

OPEN ACCESS



Journal of  
**Economics and  
International Finance**

January 2019  
ISSN 2006-9812  
DOI 10.5897/JEIF  
[www.academicjournals.org](http://www.academicjournals.org)



**ACADEMIC  
JOURNALS**  
expand your knowledge

## ABOUT JEIF

The **Journal of Economics and International Finance (JEIF)** is published monthly (one volume per year) by Academic Journals.

**Journal of Economics and International Finance (JEIF)** is an open access journal that provides rapid publication (monthly) of articles in all areas of the subject such as econometrics, trade balance, Mercantilism, Perfect competition etc. The Journal welcomes the submission of manuscripts that meet the general criteria of significance and scientific excellence. Papers will be published shortly after acceptance. All articles published in JEIF are peer-reviewed.

### Contact Us

**Editorial Office:** [jeif@academicjournals.org](mailto:jeif@academicjournals.org)

**Help Desk:** [helpdesk@academicjournals.org](mailto:helpdesk@academicjournals.org)

**Website:** <http://www.academicjournals.org/journal/JEIF>

**Submit manuscript online** <http://ms.academicjournals.me/>

## Editors

**Prof. Nathalie Jeanne-Marie HILMI**

*Professor of Economics and Finance,  
International University of Monaco,  
Hedge Funds Research Institute,  
98000 Monte-Carlo, Principality of, Monaco.  
France*

**Prof. Osamah M. Al-Khazali**

*Professor of Finance,  
School of Business and Management  
American University of Sharjah,  
P.O. Box 26666,  
United Arab Emirates,*

**Dr. Guneratne B Wickremasinghe**

*School of Accounting  
Faculty of Business and Law  
Victoria University  
Melbourne  
Victoria, 8001.  
Australia*

**Dr. Meltem Gürünlü**

*Department of Economics and Finance  
University of Turin,  
G.Prato,  
Italy.*

**Prof. Yongrok Choi**

*Department of International Trade,  
Inha university,  
Incheon,  
Korea.*

**Prof. Mohamed Osman Ahmed Bushara**

*Department of Agricultural Economics;  
FAS; Gezira University; P. O. Box 20; Wad Medani;  
Sudan.*

**Prof. Anyanwu John Chukwudi**

*Development Research Department  
African Development Bank  
15 Avenue du Ghana  
BP 323, 1002 Tunis Belvedere  
Tunis  
Tunisia*

**Prof. S. E. Neaime**

*Department of Economics,  
Institute of Financial Economics,  
American University of Beirut,  
Beirut,  
Lebanon.*

**Dr. Adrei Vernikov**

*Banking Department,  
Higher School of Economics  
P.O. Box 43,  
Moscow 125057,  
Russia.*

**Prof. Keith Pilbeam**

*Department of Economics,  
City University,  
Northampton Square,  
London EC1V OHB.  
UK.*

## Editorial Board

**Dr. Gbadebo Olusegun ODULARU**

*Regional Policies and Markets Analyst,  
Forum for Agricultural Research in Africa (FARA),  
PMB CT 173 Cantonments, 2 Gowa Close, Roman Ridge,  
Accra, Ghana.*

**Dr İlhan Ozturk**

*Çağ University, Faculty of Economics and Administrative,  
Sciences, Adana - Mersin karayolu, uzeri, 33800,  
Mersin ,Turkey.*

**Professor. Abdelkader BOUDRIGA**

*Professor of finance,  
School of Economics and Commerce,  
Tunis, Tunisia.*

**Dr. Shivakumar Deene**

*Dept. of Commerce and Management,  
Karnataka State Open University,  
Manasagangotri,  
Mysore- 570 006,  
Karnataka - India.*

**Mohammed Omrán**

*The Egyptian Exchange, 4 (A) El, Sherifein St, Down, Town,  
Postal Code 11513,  
P.O. Box 358 Mohammed Farid,  
Cairo, Egypt.*

**Dr. Kola Subair**

*Adjunct Professor, Business and, Financial Economics,  
American Heritage University,  
California, USA.*

**Dr. Bora Aktan**

*Assistant Professor of Finance,  
Yasar University,  
Faculty of Economics and, Administrative Sciences,  
Department of Finance,  
Selcuk Yasar Campus,  
Universite Caddesi, No. 35-37,  
35100 Bornova, Izmir,  
Turkey.*

**Dr. Davide Furceri**

*Office of the Chief Economist,  
Economics Department,  
2, Rue André-Pascal,  
75775 Paris Cedex 16,  
France.*

**Dr. ABDUL JALIL**

*Wuhan University,  
Economics and Management School,  
Wuhan,Hubei,  
PR China.*

**Prof. Silvia Ciotti**

*Dept of Social and Environmental Sciences,  
St. John International University,  
Della Rovere Castle - Rey Square,  
10048 - Vinovo (Turin),  
Italy.*

**Prof. Tessaleno Devezas**

*Advanced Materials and Technological, Forecasting,  
University of Beira Interior,  
6200-001 Covilhã,  
Portugal.*

**Dr. Nikolay Sukhomlin**

*Autonomous University,  
Santo Domingo,  
Dominican Republic.*

**Prof. Dev Tewari**

*Deputy Dean, Faculty of Management Studies  
Professor, School of Economics and Finance,  
Westville Campus, University of KwaZulu-Natal  
Resource Economics, Durban, 4001.  
South Africa.*

**Dr. Tarek Chebbi**

*Faculty of Law, Economics and Political Science  
University of Sousse,  
Erriadh City - 4023 Sousse,  
Tunisia*

**Professor Hichri Walid**

*Gate & Uiversity of Lyon, LAREQUAD  
Gate, 93 Chemin des mauilles, 69130 Ecully  
France.*

**Dr.Sunderasan Srinivasan**

*Navillu Road 7th Cross, Kuvempunagar,  
Mysore 570023,  
India.*

**Dr. P. Malyadri**

*Government degree College,Osmania University  
Tandur-501141,Rangareddy District  
India.*

## ARTICLES

**Impact of credit risk on corporate financial performance:**

**Evidence from listed banks on the Ghana stock exchange**

Richard Oduro, Michael Amoh Asiedu and Samuel Gamali Gadzo

**Gender difference in poverty: An empirical analysis in Bench Maji,  
Kaffa and Sheka zones, south west Ethiopia**

Mulatie Chanie and Andualem Begashaw

*Full Length Research Paper*

# **Impact of credit risk on corporate financial performance: Evidence from listed banks on the Ghana stock exchange**

**Richard Oduro<sup>1\*</sup>, Michael Amoh Asiedu<sup>1</sup> and Samuel Gamali Gadzo<sup>1</sup>**

<sup>1</sup>Department of Banking and Finance, School of Business, University of Education, Winneba, Ghana.

<sup>2</sup>Department of Accounting, School of Business, University of Education, Winneba, Ghana.

Received 16 October, 2018; Accepted 16 January, 2019

**A bank's financial performance and survival can be threatened when there is an increased exposure to credit risk. On this basis, this study seeks to identify the factors that determine the level of bank credit risk and further estimates the effects of bank credit risk on corporate financial performance using financial data from banks on the Ghana Stock Exchange over a 15-year period from 2003 to 2017. Using the method of 2SLS, it was observed variables such as capital adequacy, operating efficiency, profitability, and net interest margin are inversely related to credit risk. Conversely, bank size and financing gap tend to relate positively with credit risk. Also, annualised changes in inflation tend to positively affect credit risk. Again, it was observed that, increase in bank credit risk negatively affects corporate financial performance which is consistent with Basel accord. Thus, for banks to survive in their industry, critical attention needs to be paid to management of its credit risk exposure.**

**Key words:** Credit risk, corporate performance, loan default, interest rate.

## **INTRODUCTION**

The banking sector of every country plays a significant role in its economy's growth and development. One of such roles is to act as an intermediary between lenders and borrowers. Associated with this role is the risk that depositors will suddenly withdraw their deposits (liquidity risk) and the risk that borrowers will default in repayment of interest and the principal loans on time (credit risk). These risks, especially credit risk, have a high tendency of adversely affecting financial performance of these institutions and if not well managed, persistent exposure

to these risks poses threat to the survival of these institutions.

There have been several studies on banking crisis in different economies and the role plays by credit risk in these crises. A study undertaken by Hasan et al. (2014) revealed that, higher level of credit risk was one of the major causes of bank failures and the global financial crisis in both developing and developed countries. The global financial crisis, which originated in the US in mid-2007, was attributed to the rapid default of sub-prime

\*Corresponding author. E-mail: [pabene221@yahoo.com](mailto:pabene221@yahoo.com).

loans or mortgages (Ashby, 2011; Flaherty et al., 2013). This crisis in effect led to the collapse of some financial institutions; some banks facing financial distress which led to their bankruptcy and subsequent closure. Also, the recent banking crisis which started in 2008 in several banks of the USA and European countries was attributed to poor credit risk management practices which led to increasing interest in the studying of credit risk issue (Juta and Ingrida, 2009).

In the case of Sub-Saharan Africa, the Nigerian banking sector crises in 2009 and 2010 was attributable to high exposure to credit risk, weak and isolated financial systems and poor regulatory and supervision from the regulators, Bank of Nigeria (Marchettini et al., 2015).

In the case of Ghana, the situation is not different. From an Asset Quality Review (AQR) of banks conducted by the Bank of Ghana in 2015 and updated in 2016, some indigenous banks were identified as vulnerable with inadequate capital, high levels of non-performing loans, and weak corporate governance systems. In August 2017, the Bank of Ghana closed two of those banks (UT Bank and Capital Bank) and approved the acquisition by GCB Bank of some of their assets and liabilities under a Purchase and Assumption Agreement (PAA). Even though the closure of these banks was due to several other factors, high level of non-performing loans and hence higher exposure to credit risk played significant role in the closure as about 78% of the loan portfolios of these banks were subject to impairment. Exposing these banks to high credit risk eventually led to the revocation of their licenses (Bank of Ghana, 2017). Again in 2018, the regulator, Bank of Ghana merged five banks (namely BEIGE Bank, Sovereign Bank, Construction Bank, Unibank and Royal Bank) into a new bank known as the Consolidated Bank. Report issued by the regulator on the basis of this consolidation indicates that two of these five banks (Royal and Sovereign Bank) were included in the merger due to poor credit risk and liquidity risk management hence increasing their level of credit risk exposure.

Studies on credit risk and how it impacts corporate financial performance in developed economies are adequately represented in the corporate finance literature. We can cite the work of Altman and Saunders (1998) who did a study on credit risk measurement in a developed economies; Fatemi and Fooladi (2006) who studied the credit risk management practices among selected financial institutions, Weber et al. (2010) who also explored into incorporating sustainability criteria into credit risk management, Acharya et al. (2013) who dealt with aggregation of bank risk and Rampini et al. (2014) also dealt with dynamic risk management approach in managing credit risk. In the developing economies, however, there is still relatively not much study in the area of credit risk and corporate financial performance. Few studies identified include Odonkor et al. (2011) who

dealt with risk and how it impacted corporate financial performance of banks in Ghana, Sakyi et al. (2014) who did a similar study but focused on non-bank financial institutions and Apanga et al. (2016) who also studied credit risk management of Ghanaian listed banks. Evidently, studies on credit risk exposure and how it impacts the performance of financial institutions in the Sub-Saharan Africa and Ghana in particular, remains scanty and with the emergence of the recent instability in the banking system of Ghana, it has become undoubtedly necessary to assess the impact that exposure to credit risk will have on the performance of these banking institutions and this has been the focused of this study. This study attempts to fill this gap by first identifying the factors that determine the credit risk exposure of listed commercial banks in Ghana and then secondly, estimate the impact that the exposure to credit risk will have on the financial performance of these banks.

## **Review of related literature and hypothesis development**

### ***Determinants of credit risk***

Basel Committee on Banking Supervision (1999) defined credit risk as the potential loss to a bank when a borrower or counterparty fails to meet its credit obligations in accordance with agreed terms. It is a surrogate to loan default risk, which is the risk that a borrower would not be able to fulfil his credit obligation as and when due (Balogun and Alimi, 1990). In identifying the main influencers of credit risk exposure, Goldstein and Turner (1996) took a holistic view of those factors and argued that, the accumulation of non-performing loans is generally attributable to a number of factors, namely economic downturns, macroeconomic volatility, terms of trade deterioration, high interest rate, excessive reliance on overly high-priced inter-bank borrowings, insider lending and moral hazard. However, Berger and De Young (1997) and then Bloem and Gorter (2001) asserted that, the factors that lead to higher credit risk exposure is more micro rather than the macro factors identified by Goldstein and Turner. They rather identified factors such as poor credit management, over optimistic assessments of creditworthiness during economic booms, relaxed supervision role from the regulator and moral hazard that result from generous government guarantees.

Other researchers have taken a different dimension in respect to what determines the level of credit risk exposure. For instance, Sufian et al. (2008) supporting the claim that, credit risk exposure is influenced by adverse movement of macroeconomic variables, they stressed on the importance of a strong capital based and strong capital structure. His view is of the fact that, this offers banks in developing economies the ability to

endure financial crunches and protect depositors in times of bankruptcy and distress macroeconomic conditions. This may be the possible basis on which Bank of Ghana (BOG), the regulator persistent increase in the capital requirement in the banking industry. For instance, on 11 September 2017, BOG gave a directive which requires that, the minimum stated capital requirement of universal banks operating in Ghana from GHS120 million to GHS400 million and required that banks comply by the end of December 2018 (PWC, 2018).

### ***Effect of credit risk on corporate financial performance***

Credit risk has been identified as the key risk in banking operations that influence banks' performance in terms of profitability, solvency and liquidity (Sinkey, 1992). Good corporate financial performance is an evidence of effective business management. The banks are into business, like any other firm, with the purpose of making profit; hence, before granting a credit facility to a borrower, it has to be sure on the capability of repayment by the borrower before granting such facility. A high exposure to credit risk is a panacea to possible profitability deterioration as there is an inverse relationship between credit risk exposure and returns on investment. The profitability of a bank is adversely affected by defaults. Provisions for bad and doubtful debts are directly subtracted from the revenues of good loans.

However, a sharp contrast from Kohn (1994) indicates that, there is a trade-off between the two. Riskier securities (higher yield loans) pay a high risk premium (higher average return) because there is a greater uncertainty of payment. So, higher exposure to credit risk can possibly lead to greater returns.

Credit risk leads to capital inadequacy (insolvency). Capital adequacy shows the financial capability of a bank to meet up with its financial obligations. An acceptable capital adequacy position is equivalent to saying that a bank is not over exposed to risks (Gardner, 2007). The role of adequate capital base is to absorb unexpected and exceptional losses that it might experience especially in situations of uncertainty. The more capital a bank has, the more are its creditors or the government insurance agency protected, and the greater is the capital loss that can be sustained without resulting in bankruptcy (Shah, 1996).

Credit risk, if not well managed brings liquidity crises. A more liquid bank is able to meet up with financial demands from its customers and thus create more value and confidence in the eye of the public. A loss in liquidity shows that they cannot meet up with demand if customers turn up and thus crisis can develop (Gaffney, 2009).

The performance of a bank has linear relationship with the credit and recovery process (Asari et al, 2011). Asari

et al. (2011) rightly argued that banks are unable to earn profit from credits in default. The provisions for loan defaults reduce total loan portfolio of banks and as such affects interest earnings on such assets. This constitutes huge cost to banks. Study of the financial statement of banks indicates that unsecured loans have a direct effect on profitability of banks. This is because charge for bad debts is treated as expenses on the profit and loss account and as such impacts negatively the profit position of banks (Price Water-House Coopers, 2009).

Berger and De Young (1997) indicate that failing banks have huge proportions of bad loans prior to failure and that asset quality is a statistically significant predictor of insolvency. Fofack (2005) also reported banks holding huge loan defaults in their books can run into bankruptcy if such institutions are unable to recover their bad debts. A possible effect of loan defaults is on shareholders' earnings. Dividend payments are based on banks' performance in terms of net profit. Thus since loan defaults have an adverse effect on profitability of banks; it can affect the amount of dividend to be paid to shareholders. The effect of loan defaults on the amount of dividend paid to shareholders can also affect capital mobilization because investors will not invest in banks that have huge non-performing loans portfolio.

Kargi (2011) evaluated the impact of credit risk on the profitability of Nigerian banks. Financial ratios as measures of bank performance and credit risk were collected from the annual reports and accounts of sampled banks from 2004-2008 and analyzed using descriptive, correlation and regression techniques. The findings revealed that credit risk management has a significant impact on the profitability of Nigerian banks. It concluded that banks' profitability is inversely influenced by the levels of loans and advances, non-performing loans and deposits thereby exposing them to great risk of illiquidity and distress.

Kithinji (2010) assessed the effect of credit risk management on the profitability of commercial banks in Kenya. Data on the amount of credit, level of non-performing loans and profits were collected for the period 2004 to 2008. The findings revealed that the bulk of the profits of commercial banks is not influenced by the amount of credit and non-performing loans, therefore suggesting that other variables other than credit and non-performing loans impact profits.

It can be inferred from the literature on the effect of loan default that all banks incur certain loan losses when some borrowers default in repaying their loans. Irrespective of the extent of the risk involved loan default reduces profitability and liquidity of banks. Given the foregoing problems amongst others which banks can encounter if they do not manage their credit risk well, the managers should see to it that while carrying out their operational function of risk assumption, a judicious balance between profitability, liquidity and capital adequacy must be considered.



On this premises, the study seeks to test the following hypothesis;

Hypothesis,  $H_0$  : Profitability of the Ghanaian banks is inversely related to their credit risk exposure.

## RESEARCH METHODS

### Data

A panel data on the seven<sup>1</sup> banks listed on the Ghana stock exchange over a fifteen year period from 2003 to 2017 were used. Data from three banks; Eco-bank, CAL bank and UT bank were made up of pre-listing and post-listing data to ensure that the data are balanced. The data of UT bank however excluded 2017 financial statement as during this period the bank was taken over by GCB Bank. The time period (2003 to 2017) was selected on the basis that, it provides a current time series observations and also represents the period over which there were a major reformation in the Ghanaian banking system where the concept of universal banking principle was amplified which led to the revision of the banking law in 2004 (Act 673) to provide a sound legal framework, increasing the scope of financial liberalization and intermediation consistent with Bank of Ghana supervision policies. Bank specific data in relation to determinants of banks' performance were collected from audited accounts of the listed banks and from the fact book of the Ghana Stock Exchange (2018). Data on the macroeconomic variables were collected from the World Development Indicators data base (World Bank Online, 2018) from 2003 to 2017.

### Model parameters

In identifying the factors that influenced credit risk, the parameters of the model for the study need to be specified. The specification procedure adopted was in line with the procedure used by Aspachs et al. (2005), Saunders and Cornett (2007), Shen et al. (2009) and Vodova (2011) was followed where the functional forms of the model to estimate the determinants bank credit risk is expressed as follows;

$$LLR = f(CR, LR, ZS, MER, TTR, NIR, ROE, ROA, FG, LDR, SIZE, INF, GDP, SYC) \quad (1)$$

Credit risk exposure is measured by loan loss provision ratio (LLR). The model is specified to include bank-specific factors, namely; Capital adequacy measured by capital ratio (CR), financial risk measured by leverage ratio (LR), financial stability (Z-score), management efficiency ratio (MER), Business operational efficiency measured by trading income as a percentage of total revenues (TTR), net interest ratio (NIR), Earnings potential measured by return on equity (ROE), and return on assets (ROA), liquidity risk measured by financing gap ratio (FG), loan deposit ratio (LDR) and bank size measured by total asset (SIZE). Also, included in the model in (1) are common market factors which include percentage change in inflation (IFL), growth in gross domestic product (GDP) and short term yield on government securities measured by the short term yield curve (SYC).

Similarly, specifying the model to assess the effect of credit risk

on bank performance, it can be functionally expressed as;

$$ROA = f(LLR, LR, MER, NIR, SIZE, FG, SYC) \quad (2)$$

The model in (2) is specified to include loans loss provision ratio (LLR), financial risk measured by leverage ratio (LR), expense efficiency ratio (EER), net interest income ratio (NIR), Bank size (SIZE), Short-term borrowing to total liabilities (SBL) ratio. Also, included in the model in (2) is a common market factors known as slope of the yield curve (SYC).

### The model

To estimate the determinants of credit risk, the standard linear specification for a panel data regression model was followed and the functional model in (1) is expanded as follows;

$$LLR_{i,t} = \beta_0 + \beta_1 CR + \beta_2 LR + \beta_3 ZS + \beta_4 MER + \beta_5 TTR + \beta_6 NIR + \beta_7 ROE + \beta_8 ROA + \beta_9 FG + \beta_{10} LDR + \beta_{11} SIZE + \beta_{12} \Delta INF + \beta_{13} \Delta GDP + \beta_{14} \Delta SYC + u_i \quad (3)$$

Where,  $LLR_{i,t}$  denotes a proxy measure of credit risk ratio for bank  $i$  at time  $t$ , with  $i = 1 \dots 7$  (number of banks) and  $t = 2003 \dots 2017$  (15 time periods).  $LLR_{i,t}$  represents endogenous variable in the model. CR, LR, ZS, MER, TTR, NIR, ROE, ROA, FG, LDR, SIZE, IFL, GDP and SYC denoted capital ratios, leverage ratio, financial stability, management efficiency, trading income to total revenues, net interest ratio, earnings potential, return on assets, liquidity gap, loan deposit ratio, bank size, change in inflation, growth in gross domestic product and changes in short term yield curve respectively.  $\beta_i$  ( $i = 1, 2, \dots, 14$ ) denotes corresponding sensitivities to the explanatory variables respectively and  $u_i$  denotes the error term.

Again, to estimate the effect of credit risk on corporate performance, the functional model in (2) is expanded as follows;

$$ROA_{i,t} = \alpha_0 + \alpha_1 LLR + \alpha_2 LR + \alpha_3 MER + \alpha_4 NIR + \alpha_5 SIZE + \alpha_6 FG + \alpha_7 SYC + v_i \quad (4)$$

Where  $ROA_{i,t}$  denotes a proxy measure of corporate performance (which is return on asset) for bank  $i$  at time  $t$ , with  $i = 1 \dots 7$  (number of banks) and  $t = 2003 \dots 2017$  (15 time periods). LLR denotes loans and advances impairment loss provision ratio. In order to estimate the effects credit risk on bank profitability, model (4) is specified to include other explanatory variables (control variables) that may help in the estimation of bank profitability though they are not the main variables of interest. These include LLR, LR, MER, NIR, SIZE, FG and SYC.  $\alpha_i$  ( $i = 1, 2, \dots, 7$ ) denotes corresponding sensitivities to the explanatory variables respectively and  $v_i$  denotes a stochastic disturbance.

We can observe that, the endogenous variable in (3) is considered as exogenous variable in (4) and also the endogenous variable in (4) is considered exogenous variable in (3). When this happens, it is likely such variables may correlate with the disturbance term ( $u_i$ ) in the case of model (1) and ( $v_i$ ) in the case of model (2) leading to endogeneity, hence violating the generalised method (GM) assumptions and making our ordinary least square (OLS) estimates biased. To solve this likely problem, we substitute model (1) into model (2), as follows;

$$ROA_{i,t} = \alpha_0 + \alpha_1 (\beta_0 + \beta_1 CR + \beta_2 LR + \beta_3 ZS + \beta_4 EER + \beta_5 TTR + \beta_6 NIR + \beta_7 ROA + \beta_8 ROE + \beta_9 SIZE + \beta_{10} FG + \beta_{11} LDR + \beta_{12} IFL + \beta_{13} GDP + \beta_{14} SYC + u_i) + \alpha_2 LR + \alpha_3 EER + \alpha_4 NIR + \alpha_5 SIZE + \alpha_6 FG + \alpha_7 SYC + v_i \quad (5)$$

<sup>1</sup> Ecobank Ghana Ltd., GCB Bank, Cal Bank Ltd, SG-SSB Limited, HFC Bank Ltd., Standard Chartered Bank, and UT Bank Ltd.

It can be observed that ROA is a linear function of  $u_i$  (among other things), and hence will be correlated with  $u_i$ . This violates the GM assumptions, and the OLS estimator  $\beta_7$  will be biased.

**Justification of application of 2SLS**

The Equations 1 and 2 are specified to include one endogenous variable, LLR in the case of (1) and ROA in the case of (2). So LLR which a dependent variable for (1) is jointly determined by ROA together with other variables as specify in (1). Also, ROA which is a dependent variable in (2) is jointly determined by LLR and other variables as specified in (2). In this case, endogeneity in these econometric models is likely to arise as a result of measurement error, simultaneity, omitted variables, sample selection errors, etc. Thus, the estimates obtained from the ordinary least squares (OLS) regression of model (2) become inconsistent and biased.

Following the identification procedure outline by Gujarati (2004), model (1) which estimates the determinants of credit risk and its effect on bank profitability as shown in model (2) have two endogenous variables (LLR and ROA), thus  $m = 2$  and this is equal to the number of equations with the presence of endogeneity  $k = 2$ . In the bank profitability equation, there are eight variables (CR, ZS, TTR, ROE, FG, LDR, IFL and GDP) excluded but are present in model (1). In this case, the model (2) is over-identified since  $k = 8 > m - 1 = 2 - 1 = 1$ , thus requiring the application of instrumental variable(s) through the use of Two Stage Least Squares (2SLS) estimation procedure for the parameters.

**Method of estimation: Two Stage Least Squares (2SLS) method**

This method involves two successive applications of OLS. It is aimed at eliminating the likely correlation between ROA and  $u$ . To do this, we find a proxy for ROA, that will not be correlated with  $u$ . Let us call this proxy  $\widehat{ROA}$ . The first stage of 2SLS is to generate the proxy and the second stage is to simply substitute the proxy for ROA, and estimate the resulting equation using OLS. The proxy should however be such that, it should belong to model (2) in the second equation (the one predicting ROA), but does not belong to model (1) (the one predicting LLR). In other words, a variable Z needs to be found so that it can determine ROA, but that does not influence LLR. Thus, the variable needs to satisfy the following condition;

$$corr(Z; u) = 0 \text{ and } corr(Z; ROA) \neq 0$$

Then the following equation needs to be estimated using OLS:

$$ROA_{i,t} = \alpha_0 + \alpha_1 Z + \beta_1 CR + \beta_2 LR + \beta_3 ZS + \beta_4 EER + \beta_5 TTR + \beta_6 NIR + \beta_7 \widehat{ROA} + \beta_8 ROE + \beta_9 SIZE + \beta_{10} FG + \beta_{11} LDR + \beta_{12} IFL + \beta_{13} GDP + \beta_{14} SYC + v_i \tag{6}$$

What is being done here is to include all of the exogenous variables from model (1) on the RHS Equation (6) and add Z. These estimates would allow the generation of a new set of values for the variable  $\widehat{ROA}$  so that;

$$\widehat{ROA}_{i,t} = \alpha_0 + \alpha_1 Z + \beta_1 CR + \beta_2 LR + \beta_3 ZS + \beta_4 EER + \beta_5 TTR + \beta_6 NIR + \beta_7 ROA + \beta_8 ROE + \beta_9 SIZE + \beta_{10} FG + \beta_{11} LDR + \beta_{12} IFL + \beta_{13} GDP + \beta_{14} SYC \tag{7}$$

Now,  $\widehat{ROA}_{i,t}$  can be substituted for ROA in model (1) as follows;

$$LLR_{i,t} = \beta_0 + \beta_1 CR + \beta_2 LR + \beta_3 ZS + \beta_4 EER + \beta_5 TTR + \beta_6 NIR + \beta_7 (\widehat{ROA}_{i,t} + \widehat{v}_i) + \beta_8 ROE + \beta_9 SIZE + \beta_{10} FG + \beta_{11} LDR + \beta_{12} IFL + \beta_{13} GDP + \beta_{14} SYC + u_i \tag{8}$$

Equation 8 can be re-written as;

$$LLR_{i,t} = \beta_0 + \beta_1 CR + \beta_2 LR + \beta_3 ZS + \beta_4 EER + \beta_5 TTR + \beta_6 NIR + \beta_7 \widehat{ROA}_{i,t} + \beta_8 ROE + \beta_9 SIZE + \beta_{10} FG + \beta_{11} LDR + \beta_{12} IFL + \beta_{13} GDP + \beta_{14} SYC + (u_i + \beta_7 \widehat{v}_i) \tag{9}$$

The new equation is then estimated using OLS. This will produce consistent estimates of all the parameters including  $\beta_7$ .

**Fixed or random effect**

In applying 2SLS regression model to estimate a model parameters, either the fixed effect model (FEM) or the random effect model (REM) or the Error Components Model (ECM) may be used. In the FEM, the observed variables (a firm's performance) expressed in terms of explanatory variables are treated as if the observe variables were non-random. In FEM, it is assumed that the intercept varies for each bank (that is over space), but is constant across through time and the regression coefficients are assumed to be common across the banks. This allows for a limited degree of bank specific characteristics and disturbances capture differences over space and time. Thus, the individual specific effect is correlated with the independent variables. Conversely, the REM assumes a common average value for the intercepts and a cross-sectional difference in the intercept values of each bank is reflected in an error term.

In deciding between FEM and REM, Judge et al. (1980) stated that, it depends on the assumption one makes about the likely correlation between the cross-section specific, error components and the regressors. If it is assumed that the error components and the regressors are uncorrelated, REM may be appropriate, but if they correlate, FEM may be appropriate. However, in this study, the choice between FEM and REM is based on the Hausman tests (Hausman, 1978; Baltagi, 2001). Hausman tests the null hypothesis that, the preferred model is REM as opposed to the alternative hypothesis that the preferred model is the FEM.

**Measurement and justification of variables used in the credit risk and performance model**

With credit risk being the dependent variable, the determinants of credit risk of listed banks in Ghana were grouped into bank-specific determinants ( $X_{i,t}$  as in equation (3)) and common determinants ( $Y_{i,t}$  as in equation (3)). The measurement and justification of these factors are presented in this section of the methodology. Table 1 presents the different variables, their corresponding specific measures, data source and expected relationship with the dependent variable.

**Dependent variable**

**Loans and advances impairment loss ratio (LLR):** The dependent variable in the model is measured by the amount of impairment of loans and advances granted by the banks which is determined in accordance with the Bank of Ghana prudential guidelines and IFRS 9. The amount of impairment loss is based on loans and advances that have proved uncollectible, and is written off against the related allowance for loan impairment. For the purpose of the model, the LLR ratio is determined as the amount of

Table 1. Specific measure of study variables.

Variable	Indicators	Denoted by	Measure	Data source	Expected sign
<b>Dependent</b>					
Loan an advance impairment loss ratio		LLR	Loan and advance impairment loss divided by total gross loans and advances outstanding	Banks' credit department and bank's annual financial statements	
<b>Independents</b>					
<b>Bank – specific:</b>					
Capital adequacy	Capital ratio	CR	$\frac{\text{Shareholders fund}}{\text{Risk weighted asset}}$	Banks annual reports	Negative
	Leverage ratio	LR	$\frac{\text{Shareholders fund}}{\text{Total asset}}$	Banks annual reports	Positive
	Z-score	ZS	$\frac{\text{ROE} + \text{ROA}}{\text{Standard deviation of ROA}}$	Banks annual reports	Negative
Operational efficiency	Efficiency ratio	MER	$\frac{\text{Operating profit}}{\text{Total income}}$	Banks annual reports	Negative
	Trading income to total revenue	TTR	$\frac{\text{Trading income}}{\text{Total income}}$	Banks annual reports	Positive
Earnings potential	Net interest ratio	NIR	$\frac{\text{Interest yield}}{\text{Interest bearing asset}}$	Banks annual reports	Positive
	Return on equity	ROE	$\frac{\text{Net income}}{\text{Equity}}$	Banks annual reports	Negative
	Return on asset	ROA	$\frac{\text{Net income}}{\text{Total asset}}$	Banks annual reports	Negative
Size		SIZE	Logarithm of total Assets	Banks annual reports	Positive
Liquidity	Financing gap	FG	$\frac{\text{Loan} - \text{Deposit}}{\text{Total asset}}$	Banks annual reports	
	Net loan to deposit ratio	LDR	$\frac{\text{Loans}}{\text{Deposit}}$	Banks annual reports	
<b>Common market</b>					
Annualised percentage change in inflation		IFL	Consumer Price Index	Ghana statistical service	Positive
GDP growth		GDP	Real GDP growth	Ghana statistical service	Negative
Slope of the yield curve		SYC	GoG 5-year bond yield	Ministry of Finance	Negative

impairment charges as a percentage of the total gross loans and advances outstanding.

**Return on asset and return on equity:** Previous studies into the relationship between bank operating risk and profitability have used return on asset (ROA) and return on equity (ROE) as a proxy of measuring profitability (Ara et al., 2009). This study adopted a similar measure of profitability (that is, return on asset (ROA)). ROA measures the effectiveness of management in the utilization of the funds contributed by both shareholders of the bank and other credit providers. It is computed as the ratio of net operating profit and average total assets indicating how efficient a bank is managing its assets to generate income. This study did not use return on equity (ROE) as a measure of profitability due to its major drawback of overstating the ROE ratio for banks with high financial gearing.

### **Independent variable**

The independent variables in the model are grouped into two; bank specific determinants and common determinants.

**Bank-specific factors:** The main bank-specific factors in the model are capital adequacy, bank's asset quality, business operational efficiency, earning potentials, size and liquidity. Each of these factors is measured by indicators which are expected to have influence on the credit risk of the bank. The following paragraph provides a description of the bank-specific factors and the indicators for each identified factor.

**Capital adequacy:** measures the bank ability to accommodate shocks (financial strength) and promote stability and efficiency in the banks operation. It is measured by three alternative variables: capital ratios (CR), leverage ratio (LR), and Z-score (ZS). Capital ratio represents the ratio of equity capital (shareholders capital and reserves) divided by risk-weighted assets as reported by each bank. Leverage measures the size of average total assets relative to average total equity. It is one of the standard indicators implied by the structural approach to the pricing of default risk. Higher leverage would correlate positively with default risk. Z-score is a derivative measure of bank capitalization. It is computed as a sum of return on asset (ROA) and return on equity (ROE) to total assets ratio scaled by the standard deviation of ROA (Boyd and Runkle, 1993). A higher value of Z-score indicates a higher resistance to shocks and implies a lower credit risk and vice versa.

**Business operational efficiency:** is measured by quality of management and differences in the business models adopted by the banks. Management quality is approximated by Management efficiency ratio (MER) which is represented by the ratio of operating expenses to total revenues. It measures management flexibility to adjust operational costs to changes in the business development signalled by revenues. A higher MER is an indication of a higher is the default risk.

Business model is represented by trading income as a percentage of total revenues (TTR).

**Earnings potential:** assess the ability of the bank to generate income using the available assets. It is represented by three profitability ratios: net interest income ratio (NIR), return on equity (ROE), and return on assets (ROA). The NIR is lending margin charged by a bank and is calculated as the percentage interest yield on interest bearing assets. Since loans are priced according to their risk level, a higher lending margin may therefore signal higher risked portfolio. Therefore, a higher net interest income ratio would imply higher default risk. The ROE and ROA measure the profit a bank can generate from its available asset, hence should correlate

negatively with default risk. ROE (ROA) is computed as the ratio of net income and shareholders' fund (total assets). A higher ROE or ROA indicates better profit prospects for growth and resilience to shocks, and thus should be associated with lower credit risk.

**Bank Size (size):** is calculated as the natural log of the bank's total assets contributes to its credit since it has ability to mobilize funds from diversified sources. It is suggested that, banks face less credit risk as they grow in size as they can be selective as to who to grant credit facility to and also, are able to obtain funding at a lower cost due to implicit guarantee but beyond particular levels; they begin to face credit risk due to diseconomies of scale. Bank size is expected to be positively related with credit risk.

A bank is exposed to *liquidity risk* where there is maturity mismatch when liquid liabilities (in the form of customer deposits) are transformed into risky liquid assets (in the form of loans). It shows to what degree a bank is capable of dealing with sudden and unexpected liquidity demand from depositors. In measuring liquidity risk, two indicators were used: financing gap ratio (FG) and loan deposit ratio (LDR).

Financing gap ratio is the difference between a bank's average core loans and its average core deposits standardized by the total asset of the bank. A value above zero implies that, the bank is not able to endure a sudden customer demand, hence indicate high liquidity risk which pushes the bank to an acute situation if customers default.

Short-term loan to deposit measures the degree to which banks can withstand a sudden liquidity distress. A bank with a higher share of short-term borrowing would be more vulnerable in the event of a bank run and hence a higher LLR.

### **Common market factors**

These are factors in model (3) which affect credit risk in the banking industry as a whole. Three main factors were considered as possible factors which influence the credit risk faced by banks on the Ghana stock exchange. They include percentage change in inflation (IFL), growth in gross domestic product (GDP) and slope of the yield curve (SYC).

It is very characteristic of commercial banks to adjust for inflation factor in pricing their loan products during a period of downturn which affects the premium paid to cover their credit risk insurance. Also, monetary and fiscal policies of central bank affect the supply of money which affects inflation which has influence on the credit status of the banks. Annual percentage change in inflation was included in the model using the annualised percentage change consumer price index as reported by Ghana statistical service as a measure of inflation changes. Recent studies (Shen et al., 2009) revealed that the annual percent change in inflation (INF) had a significantly positive correlation with bank's credit risk, thus, in this study, we expect annual percentage change to correlate positively with credit risk.

GDP growth was also introduced into the model as credit risk general reduces as there is an improvement in the economy as indicated by growth in the GDP rates. GDP growth is therefore negatively correlated with the share of non-performing loans and positively with the recovery rate.

In measuring the GDP growth, the real figures were used in order to ascertain the actual impact of GDP on credit risk of the banks. The study therefore expects a negative correlation between GDP growth and credit risk insurance premium.

The slope of the yield curve reflects growth prospects of the economy and expected future short-term interest rates. If the yield curve is steepened, it is a signal of positive prospects for economic growth (hence a decline in non-performing loans and hence improvement in recovery rate would be expected). A steepening of the yield curve (future improvement in economic conditions) should

**Table 2.** Descriptive statistics of study variables.

Parameter	Mean	Std. Dev.	Skweness	Kurtosis	Jarque-Bera test	
					Statistic	Probability
Loan & Advance loss provision (LLR)	0.064	0.031	0.367	- 3.071	2.125	0.001**
Capital Adequacy Ratio (CAR)	0.298	0.129	0.883	3.190	3.215	0.000**
Leverage Ratio (LR)	0.193	0.085	0.974	3.683	2.548	0.012*
Z-Score (ZS)	2.655	0.403	- 0.162	- 3.387	2.225	0.045*
Management Efficiency Ratio (MER)	0.491	0.283	0.829	3.314	2.369	0.023*
Trading income to Total Revenue (TTR)	0.031	0.013	0.873	3.843	3.054	0.000**
Net Interest Ratio (NIR)	0.271	0.128	0.647	3.200	2.156	0.034*
Return on Equity (ROE)	0.353	0.153	0.969	3.042	2.154	0.022*
Return on Asset ( $\overline{ROA}$ )	0.062	0.027	1.127	3.991	3.654	0.023*
Financing gap (FG)	- 0.431	0.302	- 0.724	3.531	3.526	0.032*
Loan & Advance to deposit Ratio (NLD)	0.534	0.214	1.204	3.134	4.132	0.000**
Size on Bank's Asset (SIZE)	14.942	0.297	- 0.404	- 3.881	4.112	0.000**
Annualised changed in Inflation (INF)	0.183	0.057	-0.031	-3.257	2.154	0.032*
GDP growth (GDP)	0.082	0.019	-0.182	-3.140	3.251	0.012*
Slope of the yield curve (SLYC)	0.210	0.047	-0.096	-3.255	3.258	0.000**

n= 104 \*significant at 5%, \*\*significant at 1%.

therefore correlate negatively with credit default risk. In this study, the slope of the yield curve was derived here from the return on 5-year government of Ghana bonds.

## RESULTS AND DISCUSSION

### Determinants of credit risk

#### *Preliminary analysis*

A preliminary analysis of the variables used as determinants of credit risk was carried out to have a fair idea of the distribution of the data for each variable. The analysis is carried out on both the dependent variable and the independent variable (both the bank-specific variables and the general variables). Table 2 shows the summary statistics for all the variables used in the sample over the study period. The mean score for (LLR), which measures credit risk is 6.4%, with volatility of 3.1%. The distribution of the provision is positively skewed but showed a peak-like structure than a normal distribution. However, the null hypothesis of non-normality is rejected under the Jarque-Bera test indicating that, the distribution is normal. This result suggests that, some of the banks are exposed to a considerable credit hence makes higher provisions against possible losses on the amount granted. The provision made ranges from 1.3 to 13% of the gross amount of granted as loans. This also means that, banks increased the amount of credit granted during the period under study thereby exposing themselves to such risk.

In identifying the determinants of the credit risk, the adequacy of the capital of the selected banks were

considered which is in line with the study carried out by Samsudin et al. (2015). This is necessary to measure the bank ability to accommodate shocks and efficiency in the banks operation. On the average, the equity capital of the selected banks represents 29.8% of the banks' risk-weighted assets with a standard deviation of 12.9% which is a strong indication of the resilience of the banks to a sudden shock from borrowers. The size of the total equity to total asset of among the selected banks also showed an average of 19.3% with a standard deviation of 8.5% confirming the ability of these banks to accommodate credit shocks from customers using shareholders fund. Z-score, in which a derivative measure of bank capitalization showed an average of 2.655 with a standard deviation 4.03, though negatively skewed but normally distributed as the null hypothesis under the Jarque-Bera test was rejected at 5% significant level. The result obtained from the Z-score value is a strong indication of resistance to shocks and implies a lower credit risk.

On assessing the earning potentials of the banks included in the study over the study period, interest income as a percentage of investment made in asset that bears interest measured by NIR showed as average of 27.1% with a standard deviation of 12.8% indicates a substantial improvement in the earning potential of the banks over the study period. This result may be due to the factor that, majority of the interest bearing asset of these bank are kept in the form of loans and advances which are lent out to customers at an average of 27%. ROA which measures the ability of the bank's management to generate revenue from the bank's assets showed an average of 6.2% for all the banks included in

the study over the study period with a variation of 2.7%. A similar measure, ROE which measures the returns the bank was able to generate on the investment made by the shareholders showed as average 35.3% with a standard deviation of 15.3%. Both ROA and ROE depicted as positively skewed distribution but somewhat normally distributed as the null hypothesis under the Jarque-Bera test was rejected at 5% level of significance. This picture suggests a good performance during the period under study.

In assessing the quality of loans granted, the average financing gap ratio (FG) is 43% with a variation of 30.2% between the ratios of 77 to 146%. Though the distribution seems to have a long tail to the right, it appears to be a little leptokurtic relative to the normal distribution. However, the null hypothesis under the Jarque-Bera test was rejected at 5% significant level indicating that, the distribution is approximately normal and good for further statistical analysis. The negative ratios indicate a favourable financing gap ratio, that is, the banks kept a considerable amount of liquidity and hence faced minimal liquidity risk during study period. Also, the ratio of loan and advances to total deposits (NLD), an alternative measure of loan quality, showed that, a mean of 53.4% of all deposits mobilised by the banks were given as loans with a minimum of 23.3% and a maximum of 125.5%. This result is an indication of the bank lending out a significant amount of their deposits to the extent that, other banks granted loans worth more than the value of their deposits indicating that funds other than deposits were given out. Such banks could be regarded as having very strong capital based and strong credit policies.

The average asset of the banks used in the study recorded a score of 14.942 (translating to into over GHS3 billion) with a variation of 0.297 in terms of standard deviation values ranging between 13.932 to 15.839. The total assets recorded an average of 12.53% is kept in the form of liquid asset (cash, balance with Bank of Ghana and short term funds). About 42.3% of the total bank assets were kept as risky asset in the form of investment in long term asset, loans and advances and other medium term securities). The higher proportion of asset kept as risky asset may have been motivated the higher returns associated with such assets and also being kept liquid in order to meet financial obligations in a real time as and when due.

Assessing the implication of the common market indicators on credit risk, the annualised inflation showed an average rate of 18.3% with a standard deviation of 5.7% over the study period. Though the distribution of the annualised inflation rates is positively skewed, the null hypothesis under the Jarque-Bera test is rejected at 5% significant level indicating that the distribution of the annualised inflation rates is normal. Similar statistics is observed in respect of growth in the GDP rates and the slope of the yield curve. The GDP showed average growth of 8.2% with a standard deviation of 1.9% over

the study period whereas the Government of Ghana five year bond showed an average rate of 21% with a standard deviation of 4.7%. The distribution of GDP growth and that of the yield curve appears to be negatively sloped but are normally distributed at 5 and 1% level of significance respectively.

### ***Inter-correlations***

The object of this section is to examine the presence of multi-collinearity, which occurs when there is a strong correlation between two or more predictor variables in a regression model (Field, 2009). Hair et al. (2014) provided two approaches in identifying and dealing with multi-collinearity. First is an examination of the correlation matrix among the predictors. The absolute correlation coefficient greater than or equal to 0.60 is an indication of substantial collinearity. The results of the study, from Table 3, reported the highest absolute correlation coefficient of 0.514 with most correlation coefficients falling below 0.2 indicating absence of collinearity. This high correlation occurred between ROA and ROE which is expected since both measure tends to measure profitability of the banks. However, even though they exhibit high correlation, the correlation coefficient is within the acceptable limit.

Secondly, to avoid a collinearity due to the combined effect of two or more predictors, we apply the variance inflation factor (VIF). A threshold of VIF values of 10 is applied following the recommendation of Gaur and Gaur (2009) and Hair et al. (2014). VIF values are shown in Table 3 which indicates no problem of multicollinearity.

### ***Regression analysis***

In testing the stated hypothesis (Hypothesis 1), a multiple regression was carried out to determine whether or not factors such as capital adequacy, business operational efficiency, earning potential and firm liquidity determines the volatility in the firm's exposure to risk. The result of the regression analysis is shown in Table 4.

The result obtained from the analysis shows that, the model estimate fits the data as the fitness test, using the F statistic showed that, the null hypothesis of equally between the co-efficient of the predictor variables cannot be accepted at 1% level of significance. The adjusted R-square also showed that, the predictors well explained 62.8% of the variations in the credit risk which is an indication that, the selected predictor variables determine the credit risk exposure by Ghanaian banks.

On the bank-specific variables, there is a negative significant relationship between capital adequacy ratio and credit risk at 1%. This provides evidence that, bank with a strong capital adequacy is also able to absorb possible loan losses and thus avoids bank 'run',

**Table 3.** inter-correlations among study variables.

	CAR	LR	ZS	MER	TTR	NIR	ROE	ROA	FG	LDR	SIZE	INF	GDP	SYC
CAR	(20.15)													
LR	0.456**	(30.52)												
ZS	-0.451**	-0.334**	(10.25)											
MER	-0.010	-0.006	0.091	(10.22)										
TTR	0.146	-0.005	0.113	0.282**	(30.16)									
NIR	0.406**	0.084	-0.161	-0.079	0.088	(10.96)								
ROE	-0.494**	-0.442**	0.458**	0.106	0.095	-0.139	(0.29)							
ROA	-0.161	0.434**	0.430**	0.072	0.056	-0.150	0.514**	(30.12)						
FG	-0.025	-0.399**	-0.129	-0.069	-0.076	0.031	-0.051	-0.379**	(20.22)					
LDR	0.018	0.028	-0.133	-0.037	-0.157	0.024	-0.101	-0.020	0.430**	(40.12)				
SIZE	0.009	-0.430**	-0.116	-0.089	0.040	0.060	-0.026	-0.413**	0.512**	0.023	(30.52)			
INF	0.021	0.130	-0.108	-0.014	-0.045	0.151	-0.116	-0.002	-0.003	0.074	-0.168	(00.19)		
GDP	-0.091	0.044	0.048	-0.030	0.058	-0.064	0.085	0.053	-0.064	-0.101	-0.120	-0.119	(1.0)	
SYC	0.147	-0.059	-0.227*	0.008	-0.064	0.115	-0.213*	-0.210*	0.044	-0.024	0.051	0.328**	-1.12	(3.21)

VIF values are reported in parentheses on the diagonal.

n = 104; \*. Correlation is significant at the 0.05 level (2-tailed), \*\*. Correlation is significant at the 0.01 level (2-tailed).

**Table 4.** Determinants of credit risk.

Parameter	Expected relationship	Coefficient	Std. error	t-Statistic	Sig.
(Constant)	?	0.504*	0.305	1.651	0.071
Capital Adequacy Ratio (CAR)	-	-0.266***	0.038	-6.995	0.005
Leverage Ratio (LR)	-	0.115	0.081	1.408	0.163
Z-Score (ZS)	-	-0.107***	0.030	-3.602	0.006
Management Efficiency Ratio (MER)	-	-0.027**	0.012	-2.317	0.023
Trading income to Total Revenue (TTR)	-	-0.421*	0.218	-1.931	0.057
Net Interest Ratio (NIR)	+	-0.067**	0.030	-2.286	0.015
Return on Equity (ROE)	-	-0.322***	0.069	-4.693	0.008
Return on Asset (ROA)	-	-0.252	0.295	-0.854	0.108
Financing gap (FG)	?	0.110***	0.018	6.228	0.006
Loan & Advance to deposit Ratio (LDR)	?	0.113***	0.021	5.275	0.006
Size on Bank's Asset (SIZE)	+	-0.084***	0.019	-4.329	0.007
Annualised changed in inflation (INF)	+	0.104**	0.058	1.803	0.075
GDP growth (GDP)	-	-0.033	0.141	-0.237	0.814

**Table 4.** Contd.

Slope of the yield curve (SYC)	-	-0.019	0.065	-0.286	0.775
--------------------------------	---	--------	-------	--------	-------

Dependent Variable: Loan & Advance loss provision (LLR).

R-square = 0.798.

R-square Adjusted = 0.628.

F(103) = 2.68.

p = 0.000\*p is significant at the 0.1 level (2-tailed), \*\*significant at the 0.05 level (2-tailed) and \*\*\*significant at the 0.01 level (2-tailed)

insolvency and failure. Thus if a bank in Ghana wishes to be resistant to its credit risk exposure, it needs to increase in equity capital in relation to its total assets. This observation is in line with the study by Louati et al. (2015) who examine the role of capital adequacy in the credit risk exposure of Islamic and conventional banks, and concluded that, the ability of a bank to withstand credit risk shocks is to capitalise adequately.

This also confirms the Bank of Ghana recent directive of increasing the capital requirement of commercial banks in Ghana from GHS120 million to GHS400 million effectively by the end of 2019. Z-score, a measure of solvency of banks which makes use of profitability measures, also showed a negative significant relationship between credit risk and bank's solvency at 1% level of significance. The result implies that, for banks in Ghana to mitigate the effect of credit risk exposure, they should engage in more profitable activities which would increase their possibility of survival which intend to reduce their exposure to credit risk. This observation is in line with Imbierowicz and Rauch (2014) who concluded that, striving to survive in the industry would lead to reduction in credit risk exposure. Leverage ratio showed a positive relationship with credit risk, though the relationship is not significant. This implies that, in analysing factors that influence the credit risk exposure of Ghanaian banks, shareholders' capital in relation to total asset do not significantly contribute to the variations in the credit risk exposure.

In assessing the role of business operation efficiency in explaining the volatility in the credit risk exposure, two proxy measures were used; Management efficiency ratio (MER) and Trading income to total revenue ratio. The MER which measures how well management is able to control operational expense so as to accumulate funds to meet any sudden shock from credit risk showed a negative significant relationship with credit risk at 5%. The implication of this result is that, as management increases their efficiency in managing expenses, thereby increasing operation profit, credit risk exposure is expected to decrease significantly. Similar story could be told about trading income to total revenue which relates significantly negative with credit risk at 10% level of significance.

Return on equity (ROE) as expected showed a significant inverse relationship with credit risk at 1%

significant level. Return on asset (ROA) similarly showed an inverse relationship but the relationship appears not to be significant. This brings out the fact that, the role of management of profitability in relation to shareholder investment plays a significant role in managing credit risk. Efficient management of profitability in relation to shareholders' value and even total asset is necessary for effectively managing credit risk as this would ensure accumulation of returns necessary to meet any shock that may be triggered by credit risk exposure. Net interest ratio (NIR) however showed a significant inverse relationship with credit risk at 5% level of significance as against the expected positive relationship from the literature. The NIR measures the interest earned by the bank as a percentage of total interest bearing assets. The result therefore shows that, higher interest yield investments by the banks would help in significantly manage impact of credit risk. This result contracts the view put forward by Inci and Jiri Podpiera (2010) who studied the fundamental determinants of credit default risk for European large complex financial institutions and concluded that net interest ratio significantly contributes positively to credit risk. This variation in the result may be due to difference in macro-economic framework and differences in the economies within which the studies were carried out.

The relationship between bank size (SIZE), financing gap and credit risk is significantly positive at 1 and 1%, respectively providing the evidence that as banks grow bigger in size, they have the incentive to increase risk on customer default as they are able to hold more loans and consequently have larger financing gap ratio. That is, larger banks have the capacity to mobilize more deposits in which they are able to sell at relatively cheaper price. Such banks are thus able to take greater risks by granting more loans to deficit units, thereby exposing themselves to higher credit risk. This result is in line with the findings of Lucchetta (2007), Bunda et al. (2010), Rauch et al., (2009) who concluded that, as banks grow in size, their exposure to credit risk increases.

Among the three macro-economic variables which entered the model, only the annualised changes in inflation tend to significantly affect credit risk with the direction of effect being significantly positive. The changes in GDP and the slope of the yield curve, though relate negatively with credit risk exposure, they tend to be



**Table 5.** Determinants of banks' profitability.

Parameter	Coefficient	Std0. error	t-Statistic	Sig 0.
(Constant)	10.215	0.138	80.792	0.000***
Loan and Advance loss provision (LLR)	-0.268	0.072	-30.717	0.002***
Leverage Ratio (LR)	0.157	0.032	40.863	0.000***
Management Efficiency Ratio (MER)	-0.012	0.008	-10.507	0.080*
Net Interest Ratio (NIR)	-0.019	0.019	-00.987	0.326
Size on Bank's Asset (SIZE)	0.074	0.109	00.679	0.201
Financing gap (FG)	-0.143	0.042	-30.405	0.001***
Slope of the yield curve (SLYC)	0.092	0.044	20.079	0.040**

Dependent Variable: Return on Asset (ROA)

R-square = 0.881.

R-square Adjusted = 0.783.

F(103) = 3.48.

p = 0.000\*p is significant at the 0.1 level (2-tailed), \*\*significant at the 0.05 level (2-tailed) and \*\*\*significant at the 0.01 level (2-tailed).

insignificant.

## Effect of credit risk on banks' profitability

### Regression analysis

The second objective of the study seeks to analyse the effect of credit risk (measured by loan and advance loss provision (LLP)) on the performance of banks in Ghana with return on asset (ROA) being a proxy of measuring corporate performance.

In testing the stated hypothesis (Hypothesis 2), another regression analysis was carried out to find out the effect of credit risk on corporate profitability with liquidity ratio, management efficiency ratio, net interest margin, bank size, short term borrowing and the slope of the yield curve being controlled variables. The result of the regression analysis is shown in Table 5 using the return on asset as the dependent variable, a proxy measure of performance.

The model estimate fits the data well as the F statistic, which measures the common importance of the explanatory variables, showed that, the null hypothesis of equality between the co-efficient of the predictor variables is rejected at 1% level of significance. The adjusted R-square also showed that, the predictors well explained 78.3% of the variations in the corporate profitability which is an indication that, profitability of Ghanaian banks are determined by the selected predictor variables.

There appears to be an inverse relationship between credit risk and corporate performance. This is indicated by a negative regression coefficient between Loan and Advance loss provision, the instrumental variable and return on asset, a measure of bank profitability. This relationship tends to be statistically significant at 1% indicating that, as bank increases its exposure to credit risk, it tends to have a negative impact on the

performance of the company in terms of profitability. This confirms the findings of Ebrahim et al. (2016), Athanasoglou et al. (2005) and Athanasoglou et al. (2008) who concluded that serious banking problems have arisen from the failure of financial institutions to recognize impaired assets and create reserves for writing off these assets. They concluded that, banks with high credit risk tend to experience a lower profit level on their income statement. In the Ghanaian context, banks provide higher volume of lending thereby holding lesser liquid assets on their statement of financial position tend to have higher volatility in their earnings which pose the threat of lower interest income due to high level of non-collectability resulting in lower return on assets. Consequently, this arises due to the higher interest charged on such loans (due to the incorporation risk premiums in determining interest rates) thereby, increasing the obligation on the customer which increase the risk of non-payment hence loss of interest income.

Leverage ratio, measured by total equity in the total assets of the bank (LR), positively relates to the performance of banks in Ghana and is statistically significant at 1%. This implies that, as firm increases its capital base through equity, the firm tends to generate much profit since it escapes the payment of interest to debt providers. This finding is consistent with the work of Kosmidou (2008), who concluded that, a well-capitalised banks face lower risks of solvency as cost of funding is reduce to the minimum. According to Berger et al., (1995), a financial institution with a strong capital structure is essential for the development of developing economies such as Ghana; for this offer extra financial strength deals with financial crises and provides assurance to depositors during turbulent macroeconomic conditions.

On assessing the role of management efficiency in determining corporate profitability, Management Efficiency Ratio (MER) was used. This showed an inverse

relationship with profitability at 10% significant level. The result implies that, increase in management operational expenses (a measure of management efficiency) reduces corporate profit. Thus, management must strive to achieve efficiency in their expense management if it wishes to increase their profit levels. This is in line with the findings from studies undertaken by Athanasoglou et al. (2005), Pasiouras and Kosmidou (2007) and Kosmidou (2008) who also concluded a significant positive relationship existed between management efficiency in expense management and corporate profitability. This result therefore requires banks to improve their managerial practices in order to maximize profit.

In assessing whether the size of a bank (SIZE) plays a role in the profitability of the bank, the result indicated that, bank size, measured by the natural logarithm of a bank's total assets showed a positively relationship with bank profitability (ROA) but was not statistically significant. This implies that, the size of bank does not determine whether a bank would be profitable or not. This result tends to contrast the theory of economies of scale as confirmed by Athanasoglou et al., (2006), Pasiouras and Kosmidou (2007) where banks benefit from increasing returns to scale arising from corporate expansion.

The slope of the yield curve also depicted a positive significant relationship with the bank's profitability at 5% significance level indicating that, as the government of Ghana increases the rate of interest on its corporate bonds and other financial instruments, banks tend to take advantage of an invest in such instruments, thereby increasing the profit level.

## CONCLUSION AND RECOMMENDATION

From the result of the study, conclusion was arrived on the basis that, though there may be other factors that affect the credit risk of banks in Ghana, capital adequacy, management operational efficiency, management of liquidity risk and the size of the bank, annualised changes in inflation and changes in GDP are major determinants of credit risk due to their high statistical significance level of association with credit risk.

Also the profitability of banks is greatly affected by credit risk, capital adequacy, management efficiency and the slope of the yield curve. Banks with high exposure to credit risk inversely affect the profits generating ability of the bank resulting from high risk of non-payment of loan and hence loss in interest income.

On the basis of the results obtained and the conclusions arrived at, the study makes the following recommendations:

Considering the identified determinants of bank credit risk, combined with the how credit risk impacts bank

profitability, an efficient operational expense management of banks would not only increase the profit margin of these banks but also reduce the tendency of threat on the survival of these banks. This is due to the significant relationship between management expense ratio and credit risk and also with profitability.

Again, the study results confirmed that there exists a significant inverse relationship between the credit risk of commercial banks in Ghana and their profitability. Management should therefore adopt strategies to reduce their credit risk exposure to ensure increase in profitability. Some strategies would include the use of collaterals as security of granting loans should be further reviewed to reduce further incidence of bad debts, credit risk managers and lending officers should adhere strictly to good lending practice; they should know the purpose of the loan and ensure the feasibility of every loan proposed.

Also, with capital adequacy having significant relationship with credit risk provides an indication that, banks should be well capitalised in terms of equity capital so as to be able to withstand the likely shocks that are associated with credit default.

## CONFLICT OF INTERESTS

The authors declare that they have no conflict of interest.

## REFERENCES

- Acharya, Viral V, Nada M (2013). A Crisis of Banks as Liquidity Providers, *Working Paper*.
- Altman EI, Saunders A (1998). Credit risk measurement: developments over the last 20 years, *Journal of Banking and Finance* 21(11):1721-1742.
- Apanga M, Appiah K, Arthur J (2016). Credit risk management of Ghanaian listed banks. *International Journal of Law and Management* 58(2):162-178.
- Ara H, Bakaeva M, Sun J (2009). Credit risk and profitability in commercial banks in Sweden. University of Gothenburg.
- Asari F, Muhamad NA, Ahmed W, Latif N, Abdullah N, Jusoff K (2011). An analysis of non-performing loan, interest rate and inflation rate using Stata software. *World Applied Sciences Journal* 12:41-48.
- Ashby S (2011). Picking up the pieces: Risk management in a post crises world. London Financial Services Knowledge Transfer Network.
- Aspachs O, Erlend N, Muriel T (2005). Liquidity, Banking regulation and macro-economy, Mimeo: London School of Economics.
- Athanasoglou PP, Brissimis SN, Delis MD (2005). Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Profitability. Bank of Greece Working Paper, No. 25.
- Athanasoglou PP, Brissimis SN, Delis MD (2008). Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Profitability. *Journal of International Financial Markets, Institutions and Money* 18 (2):121-136.
- Bank of Ghana (2017). Liquidation of five indigenous banks into consolidated bank. Bank of Ghana public notice. [www.bog.gov.gh](http://www.bog.gov.gh)
- Balogun ED, Alimi A (1990). Loan delinquency among small farmers in developing countries: A case study of the small-farmers credit programme in Lagos State, Nigeria. *Economic and Financial Review* 26(3):36-44.
- Basel Committee (1999). Principles for the management of credit risk.

- Basel Committee on banking supervision.
- Berger A, Herring R, Szegő G (1995). The role of capital in financial institutions. *Journal of Banking and Finance*. pp. 393-430.
- Berger AN, De Young R (1997). Effects of Geographic Expansion on Bank Efficiency. *Journal of Financial Services Research* 19:163-184.
- Bloem MA, Gorter NC (2001). Treatment of Non-Performing Loans in Macroeconomic Statistics. IMF Working Paper, WP/01/209.
- Bunda I, Alexopoulou I, Ferranda A (2010). Determinants of government bond spreads in new EU countries. *Eastern European Economics* 48(5):5-37.
- Ebrahim A, Khalil A, Mohamed K, Xiangpei H (2016). A Study of Credit Risk and Commercial Banks' Performance in Yemen: Panel Evidence. *Journal of Management Policies and Practices* 4(1):57-69.
- Fatemi A, Fooladi I (2006). Credit risk management: a survey of practices. *Managerial Finance* 32(3):227-233.
- Field A (2009). *Discovering Statistics using SPSS*, 3rd ed., Sage Publications Ltd, London.
- Fofack H (2005). Non-Performing Loans in Sub-Saharan Africa: Causal Analysis and Macroeconomic Implications. World Bank Policy Research Working Paper, No. WP 3769.
- Flaherty JC, Gourgey G, Natarajan S (2013). Five lessons learned: risk management after the crisis. *The European Financial review*.
- Gaffney M (2009). Money, Credit and Crisis. *American Journal of Economics and Sociology* 68(4):983-1038.
- Gardner EPM (2007). Risk management: a new risk management tools for banks. Bradford: Emerald Publishing Group
- Gaur AS, Gaur SS (2009). *Statistical Methods for Practice and Research: A Guide to Data Analysis using SPSS*, 2nd ed., Sage Publications Ltd, London.
- Goldstein M, Turner P (1996). Banking Crises in Emerging Economics: Origins and Policy Options. BIS Economic Paper 46.
- Hair JF, Black WC, Babi BJ, Anderson RE (2014). *Multivariate Data Analysis: A Global Perspective*, 7th ed., Pearson, London.
- Hasan I, Liu L, Zhang G (2014). The determinant of global bank credit-default-swap spreads. Bank of Finland, Research Discussion Paper No. 33/2014
- Imbierowicz B, Rauch C (2014). The relationship between liquidity risk and credit risk in banks. *Journal of Banking & Finance* 40:242-256.
- Inci O, Podpiera J (2010). The fundamental determinants of credit default risk for European large complex financial institutions. IMF Working Papers, Vol.10, pp. 1-31, 2010. Available at SSRN: <https://ssrn.com/abstract=1750682>
- Juta S, Ingrjda J (2009). An Assessment and Management of Credit Risk in Baltic States' Banks. *Journal of Business Management* 2:93-100.
- Kargi HS (2011). Credit Risk and the Performance of Nigerian Banks. AhmaduBello University, Zaria.
- Kithinji AM (2010). Credit Risk Management and Profitability of Commercial Banks in Kenya. School of Business, University of Nairobi, Nairobi.
- Lucchetta M (2007). What do data say about monetary policy, bank liquidity and bank risk taking? *Economic Notes by Banca Monte dei Paschi di Siena SpA* 36(2):189-203.
- Marchettini D, Macagni M, Maino R (2015). Evolving banking trends in Sub Saharan Africa, key features and challenge. IMF series.
- Odonkor TA, Osei KA, Abor J, Adjasi CKD (2011). Bank risk and performance in Ghana. *International Journal of Financial Services Management* 5(2):107-120.
- Pasiouras F, Kosmidou K (2007). Factors Influencing the Profitability of Domestic and Foreign Commercial Banks in the European Union. *Research in International Business and Finance* 21(2):222-237.
- Rampini AA, Sufi A, Viswanathan S (2014). Dynamic Risk management. *Journal of Financial Economics* 111:271-296.
- Rauch A, Wiklund J, Frese M, Lumpkin GT (2009). Bank Orientation and Business performance An Assessment of Past Research and Suggestions for the Future. *Entrepreneurship Theory and Practice* pp. 761-786.
- Ribeiro M (2006). Credit Prudential Framework for Banks. Paper presented at the National Banking College, Accra, Ghana.
- Sakyi PA, Ofoeda I, Kyereboah-Coleman A, Abor JY (2014) Risk and performance of non-bank financial institutions. *International Journal of Financial Services management* 7(1):19-35.
- Samsudin S, Lou W, Bhatti I, Misman FN (2015)., Islamic banks credit risk: a panel study. *Procedia Economics and Finance* 31:75-82.
- Saunders A, Cornett MM (2007). *Financial Markets and Institutions; an Introduction to the Risk Management Approach*, New Jersey, McGraw Hill.
- Shah KA (1996). Why Capital Adequacy Regulation for Banks? *Journal of Financial Regulation and Compliance* 4(3):278-291.
- Shen CH, Chen YK, Kao LF, Yeh CY (2009). Bank liquidity risk and performance. <http://www.finance.nsysu.edu.tw/SFM/17thSFM/program/fullpaper/083-231345511.pdf>
- Sinquefeldt JC (1992). *Commercial bank Financial Management*, New York: Macmillan Publishing Company.
- Weber O, Scholz RW, Michalik G (2010). Incorporating sustainability criteria into credit risk management. *Business Strategy and the Environment* 19:39-50.

*Full Length Research*

# **Gender difference in poverty: An empirical analysis in Bench Maji, Kaffa and Sheka zones, south west Ethiopia**

**Mulatie Chanie<sup>1\*</sup> and Andualem Begashaw<sup>2</sup>**

Department of Economics, College of Business and Economics, Mizan Tepi University, Ethiopia.

Received 23 November, 2018; Accepted 19 December, 2018

**This paper investigated whether female headed households are poorer than male headed households in south west Ethiopia. The study employed 395 sample household questionnaires based on consumption expenditure data. The poverty measurement indices show that female headed households are more exposed for poverty than male-headed households. This result is also supported by the logistic regression output which indicates that gender of the household head has significant influence on poverty status of the households which implies female headed households are necessarily poorer than male headed households. In addition, variables such as sex, household size, dependency ratio, land size, credit access, occupation and residence are key determinants of household poverty. Whereas, age and education level of sampled household heads were not statistically significant. Finally, based on the result that female headed households are relatively poorer than male headed households, it is argued that policy options targeting female headed households would be a useful approach to reducing poverty in the study area.**

**Key words:** Poverty, gender, households, south west Ethiopia.

## **INTRODUCTION**

Up to the early millennium, poverty remains to be the biggest problem of the world. One-sixth of the global population or about one billion people live in an extreme poverty, struggle daily for survival and suffered from lack of nutrition, health, water and sanitation, shelter and other basic needs for survival (Suharko, 2007). Poverty is the failure to achieve basic capabilities such as being adequately nourished, living a healthy life, possession of skills to participate in economic and social life, permission to take part in community activities to mention a few. This conceptualization forms the basis for the belief that

‘poverty is multi-dimensional’. Although the capabilities framework offers many advantages over the income/ consumption conceptualization, yet it is argued that it requires a greater variety (Sen, 1999).

Since poverty remains a development issue, it has continued to capture the attention of both national governments and international development agencies for several decades. Indeed, subsequently the mid-1980s, reducing poverty has become a major policy concern for governments and donor agencies in all poverty-stricken countries, Ethiopia inclusive. Since the last two decades,

\*Corresponding author. E-mail: [mulat2015@yahoo.com](mailto:mulat2015@yahoo.com).

as part of global and national initiative, the government of Ethiopia has put place a poverty reduction strategy with the intention of achieved sustained economic growth. The multidimensional and dynamic phenomenon nature of poverty has multiple causes that display economic, social and political characteristics and it requires multi-dimensional poverty reduction approaches and strategies (MoFED, 2013).

Gender analysis is relevant to all aspects of economic and the social development and more specifically it was the core MDG of halving world poverty by 2015. While gender inequality is not the only, or even the most marked form of inequality in a society, it is the most pervasive. It is a feature of social relations in all societies, although it manifests itself variously in different places. Understanding the causes and consequences of gender inequality, therefore, and the power relations that generates and is generated in the process, should be of concern to all societies in the world, rich as well as poor (Kabeer, 1994).

As any other regions of Ethiopia, the greater proportion of women suffering from various forms of poverty is linked to their unequal access to education, to productive resources and to control of assets, and in some cases to unequal rights in the family and in society the South West Ethiopia. This in fact impacts negatively on the entire household, particularly on children, and as a consequence on the entire community (MoFED, 2013). Thus, the aim of this study is to analyze gender differences in poverty by taking economic factors as indicator of poverty in Bench Maji, Sheka, and Kaffa zones.

### Research problem

In developing countries, it is widely known that the economic, social, and political conditions of females are lower to that of males (Meier and Rauch, 2000). This is also the case in Ethiopia. Ethiopian females bear a heavier burden than males, due not only to economic factors, but also to the predominant position that males occupy in cultural and social structures (World Bank, 1998).

Added to that is unequal access to services that can promote their productive and income generating capacities, unequal access to social services, lack of decision-making power and their invisibility which have excluded them from the social, economic and political processes that affect their lives (MoFED, 2008).

Despite improvements in the Ethiopian economy, Ethiopia still has relatively low rates of educational enrollment, access to sanitation, and attended births, and challenges remain around investment in the health, safety and education of women and girls. Although women's contribution to economic development and the welfare of the society is both significant and multi-

faceted the economic, political and cultural bias against them has hindered women from enjoying the fruits of their contribution, unlike their male peers (TGE, 1993). The greater proportion of women suffering from various forms of poverty is linked to their unequal access to education, to productive resources and to control of assets, and in some cases to unequal rights in the family and in society.

According to the Ethiopian Mini Demographic Health Survey findings (EMDHS) which is conducted by CSA (2014), about half of women aging 15 to 49 (48%) have no formal education. About six rural women in every 10 (56%) have no education, compared with about two urban women in every 10 (22%). As stated by Regional Education Office (2012), education disparity between males and females was quite large for Bench Maji and Debub Omo zones and Basketo and Konta Special Woredas. In these administrations, female remain far behind the male counter group as can be seen from their GPI of 0.66, 0.79, 0.80 and 0.82, respectively.

According to CSA (2012), women in Ethiopia, especially in rural areas, bear the burden of collecting drinking water. In six of every ten households (62%), adult women are responsible for water collection. As marked by Bench Maji, Sheka, and Kaffa zones, Women and Children Affairs Office different years' report (2013-2015), there is unequal gender relation between men and women in the zones. Lack of assets makes women vulnerable to various forms of violence and affects her decision-making power in the family. Although Ethiopian laws give equal property rights to women, in fact tradition and women's low execution, social and economic status limits their ownership of assets. Overall, poverty touches all classes of the society including men, women, boys, girls, and age group, but it is experienced by within and outside these classes differently. Women's face hurtful situations because of their social and cultural gender roles and culturally constructed norms.

There are several studies that have been conducted on poverty in Ethiopia. However, these research works whether closely revealed the general aspect of poverty or analyzed poverty by urban or rural classification. Even other studies which have been made on poverty within the frame work of gender is failed to analyze the poverty status in terms of econometrics models. Moreover, most past studies have concentrated on urban and unsurpassed areas like Addis. The present study has been in fact, a modest effort made to fill in the research gap observed in the analysis of poverty in the South West Ethiopia with respect to gender differences in economic status. Consequently, the aim of this study is to analyze gender differences on poverty in terms of economic factors.

### Objectives of the study

The major objective of this study is to analyze gender

differences in poverty on the basis of economic factors in Bench Maji, Kaffa and Shaka zones. The specific objectives are:

1. To measure the extent of economic poverty in FHHs and MHHs.
2. To identify the effects of household characteristics and economic factors on poverty status of the household.
3. To recommend the kinds of poverty reduction approach that would be feasible for the poor.

### Significance of the study

Believing that gender issues concern not only women but society at large and that woman's problems cannot be solved by women alone, but by the coordinated efforts of the society, the government and women, is no longer disputable. Hence, it is important to see the significance of this study from different responsible bodies' aspect.

The study result helps local administrators to have a better understanding about how poverty affects women. This understanding in turn helps to develop a better participatory plan towards poor households. The study result benefits for those NGO's and donor countries engaged in development activities by providing gender based information. This information may affect their development intervention approach. It also helps financial institutions to know the participants need to develop different service ranges based on their needs. Some social norms can impose even more restrictions on women's mobility, decision-making power and control over family income, limiting their ability to develop small businesses. Overcoming these kinds of gender inequalities can have powerful social and economic impacts. In this regard this study contributes in filling the information gap by assessing the economic status of FHHs and MHHs in the study area at a household level.

## RESEARCH METHODOLOGY

### Data sources and method of collection

The data for this study are obtained from both primary and secondary sources. Secondary information on poverty is collected from different federal, regional, zonal and district offices and reports. The primary data on different economic factors and household characteristics that affects the poverty status of the household are collected from a sample of respondents from both rural and urban households in the study area through questionnaire.

The household questionnaire provides both quantitative and qualitative information on different economic factors and household characteristics that affects poverty status. So, the questionnaire includes information on demographic characteristics of the households, respondents' income, expenditure and other factors regarding their economic status.

### Sampling design

The study area has 23 rural woredas and four town administrations

(ten woredas and one administration in Bench Maji zone, ten woredas and one administrative town in Kefa zone and three woredas and two administrative towns in Sheka zone). The total number of population in the three zones according to 2015 population projection based on the 2007 Census is 2,256,074 people and there are 451,215 households. For this study, the sampling frame (population) is the list of all households in the three zones and the sampling unit in the household survey is the household, while the unit of observation is the household head. Households in this study are defined as a group of people (normally family members) living under the same roof and sharing resources and a household head refers to the presence of a husband in the household or not.

To draw a representative sample from the target population, first, 9 rural woredas and 3 town administration are chosen proportionally considering each zones and rural-urban composition based on the number of households purposively. In the second stage, the Kebeles in each woredas are listed based on number of households and 24 sample Kebeles are selected purposively taking into account the number of households in each Kebele still considering rural and urban areas.

In the third stage, all household in each Kebele are stratified into male headed and female headed households to take representative samples from each group. Then a simple random sampling technique is applied to draw sample households from each stratum proportionally. The sample size for this study is determined based on Slovin sample determination formula.

Slovin Formula:

$$n = \frac{N}{1 + NE^2}$$

where n = sample size, N = the size of the population, and e = the margin of error (5%).

$$n = \frac{451,215}{1 + (451,215)(0.05)^2} = 399 \text{ sample households}$$

The survey data is collected using a face to face questionnaire from the sample household heads.

### Methods of data analysis

The household data is analyzed based on empirical data analysis and simple statistical techniques using STATA 13 software package from 395 sample households (four questionnaires are rejected). To check whether there is a significant difference between female headed and male headed households in terms of different economic factors and demographic characteristics, mean difference on some basic variables are used.

In addition, to measure the incidence, depth and severity of poverty in the study area, the most widely used poverty indices such as head count index, poverty gap index and squared poverty gap indices are calculated. The headcount index which is the share of the population whose income or consumption is below the poverty line measures the incidence of poverty. The poverty gap index provides information regarding how far households are from the poverty line which measures depth of poverty in both male and female headed households. The squared poverty gap which takes into account not only the distance separating the poor from the poverty line (the poverty gap), but also the inequality among the poor measures how poverty severity is severe in the study area. In order to show gender difference in poverty empirically and to determine the demographic characteristics of the respondents on poverty, binary logistic regression model is developed as follows.

### Binary logistic regression model

To show whether female headed households or male headed households are more exposed for poverty and to measure the effect of different characteristics of the household on being poor, a logistic regression model is developed. In this study, the dependent variable is poverty status which is represented by per adult equivalent consumption expenditure of the household that takes two values: 1 if the household is poor and 0 for non-poor. When the dependent variable is qualitative in nature and takes two values, the appropriate econometric model would be binary response econometric models. In this regard, the linear probability model, probit model and logit models are the possible alternatives.

For this study, researchers are more interested on the logistic distribution function (binary logit model) since it represents a close approximation to the cumulative normal distribution and relatively simple from mathematical point of view and lends itself to a meaningful interpretation.

The stimulus index,  $Z_i$  is also referred to as the log of the odds ratio in favor of poor household. Taking log of both sides of Equation 3, we get the log odds ratio as:

$$\ln\left(\frac{pi}{1-pi}\right) = \ln(e^{\beta_0 + \sum_{i=1}^n \beta_i X_i}) = Z_i$$

If the disturbance term  $\varepsilon_i$  is taken into account, the model becomes:

$$Z_i = \beta_0 + \sum_{i=1}^n \beta_i X_i + \varepsilon_i$$

where  $Z_i$  stands for poverty status (the log odd ratio of the probability of a household is being poor) and  $X_i$  stands for the explanatory variables assumed to influence the household's probability of being poor or not. The choice of these independent variables is largely guided by the empirical literatures on the determinants of poverty which includes the different economic variables and demographic characteristics of the household. Therefore, Equation 5 can be rewritten as:

$$Z_i = \beta_0 + \beta_1 \text{Sex} + \beta_2 \text{Age} + \beta_3 \text{Family} + \beta_4 \text{Residence} + \beta_5 \text{Dependency ratio} + \beta_6 \text{Femalratio} + \beta_7 \text{Credit} + \beta_8 \text{Education} + \beta_9 \text{Occupation} + \beta_{10} \text{land size} + \varepsilon_i$$

After data is checked with heteroscedasticity, autocorrelation and multicollinearity tests, the parameters are estimated using maximum likelihood estimation procedure.

### Definition of variables

#### Dependent variable

**Poverty status:** Poverty can be measured in different ways. On one hand, there are objective indicators such as income level, possession of assets, or total consumption expenditure. On the other hand, there are indicators that are harder to measure such as social status, self-esteem or freedom. Many researchers used consumption as a good indicator of poverty. Dreze and Srinivasan (1997), Meenakshi and Ray (2002), and Gangopadhyay and Wadhwa (2003) used the Indian official poverty measure, which is based on people's consumption expenditure, to verify whether female-headed households are poorer than male-headed counterparts.

So, in the aforementioned logistic regression model, poverty status of the household is used as a dependent variable. Thus, sample households are classified as poor and non-poor based on per adult equivalent consumption expenditure. To derive per adult equivalent consumption for a household, the total consumption expenditure is divided by the number of individuals in the household

considering age difference. The poor are those households whose yearly per adult equivalent consumption expenditure is below the total poverty line in Ethiopia which is 7184 birr per year per adult person (National Planning Commission, 2017).

### Independent variables

**Sex:** it is a dummy variable which refers sex of the household head that takes the value 1 if the household is female, 0 otherwise.

**Age:** age of the head of the household in year.

**Family:** refers to family size in the household.

**Residence:** a dummy variable which refers the area in which the HH lives (1 if the HH is living in Rural, 0 if Urban area).

**Dependency ratio:** refers to the ratio of the number of dependents (age below 15 and above 65) to the active labour force age (between 15 and 65 including).

**Female ratio:** refers to the ratio of the number of female to the total family size.

**Credit:** is a dummy variable that takes 1 if the household has access to credit, 0 otherwise.

**Education:** a dummy variable which takes an artificial value of 1 if the household head is educated, 0 otherwise.

**Occupation:** refers to the main income source (dominant livelihood strategy) of the household (1 if salary, 2 trade, 3 if agriculture).

**Land size:** size of agricultural land in hectare.

$\beta_0$ : the intercept.

$\beta_1$  to  $\beta_{10}$ : are the partial slope coefficients.

$\varepsilon_i$ : the error term.

## RESULTS AND DISCUSSION

Demographic and Economic characteristics of sampled households

Sex and marital status of respondents

Sample respondents were composed of both male and female household heads. It was found that among the total sample respondents, 140 (35.44) was FHHs and the remaining 255 (64.56) was MHHs. With regard to marital status, 3.32, 64.56, 16.45 and 15.65% were never married, married, divorced and widowed, respectively (Table 1).

### Family size and dependency ratio

The average family size of FHHs and MHHs are 5.13 and 5.83 with standard deviations of 2.75 and 2.66, respectively and mean difference of 0.1928 which is significant at 5% level. This depicts that MHHs have large family size relative to FHHs. On the other hand, there is significant variation in the dependency ratio (number of household members older than 65 and younger than 15 divided by the number of members between the age of 15 and 65) of female and male-headed households. The mean dependency ration of FHHs and MHHs are 0.348 and 0.305, respectively which is significant at 5% level of significance. This indicates that FHHs has large dependency ratio on average relative to the male counterparts which may have its own impact on the poverty

**Table 1.** Sex and marital Status of sample households

Sex of household	Number	Percent
Female Headed	140	35.44
Male Headed	255	64.56
<b>Marital status</b>		
Never married	13	3.32
Married	255	64.56
Divorced	65	16.45
Widowed	62	15.65
Total	395	100

Source: Own Survey (2018).

**Table 2.** Family size and dependency ratio

Parameter	FHHs	MHHs	Combined	Mean difference	t-test at 5%
Mean family size	5.13	5.83	5.3316	0.1928	0.0306**
Mean dependency ratio	0.348	0.305	0.3329	0.3329	0.0466**

FHHs: Female headed households; MHHs: male headed households.

Source: Own Survey (2018).

**Table 3.** Education level of sample households (Two-sample t test with equal variances).

Sex of household	Obs.	Mean	Std.Err	Std. Dev.	[95% Conf. Interval]
Male headed	255	2.666667	0.1087969	1.737346	2.452408, 2.880925
Female headed	140	2.028571	0.129408	1.531177	1.772709, 2.284434
Combined	395	2.440506	0.085186	1.693037	2.27303, 2.607982
Diff.	-	0.6380952	0.1753837	-	.2932876, 0.9829029

Source: Own Survey (2018).

status (Table 2).

### Educational level of respondents

Education is main determinant of poverty status of households in poverty literatures. The study shows that FHHs have less years of education on average relative to MHHs. The two-sample t test shows that the mean years of schooling for FHHs is 2.02 and the male counterpart is 2.66 with mean difference of 0.63 which is significant at 5% level of significance. Thus, it is possible to conclude that there is a significant difference between female headed and male headed households educational status (Table 3).

### Owned cultivated land and credit access

The owned cultivated land size of sample respondents varied from 0 to 8.5 ha with an average holding of 1.3567

ha. The average land size for FHH is 1.2651 and that of MHH is 1.4069. The two sample t-test result shows that there is statistically significant difference between FHH and MHH in land holdings. On average FHHs have small land holdings relative to MHHs. In addition, FHHs have lower access to credit relative to MHH even though the mean difference is statistically insignificant at 5% level (Table 4).

### Consumption expenditure of household head by sex

The most widely applied measure of consumption expenditure is per capita consumption which assumes that the total annual consumption expenditure is divided by the total family size in that household. The basic assumption in this calculation is that the amount of consumption expenditure is equal for each member of a household irrespective of age and sex which implies an increase in the number of members is associated with a proportionate increase in consumption expenditure.



**Table 4.** Average land size and credit access.

Parameter	FHHs	MHHs	Combined	Difference	t-test at 5%
Average Land size	1.2651	1.4069	1.3567	0.1417	0.0123**
Credit access	0.1071	0.1764	0.1518	0.0693	0.0666***

FHHs: Female headed households; MHHs: male headed households.  
Source: Own Survey (2018).

**Table 5.** Two-sample t test of consumption expenditure by sex.

Item	FHHs	MHHs	Combined	Mean difference	t-test at 5%
Mean per capita consumption	5779.78	12867.62	10247.81	1497.802	0.0000***
Mean per adult equivalent consumption	6257.05	12995.25	10342.25	1326.555	0.0201**

FHHs: Female headed households; MHHs: male headed households.  
Source: Own Survey (2018).

But assigning equal weight to all household members ignores age and sex differences in a household. Thus, commonly adjustments are made by applying an equivalence scale even though there is no agreement on the choice of appropriate equivalence scales and decisions are often made arbitrarily (Aassve et al., 2012). In this study, a scale was used computed by Dercon and Krishnan (1998) in their study on Ethiopia by considering age. They assigned a weight of 0.49 for children of age 0 to 4.99 years, 0.84 for children of age 5 to 14.99 years and 1.0 for children of age 15 years or older.

Thus, per capita consumption expenditure (PCE) is simply total consumption expenditure (E) of the household divided by the number of families (N) in that household. The per adult equivalent consumption expenditure (PACE) can be easily computed as:

$$PACE = \frac{E}{A + \alpha C}$$

where E = total consumption expenditure of the household, A = number of adults with age of 15 and above, C = number of children below age of 15, and  $\alpha$  = the weight of the children relative to an adult (0.49 for age of below 5 and 0.84 for age between 5 and 14.99).

As shown in Table 5, the average per capita total consumption expenditure and per adult equivalent consumption expenditure for FHHs are 5779.78 and 6257.05 birr, respectively whereas 12867.62 and 10342.25 birr for MHHs.

This indicates that FHHs expenditure is relatively lower than the male counterpart which is significant at 5% level. Thus, this data reveals that FHHs are relatively poorer than MHHs.

### Extent of poverty by sex in the study area

The extent of poverty in the study area is measured using

different poverty indices. The most widely used poverty indices are the percentage of the poor (headcount index), the aggregate poverty gap (poverty gap index) which measures the depth of poverty, and the aggregate squared poverty gap (Squared poverty gap index) which measures the distribution of income (sensitivity of poverty) among the poor.

These poverty measures can be defined in terms of the well-known (Foster et al., 1984; Mentioned in MoFED, 2013)  $P_\alpha$  class of poverty measures as:

$$P_\alpha = \frac{1}{N} \sum_{i=1}^q \left( \frac{Z - Y_i}{Z} \right)^\alpha$$

where  $P_\alpha$  = the measure of poverty index, Z = poverty line,  $Y_i$  = per adult equivalent consumption expenditure, N = population size, q = the number of poor households, and  $\alpha$  = poverty aversion parameter.

The commonly used values of  $\alpha$  are 0, 1, and 2. Here, the parameter  $\alpha$  reflects the policymaker's degree of aversion to inequality among the poor. If  $\alpha = 0$ , there is no concern about the depth of poverty and the corresponding poverty index is called the headcount index ( $P_0$ ). Hence,  $P_0$  corresponds to the fraction of individuals falling below the poverty line. If  $\alpha = 1$ , the poverty index is called the *poverty gap index* ( $P_1$ ) and it measures the aggregate poverty deficit of the poor relative to the poverty line. Poverty gap index can also be interpreted as an indicator of potentials for eliminating poverty by targeting transfers to the poor. Squared poverty gap index ( $P_2$ ) measures the squared proportional shortfalls from the poverty line, which is commonly known as an index of the severity of poverty. Based on the household survey data, the three indices are calculated as shown in Table 6.

The result shows that head count poverty index (the share of sample households whose consumption expenditure per adult equivalent is below the poverty line which is 7,184 birr) is higher for female-headed

**Table 6.** Poverty indices.

Poverty Indices	Poverty indices by Sex		Total poverty indices
	Female headed HH	Male headed HH	
Head count index ( $\alpha = 0$ )	0.2901266	0.218734	0.268861
Poverty gap index ( $\alpha = 1$ )	0.0875935	0.012085	0.099688
Squared Poverty gap index ( $\alpha = 2$ )	0.0481853	0.023860	0.050571

Source: Own Survey (2018).

households than for male-headed households in the study area. The head count index of 0.2901 indicates that on average 29.01% of FHHs in the study area are living below total poverty line which implies that this much percentage of sampled FHHs are unable to meet the required minimum amount of expenditure to satisfy the minimum calorie requirement per adult equivalent per year.

The poverty incidence is by far higher compared to the MHHs incidence of poverty (21.87%). One would expect that female-headed households would have higher poverty incidence in the study area. This might be because women who tend to have completed less schooling, may have lower levels of physical capital, small land size and low credit access.

The depth of poverty (poverty gap index), a measure that captures the mean aggregate consumption shortfall relative to the poverty line is found to be 0.0875 for FHHs and 0.0120 for MHHs which means that the percentage of total consumption needed to bring the entire population to the poverty line is 8.75 and 1.2%, respectively for FHHs and MHHs.

Moreover, the squared poverty index, a measure that captures the relative deprivation among the poor households (the severity of poverty) shows there is severe inequality in poor FHHs relative to the MHHs. In this regard, 4.81 and 2.38% of relative deprivation is identified in the study areas in terms of FHHs and MHHs, respectively which implies poverty is sever in FHHs than MHHs.

The national data in Ethiopia in terms of head count index, poverty gap index and squared poverty gap index are 0.235, 0.067 and 0.028, respectively in 2015/2016, (National Planning Commission, 2017). Thus, compared to the national data, the absolute poverty situation of FHHs in this study even after two years from the national survey is higher even though the level of poverty for MHHs is lower than the national one.

### Determinants of household poverty

To check whether female headed households or male headed households are more exposed for poverty and to measure the effect of different characteristics of the household on being poor, a binary logistic regression

model was estimated using maximum likelihood estimation technique. Before running a logistic regression analysis on both continuous and discrete variables, the data were checked for heteroscedasticity, autocorrelation and multicollinearity problems. The result shows that the data is free from the aforementioned problems.

In this logistic regression analysis, the dependent variable is poverty status of the household which takes a value of 1 if that household is poor and 0 if non-poor. There are different methods of setting a poverty line in literatures that uses caloric requirements. This study uses the total poverty line of Ethiopia which is calculated in 2015/2016 which is based on the cost of basic needs method where consumption is used as the metric to measure poverty line. According to this report, the total poverty line per person per year is 7,184 birr, (National Planning Commission, 2017). So, the dependent variable takes 1 (poor) if per adult equivalent consumption expenditure of the family is below this line and 0 (non-poor) otherwise.

The dependent variable is treated against potential explanatory variables that assumed to affect poverty status of the household like sex, family size, age, education, dependency ratio, female ratio in the family, occupation, credit access and land size. The odd ratio and marginal effects of the model are estimated for 395 sample households (four questionnaires were rejected) using iterative maximum likelihood estimation procedure and the odd ratio result is shown in Table 7.

The likelihood ratio chi-square of the model which is 210.888 with p-value 0.0000 shows that our model as a whole fits significantly. The maximum likelihood estimates of the logistic regression model shows that sex, family size, residence, dependency ratio, occupation, credit access and land size are significant at 1% level of significance, whereas employment occupation is statistically significant at 5% level of significance. Family ratio is statistically significant at 10% level of significance. The remaining two explanatory variables (age and education level) are less powerful in explaining the poverty status of the household head.

The logit result shows that compared to male headed households, female headed families are more exposed for poverty which supports the descriptive analysis. The odds ratio for sex (12.98) which is significant at 1% suggests that the odd ratio of being poor of female

**Table 7.** Binary logistic regression result.

Poverty status	Odds ratio	Std. Err.	z	P> z	[95% Conf. Interval]	Marginal effects (dy/dx)
Sex	12.91493	4.579637	7.21	0.000***	6.445487, 25.87786	0.0855575
Age	0.9981712	0.0145503	-0.13	0.900	-.9700566, 1.027101	-0.0002043
Family size	1.39913	0.1331259	3.53	0.000***	1.161093, 1.685967	0.0374864
Residence	16.23398	41.68433	5.44	0.000***	13.15322, 240.4171	0.1497605
Dependency r	11.05142	15.68744	4.09	0.000***	4.886178, 90.69716	0.1400915
Famel ratio	0.5454248	0.4596882	-0.72	0.072*	-0.1045528, 2.84534	-0.0676608
Education	0.175206	0.1505501	1.26	0.208	-0.9142615, 1.510627	-0.0180197
d <sub>emp</sub>	0.045897	2.181546	2.59	0.010**	1.406201, 11.64079	-0.1560066
d <sub>buss</sub>	0.959778	1.98732	2.74	0.006***	1.480719, 10.58934	-0.1536051
Credit access	0.0821429	0.0525394	-3.91	0.000***	0.0234495, 0.2877444	-0.0789622
Landsize	0.4924016	0.0851886	-4.09	0.000***	0.3507973, 0.6911665	-0.0790758

\*\*\*, \*\*and \* represent level of significant at 1, 5 and 10% respectively.

Source: Computed from Household Survey Data (2018).

headed households is greater than the male counterpart by 12.98. The marginal effect of sex coefficient shows that when a household moves from male headed to female headed, the probability of being poor is increased by about 8.5% keeping other factors constant.

The regression result is in line with many empirical research outputs. Raja (2009) found that women were poorer than men in trouble of the global economic crisis. A study by Woolard (2002) found that female headed households had an increased probability of being poor (male headed households had a 28% probability of being poor, female headed households had 48%). Jayamohan and Amenu (2014) in their study on gender and poverty results in some major towns such as Bahir Dar, Jimma, Adama, Hawassa and Addis Ababa, the headcount poverty index is higher for FHHs as compared to MHHs. In addition, the income shortfall below the poverty line and severity of poverty are higher for FHHs as compared to MHHs and the difference is significant.

The effect of age on poverty is insignificant at 5% level which implies that there is no significant age difference in poverty in the study area. Actually, in many empirical studies the impact is ambiguous. A study by Baulch and McCulloch (1998) in Pakistan reported that the age of the head of the household made no significant impact on poverty status. The coefficient of residence shows that there is a significant poverty difference between rural and urban areas. In the study area, rural households are 14.97% more exposed for poverty than urban households. The result is almost in line with 2015/2016 Ethiopian poverty index report which is 25.6% in rural area and 14.8% in urban area (National Planning Commission, 2017).

Family size of the household has a positive correlation with poverty status of that household. The positive relationship between household size and poverty indicates that an average household with small household size is better in terms of poverty than a larger household size. The odd ratio 1.39 which is statistically

significant at 1% indicates that large families have high likelihood of being poor relative to small families. The marginal effect coefficient shows that when family size increases by one, the probability of being poor is increased by 3.7% holding other variables in the model constant.

Dependency ratio has a positive effect on the probability of being poor. Households with higher dependency ratio have a higher probability of being poor. The marginal coefficient shows that when the number of dependent family (family member whose age are below 15 and above 65 divided by age between 15 and 65) increased by one the probability of being poor increased by 14.97%. The regression result also shows that female ratio (ratio of female to the whole family member) in the family has a negative correlation with poverty status even though the coefficient is insignificant at 5% level of significance.

In the study area, households engaged in business and employment activities are less exposed for poverty relative to those who engaged in agriculture activities. The odd ratio of being poor of a HH engaged in employment and business activities are smaller by 0.045 and 0.959, respectively than HHs engaged in agriculture activities. This is a clearly indication that wage income and business activities are key in welfare improvement for households.

Credit access and land size have a negative effect on poverty. The regression result shows that a household with credit access has less probability of being poor by 7.8%. Similarly, a 1 ha increase in land size results in 7.9% decrease in the probability of being poor keeping other factors holding constant.

The coefficient of education is negative even though statistically insignificant even at 10% level of significance. So, the result implies that education does not have a significant impact on poverty status of the household. This might be because of either many livelihood systems in the study area are traditional and does not need education qualification. Another justification could be due

to the fact that in the study area, both the poor and non-poor household heads exhibited high level of illiteracy and households' educational status are almost similar for both groups. The result is against many empirical studies. According to a study by Jayamohan and Amenu (2014) on urban Ethiopia, the level of the headcount index decreases for both MHHs and FHHs as the educational level of the head increases to a higher level.

## Conclusion

Poverty is the failure to achieve basic capabilities such as being adequately nourished, living a healthy life, possession of skills to participate in economic and social life, permission to take part in community activities to mention a few. This implies that poverty is a consequence of the interaction of economic, social and political processes and reinforces each other. This conceptualization forms the basis for the belief that poverty is multi-dimensional. Poverty is a general feature in Ethiopia causing many sufferings and apparent to the largest proportion of the population. It is now widely recognized that the diversity of household and family forms and the complexity of intra-household dynamics need to be taken into contemplation in analyzing the poverty situation and designing poverty reduction strategies.

While gender inequality is not the only, or even the most marked form of inequality in a society, it is the most pervasive. It is a feature of social relations in all societies, although it manifests itself variously in different places. As a result, understanding the causes and consequences of gender inequality, and the power relations that it generates should be of the concern to all societies in the world, rich as well as poor. The present study has, therefore tried to consider gender differences in poverty on the basis of economic factors in Bench Maji, Kaffa and Shaka zones. Moreover, this study digs out some of the key instrumental causes of poverty on FHHs in a way making comparisons with their male counterparts. Simple statistical techniques, as well as poverty measurement using poverty indices and binary logit model has been employed for the analysis of the data.

Different demographic characteristics of the sampled households revealed that FHHs have lower average household size but have large dependency ratio on average relative to the male counter parts which may have its own impact the poverty status. Moreover, in terms of education level, compared to MHHs, it is further seen that the majority of FHHs are illiterate and there is a significant difference between female headed and male headed households educational status.

On average FHHs have small land holdings relative to MHHs. Furthermore, FHHs have lower access to credit relative to MHH even though the mean difference is statistically insignificant. In the study area, large portion of FHHs are engaged in business and employment

activities next to agriculture. This accompanied with less average land size holding and less the mean per capita expenditure made the female household heads more vulnerable to income poverty.

On the other hand, poverty indices based on the per adult equivalent consumption expenditure (PACE) revealed that in terms of head count poverty index, FHHs in the study area are below the total poverty line. The measures of the depth of poverty (poverty gap index) also show that there is a wide-ranging between the percentage of total consumption needed to bring the entire population and the poverty line compared to their male counter parts. Further, the relative deprivation among the poor households (the squared poverty index) shows there is severe inequality in poor FHHs relative to the MHHs. Hence, all the poverty indices revealed that FHHs are poorer than MHHs.

Then again, a number of specific conclusions can be drawn from the binary logistic models. The regression results of the model indicate that the variable specifying the gender of the household head has significant influence to affect the poverty status of the households, implying that households headed by females are necessarily poorer than their male counterparts. Family size is also an important determinant of poverty. In other words, households with larger number of children (below the age of 14) and elderly people (age of 65 and above) are more likely to fall into poverty, whereas more number of adults (people in the working age group) would have the reverse effect. One can also infer that households engaged in business and employment activities are less exposed for poverty relative to those who engaged in agriculture activities. Furthermore, credit access and land size have significant and a negative effect on poverty.

## RECOMMENDATION

Poverty reduction has been an important element of development objectives and therefore always among the highest priorities of the government of Ethiopia. This study is also conceding with the current priorities of the regional government and non-governmental organizations development effort. Hence, based on the aforementioned empirical findings, the following recommendations are forwarded.

**(1) The study result implies that** FHHs are poorer than MHHs. Therefore, there is strong evidence to suggest that poverty alleviation programs should use FHHs as proxy variables for targeting the poor. Policies targeted to reduce poverty should give particular attention for FHHs. This would be realized by an integrated effort among concerned bodies including government, NGOs as well as concerned civil societies.

(2) Efforts in areas such as insuring female's property right, specifically land and other assets should be

encouraged and extended so that women would be economically empowered and would subsequently have more saying in family decisions like fixing the desired family size.

(3) The study shows that households with large family size and large dependency ratio were poor. This calls for improving family planning and strengthening of health extension package in the study area. In addition, improving FHHs health, productivity, and labour force participation could also help to reduce dependency ratio and in return poverty.

(4) The other key message of the analysis is that since area of residence of sampled respondents is extremely significant in explaining the likelihood of being poor, government and nongovernment organizations should follow context specific development strategies.

(5) Since microfinance institutions has an inverse and significant effect on the status of poverty, the local government and development partners to be more proactive and make conscious efforts to use microfinance as an effective instrument to reduce vulnerabilities to poverty. This result provides clear insight on importance of rural and urban credit service for poverty reduction. Thus, credit schemes should be diversified to address vulnerable community groups.

(6) The study reveals that occupation type (livelihood means) are powerful determinants of poverty. Households who engaged in employment and business activities are less exposed for poverty relative to agriculture livelihood strategy. Therefore, livelihood diversification such as petty trade, handicrafts and the likes are used to diversify the sources of income and increase household consumption availability.

(7) The educational attainment of FHHs is less than the male counterparts even though it has no significant impact on household poverty status. Since literacy level of household heads is a significant determinant to fall under poverty theoretically, designing appropriate strategies to improve literacy status of households could have multiple effects to improve living standard and reduce poverty status in the study area.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

## ACKNOWLEDGEMENTS

The authors acknowledge Institute of Research and Community Development Support Directorate of Mizan Tepi University for the financial support to conduct this research. They also thank all the sampled households for their time and kind cooperation in providing necessary information for the study.

## REFERENCES

- Aassve A, Sironi M, Goisis A (2009). Happiness and Childbearing Across Europe. "Carlo F. Dondena" Centre for Research on Social Dynamics (DONDENA), Università Commerciale Luigi Bocconi, Working Papers. 108. 10.1007/s11205-011-9866-6
- Baulch, Mcculloch (1998) Poverty, inequality and growth in zambia during the 1990s institute of development studies University of sussex; UK
- Central Statistical Agency (CSA) (2012). Ethiopian Mini Demographic Health Survey. Addis Ababa Ethiopia. <https://dhsprogram.com/pubs/pdf/fr255/fr255.pdf>
- Central Statistical Agency (CSA) (2014). Ethiopian Mini Demographic Health Survey. Addis Ababa Ethiopia. [https://www.unicef.org/ethiopia/Mini\\_DHS\\_2014\\_Final\\_Report.pdf](https://www.unicef.org/ethiopia/Mini_DHS_2014_Final_Report.pdf)
- Dreze J, Srinivasan PV (1997). Widowhood and poverty in rural India: Some inferences from household survey data, *Journal of Development Economics* 54(2):217-234.
- Kabeer N (1994). Gender hierarchies in development thought. London.
- Meenakshi JV, Ray R (2002). Impact of household size and family composition on poverty in rural India, *Journal of Policy Modeling*.
- Jayamohan MK, Amenu T (2014). Gender and poverty – an analysis of urban poverty in Ethiopia, *Development Studies Research*,
- Meier GM, James ER (2000). *Leading Issues in Economic Development*, 7<sup>th</sup> ed. Oxford University Press.
- Ministry of Finance and Economic Development (MoFED) (2008). *Dynamics of Growth and Poverty in Ethiopia (1995/96 2004/05)*. Addis Ababa: Development Planning and Research Department (DPRD). <https://people.uea.ac.uk/.../dynamics-of-growth-and-poverty-in-ethiopia-199596200405>
- Ministry of Finance and Economic Development (MoFED) (2013). *Development and Poverty in Ethiopia*. Ministry of Finance and Economic Development June 2013 Addis Ababa. [dagethiopia.org/new/news-highlights/8.../18-development-and-poverty-in-ethiopia](http://dagethiopia.org/new/news-highlights/8.../18-development-and-poverty-in-ethiopia)
- National planning commission (2017). *Ethiopia's Progress towards Eradicating Poverty; An Interim Report on 2015/16 Poverty Analysis Study*. Addis Ababa.
- Raja L (2009). *Economic crisis to put more women out of work*, ILO, Geneva.
- Sen A (1999). *Development as freedom*. Oxford: Oxford University Press.
- Dercon S, Pramila K (1998). *Changes in Poverty in Rural Ethiopia 1989-1995: Measurement, Robustness Tests and Decomposition*; University of Oxford
- Suharko A (2007). *The Roles of NGOs in Rural Poverty Reduction: The Case of Indonesia and India*. Japan: GSID.
- The Transitional Government of Ethiopia (TGE) (1993). *National policy on Ethiopian Women*. Addis Ababa, Ethiopia.
- Woolard I (2002). *An overview of poverty and inequality in South Africa*. Working Paper prepared for DFID (SA).
- World Bank (1998). *Implementing the Ethiopian National Policy for Women: Institutional and Regulatory Issues*, Washington, D.C.



**Related Journals:**

