Online ISSN : 2249-460X
Print ISSN : 0975-587X
DOI : 10.17406/GJHSS

GLOBAL JOURNAL

OF HUMAN SOCIAL SCIENCES: E

Economics



BRAC on Poverty Alleviation

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Highlights

Impact of Microcredit Program

A Case Study of Jhenaidah District

Discovering Thoughts, Inventing Future

VOLUME 20 ISSUE 1 VERSION 1.0

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Volume 20 Issue 1 was originally issued as E1

Global Journal of Human-Social Science: E
Economics

Global Journal of Human-Social Science: E
Economics

Volume 20 Issue 1 (Ver. 1.0)

Open Association of Research Society

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United States of America
USA Toll Free: +001-888-839-7392
USA Toll Free Fax: +001-888-839-7392

Offset Typesetting

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Volume 20 Issue 1
Originally issued as E1



Global Journal of HUMAN-SOCIAL SCIENCE: E
Economics
Volume 20 Issue 1 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-460x & Print ISSN: 0975-587X

Effet du Pouvoir de Marché sur la Prise de Risque Bancaire en Zone CEMAC

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Abstract- This article assesses the effect of market power on Bank Risk Taking in the CEMAC zone for the period 2000-2016. Competition is approximated by a structural indicator (concentration ratio) and a non-structural indicator (Boone indicator). Bank stability is measured by z-score. Estimations by the generalised method of moments show that when the relationship between competition and banking stability is assumed to be linear, the results support the competition-fragility or concentration-stability thesis. However, the test of non-linearity by introducing the quadratic term of the measure of competition indicator in the model shows that there is a threshold beyond which an increase in market power (less competition) could begin to harm stability. Thus, before taking action on competition in the CEMAC, regulatory authorities must consider this non-linear relationship between banking stability and competition.

Keywords: market power, stability, concentration ratio (CR3), boone indicator, z-score.

GJHSS-E Classification: FOR Code: 149999



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Effet du Pouvoir de Marché sur la Prise de Risque Bancaire en Zone CEMAC

Mela Christel [α], Abessolo Yves André [σ] & Bita Charles-Alain [ρ]

Résumé- Cet article évalue l'effet du pouvoir de marché sur la prise de risque bancaire en zone CEMAC 2000-2016. La concurrence est approchée par un indicateur structurel (taux de concentration) ainsi qu'un indicateur non structurel (indicateur de Boone). La stabilité bancaire est mesurée par le z-score. Les estimations par la méthode des moments généralisés en système montrent que lorsque la relation entre la concurrence et stabilité bancaire est supposée linéaire, les résultats soutiennent la thèse de concurrence-fragilité ou concentration stabilité. Toutefois, le test de la non linéarité par l'introduction du terme quadratique de l'indicateur de mesure de concurrence dans le modèle montre qu'il existerait un seuil au-delà duquel une augmentation du pouvoir de marché (moins de concurrence) pourrait commencer à nuire à la stabilité. Ainsi, avant de prendre des mesures concernant la concurrence dans la CEMAC, les autorités de régulation doivent considérer cette relation non linéaire entre stabilité bancaire et concurrence.

Motsclés: pouvoir de marché, risque bancaire, ratio de concentration (CR3), indicateur de boone, z-score.

Abstract- This article assesses the effect of market power on Bank Risk Taking in the CEMAC zone for the period 2000-2016. Competition is approximated by a structural indicator (concentration ratio) and a non-structural indicator (Boone indicator). Bank stability is measured by z-score. Estimations by the generalised method of moments show that when the relationship between competition and banking stability is assumed to be linear, the results support the competition-fragility or concentration-stability thesis. However, the test of non-linearity by introducing the quadratic term of the measure of competition indicator in the model shows that there is a threshold beyond which an increase in market power (less competition) could begin to harm stability. Thus, before taking action on competition in the CEMAC, regulatory authorities must consider this non-linear relationship between banking stability and competition.

Keywords: market power, stability, concentration ratio (CR3), boone indicator, z-score.

I. Introduction

L'intensification de la concurrence sur les marchés bancaires après la libéralisation financière a remis la question de la stabilité des banques à l'ordre du jour. Ce regain d'intérêt s'explique essentiellement par la récurrence des crises bancaires ayant suivie cette importante réforme et les coûts socioéconomiques qu'elles ont engendrés. Hoggarth et *al.* (2001) estiment le coût fiscal des crises bancaires pour la période 1977-2000 à 4,5 pour cent du PIB. Le rôle joué par la structure des marchés bancaire dans l'explication de la stabilité a fait l'objet de sérieux débats et discussions dans la littérature et est bien loin de conduire à un consensus. En effet, deux thèses majeures s'opposent à ce sujet. La thèse de concurrence-fragilité soutient qu'une concurrence bancaire plus forte réduit le pouvoir de marché et la marge bénéficiaire des banques; ce qui les incite à prendre plus de risques et par conséquent, à causer l'instabilité. Par contre, selon la thèse de concurrence-stabilité, plus de concurrence réduit les taux d'intérêt des prêts, ainsi que les problèmes d'aléa moral et de sélection adverse entre emprunteurs et par conséquent réduit les taux de défaut de prêt, ce qui est favorable à la stabilité. Récemment, Martinez-Miera et Repullo (2010) combinent ces deux thèses concurrentes et affirment qu'un rapport en U entre la concurrence et la stabilité pourrait exister.

En zone CEMAC, les reformes financières mises sur pied suite à la crise bancaire des années 1980 ont eu des répercussions sur la structure des marchés bancaires. On note une augmentation du nombre de banque sur la période d'étude 2000-2016 et la concentration bancaire est globalement en recul sur la même période (le taux moyen de concentration pour les pays de notre échantillon[1] est passé de 87,89% en 2000 à 78,79% en 2016). De plus, face à la globalisation financière et la présence croissante des banques multinationales, le système bancaire de la CEMAC est de plus en plus interconnecté (Avom et Nana Kuindja, 2017). On note également une diminution de la stabilité bancaire mesurée par le Z-score, qui est passée de 11,50 à 9,07. Une importance particulière doit être accordée à ces changements dans la structure des marchés bancaires en zone CEMAC au regard de la controverse théorique et empirique autour de la question des effets de la concurrence sur la stabilité financière des banques.

Notre étude contribue à la littérature de plusieurs manières. Premièrement, cet article utilise la nouvelle approche introduite par Boone (2008) comme mesure de la concurrence ainsi qu'une autre mesure traditionnelle de la concurrence. Deuxièmement, cette

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[1] Il s'agit du Cameroun, du Congo et du Gabon.

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étude contribue au débat sur la non-linéarité dans la relation concurrence-stabilité en examinant la pertinence empirique des prédictions théoriques du modèle de Martínez-Miera et Repullo (2010).

La suite de l'article est organisée de la manière suivante: la section 2 présente la revue de littérature. La section 3 détaille les données et la méthodologie utilisée dans cette étude. La section 4 discute des résultats empiriques.

II. Revue de Littérature

La relation concurrence-stabilité a été examinée par de nombreuses études. Cependant cette question reste encore très controversée tant dans la théorie que dans les travaux empirique. En effet, deux thèses majeures s'opposent dans la littérature, à savoir la thèse de la concurrence-stabilité ou concentration-fragilité et la thèse de la concurrence-fragilité ou concentration-stabilité.

La thèse de la concurrence-fragilité s'articule essentiellement autour de l'hypothèse de la « franchise value »[2], qui postule que la franchise value réduit les incitations des banques à prendre des risques excessifs et les rend relativement conservatrices, afin de protéger leur droit d'exercer, ce qui contribue en retour à la stabilité du système bancaire entier. Une concurrence plus forte par contre réduirait les marges bancaires, faisant ainsi chuter la valeur de franchise des banques et les incite à prendre plus de risque pour accroître la rentabilité et gagner des parts de marché (Keeley,1990). En outre, une forte concurrence bancaire réduit le taux d'intérêt sur les prêts qui servent de tampon pour couvrir les pertes sur prêts. Par conséquent, la concurrence peut augmenter le risque de faillite bancaire. Un marché bancaire concentré et moins concurrentiel serait plus stable.

Cette vision traditionnelle de la concurrence-fragilité a été remise en cause par thèse de concurrence – stabilité développée par Boyd et De Nicolo (2005). Selon ces auteurs, la réduction des taux de prêt qui résulte de la concurrence bancaire encourage plutôt les emprunteurs à rembourser les prêts limitant ainsi le risque de défaut. Cette thèse connue également sous le vocable de l'hypothèse de "concentration-fragilité" est principalement établie sur le paradigme du «riskshifting». Ce paradigme soutient que l'augmentation du pouvoir de marché et les taux d'intérêts de prêt plus élevés qui en résultent peut affecter négativement la stabilité des banques due aux problèmes d'aléa moral et de sélection adverse de la part des emprunteurs (Stiglitz et Weiss, 1981). En effet, l'augmentation des coûts de financement pourrait éliminer les emprunteurs plus sûrs et ne maintenir que les emprunteurs les plus risqués (sélection adverse), et inciter les emprunteurs à choisir des projets plus risqués (aléa moral). Ainsi, une réduction des taux de prêt due à une concurrence bancaire plus forte réduit la probabilité de défaut de prêt et de faillite bancaire. Par ailleurs, on note l'effet de la politique du "Too Big To Fail" dans les systèmes bancaires concentrés sur les incitations à la prise de risque des banques, des emprunteurs et par conséquent sur la stabilité du système bancaire (Mishkin, 1999). En effet, comme le souligne cet auteur, les grandes banques sont plus susceptibles de recevoir des garanties ou des subventions publiques. En conséquence, le problème de l'aléa moral devient plus grave pour les gestionnaires de grandes banques qui peuvent prendre des risques excessifs sous le filet de sécurité du gouvernement[3].

Martínez-Miera et Repullo (2010) étendent le modèle de Boyd et De Nicoló (2005) et distinguent deux effets: le risk shifting et l'effet marginal. Le risk shifting indique qu'une baisse des taux de prêt (due à une forte concurrence) conduit à une probabilité de défaut plus faible de l'emprunteur (effet similaire à celui identifié par Boyd et De Nicoló, 2005). L'effet marginal repose sur l'idée qu'une concurrence plus élevée est associée à des taux de prêt plus bas, ce qui réduit les revenus d'intérêts des banques ainsi que leur capacité à couvrir les pertes. Si le risk shifting fait référence à la thèse de concurrence-stabilité, l'effet marginal fait référence à la thèse de concurrence-fragilité. Le niveau de concurrence sur le marché bancaire détermine quel effet domine. Spécifiquement, sur les marchés très concentrés, l'effet du risk-shifting domine, ainsi l'entrée des banques sur le marché réduit la probabilité de faillite bancaire, tandis que sur les marchés très concurrentiels, l'effet marginal domine, ainsi les entrées supplémentaires augmentent la probabilité de faillite. Comme dans leur modèle, la concurrence est mesurée par le nombre de banques, il s'agit d'une relation en forme de U entre le nombre de les banques et le risque de défaillance bancaire[4].

Plusieurs études empiriques ont utilisé des méthodes et échantillons divers pour évaluer l'effet de la concurrence sur la stabilité, mais les résultats sont contradictoires. Tandis que certaines études soutiennent l'effet négatif de la concurrence sur la stabilité (Keeley, 1990; Jimenez et *al.,* 2007; Fungacova

[2] La franchise value désigne la valeur actuelle des profits futurs que la banque réaliserait du fait de son accès privilégié à des marchés protégés, de la concurrence, de la réglementation et des avantages spécifiques qu'elle a pu développer tout au long de son évolution dans le secteur bancaire. C'est donc une composante intangible des actifs de la banque qui ne conserve sa valeur que si et seulement si la banque poursuit son activité (Fendri, 2012).

[3] Ainsi, la concurrence a un effet négatif et déstabilisant sur la stabilité bancaire par le canal des profits. L'impact positif et stabilisant de la concurrence sur la stabilité passe principalement par le canal du taux d'intérêt et la politique du Too Big To Fail.

[4] Par conséquent, la relation entre la concurrence et la stabilité bancaire n'est pas monotone ; mais plutôt en forme de U.

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et Weil, 2009; Beck et *al.,* 2013; Albaity et *al.,* 2019; Kabir et Worthington, 2017); d'autres en revanche, soulignent un effet positif de la concurrence sur la stabilité (Boyd et *al.*, 2006; Boyd et De Nicolo, 2005; Anginer et *al*., 2013; Goetz, 2017). Une autre vague de travaux affirment que la relation est non linéaire (Berger et *al.*, 2009; Tabak et *al.*, 2012).

Les résultats des travaux empiriques sur la relation entre la concurrence bancaire et la stabilité financière sont mitigés. En effet, dans le cas de l'économie américaine, Keeley (1990) constate que suite à la libéralisation et à la déréglementation aux États-Unis dans les années 1980, la concurrence s'est accrue et a entraîné une plus grande fragilité du système bancaire. Corbae et Levine (2018) confirment ce constat et soulignent qu'une intensification de la concurrence augmente l'efficience et la fragilité des banques aux États-Unis. Les résultats de Jimenez et *al*. (2007) soulignent qu'en Espagne, la qualité des prêts s'améliore avec le renforcement du pouvoir de marché, car les prêts non-performants ont tendance à diminuer à mesure que le pouvoir de marché augmente. De même, à l'aide de la méthode des moments généralisés, Akande et Kwenda (2017) sur un échantillon de 440 banques issues de 37 pays d'Afrique Subsaharienne soutiennent l'hypothèse de concurrence-fragilité. Ce résultat confirme celui de Kouki et Al-Nasser (2014) trouvé dans le même contexte.

Motivés par les prédictions théoriques contradictoires, Beck et *al.* (2003) sur un échantillon de 70 pays sur la période 1980-1997constatent à l'aide d'un modèle logit que les crises sont moins probables dans les économies ayant des systèmes bancaires plus concentrés. De-Ramon et *al*. (2018) au Royaume-Uni utilisent trois mesures distinctes de la concurrence (l'indicateur de Boone, l'indice de Lerner et l'indice de Herfihndahl-Hirschmann) et les incluent dans des régressions distinctes pour examiner leurs effets sur la stabilité des banques mesurée par le z-score. Leurs résultats montrent qu'en moyenne, la concurrence réduit la stabilité bancaire, mais que cet effet varie selon les banques en fonction de leur santé financière. Pour ces auteurs, la concurrence encourage relativement les banques moins solides (plus proches de l'insolvabilité) à réduire les coûts ainsi que le risque du portefeuille et à augmenter les ratios de capital, renforçant ainsi leur stabilité; tout en réduisant les incitations des banques relativement plus solides (plus éloignées de l'insolvabilité) à augmenter leurs ratios de fonds propres, ce qui affaiblit leur stabilité.

Les résultats de Albaity et *al.* (2019) sur un échantillon de 276 banques provenant de dix-huit pays du Moyen-Orient et d'Afrique du Nord (MOAN) entre 2006 – 2015 suggèrent que l'intensification de la concurrence est associée à une faible stabilité et rentabilité bancaire, ainsi qu'a un risque élevé d'insolvabilité. Pour ces auteurs, le pouvoir de marché des banques issues des profits élevés est érodé sur un marché fortement concurrentiel, ce qui les incite à prendre davantage de risque pour compenser les pertes de profits et rend par conséquent les banques plus fragiles. Ceci implique que les banques les plus stables des pays du MOAN sont celles des marchés moins concurrentiels.

D'autres études en revanche confortent la thèse de concurrence-stabilité. Schaeck et *al*. (2006) s'intéressent aux secteurs bancaires d'un groupe de 38 pays sur la période 1980-2003 en appliquant un modèle log it ainsi qu'un modèle de durée. Ils mesurent la concentration par le pourcentage des actifs totaux détenus par les trois plus grandes banques. Leur résultat principal soutient que les systèmes bancaires plus concurrentiels ont une faible probabilité de faire faillite, par conséquent ils sont plus stables que les systèmes bancaires en situation de monopole. Dans le même ordre d'idées Schaeck et Cihak (2008) en utilisant un échantillon de plus de 3.600 banques de dix pays européens et d'environ 8.900 banques des États-Unis au cours de la période 1995 à 2005, ces auteurs constatent que la concurrence mesurée par l'indicateur de Boone accroit la solidité des banques par le canal de l'efficience.

En utilisant des données de plus de 2600 banques de l'Union Européenne au cours de la période 1997-2005, Uhde et Heimeshoff (2009) fournissent une preuve empirique supplémentaire à l'hypothèse de concentration-fragilité. Ils soutiennent que la concentration du marché bancaire a un impact négatif sur la stabilité des banques européennes mesurée par le Z-score. Amidu et Wolfe (2013) ont analysé l'effet de la concurrence sur la stabilité dans 55 pays émergents, dont 22 sont des pays africains sur la période 2000-2007. Ils trouvent un lien positif et significatif entre la concurrence et la stabilité.

Anginer et *al.,* (2013) basent leur analyse du lien entre la concurrence sur le marché bancaire et le risque de défaut des banques sur un échantillon de 1872 banques issues de 63 pays à travers le monde de 1997 à 2009. Ils aboutissent à la conclusion selon laquelle plus de concurrence encourage les banques à diversifier les risques, rendant ces banques moins fragiles aux crises systémiques. Leurs résultats demeurent sans changement quand ils emploient la concentration du marché comme indicateur de mesure pour la concurrence sur le marché.

L'étude de Soedarmono et *al.* (2013) est basée sur un grand ensemble de banques commerciales d'Asie sur la période 1994-2009, les résultats indiquent qu'un degré de pouvoir de marché élevé sur le marché bancaire est associé à un ratio de capital plus élevé, une volatilité du revenu élevée et un risque d'insolvabilité bancaire élevé. Bien que les banques des marchés moins concurrentiels détiennent plus de capital, le niveau de capitalisation n'est pas assez élevé pour

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compenser l'impact de la prise de risque excessive sur le risque de défaut.

Dans une autre étude, Fiordelisi et Mare (2014) emploient un échantillon de 2.529 banques coopératives de cinq pays de l'Union Européenne (l'Autriche, la France, l'Allemagne, l'Italie et l'Espagne) entre 1998 – 2009. Ces auteurs ont également constaté que la concurrence mesurée par deux indicateurs (indice de Lerner, indice de Herfindahl-Hirschmann) a eu un effet stabilisant à la fois dans le court et le long terme ; et que la situation de crise n'a pas influencé la relation qui soutient entre la concurrence et la stabilité.

Shijaku (2016) analyse la relation entre la concurrence et la stabilité des banques albanaises pendant la période 2008 - 2015. Trois indicateurs lui permettent d'approcher la concurrence (l'indicateur de Boone, l'indice de Lerner et l'indice de Herfindahl-Hirschman). Le principal résultat soutient l'hypothèse de concurrence-stabilité. Goetz (2017) capte les changements dans la concurrence bancaire en explorant comment le processus de déréglementation a graduellement réduit les barrières à l'entrée sur les marchés bancaires urbains aux États-Unis. Sur un échantillon de 8412 banques pour la période 1978-2008, l'auteur constate que l'augmentation de la contest abilité sur le marché améliore de manière significative la stabilité des banques. Goetz (2017) parvient à la conclusion qu'une plus forte concurrence réduit la probabilité de faillite des banques, la part des prêts non performants et augmente la rentabilité. Ces résultats suggèrent que la concurrence augmente la stabilité, puisqu'elle améliore la rentabilité bancaire et la qualité des actifs.

En Afrique subsaharienne, Moyo et *al.* (2014) considèrent un échantillon de 16 pays[5] sur la période 1995-2010. Ces auteurs utilisent comme mesure de la concurrence bancaire la statistique H développée par Panzar et Rosse (1987). Ils constatent que l'entrée des banques étrangères a renforcé la concurrence sur le marché bancaire des pays de l'échantillon. Ils parviennent à la conclusion selon laquelle les banques sont plus stables dans les pays possédant des systèmes bancaires concurrentiels (un niveau plus élevé de la H-statistique).

Cette étude instructive souffre cependant de quelques limites. L'échantillon retenu est hétérogène puisqu'il comprend des pays ayant des niveaux de développement différents. De plus, elle ne tient pas compte de l'ensemble des pays de la CEMAC[6] et rien n'assure que la relation entre la concurrence et la stabilité soit commune pour l'ensemble des pays de l'Afrique subsaharienne. D'une part, les systèmes bancaires diffèrent entre ces pays (part de marché des banques, présence des banques étrangères, services fournis, clientèles servies, etc.). D'autre part, l'environnement économique, social et institutionnel dans lequel évoluent les banques n'est pas le même. Face à ce constat, il est intéressant de concentrer l'analyse sur un groupe de pays homogènes comme ceux de la zone CEMAC.

Compte tenu des développements théoriques les plus récents, quelques travaux ont évalué la non-linéarité dans la relation entre stabilité bancaire et concurrence. Dans le contexte européen, la thèse de non-linéarité a été testée et soutenu par Liu et *al.* (2013) en utilisant l'indice de Lerner comme indicateur de concurrence. La non-linéarité est également observée par Jiménez et *al*. (2013) pour les banques espagnoles. Toutefois, ce dernier résultat n'est pas robuste aux différentes mesures de concurrence choisies, la non linéarité apparaît seulement lors de l'utilisation des mesures de concentration.

La non-linéarité a également été testée en Amérique latine par Tabak et *al.* (2012). Ils trouvent qu'à des niveaux élevés et faibles de concurrence (mesurée par l'indicateur Boone), la concurrence augmente la stabilité. Cependant, à des niveaux moyens, une fragilité est observée. Sur un échantillon de 221 banques issues de 33 pays d'Afrique subsaharienne sur la période 2000-2015, Brei et *al*. (2018), confirment une relation non-linéaire entre concurrence bancaire et risque de crédit. Kasman et Kasman (2015) n'ont pas trouvé de relation non linéarité pour les banques turques. Sur un ensemble pays d'Asie du Sud-Est, Noman et *al.* (2017) découvrent une relation non linéaire entre la concurrence et la stabilité bancaires en incorporant un terme quadratique de la concurrence dans leur modèle. Une attention particulière est également accordée au test de la non-linéarité dans cette étude.

III. Méthodologie

Afin d'évaluer l'effet de la concurrence sur la stabilité bancaire dans la CEMAC, nous allons effectuer des régressions économétriques sur des données de panel pour la période 2000-2016. Notre démarche méthodologique consiste à présenter d'abord le modèle ainsi que la mesure des variables, nous décrivons ensuite la méthode d'estimation utilisée pour les estimations. Nous précisons enfin les sources des données.

a) Spécification des modèles

Pour évaluer l'effet de la concurrence sur la stabilité bancaire, nous employons un modèle dynamique comme Jimenez et *al.,* 2007; Kasman et Kasman, 2015). Ce modèle est spécifié de la manière suivante:

[5] Botswana, Afrique du Sud, Cote d'Ivoire, Tanzanie, Cameroun, Uganda, Éthiopie, Zambie, Ghana, Kenya, Madagascar, Malawi, les Iles Maurice, Mozambique, Nigeria et Sénégal.

[6] Seul le Cameroun figure dans l'échantillon.

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$$Zscore_{i,t}=\beta_0+\beta_1 Zscore_{i,t-1}+\beta_2 comp_{i,t}+\beta_3 Taille_{i,t}+\beta_4 LIQ_{i,t}+\beta_5 CIR_{i,t}+\beta_6 NIM_{i,t}+\beta_7 TCPIB_{i,t}+\beta_8 INFL_{i,t}+\varepsilon_{i,t} \quad (1)$$

Où $\mathbf{Zscore_{i,t}}$ mesure la stabilité bancaire[7], $Zscore_{i,t-1}$ capte la persistance de la stabilité bancaire,$comp$ renvoie aux indicateurs de concurrence à savoir le ratio de concentration cr3et l'indicateur de Boone, Taille désigne la taille de la banque mesurée par le logarithme du total actif ,$\mathbf{LIQ}$ désigne la liquidité bancaire, $\mathbf{CIR}$ désigne le Cost to Income Ratio, $\mathbf{NIM}$ la marge nette d'intérêt, INFL le taux d'inflation, TCPIBT le taux de croissance du PIB et ε_{it} le terme d'erreur, (i, t) indiquent respectivement le pays et le temps.

Comme Kasman et Kasman(2015), jimenez et al(2013), nous incluons également un terme quadratique de l'indicateur de mesure de la concurrence (cr3[2] et boone[2]) dans le modèle pour vérifier l'hypothèse de la non linéarité entre la concurrence et la prise de risque suggérée par Martinez-Miera et Repullo (2010). Ledit modèle se présente comme suit:

$$Zscore_{i,t}=\beta_0+\beta_1 Zscore_{i,t-1}+\beta_2 comp_{i,t}+\beta_3 comp_{i,t}^{\,2}+\beta_4 Taille_{i,t}+\beta_5 LIQ_{i,t}+\beta_6 CIR_{i,t}+\beta_7 NIM_{i,t}+\beta_8 TCPIB_{i,t}+\beta_9 INFL_{i,t}+\varepsilon_{i,t} \quad (2)$$

Dans le modèle 2 ci-dessus, les valeurs des paramètres β_2 *et* β_3 sont examinées telles que des valeurs positives et significatives de β_2 *et* β_3 fourniraient des preuves en faveur du paradigme de concurrence-fragilité. Ce paradigme suppose que plus de pouvoir de marché (moins de concurrence) incite les banques à prendre moins de risques et à être plus financièrement stable. En revanche, les valeurs négatives et significatives de β_2 *et* $\beta_3$soutiendraient plutôt le paradigme de concurrence-stabilité ; selon lequel plus de concurrence ou moins de pouvoir sur le marché incite les banques à prendre moins de risques et à être plus stable financièrement. Si β_2 est significativement positif et $\beta_3$est significativement négatif, les résultats soutiendraient la non-linéarité entre la concurrence et la stabilité telle que proposée par Martinez-Miera et Repullo (2010).

b) Mesure des variables

La démarche retenue pour la présentation des variables utilisées consiste à définir en premier la variable dépendante du modèle, pour ensuite décrire les variables explicatives. Notons que ni la concurrence bancaire ni la stabilité bancaire n'est directement observable. Ci-dessous, nous discutons d'abord du choix de la mesure de la stabilité bancaire et tournons ensuite notre attention vers celle de la concurrence bancaire.

i. *Mesure de la stabilité bancaire*

La stabilité bancaire est mesurée de manière négative. Dans ce sens, la littérature présente au moins trois principales mesures de l'instabilité bancaire à savoir: le niveau de prêts non performants (NPL), la crise bancaire systémique et la probabilité d'insolvabilité bancaire nommée Z-score.

Des auteurs comme Jiménez et *al.* (2007) ont utilisé le niveau des prêts non performants ou Non Performing Loans (NPL) pour mesurer la stabilité bancaire. Il s'agit d'un indicateur de la santé des banques définit comme le rapport entre le volume des prêts non productifs et les prêts totaux d'une banque; elle mesure le risque de crédit. Un niveau plus élevé de NPL indique un risque d'insolvabilité élevé et par conséquent une fragilité bancaire plus élevée ou une faible stabilité bancaire. Cependant, le niveau des prêts non performants reflète essentiellement le risque de crédit et ne peut pas ainsi fournir un signal global du risque auquel une banque fait face (Beck, 2008; Dushku, 2016).

Une deuxième mesure de l'instabilité bancaire est la crise bancaire systémique. Cette approche considère uniquement les crises systémiques réalisées, en listant les critères à prendre en considération pour qualifier une crise de systémique. En effet, selon Demirgüç-Kunt et Detragiache (1998) ainsi que Laeven et Valencia (2008), le système bancaire d'un pays est en situation de crise systémique lorsque:

- Des mesures d'urgence telles que le gel des dépôts sont mises en œuvre;
- Les nationalisations bancaires à grande échelle ont lieu;
- Les prêts improductifs atteignent au moins 10% du total des actifs;
- Le coût fiscal des opérations de sauvetage atteint 2 % du PIB.

La précision est l'atout principal de cette mesure de l'instabilité dans la mesure où elle ne s'intéresse qu'aux crises systémiques effectives et non potentielles, toutefois cet atout restreint en même temps sa conception de l'instabilité financière (Arnould, 2011).

La troisième mesure très utilisée dans la littérature est le Z-score. Elle mesure la probabilité qu'une banque devienne insolvable. Dans ce cas la faillite n'est qu'une probabilité. Le z-score est définit comme la somme du rendement des actifs et du rapport fonds propres sur le total actif, divisée par l'écart type du rendement des actifs (Boyd et *al*., 2006). Un z-score élevé implique une faible probabilité de faillite et, vice versa, un z-score faible signifie une probabilité

[7] Si la persistance est présente, cette variable sera positivement liée au z-score contemporain.

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d'instabilité bancaire plus élevée. À la différence de la crise bancaire systémique qui identifie la faillite du système bancaire, le z-score mesure la distance qui sépare une banque de la faillite. Selon Schaeck et Cihak (2008), mesurer le risque d'insolvabilité de la banque en employant des données bancaires comme le Z-score améliore le pouvoir statistique comparée aux autres indicateurs. En effet, les données bancaires ont la capacité d'identifier la faillite d'une banque même lorsque le système bancaire n'est pas en crise. Le z-score est également préféré parce qu'il reflète le niveau global de risque couvrant le niveau de la rentabilité, le niveau de capitalisation et la variabilité des rendements de l'actif (Beck, 2008). En plus de tous ses atouts, cet indicateur étant une méthode probabiliste est plus adapté à notre horizon temporel.

Comme Boyd et *al.* (2006), Uhde et Heimeshoff (2009), Turc-Ariss (2010), nous recourons au Z-score pour approcher la stabilité bancaire. Formellement, il se définit par la formule suivante:

$$Z\ score = (ROA + FP/TA)/\sigma ROA$$

Où le ROA (Return On Asset) désigne la rentabilité des actifs, FP/TA le ratio des fonds propres sur total actif et σROA l'écart type du ROA. Ce dernier mesure la volatilité du rendement des actifs de la banque. En effet, la détérioration de la qualité des actifs a un effet sur la solidité de la banque à travers la performance de cette dernière. Le Z-score augmente avec le niveau de profit et de capitalisation et diminue avec la volatilité du rendement des actifs. Ainsi, une plus grande valeur du Z-score indique un profil de risque plus réduit pour la banque et une stabilité bancaire plus élevée.

ii. *Mesure de la concurrence bancaire*

Tout comme la stabilité, la littérature offre divers indicateurs de mesure de la concurrence qu'on peut regrouper en deux grands groupes: les mesures structurelles basées sur le modèle SCP et celles non structurelles. Pour notre analyse, nous retenons deux indicateurs pour approcher la concurrence à savoir une mesure structurelle(le ratio de concentration CR3) et une mesure non structurelle (l'indicateur de Boone[8]) afin de tenir compte du débat relatif aux indicateurs de mesure de la concurrence

- Le ratio de concentration cr3

En se basant sur le modèle Structure-Comportement-Performance, de nombreuses études évaluant le lien entre la concurrence et la stabilité ont utilisé les indices de concentration comme mesure de la concurrence (Berger et *al*., 2009; De Ramon et *al*., 2018). Le ratio de concentration RC3 mesure la part de marché des trois plus grandes banques du marché bancaire considéré. Ce ratio s'obtient en additionnant les parts de marché des trois banques les plus importantes en termes de total actif: $CRn = \Sigma PMi$

PM représente la part de marché des n plus grandes banques. Cet indicateur fournit un résultat compris entre 0 et 1. Si le ratio de concentration tend vers 0, on est en présence d'un marché très concurrentiel. Lorsqu'il tend vers 1, le marché est dit fortement concentré.

- L'indicateur de Boone

L'indicateur de Boone quant à lui considère que la concurrence améliore la performance des firmes efficientes et affaiblit celle des firmes mois efficientes. L'idée de cet indicateur est clairement basée sur l'hypothèse de la structure efficiente de Demsetz(1973). Ainsi, il mesure l'impact de l'efficience sur la performance des banques en termes de profits et des parts de marché. Plus cet effet est fort, plus grande sera β la valeur de l'indicateur de boone en valeur absolue (Tabak et *al.*, 2011). L'intensité de la concurrence est estimée à partir de l'équation de profit suivante (Boone et *al*., 2005):

$$Ln\ (\pi_i) = \alpha + \beta \ln(MC_i) + \varepsilon_i$$

Où π représente le profit, MC le coût marginal et ε le terme d'erreur. Le coût marginal est obtenu par l'estimation d'une fonction de coût translog (Van Leuvensteijn et *al*., 2007). Théoriquement, l'indicateur de boone a un signe négatif rappelant le fait qu'une augmentation des coûts marginaux se traduit par une baisse du profit. Plus le coefficient β est négatif, plus la concurrence est forte sur le marché.

- Les variables de contrôle

En plus de la variable explicative d'intérêt, nous retenons sur la base des travaux antérieurs un ensemble de variables de contrôle spécifiques aux banques et des variables macro-économiques susceptibles d'expliquer la stabilité bancaire. Comme variable macroéconomique, nous incluons le taux d'inflation (*INFL*) mesuré par l'indice des prix à la consommation et le taux de croissance du PIB (Schaeck et Cihák, 2007; Schaeck et *al.,* 2006; Uhde et Heimeshoff, 2009), puisque les développements macro-économiques sont susceptibles d'affecter la qualité des actifs bancaires.[9] Demirgüç-Kunt et Detragiache (1998) montrent que l'environnement macroéconomique agit sur la qualité du portefeuille et la rentabilité des banques et affirment qu'un faible taux de croissance du PIB est clairement associé à une probabilité élevé de crise

[8] Cet indicateur rend compte de la concurrence du marché à travers l'efficience des banques. L'intuition qui suit par ailleurs les travaux de Demsetz (1973), est qu'une banque relativement moins efficiente sera plus fortement sanctionnée dans un marché concurrentiel.

[9] Demirgüç-Kunt et Detragiache (1998) ont affirmé que les crises surviennent lorsque l'environnement macro-économique est faible, en particulier quand la croissance est faible et l'inflation forte. Un environnement macro-économique favorable contribue également à augmenter le niveau du capital (Schaeck et Cihak, 2007).

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bancaire; Shijaku (2016) aboutit à la même conclusion. Le signe attendu est donc positif.

Par contre, l'impact de l'inflation sur la stabilité bancaire n'est pas tranché dans la littérature. Les effets de l'inflation sur les banques dépendent avant tout de son anticipation ou non par les banques (Uhde et Heimeshoff, 2009). Lorsque l'inflation n'est pas anticipée, son effet est déstabilisateur alors que cet effet reste ambigu lorsqu'elle est anticipée, puisque l'inflation contribue aussi bien à augmenter les coûts des banques que ses profits à travers une hausse des taux d'intérêt.

Quant aux variables spécifiques au secteur bancaire, nous en avons sélectionné quatre à savoir la taille des banques mesurée par le logarithme du total actif, le ratio crédits/dépôts bancaires pour capter la liquidité bancaire, le niveau d'efficience approché par le cost to income ratio (CIR) et le niveau de la profitabilité mesurée par la marge nette d'intérêt en anglais Net Interest Margin[10](NIM). Le choix de ces variables a été fait sur la base de la littérature existante (voir entre autres, Uhde et Heimeshoff, 2009; Beck et *al.,* 2013; Schaeck et Cihak, 2007; Soedarmono et *al.*, 2011).

La taille des banques est un facteur important dans la prise de risque excessive due à l'effet " Too Big To Fail " des grandes banques. Pour tenir compte cette problématique du Too Big To Fail, nous incorporons le logarithme du total actif (ln *TA*) dans nos estimations. Les grandes banques ont certainement de meilleures possibilités de diversification et de meilleurs systèmes de gestion des risques. Cependant, elles peuvent également être disposées à prendre plus de risques si elles sont considérées comme trop grandes pour faire faillite (Too Big To Fail). Par conséquent, la relation entre la taille de la banque et la stabilité reste ambiguë.

La marge d'intérêt nette ou Net Interest Margin (NIM) permet de capter la profitabilité bancaire. Selon Fendri (2012) la marge nette d'intérêt est un indicateur de la rentabilité de l'exploitation ou de la profitabilité de la banque. On peut cependant avancer que plus la marge d'intérêt dégagée est importante, plus la profitabilité de la banque est élevée et plus le risque de défaillance est réduit. Ce ratio serait alors positive mentlié à la stabilité bancaire.

Le cost to income ratio (ratio coût/revenu) est également contrôlé pour rendre compte de l'efficience des banques. En effet, Schaeck et Cihak (2012) ont démontré que l'efficience est le canal par lequel la concurrence affecte la stabilité financière. Boyd et Nicolo (2005) ainsi que Fiordelisi et Mare (2014) ont montré que les banques moins efficientes prennent plus de risque afin d'améliorer leurs performances et générer des rendements plus élevés. Le signe attendu est négatif.

Nous considérons le ratio crédit sur dépôt pour capter la liquidité bancaire qui est au cœur du métier d'intermédiation bancaire et peut affecter la probabilité d'insolvabilité des banques. Il s'agit de la fonction d'intermédiation représentée par la transformation des dépôts en crédits. Un ratio crédit sur dépôt plus élevé est associé à un risque plus élevé. Puisque comme le suggère Soedarmono et *al.*, (2011), les banques ayant un ratio crédit/dépôt plus élevé sont plus susceptibles d'avoir un problème de liquidité que celles ayant un ratio plus faible.

c) Source des données

Les données utilisées dans cette étude sont des données annuelles par pays pour la période 2000-2016.Elles proviennent des sources diverses à savoir la Financial Structure Development Data set, le World Development Indicator et les rapports annuels COBAC. L'échantillon se compose de trois pays à savoir le Cameroun, le Congo et le Gabon. D'après le rapport annuel de la zone franc de 2017, ces trois pays détiennent les trois principaux systèmes bancaires de la CEMAC qui représentent les trois quarts du bilan agrégé de la zone.

d) Méthode d'estimation

La méthode des moments généralisés en panel dynamique est retenue pour effectuer les estimations compte tenue de la nature dynamique de la stabilité bancaire et du problème d'endogénéité entre stabilité et concurrence bancaires (Noman et *al.,* 2017). Nous recourrons précisément à l'estimateur de la méthode des moments généralisés en système de Blundel et Bond (1998) encore appelée l'estimateur GMM en système pour estimer la relation dynamique entre la concurrence et stabilité financière. Cette méthode offre de meilleurs résultats par rapport à un modèle statique. En effet, une estimation des modèles 1 et 2 à l'aide de la méthode des moindres carrés ordinaires produirait des résultats biaisés en raison à la présence de la variable dépendante retardée parmi les variables explicatives.

L'efficacité de l'estimateur GMM repose sur la validité de deux hypothèses fondamentales: la validité des valeurs retardées des variables en niveau et en différence comme instruments et l'absence d'autocorrélation des termes d'erreur à l'ordre deux[11]. Pour tester la validité des instruments, Arellano et Bond (1991) suggère le test de suridentification de Sargan. Pour vérifier l'hypothèse de non corrélation des termes d'erreur, ces mêmes auteurs suggèrent un test d'autocorrélation de second ordre.

- L'hypothèse nulle du test de Sargan est la validité des variables retardées en niveau et en différences comme instruments. Si la probabilité (p-value)

[11] Par construction, le terme d'erreur en différence première est corrélé au premier ordre, mais il ne doit pas l'être au second ordre.

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trouvée est supérieure à 1%, 5% ou 10%, l'hypothèse nulle de validité des instruments ne sera pas rejetée.

- Quant au test d'autocorrélation, on distingue à ce niveau la statistique d'Arellano et Bond (1991) du test d'autocorrélation des erreurs du premier ordre AR(1) et la statistique d'Arellano et Bond(1991) du test d'autocorrélation des erreurs de second ordre AR(2). L'hypothèse nulle pour le test d'autocorrélation des erreurs de second ordre est l'absence d'autocorrélation de second ordre. Si la probabilité (p-value) trouvée est supérieure à 1%, 5% ou 10%, l'hypothèse d'absence d'auto corrélation des erreurs ne sera pas rejetée.

IV. Présentation des Résultats

Nous présentons les résultats des statistiques descriptives, de la corrélation des variables dans un premier temps et dans un deuxième temps nous présentons les résultats des régressions effectuées.

a) *Statistiques descriptives et structure de corrélation*

Tableau 2: Statistiques descriptives des variables

Variables	Observations	Moyenne	Ecart-Type	Minimum	Maximum
Zscore	51	9,01761	4,21136	0,0298311	19,09142
Boone	42	0,0088618	0,1091646	-0,2177827	0,2731003
Cr3	51	71,67575	22,48912	63,1217	100
Taille	42	6,000777	0,4640877	4,721761	6,585041
Liq	50	62,80816	18,05772	22,20019	97,2753
Nim	51	7,264629	12,76777	-3,306103	93,01026
Cir	42	55,78893	21,3963	5,528377	85,902
Tcpibt	42	3,9058	2,8956	-3,30842	8,449761
infl	42	0,8185565	1,268893	-6,910927	2,947765

Source: Auteur à partir de Stata 12

Le tableau 2 présente des statistiques descriptives des variables de l'étude. En portant notre intérêt sur quelques variables, ce tableau montre que la stabilité bancaire moyenne des pays de l'échantillon est de 9,01. Les banques du Cameroun et du Gabon sont les plus stables de la région, avec un Z-score moyen de 9,38 et 13,43 respectivement qui est supérieur à celui de l'ensemble. Inversement, les banques les moins stables financièrement viennent du Congo avec une moyenne de 4,51 seulement. Le niveau de concentration bancaire dans la CEMAC est élevé avec un niveau moyen sur la période d'étude de 71,67%. Le Gabon présente le système bancaire le plus concentré avec une moyenne de 95,16 sur la période d'étude. Ensuite vient le Congo avec une moyenne de 66,04%. Le Cameroun a le système bancaire le moins concentré de l'échantillon avec une moyenne de 63,12%. L'indicateur de Boone présente une moyenne de 0,0083.Cette moyenne est plus forte au Congo (0,094) qu'au Cameroun (0,0040) et au Gabon (-0,0729), par conséquent le système bancaire congolais est le moins concurrentiel.

b) *Résultats et leurs implications*

Le tableau 4 présente les résultats de l'estimation du modèle 1 par la méthode des moments généralisés en système. Deux régressions ont été faites sur la base du modèle 1, l'une ayant le ratio de concentration (rc3) comme mesure structurelle de la concurrence et l'autre ayant l'indicateur de Boone (boone) comme indicateur de mesure non structurelle de la concurrence. Le Z-score est la variable dépendante dans les deux régressions. Les valeurs non significatives du test de Sargan garantissent la validité des instruments. En outre, le test d'autocorelation d'Arellano et Bond indique une absence d'autocorrélation au deuxième ordre. De plus, la valeur significative du test de Wald indique que tous les modèles sont correctement spécifiés.

Rappelons que les valeurs croissantes de chacune de nos indicateurs de mesure de la concurrence (RC3 et Boone) sont associées à une concurrence moins intense ou alors à davantage de pouvoir de marché[12]. Par conséquent, trouver un coefficient positif du paramètre associé à ces indicateurs suggérerait que moins de concurrence (plus de pouvoir de marché) est associée à une plus grande stabilité. Par contre, un coefficient négatif impliquerait qu'un environnement moins concurrentiel (plus de pouvoir de marché) réduit la stabilité des banques.

[12] Concrètement, un indicateur de Boone plus élevé est associé à une concurrence moins intense et un ratio de concentration (CR3) plus élevé est associé à une plus grande concentration, ce qui peut également être interprété comme un pouvoir de marché accru sous certaines conditions (De-Ramon et al., 2018)

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Tableau 3: Synthèse des résultats du modèle 1: La relation linéaire entre la concurrence et la stabilité bancaire.

Variable dépendante: **Z score**			
Mesures de concurrence	**Régression 1 (cr3)**	**Régression 2 (boone)**	**Regression 3 (Cr3etboone)**
Constante	-4,926 (5,274)	-30,354*** (7,908)	-19,697 (4,747)***
$Zscore_{i,t-1}$	-0,445*** (0,095)	0,590*** (0,079)	0,646*** (0,097)
Cr3	0,049** (0,021)		0,085*** (0,032)
Boone		22,240*** (4,830)	2,808*** (0,999)
Taille	2,161*** (0,762)	1,869*** (0,369)	2,587*** (0,304)
Liq	0,017 (0,022)	0,020*** (0,003)	-0,005 (0,015)
Nim	0,049 (0,099)	0,025 (0,100)	0,039 (0,051)
Cir	-0,021 (0,020)	-0,006 (0,009)	0,013** (0,007)
Tcpibt	0,426*** (0,0992)	0,324*** (0,115)	0,204* (0,123)
infl	-7,282*** (1,460)	0,032*** (0,007)	0,029*** (0,007)
AR(2) (p-value)	0,260	0,249	0,450
Test de Sargan (p-value)	0,273	0,402	0,527
Wald (p-value)	0,000	0,000	0,000

Source: Auteur à partir de STATA 12

*Note: Les valeurs entre parenthèses indiquent les écarts types. ***, ** et * représentent la significativité aux seuils de 1 %, 5 % et 10 % respectivement.*

Dans la première colonne du tableau, le ratio de concentration (cr3) est l'indicateur de mesure de la concurrence tandis que dans la deuxième colonne, la concurrence est approchée par l'indicateur de Boone (boone). Dans les deux régressions, la variable endogène retardée est positive et significative au seuil de 1% confirmant ainsi la persistance de la stabilité. Ce résultat a été observé dans la plupart des articles ayant utilisé un modèle dynamique (Jiménez et *al.*, 2013; Liu et *al.*, 2013; Kasman et Kasman, 2015).

Par ailleurs, les résultats montrent que les coefficients associés au ratio de concentration (cr3) et à l'indicateur de Boone sont tous positifs et significatifs au seuil de 5% et 1% respectivement. Ce résultat implique que moins de concurrence (plus de pouvoir de marché) est associée à une plus grande stabilité bancaire dans la CEMAC. Ce résultat est théoriquement cohérent avec l'hypothèse de concurrence-fragilité ou de concentration-stabilité. Ainsi, nos résultats soutiennent quelque soit l'indicateur de concurrence utilisé l'hypothèse de la concurrence - fragilité ou de concentration-stabilité. Ces résultats sont conformes à ceux de plusieurs auteurs (keeley ,1990; Albaity et *al.*, 2019). En revanche, ces résultats sont contraires à ceux de Moyo et *al.* (2014), Boyd et *al.* (2006) ainsi que Uhde et Heimshoff (2009).

En ce qui concerne les variables de contrôle spécifiques aux banques, le coefficient de la variable taille des banques est statistiquement significatif et positif dans toutes les régressions faites sur la base du modèle 1 suggérant que les grandes banques semblent plus stables que de petites banques. Ce résultat conforte l'idée selon laquelle le pouvoir de marché accru des grandes banques peut réduire les incitations des manageurs à prendre plus de risque (Keeley, 1990). Mais contredit l'effet du Too Big To Fail souligné par Mishkin (1998) qui affirme que plus les banques seraient de taille importante, plus elles seraient risquées.

La liquidité de bancaire (LIQ) mesurée par le ratio crédit/dépôt est positivement reliée à la stabilité bancaire dans les deux régressions. Toutefois elle n'est significative que dans la deuxième régression. Ce qui indique qu'un niveau élevé de liquidité diminue le risque de liquidité et augmente la stabilité bancaire. En effet, pendant la période de crise, certaines institutions financières font faillite parce qu'elles ne peuvent pas obtenir la liquidité. Berger et Bouwman (2013) soutiennent qu'une détention élevée de liquidité peut diminuer le risque de liquidité et aider les banques à réduire la probabilité de faillite.

La marge nette d'intérêt(NIM) ainsi que le niveau d'efficience (CIR) ont les signes attendus mais

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ne sont pas significatifs. Cet absence de significativité peut s'expliquer par fait que dans les pays en voie de développement les marges élevées peuvent refléter des inefficacités dues aux coûts de transaction élevés et à l'absence des économies d'échelle (Bretschger et Kappel, 2010).

En plus des facteurs spécifiques aux banques deux variables de l'environnement macroéconomique ont été également considérées; il s'agit du taux de croissance et du taux d'inflation. Le coefficient du taux de croissance du PIB est positif et significatif dans les différentes régressions, ce qui impliquerait qu'un taux de croissance économique plus élevé booste la stabilité des banques .Ce résultat est conforme à ceux de Soerdarmono et *al.* (2013) qui soulignent qu'une augmentation de l'activité économique améliore le niveau de la solidité des banques dû à son effet sur les revenus de ces dernières.

En outre, l'effet de l'inflation sur la stabilité bancaire est négatif et significatif dans la première régression; un taux d'inflation plus élevé est associé à un plus grand risque et une faible stabilité des banques puisque l'inflation provoque l'incertitude économique et encourage les banques à limiter le crédit.

Suite aux travaux de Berger et *al.,* 2009, Tabak et *al.*, 2012 ainsi que Kasman et Kasman, 2015, un terme quadratique de l' indicateur de mesure de la concurrence est également utilisé dans notre modèle pour un test de robustesse. L'objectif est de tester la non linéarité entre la concurrence et la stabilité bancaire dans la CEMAC entre 2000 et 2016. Une fois de plus deux régressions ont été estimées sur la base du modèle (2); la première contient le ratio de concentration comme indicateur de mesure de la concurrence tandis que dans la deuxième régression, la concurrence est mesurée par l'indicateur de Boone. Le tableau 5 présente les résultats de l'estimation du modèle (2) par la méthode des moments généralisés en système. Les colonnes du tableau diffèrent uniquement par la mesure de concurrence utilisée. Selon les résultats, le test de Wald confirme que le modèle est bien spécifié. Le test de Sargan montre que les instruments utilisés dans les différentes régressions sont valides. Par ailleurs, les résultats du test d'autocorelation AR (2) indiquent une absence d'autocorrélation de second ordre.

Tableau 5: Synthèse des résultats du modèle 2: La relation non linéaire entre la concurrence et la stabilité bancaire.

Variable dépendante: Z score		
Mesures de Concurrence	Régression 1 (cr3)	Régression 2 (boone)
Constante	-22,159*** (5,240)	1,487 (1,960)
$Zscore_{i,t-1}$	0,550*** (0,085)	0,512*** (0,064)
Cr3	0,252*** (0,077)	
$Cr3^2$	-0,0013*** (0,0003)	
Boone		0,759 (3,064)
$Boone^2$		-23,842*** (8,162)
Taille	2,317*** (0,293)	1,618*** (0,537)
Liq	0,004*** (0,0015)	0,021** (0,008)
Nim	0,098* (0,058)	0,013 (0,127)
Cir	-0,0007 (0,009)	-0,005 (0,011)

[13] Dans la deuxième colonne, l'indicateur Boone est utilisé comme mesure de la concurrence. Comme mentionné précédemment, cet indicateur met l'accent sur l'effet d'une augmentation du coût marginal sur la diminution des parts de marché. Puisqu'il est négatif, un indicateur plus élevé suggère que l'évolution du coût marginal a moins d'impact sur les parts de marché, ce qui signifie que le marché est soumis à moins de concurrence. Par conséquent, un signe négatif de cet indicateur montre que la stabilité bancaire augmente lorsque la concurrence augmente tandis qu'un signe positif indique le contraire

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Tcpibt	0,313** (0,143)	0,358*** (0,137)
infl	0,00013*** (0,001)	-7,909*** (1,984)
AR(2) (p-value)	0,3133	0,1614
Test de Sargan (p-value)	0,6010	0,1571
Wald (p-value)	0,0000	0,0000

Source: Auteur à partir de STATA 12
*Note: Les valeurs entre parenthèses indiquent les écarts types. ***, ** et * représentent la significativité aux seuils de 1 %, 5 % et 10 % respectivement.*

Les résultats du tableau ci-dessous, montrent un signe positif du terme linéaire de la concurrence (boone) tandis que celui du terme quadratique est négatif et significatif . De même, le signe du terme linéaire du cr3 est positif et celui du terme quadratique négatif. Ces résultats suggèrent que la relation entre la concurrence et la stabilité bancaire est non linéaire comme l'ont souligné Martinez-Miera et Repullo(2010). Ainsi, une augmentation du pouvoir de marché, (moins de concurrence) augmente la stabilité bancaire ce qui est conforme à l'hypothèse de concentration - stabilité, mais seulement jusqu'à un certain niveau. Après ce seuil, une augmentation du pouvoir de marché mène à une réduction de la stabilité bancaire en accord avec l'hypothèse de concentration-fragilité comme suggéré de Boyd et De Nicolo (2005). Ce résultat est cohérent avec celui de Tabak et *al*., 2012 qui ont trouvé une relation en U inversé entre la concurrence et la stabilité en Amérique Latine.

V. Conclusions

L'objectif principal de cet article était d'évaluer l'effet du pouvoir de marché sur la prise de risque bancaire en zone CEMAC en utilisant les données de panel des banques de trois pays de la CEMAC sur la période 2000-2016. En outre, l'étude a testé la non linéarité dans la relation concurrence-stabilité bancaire. En utilisant la méthode des moments généralisés en panel dynamique, les résultats soutiennent d'une part lorqu'on suppose que la relation est linéaire, la thèse de concurrence-fragilité ou concentration-stabilité. D'autre part, l'introduction du terme quadratique de l'indicateur de mesure de la concurrence dans le modèle a montré que la relation entre la concurrence et la stabilité serait non linéaire dans la CEMAC; ces résultats suggèreraient qu'une augmentation du pouvoir de marché (moins de concurrence) augmente la stabilité bancaire, mais seulement jusqu'à un certain niveau. Après ce seuil, une augmentation du pouvoir de marché mène à une réduction de la stabilité bancaire.

L'effet favorable du pouvoir de marché sur la stabilité implique que les autorités de supervision en zone CEMAC doivent être prudents dans leurs actions pour augmenter la concurrence dans la mesure où elle pourrait réduire la stabilité. Afin de stabiliser davantage le secteur bancaire, les régulateurs de la sous-région doivent promouvoir la consolidation des petites banques par le biais des fusions et acquisitions. La consolidation de ces banques leur permettra d'acquérir plus de pouvoir sur le marché et augmentera également leurs chances de survie sur le marché. Néanmoins, afin d'éviter une concentration excessive dans le secteur bancaire, les régulateurs doivent faire preuve de prudence lorsqu'ils approuvent ces fusions pour ne pas mettre sur pied des banques d'importance systémique (les banques Too Big To Fail).

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*PLoS ONE*vol.12, n°5, e0176546. https://doi.org/10.1371/journal.pone.0176546

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Global Journal of HUMAN-SOCIAL SCIENCE: E Economics
Volume 20 Issue 1 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-460x & Print ISSN: 0975-587X

The Impact of Entrepreneurial Orientation on Business Performance in Star Class Hotels of Sri Lanka

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Abstract- The article studies the relationship between the Entrepreneurial Orientation and Business Performance in star class hotels of Sri Lanka. The study has utilized data collected from 215 senior managers employed in the star class hotel sector. CFA SEM analysis was performed using AMOS 21 to identify the relationship. The quantitative data analysis revealed there is a significant relationship between Entrepreneurial Orientation, and Business performance. Further, it was found Proactiveness, Risk Taking, Innovativeness, Autonomy and Competitor Aggressiveness are dimensions of Entrepreneurial Orientation.

Keywords: *entrepreneurial orientation, business performance, hospitality industry, risk-taking, autonomy.*

GJHSS-E Classification: *FOR Code: 340299*



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The Impact of Entrepreneurial Orientation on Business Performance in Star Class Hotels of Sri Lanka

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Abstract- **The article studies the relationship between the Entrepreneurial Orientation and Business Performance in star class hotels of Sri Lanka. The study has utilized data collected from 215 senior managers employed in the star class hotel sector. CFA SEM analysis was performed using AMOS 21 to identify the relationship. The quantitative data analysis revealed there is a significant relationship between Entrepreneurial Orientation, and Business performance. Further, it was found Proactiveness, Risk Taking, Innovativeness, Autonomy and Competitor Aggressiveness are dimensions of Entrepreneurial Orientation.**

Keywords: entrepreneurial orientation, business performance, hospitality industry, risk-taking, autonomy.

I. Introduction

The effort of business firms to improve their Business Performance through Entrepreneurial Orientation has drawn the attention of academic scholars and business practitioners. It seems to be a novel approach for business firms to measure Business Performance using Entrepreneurial Orientation (Kraus, Burtscher, Vallaster & Angerer, 2018, Kraus, Burtscher, Vallaster & Angerer, 2018). The global business arena has become a fiercely competitive place due to the heavy internationalization of markets supported by rapid technological advancements (Tajeddini and Trueman, 2008). For companies to survive in today's competitive markets, the growth has become a challenging task (Davidson et al. 2005). Such companies will resort into Entrepreneurial Orientation to ensure the required output increase and growth in size (Pratano et al. 2012). Adequate empirical evidence is available on the relationship between Entrepreneurial Orientation and growth (Zhang & Zhang, 2012, Li et al. 2009; Mahmood & Fanafi, 2013).

This paper explores the link between Entrepreneurial Orientation and Business Performance by defining entrepreneurial firms as firms that engage in innovation, proactive, risk-taking, autonomy, and competitor aggressive (Lumpkin and Dess, 2011). In this study, Entrepreneurial Orientation is a concept with five key dimensions that are independent of each other. These dimensions are combined and will act together to form an environment where the firm who are more entrepreneurial to exploit the opportunities: I) to sustain the current markets while generating new markets, II) to grab a sizable market slice from rivals who are less aggressive and innovative, and III) to acquire the clients, assets and also the employees of demure present businesses (Hamel, 2000; Lackeus, 2018). The literature contains numerous recent studies on entrepreneurial orientation and its potential effect on business performance. However, researches on particular industrial sector hospitality are scarce (Tajeddini, 2010). Here it is defined in such a way that has an effect on the Business Performance and a dimension with a substantial contribution to the business accomplishments of the venture (Mahmood & Hanafi, 2013).

The contemporary researchers are taking a view on Entrepreneurial Orientation can be regarded as the strategic processes accountable for decision making and as a method of entrepreneurial actions associated with a business (Omisakin, Nakhid, Littrell, & Verbitsky, 2016). To embrace entrepreneurial behaviors and practices, Entrepreneurial Orientation is viewed as a strategic tool to perform both in a creative and competitive manner (Beliaeva, 2014). Further, it is defined as a comprehensive concept that has an effect on the Business Performance and a philosophy with a considerable contribution to the success of the venture (Mahmood & Hanafi, 2013).

II. Problem Statement

According to the figures of SLTDA, the annual average occupancy rates of four-star and five-star hotels seldom exceed the level of 70% (SLTDA Statistical Report). Even some decent profits could be achieved. A substantial opportunity cost also will incur at this level of occupancy. Since selling room nights is regarded as a service, every unoccupied room only carries the cost and subsequently will erode the profitability. The hotel firms are now turning themselves towards Entrepreneurial Orientation to enhance the profits. It is worthy of examining the degree of Entrepreneurial Orientation that is practiced among four-star and five-

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the relationship between Entrepreneurial Orientation and Business performance is studied, Entrepreneurial Orientation is measured using only three dimensions. In this research, all five dimensions proposed by Lumpkin and Dess (1996), namely innovativeness, proactiveness, risk-taking, autonomy and competitor aggressiveness, are considered as components of Entrepreneurial Orientation.

III. Objectives of the Study

There are five main objectives of the study

1. To investigate whether there is a relationship between Entrepreneurial Orientation and Business Performance.
2. To study whether Innovativeness, Pro activeness, Risk Taking, Autonomy, and Competitor Aggressiveness are sub-dimensions of Entrepreneurial Orientation.

IV. Research Method

The study was based on primary data. The primary data was collected from a likert scale questionnaire using 215 senior managers from the hospitality industry representing four star and five-star hotels. The Simple random technique was adapted to collect data from respondents covering the whole island. Collected data were analyzed using CFA-SEM techniques to identify the relationship between Entrepreneurial Orientation and Business performance. The deployed software for the analysis was AMOS 21.

V. Conceptual Framework

The conceptual frame work was developed to identify the relationship between Entrepreneurial Orientation and Business Performance in four-stars and five-star hotels. Previous empirical and theoretical were used to determine the variables of the study. It consisted of five first-order independent variables innovativeness, proactiveness, risk-taking, autonomy, and competitor aggressiveness, and one second order-independent variable Entrepreneurial Orientation and one dependant variable Business Performance. Being a constituent of EO innovativeness is explained as an essential way through which businesses identify new opportunities and it is also known as a business tendency to get involved in new processes and actions to generate new solutions to problems in the business (Ofem, 2014). The proactiveness refers to the tendency of the firm to come up with new products and services ahead of the competition and act in anticipation of future demand (Wang and Altinay, 2010). Risk-taking refers to a firm's tendency to engage and the willingness to commit significant resources to opportunities with uncertain outcomes (Schillo 2011; Lumpkin and Dess 1996). Competitor aggression refers to the propensity of directly and intensely challenging its competitors to achieve entry of improving the position that is to outperform industry rivals in the market place (Lumpkin and Dess, 1996). Autonomy refers to the independent action of an individual or a team in bringing fourth an idea or a vision and carrying it through to completion (Lumpkin and Dess, 1996). Traditional financial indicators are used in the performance evaluation that are usually related to profitability. Profitability is measured by return on equity, return on assets, and return on investment. (Asheghian, 2012).

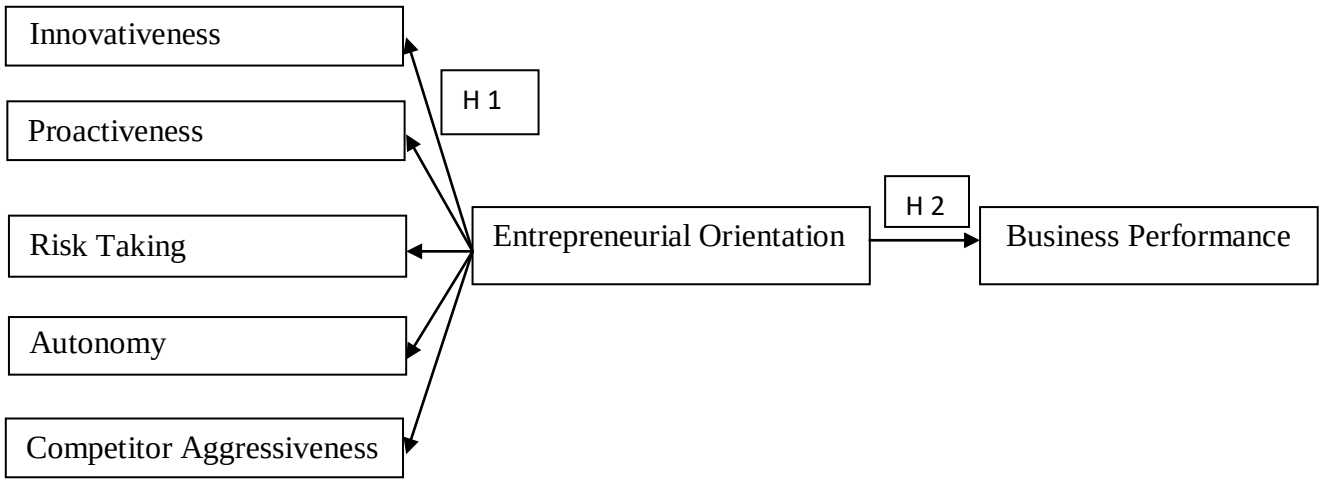

Figure 1

VI. Hypothesis of the Study

Following hypotheses were relevant to the study

1. There is a relationship between Entrepreneurial orientation and Business Performance.
2. Innovativeness, Pro activeness, Risk Taking, Autonomy and Competitor Aggressiveness are sub dimensions of Entrepreneurial Orientation.

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VII. CFA – SEM Analysis

CFA-SEM Analysis technique was used to measure the relationship between composite variables of second-order and the dependant variable. In this method firstly the individual models shall be tested for their suitability. The independent variables of first-order category namely, innovativeness, pro activeness, risk-taking, autonomy and competitor aggressiveness and the independent variable business performance were subjected to this analysis. As the second step, all six variables were combined to develop the structural model. In both, the individual model and the structural model, items were dropped during the analysis anticipating to meet the relevant values in indices required to ensure the model fit. Subsequently, the final model was developed and tested for the above-mentioned hypotheses.

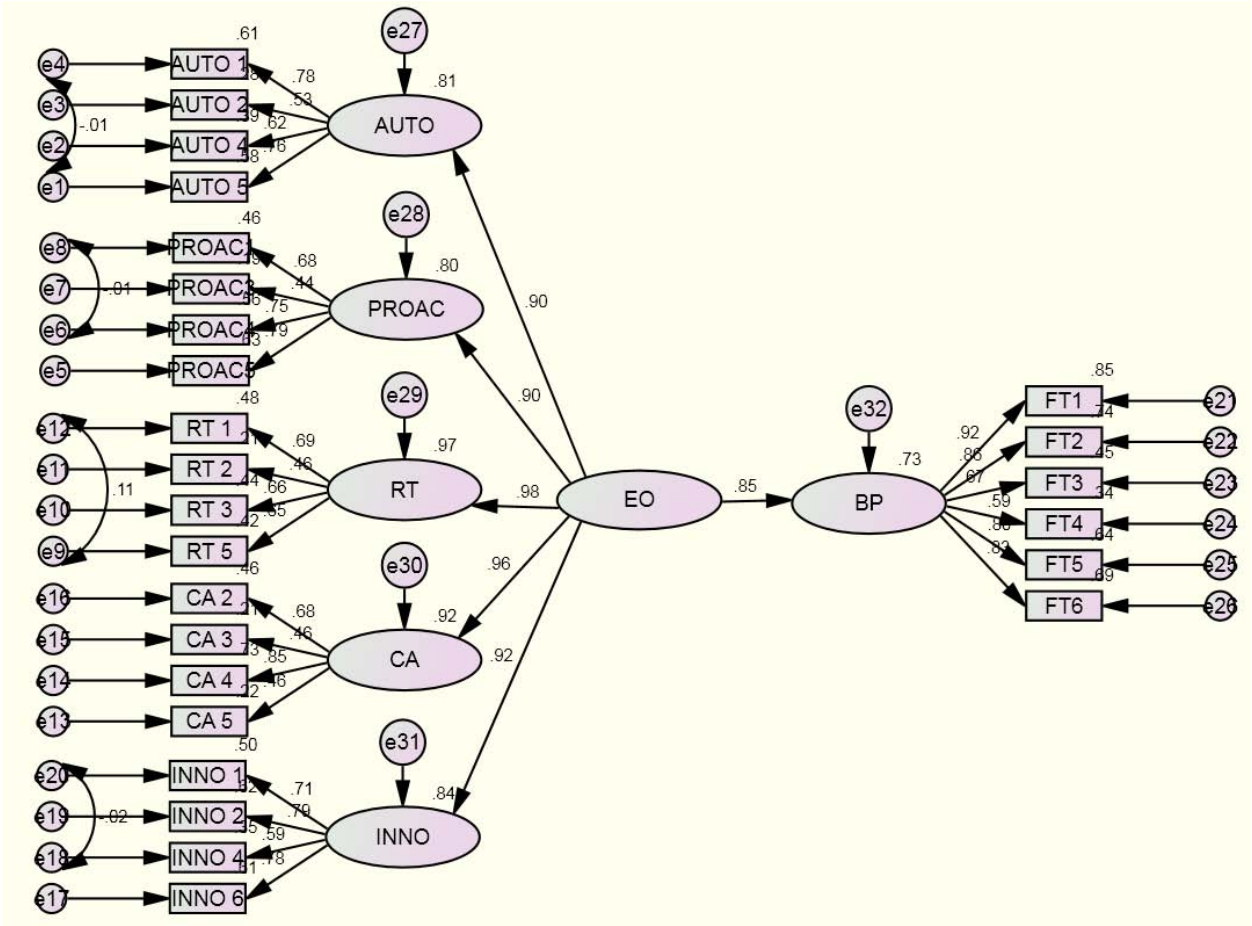

Figure 2: Final SEM Model

The individual models of dimensions Innovativeness, Pro activeness, Risk-taking, Autonomy and, Competitor Aggressiveness were developed and tested for their model fit. After treating the modification indices all dimensions reached the relevant values. The indices were selected in order to represent three important categories.

Table1: The Model fit indices of dependant and independent variables

Dimension	CMIN/DF	CFI	RMSREA	Comment
Threshold values	5	0.9	0.8	
Innovativeness	2.954	0.978	0.045	Required level is achieved
Pro activeness	2.967	0.985	0.032	
Risk taking	0.988	0.964	0.049	
Autonomy	2.943	0.988	0.053	
Competitor aggressiveness	3.948	0.991	0.061	
Business Performance	2.925	0.913	0.058	

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In the final Structural Equation Model (SEM) the five dimensions are showing a standard beta estimate value towards the Entrepreneurial Orientation with high figure. In the relationships P values are 0.000 which was less than the threshold values and were significant. The critical ratios also were above the 1.96 threshold value. Therefore hypothesis one is accepted, that depicts the Risk-taking, Competitor Aggressiveness, Innovativeness, Proactiveness and, Autonomy are measurements of Entrepreneurial Orientation.

Table 2: Results of Hypothesis 1 testing

Second order variable		First order variable	Standard Beta Estimate	Critical Ratio	P value
Entrepreneurial Orientation	<	Risk taking	0.983	9.095	0.000
Entrepreneurial Orientation	<	Competitor aggressiveness	0.959	6.406	0.000
Entrepreneurial Orientation	<	Innovativeness	0.918	Reference point	
Entrepreneurial Orientation	<	Pro activeness	0.897	10.179	0.000
Entrepreneurial Orientation	<	Autonomy	0.898	9.877	0.000

In the final Structural Equation Model (SEM), the P-value 0.000 was less than the threshold value of 0.05; the relationship was proved to be significant. The critical ratio value 11.384 was greater than the 1.96 threshold value, and there is a standard beta estimate value of 0.852 between Entrepreneurial orientation and Business performance. Therefore hypothesis two is accepted, that depicting there is a significant and sizable relationship between Entrepreneurial Orientation and Business Performance.

Table 2: Results of Hypothesis 2 testing

Second order variable		First order variable	Standard Beta Estimate	Critical Ratio	P value
Business Performance	<	Entrepreneurial Orientation	0.852	11.384	0.000

VIII. Conclusion

CFA SEM analysis demonstrates a significant and sizable relationship between Entrepreneurial Orientation and Business Performance in star class hotels of Sri Lanka. By adopting Entrepreneurial Orientation in a meaningful way, star class hotels in Sri Lanka could deliver a strong outcome. By becoming more entrepreneurial orientated, these firms could ensure their business survival and growth in a fiercely competitive tourism market. To practice Entrepreneurial Orientation, firms could rely on its dimensions Risk-Taking, Competitor Aggressiveness, Innovativeness, Proactiveness, and Autonomy. These dimensions are functioning individually from each other, where the firms could adopt different strategies according to their preference and availability of resources.

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Global Journal of HUMAN-SOCIAL SCIENCE: E
Economics
Volume 20 Issue 1 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-460x & Print ISSN: 0975-587X

Technical Efficiency Assessment of Dairy Farm in the South-West Region of Bangladesh

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Abstract- The paper concentrates on the measurement of the total factor productivity of dairy farms in the south-west region of Bangladesh. The study used stochastic frontier approach for analyzing the technical efficiency of the dairy farms. Here, seventy dairy farms are considered as a sample. The data reveals that the number of labor and the quantity of food are statistically significant at a 1 percent level of significance. The data also manifests that numerous farm-specific characteristics, i.e. farm size, farmer's age, and amount of credit are statistically significant at 1 percent, 10 percent, and 10 percent respectively. The range of technical efficiency for the farms varies from 26 percent (minimum) to 95 percent (maximum) where the mean value is 68 percent for the dairy farms of the south-west region. This implies that an average output of milk production falls 32 percent short of maximum possible level. Hence, there is scope of improvement in this sector. Therefore, to improve the farm productivity government should provide proper training, and medical treatment facilities for the farms so that the animals become healthy. If it is possible to do so then the farm level production frontier will shift upward.

Keywords: dairy farm, cobb-douglas production function, technical efficiency, south-west region.

GJHSS-E Classification: FOR Code: 149999



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Technical Efficiency Assessment of Dairy Farm in the South-West Region of Bangladesh

Fariha Farjana [α] & Afia Khatun [σ]

Abstract- The paper concentrates on the measurement of the total factor productivity of dairy farms in the south-west region of Bangladesh. The study used stochastic frontier approach for analyzing the technical efficiency of the dairy farms. Here, seventy dairy farms are considered as a sample. The data reveals that the number of labor and the quantity of food are statistically significant at a 1 percent level of significance. The data also manifests that numerous farm-specific characteristics, i.e. farm size, farmer's age, and amount of credit are statistically significant at 1 percent, 10 percent, and 10 percent respectively. The range of technical efficiency for the farms varies from 26 percent (minimum) to 95 percent (maximum) where the mean value is 68 percent for the dairy farms of the south-west region. This implies that an average output of milk production falls 32 percent short of maximum possible level. Hence, there is scope of improvement in this sector. Therefore, to improve the farm productivity government should provide proper training, and medical treatment facilities for the farms so that the animals become healthy. If it is possible to do so then the farm level production frontier will shift upward.

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I. Introduction

Bangladesh is an agricultural country, and its economy is mainly based on agriculture (Saadullah, 2001). Among 140 million people, 80 percent of them lived in the rural area where 80 percent own livestock (Haque, 2007). Agriculture in Bangladesh is characterized by diversified farming like crops, livestock, fisheries, and agro-forestry to meet the household requirements, and minimize the risk and uncertainty (Sharmin et al., 2012). Among different agricultural activities, dairy farming is one of them. The dairy sector is a one of the important contributors to boost the economy (Sharmin et al., 2012). In 2006, the livestock sector directly contributed 3 percent of gross domestic product (GDP). However, indirect benefits like draught power, manure for fuel, and fertilizer are double, i.e. 6 percent of GDP (Haque, 2007).

In Bangladesh, more than 70 percent of the dairy farmers are smallholders and contribute 70-80 percent of the country's total milk production. The growth of milk production increased from 4.1 percent to 7.4 percent in FY 2000-2005 and FY 2005-2008, respectively. Even with this faster growth, the per capita milk availability in the year 2008 is only 19 kg, (Hemme et al., 2008) which is far below the requirements (92 kg/person/year) as notified by the World Health Organization (WHO). The dairy farm is considered as a strong tool to develop a village micro-economy of Bangladesh. It can improve rural livelihoods and alleviate rural poverty (Shamsuddin et al., 2007). To achieve competitiveness, dairy farmers need to find ways of reducing costs and increasing returns (Dayanandan, 2011). Therefore, the objective of the study is to investigate the technical efficiency level of the dairy farms in the south-west region of Bangladesh.

II. Literature Review

The term efficiency is related to the productivity growth, especially in developing country perspective (Ohajianya, 2005). Efficiency in agriculture is associated with the possibility of farm production to attain the optimum level of output at least cost (Ajibefun, 2000). Ellis (1993) points out three conditions for satisfying the production unit to be efficient under neoclassical assumptions: a) same prices for inputs and outputs, b) same production functions, and c) profit-maximizing behavior. Any violation of at least one point, there is variation in efficiency level. Efficiency is composed of two components, i.e. technical efficiency (TE) and allocative efficiency. The paper concentrates solely on the technical efficiency of the dairy firms in the South-west region of Bangladesh. Therefore, TE refers to the ability to avoid waste by producing as much output as input usage allows or by using as little input as output production allows (Lovell, 1993).

There are two methods to estimate TE, i.e. Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA) (Coelli, 2005). Stochastic frontier analysis (SFA) uses econometrics based on the deterministic parameter frontier of Aigner and Chu (1968). SFA method can handle cross-section data and panel data. However, DEA deals with panel data. Sharafat (2013), Kompas and Che (2004), Masunda and Chiwesh (2015), Binici et al. (2006), Zhu et al. (2012) and others use SFA technique for studying technical efficiency of dairy farms in different countries of the world where they find mean TE is 39.5 percent, 87.39 percent, 54.9 percent, 50 percent, 61.4 percent, 55.3 percent, and 78.8 percent respectively. Since the data used in the

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paper is cross-section data, the researchers used the SFA approach.

Seyoum et al. (1998), Asogwa, et al. (2011), Umeh and Asogwa (2011), and Oladeebo (2012) apply the Cobb-Douglas stochastic frontier model for efficiency analysis. For the simplicity of analysis, this study considers the Cobb-Douglas stochastic frontier model. Smallholder milk producers played pivotal role in the dairy market of Bangladesh. They sold milk directly to consumers or milk broker at local markets. They supplied all domestic milk for the informal and traditional markets (Quddus, 2013). Khan et al. (2013) find that average milk production per cow is 6.05 liter per day. Quddus (2013) finds that 35 percent of farmers owned milk yield 11.5 liter milk per day. Hussain (2013) examines that in Bangladesh, almost two out of every three household rear cattle to produce milk for personal consumption.

a) Variables identification for Empirical Model

Farm size has a positive relationship with dairy farm efficiency. Sarafat (2013) and Tauer (2001) find a positive association between farm size and productivity at 1 percent and 5 percent significant level. These results are the same for other authors' findings like Kalirajan and Flinn (1983), Kalirajan and Shand (1985), and Belbase and Grabowski (1985).

A common approach to measure literacy rate is years of schooling. Belbase and Grabowski (1985), Kalirajan and Shand (1985) find a positive correlation between TE and education. However, Kalirajan and Shand (1985) report that there is no significant relationship between these two variables. Experience is the number of years that farmers are involved in farming activities. This coefficient of experience was positive, and it was statistically significant at the 1 percent level in the TE model of Khai and Yabe (2011); Asogwa et al. (2011). Farming experience positively contributed to improve technical efficiency (Masunda and Chiweshe, 2015).

The term area is the size of the land cultivated for farming. Khai and Yabe (2011) detected that an increase in area increases TE. It is statistically significant at 1 percent level. On the other hand, Asogwa et al. (2011) find that area has a negative impact on TE. Gelan et al. (2010) detected that Off-farm income has a negative but insignificant effect on TE. Contact with an extension officer during the past year is positively related to efficiency but statistically insignificant. The relationship between TE and the contact with extension services is negative (Sarafat, 2013). Asogwa et al. (2011) cite that household size positively affects the TE.

III. Methodology

a) Study Area and Sampling

This study considers the South-west region of Bangladesh as the study area. The authors select two districts for this study. The main occupation of the people of these two areas is agriculture. About 39.43 percent of the total population of Khulna district and 39.84 percent of the total population of Jessore district are involved with agricultural activities. People who have milk-producing cows, these farms are selected as samples. People who have at least three cattle are treated as a farm (Abdulai, 1998). This study also considers those dairy farms which have at least 3 cows. Here the number of farm animals means the total size of milking cows, calves and oxen. The total sample size is 70, where each of the districts cover 35 dairy farms. Authors apply Purposive sampling technique to select the sample from the population. The sample unit of this study is those farmers who have their own dairy farm in the study area. Table 1 delineates the detail of the sampling unit distribution.

Table No. 1: Distribution of Location and Sample Size

Name of District	Name of *Upazila*	Sample Size
Khulna	Khalishpur	5
	Dumuria	15
	Sahapur	15
Jessore	Barakpur	10
	Bodh Khana	10
	Chondipur	15
	Total	70

Source: Authors' Compilation

b) Analytical Tools

The efficiency level of a farm is measured by the ratio of actual output to the maximum attainable output. The technical efficiency shows the farm's ability to maximize output with a set of given input. The value of TE ranges from 0 to 1. Here, TE = 1 indicates that the farm is producing on its production frontier and is said to be technically efficient. Hence, (1–TE) represents the gap between actual production and optimum attainable production that is possible to achieve by moving the firm towards the frontier through readjusting inputs (Ahmed et al., 2010). If the farms utilize all the factors properly and efficiently, then the production would be at a maximum level. However, if the farms are not capable of using the factors of production efficiently then there will be a gap between the maximum level of production and

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the actual level of production, and this gap will represent inefficiency. Therefore, in this paper with the help of Stochastic Frontier Analysis (SFA) authors analyzed the factors that influence the dairy farms' production and farm-specific efficiency.

c) *Estimation of Cobb-Douglas Stochastic Production Function*

The proponent of Cobb-Douglas production function is Charles Cobb and Paul Douglas who developed the concept of production function estimation in 1928. Many studies used the Cobb-Douglas function to access the farm level production, particularly in those relating to developing agriculture. Therefore, this study employed the following Cobb-Douglas Stochastic functional form. Hence, the model is

$$\ln Y_i = \beta_0 + \sum_{i=1}^{n} \beta_i \ln X_i + V_i - U_i \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where Y_i denotes the output, i.e. liters of milk production per month, X_i indicates the vector of explanatory variables. Table 2 demonstrates the description of the variables which authors used for further analysis. Here, β_0 is an intercept term; β_i is coefficient of ith independent variables, V_i is statistical disturbance term (random error term), U_i is technical efficiency effect independent of V_i, i is the ith dairy farmer, where i = 1,……., n.

Table No. 2: List of Variables for Cobb-Douglas Production Function Estimation

Sl. No.	Variable	Unit of Measurement	Expected Sign	Literature
		Dependent Variable		
1	Milk Production	Liter / Month	NA	Sharafat, 2012
		Independent Variable		
1	Labor	Number / Month	–	Binci et al., 2006
2	Quantity of Feed	Kg / Month	+	Sharafat, 2012
3	Medicinal Cost	BDT / Month	+	Sharafat, 2012
4	Electricity Cost	BDT / Month	+	Salma, 2014

Source: Authors' Compilation

d) *Factors of Technical Efficiency Assessment*

In this segment with the help of equation 2 authors tried to find out the factors that affect farm-specific TE. The equation is as follows:

$$TE_i = \delta_0 + \delta_i \sum_{i=1}^{n} Z_i + e_i \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Where TE_i reveals efficiency function/total factor productivity, Z_i is the vector of explanatory variables, δ_0 the is intercept term, δ_i is the parameter for i^{th} independent variables and e_i is the error term. Table 3 represents a brief explanation of the vector of explanatory variable Z_i with the literature support. The values of unknown coefficients in equation (1) and (2), that is, β and the δ can be obtained jointly by using the maximum likelihood method (ML). Using equation 3 authors estimated the value of technical efficiency for each of the dairy farms.

$$TE_i = \exp(-U_i) \ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Table No. 3: List of Variables for Technical Inefficiency Assessment

Sl. No.	Variable	Unit of Measurement	Expected Sign	Literature
		Dependent Variable		
1	Milk Production	Liter / Month	NA	Sharafat, 2012
		Independent Variable		
1	Farm Size	No. of Cattle	+	Sharafat, 2012
2	Age of Respondents	Year	+	Masunda & Chiweshe, 2015
3	Educational Status	Year of Schooling	+	Binci el at., 2006.
4	Farming Experience	Farming Age (Year)	+	Sharafat, 2012
5	Household Size	No. of Family Member	+	Todsadee et. al., 2012
6	Off-Farm Income	BDT / Month	+	Jwanya &Gojing, 2014
7	Amount of Credit	BDT / Month	?	Authors' Compilation
8	Training Facility	Dummy (1 = Yes, 0 =No)	+	Salma, 2014
9	Contact with Extension Officer	Dummy (1 = Contact with Extension Officer, 0 = Otherwise)	+	Binci el at., 2006

Source: Authors' Compilation

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IV. Summary Statistics

Milk production depends on various factors like farm size, feed, labor, training, credit facility, socio-economic factors, and others. Table 4 presents the descriptive statistics of the variables used in the stochastic frontier production function estimation. The mean value of milk production is 2836.5 liter per month. The mean farm size is 11 cattle with a minimum farm size of 4 cattle and maximum of 37 cattle. For milk production, the average number of labor is four, where both family and hired labors are included. The average quantity of feed is 10035 kg. The medicinal cost comprises the vitamin cost, veterinary cost, breeding cost etc., and monthly BDT3471 is spend on cows. The farms expend minimum BDT 400 and maximum BDT3000 for electricity purpose. Meanwhile, the average amount incurred for electricity is BDT 700.

Table No. 4: Descriptive Statistics of the Study Variables for Milk Production

Variables	Unit of Measurement	Mean	Std. Dev.	Min.	Max.
Milk Production	Kg	2836.5	1761.88	270	9160
Farm Size	Number	11.44	6.84	4	37
Labor	Number	3.5	1.98	1	10
Quantity of Feed	Kg	10035.26	5456.22	500	26695
Medicinal Cost	BDT	3471.42	2344.02	400	15000
Electricity Cost	BDT	705.85	611.81	200	3000
Age	Year	43.24	9.08	20	65
Education	Year	6.42	3.67	0	17
Household Size	Number	5.14	1.82	3	14
Off-farm Income	BDT	19392.86	15966.65	0	60000
Farming Experience	Year	21.57	6.23	8	35
Amount of Credit	BDT	139500	183836.2	0	800000
Training Facility	Dummy (1=Yes, 0=No)	1.4	0.49	0	1
Contact with Officer	Dummy (1=Yes, 0=No)	1.02	0.16	0	1

N.B.: N= Number of Observation; Std. Dev. = Standard Deviation
Min = Minimum; Max = Maximum.

Source: Authors' Compilation

In Table 4, the average farmer age in the sample is 43 years old. The average year of schooling is six years, and farming experience is 22 years. These data show that most of the producers are middle aged group and experienced. However, they are not well educated, and not hiring enough labor for their farm. The average household size is 5 in number, and the maximum amount of taking a loan is BDT 800000. The average income derived from off-farm activity is BDT 19000. The loan burden indicates that the income of the farmers is not sufficient to meet up their daily needs. Therefore, farmers are taking a higher amount of loans. The average training facility, and contact with the officer are 1.4 and 1.03 percent, respectively.

a) *Explanation of the Estimates of the Cobb-Douglas Stochastic Frontier Model*

Table 5 delineates the parameter estimates of the Cobb-Douglas stochastic frontier model. The estimated output elasticity considering labor, the quantity of feed, medicinal cost, and electricity cost are 0.26, 0.48, 0.21, and -0.03, respectively. These coefficients represent the percentage change in the dependent variable as a result of the percentage change in the independent variables. In the regression analysis the explanatory variables are not multicollinear. Since the mean value of VIF is 1.92 which is less than 4, bears the testimony that the data are not multicollinear. The coefficient of labor is 0.26. It indicates that a 1 percent increase in the number of farm-worker, milk production also increased by 0.26 percent when all other variables are constant. It is statistically significant at 1 percent level. Meanwhile, in Table 5 the coefficient of the quantity of feed is 0.48 which describes that a 1 percent increases in feed quantity, milk production also increased by 0.48 percent holding other things constant. The coefficient of medicinal cost is 0.21, which implies a positive relationship between milk production and medicinal cost. A 1 percent increases in medicinal cost increases milk production by 0.21 percent. It is statistically significant at 5 percent significant level. Variances of one-sided error term $\ln\sigma^2$ u (variance of inefficiency term) and variances of two-sided error term $\ln\sigma^2$ v (variance of stochastic disturbance term) are also statistically significant at 1 percent level. The parameter Lambda (λ) is greater than one. According to Tadesse and Krishnamoorthy (1997) the value of λ more than 1 indicates a good fit for the model.

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Table No. 5: Estimates Cobb-Douglas Production Function

Variables	Coefficient	Standard Err.	t-value
ln labor	0.26***	0.10	2.65
ln Quantity of Feed	0.48***	0.07	6.27
ln Medicinal Cost	0.21**	0.10	2.00
ln Electricity Cost	-0.03	0.06	-0.50
Constant	1.97	0.87	2.25
$\ln\sigma^2$ v	-3.69***	0.89	-4.11
$\ln\sigma^2$ u	-1.23***	0.36	-3.34
$Sigma^2$	0.31	0.09	
Lambda	3.42	0.16	
Likelihood Ratio	2.07		
Log Likelihood Function	-24.60		

*N.B.: ** and *** denote 5% and 1% significance level respectively.*
Source: Authors' Compilation

b) Determinants of Technical Efficiency

Table 6 represents the estimated coefficient for the TE model and suggests several factors to explain total factor productivity. Table 6 shows that if farm size increase by 1 number of cattle, it will lead to an increase in technical efficiency of almost 0.009, and it is significant at a 1 percent level of significance. This increase in TE due to farm size increase is attributable to the economies of scale, which implies as the farm size increases, the per unit production cost reduces. An increase of farm age by one year a decrease in the TE at 0.004, and it is statistically significant at a 10 percent significance level. That is with the increase of farm age by one year, total factor productivity of the farm is decreasing. If the number of credit increases by BDT 1, TE increased by 0.00002, and it is statistically significant at a 10 percent level of significance. The other factors, i.e. off-farm income, education, household size, farming experience, training facility, and contact with the officer are not statistically significant. The value R^2 is 0.31, implying that the explanatory variables can explain 31 percent variation in the dependent variable.

Table No. 6: Technical Efficiency Parameters in Stochastic Frontier Function

Variables	Coefficient	Standard Error	t-value
Farm Size	0.009***	0.003	3.02
Farm Age	-0.004*	0.002	-1.83
Education	0.002	0.005	0.41
Household Size	-0.01	0.013	-0.75
Off-farm Income	0.000001	0.000001	1.36
Farming Experience	-0.0007	0.003	-0.22
Amount of Credit	0.00002*	0.0000001	1.89
Training Facility	-0.04	0.04	-1.20
Contact with officer	-0.13	0.11	-1.11
Constant	0.98	0.18	5.30
N	70		
R^2	0.30		

*N.B.: * and *** denote 10% and 1% significance level respectively, N= Number of Observation*
Source: Authors' Compilation

c) Farm Level Technical Efficiency

Table 7 illustrates the farm level technical efficiency of the dairy farm. The table reveals a wide variation in the level of TE among the farmers. It ranges from 0.00 to 1.00. In this paper, the range of technical efficiency for the dairy firms is from 0.26 (minimum) to 0.95 (maximum). The mean TE score is 0.68; this indicates that an average milk production falls 32 percent short of the maximum possible level. Therefore, with the available set of inputs it is possible to increase the output of dairy farm by average 32 percent in the short run.

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Table No. 7: Distribution of Technical Efficiency

Technical Efficiency	Frequency	Percentage
0.00-0.10	0	0
0.11-0.20	0	0
0.21-0.30	3	4
0.31-0.40	2	3
0.41-0.50	7	10
0.51-0.60	11	16
0.61-0.70	9	13
0.71-0.80	17	24
0.81-0.90	18	26
0.91-1.00	3	4
Total	70	100
Descriptive Statistics	Mean: 0.68 Minimum: 0.26 Maximum: 0.96	

Source: Authors' Compilation

Table 7 shows that the majority of the dairy farms belong to the most efficient category, i.e. 50 percent farms have total factor productivity score ranging from 0.71 to 1.00. However, few are less efficient, which is 17 percent milk production units are at the range of 0.01 to 0.50 total factor productivity score. Although, on average, the technical efficiency of milk production of a dairy farm is satisfactory but none of the dairy farms had TE score 1.00. The TE scores of different dairy farms of the study revel that to improve the firm-level productivity there is huge scope of improvement.

V. Conclusion

Bangladesh is an agro-based country, and most of the rural people are engaged in different agricultural activities. They are involved in this sector as their hereditary business. The analysis of the study area author finds that the average cost of milk production of 70 dairy farms is BDT 93886, and the average revenue of milk production is BDT 95832. The profit figure for this sector is small. It is because of the low milk prices, and high feed prices of cattle. But as a hereditary business, most of the respondents cannot leave it. Some respondents claim that as a low milk price, they want to convert their business from milk-producing cows to beef-producing cows. Because they think that meat-producing cattle business is more profitable than milk-producing cattle business. As a low milk price, profit in this sector is decreasing.

A dominant portion of farms mobilize revenue from milk selling, where a large portion of the cost is spending on feeding. In the production function, three variables are statistically significant. The number of labor and the quantity of feed are significant at a 1 percent level, and the medicinal cost is significant at a 5 percent level of significance. In the case of farm-level efficiency analysis three variables are statistically significant among the seven explanatory variables. Age and amount of credit are significant at the 10 percent level, and farm size is statistically significant at 1 percent level. The mean technical efficiency of a dairy farm is 68 percent, which revealed a wide variation of technical efficiency among the farmers, and it is possible to increase the output of the dairy farms.

If people are educated, they can efficiently use inputs and produce more output. So education is a must for all and people have to engage in the different training programs so that they can train themselves correctly. The government should give different facilities in the dairy sector and ensure the availability of medicine and treatment facilities. Therefore, from the above discussion, it can be concluded that dairy farming is a very important and essential sector for Bangladesh. It helps to boost the economy of a country, increases employment opportunity, and reduces the unemployment problem.

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Global Journal of HUMAN-SOCIAL SCIENCE: E
Economics
Volume 20 Issue 1 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-460x & Print ISSN: 0975-587X

Analyse de la Politique Agricole au Cameroun et Sécurité Alimentaire: Le Rôle de L'agro-Ecologie

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Abstract- The purpose of this paper is to analyze the evolution of agricultural policy in Cameroon in search of food security. Since its independence, Cameroon has experienced four major turning points in its agricultural policy. It appears that today, its so-called "second generation" policy adopts some agro-ecological requirements without, however, respecting its basic principles, including restrictions on chemical inputs and improved seeds. To feed the future generation, the agroecological transition seems inevitable and its success will gradually require substantial investments, the promotion of organic fertilizers and adapted local crops, priority for small family farms, a system of positive discrimination between conventional and agro-ecological agricultural products, and increased support from public authorities.

Keywords: *agricultural policy, agroecology, food security.*

GJHSS-E Classification: *FOR Code: 349999*

ANALYSEDELAPOLITIQUEAGRICOLEAUCAMEROUNETSCURITALIMENTAIRELERLEDELAGROECOLOGIE

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Analyse de la Politique Agricole au Cameroun et Sécurité Alimentaire: Le Rôle de L'agro-Ecologie

Zra Jean [α], Mohammadou Nourou [σ] & Woulkam Bouba [ρ]

Résumé- L'objet de ce papier est d'analyser l'évolution de la politique agricole au Cameroun en quête d'une sécurité alimentaire. Le Cameroun a connu depuis son indépendance quatre grands tournants dans sa politique agricole. Il ressort qu'aujourd'hui, sa politique dite de « seconde génération » adopte quelques exigences de l'agro-écologie sans toutefois respecter ses principes de base, dont les restrictions aux intrants chimiques et aux semences améliorées. Pour nourrir la future génération, la transition agro-écologique parait inévitable et sa réussite passera progressivement par des investissements conséquents, la promotion des engrais organiques et des cultures locales adaptées, la priorité aux petites exploitations familiales, un système de discrimination positive entre les produits agricoles conventionnels et ceux agro-écologiques, et un accompagnement accru des pouvoirs publics.

Motsclés: *politique agricole, agro-écologie, sécurité alimentaire.*

Abstract- The purpose of this paper is to analyze the evolution of agricultural policy in Cameroon in search of food security. Since its independence, Cameroon has experienced four major turning points in its agricultural policy. It appears that today, its so-called "second generation" policy adopts some agro-ecological requirements without, however, respecting its basic principles, including restrictions on chemical inputs and improved seeds. To feed the future generation, the agro-ecological transition seems inevitable and its success will gradually require substantial investments, the promotion of organic fertilizers and adapted local crops, priority for small family farms, a system of positive discrimination between conventional and agro-ecological agricultural products, and increased support from public authorities.

Keywords: *agricultural policy, agroecology, food security.*

I. Introduction

L'échec de la révolution verte, de par ses répercussions environnementales et sanitaires, a conduit les chercheurs, la communauté internationale et tous les dirigeants du monde à repenser un autre modèle, l'agro-écologie, qui pollue le moins possible et permet d'assurer une sécurité alimentaire (Altieri et Nicholis, 2005; De Schutter, 2010).

Bien plus, la récente crise alimentaire de 2007-2008 a fini par ébranler la conscience d'une communauté internationale assoupie dans sa croyance en une économie mondiale saine, la contraignant à remettre la problématique de la faim au centre de ses préoccupations et à réviser ses stratégies en matière de développement agricole (Schmitz et al. 2017; Schmitz, 2018). Le Cameron n'est pas exclu de ce débat quant à la rupture dans le modèle agricole dans une perspective d'assurer la sécurité alimentaire de sa population.

La sécurité alimentaire est un concept dynamique aux déterminants et définitions multiples (Hoddinott, 1999)[1]. La définition complète et consensuelle aujourd'hui est celle du Comité de la Sécurité Alimentaire Mondiale, la sécurité alimentaire existe lorsque tous les êtres humains ont, à tout moment, un accès physique, social et économique à une nourriture suffisante, saine et nutritive leur permettant de satisfaire leurs besoins énergétiques et leurs préférences alimentaires pour mener une vie saine et active (CSA, 2009)[2]. Ainsi, ressortent les quatre piliers de la sécurité alimentaire: la disponibilité, l'accès, l'utilisation et la stabilité.

Bien que les statistiques en matière de sécurité alimentaire au niveau mondiale ne soient pas trop inquiétantes, ce n'est pas le cas en Afrique qui concentre à elle seule presque la moitié des sous-alimentés dans le monde.[3] Au Cameroun, près de 10% de sa population est touchée par l'insécurité alimentaire. Les statistiques révèlent que c'est la région de l'Extrême-Nord qui est la plus touchée avec 35, 5%, suivi de la région d'Adamaoua avec 18, 7% et la région du Nord avec 10% (PNSA, 2017)[4].

Caractériser la politique agricole semble un exercice très difficile. En effet, il faut tenir compte de plusieurs contextes (Pouch, 2002). Tout en prenant acte de cette complexité, on se contentera ici de reprendre la définition qui fait le plus largement consensus et qui associe la politique agricole à un ensemble de mesures

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[1] Déjà en 1999, un examen des indicateurs disponibles de sécurité alimentaire par Hoddinott énumérait jusqu'à 200 définitions et 450 indicateurs différents et ceux-ci ont très probablement augmenté depuis lors.
[2] Comité de la Sécurité Alimentaire mondiale, 2009, Réforme du Comité de la sécurité alimentaire mondiale, Version finale. CFS 35: 2009/2 Rev. 2.
[3] Pour plus de détails, voir les rapports: FAO et al, 2017 et ONU, 2019.
[4] Programme National de Sécurité Alimentaire(PNSA), Evaluation de la sécurité alimentaire dans les régions de l'Est, Adamaoua, Nord et Extrême-Nord, 2017.

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dirigées vers le secteur agricole. Plus précisément, une politique agricole est « un ensemble de mesures réglementaires, dispositifs structurels, moyens financiers et humains interdépendants, mis en œuvre par la puissance publique pour contribuer à la progression du secteur agricole » (Ribier, 2008)[5].

L'élaboration d'une politique agricole dépend du contexte historique, en fonction des idées dominantes du moment. On a connu au Cameroun, quatre grands changements de politique agricole depuis son indépendance. Il s'agit des Plans quinquennaux de développement (1960-1986), de la nouvelle politique agricole (1990 - 1998), de la Politique Agricole - Nouveaux Défis (1999-2013) et de la Politique dite de deuxième génération (A partir de 2014). L'agro-écologie étant la prescription actuelle de la plupart des agroéconomistes et de la communauté internationale, l'on examinera la prise compte des exigences de ce modèle dans politique agricole actuelle au Cameroun.

L'agro-écologie est à la fois une science et un ensemble de pratiques (Altieri, 1995)[6]. Elle résulte de la fusion de deux disciplines scientifiques, l'agronomie et l'écologie. Elle renvoie à l'ensemble des méthodes et techniques agricoles (agroforesterie, agriculture de conservation, polycultures, contrôle biologique des parasites, etc.) qui permettent d'optimiser les systèmes agricoles en imitant les « processus naturels », en réduisant de manière drastique les apports externes et en préservant les processus créant ainsi des interactions et synergies biologiques bénéfiques entre les composantes de l'agroécosystème (Gliessman, 1998).

Malgré la prise de conscience des effets néfastes du modèle prédominant (agro-productiviste) et le souci de nourrir la future génération, l'une des inquiétudes majeures des décideurs du monde agricole tient aux conséquences de la transition agro-écologique. Il faut reconnaitre le succès spectaculaire qu'avait eu le modèle conventionnel en Amérique latine et en Asie. Cependant, la révolution verte est loin d'avoir eu des impacts comparables en termes de sécurité alimentaire en Afrique subsaharienne à ceux observés dans ces continents. Ce qui pose le problème de l'application d'un modèle universel à toutes les économies du monde.

Le modèle à privilégier pour accroître la production tout en limitant les effets néfastes des activités agricoles sur l'environnement et la garantie d'une sécurité alimentaire dans les pays du Sud qui sont confrontés à des multiples risques agricoles et sécuritaires, est l'un des défis à relever aujourd'hui. Ainsi, une plus grande orientation agro-écologique de la politique agricole pourrait-elle permettre d'évoluer plus rapidement vers la sécurité alimentaire ? Dans ce sens, s'il s'agit du modèle alternatif, il parait nécessaire de déterminer ce que le pays gagnerait et ce qu'il perdrait en mettant en œuvre les pratiques agro-écologiques. C'est ce qui résulterait de cette balance qui pourra intéresser sans doute les décideurs politiques mondiaux en général, et camerounais en particulier.

II. Une Evolution Dynamique de la Politique Agricole au Cameroun à la Recherche D'une Sécurité Alimentaire: une Politique Agro-écologique ?

Tout comme un pays peut changer des lois pour tenir compte des exigences socio-politiques du moment, il pourra faire de même en changeant son modèle de développement pour tenir compte des exigences économiques et environnementales. C'est ainsi que l'on observe une série de politique agricole au Cameroun depuis son accession à l'indépendance (Voir Tableau 1).

En outre, l'évolution du concept de sécurité alimentaire peut expliquer celle de la politique agricole dans le monde. En effet, ce concept a connu une évolution notable, passant d'une définition largement focalisée sur la disponibilité de la nourriture en quantité suffisante à un niveau macroéconomique, à une définition plus microéconomique et qualitative prenant en compte le caractère multidimensionnel de la sécurité alimentaire.

[5] Définition de la politique agricole selon Ribier V. (2008), dans « L'agriculture en quête de politiques », Grain de sel, n°41-42, p 7-8

[6] Miguel Altieri (1995, un des pionniers de cette discipline, propose « L'agro-écologie est la science de la gestion des ressources naturelles au bénéfice des plus démunis confrontés à un environnement défavorable »

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Tableau 1: Récapitulatif de la politique agricole au Cameroun depuis son indépendance

Politique agricole	Objectifs
Plans quinquennaux de développement (1960-1986)	Amélioration du niveau de vie de la population des zones rurales, Accroissement de la production et de la productivité agricole, Augmentation du revenu réel par habitant.
Nouvelle politique agricole (1990 - 1998)	Modernisation de l'appareil de production; Maîtrise de la sécurité alimentaire; Promotion et la diversification des exportations; Développement de la transformation des produits agricoles; Équilibre des filières de production
Politique Agricole - Nouveaux Défis (1999-2013)	Consolidation du secteur agricole, Promotion de l'organisation professionnelle et interprofessionnelle, Amélioration de la sécurité alimentaire
Politique dite de deuxième génération (A partir de 2014)	Développement des filières de production l'amélioration de la sécurité alimentaire et nutritionnelle, Modernisation des infrastructures de production du monde rural et l'amélioration des mécanismes d'accès aux financements, Gestion et la valorisation durable des ressources naturelles.

Source: Compilation des auteurs.

Durant les plans quinquennaux de développement (1960-1986), on note une prépondérance de l'État dans le déroulement de l'activité économique. Au total six plans quinquennaux ont été mis en œuvre dont cinq sont arrivés à terme, le sixième ayant été interrompu par la crise économique du milieu des années 1980.

Toutefois, malgré le maintien de l'autosuffisance alimentaire, les potentialités de production sont restées sous-exploitées et la part des cultures vivrières sur le marché des exportations insignifiante. La chute brutale du cours des matières premières dans les années 1987 a débouché sur l'application du Programme d'Ajustement Structurel (PAS) sous l'égide des bailleurs de fonds internationaux. Ainsi, il s'agissait donc pour l'État de s'orienter vers une nouvelle politique agricole mieux adaptée aux exigences du contexte libéral.

L'État, sous l'égide des bailleurs de fonds a décidé de se désengager des activités liées à la production en général et de recadrer son action sur ses fonctions régaliennes et les missions de service public. C'est la fin de la planification et le début du libéralisme. Ainsi, l'une des mesures phare est l'arrêt des subventions aux intrants chimiques, d'où la diminution de leurs quantités dans les années 1990 (Voir figure 1).

La nouvelle politique agricole (1990 - 1998) était axée en priorité sur la consolidation des acquis tant sur le plan de l'autosuffisance alimentaire que sur celui des recettes d'exportation et une amélioration significative des performances par le biais d'options nouvelles.

La stratégie de mise en œuvre de cette politique reposait sur une meilleure valorisation du potentiel de production et des possibilités de commercialisation existantes. À cet effet, cinq objectifs prioritaires avaient été retenus: la modernisation de l'appareil de production; la maîtrise de la sécurité alimentaire; la promotion et la diversification des exportations; le développement de la transformation des produits agricoles; l'équilibre des filières de production.

Toutefois, la situation sociale est restée préoccupante, marquée par des conditions de vie toujours précaires dans les campagnes, une émigration rurale forte et une aggravation du chômage. De nouveaux défis interpellaient alors le secteur rural.

La nouvelle politique agricole a été révisée en mai 1999, dans un document cadre intitulé « Politique Agricole - Nouveaux Défis ». À partir de l'an 2000 de nouveaux défis se présentent donc et il faut à tout prix les relever.

La Politique Agricole - Nouveaux Défis (1999-2013) avait pour objectifs: Tout d'abord, la consolidation du secteur agricole comme moteur du développement économique et social du pays. Ensuite, la promotion de l'organisation professionnelle et interprofessionnelle des différents opérateurs économiques qui doivent constituer les principaux acteurs du développement de l'agriculture. Enfin, L'amélioration de la sécurité alimentaire des populations grâce à l'augmentation des productions et de l'ensemble des revenus.

La politique agricole actuelle mise en œuvre au Cameroun est une politique dite de deuxième génération, le Gouvernement entend mettre en œuvre un vaste programme d'accroissement de la production agricole en vue de satisfaire non seulement les besoins alimentaires des populations, mais également des agro-industries.

Quatre domaines thématiques prioritaires ont été définis et qui seront développés à travers la formulation du Plan National d'Investissement Agricole (PNIA): Premièrement, le développement des filières de production (végétales, animales, halieutiques et forestières) et l'amélioration de la sécurité alimentaire et nutritionnelle; Deuxièmement, la modernisation des infrastructures de production du monde rural et l'amélioration des mécanismes d'accès aux financements; Troisièmement, la gestion et la valorisation durable des ressources naturelles; Enfin le renforcement des capacités des acteurs du

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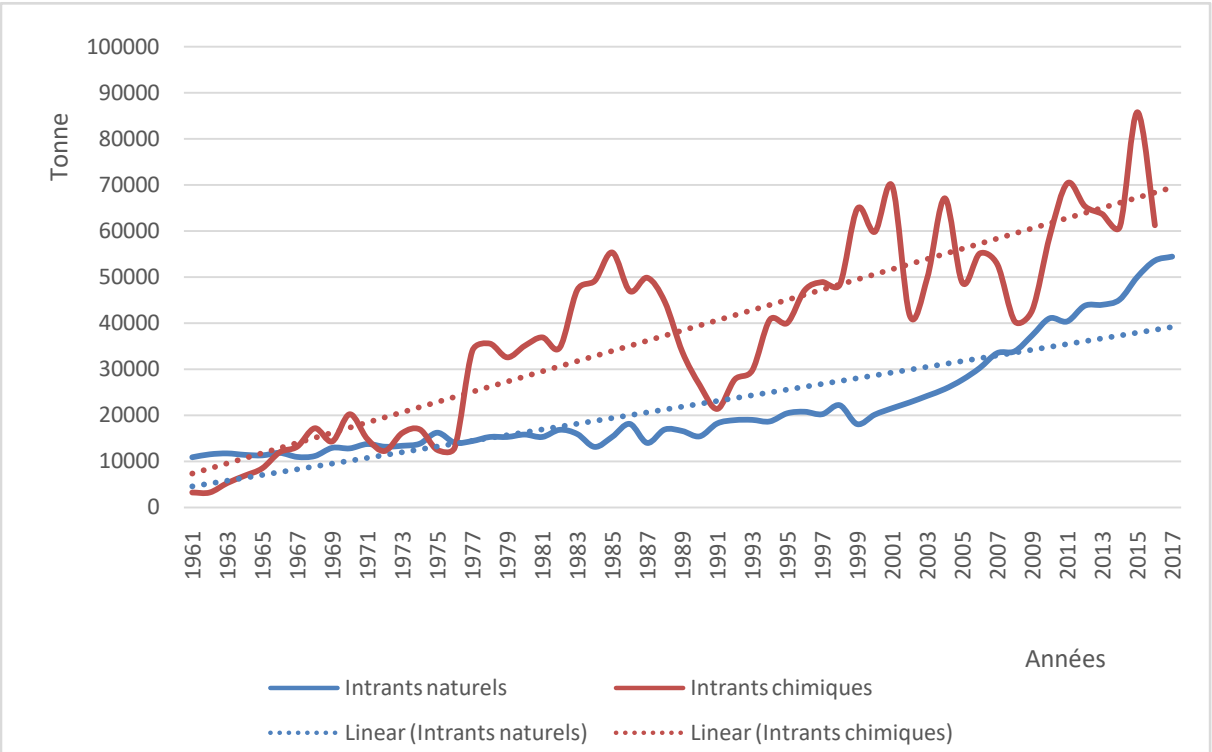
développement rural et la promotion de la concertation (Gouvernance et développement institutionnel).

Les instruments qu'utilise le Cameroun pour la mise en œuvre de cette nouvelle politique regroupent la facilitation de l'accès aux intrants agricoles (fertilisants, semences améliorées et produits phytosanitaires), aux machineries agricoles (tracteurs, matériels agricoles, etc.), la facilitation d'accès aux financements, la promotion des innovations technologiques à travers le renforcement de la liaison recherche/vulgarisation et le conseil des agriculteurs, et le développement des infrastructures du monde rural (infrastructures de transport et d'irrigation).

Pour rapprocher la politique agricole au Cameroun à celle agro-écologique, il est indispensable de dégager les principes de l'agro-écologie. En effet, ces principes prennent l'exact contre-pied de ceux qui fondent le modèle agro-productiviste. Au nombre de ces principes, notons entre autres l'agroforesterie dont le recyclage des éléments nutritifs et de l'énergie sur place plutôt que l'utilisation d'intrants chimiques, la lutte intégrée contre les parasites au lieu des pesticides, l'intégration des cultures et de l'élevage, la diversification des espèces et des ressources génétiques des agro écosystèmes dans l'espace et le temps, le compostage et l'apport d'engrais verts (Altieri et Nicholls, 2012).

La figure suivante nous aidera à déterminer la nature de la politique agricole appliquée au Cameroun. Elle retrace l'évolution des quantités utilisées des intrants agricoles (naturels et chimiques)[7] depuis 1961. Les intrants naturels comprennent les fumiers organiques dont les excréments d'animaux (bovins, ovins et autres) et les résidus de culture (Maïs, sorgho, riz, soja et blé) appliqués aux sols. Les intrants chimiques renferment les engrais chimiques (engrais NPK), les pesticides, les insecticides et des herbicides utilisés dans la production agricole.



Source: Auteurs à partir de la compilation des données de FAO (FAOSTAT, 2019).

Figure 1: Évolution des quantités des intrants agricoles utilisés au Cameroun

Depuis l'indépendance du Cameroun, l'utilisation des intrants chimiques n'a cessé d'augmenter atteignant un pic d'environ 85 mille tonnes en 2016 malgré une baisse observée dans les années 1990 à cause du PAS. Avant cette date, l'utilisation des intrants naturels est restée inférieure à 20 mille tonnes pour reprendre depuis lors.

pour les intrants chimiques et le modèle agro-écologique qui reste favorable aux intrants naturels.

À l'observation des deux courbes de tendance linéaire, elles ont une évolution ascendante et divergente; le trend des intrants chimiques étant au-dessus de celui des intrants naturels. Ce qui signifie que, les restrictions quant à l'utilisation des intrants chimiques; principes de base de l'agro-écologie, ne

[7] La nature des intrants agricoles est l'objet principal des débats entre le modèle agro-productiviste qui milite

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semblent pas être pris en compte dans les politiques agricoles au Cameroun.

En outre, le premier croisement des deux courbes dans les années 1965 signifie qu'avant cette date, l'utilisation des intrants naturels était plus accrue que ceux d'ordre chimiques (ce qui est normale puisque les principes de la révolution verte ont tardé à s'appliquer en Afrique). En fait, les principes de l'agro-écologie ne sont pas une nouveauté en Afrique (Scholle, 2015). Les paysanneries ont toujours intégré dans leurs objectifs celui de reproduction du potentiel productif des écosystèmes cultivés. Il s'agissait des rotations de cultures, utilisation de légumineuses, intégration d'arbres dans les écosystèmes cultivés (agroforesterie), intégration entre agriculture et élevage, techniques de lutte biologique, dispositifs antiérosifs, etc. Mais avec le développement de la révolution verte au Cameroun, certaines de ces pratiques ont régressé, voire sont perdues.

Il est important de relever queles pratiques agro-écologiques nécessitent une offre de biens publics tels que services de vulgarisation, installations de stockage et infrastructures rurales (routes, électricité, technologies de l'information et de la communication) et donc l'accès aux marchés locaux, au crédit, la recherche-développement dans le domaine agricole, l'éducation et le soutien aux organisations et coopératives d'agriculteurs (De Schutter, 2010). Vu les instruments qu'utilise le Cameroun, comme décrits ci-dessus dans sa politique de seconde génération, il est clair qu'il œuvre dans certaines offres de biens publics à travers les différents programmes et projets[7] telles que voulues par le modèle agro-écologique. Pour l'essentiel, le basculement vers ce modèle passe par une parfaite connaissance de ses enjeux.

III. Le Rôle de L'agro-écologie Dans la Sécurité Alimentaire: Un Modèle Aux Conséquences Variable Set Aux Contraintes Multiples.

À la question de savoir si l'agro-écologie est une meilleure solution pour nourrir la future génération, la réponse parait nuancée. Bien qu'elle réponde aux différents critères de la sécurité alimentaire, son caractère marginal crée de doute quant à sa capacité à nourrir les générations présente et future.

Sur le long terme, les pratiques agro-écologiques garantiraient des rendements supérieurs aux pratiques conventionnelles, et ceci quel que soit le sous-secteur (Herren*dir.* 2011)[8].

En effet, l'agro-écologie accroît la productivité agricole grâce à l'agroforesterie, la diversité des cultures, bétail, pollinisateurs, insectes, poisson, organismes du sol et autres éléments à l'intérieur ou autour des systèmes de production (Pretty, 2008).

En matière d'accès à l'alimentation, l'agro-écologie serait capable d'augmenter les revenus et donc le pouvoir d'achat. D'une part en augmentant les rendements; d'autre part, et c'est l'un des points principaux de l'argumentation, en réduisant, voire en supprimant, le recours aux intrants chimiques (Li Ching, 2008) qui sont extrêmement coûteux en Afrique Subsaharienne et dont le prix risque de suivre la courbe ascendante de celui des énergies fossiles. Cette réduction du recours aux intrants chimiques permet également de réduire les externalités négatives, à la fois en termes d'impact sur l'environnement, sur la santé humaine et de rendre les petits exploitants vulnérables moins dépendants des commerçants locaux et des prêteurs.

Durant le moment de la pure révolution verte, les pratiques de l'agriculture conventionnelle visaient principalement à améliorer les récoltes de céréales. La simplification des systèmes agricoles, avec le développement des monocultures et la focalisation sur quatre ou cinq grandes cultures, s'est ainsi traduite par une simplification du régime alimentaire, notamment pour les individus les plus pauvres (Purushotaman, 2011)[9]. Le passage de systèmes de cultures diversifiées à des systèmes simplifiés basés sur les céréales (le riz, le blé et le maïs) a ainsi contribué à une déficience en micronutriments dans de nombreux pays en développement (Demment et al, 2003).

L'agro-écologie vise la mise en place de systèmes agricoles résilients permettant ainsi la stabilité alimentaire. D'une part, face à la volatilité des prix, diversifier la production permet de réduire les fluctuations de revenus des petits agriculteurs. En effet, si les rendements d'une variété sont moins importants ou si le prix d'un produit est faible, la diversification permet, à la différence de la monoculture, de réduire la vulnérabilité des producteurs.

D'autre part, l'agro-écologie repose sur des cultures locales adaptées, et permet ainsi une meilleure résilience face aux contraintes climatiques se traduisant par l'augmentation du nombre d'événements météorologiques extrêmes et aux ravageurs locaux; face aux variations climatiques (hausse des températures, variation de la pluviométrie, etc.) et aux chocs environnementaux (sécheresses, inondations, etc.)

[8] Il s'agit principalement des programmes et projets suivants: ACEFA, PIDMA, PASGIRAP, PADMIR, PNVRA/PROSAPVA et PADFA.

[9] HERREN, H. (dir.), (2011). Agriculture, Investing in Natural Capital. Dans PNUE, *Towards a Green Economy Report. Pathways to Sustainable Development and Poverty Eradication* (pp. 31-77). Arendal: PNUE; GRID-Arendal.

[10] PURUSHOTAMAN, S. (2012) Repenser l'agriculture en Inde après la Révolution verte, in Jacquet, P., Pachauri, R., Tubiana, L. (dir), *Regards sur la Terre 2012: Développement, alimentation, environnement: changer l'agriculture ?,* Armand Colin, p 257-259

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Bien qu'il y ait, aujourd'hui, un large consensus au tour du modèle agro-écologique, son application reste encore marginale à cause des nombreuses difficultés causant le scepticisme des acteurs du développement. D'après Scholle (2015)[10], la transition vers des systèmes agro-écologiques est loin d'être aisée. Leur adoption et leur application par les agriculteurs se heurtent aux difficultés suivantes de différents ordres, en termes d'appréhension des risques, de temporalité, de sécurité foncière et d'investissement.

L'inévitable baisse des rendements à court terme lors de la phase de reconversion de l'agriculture conventionnelle vers l'agro-écologie est le principal problème qui inquiète ces acteurs aujourd'hui. Par exemple, il faut plusieurs années avant que la fertilité des sols ne soit régénérée suite à l'abandon des engrais chimiques. Imaginons que les agriculteurs sont dans une situation de précarité économique et sociale et doivent faire face à des priorités immédiates, ce qui en est le cas en Afrique, les paysans prendront difficilement de tels risques de diminution des volumes de production même pendant une période relativement courte.

Les investissements agro-écologiques peuvent difficilement être mis en œuvre, si les agriculteurs ne sont pas certains de bénéficier des résultats. Comment peut-on investir dans une parcelle, en luttant par différentes formes contre l'érosion, si potentiellement tu ne peux la cultiver qu'un an ? Dans des régions d'Afrique densément peuplées, les paysans savent que le propriétaire de leur parcelle louée pourrait la récupérer s'il se rend compte que la fertilité a été notablement améliorée.

Le scepticisme peut également s'expliquer par le fait que les bailleurs préfèrent adopter une stratégie de prudence, conservatrice, qui consiste globalement à adapter un modèle conventionnel, qui a fait ses preuves en termes de productivité par le passé, plutôt que d'effectuer une rupture par rapport à ce dernier. De leur côté, les États semblent considérer le système conventionnel comme un idéal de développement, sans prendre en compte les interrogations soulevés par ces modèles (impacts sur l'environnement, sur la santé humaine, sur l'emploi, sur les finances publiques, etc.).

En outre, l'agro-écologie est souvent associée à des besoins de main-d'œuvre plus importants que dans l'agriculture conventionnelle (Pimentel et al., 2005). L'on doit ramasser de la fumure organique, la faire décomposer, transporter aux champs, il faut trouver des plantes qui agissent comme bio-pesticides. Il faut par exemple plusieurs charrettes de fumure organique décomposée pour un hectare de terres. Alors qu'il vous suffit d'acheter et de transporter un sac d'engrais en agriculture chimique. La transition agro-écologique devient alors illusoire, d'autant qu'elle implique des investissements initiaux importants (y compris en travail) et présente un risque aux yeux des agriculteurs.

Pour faire face à cet obstacle de main d'œuvre, il est tout aussi normal et souhaité que les produits agricoles qui en seront issus soient positivement discriminés tant au niveau de leur reconnaissance physique qu'au niveau de leurs prix sur le marché. Ceci appelle notamment l'intervention de l'État et des Organisations Non Gouvernementales pour un accompagnement efficace des producteurs qui se lanceraient dans l'agro-écologie.

La situation actuellement vécue qui fait confondre sur le marché les produits agricoles conventionnels et les produits agricoles écologiques est défavorable aux producteurs écologiques, car les seconds sont plus coûteux en travail que les premiers, même s'ils sont de qualité sanitaire meilleure. La non différentiation des prix sur les marchés pour les produits agricoles, quelle que soit la forme d'agriculture qui les a générés, ne peut motiver les producteurs à aller à l'agro-écologie.

Si la maximisation du revenu monétaire est primordiale chez l'exploitant orientée sur l'agriculture commerciale, la minimisation des risques doit être privilégiée dans l'exploitation familiale, surtout chez les petits exploitants. Cette minimisation des risques est traduite notamment à travers la diversification de cultures[11] ; ce qui est déjà un pas vers l'agro-écologie. En plus, les petites exploitations sont plus prédisposées à aller à l'agro-écologie, vu qu'elles ont d'ailleurs peu de moyens pour acheter une quantité de plus en plus grande d'intrants externes.

IV. Conclusion

Depuis son indépendance, le gouvernement camerounais ne cesse de changer ses actions dirigées vers le secteur agricole dans une perspective de répondre aux exigences sociétales. Il a connu des périodes des plans quinquennaux de développement (1960-1986) jusqu'à la politique dite de « deuxième génération » mise en place depuis 2014 dont les objectifs spécifiques sont entre autres le développement des filières de production et amélioration de la sécurité alimentaire et nutritionnelle, la modernisation des infrastructures de production du monde rural et l'amélioration de l'accès au financement.

Bien que le Cameroun œuvre dans l'offre des biens publics tels que les services de vulgarisation,

[11] Scholle, J., (2015), Pratiques agro écologiques et agro forestières en zone tropicale humide, Guide technique, Edition du GRET, 308 p.

[12] Il s'agit d'organiser un portefeuille d'activités agricoles ou de procédures qui permettent des compensations de pertes et de bénéfices. Le dicton populaire « ne pas mettre tous ses œufs dans le même panier » illustre d'ailleurs parfaitement la méthode de diversification.

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installations de stockage et infrastructures rurales et donc l'accès aux marchés locaux etc., il semble être sceptique quant aux respects des principes de base de l'agro-écologie. Il s'agit pour l'essentiel des restrictions aux intrants chimiques et aux semences améliorées qu'il ignore dans sa politique actuelle. Toute chose qui conduit à affirmer que le Cameroun est, en partie, encore attaché au modèle agro-productiviste. Et pourtant les avantages en termes de sécurité alimentaire, du moins à long terme, en faveur du modèle alternatif dit « agro-écologie »pèseraient plus que les inconvénients.

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Global Journal of HUMAN-SOCIAL SCIENCE: E Economics
Volume 20 Issue 1 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-460x & Print ISSN: 0975-587X

Impact of Microcredit Program of BRAC on Poverty Alleviation: A Case Study of Jhenaidah District in Bangladesh

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Abstract- This main purpose of this study is to examine the role of conventional microcredit for poverty alleviation. Bangladesh Government and Non-Government Organizations (NGOs) have been trying to alleviate poverty of its people. NGOs provide microcredit to poor people to enhance their income and improve the living levels. The study reveals that microcredit programs have generated positive results for large numbers of the poor. Micro-credit has significant impacts on income, savings and expenditure levels of the household. The poor are not homogeneous, so impact varies significantly among different segments of the population according to their socio-economic status, gender, background, family composition and others. The analysis shows that in general, the microcredit is an instrument that can help to accumulate savings and income and finally assist to alleviate poverty. But still it is not only the instrument that can alleviate poverty but it is the vital component that can help to the poor people for standard living levels. Our analysis shows that after taking loan there is a significant change in the respondents' income savings and expenditures.

Keywords: *poverty, microcredit, poverty alleviation.*

GJHSS-E Classification: *FOR Code: 149999*



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Keywords: poverty, microcredit, poverty alleviation.

I. Introduction

a) Poverty

Poverty is a multi-dimensional phenomenon related to the inadequacy or lack of social, economic, cultural, and political entitlements (Momoh 2005). Poverty is a multidimensional phenomenon that has different meaning for different people. Poverty can be viewed as absolute or relative, as a lack of income or failure to attain capabilities. It can be chronic or temporary, is sometimes closely associated with inequality and is often correlated with vulnerabilities, underdevelopment and economic exclusion Poverty is as an inability to afford the minimum standard of living. According to UNDP (2006), a person living under one dollar per day is considered to be living under the poverty line. In economic terms a country, region or household are poor when the per capita income of a country or the income of a household is very low. In political terms a country a region or a group of people are poor which are dependent on more powerful groups or individuals in order to express their own rights or choices. Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty is losing a child to illness brought about by unclean water. Poverty is powerlessness, lack of representation and freedom (World Bank - 2000).

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b) Microcredit

Microcredit programs extend small loans to the very poor people for self employment projects that generate income, allowing them to care for themselves and their families. Microcredit also called "microfinance" and "micro lending" means providing small working capital loans to the self-employed people. Even small amounts of capital can make the difference between absolute poverty and a thriving little business generating enough income to feed the family, send kids to school, and build decent housing. Micro-credit refers to programs that are poverty focused and that provide financial and business services to the very poor people for generation of self-employment and income. Credit is a powerful instrument to fight against poverty. The role of micro-credit in reducing poverty is now well recognized all over the world. Governments, donors, development agencies, banks, universities, consultants, philanthropists and others have increasing interest in it. The universal objective of microfinance is to make it possible for large numbers of low-income people to access institutional financial services, hence the potential benefits of microfinance has accounted for its widespread adoption as an economic development, job creation and poverty reduction strategy. There is an on-going debate whether credit alone or credit plus is needed for poverty reduction. There are views that credit alone on its own is inadequate to fight against poverty. The need for other services is also important in this respect. Such views, although, do not negate the role of credit; fail to appreciate the role of credit on its own merit.

II. Objectives of the Study

The basic objective of this study is to analyze the impact of microcredit on household savings. For that the specific objectives are:

- To assess the impact of microcredit programs on poverty alleviation.

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- To identify the socio-economic and demographic factors that affect household poverty status.
- To evaluate whether the microcredit programs are effective in accumulating savings of the participating households.

III. Research Methodology

a) Data Collection and Sampling Techniques

The present study is based on primary data that have been collected by the researcher from *Jhenaidah* district of Bangladesh through questionnaire during January 2019 to June 2019 for the purpose of our analysis. A well-organized questionnaire is prepared for data collection. Our study draws the sample data and information from BRAC. The survey has been conducted with great care which covers different socio-economic information of 400 microcredit borrower. The selection of the respondents has been made using the multistage simple random sampling procedure. At the first stage, two out of six *upazilas* under *Jhenaidah* district are selected using simple random sampling method. The *upazilas* are *Sailokupa and Kaligonj*. There are 6 and 11*unions* under *Sailokupa* and *Kaligonj upazilas,*[i] respectively. At the second stage, using random sampling technique, from each *upazila* two *unions* are chosen which are Nittanondopur and Abaipur of *Sailokupa upazila* and Triechandpur and Rakhalgachi of *Kaligonj upazila*. At the third stage, two villages under each union are selected using random sampling technique. Finally, lists of respondents of the selected villages are collected from the *upazila* BRAC office.

The sample size of the respondents was determined by using the formula (Guilford and Fruchter, 1978): $N = \frac{Z^2 pq}{d^2}$

Where, N = Minimum sample size, Z = 1.96 which corresponds to the 95% confidence level, p = Prevalence of 1% (0.01), q = 1-P = 0.99, d = precision level 1% (0.01) and $N = \frac{1.96^2 \times 0.01 \times 0.99}{0.01^2} = 380$

When adjusted for a non-responders rate of 10%, N is 418. Hence, a sample of 418 respondents separately from the above mentioned financial institution was selected. Therefore 418 questionnaires were prepared and distributed randomly to the respondents, of which 400 filled-in questionnaires were returned.

b) Techniques of Data Processing and Analysis

The basic objective of this study is to analyze the impact of microcredit on savings of respondents after taking loan from BRAC that I have mentioned in the above points.

To analyze this, I have adapted the multiple linear regression models for regression analysis and I have analyzed independent samples test to compare respondent's savings level before and after taking loan. On the other hand, I have also analyzed frequency distribution of the respondents according to age, education, gender, number and earners in the household, occupation, size and residential status was presented in Tables and discussed in the paper. Computer software mainly SPSS version 20 are applied to analyze the data. Corrected standard errors are used to allow for heteroscedasticity.

Model specification:

Thus the multiple linear regression models were used and written as follows:

$$Savings\ (S) = \alpha + \beta_1(AR) + \beta_2(EAR) + \beta_3(DHR) + \beta_4(TYR) + \beta_5(OR) + \beta_6(TExpR) + \beta_7(ER) + \beta_8(SH) + \beta_9(RSH) + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots \text{ i}$$

Where the independent variables are:

- AR = Age of the respondent
- ER= Education of the respondent
- GR= Gender of the respondent
- EAR= Number of earners in the household
- DHR= Number of dependents in the household
- AL=.The amount of loan.
- TYR= Total income of the respondent
- OR= Occupation of the respondent
- TExpR=Total expenditure of the respondent
- SH=Size of the household
- RSH=Residential status of the household
- And the dependent variable is:
- Total savings of the respondent (TSR)

c) Reliability and Validity Test

The reliability value of our surveyed data was 0.835 for variables. If we compare our reliability value with the standard value of 0.6 as recommended by Bagozzi and Yi's (1988), we find that the scale used by us are sufficient reliable for data analysis.

IV. Analysis of Findings

a) Sample Characteristics

Table- 1,2,3,4,5,6,7 summarizes the respondent's socio-economic and demographic characteristics according to their age, gender, and educational background, number of earners and

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dependents of households, occupation, residential status and family size. A number of researches in the region have found that those factors had significant impact on the respondents borrowing and standard living levels. The respondents' profile is discussed in the following sub sections.

Table 1: Age group of the Respondents

Age in Years		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 thru 30	264	66.0	66.0	66.0
	31 thru 40	69	17.3	17.3	83.3
	41 thru 50	44	11.0	11.0	94.3
	51 thru highest	23	5.8	5.8	100.0
	Total	400	100.0	100.0	

Source: Author's Field-work (2018)

Table 1 shows that the most of the respondents belong to the mid-age group (20-30 years) which is 66%. Average age of respondent in the study is 30.84 years with maximum age of 52 years and a minimum of 21 years. With an increase in the age of the respondent the probability being poor will fall as a result the savings of the respondent increases.

Table 2: Gender of the Respondents

Gender		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	97	24.3	24.3	24.3
	Female	303	75.8	75.8	100.0
	Total	400	100.0	100.0	

Source: Author's Field-work (2018)

Table 2 shows the gender distribution of the respondents. Field survey indicates that most of the microcredit borrowers are female (75.8%) and male borrower is 24.3%.

Table 3: Marital Status of the Respondents

Marital Status		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	34	8.5	8.5	8.5
	Married	334	83.5	83.5	92.0
	Divorced	32	8.0	8.0	100.0
	Total	400	100.0	100.0	

Source: Author's Field-work (2018)

Overwhelming majority of the respondents is married. Table 3 shows that the married respondents are 83.5%. It is assumed the marital status of microcredit borrower is the quite a reflection of our societal and cultural ideology and values.

Table 4: Residential status of the Respondents

Residential Status		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Urban	28	7.0	7.0	7.0
	Semi Urban	200	50.0	50.0	57.0
	Rural	172	43.0	43.0	100.0
	Total	400	100.0	100.0	

Source: Author's Field-work (2018)

Table 4 shows that maximum respondent live in semi urban area which is 50.0 % and in rural areas it is 43.0%. It indicates that most of the borrowers are in rural region.

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Table 5: Educational status of the Respondents

Educational Status		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sign Only	55	13.8	13.8	13.8
	Primary	124	31.0	31.0	44.8
	Secondary	132	33.0	33.0	77.8
	Higher Secondary	67	16.8	16.8	94.5
	Graduate	22	5.5	5.5	100.0
	Total	400	100.0	100.0	

Source: Author's Field-work (2018)

Table 5 shows that most of the respondents are educated and among them 33.0 % are completed secondary school certificate (SSC) where 5.5 % are graduate and 13.8% are capable to sign only.

Table 6: Occupational status of the Respondents

Occupation		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Day Labor	63	15.8	15.8	15.8
	Farmer	77	19.3	19.3	35.0
	Small Business	97	24.3	24.3	59.3
	Shopkeeper	101	25.3	25.3	84.5
	Housewife	48	12.0	12.0	96.5
	Others	14	3.5	3.5	100.0
	Total	400	100.0	100.0	

Source: Author's Field-work (2018)

In this table we see that 25.35 are shopkeeper that means small traders and small businessman are 24.3%. Since Bangladesh is an agricultural country so farmer are 19.3%. Only housewife whose have no specific job they do for self reliance

Table 7: Earners in the Household

Earners in the Household		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	315	78.8	78.8	78.8
	2.00	74	18.5	18.5	97.3
	3.00	11	2.8	2.8	100.0
	Total	400	100.0	100.0	

Source: Author's Field-work (2018)

Table 7 shows that most of the households' earners are single which 78.8% are and rests of them are dependents. In indicates a large number of people are not self employed or employed.

V. Impact of Conventional Microcredit on Respondent's Savings (After Loan)

In this study we have estimated simultaneous equations model to determine the impact of microcredit on respondent's savings level. Total savings of the respondent are estimated as the dependent variables. Age of the respondent (AR), Education of respondent (ER), Gender of the respondent (GR), Number of earners in the household (EAR), Number of dependents in the household (DHR), the amount of loan (AL), expenditure for food and non-food items (per month) after loan, Earners in the Household, Occupation, Gender of Respondent, Size of the household (SH), Interest rate (IR) are estimated as independent variables.

a) Regression results of savings (s) and independent variables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.951[a]	.948	.935	.024751	1.977

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ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	974646212.316	14	69617586.594	52.802	.000[b]
	Residual	507611851.684	385	1318472.342		
	Total	1482258064.000	399			

a. *Dependent Variable: Respondent's Savings (Per Month) after loan*
b. *Predictors: (Constant), Income of the respondent (Per Month) after loan, Expenditure for Food Items (per month) after loan ,Age of the Respondent, Education of Respondent, Dependents in the Household, Expenditure for Non-food Items (per month) after loan, Earners in the Household, Occupation, Gender of Respondent, Family Size, Expenditure for Food Items (per month) after loan*

Coefficients

	Std. Error	Beta	t	Sig.
(Constant)	.245		.530	.597
Age of the Respondent	.044	-.018	.600	.049
Family Status	.088	.007	.219	.827
Educational Status	.019	.026	-.844	.099
Occupation of Respondent	.064	-.059	1.912	.057
Size of the household	.093	-.004	.119	.005
Respondent's Income (Per Month) after loan)	.024	.117	5.139	.000
Expenditure for Food Items (per month) (after loan)	.065	-.963	-9.297	.000
Expenditure for Non-food Items (per month) (after loan)	.060	-.807	-8.956	.000
Earners in the Household	.007	.009	.282	.078
Dependents in Household Interest Rate	.022	-.010	-.270	.087
	.065	-0.20	-.241	.003

Source: Author's Field-work (2018)

The value of the coefficient AR (Age of the Respondent) is negative sign, it implies that savings decreases due to youth unemployment and inexperience. This implies that, with an increase in the age of the respondent the probability being poor will fall as a result the savings of the respondent increases. In the context of our country, there is a joint family system in rural areas, the older of the respondent, the higher of the respondent's earnings and accumulation of resources. Field survey data shows that the incidence of poverty increases with youth unemployment and inexperience and incidence of poverty decreases with age of the respondent.

The value of the coefficient SH (Size of the Household) is negative sign. This implies that, the household size has a negative impact on the household income. The higher the household size the lower the household income. With a decrease in the household size the probability being poor will fall, as a result the income of the family increases. This conclusion is consistent with the earlier observation that the incidence of poverty increases with the household size. The coefficient of household size is -.004, it means that if other things are remaining the same, the size of household increases by one unit which will reduce the household income by 0.4. Field survey data shows that the incidence of poverty increases with the increases of household size.

The coefficient of ER (Education of the Respondent) has a negative effect on poverty and income. This implies that the more educated an individual, the greater the potential to exploit resources and technology and avoid poverty, higher the education higher the savings of the family. The coefficient of household education is 0.026; it means that if other things are remaining the same, one per cent increases in education of household will increase the household savings by 2.6. Field survey data shows that the incidence of savings decreases with the increases in education of household.

The coefficient of EAR (Earners in the household) has negative effects on poverty. This implies that the more earners of the household lower the poverty and increase the household welfare. The coefficient of earner of household is .009; it means that if other things are remaining the same, one unit increases in earners of household will increase the household savings by 0.9. Field survey data shows that the incidence of poverty decreases with the increases in earners of household.

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The coefficient of DHR (Number of dependents in the household) has positive effects on poverty, higher the dependency ratio lowers the income of the family. The coefficient of dependency ratio is -0.010, it means that if other things are remaining the same, one unit increases in dependency ratio of household will decrease the household savings by 1.0. Field survey data shows that the incidence of poverty increases with the increases of dependency ratio.

Total income of the respondent (TYR) plays a vital role to accumulate savings that can tend to raise investment for the development of rural Bangladesh. From the field survey, it is evident that the coefficient of TYR (Total Income of the Respondent) has negative impact on poverty, increases of TYR, and increases of savings of the respondent. The coefficient of respondent's savings is .117; it means that if other things are remaining the same, one unit increases in savings of respondent will increase the respondent's asset by 1.7. Field survey data shows that the incidence of poverty decreases with the increases of savings of respondent.

There are more occupations create in rural Bangladesh. From the field survey, it is evident that the coefficient of occupation of the respondent (OR) has positive impact on poverty alleviation. The coefficient of respondent's occupation is 0.059; it means that if other things are remaining the same, occupational status does ensure the variation on savings of the respondent.

The coefficient of interest rate (IR) has negative effects on income and savings, higher the interest rate lowers the income of the family. The coefficient of interest rate is -0.20, it means that if other things are remaining the same, one unit increases in interest rate on the amount of loan will decrease the respondent's income by 2.0. Field survey data shows that the incidence of poverty increases with the increases of interest rate.

Total expenditures for food and non-food items of the respondent (TExpR) play a vital role to measure living levels of households. From the field survey, it is evident that the coefficients of expenditure for food and non-food items are -0.963 and -0.807. It means that if other things are remaining the same, one unit decrease in expenditure of respondent will increase the respondent's savings by 6.3 and 0.7. Field survey data shows that the incidence of poverty decreases with the increases of savings of respondent.

Table 8: Comparative savings statistics of respondent (before and after loan)

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
TSR AL	Equal variances assumed	.11	.074	4.78	398.00	.00	960.05	.074	565.41	1354.70
	Equal variances not assumed			4.84	260.15	.00	960.05	.019	569.78	1350.32
TSR BL	Equal variances assumed	1.23	.027	.76	398.00	.00	113.48	.074	178.94	405.89
	Equal variances not assumed			.69	196.68	.00	113.48	.027	212.46	439.41

Source: Author's Field-work (2018)

Table 8 shows comparative savings statistics of respondent (before and after loan). After loan around 271 numbers of respondents say that microcredit can accumulate savings and it is an instrument that can help us to alleviate poverty and self-reliability.

VI. Major Findings

From the estimation it may be concluded that the microcredit programs are effective in generating higher income and savings for borrowers. This is a very important finding as it confirms the claims made by the microcredit providers. We may conclude from this finding that microcredit is providing better quality of life for its borrowers. We know from experience that people's income increases as they grow older. Our estimation results suggest that age of the respondent has a significant and positive impact on income and assets. As someone grows older them income also

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grows. Our results also suggest that educations of the respondents are an important factor in affecting income and assets positively. Education helps people to be more enlightened. According to this finding, education enhances borrowers' income and assets. We have also found from this analysis that infrastructural facilities in the village facilitates borrowers' income and assets. This study also suggests that as the number of earners increases in a household, amount of borrowing also increases. This could be due to the fact that having more earning members increases the ability to repay loans quickly as well as obtain more loans. Infrastructural facilities facilitate the household outcomes. It is also found that families having more earning members enjoy better household outcomes.

VII. Challenges in Microcredit Programs

a) Cycle of loans and liability

Microcredit has changed life style of the poor people but they could not come out from the causes of poverty. Sometimes they use microcredit loan from one organization to meet interest obligations from another. It chained the poor people, so they are rolling in the cycle of loans and liability.

b) Highly expensive

Microcredit imposes high interest on the borrowers. So, many borrowers fail to repay the loans. As a result they are carrying the burden of high interest which is not at all in favor of eradicating poverty.

c) The human system for collecting installment

The way micro credit lenders collect the installment of the loans is really pitiable. Most of the field officers are in a position of power locally and are judged on repayment rates as the primary metric of their success. They sometimes use force and even violent tactics to collect installments on the microcredit loans. Many borrowers bound to sale there their last belongings to pay the installment. Many committed suicide under frustration.

d) Increases dowries

A large number of people believe that, microcredit increase the dowries. Poor parents take loan for their daughter to meet the demand of the grooms. Many people put pressure on women to borrow from the micro financer. Micro credit is indirectly responsible for increasing dowries. Ignorance to agriculture sector: Micro credit could not play any significant role in the agriculture sector. But it is simply impossible eradicate poverty from our country without developing this sector.

VIII. Recommendations and Conclusion

Microcredit, originated in Bangladesh has blown out all over the globe. Today within the international coverage of microcredit Bangladesh's achievement stands out prominently. The world community has appreciated the contributions of Bangladesh in the field of microcredit, which was evident in the Asia Pacific Region Microcredit Summit (APRMS) Meeting of Councils in Dhaka, Bangladesh from 16-19th February, 2004 arranged by Palli Karma - Sahayak Foundation (PKSF), in association with the Microcredit Summit Campaign based in Washington D.C. More than 1200 participants from 47 countries from different parts of the globe pledged their firm commitment to take forward the microcredit movement. Bangladesh government has also placed adequate emphasis on microcredit programs. The Interim Poverty Reduction Strategy Paper (IPRSP) of the government of Bangladesh has outlined some important roles for microcredit. The policy makers have recognized the importance of microcredit in Bangladesh and the present government has pledged its support to this program.

To become micro credit programs more fruitful we should give emphasis on the followings –

- Ensuring close monitoring.
- Using micro credit in high profitable business.
- Fixing reasonable rate of interest.
- Making sufficient laws for the operation of micro credit.
- Ensure suitable behavior of by the officers.
- Give more emphasis on rural economic productive sector, especially in agriculture.
- Ensure more research in micro credit and its effectiveness. If we fulfill these requirements, we could hope that micro credit becomes a tool of eradicating poverty. Only then we can get poverty and hunger free Bangladesh.

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[i] Upazila is 'sub-district' formerly called thana. It is an administrative region in Bangladesh (From Wikipedia, the free encyclopedia)

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Certificate, LoR and Momento **2** discounted publishing/year **Gradation** of Research **10** research contacts/day **1 GB** Cloud Storage **GJ** Community Access	**Certificate,** LoR and Momento **Unlimited** discounted publishing/year **Gradation** of Research **Unlimited** research contacts/day **5 GB** Cloud Storage **Online Presense** Assistance **GJ** Community Access	**Certificates,** LoRs and Momentos **Unlimited** free publishing/year **Gradation** of Research **Unlimited** research contacts/day **Unlimited** Cloud Storage **Online Presense** Assistance **GJ** Community Access	**GJ** Community Access

Preferred Author Guidelines

We accept the manuscript submissions in any standard (generic) format.

We typeset manuscripts using advanced typesetting tools like Adobe In Design, CorelDraw, TeXnicCenter, and TeXStudio. We usually recommend authors submit their research using any standard format they are comfortable with, and let Global Journals do the rest.

Alternatively, you can download our basic template from https://globaljournals.org/Template.zip

Authors should submit their complete paper/article, including text illustrations, graphics, conclusions, artwork, and tables. Authors who are not able to submit manuscript using the form above can email the manuscript department at submit@globaljournals.org or get in touch with chiefeditor@globaljournals.org if they wish to send the abstract before submission.

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Authors must ensure the information provided during the submission of a paper is authentic. Please go through the following checklist before submitting:

1. Authors must go through the complete author guideline and understand and *agree to Global Journals' ethics and code of conduct,* along with author responsibilities.
2. Authors must accept the privacy policy, terms, and conditions of Global Journals.
3. Ensure corresponding author's email address and postal address are accurate and reachable.
4. Manuscript to be submitted must include keywords, an abstract, a paper title, co-author(s') names and details (email address, name, phone number, and institution), figures and illustrations in vector format including appropriate captions, tables, including titles and footnotes, a conclusion, results, acknowledgments and references.
5. Authors should submit paper in a ZIP archive if any supplementary files are required along with the paper.
6. Proper permissions must be acquired for the use of any copyrighted material.
7. Manuscript submitted *must not have been submitted or published elsewhere* and all authors must be aware of the submission.

Declaration of Conflicts of Interest

It is required for authors to declare all financial, institutional, and personal relationships with other individuals and organizations that could influence (bias) their research.

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Plagiarism is not acceptable in Global Journals submissions at all.

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Authors are solely responsible for all the plagiarism that is found. The author must not fabricate, falsify or plagiarize existing research data. The following, if copied, will be considered plagiarism:

- Words (language)
- Ideas
- Findings
- Writings
- Diagrams
- Graphs
- Illustrations
- Lectures

- Printed material
- Graphic representations
- Computer programs
- Electronic material
- Any other original work

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2. Drafting the paper and revising it critically regarding important academic content.
3. Final approval of the version of the paper to be published.

Changes in Authorship

The corresponding author should mention the name and complete details of all co-authors during submission and in manuscript. We support addition, rearrangement, manipulation, and deletions in authors list till the early view publication of the journal. We expect that corresponding author will notify all co-authors of submission. We follow COPE guidelines for changes in authorship.

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Unless specified in the notification, the Editorial Board's decision on publication of the paper is final and cannot be appealed before making the major change in the manuscript.

Acknowledgments

Contributors to the research other than authors credited should be mentioned in Acknowledgments. The source of funding for the research can be included. Suppliers of resources may be mentioned along with their addresses.

Declaration of funding sources

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Preparing your Manuscript

Authors can submit papers and articles in an acceptable file format: MS Word (doc, docx), LaTeX (.tex, .zip or .rar including all of your files), Adobe PDF (.pdf), rich text format (.rtf), simple text document (.txt), Open Document Text (.odt), and Apple Pages (.pages). Our professional layout editors will format the entire paper according to our official guidelines. This is one of the highlights of publishing with Global Journals—authors should not be concerned about the formatting of their paper. Global Journals accepts articles and manuscripts in every major language, be it Spanish, Chinese, Japanese, Portuguese, Russian, French, German, Dutch, Italian, Greek, or any other national language, but the title, subtitle, and abstract should be in English. This will facilitate indexing and the pre-peer review process.

The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.

Manuscript Style Instruction (Optional)

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11'", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

a) A title which should be relevant to the theme of the paper.
b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
d) An introduction, giving fundamental background objectives.
e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
f) Results which should be presented concisely by well-designed tables and figures.
g) Suitable statistical data should also be given.
h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
j) There should be brief acknowledgments.
k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.

Format Structure

It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

All manuscripts submitted to Global Journals should include:

Title

The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

Author details

The full postal address of any related author(s) must be specified.

Abstract

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Keywords

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, “What words would a source have to include to be truly valuable in a research paper?” Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.

Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

Preparation of Eletronic Figures for Publication

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

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Tips for writing a good quality Social Science Research Paper

Techniques for writing a good quality homan social science research paper:

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of homan social science then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.



6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.
Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

19. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

20. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

21. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

22. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

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Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.



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Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.



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Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

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

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."



Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

The Administration Rules

Administration Rules to Be Strictly Followed before Submitting Your Research Paper to Global Journals Inc.

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References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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