal use as a possibility and right to access connected with the democratic goods,*
- *the distinction between traditional and modern technological means of communication,*
- *the predominance of a technological determinism, thus the position regarding the effect of new technology in the improvement of the life of constantly more citizens, of every social stratum,*
- *the confirmation of a causal link between the new technology and the overall social wellbeing and development,*
- *democratic pluralism and broadening democracy, as there is a possibility for free access to common goods,*
- *the recess of total dominance and fixation on the regime that is achieved through the broader control of power, due to the possibilities offered by the medium itself,*
- *the dismantling of totalitarian forms of governing and the respective leaderships and the withdrawal of one and only strong political message through the proliferation of multiple messages,*
- *broadening participation in civic and political representation of a larger number of citizens,*
- *the incorporation of different opinions and groups in the public consultation, that were silent or left aside.*

All of the aforementioned ascertainments, even though they are correctly based on the increase of interactions between the citizens and various poles of power and the fact that interactivity is continuously favored by new techniques, especially when these are offered for mass usage, present an overoptimistic and often formalistic or one-sided or one-factor estimation of the connection between broadening internet usage and the restriction of multiple inequalities.

In this framework, it is not by chance – and particularly in an individualized dimension that is characterized by the absence of social collegialities – that it means the participation in the prospects of electronic governance, which is also called to deal with the crisis of representation in the political system that is being sought. The same meaning is also given to the concept of consultation as it often also derives from the individualized response of citizens, who are familiar with the techniques of using the internet, in the institutional political bodies that raise issues, not as much for a public consultation, but in order for them to be put to the vote; votes, which usually have the character of the opinion poll and are not utilized for consultation regarding the co-formulation of politics.

However, those ascertainments are mainly superficial given that it is doubtful that social and geographical inequalities are dismantled or restricted due to the ascertained broadened internet usage without seeking and analyzing social comparative data that regard socio-economic characteristics of users, [8, 3] the quality of usage and mainly the emphasis on productive processes and carrier prospects, the time of usage and the possibility of utilizing the functions that are constantly being upgraded and that constantly create new working environments and entrepreneurial planning, or even new communication practices with emphasis on the new social collegialities. Against such an ascertainment and similar arguments some particular aspects that can be examined are important, and in particular:

- *the time of usage, thus a parameter that defines the equality or inequality that is produced through the use of new technologies,*
- *the different possibility of managing time regarding usage of the modern means of technology,*
- *the distinction between productively available and non-productive time, regarding the utilization of new technologies,*
- *Internet usage for learning, information, entrepreneurship or for professional purposes and professional development,*

As a conclusion, what is being sought is whether the different quality in usage creates conditions to broaden inequalities and create new social elites, which utilize the benefits of the use of the new technologies in the most efficient way.

Including all the aforementioned quality criteria for differentiation regarding the additional hypotheses, the interest of the analysis is shifted further than the broadened chances for access and increase of the percentage of new technologies users and the examination in particular of the distinctive character of the digital goods and the determining factors, that are detected both is their way of usage and in the quality of the goods in combination with the purposes and the environment of usage is attempted.

METHOD OF ANALYSIS AND SOURCES FOR RAISING STATISTIC DATA

For the examination of the existence of social and peripheral inequalities between a) the various groups of European Countries, b) citizens with different socio-economic characteristics and c) enterprises that present a different size, a secondary analysis of statistic data, which come from surveys in the Member-States of the European Union and published by Eurostat, was conducted.

The time series concerning citizens and households covers the recent period 2005-2013, while for the last year 2013 thematic maps are presented to make similarities and differences among Countries more obvious.

ANALYSIS OF SECONDARY DATA REGARDING THE RESTRICTION OR THE INCREASE OF SOCIAL AND PERIPHERAL INEQUALITIES

From Table 1 it becomes obvious that in 2005 the citizens of almost all European Countries aged between 16 and 74, have never used the Internet in percentages ranging from 36% to 82%. The highest percentages of non-usage of the Internet, over 50%, appear in the Southern and Central – Eastern Countries, Spain 50%, Latvia 51%, Malta 57%, Poland 58%, Hungary 60%, Lithuania 61%, Italy 62%, Czech Republic 63%, Portugal 63%, Cyprus 64%, Greece 73% and Turkey 82%, whereas only one country from Western Europe, Ireland (55%) ranges over 50%. On the contrary, the lowest percentages under 30% are presented by the Northern and Western Countries of the European Union, Iceland 11%, Sweden 12%, Denmark 14%, Norway 15%, the Netherlands 18%, the United Kingdom 28%, Germany 29% and Luxemburg 29%.

Table 1: Percentage (%) of people aged between 16 and 74 that have never used the Internet during the years 2005 - 2013

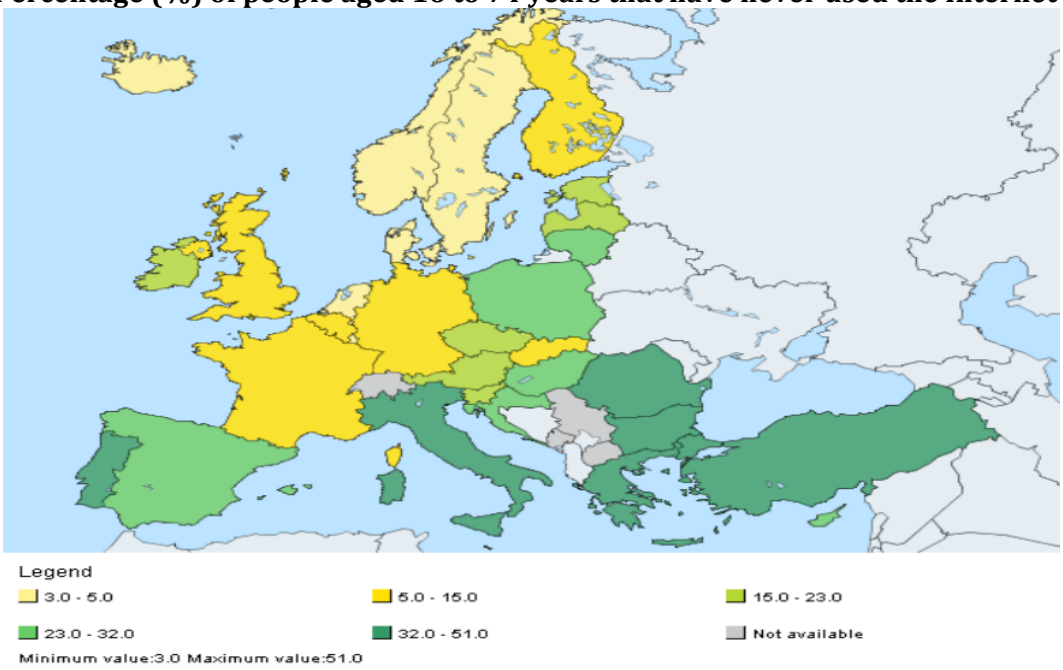
	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU (28 countries)	:	:	37	33	30	27	24	22	21
EU (27 countries)	43	42	37	33	30	27	24	22	20
Belgium	39	34	29	26	20	18	14	15	15
Bulgaria	:	71	65	57	53	51	46	42	41
Czech Republic	63	49	46	33	33	28	24	19	17
Denmark	14	10	12	12	11	9	7	6	4
Germany	29	26	23	20	19	17	16	15	13
Estonia	36	34	32	26	26	22	20	19	16
Ireland	55	42	35	32	30	27	21	18	18
Greece	73	65	62	56	53	52	45	42	36
Spain	50	47	43	38	36	32	29	27	24
France	:	46	34	26	25	20	18	15	14
Croatia	:	:	56	54	47	42	39	35	29
Italy	62	59	54	50	45	41	39	37	34
Cyprus	64	62	56	54	48	45	41	36	32
Latvia	51	45	39	34	31	29	27	24	22
Lithuania	61	54	49	43	38	35	34	31	29
Luxemburg	29	27	20	16	11	8	8	6	5
Hungary	60	52	46	37	36	32	28	26	24
Malta	57	58	51	49	40	36	30	29	28
The Netherlands	18	16	13	11	10	8	7	6	5
Austria	40	34	28	25	25	23	18	17	16
Poland	58	52	48	44	39	35	33	32	32
Portugal	63	60	56	54	50	46	41	34	33
Romania	:	74	69	64	62	57	54	48	42
Slovenia	48	43	39	40	33	28	29	28	23
Slovakia	42	41	35	25	22	17	20	18	15
Finland	23	18	17	13	15	11	9	7	6
Sweden	12	10	15	9	7	7	5	5	4
United Kingdom	28	29	22	19	15	13	11	10	8
Iceland	11	9	8	8	6	5	4	3	3
Norway	15	17	11	8	6	5	5	4	3
Former Yugoslav Republic	:	69	:	51	47	44	:	:	:
Serbia	:	:	65	:	56	:	:	:	:
Turkey	82	:	70	64	62	58	:	:	51

Source: Eurostat, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tin00093

Gradually and until today (2013) these percentages are decreasing spectacularly in every country. However, the Southern and Central – Eastern Countries of the European Union continue, until 2013, to present the highest percentages of people aged 16 to 74 who have never used the Internet [Bulgaria (41%), Romania (42%), Greece (36%), Italy (34%), Cyprus

(32%), Portugal (33%), Turkey (51%), Poland (32%), Spain (24%), Croatia (29%), Latvia (22%), Lithuania (29%), Hungary (24%), Malta (28%), Slovenia (23%)]. On the contrary, the Northern – Western Countries keep on reducing the percentages of non-usage of the Internet and in 2013 some of them present a single-digit percentage [Iceland (3%), Norway (3%), Sweden (4%), Denmark (4%), the Netherlands (5%), Luxemburg (5%), Finland (6%), the United Kingdom (8%), France (14%), Belgium (15%)] (Map 1).

Map 1: Percentage (%) of people aged 16 to 74 years that have never used the Internet in 2013



Source: Eurostat, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tin00093

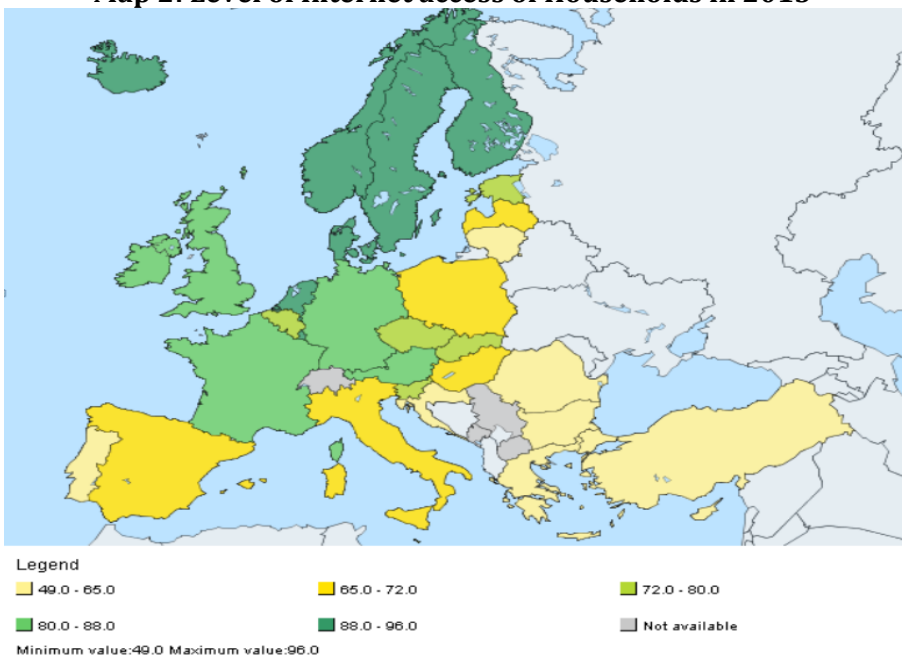
Regarding the level of Internet access of households, it is obvious from Table 2 that even since the first years of the analysis the Northern-Western Countries present the highest percentages of Internet access, over 50% [Belgium (50%), Finland (54%), United Kingdom (60%), Norway (64%), Luxemburg (65%), Sweden (73%), Denmark (75%), the Netherlands (78%) and Iceland (84%)]. Following a constant increase, regarding the level of Internet access of households in 2013, all European Union countries range over 50% (Map 2). As a matter of fact, some of them such as Denmark, Luxemburg, the Netherlands, Norway and Iceland tend to approach 100%.

Table 2: Level of Internet access of Households during the years 2005 – 2013 (percentages %)

	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU (28 countries)	:	:	55	60	66	70	73	76	79
EU (27 countries)	48	49	55	60	66	70	73	76	79
Belgium	50	54	60	64	67	73	77	78	80
Bulgaria	:	17	19	25	30	33	45	51	54
Czech Republic	19	29	35	46	54	61	67	65	73
Denmark	75	79	78	82	83	86	90	92	93
Germany	62	67	71	75	79	82	83	85	88
Estonia	39	46	53	58	63	68	71	75	80
Ireland	47	50	57	63	67	72	78	81	82
Greece	22	23	25	31	38	46	50	54	56
Spain	36	39	45	51	54	59	64	68	70
France	:	41	55	62	69	74	76	80	82
Croatia	:	:	41	45	50	56	61	66	65
Italy	39	40	43	47	53	59	62	63	69
Cyprus	32	37	39	43	53	54	57	62	65
Latvia	31	42	51	53	58	60	64	69	72
Lithuania	16	35	44	51	60	61	60	60	65
Luxemburg	65	70	75	80	87	90	91	93	94
Hungary	22	32	38	48	55	60	65	69	71
Malta	41	53	54	59	64	70	75	77	79
The Netherlands	78	80	83	86	90	91	94	94	95
Austria	47	52	60	69	70	73	75	79	81
Poland	30	36	41	48	59	63	67	70	72
Portugal	31	35	40	46	48	54	58	61	62
Romania	:	14	22	30	38	42	47	54	58
Slovenia	48	54	58	59	64	68	73	74	76
Slovakia	23	27	46	58	62	67	71	75	78
Finland	54	65	69	72	78	81	84	87	89
Sweden	73	77	79	84	86	88	91	92	93
United Kingdom	60	63	67	71	77	80	83	87	88
Iceland	84	83	84	88	90	92	93	95	96
Norway	64	69	78	84	86	90	92	93	94
Former Yugoslav Republic	:	14	:	29	42	46	:	:	:
Serbia	:	:	26	:	37	:	:	:	:
Turkey	8	:	20	25	30	42	:	:	49

Source: Eurostat, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=0&language=en&pcode=tin00134

Map 2: Level of Internet access of Households in 2013



Source: Eurostat, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=0&language=en&pcode=tin00134

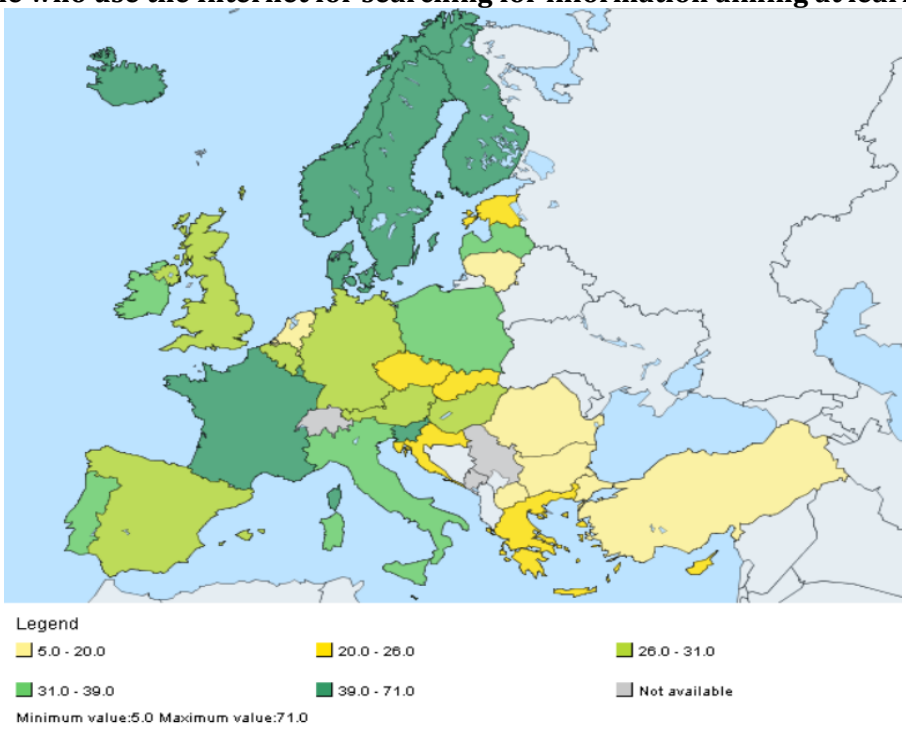
As has already been mentioned, an important factor to define social cohesion or social and peripheral inequalities, that can be brought upon by Internet usage is the way it is being used (learning, information, entrepreneurship or simple usage). Through Table 3 it is obvious that the highest percentage of people, who use the Internet in order to search for information aiming at learning in 2007, appears in the Northern – Western Countries [Finland (30%), France (41%), Iceland (42%), Norway (46%), Luxemburg (47%) and Denmark (53%)]. In 2010 the usage aiming at learning increases in all of Europe in comparison to 2007 and the countries with a high percentage in 2007 relatively slow down their pace, in a way that in some cases a decrease of the percentage to be appeared in comparison to 2009. On the contrary, several countries with lower percentages in 2007 accelerated this usage significantly. Greece, as a characteristic example, from 5% in 2007, approaches 24% in 2010. In general, the image regarding this characteristic is mixed in Europe with Bulgaria maintaining the Internet usage for learning only at 5% and Spain surpassing 70% of its population.

Table 3: Percentage (%) of people using the Internet for searching for information aiming at learning (2007 - 2010)

	2007	2008	2009	2010
EU (28 countries)	23	27	32	32
EU (27 countries)	23	27	32	32
Belgium	17	20	27	31
Bulgaria	2	5	4	5
Czech Republic	17	25	26	21
Denmark	53	47	50	56
Germany	27	28	31	29
Estonia	:	22	24	26
Ireland	16	21	30	35
Greece	5	22	23	24
Spain	19	25	29	29
France	41	47	53	47
Croatia	13	17	18	21
Italy	21	24	32	35
Cyprus	21	17	23	22
Latvia	5	13	34	39
Lithuania	20	20	22	20
Luxemburg	47	50	59	65
Hungary	19	22	29	30
Malta	21	23	34	38
The Netherlands	14	15	17	19
Austria	9	12	24	27
Poland	19	28	31	33
Portugal	26	33	39	39
Romania	8	11	15	17
Slovenia	24	31	29	42
Slovakia	3	14	15	21
Finland	30	31	66	67
Sweden	27	33	37	44
United Kingdom	24	25	31	29
Iceland	42	65	68	71
Norway	46	52	51	57
Former Yugoslav Republic of Macedonia	:	14	15	11
Serbia	1	:	10	:
Turkey	10	10	11	14

Source: Eurostat, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tin00104

Map 3: People who use the Internet for searching for information aiming at learning in 2010



Source: Eurostat,
http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tin00104

Map 3 also makes obvious the gap between, this time, Western and Eastern Countries in Europe.

One more important factor to examine is the level of personal Internet usage skills for people aged 16 to 74 years. In particular, the 6 usage skills that have been taken into account in the production of the data of table 4 and map 4 are the following: the usage of search engines, sending e-mails with attached files, sending messages in chatrooms, newsgroups or any online discussion forum, Internet usage for phone calls and peer-to-peer file sharing for sharing movies, music
(Eurostat,http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdsc470).

Through Table 4 it is obvious that the skills of people of every country for all the years of researching range in low levels under 50% even in 2013. The particular data refer to people who have achieve at least 1 of the above 6 skills regarding the Internet. It is characteristic that these skills are not extended in more people in Europe, during the 2005-2013 period of time, as a matter of fact in some countries and developed internet-wise as well (Sweden, Denmark etc) they are becoming dramatically less.

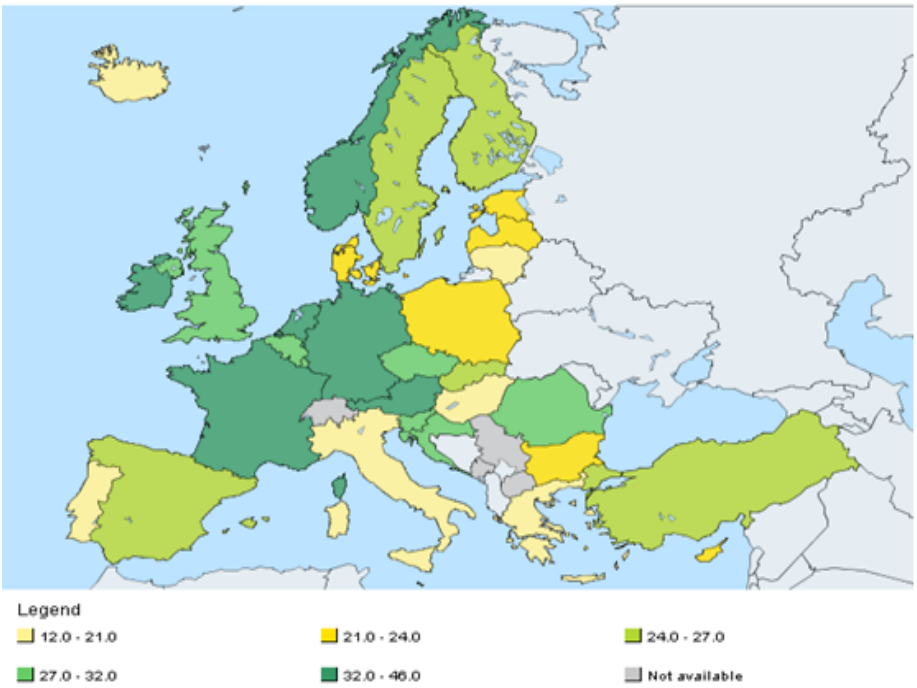
Table 4: Percentage % of people with skills in the use of the Internet aged between 16 and 74 during the years 2005 -2013

	2005	2006	2007	2010	2011	2013
EU (28 countries)	:	:	29	31	30	30
EU (27 countries)	31	30	29	31	30	30
Belgium	:	39	40	39	34	29
Bulgaria	:	10	13	21	19	22
Czech Republic	:	30	25	31	28	32
Denmark	47	40	37	36	29	23
Germany	41	41	41	41	42	46
Estonia	18	17	20	23	19	24
Ireland	37	42	42	36	36	35
Greece	20	23	22	25	20	21
Spain	:	27	23	30	28	27
France	:	:	25	29	31	34
Croatia	:	:	15	25	17	29
Italy	14	14	15	20	21	19
Cyprus	20	20	25	24	20	22
Latvia	27	29	22	22	12	23
Lithuania	20	20	18	17	13	12
Luxemburg	34	31	28	37	30	32
Hungary	19	23	22	24	22	20
Malta	28	22	22	24	19	26
The Netherlands	49	44	39	36	34	36
Austria	38	36	38	38	35	35
Poland	22	22	24	28	29	23
Portugal	20	22	16	15	20	21
Romania	:	14	16	25	20	29
Slovenia	30	27	25	30	23	28
Slovakia	39	34	34	29	27	26
Finland	37	39	39	48	29	27
Sweden	52	48	45	38	30	25
United Kingdom	:	38	41	38	35	31
Iceland	37	35	31	25	20	18
Norway	39	35	38	36	30	37
Switzerland	:	:	:	:	:	:
Former Yugoslav Republic of Macedonia	:	21	:	21	:	:
Serbia	:	:	20	:	:	:
Turkey	:	:	27	22	:	27

Source: Eurostat, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdsc470

Through table 4 it is obvious that people who present higher skills are the citizens of Germany (46%), Norway (37%), the Netherlands (36%), Ireland (35%), Austria (35%), France (34%), the Czech Republic (32%) and Luxemburg (32%). These are followed, with lower percentages, by the citizens of the United Kingdom (31%), Romania (29%), Croatia (29%), Belgium (29%), Slovenia (28%), Turkey (27%), Finland (27%) and Spain (27%). All the other countries follow with percentages under 26% whereas Italy (19%), Iceland (19%) and Lithuania (15%) range under 20%.

Table 4: Percentage % of people with skills in Internet usage aged between 16 and 74 during the year 2013



Source: Eurostat, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdsc470

The regional pattern of differences between western-eastern countries is appeared again, according the map 4.

At this point it is important to present the utilization rate of the Internet according to the level of education. It is obvious that in the European Union as a whole as well as in the individual countries, the percentage of people who use the internet is very high among the people with a higher level of education, whereas at a lower level of education the percentage of using the internet decreases. In the European Union of 28 member states 95% of the people with a high level of education use the Internet, at a middle level of education this percentage decreases to 80% and at a lower level at 52%. The same tendency is presented in the individual countries of table 5, too. It is also characteristic that between the countries, regarding every level of education, the participation is higher in countries such as Denmark, Sweden and the Netherlands compared with Greece, Bulgaria and Romania. It is interesting that in the first countries the percentage for people of a higher level of education is up to 100%. On the contrary, in the last countries (of the South) the amount of people with low level of education using the Internet is extremely low (21–35%).

In particular, in Greece 25% of the people with low level of education, 70% of the people with a medium level of education and 91% of people with a high level of education use the Internet. Respectively, in Italy, 35% of the people with low level of education, 76% of the people with a middle level of education and 87% of the people with a high level of education use the Internet. In Spain, the respective percentages are 49%, 86% and 95% and in Bulgaria 21%, 54% and 88%. It is remarkable that the percentage of people who used the Internet during the last trimester of 2013 in the Netherlands, Denmark and Sweden are closer among all three levels of education (over 80%).

Table 5: Percentage % of people who used the Internet the last trimester according to their level of education in selected EU Countries, 2013

COUNTRY	LEVEL OF EDUCATION		
	LOW*	MIDDLE**	HIGH***
E.U.-28	52	80	95
Greece	25	70	91
Italy	35	76	87
Spain	49	86	95
Netherlands	83	97	99
Denmark	91	96	99
Sweden	82	96	99
Bulgaria	21	54	88
Romania	23	53	94

Source: Eurostat, http://epp.eurostat.ec.europa.eu
*Low level: no official education or primary education or lower secondary education (junior high school)
** Middle level: Upper secondary education (senior high school) or post-secondary (non-tertiary)
*** High level: higher education

At this point it is important to present the utilization ratio of the Internet according to income. It is obvious that in the European Union as a whole as well as in the individual countries, the percentage of people who use the internet is very high among the people with a higher income, whereas for people with a lower income the percentage of using the internet decreases. In the European Union of 28 member states 96% of the people with a high income use the Internet, at a middle level of income this percentage decreases to 85% and at a very low level at 60%. The same tendency is also presented in the individual countries of table 6. It is also characteristic that between the countries themselves regarding every level of income the participation is higher in countries such as Denmark, Sweden and Belgium compared with Bulgaria, Lithuania, Italy, Hungary, Poland and Greece. It is interesting that in the former countries the percentage for people of a high level of income is up to 100%. On the contrary, in the latter countries (in the South, Center- Eastern) the amount of people with very low income using the Internet is extremely low (17–42%).

Table 6: People who used the Internet during the last trimester according to their income level % in E.U. countries 2013

LAND	IN COME			
	VERY LOW	LOW	MIDDLE	HIGH
Belgium	60	71	85	96
Denmark	83	93	97	99
Lithuania	31	50	75	93
Hungary	37	55	76	94
Poland	41	56	68	78
Sweden	83	91	96	99
Bulgaria	17	33	63	77
Greece	42	62	84	95
Italy	37	48	61	74

Source: Eurostat, http://epp.eurostat.ec.europa.eu

Finally, according to Table 7, the deviation of enterprises between countries is smaller, that is enterprises as a whole use the Internet on a larger scale in comparison with individuals. Nevertheless, small enterprises present, even the slightest, smaller percentages of Internet access. This also constitutes a differentiation in the enterprise's possibilities to develop in favor of the larger ones, which are generally presumed to be more sustainable.

Table 7: Internet access level of enterprises during 2013 (Percentage %)

	Small enterprises*	Large enterprises**		Small enterprises*	Large enterprises**
EU (28 countries)	96	100	**Hungary**	87	98
EU (27 countries)	96	100	**Malta**	94	98
Belgium	96	99	**The Netherlands**	100	100
Bulgaria	87	99	**Austria**	97	100
Czech Republic	96	100	**Poland**	92	100
Denmark	99	100	**Portugal**	95	100
Germany	98	100	**Romania**	82	98
Estonia	96	100	**Slovenia**	97	100
Ireland	94	99	**Slovakia**	98	99
Greece	86	100	**Finland**	100	100
Spain	96	100	**Sweden**	97	99
France	99	100	**United Kingdom**	95	99
Croatia	97	99	**Iceland**	98	100
Italy	97	100	**Norway**	97	99
Cyprus	92	100	**Former Yugoslav Republic of Macedonia**	90	98
Latvia	93	99	**Turkey**	:	:
Lithuania	100	100	**Luxemburg**	98	100

Source: Eurostat,
http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_ci_in_en2&lang=en
* Small enterprises (10-49 employees), without financial sector
** Large enterprises (250 employees or more), without financial sector

The differentiation in the Internet usage depending on the size of the enterprise is verified by Table 8 too, where the percentage of large enterprises (over 250 employees) is shown in more advanced internet applications, thus the possibility to employ long-distance employees who are connected with the enterprise's computer systems from home (2006). On the contrary, for small enterprises the long-term employed staff decreases. Thus, the differences in the development of the enterprises remain against the small ones and in favor of the large ones.

It is important to mention that apart from the differences that prevail between the size of the enterprises; the differences between the European Union countries are also visible. The highest percentages of employing long-distance employees who are connected via informatics systems from home are mainly presented in the Northern – Western Countries in comparison with the respective Southern, Central – Eastern countries., as do not only in the large enterprises of these countries, that prevail with percentages that are often over 70% [Denmark (95%), Finland (77%), Sweden (84%), United Kingdom (79%), Iceland (66%), Norway (94%), Belgium (71%), Ireland (59%), the Netherlands (85%)] as well as the small ones [Denmark (46%), Finland (24%), Sweden (34%), United Kingdom (26%), Iceland (42%), Norway (44%), Belgium (21%), Ireland (20%), the Netherlands (29%)] but in the smaller enterprises as well.

Table 8: Percentage % of enterprises that have long-distance employees who are connected with the enterprise's computer systems from home (2006)

	Small enterprises*	Medium enterprises **	Large enterprises***
EU (27 countries)	13	30	55
Belgium	21	50	71
Bulgaria	9	10	17
Czech Republic	15	31	48
Denmark	46	81	95
Germany	15	39	65
Estonia	18	34	53
Ireland	20	38	59
Greece	14	25	52
Spain	5	17	40
Italy	2	7	23
Cyprus	10	28	62
Latvia	5	12	27
Lithuania	11	13	30
Luxemburg	16	25	66
Hungary	8	16	36
Malta	:	:	:
The Netherlands	29	56	85
Austria	16	37	64
Poland	3	8	15
Portugal	7	21	49
Romania	6	9	20
Slovenia	23	32	65
Slovakia	12	17	34
Finland	24	56	77
Sweden	34	59	84
United Kingdom	26	49	79
Iceland	42	67	66
Norway	44	78	94

Source: Eurostat,
http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=tin00082&language=en
* Small enterprises (10-49 employees), without the financial sector
** Medium enterprises (50-249 employees), without the financial sector
*** Large enterprises (250 employees or more), without the financial sector

CONCLUSION

On the basis of the theoretical documentation where the questions were raised that approach the dynamic of differentiated characteristics that highlight new forms of inequalities in various levels – and in particular between countries, on a different financial level and educational capital, reaching even enterprises with different sizes, the following conclusions derive, based on the analysis that preceded:

By giving the usage variable a content, thus by detecting its qualitative characteristics on the expected utility through obtaining valuable information, upgrading skills and learning outcomes, the finding is fierce that on a level of people the differentiation regarding the usage

and the way of usage is correlated with the intensity of social inequalities and mainly with the new features the inequalities which are connected to the utilization of new technologies present. Those differentiations, as they have been commented on through the tables that have been presented, reflect common characteristics of citizens regarding the qualitative and productive utilization of modern communication media that are obviously differentiated on a geographical level, depending on the progress, the achievements and the integration grade of modern means of information and communication and the facilitation the various member states provide to the citizens within the unified European area to utilize those possibilities that are being provided.

So, it is ascertained that citizens of countries, that have modern means of information and communication with advanced possibilities of utilization, such as the Northern Western European countries, indeed utilize those possibilities in very high percentages. This facilitation is the result of the development perspectives that those member states have drawn on a level of political integration of new technologies in the sector of finances, work and promotion of the entrepreneurial spirit.

The finding, that the possibilities that are provided are utilized on a high level in those countries and with relatively small internal differentiations from citizens who present different financial characteristics, a different educational level and social capital, is also important. It is typical, that all chances of utilizing digital means are diffused in all educational and income levels, something that is interpreted from the fact that even people with a low level of education or income are not excluded from information society and, by extension they do not face or experience the special type of social inequalities regarding the criterion of penetration and utilization the modern media offer very strongly. This ascertainment clearly shows elements of digital convergence and internal social cohesion in these countries.

On the other hand and on a level of unified European area the intended convergence is reversed, given that in the European South the internal differentiations are large and are ascertained by the width of deviation presented by the different socio-economic groups regarding the utilization of the possibilities of using new technologies. So, the digital divide is obvious in the internal of those countries (of the European South), as well as in an overall comparison of the European countries on a geographical North-South level.

Those differentiations in combination with the growth of the divide as well as with the inability to monitor and utilize the possibilities and goods by large population strata, not only solidify social inequalities, but there is also a risk emerging that those inequalities will broaden. It concerns inequalities that obtain new characteristics and are largely connected with the inability of structural changes and political measures that will encourage the use of new technologies to predominate, which may be not only individually but overall efficient as well, to the extent that it either follows a central or peripheral planning of confirmation or validation, or there is a recognition of the success in the framework of entrepreneurship and innovation.

Furthermore, the finding that the simple dissemination of usage in not capable to reverse this evolution is also important, because the main criterion of an eventual reversal is the reinforcement of the qualitative characteristics of usage and in particular those that are connected to the professional perspective, the entrepreneurial spirit and innovation, something that is not yet apparent as a possible evolution for a large number of citizens. At this point it has to be mentioned that the success of a broad dissemination, which however is reduced to the usage in the framework of free time and recreation, cannot bring upon a reversal in this situation.

On another level that refers to the differentiations regarding the use of new technologies concerning enterprises, no strong deviations are reflected given that the usage is widespread enough in all the forms of enterprises. Of course, differences are also presented here that are mainly detected in the innovation and acceleration of entrepreneurial activity in an international environment, something that requires an even higher utilization of modern technological means on the part of certain enterprises. Furthermore, regarding enterprises the differentiation especially regards special cost-saving usages which also facilitate social problems (reconciliation of family and work), such as teleworking. Here, the precedence of the already privileged large enterprises, which due to the allocation of resources and integration of innovation differentiate themselves even more from the small enterprises regarding the prospects for development, can be seen.

In conclusion and on a level of social inequalities, the weaker socio-economic groups still fall quantitatively and qualitatively short in Internet usage, a fact that means high social inequalities. The divide is more intense in the countries in the South compared to the countries in the North and West, so that not only shortage can be noticed in the former in comparison with the latter, but regression of the aspired social cohesion too, which endangers social peace and the prospects of development and social justice.

References

Bucy, E. P., Social access to the internet, *Harvard International Journal of Press/Politics*, 2000, 5(1), 50-61.

Mancinelli, E., E-inclusion in Information Society, In Pinter, R. (edit.), *Information Society*, Thessaloniki: Technological Educational Institute of Thessaloniki, 2008, p. 247-270.

Peter, J., & Valkenburg, P. M., Adolescents' internet use: Testing the ''disappearing digital divide'' versus the ''emerging digital differentiation'' approach. Poetics, 2006, 34: p. 293-305.

Castells, M., *The Rise Of The Network Society*, Oxford: Blackwell Publishers, 2000.

Van Dijk, J., *The Deepening Divide: Inequality in the Information Society*, Thousand Oaks CA, London, New Delhi: Sage Publications, 2005.

DiMaggio, P., Hargittai, E., Russell Numan, W., & Robinson, J. P., Social Implications of the Internet, *Annual Review of Sociology*, 2001: 27:¨307-336.

Witte, J. C., & Mannon, S. E., *The Internet and Social Inequalities*, New York: Routledge, 2010.

Bonfadelli, H., The Internet and knowledge gaps, A theoretical and empirical investigation, *European Journal of Communication*, 2002: 17(1), 65–84.

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Big Five Personality Types & Knowledge Hiding Behaviour: A Theoretical Framework

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ABSTRACT

The paper provides a theoretical framework explaining the relationship between personality types and knowledge hiding behavior. In a knowledge based economy, knowledge is the foundation of a firm's competitive advantage. Capturing, storing, sharing, and using knowledge has gradually become an integral part of most firms' knowledge management strategy. Extensive knowledge sharing within organizations still appears to be the exception rather than the rule. Hoarding knowledge and looking guardedly at the knowledge offered by others are natural human tendencies (Davenport & Prusak, 1998). So far, there have been studies on knowledge sharing but knowledge hiding is the area which is still untapped. Moreover, no study has been done to study the relationship between personality types and knowledge hiding behavior. This study, therefore, attempts to fill that research gap by providing a theoretical framework based on literature review. The study uses big five dimensions of personality theory of organization behaviour as it emerged from decades of research and has gained distinct prominence. Limitations and directions for future research are outlined.

Keywords: Knowledge hiding, big five personalities, knowledge sharing

INTRODUCTION

In a knowledge based economy, capturing, storing, sharing, and using knowledge has gradually become an integral part of most firms' knowledge management strategy. Organizations today want to make sure that they have an effective flow of knowledge to derive the maximum value from the knowledge asset. Transfer and sharing of knowledge are two quintessential of knowledge management. However, employees tend to withhold their knowledge even if they are encouraged and rewarded for doing so (Bock, Zmud, Kim, & Lee, 2005; Swap, Leonard, Shields, & Abrams, 2001). Many of the researchers tried to identify that why do people hoard or hide their knowledge (Ford, 2008; Garfield, 2006; Hislop, 2003; Webster et al., 2008) and others have tried to find the reasons as to why this happens and what could be done to promote knowledge sharing in the organizations (DeLong & Fahey, 2000; Elliott & O'Dell, 1999; Voelpel, Dous & Davenport, 2005). In spite of various steps initiated by management, extensive knowledge sharing within organizations still appears to be the exception rather than the rule. Hoarding knowledge and looking guardedly at the knowledge offered by others are natural human tendencies (Davenport & Prusak 1998).

LITERATURE REVIEW

Knowledge sharing

Knowledge sharing can be referred to as the process of capturing knowledge or moving knowledge from a source unit to a recipient unit (Bircham-Connoly, Corner & Bowden, 2005). Willem (2003) on the other hand defines KS as exchange of knowledge between two parties in a reciprocal process allowing reshape and sense making of the knowledge in the new context. Today's professionals are confronted with the ''information-based, knowledge-driven, service-intensive economy'' (Bartlett & Ghoshal, 2002). Thus, knowledge is dependent on the individuals in the organization. It has been suggested that organizational knowledge resides in the interactions between individuals which forms the basis of competitive advantage (Argote & Ingram, 2000; Nonaka, 1991). Knowledge can be classified into tacit and explicit (Nonaka, 1994). Explicit knowledge is defined by Polanyi (1966, 1998) as knowledge that is formal, systematic and can be codified into records, databases. Tacit knowledge on the other hand is defined as knowledge that is personal, intangible and embedded in the cognitive minds of people and is obtained through learning and experience (Polanyi, 1966, 1998). Such knowledge can only be transferred by applying it (Choi & Lee, 2003). This knowledge is therefore more difficult to retain since it is intangible and not available in records. Van den Hooff & de Ridder (2004) further divide KS into a) knowledge donating – one's own view on his KS willingness b) knowledge receiving –one's view on colleagues KS willingness. This research will explore KS views based on these two dimensions.

Several studies have tried to identify the reasons for people not sharing knowledge. Riege (2005) has classified KS barriers into three broad categories, viz., (a) individual barriers, (b) organizational barriers, and (c) technological barriers. Individual barriers refer to personal barriers such as lack of communication skills, lack of social networks, differences in culture, lack of time, lack of trust, lack of motivation, lack of awareness of the benefit of KS, lack of interaction, fear of not receiving recognition (Riege, 2005; Jain et al., 2007; Wai Ling et al., 2009). Organization barriers are barriers that originate from the firm. Examples of such barriers are lack of rewards, lack of support from top management, ineffective HRM practices, weak organizational structure, inadequate infrastructure, poor organizational culture, office politics, lack of KM/KS strategies, lack of formal and informal avenue to share knowledge, competition between business units, lack of training etc. (Riege, 2005; Jain, et.al, 2007; Wai Ling et.al, 2009). Among the technology barriers highlighted (Riege, 2005) are lack of integration of IT systems/processes, lack of technical support, lack of maintenance of integrated IT systems, people's reluctance to use IT systems and lack of training for familiarization of IT systems and processes.

Knowledge Hiding

Knowledge hiding is defined as an intentional attempt by an individual to withhold or conceal knowledge that has been requested by another person (Connelly, Zweig, Webster, & Trougakos, 2011). Connelly et. al. (2011, p. 67) contend that "knowledge hiding is not simply the absence of knowledge sharing. Although a comparison of knowledge hiding and sharing might suggest that individuals either share or hide their knowledge, we suggest that these variables are not the opposites of each other but rather two conceptually distinct constructs." According to one research (Takala & Urpilainen, 1999), hiding is not always deceptive. Hiding of knowledge could have positive intentions. This behaviour could be possessed to maintain confidentiality or to protect the interests of other parties (Saxe, 1991). Literally, it is not a uniformly negative behaviour. (Lane & Wegner, 1995). A newspaper survey of approximately 1700 readers suggests that 76 per cent of employees withhold knowledge from their colleagues (The Globe & Mail, 2006).

Interestingly, this knowledge hiding construct is comprised of three dimensions (Xenoudaki & Stafyla, 2012 p. 372): "playing dumb, evasive hiding, and rationalized hiding. An employee using the playing dumb strategy denies having the requested knowledge at his or her disposal and does not share this knowledge, not even in fragments. If an employee communicates false information, or promises to deliver the requested information at a later time while having no intention of doing so whatsoever, then he or she is thought to be operating under the strategy of evasive hiding. These two strategies are likely to have the intention of deception on behalf of the transmitter. During the third strategy, that of rationalized hiding, the hider does not share the requested knowledge (or information), although it does offer the seeker an explanation regarding the reasons for which he or she is unable to deliver, either by expressing a personal weakness to do so, or by transferring the responsibility for hiding that knowledge to a third party (for example, to the supervisor)."

Different researches have assigned different set of reasons behind knowledge hiding behavior within the organizations such as prosocial, instrumental, laziness, etc. (Connelly et al, 2011, Webster et al., 2008). Various perspectives are proposed by one more research including social exchange, norms of secrecy and territorial behaviors (Webster et al., 2008).

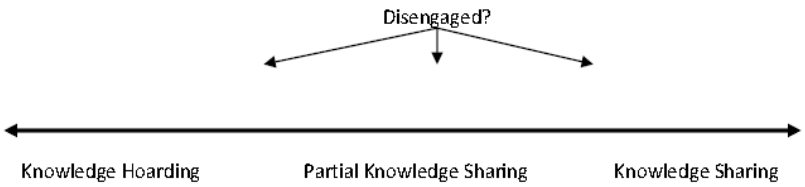
Knowledge Hiding vs. Hoarding

Researchers have attempted to distinguish between knowledge hiding and knowledge hoarding. Knowledge hoarding represent the act of accumulating knowledge that may or may not be shared at a later date (Hislop, 2003). It is more an act of accumulating knowledge with a purpose of making some gain out of it. According to Connelly et al (2011), in contrast to knowledge hoarding, knowledge hiding represents an intentional concealment of knowledge, or an intentional attempt to withhold or conceal knowledge that has been requested by another individual.

According to research by Ford (2008), there might be a behavior, called disengagement, in which individuals neither do share nor actively do hoard/hide their knowledge. However, knowledge hoarding is amassing and protecting of knowledge. Also, hiding is subset of knowledge hoarding. Hiding is basically protecting of knowledge which has been requested whereas hoarding would be the act of not sharing the knowledge (Ford, 2008).The research by Ford identified three different constructs i.e. knowledge sharing, partial knowledge sharing and knowledge hoarding and gave a diagrammatic representation of these three constructs on a continuum (Diagram source- Ford, 2008)-

Figure 1

Knowledge Sharing and Hoarding Continuum



Well, similar to hiding of knowledge, hoarding is not acceptable in the organizations. Employees shouldn't be allowed to hoard knowledge and information. Hoarding takes organizations at risk and hampers the productivity of other workers (Lloyd, 2009). Hence, the concepts of these two may overlap at times, but these are two different constructs in nature.

RESEARCH METHODOLOGY

Since the research in the field of knowledge hiding is quite novel, there is not much literature available. More than 70 research papers including knowledge hiding and knowledge sharing were culled from various sources such as EBSCO, JSTOR, PROQUEST, Google Scholar etc. However, only those papers were used which were relevant to this study. The focus while doing the literature review on knowledge hiding was on recent papers so that current state of the field could be identified. While doing the literature review on big five personalities, though there were umpteen literature available, only classical papers have been used. The keywords chosen to search the articles/papers were knowledge hiding, hiding, knowledge sharing, sharing, big five personalities, personality dimensions etc. Besides articles and papers, few surveys and newspaper articles were also referred.

BIG 5 PERSONALITY THEORIES: LITERATURE REVIEW AND PROPOSITIONS

Researchers have been trying to find out the reasons behind variety of individual behaviours such as sharing of knowledge, hoarding or hiding of knowledge etc. Relationship between personality types and learning styles, leadership styles, job satisfaction, job performance etc is well documented. However, the relationship between personality types and knowledge hiding remains unexplored. Earlier researches have shown that individuals who score high on personality inventories tend to be more motivated and enthusiastic about knowledge sharing (Matzler & Mueller, 2011). Few research studies took help of various personality theories to identify their relationship with knowledge sharing such as the Five Factor Model of Personality (FFM) or the Big Five Personality Model (Matzler & Mueller, 2011), self-efficacy (Tsai & Cheng, 2010) and self-esteem (Lee & Jang, 2010). At the same time, factors such as personal competence and confidence are one of the major requirements for an individual to possess knowledge sharing behaviour (Yaakub et al, 2013).

According to previous researches, individuals who are positive about themselves can face criticism and accept feedback more effectively (Judge & Mueller, 2011). They are hardly affected by negative evaluations and are risk taking (Lee & Jang, 2010). "Positive personality traits such as trust and openness are likely to be more influenced by anxiety and tend to withdraw from knowledge sharing behavior. They are afraid of being critiqued and evaluated by others. In our context, it is expected that high core self-evaluations will reduce evaluation apprehension and increase one's motivation in sharing knowledge (Yaakub et al, 2013)".Hence, it is clear that personality plays very important role in knowledge sharing or hoarding of information within organizations. As already discussed, various theories of personalities are used to identify the same but the two majorly used models are the big five personality model (Goldberg, 1990) and Myers-Briggs Type Indicator (MBTI) by Briggs & Myers (1987). Both the theories have their own pros and cons but big five personality instrument has been used often to assess the personality of individuals (Goldberg & Saucier, 1995; Mount, Ilies & Johnson, 2006; Sodiya, Longe, Onashoga, Awodele, & Omotosho, 2007). The main reason behind this is that it covers most aspects of personality (Robbins, 2003). The big five traits emerged from decades of research and have been celebrated for their ability to simplify an otherwise overwhelming number of traits (Hofsted, 1994; John, 1990; McCrae & Costa, 1987), their cross-cultural capability (McCtae & Costa, 1997), and their ability to predict behavior. To understand Big Five Personalities dimensions (Extraversion, Emotional Stability, Agreeableness,

Conscientiousness, and Openness to Experience) and how does it affect the knowledge hiding behaviour, we need to understand each of these dimensions one by one.

Extraversion

This is the first dimension in big five personality and most frequently this is called as Extraversion or Surgency (Botwin & Buss, 1989; Digman, & Chock, 1981; Hogan, 1983; Howarth, 1976; Norman, 1963). The major traits include outgoing, gregarious, assertive, talkative, and energetic. Hogan (1986) considers this dimension as of two components. The first one is 'ambition' that includes initiative, surgency, ambition, and impetuous and the other one is 'sociability' that includes sociable, exhibitionist, and expressive. In a research, extraversion is found to be positively related to the attitude towards knowledge sharing (Teh, Yong, Chong, & Yew, 2011).

Individuals high in extraversion tend to be sociable (Besser & Shackelford, 2007). Extraverts are highly enthusiastic, energetic and positive. Studies have suggested that extraverts are likely to have positive emotions and contribute to greater team satisfaction (Watson & Clark 1984; Barrick, Stewart, Neubert, & Mount, 1998). As extraverts are emotionally positive and are quite satisfied when working with teams, these individuals might increase knowledge sharing among group members to make their team viable (Teh et al, 2011). On the basis of the traits possessed by extraverts, it is assumed that these individuals would not prefer to hide knowledge. These people would be highly outspoken and enthusiastic about revealing whatever knowledge they have. Hence, it is proposed that-

Proposition 1- A negative relationship exists between extraversion and knowledge hiding behaviour.

Neuroticism

This is the second dimension of big five personality. According to Barrick and Mount (1991), "Common traits associated with this factor include being anxious, depressed, angry, embarrassed, emotional, worried, and insecure." According to John (1989), "Neuroticism contrasts emotional stability with different negative moods such as anxiety, sadness and nervous tension." It is said that people who are high on neuroticism often express their attitudes toward their co-workers (Lepine & Dyne, 2001). In a research, neuroticism is found to be positively related to the attitude towards knowledge sharing (Teh et al., 2011). Infact, in one more research, it is found that neuroticism people have poor emotional stability and can easily surrender under anxiety, depression or insecurity (Martínez et al., 2010). Hence, despite of the fact that neurotic people possess negative moods and anxious behaviour, taking previous researches into consideration, it can be assumed that people who are high on neuroticism would not indulge in knowledge hiding behaviour. This presents another set of proposition.

Proposition 2- A negative relationship exists between neuroticism and knowledge hiding behaviour.

Agreeableness

The third dimension agreeableness is also known as Likability (Conley, 1985; Hakel, 1974; Hogan, 1983; McCrae & Costa, 1985; Norman, 1963). Researchers have given different names to it such as friendliness (Guilford & Zimmerman, 1949), social conformity (Fiske, 1949) etc. Characteristics which identify agreeableness are being courteous, flexible, trusting, good-natured, cooperative, forgiving, soft-hearted, and tolerant. Agreeableness indicates individual's predisposition of being interpersonally pleasant (Besser & Shackelford 2007). Individuals high in agreeableness are courteous, good-natured, helpful, forgiving, generous, joyful and

cooperative (Barrick & Mount, 1991). Characteristics such as sympathetic, altruistic, cooperative, trust worthy and friendly nature are possessed by them which shows that they are willing to share their knowledge in order to make the project successful (Srinivasan, 2009). Due to the characteristics possessed by agreeable individuals, it can be assumed that they would not indulge in knowledge hiding behaviour. Being good natured and liked by people, they would like to be supportive towards others. The proposition proposed is as follows:

Proposition 3- A negative relationship exists between agreeableness and knowledge hiding behaviour.

Conscientiousness

It is also known as Conscience (Hakel, 1974; John, 1989; McCrae & Costa, 1985; 1987; Norman, 1963), although it has also been called Conformity or Dependability (Hogan, 1983). This dimension remained contentious among research scholars as some writers (Botwin & Buss, 1989; Hogan, 1983; John, 1989) have suggested that conscientiousness implies dependability which means being careful, responsible, well thought-out, and planful. Others have added some additional traits to these which say it includes volitional variables such as hardworking, persevering and achievement-oriented. It is assumed that a person high on conscientiousness is more cooperative with others compared to those having lower level of conscientiousness (Lepine & Dyne, 2001). Conscientiousness possesses traits related to dependability, sense of accomplishment and perseverance (Thomas, Moore & Scott, 1996). Individuals with high conscientiousness are considered to be more dutiful, dependable, reliable, responsible, organized and hardworking (Barrick & Mount, 1991). These people are responsible but due to their highly achievement orientation, it could be assumed that these people will indulge in hiding of knowledge to achieve their target, which leads to next proposition:

Proposition 4- A positive relationship exists between conscientiousness and knowledge hiding behaviour.

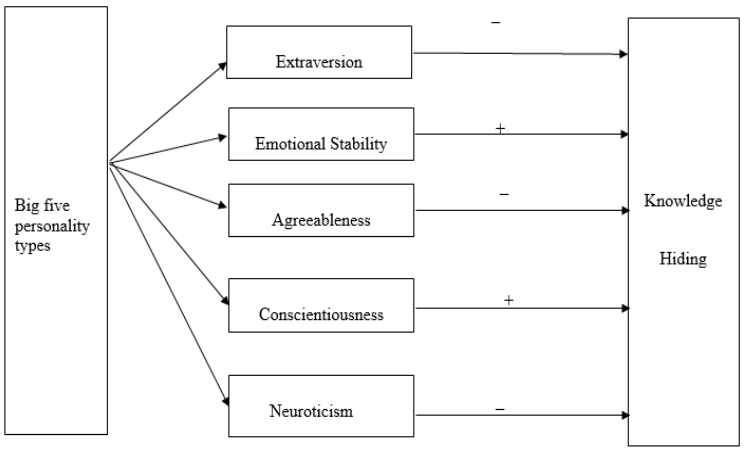
Openness to Experience

This is the last dimension and also known as Intellect or Intellectence (Digman & Takemoto-Chock, 1981; Hogan, 1983; John, 1989). Openness to Experience (McCrae & Costa, 1985) or Culture (Hakel, 1974; Norman, 1963), the trait it possesses includes being imaginative, inquisitive, cultured, original, broad-minded, intellectual, and creatively sensitive. This dimension reflects individual's independent, liberal, and daring behaviour. Due to this nature, these individuals intend to gain new knowledge.

In a research, openness to experience is found to have an inverse relationship with the attitude towards knowledge sharing (Teh et al, 2011). Being curious, intelligent, innovative and daring or courageous in nature, it could be assumed that these people would have preference for hiding of knowledge. Hence, the next set of propositions follows:

Proposition 5- A positive relationship exists between openness to experience and knowledge hiding behaviour.

Diagrammatically, the proposed theoretical framework between the big five personality dimensions and knowledge hiding can be shown as follows:



Relationship between big five personality dimensions and knowledge hiding

CONCLUSION, LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCHERS

The paper makes an attempt to explain a possible relationship that may exist between personality types and knowledge hiding. The relationship needs to be tested empirically. An empirical study by future researchers in different contexts will add to the existing body of knowledge in this field. Such a study will have practical utility for the organizations (such as academic institutions and companies in the IT domain) for whom organizational learning and knowledge management is of great importance. Organizations will be able to design a selection test so that they are able to recruit people with required personality type. The paper makes a unique contribution to theory because this construct has not been examined so far.

It may be noted that the paper has not considered the factors that may have moderating effect on knowledge hiding. It may be worthwhile to see if the culture, leadership, degree of trust etc. may moderate the effect of personality on knowledge hiding. It will also be useful to examine how knowledge hiding affects organizational performance and the kind of organizations that are likely to suffer more because of knowledge hiding.

References

Argote, L. & Ingram, P. (2000). Knowledge transfer: A basis for competitive advantage in firms. *Organizational Behavior and Human Decision Processes*, *82* (1), 150-169.

Barrick, M. R. & Mount, M. K. (1991). The big five personality dimensions and job performance: a meta-analysis. *Personnel psychology*, *44*, 1-26.

Barrick, M.R., Stewart, G.L., Neubert, M.J. & Mount, M.K. (1998). Relating member ability and personality to work-team processes and team effectiveness. *Journal of Applied Psychology*, *83*(3), 377-391.

Bartlett, C.A. & Ghoshal, S. (2002). Managing Across Borders: The Transnational Solution: Harvard Business School Press.

Besser, A. & Shackelford, T.K. (2007). Mediation of the effects of the big five personality dimensions on negative mood and confirmed affective expectations by perceived situational stress: A quasi-field study of vacationers. *Personality and Individual Differences, 42*(7), 1333-1346.

Bircham-Connolly, H., Corner, J. and Bowden, S. (2005). An empirical study of the impact of question structure on recipient attitude during knowledge sharing. *Electronic Journal of Knowledge Management, 32* (1), 1-10.

Bock, G.W., Zmud, R.W., Kim, Y. G., & Lee, J. N. (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces & organizational climate. *MIS Quarterly, 29*, 87–112.

Botwin, M.D. & Buss, D.M. (1989). Structure of act-report data: Is the five-factor model of personality recaptured? *Journal* of *Personality* & *Social Psychology, 56,* 988-1001.

Briggs, K.C., Myers I.B. & McCaulley M.H. (1987). The Myers-Briggs Type Indicator (Form G). *Consulting Psychologists Press*, Palo Alto, CA.

Choi, B. & Lee, B. (2003). An empirical investigation of KM styles and their effect on corporate performance. *Information and Management, 40* (5), 403-417.

Conley J. J. (1985). Longitudinal stability of personality traits: A multi trait-multi method multi occasion analysis. *Journal* of *Personality* & *Social Psychology, 49,* 1266-1282.

Connelly E. C., Zweig D., Webster J., & Trougakos P. J. (2011). Knowledge hiding in organizations. *Journal of Organizational Behavior*, *33*, 64–88.

Davenport, Thomas H., & Prusak, L. (1998). *Working Knowledge: How Organizations Manage What They Know*. Cambridge, MA: Harvard Business School Press.

DeLong, D.W. & Fahey, L. (2000). Diagnosing cultural barriers to knowledge management. *Academy of Management Executive, 14*(4), 113-127

Digman, J. M., Takemoto-Chock, N. K. (1981). Factors in the natural language of personality: Re-Analysis, comparison, and interpretation of *six* major studies. *Multivariate Behavioral Research,* I6, 149-170.

Elliott & O'Dell,C. (1999). Sharing Knowledge & Best Practices: The Hows and Whys of Tapping Your Organization's Hidden. *Health Forum Journal, 42*(3), 34.

Fiske D W. (1949). Consistency of the factorial structures of personality ratings from different sources. *Journal ofAbnoma1 Social Psychology, 44,* 329-344.

Ford, D. P. (2008). Disengagement from knowledge sharing: the alternative explanation for why people are not sharing. *Administrative Sciences Association of Canada*, 1-24.

Garfield, S. (2006). 10 reasons why people don't share their knowledge, *KM Review, 9*(2), 10-11.

Goldberg, L. R., & Saucier, G. (1995). So what do you propose we use instead? *Psychological Bulletin, 117*, 221–225.

Goldberg, L.R., (1990). An alternative "description of personality": The big-five factor structure. *Journal of Personal and Sociological Psychology*, *59,* 1216-1229.

Guilford, J. P. & Zimmerman, W. S. (1949). *The Guilford-Zimmerman Temperament Survey.* Beverly Hills, CA: Sheridan Supply.

Hakel, M. D. (1974). Normative personality factors recovered from ratings of personality descriptors: The beholder's eye. *Personnel psychology*, *27*, 409-421.

Hislop, D. (2003). Linking human resource management and knowledge management via commitment: A review and research agenda. *Employee Relations*. doi:10.1108/01425450310456479

Hogan, R. (1983). A socio analytic theory of personality. In Page MM. (Ed.), *Personality current theory & research: Nebraska symposium on motivation.* Lincoln, NE University of Nebraska Press.

Howarth, E. (1976). Were Cattell's 'personality sphere' factors correctly identified in the first instance? *British Journal of Psychology, 67*, 213-230.

Jain, K.K, Sandhu, M.M. and Sidhu, G.K (2007), "Knowledge sharing among academic staff: a case study among business schools in Klang Valley, Malaysia", *Journal for the Advancemnet of Arts and Science,* Vol. 2 January 2007, pp.23-29.

John O. P. (1989). Towards a taxonomy of personality descriptors. In Buss DM, Cantor N (Eds.), *Personality psychology: Recent trends and emerging directions*. New York: Springer-Verlag.

John, O. P. (1990). The "Big Five" factor taxonomy: Dimensions of personality in the natural language and in questionnaires. In L. A. Per vin (Ed.) Handbook of personality: Theory and research, 66-100, New York: Guilford Press.

Judge, T. A. & Mueller, J. D. (2011), "Implications of core self-evaluations for a changing organizational context", Elsevier Science BV, *Human Resource Management Review*, *21*(4), 331-341.

Lane, J. D., & Wegner, D. M. (1995). The cognitive consequences of secrecy. *Journal of Personality and Social Psychology*, *69*, 237–253.

Lee E. J., Jang, J. W. (2010). Profiling good Samaritans in online knowledge forums: Effects of affiliative tendency, self-esteem, and public individuation on knowledge sharing. *Computers in Human Behavior, 26 (*6), 1336-1344.

Lepine, J.A. & Dyne, L.V. (2001). Voice and cooperative behaviour as contrasting forms of contextual performance: Evidence of differential relationships with big five personality characteristics and cognitive ability. *Journal of Applied Psychology*, *86*(2), 326-336.

Lloyd J. (2009). Manager Must Show Employees That Hoarding Knowledge Won't Bring Job Security. Aspen publishers Inc.

Lorr, M, Manning, T. T. (1978). Higher-order personality factors of the ISI. *Multivariate Behavioral Research, 13,* 3-7.

Martínez, L.G., A.R. Díaz, G. Licea & Castro J.R. (2010). Big five patterns for Software Engineering roles using an ANFIS learning approach with RAMSET. Proceedings of the 9th Mexican International Conference on Artificial Intelligence Conference on Advances in Soft Computing: Part II (MICAI' 10), 428-439.

Matzler K. & Mueller J. (2011), "Antecedents of knowledge sharing – Examining the influence of learning and performance orientation", Elsevier Ltd*., Journal of Economic Psychology*, 32(3), 317-329.

McCrae, R. R., & Costa, P. T. (1997). Personality trait structure as a human universal. *American Psychology*, *52*, 509-516.

McCrae, R. R., & Costa, P. T., Jr. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology, 52,* 81-90.

McCrae, RR, & Costa P. T. (1985). Updating Norman's "adequate taxonomy": Intelligence and personality dimensions in natural language and in questionnaires. *Journal of Personality & Social Psychology, 49*,710-721.

Mount, M., Ilies, R, & Johnson, E. (2006). Relationship of Personality Traits and Counterproductive Work Behaviors: The Mediating Effects of Job Satisfaction. *Personnel Psychology, 59*, 591-622.

Nonaka, I. (1991). The knowledge-creating company. *Harvard Business Review*, *69* (6), 96-111.

Nonaka, I. (1994), A dynamic theory of organizational knowledge creation. *Organization Science, 5* (1), 14-37.

Norman, W. (1963). Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. *Journal of Abnormal & Social Psychology, 66,*576-583.

Polanyi, M. (1966). The Tacit Dimension, Routledge and Kegan Paul: London, UK.Polanyi, M. (1998). The Tacit Dimension, in Prusak, L. (Ed), *Knowledge in Organization*, Butterworth-Heinemann, Boston, MA

Riege, A. (2005). Three dozen knowledge sharing barriers managers must consider. *Journal of Knowledge Management, 9* (3), 18-35.

Robbins, S. P. (2003). Organizational Behaviour. *Prentice Hall, New Jersey*.

Saxe, L. (1991). Lying: Thoughts of an applied social psychologist. *American Psychologist*, *46*, 409–415.

Sodiya, A.S., H.O.D. Longe, S.A. Onashoga, O. Awodele and L.O. Omotosho (2007). An improved assessment of personality traits in software engineering. *Interdisciplinary Journal of Information in Knowledge Management, 2,* 163-178.

Srinivasan, S. S. (2009). Performance under requirements uncertainty: A personality perspective. Proceedings of PACIS.

Swap, W., Leonard, D., Shields, M., & Abrams, L. (2001). Using mentoring and storytelling to transfer knowledge in the workplace. *Journal of Management Information Systems*, *18,* 95–114.

Takala, T. & Urpilainen, J. (1999). Managerial work and lying: A conceptual framework and an explorative case study. *Journal of Business Ethics*, *20*, 181–195.

Teh L. P., Yong C.C., Chong W.C. and Yew Y. S. (2011). Do the Big Five Personality Factors affect knowledge sharing behaviour? A study of Malaysian universities. *Malaysian Journal of Library & Information Science*, *16*(1), 1-16.

The Globe and Mail (2006). The weekly web poll. Friday May 12, 2006, C1.

Thomas, P., Moore, K.S. & Scott, K.S. (1996). The relationship between self-efficacy for participating in self-managed work groups and the big five personality dimensions. *Journal of Organizational Behavior,* 17(4), 349-362.

Tsai, T. M. & Cheng, C. N. (2010), Programmer perceptions of knowledge-sharing behavior under social cognitive theory, Elsevier Ltd*., Expert Systems with Applications*, *37*(12), 8479-8485.

Van den Hooff, B. & De Ridder, J.A. (2004), Knowledge sharing in context: The influence of organizational commitment, communication climate and CMC use on knowledge sharing, *Journal of Knowledge Management, 8* (6), 117-130.

Voelpel, S. C., Dous, M., & Davenport, T. H. (2005). Five steps to creating a global knowledge-sharing system: Siemens' ShareNet. *Academy of Management Executive*, *19*(2), 9–23.

Wai Ling, C., Sandhu, M.S. and Jain, K.K. (2009), Knowledge sharing in an American multinational company based in Malaysia. *Journal of Workplace Learning*, *21* (2), 125-142.

Watson, D. and Clark, L.A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin*, 96(3), 465-490.

Webster, J., Brown, G., Zweig, D., Connelly, C. E., Brodt, S., & Sitkin, S. (2008). Beyond knowledge sharing: Knowledge withholding at work. In J. J. Martocchio (Ed.), *Research in personnel and human resources management, 27,* 1–37. Bradford: Emerald Group Publishing.

Willem, A. (2003). The Role of Organization Specific Integration Mechanisms in Inter-Unit Knowledge Sharing. PhD Dissertation, Vlerick Leuven Gent Management School, Ghent University, Belgium. Retrieved from http://72.14.203.104/search?q=cache:AwAf_ok1x7UJ:www.ofenhandwerk.com/oklc/pdf

Xenoudaki, C. & Stafyla A. (2012). Contextual Factors and Personality Traits in the Exhibition of Deceiving and Hiding-Related Behaviors of Employees, in Post Layoff Environments in Greece. *International Conference on Enterprise Systems, Accounting and Logistics*, 369-384.

Yaakub, K., Shaari, R., Panatik, S. A., Rahman, A. (2013). Towards an Understanding of the Effect of Core Self-Evaluations and Knowledge Sharing Behaviour. *International Journal of Applied Psychology*, *3*(1), 13-18. doi:10.5923/j.ijap.20130301.03

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An Empirical Analysis of the stochastic implications of Stock Price Movements in the Nigerian Capital Market

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ABSTRACT

The study provides further empirical insight on the behavior of stocks in four selected sectors of the Nigerian economy using the Runs and GARCH techniques to analyze monthly stock data for the period January to December, 2011. The results of the Runs Test do not support random movements of stocks in all the sectors, indicating homoscedasticity. The GARCH estimated model also shows volatility clustering in all the sectors except the Agricultural sector, which implies weak form inefficiency of the Nigerian capital market.

Keywords: Randomness; stochastic movements; runs; GARCH; homoscedasticity; heteroscedasticity; Nigeria

INTRODUCTION

Stock prices are generally presumed to move at random, a characteristic that makes stocks unpredictable, whether they are traded in developed or emerging capital markets. In other words, prices of stocks change almost every minute relative to the demand for them. Despite this expected trend some studies have indicated that stock prices are homogenous, showing evidence of consistency over a definite time horizon. Thus, the hypothesis of stochastic or random stock movements has continued to elicit curious interest, generating considerable questions about its efficacy in capital markets, including Nigeria.

When stock prices display stochastic tendency in a market, we say such market is weak form efficient and therefore, investors cannot outperform the market through speculative activities or predicting changes in prices to take advantage of other investors. The controversy over the random movement of stock prices and the attendant efficiency of the capital markets in the weak form have evoked a number of empirical studies that support the efficient market theory (Pele and Voineagu, 2008; Adelegan, 2009; Okpara, 2010). Similarly, there have also been studies that have given empirical validity against the efficient market theory, suggesting that stock prices are homogenous and not stochastic (Khan and Ikam, 2010; Nwosa and Oseni, 2011).

As an emerging market, the outcome of empirical investigations into the efficiency of the capital market has thrown up conflicting results in Nigeria. While the earlier works including Ayadi (1984) have received considerable endorsement and support from subsequent researches that stock prices in the Nigerian capital market move stochastically, recent researches however posit that previous prices can successfully predict current stock prices.
The answer to the question on whether stock prices move randomly or markets are weak form efficient over time and across capital markets has continued to attract interesting scholarship necessitating fresh investigation. We are thus motivated to contribute to this ever-refreshing

debate. Thus, the primary concern of this study is to examine the empirical validity of the random work hypothesis and if the stochastic behavior of stocks is empirically in sync with the efficient market hypothesis in the Nigerian capital market. The rest of the paper is presented as follows: literature review, methodology and data, results, conclusion and recommendations.

LITERATURE REVIEW

Pele and Voineagu (2008) investigated the Romanian capital market to determine its efficiency by adopting a model for long-horizons returns which decomposes the time series of prices natural logarithms into the sum of a random walk and a stationary component and evaluated the top 10 stocks that account for 60% of market capitalization. Relying on the parameters of the autoregressive process where the market is presumed efficient if p = 1 and inefficient if p =/ 1, they concluded that the Romanian Capital market was efficient in the weak form. They noted that the long-term stock price dynamics are influenced to a large extent by the actions of some potential short term and general factors. As a consequence they cannot reject the weak form efficiency hypothesis.

Khan and Ikram (2010) investigated the impact of foreign institutional investors on the Indian capital market with respect to the influence of publicly available information on asset returns, whether it is possible to capitalize on such information to earn excess return. Using data from 1st April 2000 to 31stMarch, 2010 consisting of monthly averages of two major stocks, the study adopted correlation and regression techniques and found that there is a significant impact on Indian capital market by the activities of foreign institutional investors. It concluded that the Indian capital market is semi – strong form efficient as the activities of the foreign institutional investment (FII) verily create instant reaction in the market, thus no investor can outperform the market.

Grossman and Stiglitz (1980) examined the impossibility of informationally efficient markets by calculating the expected utility of the informed and the expected utility of the uninformed investor. They assumed that both investors are identical ex-ante, the only difference is whether the informed and uninformed have spent money to obtain information. Extending the noisy rational expectations model introduced by Robert Lucas which Jerry Green applied to the study of information flows, the authors assumed a two asset model (a safe asset yielding a return and a risky asset) and two types of individuals, those who are informed traders and those who are uninformed traders. Applying Constant Absolute Risk- Aversion Model (CARM) to estimate budget constraints of an investor, individual's utility maximization, equilibrium price distribution, existence of equilibrium and characterization theorem, the authors concluded that it is impossible for capital markets to be informationally efficient.

Jenning and Stark (1985) conducted an investigation into the speed of stock price adjustment to new information, using PW stochastic process tests on how stratified sample data of last forecast after the announcement of earnings estimates of the Standard and Poor's Corporation and 40 other professional security analyst. The study revealed that announcements with anticipated high information content were associated with price adjustment processes, while those with low information content showed less evidence of anticipatory price movement, indicating price influences with high content announcement.

In a different market, Mobarek and Keasey (2000) investigated the Dhaka Stock Market of Bangladesh with a view to determining whether it is weak-form efficient as an emerging market. They adopted parametric tests of auto-regression and auto-regressive-integrated-moving average (ARIMA) to estimate daily market returns covering a sample period of 1st

January, 1988 to 31st December, 1997 and also non-parametric tests of koglomorov-Smirnov goodness of fit test and runs test and concluded that the Dhaka Stock Market of Bangladesh is not weak-form efficient. Hence the position that the stock prices move randomly is debunked in this market. A review of studies conducted in Nigeria showed mix conclusions as well.

Ayadi (1984) examined whether stock prices in Nigeria follow a predictable path by using Monday closing prices of 30 securities of the Nigerian stock exchange between 1stJanuary, 1977 and 31st December, 1980. Adopting the estimation models of Wald-Wolfwitz and runs non-parametric tests, the results show that share price movements in Nigeria follow a random walk.

Adelegan (2009) investigated whether the Nigerian capital market is efficient in the semi-strong form with respect to reactions to dividend announcement. The study used share price cutting across the pre and post liberalization regimes, concentrating on the 3-day, 21-day and 61-day event windows in the short-run for the period 1990 to 1999. In evaluating the speed of adjustment to announcements of dividend payments and omissions for 742 announcement dates. The study found that the Nigerian capital market is not semi-strong efficient.

Recently, Okpara (2010) in further investigating the random walk hypothesis in the Nigerian stock market used end of month averages of 121 securities listed in the NSE for the period 1984 to 2006. The study adopted the non-parametric test, runs test and the more scientific test, autocorrelation involving correlograms and the Ljung – Box Q statistics. The study confirmed that the Nigerian stock market is weak form efficient, thus corroborating earlier work of Ayadi (1984).

Concerned over the contrasting results of studies on the Nigerian capital market which at a time concluded that the market was efficient in the weak form and later that it was efficient in the strong form, particularly at a time when improved infrastructure should have impacted the information flow and enhanced performance, Emenike (2008) investigated the Nigerian capital market to determine whether it is efficient across time. The study was interested in knowing if efficiency could change over time. Using the monthly All Share Index (ASI) of the NSE, the study considered three distinct periods beginning from January 1985 to December 1992; January 1993 to December 1999 and January 2000 to December 2007. The statistical tools of normality test and runs test were used. The study showed that the Nigerian capital market is not efficient in the weak form across time. This however contradicts some previous studies.

For instance, Samuel and Yacout (1981) was reported in Adelegan (2009) to have used serial correlation test to examine weekly prices of 21 Nigerian firms listed in the Nigerian stock exchange from July 1977 to July 1979 and concluded that stock price changes are not serially correlated but follow a random walk, thereby accepting the weak-form market efficiency.

Olowe (1999) was reported by Okpara (2008) to have used the correlation analysis of monthly returns data of 59 individual stocks listed in the NSE to examine the weak form efficiency of the NSE and corroborated the findings of Samuel and Yacout (1981) and Ayadi (1984).

In their study, Ojo and Azeez (2012) conducted an examination to determine whether the Nigerian capital market is efficient in the strong form. Employing the econometric tool of autoregressive heteroscedasticity (ARCH) introduced by Engel (1982) and the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) introduced by Bollerslev (1986) to estimate data obtained from the NSE covering the period 1986 to 2010 the study indicated that the Nigerian capital market is efficient in the weak form.

Ajao and Osayuwu (2012) investigated the weak form efficiency of the Nigerian capital market using serial correlation technique to determine the independence of successive price movement and runs test to investigate the randomness of share price movement. Month end value data of the All Share Index (ASI) from the Nigerian stock exchange covering the period 2001 to 2010 was used for the analysis. The study concluded that prices of stock traded in the Nigerian capital market are random, thus giving fillip to the Random Walk Theory, which of course implies that the market is efficient in the weak form.

But the work of Nwosa and Oseni (2011) that examined the efficiency of the Nigerian stock market, for the period 1986 to 2010, using serial autocorrelation and regression analysis revealed that the Nigerian capital market is informationally inefficient. This means that stock prices do not exhibit random walk. According to their work, the lag value of stock price is significant, implying that previous stock prices can successfully predict current stock prices.

Therefore in an attempt to further investigate the form of efficiency of the Nigerian capital market, against the backdrop of conflicting findings of previous research works, the study decided to adopt detailed sectoral investigations with a view to establishing whether the findings in each of the sectors will correlate the overall market position.

METHODOLOGY

In this study, we used the non-parametric technique of *Runs* test in determining whether stock prices in the Nigerian capital market move at random based on its frequently varied use in previous researches, particularly in emerging markets (Vulic; Emenike, 2008; Barnes, 1986; Claessens, et al, 1995; Dickinson and Muragu, 1994; Simon and Larvea, 2004; Rahman and Hossain, 2006 as reported in Emenike, 2008). A *run* is defined as a succession of one or more identical symbols, which are followed and preceded by a different symbol or no symbol at all (Wang, 2003). As Gujarati and Sangeetha (2007) posited, while too many runs indicate negative correlation too few runs may suggest positive autocorrelation. In undertaking the *runs* test Gujarati (2007) expressed the *Mean, Variance* and expected approximated probability as shown below:

$$\text{Mean: } E(R) = \frac{2N_1N_2}{N} + 1 \qquad (1)$$

$$\text{Variance: } \sigma^2_R = \frac{2N_1N_2(2N_1N_2 -)}{(N)2(N-1)} \qquad (2)$$

$$\text{prob } [E(R) - 196\sigma_R \leq R \leq E(R) + 1.96\sigma_R] = 0.95 \qquad (3)$$

The Z statistics gives the probability of the difference between the actual and expected runs.

$$Z = \frac{R-M}{\sigma^2_R} \qquad (4)$$

Where:

N: total number of observation = N1 + N2
N1= number of + symbols (i.e + residuals)
N2 = number of – symbols (i.e – residuals)
R = number of runs

A further application of the parametric test, GARCH, which allows for time variant conditional variance and nonlinearities in generating mechanism (Okpara, 2010) is used to corroborate the findings of the Runs test. Adapting Brook's (2008) presentation, the GARCH model, which can be used to interpret the current fitted variance and information about volatility during the previous period, is expressed as:

$$\sigma^2_t = \alpha_0 + \alpha_1\varepsilon^2_{t-1} + \beta\sigma^2_{t-1} \quad (5)$$

Where:

σ^2_t = Conditional Variance

α_0 = Constant

$\alpha_1\varepsilon^2_{t-1}$ = Information about volatility during the previous period

$\beta\sigma^2_{t-1}$ = Fitted variance during the previous period

DATA

Data for this study, the daily stock prices, sourced from the website of Central Securities and Clearing system (http:/www.cscsnigerialtd.com), was downloaded in Microsoft excel format and converted into monthly balances. We further sourced the monthly balances of the Nigerian Stock Exchange All Shares index (ASI) from the fat book of the Nigerian Stock Exchange.

Application of Runs Test for the Random Movement of Agricultural Sector Stocks

Table-1 Run Test Results

	RS
Test Value[a]	0.2
Cases < Test Value	36
Cases >=Test Value	36
Total Cases	72
Numbers of Runs	42
Z	1.187
Asymp. Sig.(2-tailed	.235

a: Median

Source: Author's Computation

Table-1 reports the test of the random movement of returns in the agricultural sector based on Runs test Technique. The results show that observed z- statistics value of 1.187 is less that the critical value of 1.645. Therefore, we cannot reject the null hypothesis that the series of returns do not move randomly. This in order words means that the agricultural sector of the stock market cannot be said not to have memory.

Application of GARCH in Testing for Agricultural Sector Stocks Random Movements

Table-2. The Result of the GARCH Model

Variable	Coefficient	std. Error	z-Statistic	Prob.
VOLRS	**-7.339240**	**7.250817**	**-1.012195**	**0.3114**
RESID(-1)^2	**0.104487**	**0.172648**	**0.605205**	**0.5450**
GARCH(-1)	**0.158392**	**0.816374**	**0.194018**	**0.8462**

Source: Author's computation

The results in table 4.2 above show that there is no significant relationship between return and volatility given that the z- critical of 1.645 which is greater than the observed z-statistics at

value of -1.012195. The observed negative z-statistics value is further indicative of an inverse relationship between volatility and returns. There is also no volatility clustering and no presence of ARCH or GARCH since the combined value of the coefficients is only 0.258.

The Cause and Effect of Volatility and Returns in the Agricultural sector

Table-3 Granger Causality Test Results

Null Hypothesis:	Obs	F-Statistics	Probs
VOLRS does not Granger Cause RS	70	0.63747	0.5319
RS does not Granger Cause VOLRS		3.21141	0.0468

Source: Author's computation

The study observed that volatility does not Granger cause return since the critical F- statistics value of 2.37 is greater that the observed value of 0.63747. Accordingly, we cannot reject the null hypothesis. However returns does Granger cause volatility as the null hypothesis is rejected since the calculated F-statistic value of 3.2114 is greater that the critical value. The results show a unidirectional relationship.

From the results above, particularly the *runs* test, the study shows investors can conveniently use previous returns to predict future returns. This certainly confers advantage on market participants and analysts who indulges in the use of past data to predict future outcome to outperform the market since the series of returns do not have stochastic movement. The study further shows that the risk – return relationship is not only insignificant but also inverse in the agricultural sector. Investment in agriculture though preferred but usually not attractive because of perceived high volatility. Therefore performance of the agricultural sector may not have been strictly defined by market forces but due to government intervention. Given the employment potentials of the sector, government's intermittent interventions in forms of grants and subsidies constitute the occasional stimulus to drive the sector. The volatility and returns relationship in the mean variance equation of the GARCH Model further elucidates that the agricultural sector of the Nigerian capital market is not efficient in the weak form.

Application of Runs Test for the Random Movement of Automobile Sector Stocks

Table-4. Runs Test Results

	RS
Test Value[a]	.00
Cases<Test Value	32
Cases>=Test Value	40
Total Cases	72
Number of Runs	29
Z	1.816
Asymp. Sig. (2-tailed)	.069

a. Median

Source: Author's Computation

At an observed z- value of -1.816, which is less than the critical value of 1.645 at 5% degree of freedom, table 4.4 shows that the series of returns do not move randomly. This means there is

presence of runs or the market has memory. Therefore the impact of previous returns on current returns cannot be ruled out.

Application of GARCH in Testing for Automobile Sector Stocks Random Movements

Table-5. The Results of the GARCH Model

Variable	Coefficient	std. Error	z-Statistic	Prob.
VOLRS	4.321934	0.102205	42.28694	0.0000
RESID(-1)^2	-0.043669	0.003937	-11.09199	0.0000
GARCH(-1)	1.026246	0.006165	166.4500	0.0000

Source: Author's computation

From the mean equation in table 4.5 there is a positive relationship between return and volatility given the Z-statistics of 42.29. Given that the combined coefficients in the ARCH and GARCH in the variance equation are approximation 1, the study shows that there was volatility clustering of the returns. The presence of ARCH and GARCH further showed that there was no randomness in the movement of the returns.

The Cause and Effect of volatility and Returns in the Automobile Sector

Table-6. Granger Causality Test Results

Null Hypothesis	obs	F-statistic	Prob.
VOLRS does not Granger cause RS	70	0.95175	0.3914
RS does not Granger Cause VOLRS		0.82379	0.4433

Source: Author's computation

The calculated F-statistics values in table 4.6 are both less than the critical value of 2.37. We do not therefore reject the hypothesis that neither volatility nor returns Granger cause the other in the automobile sector. This finding is however not in tandem with theory.

Application of Runs Test for the random Movement of Banking sector stocks.

Table-7. Run Test Results

	RS
Test Value[a]	-.02
Cases<Test Value	36
Cases>=Test Value	36
Total Cases	72
Number of Runs	27
Z	-2.374
Asymp. Sig. (2-tailed)	.018

From the runs test in table-7, we observed z- statistics value of -2.374 is less than the critical value of 1.6449.

We cannot therefore reject the null hypothesis that the series of returns do not move randomly. Infact, the results showed there was presence of runs and the market has memory. Previous returns were thus not independent of current returns.

Application of GARCH in Testing for Banking Sector Stocks Random Movements.

Table-8. The Results of the GARCH Model

Variable	Coefficient	std. Error	z-Statistic	Prob.
VOLRS	0.303111	1.136815	0.266632	0.800
RESID(-1)^2	0.787034	0.390358	2.016186	0.044
GARCH(-1)	0.542846	0.127496	4.257755	0.000

Source: Author's computation

The mean equation in table 8 examines the relationship between volatility and return. It reveals that there is positive and significant relationship between volatility and returns during the study period. In the variance equation, we observed volatility clustering and the presence of ARCH and GARCH since the sum of the coefficients approximates 1.32.

The Cause and Effect of Volatility and Returns in the banking Sector

Table-9. Granger Causality Test Returns

Null Hypothesis	obs.	F-statistic	Prob.
VOLRS does not Granger cause RS	70	0.37564	0.688
RS does not Granger Cause VOLRS		16.2641	0.E-06

Source: Author's Computation

We noticed that the calculated F-statistics in the test of volatility compared to the critical value of 2.37 suggests that we cannot reject the null hypothesis that volatility does not Granger Cause return. This however is not applicable to the test of returns, which calculated F-statistics is greater than the critical, thus indicating that we can reject the null hypothesis. The unidirectional relationship between volatility and returns in the banking sector thus indicates that investors can use returns to predict volatility. In other words, where the returns of an asset of this sector is noticed to be high it portends that such asset has high risk and when the return is low, it presupposes low risk.

Application of Runs Test for the Random Movement of Beverages Sector Stocks

Table-10. Run Test Results

	RS
Test Value[a]	.00
Cases<Test Value	36
Cases>=Test Value	36
Total Cases	72
Number of Runs	29
Z	-1.899
Asymp. Sig. (2-tailed)	.058

a. Median

The results from the runs test in table 4.10 shows that the calculated z-statistic value of -1.899 is less than the critical value of 1.645, we cannot therefore reject the null hypothesis that the series of returns do not move randomly. It means investors in this sector can conveniently predict future returns with previous returns. This indicates weak form inefficiency.

Application of GARCH in Testing for Beverages Sector Random Movements

Table-11. The Results of the GARCH Model

Variable	Coefficient	std. Error	z-Statistic	Prob.
VOLRS	0.640794	1.815452	0.352967	0.7241
RESID(-1)^2	0.515304	0.258933	1.990110	0.0466
GARCH(-1)	0.565833	0.123910	4.566487	0.0000

Source: Author's Computation

The mean equation result in table 4.11 above indicates that there is positive relationship between volatility and returns, which is significant. The volatility coefficient of 0.640 shows that volatility could influence returns up to 64%. The variance equation also show that there is the presence ARCH and GARCH, given that the sum of coefficients is greater than 1. This means there was volatility clustering or pooling of the returns and this indicates autocorrelation.

The Cause and Effect of Volatility and Returns in the Beverages Sector

Table-12. Granger Causality Test Results

Null Hypothesis	obs.	F-statistic	Prob.
VOLRS does not Granger cause RS	70	1.25812	0.2910
RS does not Granger Cause VOLRS		16.2641	3.E-15

Source: Author's computation

While we do not reject the null hypothesis that volatility does not Granger cause returns since the observed F-statistics value is less that the critical, we do reject the null hypothesis that returns does not Granger cause volatility. There is therefore a unidirectional relationship between volatility and returns in the beverages sector. This finding corroborates the results of the banking sector where we discovered that returns can be used to predict the riskiness of assets.

DISCUSSION OF FINDINGS

The GARCH model, as an estimation technique for time variant conditional variance and nonlinearities in generating mechanism, provides good fit for stock returns volatility and hence the results obtained could be reliable. However, the observed volatility clustering and the presence of ARCH and GARCH in the automobile, banking and beverages sectors indicate interdependency of the series of returns. Because even where the variance equation of the GARCH indicate volatility clustering, the returns could be deterministic in nature, lending credence to possible linear dependency of previous returns and current returns. These situations may not have been peculiar to the Nigerian capital market, as an emerging market that is fraught with the challenges of effective information asymmetry and ethical practices until recently.

The study notes that outside the agricultural sector there is positive and significant relationship between risk and return which is in sync with theoretical construct. The off-curve finding in the agricultural sector, as noted previously can be explained from the perspective of its high-risk nature that usually repels investors in the normal course of business. In other words, what attracts investors to the agricultural sector is the promise of high returns characterized by direct government intervention in most cases. For instance since the inception of the present administration in 2010, so much attention has been given to the

agricultural sector because of government's determination to make the agricultural sector the hub of the economy.

Nonetheless, the results of the other sectors that show a unidirectional relationship between volatility and returns, other than being in sync with theory, has remained the fulcrum of finance theory. This is more so that the reward to risk is the expected returns, which either offers commensurate benefits or earns a premium. It would serve as a disincentive if investors are not promised higher returns for investing in assets with risky characteristics. It thus infers that when investors invest on assets that are risky they are assured of higher returns since risk (volatility) move in the same direction.

CONCLUSION AND RECOMMENDATIONS

The pattern of stock price movements in the four sub-sectors of the Nigerian capital market namely, agricultural, automobile, banking and beverages sectors, were investigated using the *Runs* and GARCH techniques for the period January 2006 to December 2011. The *Runs* test results reveal that stocks of the selected sectors do not move at random, indicating that stocks in these sectors do not manifest stochastic behavior. In other words, these sectors in the Nigerian capital market demonstrate weak form inefficiency. Looking at the results of the GARCH mean model at lag one so as to further amplify our finding, we discovered that with the exception of the Agricultural Sector, stock returns demonstrate volatility clustering,and thisindicates autocorrelation and weak-form inefficiency(Emenike, 2008). Thus, the results of the Runs test and GARCH technique seemingly suggest that stock prices in these sectors of the market do not show stochastic behavior and hence cannot be said to be efficient in the weak form.

The findings portend a situation where investors, with clear analytical capacity can predict future returns from previous returns and can make substantial gains by investing in those sectors of the Nigerian capital market. A critical study of the risk profile of the sectors, particularly the sectors with positive and unidirectional risk-return relationship presents opportunities for investors to leverage since there is the likelihood of earning higher returns in excess of the market average in those sectors. But this would require regular monitoring as the dynamics of the economy and the market could change a given asset characteristics overtime.

We therefore recommend that there should be proper strengthening of policy framework as well as improved communication infrastructure to facilitate information dissemination to investors in these sectors. This will contribute to repositioning the entire operational framework of the market in pursuit of its fundamental mandate of advancing the economic frontiers and growth of the country.

References

Adams, A., Bloomfield, D., Booth, P. and England, P. (1993).Investment mathematics and statistics. Kluwer Academic publishers Group, Norwell, Massachusetts, USA.

Adelegan, O. J. (2009). Price reactions to dividend announcements on the Nigerian capital market. AERC Research Paper 188. Retrieved from price reactions to Dividend Announcement NCM. Pdf – Adobe Reader.

Ajao, M. G. & Osayuwu, R. (2012). Testing the weak form of efficient market hypothesis in Nigerian capital market. Accounting and Finance Research, Vol. 1(1), 169-179. Retrieved from http://www.sciedu.ca/afr.

Ayadi O. (1984). The random walk hypothesis and behavior of share prices in Nigeria. The Nigerian journal of Economics and social Studies, 26(1), 57-71.

Brooks, C. (2008). Introductory Econometrics for finance, (2nd ed.). Cambridge, UK, Cambridge University Press.

Dogu, M., Karacaer, S., & Karan, M. B (2010).Empirical testing of insider trading in the lstanbul stock exchange. International Research Journal of Finance and Economics, 15, 97-107. Retrieved from http://www.eurojournals.com/finance.htm

Echekoba, F.N. &Ezu, G. K. (2012). Effective Market Hypothesis: A historical perspective (A study of Nigerian capital market). Kuwait Chapter of Arabian Journal of Business and Management Review, 1(8), 76-86.

Emenike, K. O. (2008). Efficiency across time: Evidence from the Nigerian Stock exchange. Retrieved from http://mpra.ub.muenchen.de/22901/MPRA Paper No. 22901, posted 29, May 2010/19:55

Fama, E. F.(1965) "Random walks in stock market prices". Journal of Business. Retrieved from http://www.chicagobooth.edu/facaulty/selected papers/sp16.pdf
Grossman,S.j. &Stiglitz, J. E. (1980). ON THE IMPOSSIBILITY of informational efficient markets. The American Economic Review, 70(3), 393-408.

Gujarati, D. N. Sangeetha (2007). Basic Econometrics. (4th ed.). Tata Mcgraw-Hill Publishing Company Ltd., New Delhi.

Jennings, R. & Starks, L. (1985). Information content and the speed of stock price adjustment. Journal of Accounting Research, 23(1), 336-350.

Jensen, M. C. (1978).Some anomalous evidence regarding market efficiency. Journal of finance Economics, 6(2/3), 95-101.

Khan, A. Q. &Ikram, S. (2010). Testing semi-strong form of efficient market hypothesis in relation to the impart of foreign institutional investors" (FII) investments on Indian capital market. International Journal of Trade, Economics and Finance, 1(4), 373-379.

Maheu, J. M.& McCurdy, T. H. (2007). Components of market risk and return. Journal of Financial Econometrics, 5(4), 560-590.

Mobarek, A. & keasykeavin (2000). Weak form efficiency of an emerging market: evidence from Dhaka stock market of Bangladesh. E-m-h.org/Moke00.pdf.

Nwezeaku, N. C. and Okpara, G. C. (2010) the effects of financial deepening on stock market returns and volatility: evidence from Nigeria. Internal Research Journal of Finance and Economics, 40 (2010). http:www:eurojournals.com/finance.htm

Nwosa, P. I. and Oseni , I. O. (2011). Efficient market hypothesis and Nigerian stock market. Research journal of Finance and Accounting, 2(12): 38-46.

Ogege, S. & Ezike J. E. (2012). THE Nigerian capital market and economic development: A critical appraisal. International Business Research, 5(8), 228-236.
Oke, M. O. & Azeez B. A. (2012). A test of strong-form efficiency of the Nigerian Capital Market. Business System Review, 1(1), 10-26. Retrieved from http://www.business-systems-review.Org.

Okpara, G. C. (2010). Stock market prices and the random walk hypothesis: Further evidence from Garch model. The International Journal of Applied Economic and Finance, 4(2), 62-66.

Olowe, R. A. (1998). "stock splits and efficiency of the Nigerian stock market". African Review of Money, Finance and Banking.www.jstor.org/stable/23026306

Pele, D. T. &Voineagu V. (2008). Testing market efficiency via decomposition of stock return: Application to Romanian capital market. Romanian Journal of Economic Forecasting, (3), 63-79.

Seyhun H. N. (1986). Insiders' profit, cost of trading and market efficiency. Journal of Financial Economics, vol. 16: 189-212

Wang, Y (2003), "Nonparametric tests for randomness", ECE 461 Project Report. WWW.ifp.illinois.edu/-ywang11/paper/ECE461Proj.pdf-United states.

Ziobrowski, A. J., W., Cheng, P. and Ziobrowski B. J. (2011). Abnormal returns from the common stock investment of members of the U. S. House of Representatives. Business and Politics. 13(1).http://www.bepress.com/bap/vol13/iss1/art4

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Brooding Broilers: The Experience of the Nazareth Agro-Pastoral Training and Production Centre (NAPTPC) in the North West Region of Cameroon.

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ABSTRACT

The paper observes that the brooding stage in poultry production is often neglected by both poultry farmers and researchers. It then investigates into the brooding techniques, challenges, measures adopted to solve challenges at the brooding stage and the prospects of brooding broilers in the Nazareth Agro Pastoral Training and Production Centre (NAPTAPC) .Data was obtained from the centre through interviews, questioners, and discussions with all stakeholders involved in the brooding stage of production. Participant observation was equally used to obtain some of the data. The data was analyzed using descriptive statistics. The results showed that the brooding techniques used by this centre do not significantly deviate from the expected standard. It was also found that the centre suffered from the problem of loss of chicks, inadequate space, and inadequate capital for expansion and low demand for three weeks old chicks. To reduce this problem, the centre makes provision for a foot bath containing disinfectant to limit the spread of diseases, automatic generator to ensure a continuous supply of electric heat and correct administration of vaccines. Also, the surroundings as well as equipment were also kept clean. Above all, workers work in shifts so as to give adequate attention to the chicks. This center is optimistic to expand its activities in the near future. These findings are important and should not be ignored when examining issues of poultry production in the region. Finally, the paper recommends that the centre should ensure to always receive good quality day old chicks and to carry out brooding of broilers when climatic conditions are conducive to their growth. The center should also respect the standard stocking capacity of chicks to avoid the negative consequences of overcrowding.

JEL Classification: E23, F2, F21, F43
Keywords: Brooding broilers, Nazareth Agro- Pastoral Training and Production Centre-Cameroon.

INTRODUCTION

The poultry industry has come to be considered as a means to fight poverty in Cameroon. It is important as a source of employment and income to many families. Unlike other ventures, it provides faster turn over on capital investment. This has led to the setting up of formal businesses and training institutions specializing in poultry in Cameroon.

Elsewhere, Brannius (1997), reports that the interest of operators in the industry is gradually being killed, due to prevalence of diseases and other challenges or constraints in the industry.

National production of poultry products over the years could increase if these challenges are investigated and addressed. The benefits which the country gets from the poultry industry are very important to the country's growth. It provides food security and protein intake for poor countries (Lathan, 1997). Unfortunately, this sector in the North West Region of Cameroon faces some challenges which tend to reduce the profitability of the sector. Despite the challenges confronting the poultry business, Nazareth Agro Pastoral Training and Production Center (NAPTAPC) remains focused, as it trains youths in poultry production techniques.

Production is always in stages and every stage is very important to ensure overall efficiency in the production chain. In the poultry industry, production ranges from hatchery, brooding of broilers or layers, fattening and marketing. The brooding of broilers is one of the foundation stages in the production chain which needs the close attention of operators in the sector and that of researchers. Unfortunately, this stage of production in this industry has not been considered seriously by most operators in the sector and by researchers. Really, more attention is focused on the fattening of birds, production of eggs and marketing. This is erroneous since this stage determines the quality and quantity of the products of the other stages in the industry. The Nazareth Agro Pastoral Training and Production Center (NAPTAPC) is involved in all stages of production which are faced with a variety of challenges. This leads us to seek to know the unique brooding techniques used by the above center and to question the major brooding constraints and challenges it faces in its effort to be a production leader in the North West Region. How can this center overcome its brooding constraints and challenges to maintain or even build upon its production share and become a market leader in the region? What are the future prospects of the Center if it is able to address its production problems especially brooding challenges and problems?

It is therefore the objective of this study is to examine the challenges and prospects of brooding in the Nazareth Agro Pastoral Training and Production Center (NAPTAPC). More specifically, this study seeks to describe the unique brooding techniques used, identify the main brooding challenges faced, find out how the center addresses its brooding challenges, and determines the brooding prospects of the Center. The rest of the study is organized as follows: Section two situates the study in its proper perspective by reviewing both conceptual and empirical works in the domain. Section three is devoted to the method of analysis. Section four presents the results of the study. Section five provides a summary and conclusion to the study.

LITERATURE REVIEW

Conceptual Literature

Definition of key l concepts

Parkhurst and Mountney (1988) consider poultry to collectively designate species of birds which are domesticated to reproduce and grow in captivity so as to render the products of economic value. Chickens, turkeys, ducks, geese, some quail and pheasants, guineas and pigeons generally meet the above criteria. They provide meat, eggs, feathers, fertilizer, animal food and other by – products such as pharmaceuticals. They also serve as laboratory animals for scientific research. Birds kept only for companionship or beauty, are not considered poultry. In this study poultry is limited to the domestication of chickens.

Broilers are chickens (*Gallus gallusdomesticus*) bred and raised specifically for meat production. Chickens are one of the most common and widespread domestic animals, and with a population of 19 billion in 2011, there are more chickens in the world than any other species of bird. Typical broilers have white feathers and yellowish skin. Most commercial broilers bred for meat reach slaughter weight at between 5 to 7 weeks of age, although slower growing

strains reach slaughter weight at approximately 14 weeks of age. Because of this young age, much of their behavior and physiology is that of an immature bird.

In zoology brooding is a pattern of behavior of certain egg-laying animals, especially birds, marked by cessation of egg laying and readiness to sit on and incubate eggs. Incubation itself is the process of maintaining uniform heat and humidity of the developing eggs, usually accomplished by one or both parents sitting on the eggs at all times. Many birds develop a brood patch—an area of bare, featherless skin on the underbody—in preparation for incubation and brooding. A network of blood vessels in the skin of the brood patch raises the temperature locally. After the hatch, the parent bird's brood their young, keeping them warm by spreading the feathers out, umbrella-like, so the young can maintain contact with the skin of the adult. In domestic fowl the term "broody hen" refers both to a sitting (incubating) bird and, later, to the same hen brooding her chicks. In this study brooding is simply understood as the process of breeding or taking care of chicks from day old to three weeks.

Related Literature

Brooding Of Broilers

Small poultry flock owners often experience problems of one sort or another with their young birds. In the majority of cases, the problems are related to either management or nutrition. To prevent or reduce these problems a number of management or brooding techniques are suggested by Chernos and Schneider (2004).

Management

A lot of preparation is done in advance such as cleaning and disinfection of all housing facilities and equipment. Given that some disease causing agents can stay in the soil for several months and years, detergent s and appropriate disinfectants should be used in washing all dust, dirt and organic matter from all housing facilities and equipment. A high pressure washer is ideal for washing .All these is done as soon as the old flock leaves. The Agricultural Operation Practices Act (AOPA) regulates how manure is handled. AOPA does not register small poultry farmers having less than 2000 birds but these farmers are still expected to meet up with the requirements of the act. AOPA states that manure, composting materials and compost can only be incorporated within 48 hours to arable land about 150m away from living residence. This is done to avoid re-infection from insects, wild birds, and even humans. After removal of litter, the house should be washed and disinfected with disinfectants .Disinfectants should never be mixed but rather it is very important to follow the exact prescription on the label. All other movable equipment such as the feeders, drinkers and other equipment should be properly washed and sunned because ultraviolet rays are a good germicide. In case of portable brooding houses, all outdoor runs should be rotated and all manure scraped off in other to expose soil underneath to sunlight.

Barn, Yard and Equipment Set-up

A: LITTER

Coarse wood shavings are the best litter to use. Sawdust and fine shavings should be avoided to prevent litter picking by chicks which can cause gizzard impaction. Also, ordinary garden sphagnum peat moss should be avoided to prevent the growth of mould which can cause pneumonia as the chicks breathe in. Rather only peat moss which has been labeled and sterilized for poultry should be used. Other commonly used litter includes chopped wheat straw and chopped paper etc. Bedding material should be spread two weeks before chick's arrival to a thickness of 10cm. It is done this early to enable the saw dust to dry up well hence preventing mould.

B: *FENCING*

Fencing of about 2m high using wire, digging 60cm into the ground and angling outward from the pen should be done outside the brooding house to prevent predators such as rat moles, foxes, skanks e.t.c. To prevent hawks, Life size replicas of plastic made owls should be placed on top of poultry houses.

C: BARN HEATING and TEMPERATURE

Electric brooder lamps, charcoal pots and electric bulbs are the main sources of heat commonly used in poultry flocks. In order to ensure proper functioning of lighting equipment as well as preventing cold beddings, the brooding house should be heated a couple of days before chicks arrive. This activity is very important as cold floors weaken the chick's immune system and can increase water belly incidence.

A temperature of 32 degrees centigrade at chick's height is most appropriate when placing broiler chicks. This temperature is reduced weekly until a temperature of 21 degrees centigrade is reached. In the case of turkey poults, 35 degrees centigrade is most appropriate and also gradually reduced weekly until 21 degrees centigrade is reached.

Finally, observation is the best thermometer. During observation, huddled chicks will mean there is cold, while crowded birds at the corners of the brooder guard will signify too much heat. Therefore evenly distributed birds will mean that the ideal temperature has been met.

D: *EQUIPMENT*

In the brooding house, the brooder guard is a multi -purpose equipment. It keeps the chicks confined. It brings the chicks closer to their feed, water and warmth. The circular guard is most appropriate because it eliminates crowding corners. Fig 1 shows a suitable equipment layout for chicks and poults.

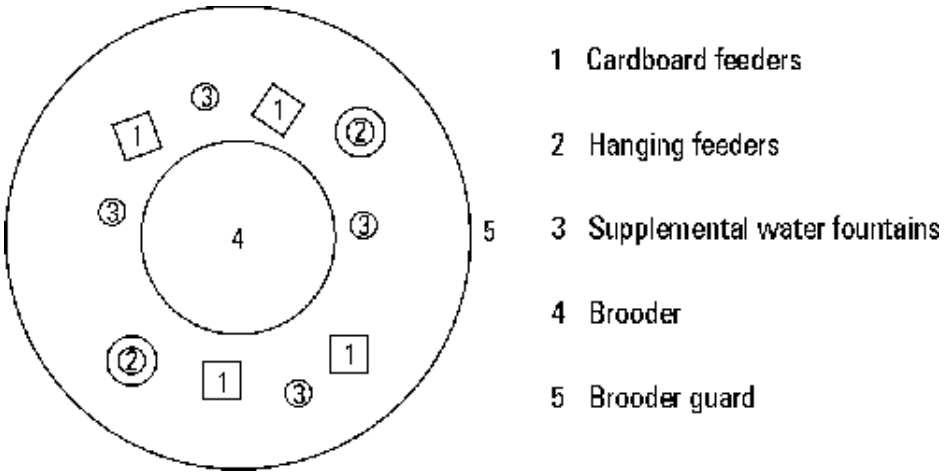

Figure 1. Brooding diagram

Source: Chernos and Schneider (2004).

Nipple and fountain drinkers are the most commonly used drinkers. Nipple drinkers are the best to provide clean water for poultry. Nipple drinkers require high light intensity to attract young birds to the nipple. One nipple can serve up to 20 birds. Fig 2 shows a nipple drinker.

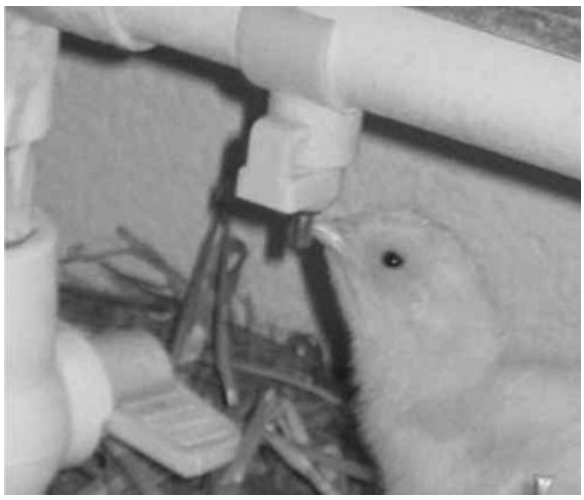

Figure 2. Nipple drinkers
Source: Chernos and Schneider (2004).

Fountain drinkers (Fig 3) are often used to start flocks and are later supplemented with nipple drinkers.

Figure 3. Supplementary fountain drinker
Source: Chernos and Schneider (2004).

The standard 3 foot through feeders (Fig 4) are suitable for chicks and can be gradually replaced with hanging feeders once the chicks reach 3 weeks of age.

Figure 4.Hanging feeder
Source: Chernos and Schneider (2004).

Light intensity of 20 lux is most suitable within the first three days of life. High light intensity will trigger aggressive behaviours like feather picking and cannibalism.

E: *FLOOR SPACE REQUIREMENT*

0.19m square per chick is most appropriate for broiler and layer chicks in small flocks. However this area could be increased for heavier breeds of turkey and could also be reduced in case of large flocks for commercial purposes.

NUTRITION

Poultry owners often receive their chicks at the same time. To ensure a good skeletal system and healthy musculature, broiler chicks should be fed with a medicated chick starter with at least 24% protein content. In case of turkey poults, feed with 28% protein content is ideal. When protein content is low, it can result to some diseases such as leg weakness. Outdoor runs should be avoided or better still moved in cycles to avoid some diseases such as black head for turkey poults which is spread by earthworms and can cause 100% mortality. In case of home- made feed, vital minerals, vitamins and other elements like granite grit should be included in the feed.

Empirical Literature

Temperature and brooding

Oviedo-Rondón.E. et al (2009) hold that the brooding phase is a critical phase in the life of chickens. During this early period the ability to self-regulate body temperature (TEM) is not completely functional. House TEMs have been managed based on historical general recommendations that have demonstrated adequate broiler performance. They hold that the best house TEM conditions that guarantee physiological comfort for chickens of strains that have increased growth rates and muscle mass growing up to 7 and 9 weeks are unknown. Preliminary data from our trials showed that optimal house TEM for brooding might not be the same for every flock. Therefore, a study to optimize brooding TEM utilizing rectal TEM as a tool to adjust ambient TEM was proposed. Chick body TEM data can be easily collected with pediatric thermometers at very low cost. Rectal TEM are indicators of effective TEM which is dependent upon environmental TEM (dry bulb), relative humidity and air speed. Our objective was to compare, under commercial conditions flock live performance, meat yield, and gas propane use of the integrators traditional brooding TEM management systems to one that is managed by direct measurement of hatchling rectal TEM. Their findings showed that rectal TEMs can be used as a tool to micromanage brooding TEMs.

in power ventilated houses. The results also suggested that profiles of house TEMs for each farm or house can be slightly different depending on weather, type of housing, brooding equipment and age of litter. Additionally, every flock may need slightly different optimum TEMs to obtain the best performance possible depending on growth rates associated with broiler strain, chick quality and feed traits. House TEMs during the first week of age obtained with our methodology and the traditional recommendations of brooding were very similar. Main differences in house TEMs were observed during the second and third week, when the chickens showed a need to lower house.

TEMs. Obtaining the best brooding TEMs can improve final body weight, feed conversion, and flock uniformity of 9 weeks-old broiler flocks. Additionally, it was possible to reduce gas usage between 8 and 45%.

Importance of marketing in the poultry industry

Gyau (2011) and Ajua. (2009), observe that the poultry industry serves as employment and a

source of income to many people but that, marketing aspect has been neglected. More attention is focused only to the production aspects. He then sets out to identify the challenges and prospects of marketing poultry and poultry products in Kumasi by using Akate Farms trading and Company Limited as a case study. Collecting information by means of questionnaires, interviews, personal observations, and focused group discussion with key stakeholders and telephone conversation with actors in the industry, it was revealed that the growth of Akate Farms Trading and Company Limited is likely to decline if the challenges such as fluctuating price of maize, high interest rate on loans, government's failure to protect the local industry by enacting laws to check the importation of cheap foreign poultry products and lack of subsidies on agric inputs like feed, drugs, equipment and several others are not addressed by the company and other stake holders. From the study, it was revealed that Akate Farms trading and Company Limited does a lot of marketing but it has no defined marketing plans to address challenges in the industry. It also does not conduct marketing research. It was concluded that if Akate Farms fails to draw marketing plans and conduct marketing research, it will be overtaken by the marketing challenges in the industry. Among the several recommendations made were that the company should not be afraid of competitions from local and foreign producers. Rather it should adopt marketing plans which will help maintain and expand its market share.

From the above it is seen that the brooding of broilers stage in the poultry industry has not been given adequate attention. It is the preoccupation of the present study.

Management of Day old Chicks

Ngweke(2012) in a study of the Nazareth Agro-pastoral Training Center examined the management of Day old Chicks through participant observation. The results of this study showed that this center in its management effort faced a number of constraints lack of laboratory technicians, lack of space by chicks, toxic sent of ammonia gas, water system and inadequate personnel. In the current study our interest is focused on the causes of the challenges faced in the brooding stage proper of production and coping mechanisms adopted by the center.

Brooding of broilers

Nasa (2013) examined the brooding of broilers at the institute of Agricultural research for Development (IRAD) Mankon with aim to identify the unique techniques used and to identify the common diseases plaguing the chicks. It was found out that the center adapted the brooding process to its reality in terms of resources and the physical environment. The center faced difficulties in separating sick chicks from those in good health. There were also rats that ate feed of the chicks.

METHODOLOGY

Scope and Area of the Study

Scope of the Study

The research does not cover everything about the poultry industry. It focuses mainly on brooding of broilers especially the challenges associated with brooding techniques and the measures used to solve them. The study also examines the extent in the deviation of these brooding techniques from the expected standard.

Area of the study

This study was carried out in the Nazareth Agro Pastoral Training and Production Center (NAPTAPC).This center is owned and managed by the Piarist fathers in Cameroon. The Piarist father is a religious order in the Catholic Church founded in 1597 by St, Joseph Calasanz. On the 27th of December 1987, three Piarist priests arrived in Bamenda and began the first

community of the order in Cameroon. Their mission was to give good and quality moral and intellectual education to children and young people especially the poor.

The idea of the creation of the NAPTAPC was conceived in 1990 by the Menteh community. This idea came about as a result of the presence of children who couldn't further their education after primary education and some secondary school dropouts in the village. These children were to remain poor unless something was done to salvage their situation and to make them self-reliant. This led to the creation of the center in Menteh - Nkwen. Given that agriculture is the backbone of Cameroon's economy, educating its citizens in agriculture will likely increase the rate of growth of the country.

This Center offers the opportunity to train and employ young farmers who would increase food production where surpluses will be sold to small consumers and in turn encouraged self-employment. The above considerations then led to the construction of the project in the year 2000, at the present site in Menteh. The training did not go operational immediately until 2003.

This center admits and trains students for a period of 10 months during which theoretical and practical courses are carried out in the center, encouraged them to farm, group them into cooperatives groupings, help them to set up their small family agro pastoral enterprises and follow them up in order to ensure the sustainability of the enterprises.

Consideration for admission into the training program is not based on educational level but on the ability to acquire technical knowledge and skills. This institution admits candidates of various educational backgrounds with at least the first school leaving certificate. Applicants undertake to engage in full time agricultural and animal husbandry business.

Normally, applicants are between the ages of 18-35 years. Priority is given to young people from a poor family background or orphans. The institution currently has a student population of 20 trainees including 11 girls and 9 boys. It offers free training to its students.

NAPTPC integrates production as a pedagogic tool in its educational program. The students are trained in an entrepreneurial environment which enables them to understand the complexities of agricultural production and marketing. The centre is managed at the same time as an enterprise and as an educational institution.

The Nazareth agro pastoral training and production centre is located in Menteh – Nkwen, in Bamenda III sub division of Mezam Division, North West Region of Cameroon about 2km away from Mile 4 junction. The area experiences two distinctive seasons which are dry and the rainy seasons. The dry season runs from mid-November to mid-March while the rainy season runs from mid-March to November. NAPTPC occupies a land surface area of 11ha.

Data Collection and Analysis

The research was a field study and it was designed to collect data from primary and secondary sources. In respect of the primary sources, questionnaires and interviews were conducted among informants who worked in the brooding unit of the poultry. Observations and face-to-face discussions with key stakeholders were used as research instruments from 5th of March to the 25th of March. Data was sought on the brooding techniques, the constraints and challenges faced, the measures adopted to solve problems and the future prospects of brooding in the Center. The data collected was analyzed/presented using text, tables, pictures and line graph.

PRESENTATION AND DISCUSSION OF RESULTS

Brooding of broilers in NAPTAPC

In NAPTAPC the main system of heating used was the charcoal pot heating system. This system was supported with electric bulbs so as to meet up with the required temperature. The house covers a surface area of 300 m sq. It has six windows for proper ventilation and a foot bath to reduce infection. The inside is divided into four sections with each section sealed from the corners with plywood. The tops were sealed with polythene papers about 2m away from the ground in order to conserve heat.

4.1.1 Preparation to receive chicks.

In NAPTAPC the following steps were taken to prepare for the arrival of chicks.

- The previous litter was removed and kept in the compost unit.
- The house was thoroughly washed and disinfected with lime stone. The foot bath was also filled with disinfectant which was always changed after two days.
- The house was aerated for one week.
- Two hours to the chicks arrival, Litter was sprinkled on the ground to a depth of about 5cm.The litter used was white wood shavings. The house was heated using charcoal pots and electric bulbs.
- Thermometers were put in each section and the temperature was regularised to reach 36 degree centigrade.
- The drinkers and feeders were washed and also disinfected.
- Finally an information board was prepared with record sheets attached.

Actual reception of chicks.

ALIVERT Company was the main supplier of day old chicks to the NAPTAPC. NAPTAPC received chicks on the 5th of March 2014.On arrival , the chicks were received by a specialist who introduced the chicks to water by beak dipping. The chicks were removed one by one and the number recorded for each carton. NAPTAPC received a total number of 1536 chicks. 36 chicks being an extra to take care of future losses. The feeders were filled with starter feed and evenly distributed all over the unit. These 1536 chicks occupied two sections with each section containing 768 chicks.

Picture1: Reception and counting of day old chicks
Source: Snapped by Author

The drinkers were placed on a 10cm square plank with a 3cm height to avoid the entry of litter and droppings from the ground. The first vaccines (Newcastle, Infectious bronchitis) were given on the third day i e on the 7th of March 2014.This delay was to make sure that the chicks get use to the water. Before the vaccine was administered, the chicks were starved of water for about three hours. From the date of their arrival, a standard prophylactic treatment was strictly followed up which explains in detail every activity carried out. Below is the standard prophylactic treatment of NAPTAPC on table1.

TABLE1. PROPHYLACTIC TREATMENT FOR BROILERS

Date	Day	Temperature	Treatment	Administration
5/3/14	1	36	Anti-stress Amintotal*/SuperMultivit/Hypraminchock-p	Beak dipping
6/3/14	2	36	Anti-stress :Alyseryl/Oxykel +Amintotal	Free consumption
7/3/14	3	36	Vac: Newcastle, Infectious bronchitis and gumboro.Antwastress;Amintotal*SuperMultivit/ Hypraminchock-p	At least 2hours without water. After then free consumption
8/3/14	4	34	Anti-stress;Aliseryl/Oxykel+Amintotal	Free consumption
9/3/14	5	34	Anti-stress; Aliseryl /Oxykel+Amintotal	Free consumption
10/3/14	6	34	Anti-stress; Aliseryl /Oxykel+Amintotal	Free consumption
11/3/14	7	34	Anti-stress; Aliseryl /Oxykel+Amintotal	Free consumption
12/3/14	8	32	Anti-stress; Aliseryl /Oxykel+Amintotal	Free consumption
13/3/14	9	32	Anti-stress; Aliseryl /Oxykel+Amintotal	Free consumption
14/3/14	10	32	Anti-stress; Aliseryl /Oxykel+Amintotal	Free consumption
15/3/14	11	32	Vac:Gumboro. Anti-stress;Amintotal/ SuperMultivit/Hipraminchock-p.	At least 2hours without water. After then free consumption
16/3/14	12	32	Anti-stress Amintotal*/superMultivit/Hipraminchock-p	Free consumption
17/3/14	13	32	Anti-stress Amintotal*/superMultivit/Hipraminchock-p	Free consumption
18/3/14	14	32	Coccidiostat:Amprolium 20%*/Anticox	Free consumption
19/3/14	15	28	Coccidiostat;Amprolium 20%*/Anticox	Free consumption
20/3/14	16	28	Coccidiostat;Amprolium 20%*/Anticox	Free consumption
21/3/14	17	28	Vac; Newcastle and Infectious Bronchitwas Coccidiostat;Amprolium 20%*/Anticox	At least 2hours without water. After then free consumption
22/3/14	18	28	Coccidiostat:Amprolium 20%*/Anticox	Free consumption
23/3/14	19	28	Coccidiostat:Amprolium 20%*/Anticox	Free consumption
24/3/14	20	28	Coccidiostat:Amprolium 20%*/Anticox	Free consumption
25/3/14	21	28	Vac;Gumboro	At least 2hours without water. After then free consumption

Source: from NAPTAPC.

Looking at the prophylactic program on table 1 above, it is seen that it was of a very high standard because all the doses administered were properly timed based on specialists' prescription. From the program one can notice that the chicks were not vaccinated on arrival, this was deliberately done on the third day assuming that all the chicks must have acquainted

themselves with water. Before each vaccine was administered, the chicks were starved of water for two hours. This measure was taken to enable them get thirsty.

Also it was noticed that they were given ANTI-STRESS almost every day. This was done to relief them of all possible stress such as: transportation, noise, vaccination, cold, etc. Coupled with the prophylactic program followed up above, the brooding house was constructed with the provision of a record board consisting of record sheets and record pens. The centre ensures a strict keeping of records to ensure its future success. Below was the record kept of this batch of chicks on Table 2 . From Table 2, one can notice how explicit each activity took place. A total of 205 chicks died during the brooding period giving an average of about 10 chicks per day. The minimum number of chicks that died per day was 1 and the maximum number was 31chicks. However, there was a great drop in the mortality rate towards the end of the brooding period. This table shows also that as the days progressed there was a great increase in the intake of feed from 50kg to 100kg.The consumption of water also increased progressively from 40 litres to 280 litres.

TABLE2: RECORD KEEPING OF BATCH OF BIRDS FROM THE 5TH OF MARCH TO THE 25TH OF MARCH 2014.

Date	Day	Stock	Death	Cause	Quaran -tine	Left	Feed (kg)	Water (lit)	Weight (gr)
5/3/14	1	1536	0			1536	50	40	39.5
6/3/14	2	1536	13	Origin & transportation stress	/	1523	50	40	/
7/3/14	3	1523	14	Origin and transportation stress	/	1509	50	40	/
8/3/14	4	1509	20	Origin and transportation stress	/	1489	50	40	/
9/3/14	5	1489	23	Origin and transportation stress	/	1466	50	40	/
10/3/14	6	1466	31	Origin and overcrowding	/	1435	70	50	/
11/3/14	7	1435	18	Origin and overcrowding	3	1417	70	50	/
12/3/14	8	1417	14	Origin and overcrowding	3	1403	75	50	/
13/3/14	9	1403	14	Origin and overcrowding	1	1389	75	70	/
14/3/14	10	1389	4	Origin and overcrowding	/	1385	75	70	/
15/3/14	11	1385	11	Origin and overcrowding	/	1374	75	80	/
16/3/14	12	1374	5	Origin	/	1369	90	90	213.8
17/3/14	13	1369	6	Origin	/	1363	90	100	225.5
18/3/14	14	1363	8	Origin	1	1355	90	120	241
19/3/14	15	1355	3	Origin	1	1352	95	150	248
20/3/14	16	1352	7	Origin	1	1345	95	150	259
21/3/14	17	1345	4	Origin	/	1341	95	180	262
22/3/14	18	1341	4	Origin	/	1337	100	240	268
23/3/14	19	1337	3	Origin	/	1334	100	250	271
24/3/14	20	1334	1	Origin	/	1333	100	260	275
25/3/14	21	1333	2	Origin	/	1331	100	280	280

Source: from the naptapc information board.

CHALLENGES AND CONSTRAINTS IN THE BROODING STAGE

The main problem faced in the NAPTAPC with this particular batch of chicks was high mortality .It was suspected that this high mortality was due to its origin. i.e. the parent stock which produces the eggs were old and needed to be replaced.

TABLE3: Rate Of Loss Of Broilers

DAY	STOCK	Absolute Death	Percentage
1	1536	0	0.00%
2	1536	13	0.85%
3	1523	14	0.92%
4	1509	20	1.33%
5	1489	23	1.54%
6	1466	31	2.11%
7	1435	18	1.25%
8	1417	14	0.99%
9	1403	14	1.00%
10	1389	4	0.29%
11	1385	11	0.79%
12	1374	5	0.36%
13	1369	6	0.44%
14	1363	8	0.59%
15	1355	3	0.22%
16	1352	7	0.52%
17	1345	4	0.30%
18	1341	4	0.30%
19	1337	3	0.22%
20	1334	1	0.07%
21	1333	2	0.15%
Total	-	205	14.24%

Source: From NAPTAPC Brooding House

From the above table the trend of deaths can be derived as shown ion Figure1 below.

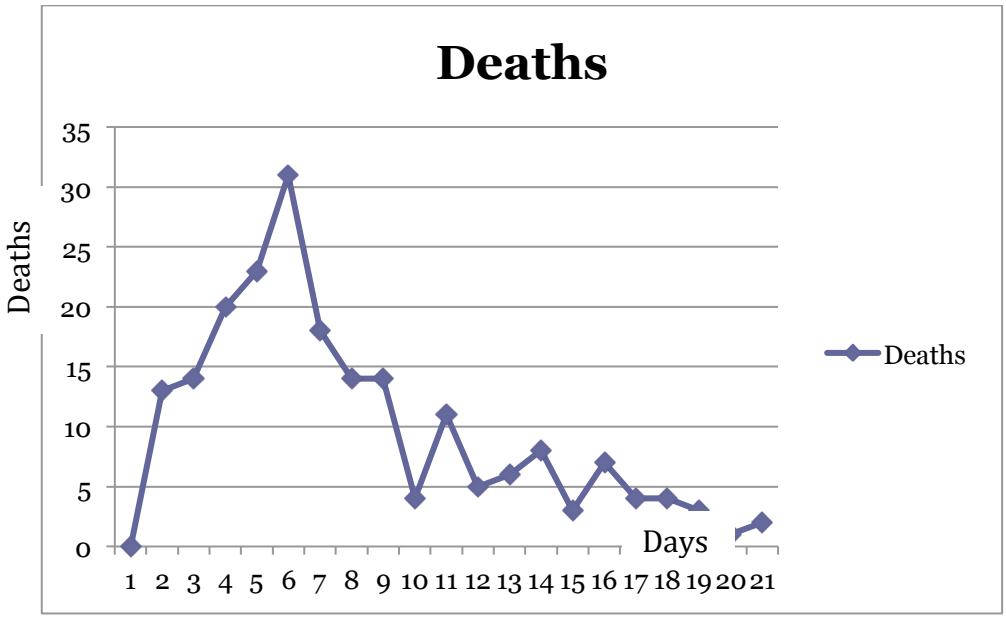

Figure 1: Trend of chick's mortality
Source: Sketched by Student Researcher

The above graph shows the trend of the deaths of day old chicks during the period of 21 days. It is seen that the mortality rate for these chicks is higher during the early brooding period. Another serious challenge faced by the NAPTAPC was the weather change which comes with a lot of infections caused by cold hence a lot of money was spent on drugs.

The lack of sufficient capital was also one of the main constraints faced by the centre. In fact, no business man accepts to have enough capital no matter how successful he/she was. The lack of

space was also one of the main problems faced by the centre. In fact, the canter did not respect the stocking capacity of 50 chicks per square meter. The insufficient space coupled with the cold weather causes overcrowding which eventually leads to the death of some chicks. The marketing of the chicks at three weeks was below average in this center. At the end of three weeks, buyers did not immediately show up. Hence the center has a marketing problem as it needs more customers of three weeks chicks.

Measures adopted to solve problems faced.

In the NAPTAPC, some measures were taken to overcome the problems faced. First of all the brooding house was constructed with provision of a foot bath containing a disinfectant to limit infections from workers entering the brooding house. Though there was a foot bath available, there was limited entry of workers in the brooding house.ie no worker from any other unit was allowed to enter the brooding room. With these measures followed up strictly, there was a great reduction of infected chicks at the NAPTAPC. There was an automatic generator to supply electric heat in case of power failure. There were also stand by bush lambs to support the heating. There was equally the proper follow up of a well organised prophylactic program which ensures the proper timing of vaccines. The surroundings were swept every morning as well as the drinkers being emptied and washed every morning. Also the litter was being refreshed by adding new litter on top of later after every week. To combat the issue of overcrowding due to space, after the first week the chicks were reduced from the two units and transferred to the other two prepared units. This measure reduced the number of chicks from 768 chicks to 384. Lastly, one very important measure taken at this centre was the provision of a bed where workers spend the night in turns to ensure an even temperature at night as well as other aspects like the availability of water, food.

Prospects of brooding.

The NAPTAPC has a positive view of brooding in future .This positive view was due to some future plans which they were putting in place. They were putting in place the required techniques, equipment and other necessary conditions required for setting up a hatchery unit which would take the NAPTAPC centre to another level. If this plan was accomplished, it will go a long way to reduce the mortality caused by transportation stress. Also, the centre plans to henceforth employ only well trained agricultural technicians into the brooding field. This will create the availability of good brooding techniques which in turn will increase the success of brooded chicks of the NAPTAPC.

CONCLUSION AND RECOMMENDATIONS

This study aimed at examining the challenges and prospects of brooding in the Nazareth Agro Pastoral Training and Production Center (NAPTAPC). More specifically, the study sought to describe the brooding techniques, identify the main brooding challenges that Nazareth Agro Pastoral Training and Production Center (NAPTAPC) faced identify measures used to solve the challenges and to determine the brooding prospects of Nazareth Agro Pastoral Training and Production Center (NAPTAPC). Data was collected from primary and secondary sources. As concerns the primary sources, questionnaires and interviews were conducted among informants who worked in the brooding unit of the poultry. Observations, face-to-face discussions with focused groups and key stakeholders were used as research instruments.

The results showed that the brooding techniques used by NAPTAPC did not deviate significantly from the standard techniques. This center faced challenges ranging from loss of birds, inadequate space, inadequate capital for expansion, adverse weather conditions which lead to diseases and low demand for three weeks chicks. As concerns coping mechanisms, the NAPTAPC has made provision for a foot bath containing a disinfectant to limit infections from

workers entering the brooding house. An automatic generator and stand by bush lambs are used to ensure a regular supply of energy/ heat/ warmth for the chicks. There is a good implementation of prophylactic program which ensures vaccines are administered at the right time. The surroundings of the brooding house are always kept clean and all equipment cleaned and disinfected as well as new litter added on top of old litter. Above all, the centre ensures that workers work round the clock in shifts so as to give adequate attention to the chicks. Lastly, one very important measure taken at this centre is the provision of a bed where workers spend the night in turns to ensure an even temperature at night as well as other aspects like the availability of water, and food. As concerns the future prospects. NAPTAPC plans to put in place the required techniques, equipment and other necessary conditions required for setting up a hatchery unit which would take the NAPTAPC centre to another level.

The brooding stage in poultry production as earlier observed is very important to the growth and success of the poultry business. Really, this stage determines both the quality and quantity f the products at the later stages of production. Consequently the brooding techniques practiced should not deviate significantly from the expected standard. If the standard practice is followed, frequent problems of loss of chicks, and inadequate space amongst others will be reduced. The problem of low demand for the 03weeks old chicks shows that all the stages of production in poultry production like in other industries are linked. This means that production could be carried out in a more efficient way if while brooding broilers marketing arrangements are made simultaneously or even in advance. Also, the findings showed that the main cause of death of chicks resulted from their origin i.e hatchery. This goes to suggest that poultry production units should seriously consider having their own hatcheries to ensure good quality day old chicks and to minimise losses from this source. Following the evolution of the death of chicks, it was found that the rate of mortality was high during the early brooding period especially during the 5^{th}, 6^{th}, and 7^{th} day. Special care should be taken during this period so as reduce the loss.

From a policy perspective, a number of recommendations emerge. To avoid sudden and massive deaths of day old chicks due to their source, it is recommended that the centre should look for an alternative supplier of day old chicks. The centre could equally sign guarantee contracts for the duration of three weeks for the day olds supplied. The centre should at the moment respect the standard stocking capacity of their brooding room. A team should be put in place to trace and identify buyers of 3 weeks and advertise to them the three weeks old. Various insurance policies could be used to protect against specific types of losses. Given that this study is a case study, its findings cannot really be generalised to represent the situation of the poultry industry in the region. In this direction, it is recommended that future research be directed towards the study of a cross section of poultry farmers in the region.

References

Ajua.A. N. (2009), Practical poultry production and marketing, Yaoundé self-supporting rural development association (SESURUDEV).

Brannius L. (1997), Poultry Health and Hygiene; Pathogenic Diseases. Journal on Poultry Health. Vol. 10 (2) pp. 110

Chernos.R.J. and Schneider.B. (2004). Basic Poultry Brooding for Small Flock Owners,Agdex 450/22-1. Revised August 2004.

GYAU.J. (2011). Unplushibed Thesis submitted to the Institute of distance Learning Kwame Nkrumah University of Science and Technology in partial fulfilment of requirements for award of the Degree of Commonwealth Executive Masters in Business Administration.

Lathan M.C. (1997). Human Nutrition in the Developing World. Food and Nutrition Series No. 29. Rome. pp. 23

Nasa. A. M.(2013).Brooding of Broiler Chicks from Day old to three weeks of Age Using charcoal heating system at the institute

Ngweke.B.V.(2012).The Management of day old Chicks, Unpublished Project for Assistant Agricultural Technicians, Technical School of Agriculture Bambili.

Oviedo-Rondón.E. et al (2009). Optimizing Brooding for Broilers, Project #F017, Department of Poultry Science College of Agriculture and Life Sciences, North Carolina State University Raleigh, NC 27695-7608

Parkhurst C.R. and Mountney, G.J. (1988). Poultry Meat and Egg Production. Published by Van Nostrand Reinhold. New York. pp. 1- 5.

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Dynamics of Young Indian Consumers' Buying Behaviour Towards Branded Apparels: Gender Perspective

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ABSTRACT

Consumer market for fashion apparel has become more varied by in surge of designer brands, store brands, personalization and advertisements in the global market place of today. There is an increase in positive attitude towards western brands. Over the past decade, the fashion industry has gone through some major structural changes. This study examines the insights of gender perspective and throws light on shopping habits, brand awareness, brand preference of young consumers in the apparels segment. It focuses on the differences in the shopping orientations of male and female shoppers with respect to the various buying behaviour dimensions divided into five attributes i.e. Store Attributes, Product attributes, Reference Groups, Consumer characteristics and Promotional factors.The results gathered can be a useful ingredient for the marketer to strategize on the basis of gender perspective.

Keywords: Gender perspective, Shopping Behaviour, Young consumers, Branded Apparels, Store Attributes, Product Attributes, Consumer Characteristics, Reference Groups, Promotional Factors

INTRODUCTION

The apparel and clothing industry being positioned at first place and also the spending on apparel and clothing among the customers are getting increased day by day; it becomes imperative to study the changing behaviour of consumers. Over the past decade, the fashion industry has gone through some major structural changes. In the fast evolving fashion industry, even the best of plans and activities can be undermined by economic changes and actions of competitors. But what is challenging in nature is the fashion trend cycles that are accelerating as nowadays the average successful clothing trend lasts for a very short span of time i.e. 6-12 weeks and hence to gain from the situation is more difficult. There is a clear understanding amongst the retailers that a complete view of the target consumers is very helpful in ornamenting shopping propensity.

Traditionally, Indians preferred dresses stitched by local tailors catered exclusively to local demand. The growing awareness of brands since 1980s and the convenience offered by ready-to-wear garments were largely responsible for the development of the branded apparel industry in India (Indian Retail Report 2013). Other factors affecting to its growth are considered as better purchasing power in the hands, access to fashion trends outside the country, and the superior quality of fabrics available in the fashion market. 1990s witnessed a drastic change in the overall economic environment of the country which is described liberal

trade and new investment policies. It was seen the effects of such liberalized polices in the clothing industry also. After liberalization of Indian economy, there emerged more than 100 leading brands that jostled for consumer mind space. Today, Indians are more inclined than consumers in other markets to buy apparel for a specific purpose. Indeed, 38 percent of Indian respondents to a recent McKinsey study said they were highly likely to buy apparel for special events, a significantly higher proportion as compare to Brazil (5%), Russia (3%) or China (6%). The growth of the Indian and global fashion designers has encouraged the branded apparel market additionally.

The purpose of this study is to investigate buying behaviour which constitutes buying behaviour dimensions and shopping habits as regards young Indian consumers in the age group of 18-25 years. In this competitive era marketer must be fully aware about the customer needs distinctly and separately as two groups males and females as regards what are they expecting from a brand, how they differ in their buying behaviour, factors which push them to purchase a particular brand, their total outlay, shopping frequency etc. to attain a competitive edge. This vital information can help the companies to formulate the strategies as per the customer needs & deliver them the products which consumer want from the company which will be profitable for the company embedding gender perspective. Retailers and marketers should understand the immense diversity among consumers if they are to market apparel accurately and successfully.

REVIEW OF LITERATURE

Personal factors modify how a male or female is perceived and the most important personal factor is the consumer personality. Personality is a dynamic concept which changes with the life has gone, describing the growth and development of human psychological setup which also differ on gender aspect. Most of the time products project a "personality" or an image that has an appeal to the consumer, with which consumer (he or she) can relate to. The point that is important from marketing point of view is, given the consumer's different and distinct personality traits concerning gender issue, the marketer should be able to identify these differences and its influence on the buying behaviour. Along with many basic differences of their personality, the personal factors which affect the perception of a consumer are the occupation, economic status, age, education and social life. The new brand or style in outfit can be perceived as a necessity, luxury or a super luxury product depending upon the awareness and attitude towards particular item which depend on anyone of the above or the association of two or more. Many studies have given insights about gender difference in building relationships with brands.

According to Chen-Yu and Seock (2002), the "fundamental segmentation of the clothing market is based on gender", and gender therefore plays a vital role in influencing a consumer's clothing selection and apparel buying behaviour (Bohdanowicz and Clamp 1994 cited in ChenYu and Seock 2002). Shopping is even described by Dholakia (1999:) as a "gendered activity". The results revealed by these studies magnify the role of women in judgment of a brand and consider women as an active partner than men in buying behaviour.

The retail market in developed countries of the world was at the mature stage (Berner *et. al.,* 2001). Intense competition and sluggish population growth was motivating leading apparel brands of the world to enter in new markets and attract new customers (Steenkamp and Hofstede, 2002). The emergence of economies particularly India with strong middle class was impelling these apparel firms' to ensure their presence in such economies (Dickson *et. al.,* 2004).

Clothing is one of the consumer products that are vulnerable to fashion dynamics and sways making it important for the marketers to test whether consumer loyalty to the brands has changed. In sports apparel, loyalty is a vital construct in strategic marketing. Studies such as (Hu, et al.,2010) show that in competitive repeat-purchase markets, loyalty is shaped more by the passive acceptance of brands than by strongly held attitudes about them. Wearing clothes is often regarded as a habitual and everyday practice. However, apparel has been used not only to meet basic human needs (e.g., protecting from the elements) but also to communicate identities (Postrel, 2003). Wearing clothing is one of the ways in which people construct their identities and have their identities shaped by others (Davis, 1984; Kaiser, 1985; McCracken, 1988; Roach-Higgins & Eicher, 1992; Stone, 1962).

Shopping behaviour is a complex and multidimensional concept. Defining shopping orientation is extremely difficult, due to numerous interrelated variables. Although the concept shopping orientation is described by researchers from various perspectives, certain major variables (or concepts) are repeated in the different description. Stone (1954) introduced the concept shopping orientation. He referred to shopping lifestyles or shoppers‟ styles that place emphasis on certain activities in particular. Other researchers added to this definition by pointing out that shopping-specific lifestyles encompass shopping activities, interests, and opinions. The definitions of shopping orientation reflect a view of shop-ping as a complex personal, economic, social and recreational phenomenon (Darden and Howell, 1987; Shim and Kotsiopulos 1993). Shoppers with different shopping orientations reveal different consumer characteristics and differences in market behaviour, including different needs and preferences for information sources, store preferences and store attributes (Shim and Kotsiopulos, 1992).

CONCEPTUAL FRAMEWORK AND RESEARCH OBJECTIVES

Conceptual Framework

On the basis of the previous studies undertaken in this area, a number of factors have been identified which affect the perception of customers in respect of brands and consequently their evaluation. These factors have been incorporated in the current study as five dimensions of buying behaviour model which influence the purchase intentions of the customer. These include store attributes, product attributes, Reference groups, consumer characteristics and promotional factors.

Store Attributes

Store attributes are the store atmospherics and characteristics like facilities in the store, services provided by the store, store format etc. which influence the consumer apparel buying behaviour. (Gurunathan, 2013). The retail stores play major role in influencing consumers for both store and manufacturer's brands. Attitude toward promoted brands is characterized by positive store image, smart shopper self-perception, need for affiliation, and money attitude regarding power-prestige and anxiety. However, attitude of consumers towards store brands is determined by more positive store image, price advantage, range of products to exercise buying options, loyalty and trust related factors (Liu and Wang, 2008). In the present study, this attribute comprises variety, post transaction services, services by staff, physical facilities and membership facilities.

Product Attributes

Product attributes are the product feature such as product quality, price, style, design, colour etc. Kwan et al (2004) identified five factors in clothing choice criteria viz. named product and self-image related criteria, style and quality related criteria, durability and easy care, fit and sex appropriateness, and price. Product quality refers to the features or characteristics of a

product or service that is able to satisfy the stated or implied customer needs. In other words, product quality can be defined as "fitness for use" or 'conformance to requirement" (Russell-Bennett, McColl-Kennedy & Coote, 2007). In this study, product attribute dimension includes price, fit, quality, style and durability

Reference Groups

The youth of today generally seek acceptance from their peers to boast their self-confidence and to blend with their social surrounding. Reference groups are the external influencers like television programmes, magazines, consumers' favourite celebrities or stars, friends, family members, other persons etc. who influence the apparel buying behaviour of the consumers. This dimension in the present study is measured by influence of family and friends, past experience, Internet, TV/Magazines and Celebrity influence

Consumer Characteristics

Consumer characteristics approach seemed to be the most powerful and explanatory as it focused on the mental orientation of consumers in making decisions. Consumer characteristics are the consumer attributes like involvement, fashion & brand consciousness, loyalty, emotion etc. which differs from consumer to consumer and also have effect on apparel buying behaviour. In this study this dimension is measured under the indicators viz. fashion consciousness, store image, impulsive buying behaviour, brand loyalty, and preference to wear and try before purchase.

Promotional Factors

These are the various promotional techniques used by the marketer to attract a large consume base. Duncan (2005) states that advertising has historically been the main communication choice for marketers as it can quickly increase brand awareness and brand knowledge though advertising impact is difficult to measure. Advertising plays a conspicuous role in marketing as it operates more visibly than other marketing variables (Eadie *et al*., 1999). In the present study, this dimension includes pricing techniques, social media, in- store promotions, celebrity endorsements, and visual display.

Research Objectives

The present study seeks to investigate the buying behaviour which constitutes: buying behavior dimensions, shopping habits such as shopping expenditure and frequency giving a gender perspective view and examine different factors influencing young consumers buying behaviour in apparel retail segment. .

This objective has been categorized into following sub-objectives as listed hereunder.

1. To identify the differences in buying behavior dimensions between males and female
2. To identify the differences in shopping expenditure between males and females
3. To identify the differences in shopping frequency between males and females

To achieve the above objectives following hypotheses were formed:

$H_{1:}$ Males and females carry out differences in their buying behaviour dimensions.
$H_{2:}$ Males and females carry out differences in their shopping expenditure
$H_{3:}$ Males and females carry out differences in their shopping frequency

Rationale Of The Study

As suggested by Maslow's hierarchy of needs, all humans have a need for clothing, whether to satisfy a physiological need, for both privacy and protective reasons, or in order to meet needs related to esteem and belongingness (Hawkins, Mothersbaugh and Best 2007). Thus, some

money will be spent throughout their lifetime on the purchase of various garments to satisfy these needs (Hawkins *et al.* 2007). It is, therefore, useful to investigate the capital-and people-intensive, substantial clothing industry of India, particularly in terms of the branded apparel buying behaviour of young consumers in the age group of 18-25 years. The need for this research is due to the multifaceted and complex nature of the shopping habits with regards to these consumers, especially within a multicultural society such as India.

These insights of young consumer behavior will be imperative in strategy formulation and facilitate to gain from the situation which is instrumental in increasing the turnover. This segment of society i.e. young consumers is very important group amongst all the groups in the society because major purchases in the family, is done for this segment and revolves around this segment. This makes it all the more important to understand the psychology, mindset, motivators, satisfiers and dissatisfiers. The target segment was selected looking at the Indian existing and expected demographics which serves as a major clientele to the apparel industry in India. Today's teenagers are not only a more powerful segment but probably one of the most profitable. Within Generation Y, a sub-generation, referred to as the "Twixters" and aged 18 to 25, has been identified and referred to as a "larger phenomenon" in today's society (Grossman 2005). Grossman (2005) explains that, "in the past, people moved from childhood to adolescence and from adolescence to adulthood, but today there is a new, intermediate phase along the way. The years from 18 until 25 and even beyond have become a distinct and separate life stage, a strange, transitional never-never land between adolescence and adulthood in which people stall for a few years". The individuals caught up in this so-called pause in the natural progression of life are referred to as being "betwixt and between", hence the name "Twixters" (Grossman 2005). This subgroup of Generation Y, which accounts for over one-third of this generation (Martin and Turley 2004), is thus the chosen sample of this study.

RESEARCH METHODOLOGY

The present study is based on a sample frame of 500 respondents consisting of students and working professionals of Delhi/NCR, Bangalore and Chandigarh area in the age group of 18-25 years. The questionnaire was self-administered in the colleges and was also sent through emails and social networking sites like Facebook and linked in. Five hundred and fifty questionnaires were distributed but five hundred questionnaires were elucidated and used for the final analysis after eliminating those that were partially completed.

The final questionnaire comprised of 3 parts with a total of 35 questions. Section I of the questionnaire contained 4 questions on demographic factors of the respondents including gender, Age, Education and Occupation. Section II of the questionnaire consists of 6 questions on Branded apparels and shopping habits including Brand awareness, brand preferences, place preference, shopping for special occasions, shopping frequency and shopping expenditure. Section III of the questionnaire contained 25 questions relating to 25 traits corresponding to 5 apparel buying behaviour dimensions viz., Store Attributes (Services by staff, Membership facilities, Physical facilities, Post transaction services, Variety), Product Attributes (Fit, Durability, Style, Price, Quality) ,Reference Groups (Influence of family and friends, celebrity influence, Past Experience, TV/magazines, Internet), Consumer characteristics (Fashion consciousness, Preference to wear and try before purchase, Impulse buying behaviour, Store image, brand loyalty) and Promotional factors(Social media, In- store promotions, pricing techniques, visual displays, Celebrity endorsements).All these questions were measured with a 5 point Likert Scale that ranged from strongly disagree (1) to strongly agree (5).

The empirical results and analysis have been presented section wise. In the first section, Reliability and Equivalence of Various Items in Apparel Buying Behaviour Dimension**s** was determined by observing Cronbach's alpha values. The second section is emphasizing on general information about respondents in terms of their Brand awareness, Brand preference, shopping frequency and shopping expenditure and other shopping habits**.**

In the third section, differences in buying behavior dimensions between males and females have been analyzed. Lastly, in the Fourth section differences in Shopping expenditure and shopping frequency between males and females have been evaluated.

DATA ANALYSIS AND INTERPRETATIONS

Demographic Descriptive

Table 1 below shows that 64percentage of respondents were females, 36 percent were in the age group of 21-24 years, 44 percent were under graduates and 64 percent were students**.**

Table 1 Demographic descriptive

Demographics		Frequency	Percentage	Cumulative Percentage
GENDER				
	Male	178	36	36
	Female	322	64	100
	Total	500	100	
AGE				
	18-21	321	64	64
	21-25	179	36	100
	Total	500	100	
EDUCATION				
	UG	221	44	44
	PG	170	34	78
	Above PG	109	22	100
	Total	500	100	
OCCUPATION				
	Student	318	64	64
	Employee	112	22	86
	Self employed	70	14	100
	Total	500	100	

Reliability Analysis

Reliability and Equivalence of Various Items in Apparel Buying Behaviour Dimensions was determined and Cronbach's alpha values were observed.

From the Table 2 below, all the five dimensions of buying behaviour i.e. store attributes, product attributes, reference groups, consumer characteristics and promotional factors achieved a high Cronbach's alpha coefficient, suggesting high reliability (greater than 0.6 recommended by Nunally and Bernstein) and internal consistency. The results of Hotelling's T-squared test confirmed that the mean of different apparel buying behaviour items under the five dimensions was significantly differ from each other at 1percent level. This shows that there is no equivalence between all the 25 items and that they are different.

Table 2: Reliability Analysis

Dimensions	No. of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Hotelling's T-Squared Test	F value	Df	p-value
Store Attributes	5	.879	.882	191.60	47.61	4,496	.000
Product Attributes	5	.928	.929	425.21	31.11	4,496	.000
Reference Groups	5	.875	.826	79.46	19.74	4,496	.000
Consumer characteristics	5	.925	.925	380.69	44.90	4,496	.000
Promotional Factors	5	.827	.830	793.86	48.18	4,496	.000

Basic Information: Branded apparels

This section gives general information and views about the sample respondents on Brand Awareness and shopping habits.

Brand Awareness and shopping habits

Accessibility of branded apparels among Indians has transformed as in the past, very few consumers could afford them. The landscape of brand awareness in India is changing and people are very much aware of the brand culture prevalent in our country. Young Consumers, today are cognisant of most of the national and International brands. As shown in in Fig 1, (A), 97 percent of the respondents said that they buy branded apparels. Foreign companies seek to capture the attention of the young consumers through various promotional techniques and advertising. Consequently, Brands create awareness in the consumers mind even before they are available in the stores and once they are out in the market, consumers are geared up to search for these and purchase them.

Also the increase purchasing power of many urban Indians has led to more people being able to afford branded apparels. In fig 1, (B) it is exhibited that 35 percent of the respondents prefer to buy national brands and 40 percent of respondents prefer to buy a combination of both national and international brands. McKinsey conducted a proprietary research project on apparel-shopping attitudes and behaviour and concluded, that as consumers have greater disposable income, they increasingly spend their money on items beyond the basic necessities. One of the first categories to feel this change is apparel.

When respondents were asked that where they go for shopping for apparels, a major segment i.e. 68 percent as shown in Fig 1, (C) responded that they prefer malls over traditional shops and e-shopping. This is primarily on account of convenience offered to them in terms of assortment of wide variety of stocks in terms of styles, colour, price range, brands, sizes etc. which they can try before purchase all at one place. This trend highlights the mall mania amongst the youth and the craze for shopping there. Also the pleasure of shopping is enhanced with various recreational facilities like Cineplex's, eating joints, games zones like bowling etc. which makes them stay for long within the mall.

For Indian shoppers, Consumers' wardrobe is shifting from need- based clothing to occasion specific dressing and is gradually becoming more detail- oriented (Textile and apparel

compendium 2012, Technopak).Most of the youngsters today buy apparels for special events or occasions. Occasion specific dressing and important festivals also many a times influences impulse buying amongst the youth. In a country like India, youngsters are mostly in festive mood due to various festival occasions round the year which acts as a powerful stimulant. The Indian consumer is clearly enjoying the modern trade shopping experience and is increasingly shopping there, as is evident from the increased spending at modern stores. Fig 1, (D), shows that 89 percent of the respondents buy clothing for special events or festivals.

Consumer's response to the frequency of purchasing branded apparel exhibited that most of them indulge in shopping for apparels occasionally. Fig 1, (E), exhibits, 60 percent of the respondents buying branded apparels occasionally. As discussed that the aspirations of purchasing apparels are constantly changing in the youth's mind, marketers must understand their shopping behaviour and make persistent marketing efforts to transmit the frequency of buying behaviour from occasionally to frequently. This could be done through various promotional offers which can act as a powerful stimulant for a consumer to visit the store and shop.

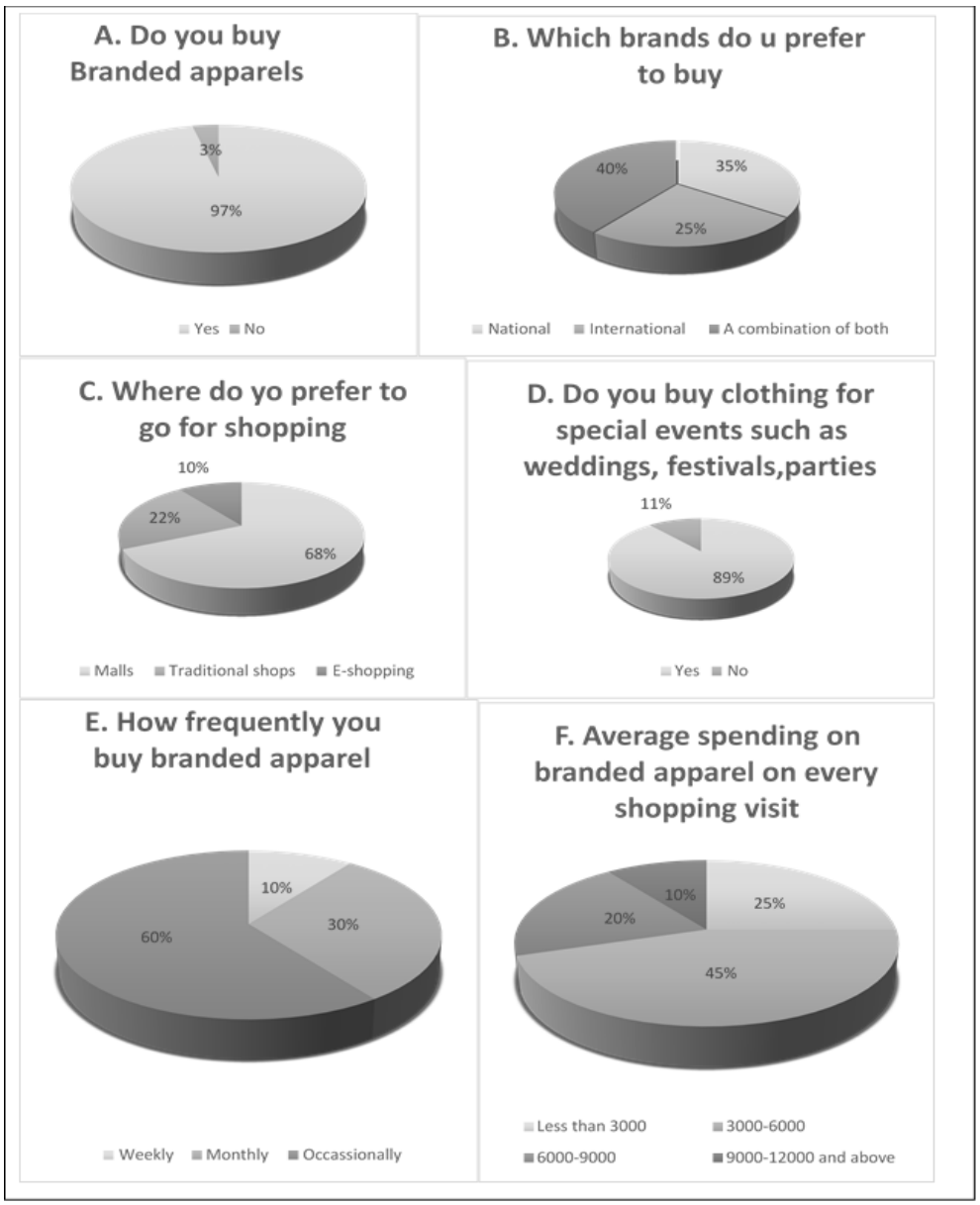

Fig 1: Brand Awareness and Shopping Habits

Given the inflationary pressures on the household budget, Indian consumers have become all the more value conscious .The access to both modern and traditional trade formats coupled with an awareness of various deals being offered in the market, allows the consumer to make a more informed, value-for-money shopping decision. People in India are price sensitive and don't prefer spending more than 5000 rupees each time they go out for shopping. This gives a clear indication to marketer as majorly the Indian consumers are under Middle income group segment (as per the census 2011 report, The Indian middle class, target consumers for many companies, is expected to swell up to 267 million people in the next five years, up 67 per cent from the current levels) and on account of income constraint don't wish to spend beyond a limit. Marketers must embed this buying behaviour while formulating their strategies and come up with low range or eco range of products to encourage the consumers to buy which could eventually lead to an increase in the shopping expenditure. Fig 1, (F), below shows that 25 percent of respondents prefer less than 3000 rupees, 45 percent spend somewhere between rupees 3000-6000, 20 percent between 6000-9000 rupees while only 10 percent end up spending in the range of 9000-12000

Buying behaviour dimensions: Gender Perspective

For the analysis, the sample respondents have been classified on the basis of gender i.e. females and males. Statistical comparisons have been made between variables across males and females using a student sample *t*-test to establish if the means are statistically different. The hypothesis to be tested is:

$H_{1:}$ Males and females carry out differences in their buying behaviour dimensions.

Tests of Normality

In order to conduct Independent Sample Student t-test, the data needs to meet the assumption of normality. The different dimensions of buying behavior across genders i.e. males and females were normally distributed, as assessed by Shapiro- wilks test ($p>.05$) (Shapiro & Wilk, 1965; Razali & Wah ,2011). A Levene's test verified the equality of variances in the samples (homogeinity of variance)($p>.05$) (Martin & Bridgmon, 2012).

The independent samples t- test was used to find a difference between the means of two independent samples, which in this study refers to females and males with respect to the attributes applied while choosing branded apparel. The results are as follows:

Store Attributes

To make analysis, table presentations have been made. Table 5.4 shows the *t*-values of variables under store attributes of sample males and females.

Table 3 Variables considered under store attributes of buying behaviour for males and females

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval	
									Lower	Upper
Services of staff	Equal variances assumed	1.417	.234	-.072	498	.943	-.006	.086	-.176	.164
	Equal variances not assumed			-.073	387.071	.942	-.006	.085	-.173	.160
Membership facility	Equal variances assumed	.418	.518	.164	498	.870	.015	.094	-.169	.200
	Equal variances not assumed			.165	370.028	.869	.015	.094	-.169	.200
Physical facility	Equal variances assumed	1.259	.262	3.12	498	**.044**	.009	.085	-.158	.177
	Equal variances not assumed			3.10	381.420	.036	.009	.084	-.156	.175
Post-transaction services	Equal variances assumed	2.486	.116	-1.046	498	.296	-.107	.102	-.307	.094
	Equal variances not assumed			-1.069	390.037	.286	-.107	.100	-.303	.089
Variety	Equal variances assumed	4.209	.141	2.02	498	**.024**	-.050	.106	-.259	.158
	Equal variances not assumed			2.08	396.706	.029	-.050	.103	-.253	.153

The results of the t-test presented in the above table, reveal that significant differences were found in the level of importance attributed by female and male respondents to the attributes of **Physical facilities** in a store and **Variety**. The independent sample t-test was associated with a statistically significant effect with t (498) =3.12, p=.044 for Physical facility and t (498) = 2.02, p=.024 for Variety. Thus we may say that female consumers are more concerned about the physical facilities in a store in terms of spaciousness, adequate and convenient number of trial rooms to the customers with sufficient lighting and mirrors as is revealed by the survey where 70 percent of the female respondents responded that for them Physical facilities in a store are extremely important, whereas only 40 percent of their male counterparts favoured in favour of this variable. With respect to variety, 82 percent of females responded that it is important for them that the store they go to shop for apparel has wide assortment of stock so that it facilitates them to make an easier choice. For males on the contrary, only 53 percent strongly

agreed in favour of this variable. This is supported by Chen-Yu and Seock (2002) who conducted a study to investigate the clothing purchase motivations, information sources and selection criteria of young male and female consumers, aged between 13 and 19. Their findings revealed that, "for both male and female participants, price was the most important store selection criterion" (Chen-Yu and Seock 2002). Furthermore, "female participants considered product variety/availability and store display significantly more important than male participants", while there were no significant differences between males and females in terms of perceptions of importance regarding the attributes of store environment/community involvement and customer service/store image, thus "assigning similar weights to the importance" of these factors (Chen-Yu and Seock 2002).

Dholakia (1999) concurs with Chen-Yu and Seock (2002) and also suggests that "the female patron will continue to be the main target of store layout and design efforts". In the study conducted by Chen-Yu and Seock (2002), the attribute of Product variety/availability included dimensions such as availability of different sizes, wide variety of different styles, and availability of well-known brands, while the attribute of store display also refers to factors such as window and product displays, and attractive store layout (Chen-Yu and Seock 2002). A possible explanation for the female participants regarding these attributes to be more important than the male participants may be due to the females shopping motivation of recreation, as "product variety and store display increase the fun and enjoyment" (Chen-Yu and Seock 2002).

Since females are more emotional in their appeal, the buying environment may play a more important role for women customers. They see shopping as a fun, joyful and hedonic activity and look forward to this communal event with cheerful prospects.

Product Attributes

To make analysis, table presentations have been made. Table 4 on next page shows the *t*-values of variables under product attributes of sample males and females.

The results of the t-test presented in the table below, reveal that significant differences were found in the level of importance attributed by female and male respondents to the attributes of **Style** of apparels. The independent sample t-test was associated with a statistically significant effect with t (498) =2.01, p=.039 for Style attribute. It is revealed by the survey that 81 percent of the female respondents responded that while buying apparel, it is of utmost importance that they should be stylish and suit to their personality, whereas only 56 percent of their male counterparts favoured in favour of this variable This is supported by Zhang *et al.* (2002) who concurs that, of all the demographic variables, "Gender is the one that has significant impacts on the importance of most of the attributes". Accordingly, it was found that the female Chinese consumers regarded the attributes of fit, comfort, style, colour and easy care to be more important compared to the male respondents with regard to choosing casual clothing, whereas there was no significant difference in the importance ratings of price, workmanship and trendiness between the two genders (Zhang *et al.* 2002).

Table 4- Variables considered under product attributes of buying behaviour for males and females

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Fit	Equal variances assumed	1.297	.255	-1.121	498	.263	-.111	.099	-.307	.084
	Equal variances not assumed			-1.144	388.282	.253	-.111	.097	-.303	.080
Durability	Equal variances assumed	2.299	.130	-.483	498	.629	-.044	.092	-.224	.136
	Equal variances not assumed			-.495	392.658	.621	-.044	.089	-.220	.131
Style	Equal variances assumed	1.465	.227	2.01	498	**.039**	-.016	.099	-.210	.177
	Equal variances not assumed			2.05	380.261	.031	-.016	.097	-.208	.175
Price	Equal variances assumed	.524	.469	-.982	498	.327	-.093	.095	-.280	.094
	Equal variances not assumed			-.992	376.329	.322	-.093	.094	-.279	.092
Quantity	Equal variances assumed	2.038	.154	-1.139	498	.255	-.118	.103	-.321	.085
	Equal variances not assumed			-1.149	374.582	.251	-.118	.103	-.320	.084

Style is a form of Self Expression that help the youngsters to cope with social situations. The right style provides them with acceptance and identity among peers and makes them feel trendy. According to (Cox and Dittmar 1995 cited in Bakewell *et al.* 2006), female students perceive clothes "in terms of their symbolic value for gaining approval and acceptance from peers"

Reference Groups

To make analysis, table presentations have been made. Table 5 shows the *t*-values of variables under reference groups of sample males and females.

Table 5 -Variables considered under reference group of buying behaviour for males and females

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Influence of family of friends	Equal variances assumed	.004	.949	2.12	498	**.031**	-.017	.110	-.234	.199
	Equal variances not assumed			2.17	363.118	.029	-.017	.110	-.235	.200
Celebrity Influence	Equal variances assumed	3.225	.073	-1.215	498	.225	-.128	.105	-.334	.079
	Equal variances not assumed			-1.200	352.253	.231	-.128	.106	-.337	.082
Past Experience	Equal variances assumed	1.513	.219	-.266	498	.790	-.025	.096	-.214	.163
	Equal variances not assumed			-.271	384.160	.787	-.025	.094	-.210	.160
TV/Magazine	Equal variances assumed	.676	.411	-.805	498	.421	-.092	.114	-.317	.133
	Equal variances not assumed			-.812	374.013	.417	-.092	.113	-.315	.131
Internet	Equal variances assumed	.917	.339	-.871	498	.384	-.098	.113	-.320	.123
	Equal variances not assumed			-.885	381.920	.377	-.098	.111	-.317	.120

The results of the t-test presented in the above table, reveal that significant differences were found in the level of importance attributed by female and male respondents to the attributes of **Influence of family and friends**. The independent sample t-test was associated with a statistically significant effect with t (498) = 2.12, p=.031.The survey results revealed that 63 percent of females strongly agree that family and friends hold a strong opinion for them while they are shopping for apparels. For males, 51 percent strongly agreed regarding the importance of this variable. As stated earlier, female students perceive clothes "in terms of their symbolic value for gaining approval and acceptance from peers" (Cox and Dittmar 1995 cited in Bakewell *et al.* 2006). Zhang *et al.* (2002). It has been suggested that individuals are more susceptible to reference group influence when the product is conspicuous and publicly

consumed (Bearden and Etzel, 1982; Makgosa and Mohube, 2007) such as fashion apparel and accessories. Females place greater value on promoting and maintaining relationships. They are highly conscious and concerned with promoting interpersonal harmony (Rosenberg and Simmons, 1975). Females tend to discuss consumption matters with peers, such as information search, purchase decisions and brand preferences more frequently than males (Mangleburg et al. 1997; Moschis and Mitchell 1986). Differences have also been observed with respect to parental influence. For instance, females have in the past demonstrated a higher degree of parental influence as compared to males (Feltham, 1998). In addition, gender differences have also been observed with respect to friends, siblings and media influence (Wilson and MacGillivray, 1998). Feltham (1998) also reported that females have demonstrated a higher degree of parental influence as compared to males. The findings are contradictory to the study conducted by (Bearden and Etzel, 1982; Makgosa and Mohube, 2007) who suggested that males, rather than females, are more likely to purchase designer label brands to be accepted by their friends.

Consumer Characteristics

To make analysis, table presentations have been made. Table 6 shows the *t*-values of variables under consumer characteristics of sample males and females.

The results of the t-test presented in the table below, reveal that significant differences were found in the level of importance attributed by female and male respondents to the attributes of **Preference to wear and try before purchase**, **Store image** and **Brand Loyalty**. The independent sample t-test was associated with a statistically significant effect with t (498) =2.13, p=.014 for Preference to wear and try before purchase, t (498) = 2.15, p= .035 for Store Image and t (498) = 2.16, p=.023 for Brand loyalty. Survey results revealed that 68 percent females prefer to wear and try the product before purchasing it while in case of males this figure stood at 54 percent. For store image, 73 percent females strongly agreed that store image is important for them and 69 percent of them said they tend to visit the same shop for buying a particular brand and hence are more store loyal and brand loyal as compared to their male counterparts with a huge difference as only 44 percent of males agreed that store image is important to them while 38 percent tend to be brand loyal customers. Lysonksi et al. (1996) indicated that the consumer characteristics approach seemed to be the most powerful and explanatory as it focused on the mental orientation of consumers in making decisions. This is in coherence with previous studies .With regard to the specific shopping behaviour and preferences of males and females, “women want choice, and they’re willing to try on way more articles of clothing than men are to find the right thing” (Yarrow and O’Donnell 2009), while “men, on the other hand, view lots of choice as overwhelming” (Yarrow and O’Donnell 2009). Accordingly, women “may be more apt to bargain-hunt when it comes to fashion” (Smith 2008), while men are “more focused on solutions than on options” (Yarrow and O’Donnell 2009). Furthermore, according to Mulpuru, a Research Analyst, “men tend to value their time more” (Smith 2008) and are thus “much more forthright than women in expecting quick checkout service” (Yarrow and O’Donnell 2009). Men do not, however, “like to ask for advice, insight, or different sizes” (Yarrow and O’Donnell 2009). With regard to online shopping in particular, men have been described as a “retailer’s dream” as they “spend more, make snap decisions, and return less stuff” (Smith 2008). Ultimately, men and women use fashion in different ways: “women tend to enjoy fashion in its own right, as creative expression and as a social vehicle”, while “men use fashion and dressing in a solution-focused way” (Yarrow and O’Donnell 2009).

Table 6- Variables considered under consumer characteristics of buying behaviour for males and females

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Preference to wear and try before purchase	Equal variances assumed	.000	.989	2.13	498	**.014**	-.068	.114	-.293	.157
	Equal variances not assumed			2.16	365.775	.021	-.068	.114	-.293	.157
Fashion Consciousness	Equal variances assumed	.009	.924	-1.057	498	.291	-.122	.116	-.350	.105
	Equal variances not assumed			-1.050	358.055	.294	-.122	.117	-.351	.107
Impulse buying behavior	Equal variances assumed	.822	.365	-.836	498	.403	-.101	.121	-.340	.137
	Equal variances not assumed			-.844	374.780	.399	-.101	.120	-.338	.135
Store Image	Equal variances assumed	.000	.986	2.15	498	**.035**	-.104	.108	-.316	.108
	Equal variances not assumed			2.11	377.686	.033	-.104	.107	-.314	.106
Brand loyalty	Equal variances assumed	.360	.549	2.16	498	**.023**	-.007	.113	-.229	.214
	Equal variances not assumed			2.09	357.367	.031	-.007	.113	-.230	.216

With regard to gender differences in terms of attribute salience, "men give more prominence to proximity. Women tend to trade this off with merchandise offered by the store" (Sinha *et al.* 2002). This may be due to the fact that women often "buy for other members of the family and hence would like to make a more informed decision" (Sinha *et al.* 2002)

Bakewell and Mitchell (2006) conducted a study investigating the decision making styles of males versus female consumers. Female shoppers in the study tended to be bargain seekers, where they purchase as much as possible at sale prices; demonstrate the "imperfectionism" trait, where they will settle for a product which is not precisely what they require nor the best

in its category; as well as being store loyal, where they tend to visit the same stores each time they shop (Bakewell and Mitchell 2006).

Promotional Factors

To make analysis, table presentations have been made. Table 7 shows the *t*-values of variables under promotional factors of sample males and females.

Table 7- Variables considered under promotional factors of buying behaviour for males and females

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Social Media	Equal variances assumed	1.139	.286	.571	498	.569	.058	.102	-.143	.260
	Equal variances not assumed			.580	383.399	.562	.058	.101	-.140	.257
In-store promotion	Equal variances assumed	2.719	.100	2.08	498	**.034**	-.061	.096	-.251	.128
	Equal variances not assumed			2.01	386.196	.041	-.061	.095	-.247	.125
Pricing techniques	Equal variances assumed	.019	.892	2.12	498	**.013**	.009	.100	-.187	.206
	Equal variances not assumed			2.07	368.003	.017	.009	.100	-.187	.205
Visual Display	Equal variances assumed	1.954	.163	2.00	498	**.046**	.018	.110	-.198	.233
	Equal variances not assumed			2.01	391.892	.049	.018	.107	-.193	.228
Celebrity Endorsement	Equal variances assumed	2.524	.113	1.073	498	.284	.124	.116	-.104	.352
	Equal variances not assumed			1.096	388.757	.274	.124	.114	-.099	.348

The results of the t-test presented in the above table, reveal that significant differences were found in the level of importance attributed by female and male respondents to the attributes of **In-store promotions, Pricing techniques** and **visual displays**. The independent sample t-

test was associated with a statistically significant effect with t (498) =2.08, p=.034 for in-store promotions, t (498) =2.12, p=.013 for Pricing techniques and t (498) = 2.00, p=.046 for Visual displays According to the survey 73 percent, 62 percent and 60 percent of female respondents strongly agreed with respect to In-store promotions, pricing techniques and visual displays influencing their buying intentions. However these figures were significantly low for males, as only 43 percent, 54 percent and 33 percent of them tend to be strongly influenced by in-store promotions, pricing techniques and visual displays respectively.

Female consumers tend to be more influenced by various promotional techniques such as discounts, coupons, etc. when making decisions relating to apparel brands as they are more concerned with self-expression and gaining social approval as compared to males who are more rational in their approach.

Visual displays act as a powerful stimulant for a female shopper and drives them to enter a store as compared to male shoppers who don't as such bother about the outside appearance of a store. This is supported by previous studies which state that females have been found to be more sensitive to the informative details provided in advertisements (Auty and Elliot, 1998), or in the way information is processed (Laroche et al, 2000). With particular reference to susceptibility to interpersonal influence, females have been found to be more susceptible to the display aspects of clothing i.e. value-expressive influence, whereas males were more influenced by utilitarian aspects of the same (Rose, Boush and Friestad, 1998).

Shopping Expenditure and shopping frequency between males and females

In order to identify the dynamics of male and female buying behaviour with respect to Shopping Expenditure and shopping frequency , one – way ANOVA test has been used.
This technique is used to compare means of two or more samples.

Shopping Expenditure

To examine the male and female buying behaviour with respect to shopping expenditure, the following hypothesis has been tested using ANOVA.

H_2**:** Males and females carry out differences in their shopping expenditure

In order to apply one –way ANOVA test, the assumptions were duly met as data was normally distributed. The Shapiro- wilk test (p>.05) showed that shopping expenditure were approximately normally distributed for both males and females. Also Levene's test (homogeneity of variance) (p>.05) (Martin & Bridgmon, 2012) verified the equality of variances in the samples. In Table 8 below, the results of ANOVA shopping expenditure are shown.

Table 8 ANOVA Shopping Expenditure

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.792	1	1.792	7.96	.022
Within Groups	112.05	498	.225		
Total	113.842	499			

As is exhibited from the above table, there is no statistically significant difference between groups as determined by one-way ANOVA (F (1,498) = 7.96, p = .022). Thus the H_2 is rejected i.e. Males and females carry out differences in their shopping expenditure and null hypothesis is accepted. Thus we may say that males and females in the age group of 18-25 years exhibit similar behavioural pattern when it comes to spending money for apparels and there are no significant differences between the two groups. As an emerging and growing market, the youth has been of interest in recent time's .Having a general liking for purchasing, this cohort has significant spending power and is likely to spend impulsively given the amount of free time they have for shopping (Der Hovanesian, 1999; Gardyn, 2002; Ma and Niehm, 2006). The Indian consumers today are becoming more materialistic. The Indian consumers need global, branded and local products. (Khanna and Palepu, 2006). The growth of Information technology, rapid changing fashion trends have made today's youth extremely fashion savvy and Brand conscious. Generation Y research conducted by Yarrow and O'Donnell (2009) show that men spend far less on shopping than their female counterparts. However, with changing times, it is evident that men of Generation Y are spending more on shopping for apparels as compared to men of previous generations. This is also because today men are equally conscious of their looks and appearance as women.

Shopping Frequency

To examine the male and female buying behaviour with respect to shopping expenditure, the following hypothesis has been tested using ANOVA.

H_3**:** Males and females carry out differences in their shopping frequency

In order to apply one –way ANOVA test, the assumptions were duly met as data was normally distributed. The Shapiro- wilk test (p>.05) showed that shopping frequency respectively were approximately normally distributed for both males and females. Also Levene's test (homogeneity of variance) (p>.05) (Martin & Bridgmon, 2012) verified the equality of variances in the samples. In Table 9 below, the results of ANOVA shopping frequency are shown.

Table 9 ANOVA Shopping Frequency

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.242	1	2.242	9.46	.001
Within Groups	118.23	498	.237		
Total	120.472	499			

As exhibited from the above table there is no statistically significant difference between groups as determined by one-way ANOVA (F(1,498) = 9.46, p = .001) Thus the H_3 is rejected i.e. Males and females carry out differences in their shopping frequency and null hypothesis is accepted. Thus we may say that males and females in the age group of 18-25 years exhibit similar behavioural pattern when it comes to shopping frequency for apparels and there are no significant differences between the two groups. Males and females today have an equal level of exposure with respect to every little aspects of life. Be it education, career, work-life, extra - curricular activities etc. women are increasingly focussed and goal- oriented. Both the genders extensively make use of the information and communication technology and don't hold any gender differences attributable to shopping frequency. Males do not consider shopping as a

feminine activity and are increasingly eager to shop for apparels as much as their counterparts. Otnes and McGrath (2001) conducted a study investigating the perceptions and realities of male shopping behaviour in which the findings contradicted the general male shopping stereotypes of "Grab and Go", "Whine and Wait" and "Fear of the Feminine". Accordingly, it was concluded that "men often evaluate alternatives, bargain, and even shop in "feminine stores" (Otnes and McGrath 2001). There are many reasons for this, such as the changing perceptions of shopping which is now seen as something "fun and sociable" (Yarrow and O' Donnell 2009) and a way of spending time with friends; men have "gotten more particular in their tastes; and retailers have gotten better catering to them" (Yarrow and O' Donnell 2009). Inevitably, gender differences are slowly fading as a " shift towards gender convergence" becomes more prominent (Yarrow and O' Donnell 2009) and generally , "there's much more freedom for men to explore formerly female categories like cooking and clothes, and for women to dip traditionally guy categories like extreme sports and yard care" (Yarrow and O' Donnell 2009).A study analyzed the significance of demographic profile of consumers affecting the purchase decision of branded garments and to observe from gender perspective the consumer awareness about apparel brands available in the Indian market and also to find out whether there is a significant difference in total expenditure on branded apparels done by males vis- a - vis females. The results reveal that there are no significant differences in the brand awareness, shopping frequency and shopping expenditure between males and females (Rajput, Kesharwani, Khanna, 2012).

Nevertheless, retailers must still note that the main "interests" of both men and women have remained almost unchanged, with men spending " big on luxury" (Smith 2008), as well as preferring to purchase "music, electronics, games and sporting equipment", while women prefer to shop for " clothing, accessories and home decorations" (Yarrow and O' Donnell 2009)

DISCUSSIONS AND IMPLICATIONS

A) The study indicates that Consumers are aware of most of the national and International brands available in the country and have immense craze for shopping in malls. This has a very important implication for the marketer as they must take effective steps to ensure that they create an entertaining shopping environment cognisant of the fact that the longer the shoppers' stay in a store and more goods they are exposed to. So providing various enhancements to shopping experience in terms of amenities like cafes, various forms of entertainment etc. might increase the sales volume.

B) Given the erratic and ever-changing mind- set of the young consumers, marketers must understand their shopping behaviour and make persistent marketing efforts to transmit the frequency of buying behaviour from occasionally to frequently. This could be done through various promotional offers which can act as a powerful stimulant for a consumer to visit the store and shop. Indian consumers today have become all the more value conscious and given their budgetary constraints, it's extremely important for the marketer, to come up with low range/ eco- range of products to cater to a larger segment.

C) Taking the gender perspective into consideration, it was revealed that female respondents place greater importance to attributes such as Physical facilities, Variety, Style, Family and friends, store image, Brand Loyalty, Preference to wear and try before purchase, and promotional factors as compared to their male counterparts. Female shoppers tend to be bargain seekers when it comes to apparels and their purchase decisions are significantly influenced by discount schemes. Thus marketers must embed this in their strategies by

coming up with appealing advertising, convenient locations, low prices for their female shoppers.

D) The study reveals similar behavioural patterns between males and females with respect to shopping expenditure and shopping frequency. This has a very important implication for the marketer as they must understand that men of today are equally conscious of their looks, appearance and style as are females. Hence it is imperative that a wide range of products in terms of variety, latest trends, colours etc. be available for this gender as well. Gone are the days when colour pink was only associated with females. The male gender today has equally become experimental and prefer variety of vibrant colours as do their female counterparts.

E) This study contributes to academia by providing a conceptual framework to understand apparel buying behaviour of young India consumers. Practitioners may also utilize this model in the present study to improve their retailing strategies to increase their retail sales by offering well-maintained retail services, facilities, promotions and quality merchandise. The marketers must play a decisive role to understand the Consumer buying behaviour for branded apparels and cater to this younger segment more profitably.

F) Marketers need to put in their best efforts to deeply understand the consumer behaviour rather than just concentrating on ambience and sheer novelty to increase sales. With fast changing trends in fashion cycles, it is imperative for the marketer to be dynamic and flexible in their approach for a better understanding of consumer behaviour. This will lead to a reduction in failure rate. Marketer must do away with unnecessary increase in overhead expenses and offer variety of products at cheaper prices. They must come up with good business models and have a whole new orientation to meet customer demands. The study represents the young consumers in the age group of 18-25years also called a 'Twixter'. For this group, marketers should focus on and emphasize the attributes that have been considered to be the most influential in buying decisions. The key to win their confidence and retain them is to understand deeply their needs and to deliver more value than the rivals.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

The study is only limited to Delhi/ NCR, Bangalore and Chandigarh region and hence findings cannot be generalized universally. The study investigates the buying behaviour for the apparel segment only. Future studies may examine buying behaviour in other retail segments. Also, the current study focusses on apparel buying behaviour in a retail store. Future studies can examine online apparel buying behaviour or buying through other retail formats. The present study is based on the consumer buying behaviour of branded apparels of only 500 respondents. Hence the sample may not be the true pointer of the entire universe and a larger sample size may be considered for future research. The present research has not considered age groups beyond 18-25 years. Hence the representative sample chosen for the study can be expanded to include consumer groups such as middle – aged or elderly groups to get a more comprehensive insight of consumer buying behaviour. Also, a future study on apparel buying behaviour of female consumers per se can be examined in a country like India as several literature revealed this segment to be highly lucrative and potentially profitable as they are the chief purchasing officers and decision makers in majority of households.

References

Amit. G., Pakhie. S., Peush. N., Prakash. B., Ruby. J., Brahma.K.P. (2012). "Textile & Apparel Compendium 2012", www.technopak.com.

Auty, Elliott. (1998). Fashion involvement, self-monitoring and the meaning of brands. Journal of Product &Brand Management, 7(2), 109-123. http://dx.doi.org/10.1108/10610429810216874

Bakewell, C. and Mitchell, V.W., (2006). Male versus female consumer decision making styles. Journal of Business Research, 59. pp. 1297-1300. Available:

http://www.sciencedirect.com/science?_ob=MImg&_cid=271680&_user=2822922&_pii=S0148296306001317&_coverDate=11%2F30%2F2006&view=c&wchp=dGLzVlVzSkzV&_valck=1&md5=5adbe189a648fb68bcfc5a930fcd9770&ie=/sdarticle.pdf

Bearden, W.O., & Etzel, M.(1982), "Reference Group Influence on Product and Brand Purchase Decisions", Journal of Consumer Research, 9(2), 183-194

Berner, R., Khermouch, G. and Pascual, A. (2001), "Retail reckoning", BusinessWeek Online, available at: www.businessweek.com/magazine/content/01_50/b3761089.htm

Chen-Yu, J.H and Seock, Y. (2002). Adolescents‟ Clothing Purchase Motivations. Information Sources, and Store Selection Criteria: A Comparison of Male/Female and Impulse/Nonimpulse Shoppers. Family and Consumer Sciences Research Journal, 31 (1).pp.50-77.Available: http://onlinelibrary.wiley.com/doi/10.1177/1077727X02031001003/pdf

Darden, W.R., & Howell, R.D., (1987). Socialization effects of retail work experience on shopping orientations. Journal of the Academy of Marketing Science 15(3):52-63.

Davis, S.M. (1984). Managing corporate culture. Cambridge, Mass.: Ballinger.

Der Hovanesian, M., (1999) spending it, investing it – coming on strong: The children of the baby boomers are affecting spending and investing as their parents did; the similarity ends there. Wall Street Journal, Eastern Edition, p 12.

Dholakia, R.R., (1999), Going shopping: key determinants of shopping behaviours and motivations. International Journal of Retail and Distribution Management, 27 (4). pp.154-165.Available: http://www.emeraldinsight.com/journals.htm?articleid=857255&show=abstract

Dickson, A.M., Lennon, J.S., Montalto, C.P., Shen, D. and Zhang, L. (2004), "Chinese consumer market segments for foreign apparel products", Journal of Consumer Marketing, Vol. 21, pp. 301-317

Duncan, T. (2005). Principles of Advertising & IMC, 2nd ed. New York, USA: McGraw-Hill Irwin

Eadie, D., Hastings, G., Stead, M. and Mackintosh, A.M. (1999). Branding: could it hold the key to future tobacco reduction policy? Health education, 99(3): 103-110.

Feltham, T.S.(1998), "Leaving Home: Brand Purchase Influences on Young Adults", Journal of Consumer Marketing, 15(4), 372-385

Gardyn, R., (2002) Educated consumers. American Demographics 24 (10), 18-19.

Grossman, L., (2005). Grow Up? Not so Fast. Time, 24 January, pp. 1-6. Available: http://cseweb.ucsd.edu/~datorres/docs/grow_up_not_so_fast.pdf

Gurunathan,K.B., Krishnakumar, M.2013." Factors Influencing Apparel Buying Behaviour in India: A Measurement Model "Paripex - Indian journal of research, Volume : 2, Issue : 3, March 2013

Hawkins, D.I., Mothersbaugh, D.L. and Best, R.J. (2007). Consumer Behaviour: Building Marketing Strategy. 10th ed. Boston: McGraw-Hill Irwin

Hu, T., Chuang, S., Hsieh, W., Chang, C. and Chang, C. (n.d). Investigating brand strategy, brand equity, and channel strategy on market performance – an empirical investigation of the cosmetic industry. Available: http://academic-papers.org/ocs2/session/ Papers/ G4/551-1867-1-DR.doc.

Kaiser, S. B. (1985). The social psychology of clothing and personal adornment. NewYork: Macmillan.

Khanna, T., & Palepu, K. G. (2006). Emerging giants: Building world class companies in developing countries. Harvard Business Review, 84(10), 60-69.

Kwan. C.Y, Yeung. K.W, Au. K.F (2004), "Decision – making Behaviour towards Casual Wear Buying: A Study of Young Consumers in Mainland China", Journal of Management and World Business Research, Vol 1, No.1.

Laroche, M., Saad, G., Cleveland, M., & Browne, E. (2000). Gender differences in information search strategies for a Christmas gift. Journal of Consumer Marketing, 17(6), 500-524.

Liu, T. and Wang, C. (2008), Factors affecting attitudes toward private labels and promoted brands, Journal of Marketing Management, 24(3), 283-298

Lysonski, S., Durvasula, S., & Zotos, Y (1996), Consumer decision making styles: A multi country investigation. European Journal of Marketing, 30(12), 10-21. http://dx.doi.org/10.1108/03090569610153273

Ma, Y.J., Niehm, L.S., (2006). Service expectations of older generation Y customers: An examination of apparel retail settings. Managing Service Quality 16 (6), 620-640

Makgosa, R. & Mohube, K.(2007), "Peer influence on young adults‟ product purchase decisions", African Journal of Business Management, June, pp.064-071

Mangelburg, T. F., Grewal, D. & Bristol, T. (1997), "Socialization, gender, and adolescents‟ self-reports of their generalized use of product labels", Journal of Consumer Affairs, Vol. 31, 255-279

Martin, C.A. and Turley, L.W., (2004). Malls and Consumption motivation: an exploratory examination of older Generation Y consumers. International Journal of Retail and Distribution Management,32(10).pp.464-475.Available: http://proquest.umi.com/pqdweb?did=725772301&Fmt=4&clientld=30060&RQT=309&VName=PQD

Martin, W.E., & Bridgmon, K.D., (2012). Quantitative and statistical Research Methods: From Hypothesis to results. Somerset, NJ:Wiley

McCracken, G. (1988). The long interview. Newbury Park, CA: Sage Publications.

Moschis & Mitchell (1986), " Television advertising and interpersonal influences on teenagers' participation in family consumer decisions", Advances in Consumer Research, Vol. 13, ed. Richard Lutz, Provo, UT: Association for Consumer Research, p. 181-186

Nunally, J.C., & Bernstein, I. H. (1994). Psychometric theory (3rd ed.). New York: Mc Graw Hill

Otnes, C. and McGrath, M.A. (2001), Perceptions and realities of male shopping behaviour. Journal of Retailing,77.pp111-137. Available:http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6W5D-42SGGVW-7-4&_cdi=6568&_user=2822922&_pii=S0022435900000476&_origin=gateway&_coverDate=01%2F01%2F2001&_sk=999229998&view=c&wchp=dGLzVtzzSkzS&md5=30fff2ff613bdf7e70d2f31811fa5bf0&ie=/sdarticle.pdf

Postrel, V. (2003), The Substance of Style: How the Rise of Aesthetic Value Is Remaking Commerce, Culture, and Consciousness, Harper Collins, New York.

Rajput, N., Kesharwani, S., Khanna, A. (2012). Consumer attitude towards branded Apparel: gender perspective. International Journal of Marketing Studies, Vol. 4(2).pp 111-120. http://dx.doi.org/10.5539/ijms.v4n2p111.

Razali, N.M., & Wah, Y.B., (2011). Power comparisons of Shapiro –Wilk, Kolmogorov-Smirnov. Lilliefors and Anderson -darling tests. Journal of statistical Modelling and Analytics, 2(1), 21-33

Roach-Higgins, M.E., & Eicher, J. B. (1992). Dress and identity. Clothing and Textiles Research Journal, 10(4), 1-8.

Rose, G.M., Boush, D.M. & Friestad, M. (1998), "Self-esteem, susceptibility to interpersonal influence,and fashion attribute preferences in early adolescents," European Advances in Consumer Research, 3, 197-203

Russell-Bennett, R., McColl-Kennedy, J.R. and Coote, L.V. (2007). Involvement, satisfaction, and brand loyalty in a small business services setting, Journal of Business Research 60(12): pp. 1253-1260. Available : http://eprints.qut.edu.au/13239/1/13239.pdf

Shapiro, S.S., & Wilk, M.B., (1965). An analysis of variance test for normality (complete samples). Biometrika, 52(3/4), 591-611

Shim, S, & Kotsiopulos, A. (1993). A typology of apparel shopping orientation segments among female consumers, Clothing and Textiles Research Journal 12(1):73-85

Sinha, P.K., Banerjee, A. and Uniyal, D.P., (2002) Deciding where to buy: Store choice behaviour of Indian shoppers. Vikalpa, 27 (2). pp. 13-28. Available: http://www.vikalpa.com/pdf/articles/2002/2002_apr_jun_13_28.pdf

Smith, R.A., (2008) Fashion Online: Retailers Tackle the Gender Gap. Wall Street Journal. pp. 1-2. Available: http://proquest.umi.com/pqdweb?did=1444807621&sid=4&Fmt=3&clientId=30060&RQT =309&VName=PQD

Steenkamp, J.E.M. and Hofstede, F. (2002), "International market segmentation: issues and perspectives", International Journal of Research in Marketing, Vol. 19 No. 3, pp. 185-213.

Stone, G.P., (1954). City shoppers and urban identification: Observation on the social psychology of city life. American Journal of Sociology 60(1):36-45

Stone, G. P., (1962). Appearance and the self. In A. M. Rose (Ed.), Human behavior and social processes: An interactionist approach (pp.86-118). New York: Houghton Mifflin.

Wilson, J.D. & MacGillivray, M.S.(1998), "Self-perceived influence of family, friends and media on adolescents clothing choice," Family and Consumer Sciences research Journal, Thousand Oaks, June www.statistics.gov.com.my

Yarrow, K. and O'Donnell, J., (2009) Gen BuY: How tweens, teens, and twenty-something's are revolutionizing retail. San Francisco, Jossey-Bass.

Zhang, Z., Li, Y., Gong, C. and Wu, H., (2002). Casual wear product attributes: A Chinese consumers‟ perspective. Journal of Fashion Marketing and Management, 6 (1).pp.53-62. Available:http://www.emeraldinsight.com/Insight/ViewContentServlet?Filename=Publishe d/EmeraldFullTextArticle/Articles/2840060105.html

http://www.ibef.org/download/Retail50112.pdf

http://www.mckinsey.com/insights/consumer_and_retail/how_half_the_world_shops_apparel_in_brazil_china_and_india