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A Study on Selected NGOs

The Determinants of Inflation

Highlights

Effectiveness of Micro-Credit

Socio-Economic Development

Discovering Thoughts, Inventing Future

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Ways to Accelerate Russia's Economic Growtn

By Anisimov Andrey Leonidovich & Mikhail A. Kombarov
Ural State University of Economics

Abstract- The primacy of economic growth is that it is a key condition for improving the well-being of society. Therefore, almost any country in the world should strive to achieve stable and high rates of growth. Russia is no exception, but at present it can not boast of special successes in this area. The present study is devoted to the identification of factors that inhibit the growth of its economy to some extent, as well as to the search for possible ways to combat them. In the course of its implementation, it was revealed that some scientists refer to these factors as low labor productivity and a high level of shadow employment. With the help of regression analysis, the author proved the reliability of all these judgments and proposed recommendations, the introduction of which may improve the values of the studied indicator.

Keywords: economic growth; GDP; labor productivity; fixed assets; shadow employment.

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Ways to Accelerate Russia's Economic Growtn

ПУТИ УСКОРЕНИЯ ЭКОНОМИЧЕСКОГО РОСТА РОССИИ

Anisimov Andrey Leonidovich [α] & Mikhail A. Kombarov [σ]

Abstract- The primacy of economic growth is that it is a key condition for improving the well-being of society. Therefore, almost any country in the world should strive to achieve stable and high rates of growth. Russia is no exception, but at present it can not boast of special successes in this area. The present study is devoted to the identification of factors that inhibit the growth of its economy to some extent, as well as to the search for possible ways to combat them. In the course of its implementation, it was revealed that some scientists refer to these factors as low labor productivity and a high level of shadow employment. With the help of regression analysis, the author proved the reliability of all these judgments and proposed recommendations, the introduction of which may improve the values of the studied indicator.

Keywords: economic growth; GDP; labor productivity; fixed assets; shadow employment.

Аннотация- **Первостепенность экономического роста заключается в том, что он представляет собой ключевое условие повышения благосостояния общества. Поэтому к достижению стабильных и высоких его темпов стремится практически любая страна в мире. Россия не является исключением, но в настоящее время не может похвастаться особыми успехами в этой области. Установлению факторов, в той или иной степени тормозящих рост её экономики, а также поиску возможных путей борьбы с ними и посвящено настоящее исследование. В ходе его проведения выявлено, что некоторые учёные относят к данным факторам низкую производительность труда и высокий уровень теневой занятости. С помощью регрессионного анализа автором доказана достоверность всех этих суждений и предложены рекомендации, внедрение которых, возможно, улучшит значения исследуемого показателя.**

ключевыеслова: экономический рост; ввп; производительность труда; основные средства; теневая занятость.

I. Введение

Экономика России, как и любой другой страны мира, никогда не стоит на месте [8, с. 94]. Ежегодно её масштабы демонстрируют какую-либо динамику, которая бывает как положительной, так и отрицательной. Положительная указывает на экономический рост, т.е. свидетельствует о появлении новых предприятий, о повышении эффективности существующих производств, об укреплении национальной валюты и об улучшении благосостояния каждого гражданина. Отрицательная характеризуется как негативное явление. В этом случае наблюдается сокращение рабочих мест, рост безработицы и падание уровня жизни населения. В качестве показателя, отражающего информацию о такой динамике, выступает изменение объёма ВВП[5, с. 46; 12, с. 33]. Поэтому установление факторов, способных оказать на него то или иное влияние, весьма актуально.

II. Факторы, Оказывающие Влияние на ввп Страны

Одним из подобных факторов служит производительность труда. С этим согласны А. А. Чуракова[13, с. 227], а также профессора Е. В. Балацкий и Н. А. Екимова, по мнению которых она является одним из наиболее удобных и интегральных измерителей уровня технологического развития общества, тесно связанным с его благосостоянием и с конкурентоспособностью [1, с. 15]. Аналогичной точки зрения придерживается директор Института экономики РАН, Е. Б. Ленчук, считающая, что низкие её темпы сдерживают рост отечественной экономики [19, с. 17]. Помимо производительности труда, размер ВВП зависит и от уровня теневой занятости, о чём утверждает кандидат экономических наук, О. М. Лизина, ссылаясь на выводы одного из ведущих специалистов в данной области – профессора Университета Кеплера, Ф. Шнайдера [7, с. 63].

Достоверность всех суждений можно проверить с помощью регрессионного анализа. Исходные данные для его проведения представлены в таблице 1.

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Таблица 1: Данные для проведения регрессионного анализа[17, 20]

Год	Динамика ВВП России, %	Динамика производительности труда в России, %	Уровень теневой занятости, % от ВВП
2003	7,3	7,0	40,08
2004	7,2	6,5	37,68
2005	6,4	5,5	36,41
2006	8,2	7,5	35,47
2007	8,5	7,5	34,59
2008	5,2	4,8	32,60
2009	-7,8	-4,1	36,79
2010	4,5	3,2	33,70
2011	4,3	3,8	32,03
2012	3,7	3,3	31,88
2013	1,8	2,2	32,21
2014	0,7	0,7	31,04
2015	-2,3	-1,1	33,72

Проведённый в программе MS Excelанализ показал, что связь между ежегодной динамикой ВВП и двумя анализируемыми факторами действительно является тесной, поскольку значение коэффициента корреляции (Множественного R) оказалось равно 0,99[6, с. 47]. Полученная в результате его проведения эконометрическая модель зависимости удовлетворяет всем условиям качества и всем предпосылкам метода наименьших квадратов,что позволяет признатьсуждения о влиянии уровня теневой занятости и производительности труда на объём ВВП абсолютно верными.Она имеет следующий вид:

Динамика ВВП России = 5,28 + 1,35*Динамика производительности труда в России – 0,19*Уровень теневой занятости

Это означает, что годовой прирост производительности труда на 1% увеличивает объём ВВП на 1,35%, а каждый процент теневой занятости снижает этот показатель на 0,19%. Следовательно, для стимулирования экономического роста правительству нашей страны необходимо ускорять производительность труда и вести борьбу с неформальной занятостью.

В рамках первой задачицелесообразно уделить должное внимание основным фондам хозяйствующих субъектов. Неудовлетворительное их состояние в настоящее время характеризуется высокой степенью износа, низкими коэффициентами выбытия и обновления [19, с. 19]. Приведённые в таблице 2 значения этих показателей, а также их динамика за период с 2001 по 2018 гг. обрисовывают ситуацию, в которой придётся забыть о расширенном воспроизводстве, поскольку речь может идти только о выживании [10, с. 31; 18].

Таблица 2: Показатели состояния основных средств компанийРоссии за период с 2001 по 2018 гг. [20]

Год	Коэффициент обновления, %	Коэффициент выбытия, %	Степень износа, %
2001	2,1	1,3	41,1
2002	2,2	1,3	44,0
2003	2,5	1,2	43,0
2004	2,7	1,1	43,5
2005	3,0	1,1	45,2
2006	3,3	1,0	46,3
2007	4,0	1,0	46,2
2008	4,4	1,0	45,3
2009	4,1	1,0	45,3
2010	3,7	0,8	47,1
2011	4,6	0,8	47,9
2012	4,8	0,7	47,7
2013	4,6	0,7	48,2
2014	4,3	0,8	49,4
2015	3,9	1,0	47,7
2016	4,4	0,8	48,1
2017	4,3	0,7	47,3
2018	4,3	0,7	47,4

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Из таблицы видно, что степень износа основных средств увеличивается, приближаясь к отметке в 50%, а коэффициент их выбытия снижается, иуже более 10 лет не превышает 1%. Одновременно происходит рост коэффициента обновления. Следовательно, отечественные предприятия приобретают новые активы, но не спешат с выводом из эксплуатации старых. Эти слова подтверждается данными Федеральной службы государственной статистики: в 2012 году доля полностью изношенных основных средств в общем их объёме составляла 14%, а к 2018 увеличилась до 18,7%.

III. Последствия Предпринимаемых Действий и Способы их Преодоления

Подобные действия могут привести к различным отрицательным последствиям, таким, как снижение качества выпускаемой продукции, нерациональное использование ресурсов, увеличение вероятности аварийных происшествий и несчастных случаев на производстве, рост текучести кадров, связанный с повышенным производственным риском и т.д. [4, с. 14; 9, с. 124]. Поэтому за их совершение должна быть предусмотрена ответственность, для чего в некоторые законодательные акты РФ необходимо внести следующие изменения:

- дополнить п. 20 ПБУ 6/01 «Учёт основных средств» и п. 59 Методических указаний по бухгалтерскому учёту основных средств абзацем седьмым и шестым соответственно следующего содержания «Объект основных средств с истекшим сроком полезного использования подлежит немедленному и обязательному выводу из эксплуатации»;
- в абзаце втором п. 76 Методических указаний по бухгалтерскому учёту основных средств слова «может иметь место» заменить словами «имеет место»;
- дополнить КоАП РФ статьёй 15.11.1 «Грубое нарушение правил ведения хозяйственной деятельности», которая будет устанавливать административную ответственность за использование в производстве изношенных основных средств в виде штрафа для должностных лиц в размере от 20 до 50 тыс. руб. или дисквалификации на срок до трёх лет.

Для того, чтобы процесс обновления основных средств не ставил финансовых трудностей перед хозяйствующими субъектами, им должны помогать в этом коммерческие банки, ведь они призваны повышать общую эффективность производства [3, с. 93]. Следовательно, Центральному банку РФ необходимо принять указание, которое обяжет их выдавать кредиты предприятиям на данные цели по ставке, не превышающей 5% годовых.

Второй, не менее важный способ ускорения российского экономического роста, заключается в снижении уровня теневой занятости, который в нашей стране всегда превышал допустимые пределы [17]. Для этого целесообразновнести некоторые изменения в Налоговый и Уголовный кодексы. Так, из НК РФ необходимо исключить положения, ущемляющие налоговые права нерезидентов. Речь идёт о п. 3 ст. 224, который увеличивает для них налоговую ставку, и п. 4 ст. 210, лишающем их права на получение налоговых вычетов. Не исключено, что такие обстоятельства подталкиваютмигрантов уклоняться от налогообложения различными путями. Это могут быть незарегистрированные работы по ремонту бытовой техники, пошив контрафактной одежды [16], наркобизнес [11, с. 53] и др. Эффективность подобной меры доказывается на примере Литвы. Здесь размер подоходного налога одинаков для всех категорий граждан, а масштабы теневой занятости не способны нанести существенного ущерба экономическому росту.

В Уголовный кодекс нужно ввести статью, которая будет наказывать лиц, проработавших на неофициальном рабочем месте более 12 месяцев подряд. Таким наказанием может являться штраф в размере, равном 10-кратной сумме неуплаченного НДФЛ, либо лишение свободы на срок от 2 до 4 лет. Помимо этого, необходимо наказывать и работодателей, предоставлявших такое место в течение указанного срока, одним из следующих способов: а) штрафом в размере, равном 10-кратной сумме неперечисленых страховых взносов; б) лишением свободы на срок от 3 до 5 лет. Следует отметить, что подобные наказания используют на практике некоторые аутсайдеры теневой экономики. Например, гражданам Франции, уклоняющимся от уплаты налогов, грозит до 7 лет тюрьмы и штраф до 2 млн. евро[15, с. 37], а в Швейцарии с 2008 года работодатели сферы строительства и сельского хозяйства за приём нелегальных сотрудников могут быть оштрафованы на 1 млн. франков и лишиться свободы на 5 лет [2, с. 23; 14, с. 521-522].

IV. Заключение

Таким образом, из вышеизложенного следует, что рост российской экономики можно ускорить несколькими простыми способами. Это введение обязанности для всех хозяйствующих субъектов выводить из эксплуатации изношенные основные фонды и применение налоговой политики, используемой европейскими государствами.

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The Determinants of Inflation in Cameroon

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Abstract- The purpose of this paper is to highlight the determinants of inflation in Cameroon from 1970 to 2015. The study uses quantitative approaches, mainly ordinary least squares and the model of error correction. The results revealed that in long run and short run, inflation is positively influenced by economic growth and volume of money. The results also stressed that household consumption expenditures, exportations of goods and services, financial liberation and devaluation positively impact inflation in Cameroon, while the importations of goods and services negatively influences inflation of the country. The results of this study mainly indicate that the control of price can reduce the excess of profits gained by firms and reduce importation of goods and services that also import international inflation in the country.

Keywords: inflation, volume of money, economic growth.

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The Determinants of Inflation in Cameroon

Moussa Elhadji Saidou [α], Charles Alain Bita [σ] & Valère Amassangka Haman Haman [ρ]

Abstract- The purpose of this paper is to highlight the determinants of inflation in Cameroon from 1970 to 2015. The study uses quantitative approaches, mainly ordinary least squares and the model of error correction. The results revealed that in long run and short run, inflation is positively influenced by economic growth and volume of money. The results also stressed that household consumption expenditures, exportations of goods and services, financial liberation and devaluation positively impact inflation in Cameroon, while the importations of goods and services negatively influences inflation of the country. The results of this study mainly indicate that the control of price can reduce the excess of profits gained by firms and reduce importation of goods and services that also import international inflation in the country.

Keywords: inflation, volume of money, economic growth.

Résumé- L'objectif de ce papier est de mettre en évidence les déterminants de l'inflation au Cameroun entre 1970 et 2015. Pour y parvenir nous avons eu recours à la méthode des moindres carrés ordinaires. Ainsi, l'utilisation du modèle à correction d'erreur montre qu'à long et court terme, la croissance économique et la masse monétaire influencent positivement l'inflation au Cameroun. Par ailleurs, les dépenses de consommation des ménages, les exportations de biens et services, la libéralisation financière et la dévaluation contribuent de manière positive à expliquer l'inflation au Cameroun. En revanche, les importations de biens et services ont plutôt une influence négative. À cet égard, ce papier soutient un contrôle des prix pratiqués par les entreprises afin d'éviter des marges bénéficiaires excessives d'une part et la limitation des importations afin d'éviter l'inflation importée d'autre part.

Motsclés: inflation, masse monétaire, croissance économique.

I. Introduction

Friedman (1969) affirmed in this quotation that "inflation is a dangerous disease that can be sometimes fatal." Meanwhile the stabilization of price is the primordial objective of major modern central banks. In Economic and Monetary Community of Central Africa (CEMAC), as well as in major economic and monetary zone, one criteria of macroeconomic convergence have been adopted and it stipulates that, the rate of inflation cannot go beyond 3 per cent. However, between 1980 and 1987, the rate of inflation in Cameroon was not less than 7 per cent (Touna Mama, 2008).

In 1995 the rate of inflation reached 35 per cent just after the devaluation on CFA Francs. During the first semester of 2015, the rate of consumption price reach 3.4 per cent compared to the first semester of 2014 where this rate was estimated at 2.5percent.According to National Institute of Statistics the increasing of price affected: the price of transportation (14.5 %), hotel and restaurant services (5.2%), alcohol and cigarette (4.1%). The increase in the price of goods and services year to year need to be study and find out the determinants of inflation in Cameroon.

In fact, the economics literature on the determinant of inflation is abundant and many theories on the causes were stipulated. However, theories and empirical approaches give different determinants of inflation as well as different its influences. In Cameroon, the determinants of inflation are not well known. Meanwhile, this paper aims to highlight the determinants of inflation in Cameroon, based on the hypothesis that economic growth and the increase of volume of money can positively influence inflation of the country.

The remainder of the paper structure is as follows: the literature review (2), the methodology of the study (3), the results and discussion (4), and the conclusion come at last (5).

II. Literature Review

Broadly, the causes of inflation can be classified between monetary factors and non-strict monetary factors.

The first known monetary theory is the quantitative theory of money. The dichotomy vision that sustain the foundation of this theory was developed by neoclassical economist such as Walras (1874), Arrow and Debreu (1954) that were not opposed to classic economist (Jean Baptiste Say). Let us noticed that before classic economist, some authors such as Bodin (1568), Petty (1662), Locke (1692), Hume (1752), and Cantillon (1757) have suggest the analysis of monetary phenomenon, that will later give birth to the current theories.

According to classic economists, money have the function of the intermediary of exchange at and the function of a reserve of value was refused to money. They also argued that the money cannot have a disability role. Money just modify the appearance of things; it is a voile that does not change reel equilibrium (Walras, 1874, Arrow and Debreu, 1954). However

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neoclassic economists (Jevons 1881, Menger 1892, Walras, 1988, and Pareto, 1906) argued that the non-proportional increase in the volume of money compared to the increase of wealth is the main cause of inflation due to the misappropriate anticipation of economic agents.

While monetarist approach (Friedman 1969, and Meltzer, 2003), argued that, inflation is a monetary phenomenon. Indeed, each variation of price is the result of the variation of the volume of money. So to fight inflation, the evolution of volume of moneymay be limited. However, this restrictive function of money was criticized by Keynesian approach (Gregory Mankiw, 2000; Joseph Stiglitz, 2014) and Neo Keynesian authors who received Nobel Price (Hicks 1972, Modigliani, 1985, Samuelson, 1970, Solow, 1987, etc.) as they argued that money can be used to stimulate production.

According to the authors of new classic macroeconomics (Lucas, R, 1995; Kydl and and Prescott, 1977), money does not influence the real economy sphere. Therefore, inflation does not have as solemn source, money, it can also have non strict monetary factors (inflation from demand, inflation by cost and inflation by structural factors). The post Keynesian or post Kelekian (Kalecki, 1937) analyses of inflation focuses on the conflict that rise during the share of income between four groups: labour, capital, government and foreign countries. The effort of each segment in the search of improving its income (salary, profits, taxes, and the price of importation) generally lead to the lost for others that react by increasing their prices.

Literature also present some empirical studies across the world that identified the cause of inflation in many countries. Maryam et al, (2014) analyses the cause of inflation in Malaysia from 1980 to 2012. Using multiple regression model, these authors found out that economic growth, public expenditures, importation of goods and services, real interest rate and volume of money have a significant influence on inflation. Furrukh et al., (2011), analyses the determinant of inflation in Pakistan from 1972 to 2010 using the model of error correction, the results revealed that on long run period, the price of consumption was positively influence by GDP.

Armesh et *al* (2010), studying the cause of inflation in Iran using the method of Ordinary Least Squares (OLS) found out that, on the long run period economic growth negatively influence inflation. World Bank (1996) studied inflation on 127 countries from 1960 to 1992 found out the negative correlation between inflation and economic growth. In the same line, Bocco and Ablefonlin (2009) studying inflation from 1972 to 2007 base on a model of error correction, stressed that economic growth negatively influence inflation while the price of importation positively influence inflation. Beridabaye (2007) studying inflation in Democratic Republic of Congo using linear logarithm based on the model of quantitative theory of money, found out that, economic growth, the price of petrol and devaluation have a significant influence on the inflation of the country. While Husain (2007), studying the relationship between inflation and the supply of national money in Koweit from 1972 to 2004 found out the existence of a positive relationship between inflation and volume of money on the long run period. And Jalali (1997) stressed the fluctuation of price and the rate of inflation before World War II in Iran. He concluded that the supply of money is the main factor that increase the level of price. In this sense Armesh et *al* (2010), studying the inflation from 1961 to 2005 in Iran using Ordinary Least Squares method, found out that the supply of money positively influence inflation on long run period.

III. Methodology of the Study

This section present econometric approach conducted, variables and the process of data collection and analysis. To identify the cause of inflation, major authors used econometric models (Maryam et al, 2014; Beridabaye, 2007; and Armesh et *al*, 2010). The common models including: generalized moment method and ordinary least squares. However, the choice of one of this model depend of some econometric test (unit root and co intégration test). So, in this paper ordinary least squares is used. The study adopted Myriam et al (2014) model and some modifications were added according to the specificities of Cameroon context. Furthermore, ordinary least squares model is easy to test and it is the most used model by economist when is come to identify the determinants of inflation.

a) The variables of studies

i. *Dependent variable (INF)*

Inflation is a dependent variable. In macroeconomic analysis two main indicators are usually used to measured inflation. The consumer price index (for most European countries) and the GDP deflator who is an instrument for correcting an economic size of the effects of inflation.

This paper used the consumer price index to measure inflation based on Blix (1995) model.

ii. *Independents Variables(X)*

- Economic Growth (GDP)

GDP per capita is used as proxy for ec onomic growth. GDP is the main measure of economic growth and it indicating the level of the wealth of a given country. However, the increase in GDP can lead to the increase in price of goods and services due to the increase of demand that is higher than the Supply of goods and services. The general consensus among economists is that inflation has a statistically significant

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negative impact on growth. So, we expected a positive correlation between GDP per capita and inflation rate in Cameroon.

- The Volume of Money (M2)

In major empirical studies, different aggregates are used to measure the volume of money. In this paper, the aggregate M2 in the percentage of GDP is a measure of the volume of money. According to Fischer (1911) quantitative theory of money that stipulated that an increase in the volume of money when held other variables constant leads to the increase in prices. So this variable has a positive sign.

- Households Consumption Expenditures (HCE)

Households Consumption Expenditures have a positive influence on inflation. When households, and firms increase their expenditures, the global demand of goods and services increase and consequently prices increase too. This variable is measured in percentage in GDP, and expect to have a positive sign.

- Importations of Goods and Services (IMGS)

The increase of importations can reduce the rate of inflation caused by domestic demand. The increase of importations expenditures when held other variables constants reduce the consumption of domestic goods and consequently the national inflation (Muktadir-Al-Mukit & Shafiullah, 2014). So the influence of this variable is negative.

- Exportations of Goods and Services (EXGS)

The exportations of goods and services offered foreign currencies to resident economic agents. So the effect of exportation on inflation is different from the importation's effect on inflation. The increase of exportations leads to the reduction of domestic supply compared to domestic demand, and consequently to inflation.

iii. *Dummy variables*

In this study, devaluation of CFA francs and financial liberalization are dummy variables.

- Devaluation (DEV)

Devaluation aims to improve economic competitiveness through the establishment of equilibrium (mainly the correction of disequilibrium caused by commercial deficit). Two main effects are expected from devaluation. The decrease of the value of the local currency increase the price, and the value of importations in foreign currencies, this effect is called: "price effect". On long-run landscape devaluation generated "volume effect", the decrease in prices of exported product increase the quantities sell abroad at the same time the increase of prices of imported product reduce the demand of foreign goods except for some raw materials (such as uranium, etc.). These contradictories effects of devaluation can be summarised on "J curve": In the first place, devaluation causes a brief degradation of the commercial sheet (this is price effect represented on the left side of J curve) and later the improve of this commercial sheet (this is volume effect represented on the right side of J curve).

- Financial liberalization (LIB)

Financial liberalization emerged from the works of Mckinnon (1973) and Shaw (1973) in the earlier 70. These authors argued that: on the one hand the limitation of the interest rate at its lowest level reduces savings and the supply of credits and consequently leads to the reduction of investment and the decrease of economic growth. And on the other hand, financial repression leads to unfair allocation of credits. So financial liberalization eases the access of households to bank credits and consequently increase the volume of money and later the increase in prices. So the expected sign of devaluation is positive.

- Econometric model

In line with Maryam et *al.,* (2014), and also of some adjustments due to the specificities of Cameroon economic structure, the multiple regression model of this study stress that inflation is a function of economic growth, the volume of money, households' expenditures, importations and exportations of goods and services, devaluation and financial liberalization. So the general form of empirical model is as follow:

$$INF = f(GDP, M2, HCE, IMGS, EXGS, DEV, LIB\ )$$

The econometric form of the model in the long run landscape is:

$$INF = \beta_0 + \beta_1 GDP_t + \beta_2 M2_t + \beta_3 HCE_t + \beta_4 IGMS_t + \beta_5 EXGS_t + \beta_6 DEV_t + \beta_7 LIB_t + \varepsilon_t$$

The econometric form of the model in the short run landscape is:

$$INF = \beta_0 + \beta_1 D(GDP)_t + \beta_2 D(M2)_t + \beta_3 D(HCE)_t + \beta_4 D(IGMS)_t + \beta_5 D(EXGS)_t + \beta_6 D(DEV)_t + \beta_7 D(LIB)_t + RESID(-1)$$

Table 1 summarized the different sign of each variable of the model:

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Table 1: The different sign of variables of the model

Variables	Proxy	Parameters and Expected sign.
Economic Growth (GDP growth)	Gross Domestic Product per capita in%	β_1 (+)
Volume of money (M2)	The ratio of Volume of Money on GDP per capita in %	β_2 (+)
Households Consumption Expenditures (HCE))	The total sum of households' consumption expenditures expressed in percentage of GDP	β_3 (+)
Importations of goods and services (IMGS)	The total sum of goods and services imported in %	β_4 (-)
Exportations of goods and services (EXGS)	The total sum of goods and services exported in %	β_5 (+)
Devaluation (DEV)	Expressed in 0 before 1994, and 1 from 1994	β_6 (+)
Financial liberalization (LIB)	Expressed in 0 before 1990, and 1 from 1990	β_7 (+)

Source: Authors own elaboration based on economic theories

b) Source of data

The data used for estimation were withdrawn from World Bank Data base mainly the world Development Indicators (WDI, 2016). The data are from 1970 to 2015, which is the time period of this study. The study, mainly focuses on this period due to the unavailability of data for some variables, and so this period corresponds to the rising of inflation in Cameroon.

IV. Results and Discussion of Econometric Estimation

a) Statistical analysis of the results

Table 2 summarize the results of different test on short and long runs

Table 2: Results of estimations

Dependent variable : inflation rate		
Independents variables	Relation of the long-run	Relation of the short-run
C	-61.183 (-2.059)	-0.621 (-1.420)
GDP	0.452 (2.351) **	0.157 (2.256) **
M2	1.155 (2.762)***	0.522 (1.726) *
IMGS	-1.479582 (-3.448) ***	-0.530 (-2.830) ***
EXGS	0.452 2.974) ***	0.259 (1.792) *
HCE	0.884(2.342) **	/
DEV	6.652 (1.908) **	37.289 (12.302) ***
LIB	-15.397 (-4.011) ***	-12.640 (-4.092) ***
RESID (-1)	/	-0.965664 (-9.754105) ***
R^2	0.506	0.890
R^2 ajusté	0.416	0.869
F-statistic (k, n-k)	5.581	42.954
Prob(F-statistic)	0.000178	0.000000
Durbin-Watson stat	1.996	2.167
Observation	46	46

Source: Authors own elaboration (generated from Eviews 8.0)

Notes: Numbers below coefficients are the corresponding T-student and (***), (**) and (*) denotes statistical significance at the 1%, 5% and 10% levels respectively.

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b) Analysis and interpretation of results

For all estimation results, the variation of the rate of inflation is between 41 and 86 percent in Cameroon during the period of the study (1970 to 2015). The results revealed that the model was statistically valid (F-stat=0.000178). This means, explanatory variables such as economic growth and volume of money have the expected signs effect on inflation. However, in short-run these two variables have a negative sign but still statistically significant. This means in short-run, the disequilibrium between the rate of inflation and these two variables are established. Furthermore, the Durbin Watson statistic value (DW= 1.996) indicated the absence of autocorrelation of residues and the absence of heteroscedasticity (see results in Appendix 1).

i. *Explanatory variables*

- Economic Growth (Gross Domestic Product per capita growth)

According to the results of the estimations of two models, the GDP is positive and statistically significant. So, an increase in GDP leads to an increase in the rate of inflation at the level of 0.452 in long run and 0.157 in the short-run respectively. This result is in line with Thouraya and Younes (2007) and Nubukpo (2002) who also found out that economic growth has negative impact on inflation. The economic growth generated increase of demand compared to supply (due to the increase of wealth and the reduction of unemployment rate) and consequently the increase in prices.

- Volume of money (M2)

The coefficient of this variable are 1.155 in long run and 0.522 in the short-run, this means when the volume of money increase by one unit, the rate of inflation increase by 1.155 and 0.522 in the long-run and short-run, respectively. This result is in live with money quantitative theory of Fisher (1911), and monetarist economist that support that inflation are everywhere and always a monetary phenomenon.

ii. *Control variables*

- Importations of Goods and Services (IMGS)

The coefficient of importations of goods and services are - 1.479 in the long-run and - 0.53 in the short-run, this means when the importations of goods and services increase by one unit, the rate of inflation decrease by 1.479 and 0.53 in the long-run and short-run respectively. The increase of importations reduces the consumption of domestic goods and consequently inflation rate. This matches the result of previous studies of Muktadir-Al-Mukit & Shafiullah (2014) in Bangladadeshand Mariam et *al* (2014) where importations were found to have a significant negative impact on inflation.

- Exportations of Goods and Services (EXGS)

The coefficient of exportations of goods and services are – 0.983 in the long-run and 0. 259 in the short-run, so when the exportations of goods and services increase by one unit, the rate of inflation increase by 0.983 and 0.259 points in the long-run and short run respectively. The exportations of goods and services reduce the supply of domestic goods and services and leads to the increase of inflation rate.

- Households Consumption Expenditures (HCE)

The increase by one unit of households' consumption expenditures in the long-run leads an increase in the rate of inflation by 0.884 point. This result respect the law of supply and demand that stipulates that an increase in demand lead to an increase in price when holding other variables constant. However, in the short-run this variable is not statistically significant.

iii. *Dummy variables*

- Devaluation (DEV)

Let notices that, the devaluation of CFA francs has an important influence on inflation. The coefficient of this variables are 6.652 and 37.289 in the long run and short run respectively, and it have the expected signs for two models. Meanwhile, a devaluation of 50 % of CFA francs leads to the increase of 6.652 in the long-run and 37.289 in the short-run. Cameroon reach the highest rate of inflation, estimated at 35 percent after the devaluation occurred in 1994. This result is in line with Béridabaye (2007) that argued that devaluation lead to an increase in inflation rate.

- Financial liberalization (LIB)

The coefficient of this variable has an unexpected sign, hence the influence of financial liberalization is perceived on inflation in Cameroon. The financial liberalization eases the access to credits and consequently, improve investments and competitiveness which later leads to the decrease of prices thanks to the reduction of the interest rate of bank credits (Bita, 2008).

V. Conclusion

Broadly, major studies on inflation revealed that the determinants of inflation are various and differ from one country to another. Some variables are commons to countries with the same similarities, but still some differences can exist. So the main objective of this paper was to identified the determinants of inflation in Cameroon and evaluated the influence of each determinant. Base on ordinary least squares method and the model of error correction, the results from this paper show that economic growth and volume of money positively impact the level of inflation in short and long runs. Variables including exportations of goods and services, devaluation, financial liberalization and household consumption expenditures have a positive impact on inflation. While importations of goods and services have a negative impact on the inflation rate.

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This result call upon government to review the budgetary policy in order to fight inflation. The increase of supply is also important mainly when it is accompanied by the control of the effect of production on employment and wages. Commercial bank need also to control the supply of credits to economic agents. So, to control the rate of inflation, a policy of inflation can be put in place.

Monetary policies can also help in fight against inflation in Cameroon and in the CEMAC zone in large. The increase of interest rate of the central bank (Bank of the States of Central Africa, BEAC*)* to reduce the volume of money can consequently, increase the cost of bank credits and lead to the decrease in demand of credits, the volume of money and inflation rate can also decrease. The increase of the rate of the stocks of money can reduce inflation. And the application of quotas to the volume of monthly credits offer by commercial banks can control credits distributed to individuals and enterprises.

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Appendices

Table A1: Heteroscedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.563239	Prob. F(7,38)	0.1762
Obs*R-squared	10.28475	Prob. Chi-Square(7)	0.1730
Scaled explained SS	46.16317	Prob. Chi-Square(7)	0.0000

Source: Eview.8.0

Table A2: Long run Estimation

Dependent Variable: INF
Method: Least Squares
Date: 04/05/17 Time: 20:20
Sample: 1970 2015
Included observations: 46

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-61.18260	29.71943	-2.058674	0.0464
LIB	-15.39792	3.838481	-4.011460	0.0003
PIB	0.452479	0.192434	2.351347	0.0240
MM	1.155677	0.418392	2.762188	0.0088
IMPBS	-1.479582	0.429076	-3.448301	0.0014
EXPBS	0.983559	0.330647	2.974650	0.0051
DEV	6.652686	3.486591	1.908078	0.0640
DEPMEN	0.884692	0.377601	2.342931	0.0245

R-squared	0.506938	Mean dependent var	6.285821
Adjusted R-squared	0.416110	S.D. dependent var	6.680942
S.E. of regression	5.105086	Akaike info criterion	6.255123
Sum squared resid	990.3524	Schwarz criterion	6.573147
Log likelihood	-135.8678	Hannan-Quinn criter.	6.374256
F-statistic	5.581337	Durbin-Watson stat	1.996547
Prob(F-statistic)	0.000178		

Source: Eview.8.0

Table A3: Short run Estimation

Dependent Variable: D(INF)
Method: Least Squares
Date: 04/05/17 Time: 20:46
Sample (adjusted): 1971 2015
Included observations: 45 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.621535	0.437501	-1.420650	0.1638
D(LIB)	-12.64059	3.088664	-4.092574	0.0002
D(PIB)	0.157947	0.069990	2.256712	0.0300
D(MM)	0.522146	0.302361	1.726895	0.0925

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D(IMPBS)	-0.530839	0.187525	-2.830768	0.0075
D(EXPBS)	0.259990	0.145042	1.792523	0.0812
D(DEV)	37.28997	3.031194	12.30207	0.0000
RESIDUS(-1)	-0.965664	0.099001	-9.754105	0.0000

R-squared	0.890429	Mean dependent var	-0.070491
Adjusted R-squared	0.869700	S.D. dependent var	7.792993
S.E. of regression	2.813045	Akaike info criterion	5.066223
Sum squared resid	292.7893	Schwarz criterion	5.387408
Log likelihood	-105.9900	Hannan-Quinn criter.	5.185958
F-statistic	42.95455	Durbin-Watson stat	2.167669
Prob(F-statistic)	0.000000		

Source: Eview.8.0

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Egypt Public Debt Dynamic and its' Trajectory Projection

By Mohammed I. Abdu

Abstract- Egypt's general government debt recorded a precarious level at the end of the fiscal year 2015/16 by 103.2% of GDP. Although the economic reform program has succeeded in putting the debt level on a downturn path, the debt level is still high compared to the other middle income economies countries group and is subject to significant risks. The paper aims to identify the main drivers of the change in Egypt's general government debt as a percentage of the GDP, starting from 1999 to 2019 by using a multiple regression model. Also, the paper reviews the Egyptian public debt trajectory under different scenarios for the upcoming five years (2020 – 2024). The findings of the applied model correspond to the economic theory, as both the previous year debt and exchange rate lead to an increase in the debt level as a percentage of GDP. On the other hand, real GDP growth, interest rate, and the primary balance have a reduction effect. Furthermore, the model is used to forecast the debt level over the medium term under different scenarios. The results show that the debt level as a percentage of GDP is expected to spike in 2020 and then return to the downturn trajectory gradually. Also, the compound shock consisting of the shrink of real GDP growth and exchange rate depreciation will have the most severe effect.

Keywords: *debt dynamic; debt trajectory; forecasting debt level; general government debt.*

GJMBR-B Classification: *Code: F43*



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Mohammed I. Abdu

"The views expressed in this Paper are those of the author and do not necessarily represent the organization he works for".

Abstract- **Egypt's general government debt recorded a precarious level at the end of the fiscal year 2015/16 by 103.2% of GDP. Although the economic reform program has succeeded in putting the debt level on a downturn path, the debt level is still high compared to the other middle-income economies countries group and is subject to significant risks. The paper aims to identify the main drivers of the change in Egypt's general government debt as a percentage of the GDP, starting from 1999 to 2019 by using a multiple regression model. Also, the paper reviews the Egyptian public debt trajectory under different scenarios for the upcoming five years (2020 – 2024). The findings of the applied model correspond to the economic theory, as both the previous year debt and exchange rate lead to an increase in the debt level as a percentage of GDP. On the other hand, real GDP growth, interest rate, and the primary balance have a reduction effect. Furthermore, the model is used to forecast the debt level over the medium term under different scenarios. The results show that the debt level as a percentage of GDP is expected to spike in 2020 and then return to the downturn trajectory gradually. Also, the compound shock consisting of the shrink of real GDP growth and exchange rate depreciation will have the most severe effect.**

Keywords: debt dynamic; debt trajectory; forecasting debt level; general government debt.

I. Introduction

Even before the outbreak of (COVID-19) pandemic, there was an ongoing debate about the accumulation of public debt across the world; since the increasing debt level has become a global phenomenon, not only affecting developing and emerging markets, but also developed countries. However, this increase in debt level raises concerns about whether it could be a harbinger of fiscal crisis. (Badia, Medas & Xiang, 2020)

The United Nations Conference on Trade and Development (UNCTAD) estimated that the ratio of global debt to GDP at the beginning of 2018 was one third higher than that recorded at the beginning of the global financial crisis in 2007/08, and almost four times the global GDP. (Hawkins, Blankenburg & Kozul-Wright, 2019)

Egypt experienced cycles of public debt accumulation over the past decades. The highest record of general government debt as a percentage of GDP over the past two decades was registered in the fiscal year 2016/17 by 103.2%. Due to the longstanding challenges of the Egyptian economy at that time, the Egyptian government has initiated the economic reform program to address the economic challenges including the large budget deficit that leads to the accumulating public debt. (IMF, 2016)

The economic reform program has led to an improvement in macroeconomic indicators. Real GDP grew stably by 5.3% and 5.6% in the fiscal years 2017/18 and 2018/19, respectively, compared to 4.2% in 2016/17, and on average of 3.5% during the fiscal years 2012/13–2015/16. Given the drivers for economic growth, the contributions of both net exports and investment have increased, while the contribution of consumption, which was historically the main driver for economic growth, has decreased. (Arab Republic of Egypt Ministry of Finance [Mof], 2019)

Furthermore, the economic reforms address fiscal imbalances. The applied measures on both revenue and expenditure sides have led to a consecutive decline in the overall balance deficit. Between the fiscal year 2015/16 and 2018/19, the overall balance deficit narrowed by 5.1% to represent 7.4% of GDP, while the primary balance position turned from a deficit to a surplus during the same period.

Together, the robust GDP growth and the improvement in the fiscal situation have led to a gradual decline in the debt level as a percentage to GDP, since the general government debt as a percentage of GDP decreased between the fiscal year 2015/16 and 2018/19 roughly by 13% to become 83.8% in 2018/19.

Despite this notable decline in Egypt's debt to GDP ratio, it is considered to be high and subject to significant risks. The structure of government debt is one of those risks since the external component was growing gradually from 8.2% in the fiscal year 2015/16 to 21.4% in the fiscal year 2018/19; which exposed the government finance to external shocks. Also, the domestic debt has a challenging maturity, since more than one-third of the outstanding debt is issued on a maturity that is less than one year, and hence exposes the government to refinancing risks.

Moreover, the considerable contingent liabilities represent another source of fiscal risk. Apart from the high debt level and risky structure, there are challenges pertaining to government debt management. The institutional setup is fragmented since the responsibility

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of managing the debt is dispersed across the Ministry of finance, the Central bank, and the Ministry of international cooperation, along with limited coordination. Additionally, the slowdown in the momentum of GDP growth could be another source of risk. (World Bank Group [WB], 2019)

This paper examines the different factors that may affect the public debt level as a percentage of GDP over the period from 1999 to 2019. Also, it aims to forecast the trajectory of general government debt as a percentage of GDP on the medium term from 2020 to 2024 under different scenarios. The paper also depicts the magnitude and the dynamic of Egypt's general government debt and its structure.

II. Theoretical Background and Literature Review

This paper uses equation (1) to determine the main drivers of Egypt general government debt ratio to GDP through linking the accumulation of the stock of debt over time to fiscal balance, exchange rate, and other factors (Piscetek, 2019)

The basic formula for the evolution of public debt could be characterized as follows:

$$D_{t+1} = \frac{e_{t+1}}{e_t} * \left(1 + r^f_{t+1}\right) * D^f_t + \left(1 + r^d_{t+1}\right) * D^d_t - (T_{t+1} + G_{t+1} - S_{t+1}) + O_{t+1} + RES_{t+1} \quad (1)$$

Obligations associated with the stock of debt from the previous period

Primary Fiscal Balance

Other one-time factors

This equation is adopted by the IMF debt sustainability analysis tool for market access countries. Where superscript "f", "d" refer to items denominated in foreign and domestic currency, respectively, and subscripts refer to periods. Where (D) is the stock of public debt, (e) is the nominal exchange rate, (r) is the effective nominal interest rate, (T) is the total public sector revenues, (G) is the total grants to the public sectors, (S) is the public expenditures excluding interest payment, (O) is other identified debt-creating flows, and (RES) is a residual ensuring that the identity holds.

To simplify the equation and to measure the debt burden as a ratio of GDP, the previous equation is divided by the GDP and expressed as follows:

$$d_{t+1} = \frac{e_{t+1}}{e_t} * \left(1 + r^f_{t+1}\right) * d^f_t + (1 + r^d_{t+1}) * d^d_t - pb_{t+1} + SFA_{t+1} \quad (2)$$

Where (d) represents the debt as a ratio of GDP, (pb) is the primary balance as a percentage of GDP, and (SFA) is the unidentified residual as a percentage of GDP. (IMF, 2013)

The equation can be further simplified if all debt is assumed to be denominated in local currency and the residual is ignored. So, it will be represented as follows:

$$d_{t+1} = \left(\frac{1+r}{1+g}\right) d_t - pb_{t+1} \quad (3)$$

Where (d) is the stock of debt as a ratio of GDP, (r) is the real interest rate, (g) is the GDP growth, and (pb) is the primary balance as a ratio to GDP. (Cherif & Hasanov, 2012).

Several studies attempted to determine the effects of different factors on the evolution of public debt as a ratio to GDP, while other studies tried to forecast the level of public debt. Abbas, et al. (2013) study analyzed the scale of the problem of public debt in advanced economies, in addition to identifying the factors that drive debt as a percentage of GDP using a sample of 30 advanced economies for the period between 1980 and 2011.The paper found that reducing the debt level requires well designed fiscal consolidation and sustainable GDP growth over the medium term.

Anaya and Pinenkowski (2015) study explained how the prime drivers of public debt interact with each other. The study focused on specific factors; namely, GDP growth, primary balance, interest rate, and inflation. Using a sample of 15 countries, the study found that some interactions aggravate the impact of the shocks leading to debt accumulation, while others stabilize debt dynamics.

Nikoloski's and Nedanovski (2016) study provided an analysis for the Republic of Macedonia debt dynamics and its' structure for 16 years from 2000 to 2016. Also, the study submitted a recommendation to Macedonia policy makers that the borrowed funds should be directed to productive purposes. Otherwise, it might push the country's economy into an unsustainable zone.

Piscetek (2019) study analyzed the effects of four main variables; real interest rate, real GDP growth, exchange rates, and primary balance on the development of New Zealand's public debt ratio to GDP. The study monitored debt dynamics over a decade after the global financial crisis (2008-2018), and introduced a forecast for the period from (2019-2023), in addition to a medium-term projection for the period (2024-2033).

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Regarding the studies that focused on the driver of Egypt public debt and tried to present a forecast to its' trajectory, Alba, Al-shawarby, and Iqbal (2004) aimed in their study to investigate the main drivers for public debt accumulation in Egypt at the beginning of the 21st century, and assessed the sustainability of fiscal trend in that period. Also, the study forecasted the public debt as a percentage to GDP, according to a number of scenarios, for the period from 2004 to 2018.The study found that Egypt's public debt as a percentage to GDP was high compared to other lower middle-income countries in that period. Also, the study indicated that Egypt's debt had been driven by structural factors rather than cyclical factors. Furthermore, the paperargues that fiscal adjustment was needed to sustain the public debt.

The main objective of the study of El-Mahdy and Torayeh (2009) was to analyze and assess whether Egypt's domestic public debt behavior is consistent with a sustainability path. In the same context, the study estimated the impact of some macroeconomic variables on the domestic public debt, it introduced a forecast for the level of domestic public debt as a ratio of GDP for ten years, from 2007 to 2017. Moreover, the study states that a deep fiscal reform and policies to stimulate GDP growth were needed to sustain the debt on the medium term.

Another study by Massoud (2014) that focused on identifying public debt problems in Egypt, introduced a forecast for the level of public debt as a percentage of GDP for the period from 2013 to 2020 under different scenarios. The study's main findings were as follows: Egypt's public debt is expected to be sustainable until 2020; real GDP growth has a positive effect in reducing the debt to GDP ratio; fiscal consolidation is a key factor in reducing debt level.

Alnashar (2019) study has also sought to assess the main drivers of the evolution in Egypt's public debt from the fiscal year 2001/02 till 2016/17 through using two different techniques: first, the debt dynamics decomposition exercise, and second, structural VAR analysis. Furthermore, the study argued that the exchange rate and primary balance have equal importance in the determination of government debt accumulation over the period that the paper covered.

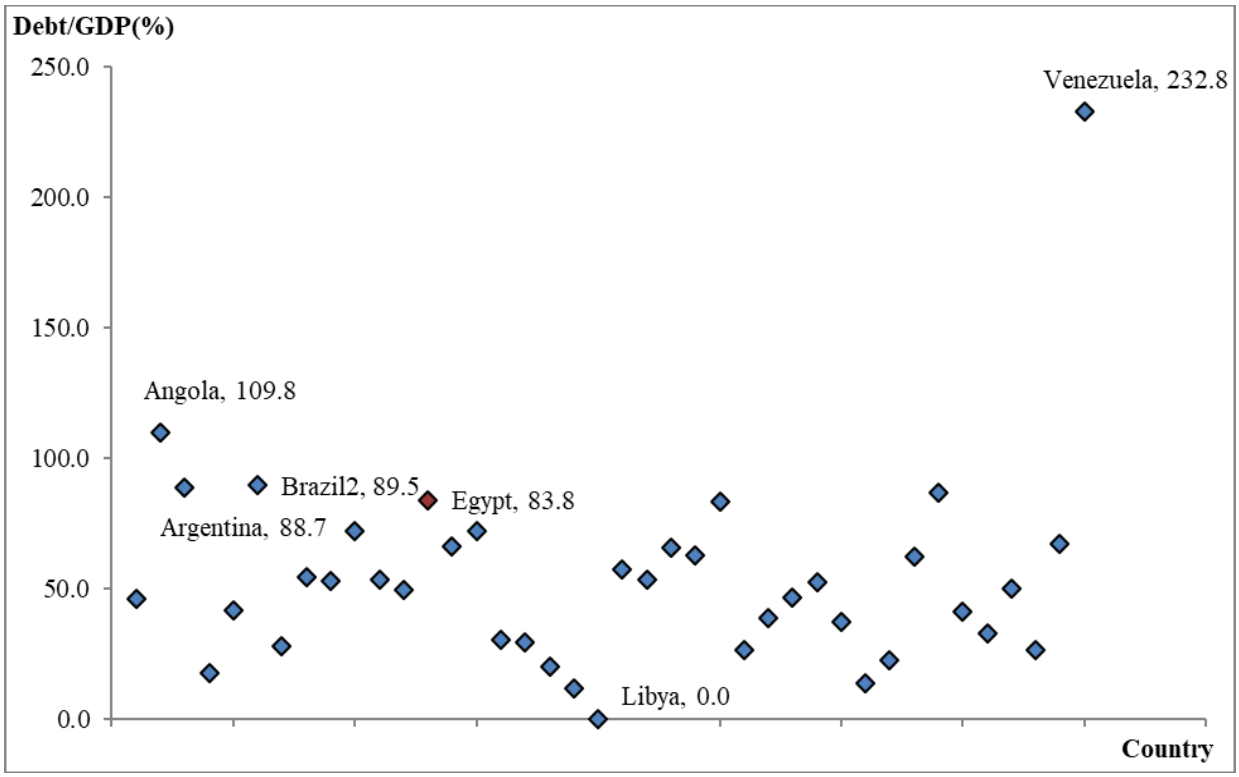
These mentioned studies covered a prior period to the study in our hand, except Alnashar's (2019) study, which monitored an overlapping period with the period covered in this study. However, Alnashar (2019) study was limited to analyzing the factors that influence the debt to GDP ratio, while this study includes a forecast of the debt level as a percentage of GDP for the upcoming five years, from 2020 to 2024.

III. Egypt Government debt: Level, Magnitude, and Structure

a) The level of government debt

Egypt's economic situation has improved significantly after applying the economic reform program that was launched in 2016. The macroeconomic reforms have promoted growth and narrowed the overall deficit, putting public debt on a declining pass (International Monetary Fund [IMF], 2019). However, Egypt's public debt level as a percentage of GDP in 2019, compared to the emerging market and middle-income economies, is still high. This could be seen clearly from the figure (1):

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Source: IMF, Fiscal Monitor, IMF, April 2020

Figure (1): Egypt general government debt compared to the other middle-income economies

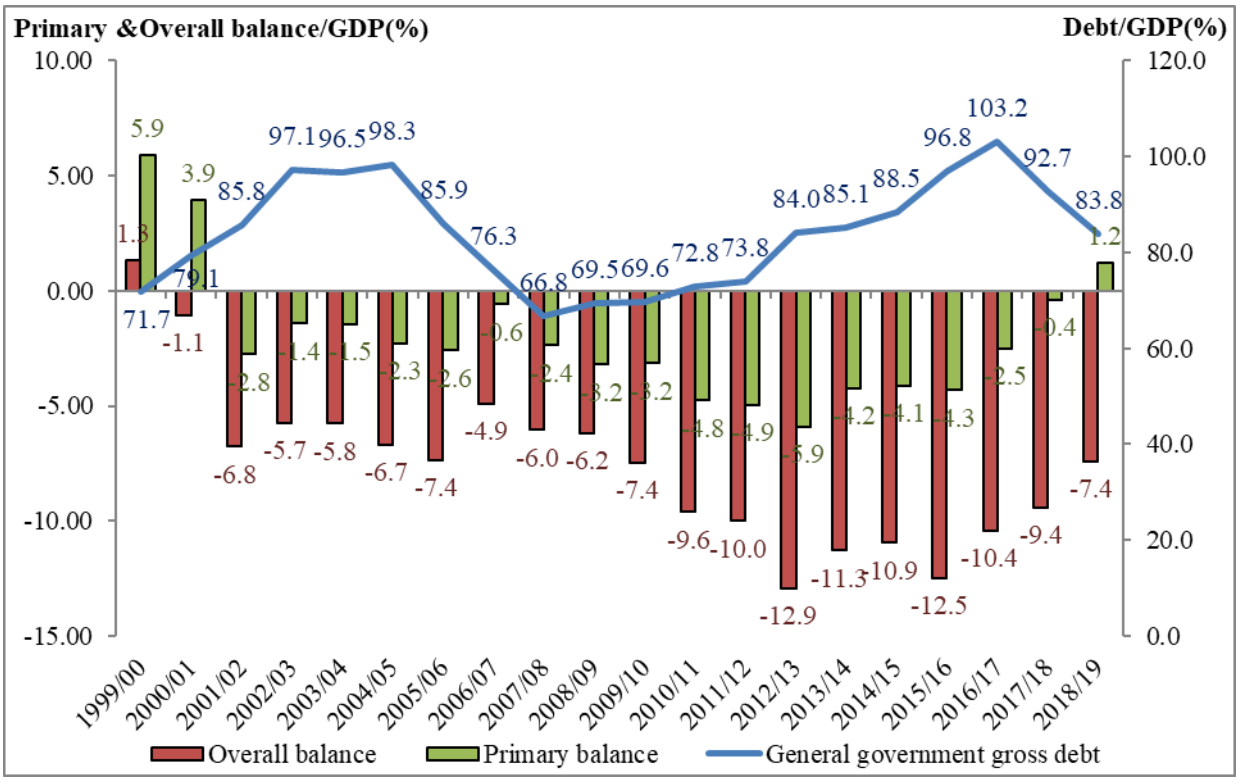
From figure (1), we could see that Egypt is one of those countries which has the highest debt to GDP ratio in the middle-income countries group by 83.8% after Venezuela the Southern American Country which remains in a deep political and economic crisis (Congressional Research Service [CRS], 2020), Angola, the African country that was affected hardly by the long decline in international oil prices (IMF, 2019), Brazil, which experienced notable fiscal deterioration from 2014 to 2017 (Holland, 2019), and Argentina that is grappling with a sharp economic crisis and has a long history of defaulting external debt (CRS, 2020).

b) Egypt general government debt magnitude

Egypt experienced a cycle of public debt accumulation over the past decades. At the end of the fiscal year 2018/19, Egypt government public debt was reported as 83.8% of GDP, 78.6% in domestic currency, and approximately 21.4% in foreign currency.

Public debtis linked to the deficit, and rising public debt could be a consequence of persistent fiscal deficit, since fiscal deficit needs to be financed through debt. Over time, the growth in public debt burden puts additional pressure on the fiscal accounts through the increase in interest payment components, which may lead to a deficit-debt spiral with adverse implications on fiscal stability and economic growth balance to service it (Alba et al., 2004).

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Source: IMF, World Economic Outlook Database, IMF, October 2019
IMF, Fiscal Monitor, IMF, April 2020

Figure (2): Egypt general government debt and overall and primary balance (1999/00 - 2018/19)

Figure (2) shows the level of general government debt, overall and primary balance, as a percentage of GDP over the last two decades. The figure clearly shows that general government debt is correlated to primary and overall balance and that the overall balance has a direct impact on the amount of the debt.

Furthermore, the average of Egypt general government debt over the last two decades was 84.5% of GDP, and reached its peak at the end of fiscal year 2016/17, registering 103.2% of GDP. On the other hand, overall and primary balance registered their maximum deficit by 12.9% and 5.9% of GDP, respectively, by the end of the fiscal year 2012/13 over the monitored two decades.

The Egyptian economy faced adverse conditions at the beginning of the 21st century. Due to the exacerbation of the 11th of September attacks, the region's security problems and world economic slowdown, which resulted in a drop in public revenues and a slowdown in growth (African Development Bank/Organization for Economic Cooperation and Development [AfDB/OECD], 2003). Also, the Central Bank of Egypt (CBE) announced the float of the Egyptian pound (Selim, 2010). As a result of all these events, Egypt's general government debt reached its peak in the first decade of the 21th century registering 98.3% at the end of fiscal year 2004/05. During that period, the government carried several of fiscal and structural reforms. Many laws were introduced, including the new income tax law no. 91 of 2005.The subsidized fuel price was raised twice in 2004 and 2006, and the electricity price increased in 2004. The pace of privatization was accelerated. Also, the government made the economy more open, increased the role of the private sector, and launched a comprehensive reform plan for the financial sector (Alissa, 2007). Those reforms had a positive result, including higher growth rates and a remarkable increase in the inward foreign direct investments. All these mentioned developments have resulted in a decline of the government debt to GDP ratio to reach its' lowest point over the whole monitored period in the end fiscal year 2007/08, registering 66.8%.

Since the fiscal year 2008/09, the general government debt as a ratio to GDP has started to grow gradually, impacted by the consequence of the global financial crisis, and the government, fiscal stimulus package, to counter its' negative impact. This was followed by the economic downturn that Egypt has gone through within the period of political and social instability that has taken place after the 25th of January revolution (Alnashar, 2019) and led to the peak of Egypt government debt as a ratio of GDP in 2016/17.

Since Egypt's adoption of the economic reform program in November 2016, the macroeconomic

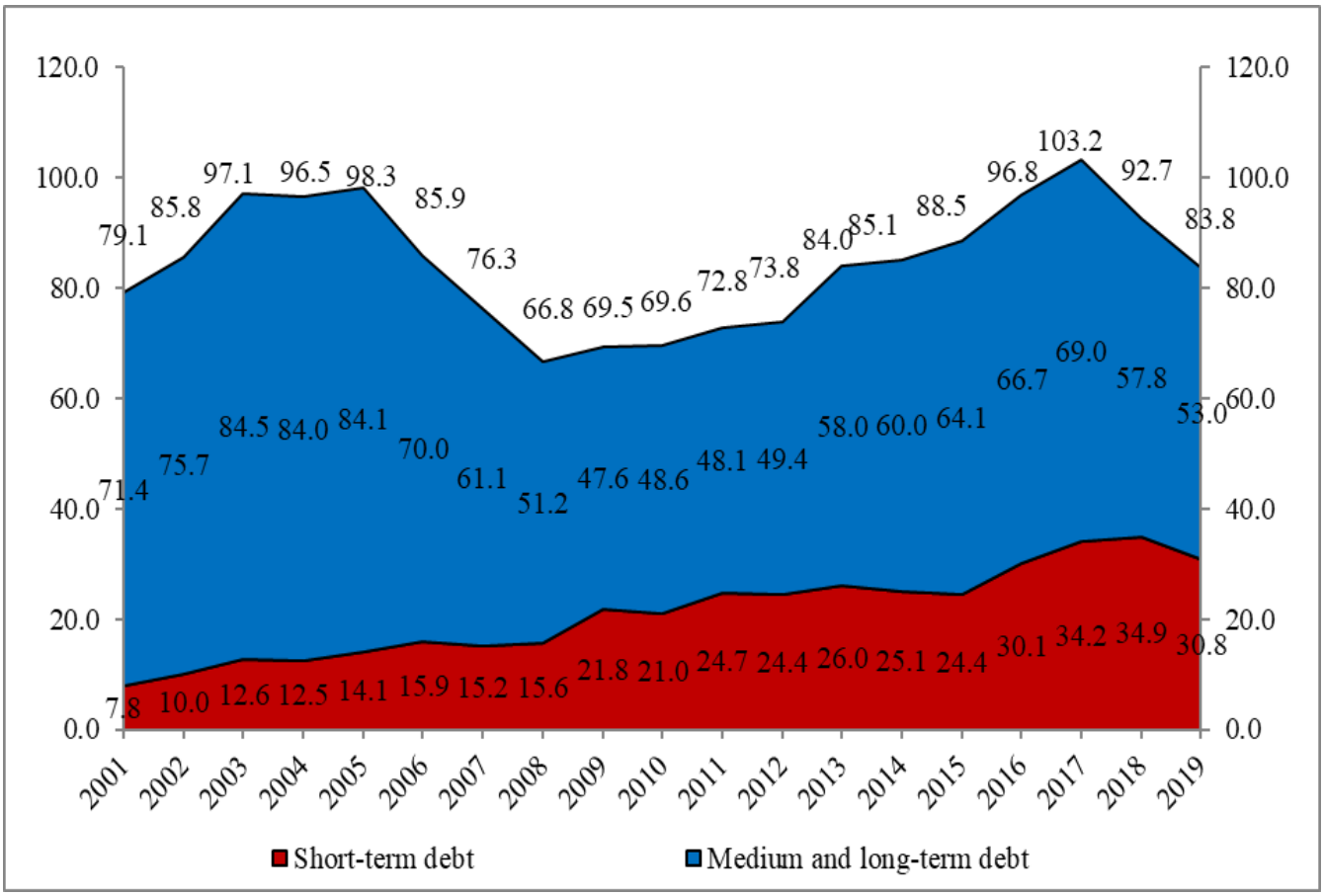
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situation has improved significantly; where the GDP has returned to its strong growth, and the overall balance has shrunk to a single digit, while the primary balance has turned to a positive amount (IMF, 2019). All these evolutions have put the general government debt as a ratio to GDP in a down turn pass to record 83.8% at the end of the fiscal year 2018/19.

c) Egypt General Government Debt Structure

This section reviews the structure of Egypt's general government debt according to two criteria: First, according to the debt maturity, and second, according to the currency of debt.

Figure (3) shows the structure of Egypt's general government debt based on maturity. Where Treasury bills are classified as short term debt, all other types of debt are classified as long term. From figure (3), we could note that the short term debt has grown steadily over the monitored period from 7.8% of GDP in 2001 to its' highest ratio in 2018 to record 34.9% of GDP. This ratio decreased in 2019 to represent 30.8% of GDP.



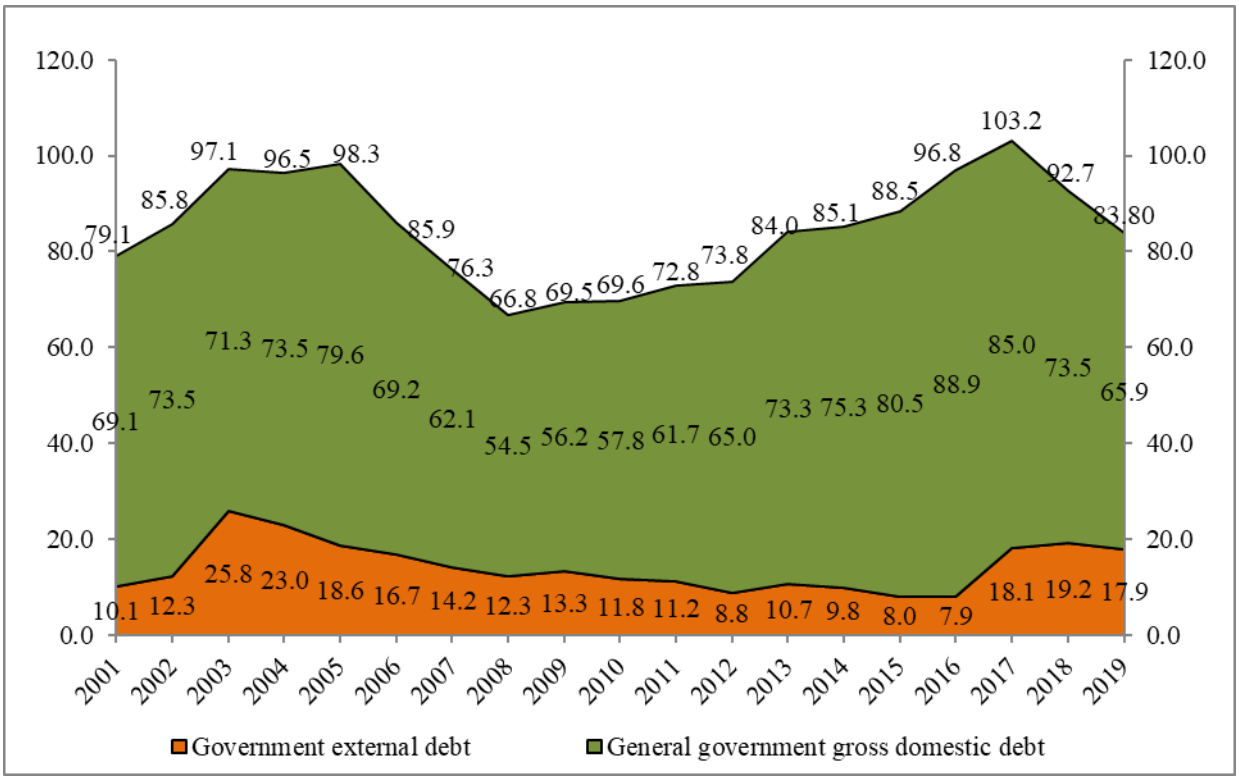
Source: Arab Republic of Egypt Ministry of Finance, The Financial Monthly Bulletin Central Bank of Egypt, Monthly Statistical Bulletin

Figure (3): Egypt general government debt by maturity (2001 – 2019)

Figure (4) shows the structure of general governmentdebt based on its' currency. Debt in foreign currency is classified as government external debt. From figure (4), we could note that the external debt over the monitored period has witnessed two episodes of spikes in 2003 and 2017 after the two times devaluation in 2003 and 2016.

The figure shows that government external debt has grown from 10.1% of GDP in 2001 to 25.8% of GDP in 2003 due to the Egyptian pound devaluation in January 2003. After that, the government external debt started to decrease steadily to reach its' lowest point in 2016. As a result of the second Egyptian Pound devaluation in November 2016 and the increase of external borrowing from the international financial institutions and international bond issuances, the government external debt increased to 18.1% and 19.2% of GDP in 2017 and 2018, respectively, then it started to decrease in 2019 to reach 17.9% of the GDP.

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Source: Arab Republic of Egypt Ministry of Finance, The Financial Monthly Bulletin
Central Bank of Egypt, Monthly Statistical Bulletin

Figure (4): Egypt general government debt classified by currency (2001 – 2019)

IV. The Dynamic of Egypt Government Debt

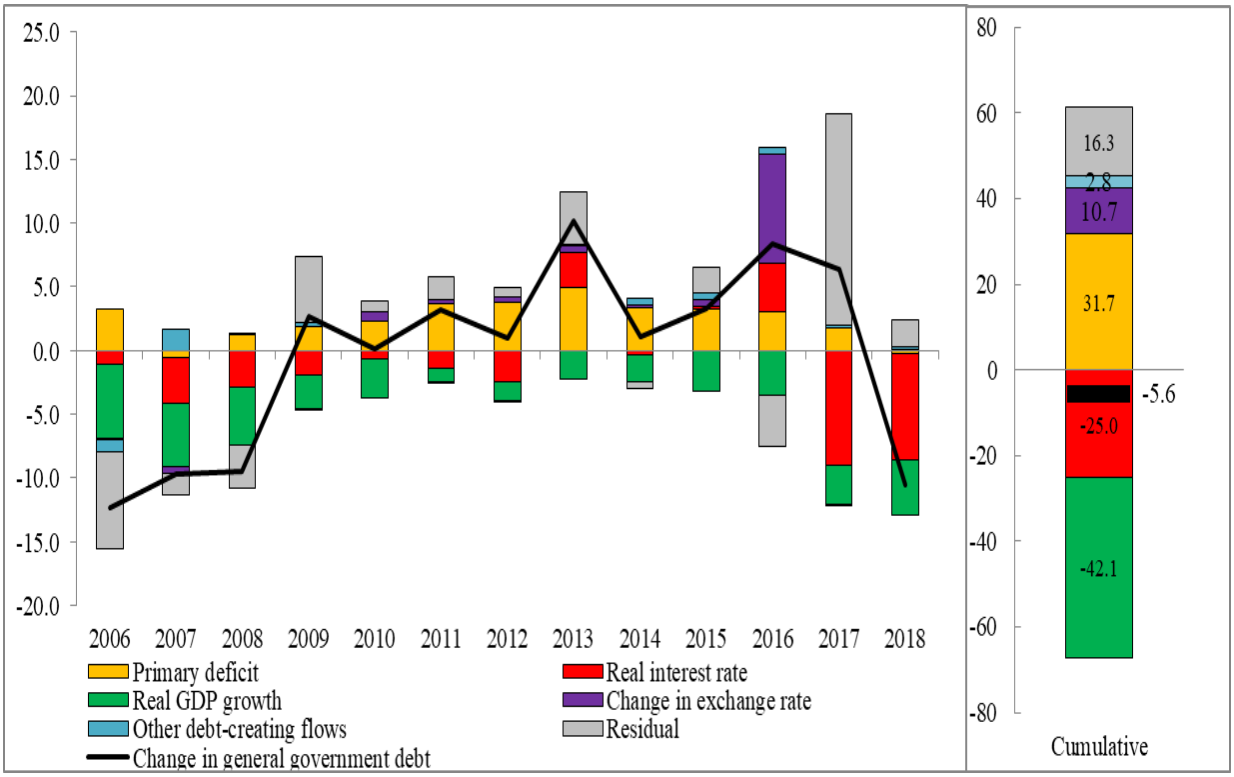
This part will investigate Egypt's general government debt drivers by using the International Monetary Fund tool for debt sustainability analysis for market access countries. It is the same tool that was used by Alnashar in her study (Alnashar, 2019).

The debt sustainability analysis tool for market access countries identifies the main drivers for the change in general government public debt, such as, primary balance, real GDP growth, real interest rate, exchange rate, other debt creating flows, and residuals. Due to the lack of data required for applying the analysis for the whole monitored period, the analysis is applied only in the period from 2005 till 2018.

Figure (5) and table (1) depict that general government debt as a percentage of GDP has decreased from 2005 till 2018 by 5.6%, as real GDP growth and real interest rate have contributed to the decrease of debt accumulation by 42.1% and 25%, respectively. On the other hand, primary balance, change in the exchange rate, other debt-creating flows, and the residual has resulted in the elevating of debt by 31.7 %, 10.7%, 2.8%, and 16.3%, respectively.

Also, it's also clear that debt as a percentage to GDP was decreasing steadily from 2005 till 2008 as a result of the strong real GDP growth over that period, the negative real interest rate, the appreciation in the national currency, and the contribution of unidentified items which brought down the general government debt ratio to GDP. Additionally, the contribution of primary balance and the other debt-creating flows was fickle.

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Source: International Moneatry Fund, World Economic Outlook, IMF, October 2019 Arab Republic of Egypt Ministry of Finance, The Financial Monthly Bulletin. Central Bank of Egypt, Monthly Statistical Bulletin

Figure (5): Contribution to changes in general government debt to GDP (2006 – 2018)

Over the period from 2009 to 2017, the general government debt as a percentage of GDP has started to grow rapidly from 69.5% to 103.2%. The main driver for that increase was the primary deficit, which recorded 3.1% on average, then the residual by 3%, the change in exchange rate by 1.2%, and the other debt-creating flows by 0.2% on average during the same period.

Over the same period, real GDP growth and real interest rate have mitigated the increase in the general government debt as a percentage of GDP since they contributed negatively by 2.5% and 1%, respectively.

It's important to mention that the other debt-creating flows, especially in the period from 2006 to 2008, includes the effect of privatization, while below the line transactions represent a considerable part of the residual. (Alnashar, 2019)

Table (1): Contribution to changes in general government debt to GDP (2006 – 2018)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Genreral government debt	85.9	76.3	66.8	69.5	69.6	72.8	73.8	84.0	85.1	88.5	96.8	103.2	92.7
Change in general government debt	-12.3	-9.7	-9.5	2.7	0.1	3.2	1.0	10.2	1.1	3.3	8.4	6.3	-10.5
Primary balance	3.2	-0.6	1.2	1.9	2.3	3.7	3.8	4.9	3.4	3.2	3.1	1.7	-0.2
Real Interest rate	-1.1	-3.5	-2.9	-1.9	-0.7	-1.4	-2.5	2.7	-0.4	0.2	3.8	-9.0	-8.3
Real GDP growth	-5.9	-5.1	-4.5	-2.7	-3.1	-1.1	-1.4	-2.2	-2.1	-3.2	-3.5	-3.1	-4.3
Exchange rate	-0.1	-0.5	0.0	-0.1	0.7	0.3	0.3	0.6	0.2	0.6	8.6	-0.1	0.1
Other debt-creating flowes	-0.9	1.6	0.0	0.3	0.0	-0.1	0.0	0.1	0.5	0.5	0.5	0.2	0.2
Residual	-7.6	-1.6	-3.3	5.1	0.9	1.9	0.7	4.1	-0.5	2.1	-4.1	16.6	2.1

Source: Author Calculation by using IMF DSA for MAC

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V. Empirical Analysis for Egypt General Government debt Drivers

Based on the economic theory and previous studies, this section investigates the main drivers for the accumulation of Egypt's general government debt over the period from 1999 to 2018.

a) Choice of Variables

To empirically examine the main drivers for general government debt accumulation, the analysis includes five variables: general government debt/GDP, Gross domestic product at constant prices, General government primary balance, Egyptian Pound Exchange rate, and Treasury bills rate used as a proxy for the interest rate.

The world economic outlook (WEO), published by the IMF in October 2019, is the source of data for general government debt/GDP, Gross domestic product at constant prices, and General government primary balance, while the IMF International Financial Statistics (IFS) is the source of Egyptian Pound Exchange rate and Treasury bills rate.

b) Determination of the Stationarity of Data

The Augmented Dickey-Fuller (ADF) unit root test was used to test the stationarity status for time series variables after transforming the variables to their natural logs except for the interest rate. The test illustrated that all variables are not stationary except for the debt/GDP.

Therefore, I took the first difference for all other variables to become stationary. The results of the ADF test are presented in table (2):

Table (2): Augmented Dickey-Fuller (ADF) Unit Root Tests (1999 – 2018)

Variables	ADF	
	At level	At first difference
Log (D_t)	-3.861990*	-
Log (g)	-1.320759	-3.164164*
Log (pb)	-2.283031	-5.129596*
Log (ex)	2.349185	-2.563357*
R	2.180813	-4.447022*

Source: Author Calculations
** Indicates stationarity at 1%*

c) Model

To estimate the contribution of different variables to general government debt/GDP over the monitored period, I used the following Multiple Regression Model:

$$\ln (D_t) = C + \beta_1 \ln (D_{t-1}) - \beta_2 \Delta \ln (g) - \beta_3 \Delta \ln (pb) + \beta_4 \Delta \ln (ex) - \beta_5 \Delta (r) + e_t$$

Where:
D: General government debt/GDP
g: Gross domestic product at constant prices
pb: General government primary net lending/borrowing
ex: Egyptian Pound Exchange rate
r: Treasury Bill Rate

Table (3): Parameter Estimates of the Multiple Regression Model (2000 – 2019)

Dependent Variable: ln (D)
Method: Least Squares
Sample (adjusted): 2000 2019
Included observations: 20 after adjustments

Variable	Coefficient	Standard Error	t-Statistic	p-value
Constant	0.639358	0.281043	2.274949	0.0392
D_{t-1}	0.880180	0.065757	13.38530	0.0000
G	-3.023533	0.629119	-4.805981	0.0003
Pb	-0.021587	0.007475	-2.887821	0.0119
Ex	0.408857	0.081334	5.026870	0.0002
R	-0.012420	0.005950	-2.087190	0.0556*
R-squared	0.950924	Mean dependent var		4.420714
Adjusted R-squared	0.933396	S.D. dependent var		0.133410
S.E. of regression	0.034430	Akaike info criterion		-3.656451
Sum squared resid	0.016596	Schwarz criterion		-3.357731
Log likelihood	42.56451	Hannan-Quinn criter.		-3.598137

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F-statistic	54.25400	Durbin-Watson stat	1.926747
Prob(F-statistic)	0.000000		

Source: Author Calculations

Table (3) reports the parameter estimates for the multiple regression with general government debt as a percentage of GDP as the dependent variable. The coefficients of all variables have the expected sign and are statistically significant; only the interest rate is significant at 10%.

So, the estimated model will be as follows:

$$\ln (D_t) = 0.64 + 0.88 \ln (D_{t-1}) - 3.02\Delta\ln (g) - 0.02\Delta\ln (pb) + 0.41\Delta\ln (ex) - 0.01\Delta(r) + e_t$$

The model shows that the increase in last year's debt to GDP ratio by 1% increases the current year debt by 0.88%. Also, the increase in GDP growth by 1% decreases the debt to GDP ratio by 3%. Furthermore, the increase in the primary balance surplus by 1% decreases the debt to GDP ratio by 0.02%. On the other hand, the depreciation in Egyptian Pound by 1% increases the debt to GDP ratio by 0.41%, whereas the increase in interest rate by 1% decreases the debt to GDP ratio by 1.2%; this attributed to the fact that real interest rates are often negative in Egypt. The previous debt dynamic analysis supports the findings of the model, especially the relation between the debt/GDP ratio and real interest rate.

VI. Forecast Egypt General Government Debt

To forecast the general government debt ratio to GDP over the medium term for the period from 2020 till 2024,I used the same multiple regression model that was used to estimate the drivers after expending the model data to 2024.

As in the previous model, the world economic outlook (WEO), published by the IMF in October 2019, was the source of forecasted data for general government debt/GDP, Gross domestic product at constant prices, and General government primary balance. Furthermore, the Economist Intelligence Unit report about Egypt, generated in the 26th of August 2019, was the source of the forecasted exchange rate and interest rate for the period from 2020 to 2023, while the 2024 forecasted value was calculated as the average of values from 2020 to 2023. (Economist Intelligence Unit, 2019)

The ADF test is used to check the stationarity of all variables that were transformed to their natural logs. The test indicated that all variables are not stationary except for the debt/GDP. Table (4) presents the stationarity of the variables at the level and first difference:

Table (4): Augmented Dickey-Fuller (ADF) Unit Root Tests (1999 – 2023)

Variables	ADF	
	At level	At first difference
Log (D_t)	-3.857319*	-
Log (g)	0.194187	-3.432872*
Log (pb)	-2.004968	-5.787225*
Log (ex)	-0.826175	-3.311840*
R	-1.939085	-4.024314*

Source: Author Calculations

** Indicates that the variable is stationary at 1%.*

Table (5), reports the parameter estimates for the multiple regression with general government debt as a percentage of GDP as the dependent variable. The coefficients of all variables have the expected sign and are statistically significant; only the interest rate is significant at 10%.

The estimated model is as follows:

$$\ln (D_t) = 0.77 + 0.84 \ln (D_{t-1}) - 1.91\Delta\ln (g) - 0.02\Delta\ln (pb) + 0.44\Delta\ln (ex) - 0.01\Delta(r) + e_t$$

The model shows that the increase in last year's debt to GDP ratio by 1% increases the current year debt by 0.84%. Also, the increase in GDP growth by 1% decreases the debt to GDP ratio by 1.91%. Furthermore, the increase in the primary balance surplus by 1% decreases the debt to GDP ratio by 0.02%. On the other hand, the depreciation in Egyptian Pound by 1% increases the debt to GDP ratio by 0.44%. In contrast, the increase in interest rate by 1% decreases the debt to GDP ratio by 1.02%.

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Table (5): Parameter Estimates of the Multiple Regression Model (2000 – 2024)

Dependent Variable: ln (D)
Method: Least Squares
Sample (adjusted): 2000 2024
Included observations: 25 after adjustments

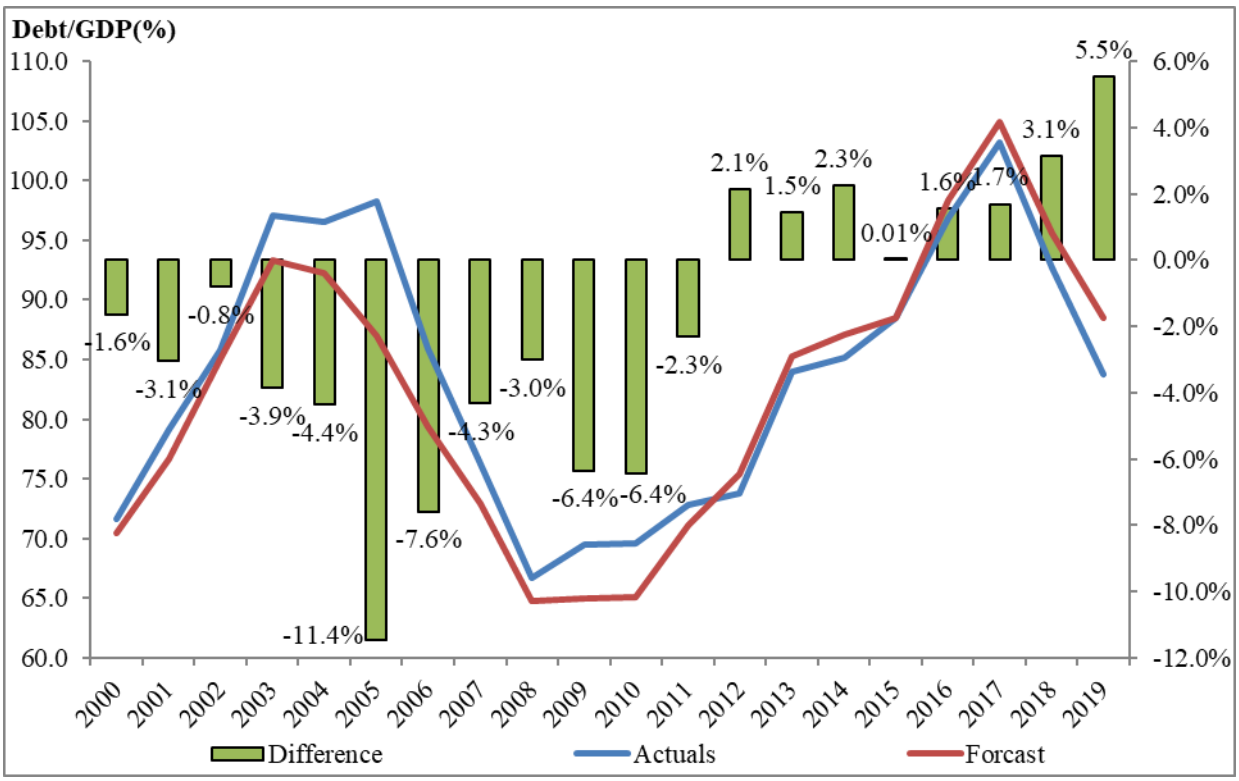
Variable	Coefficient	Standard Error	t-Statistic	p-value
Constant	0.769226	0.288493	2.666354	0.0153
D_{t-1}	0.838553	0.066579	12.59478	0.0000
G	-1.908235	0.486295	-3.924023	0.0009
Pb	-0.023494	0.007854	-2.991520	0.0075
Ex	0.444235	0.083026	5.350561	0.0000
R	-0.010211	0.005778	-1.767169	0.0933*
R-squared	0.931091	Mean dependent var		4.407326
Adjusted R-squared	0.912958	S.D. dependent var		0.124435
S.E. of regression	0.036712	Akaike info criterion		-3.565857
Sum squared resid	0.025608	Schwarz criterion		-3.273326
Log likelihood	50.57321	Hannan-Quinn criter.		-3.484721
F-statistic	51.34556	Durbin-Watson stat		1.803196
Prob(F-statistic)	0.000000			

Source: Author Calculations

Figure (6) depicts the actual and forecasted debt to GDP ratio for the period from 2000 to 2019.

According to figure (6), the model provides a reasonably acceptable forecast for the general government debt as a percentage of GDP over the monitored period. The average difference over the 20 monitored years is -1.9%; the highest difference registered in 2005 is -11.4% from the actual, and the lowest difference registered in 2015 is 0.01% from the actual.

It's important to mention that the model forecast shows a better result over the second-decade data since the average difference between the actuals and forecast decreased to 1.7% over the period from 2011 to 2019. Also, the highest difference decreased to 5.5% in 2019, and the lowest difference was in 2015.



Source: International Moneatry Fund, World Economic Outlook, IMF, October 2019
Author Calculations

Figure (6): Egypt general government debt to GDP forecast 2020 to 2024

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The model is also used to forecast the government debt as a percentage of GDP for the period from 2020 to 2024, under different scenarios. Table (5) shows the assumption for these scenarios.

Table (6): Description of various scenarios for debt forecasting from 2020 to 2024

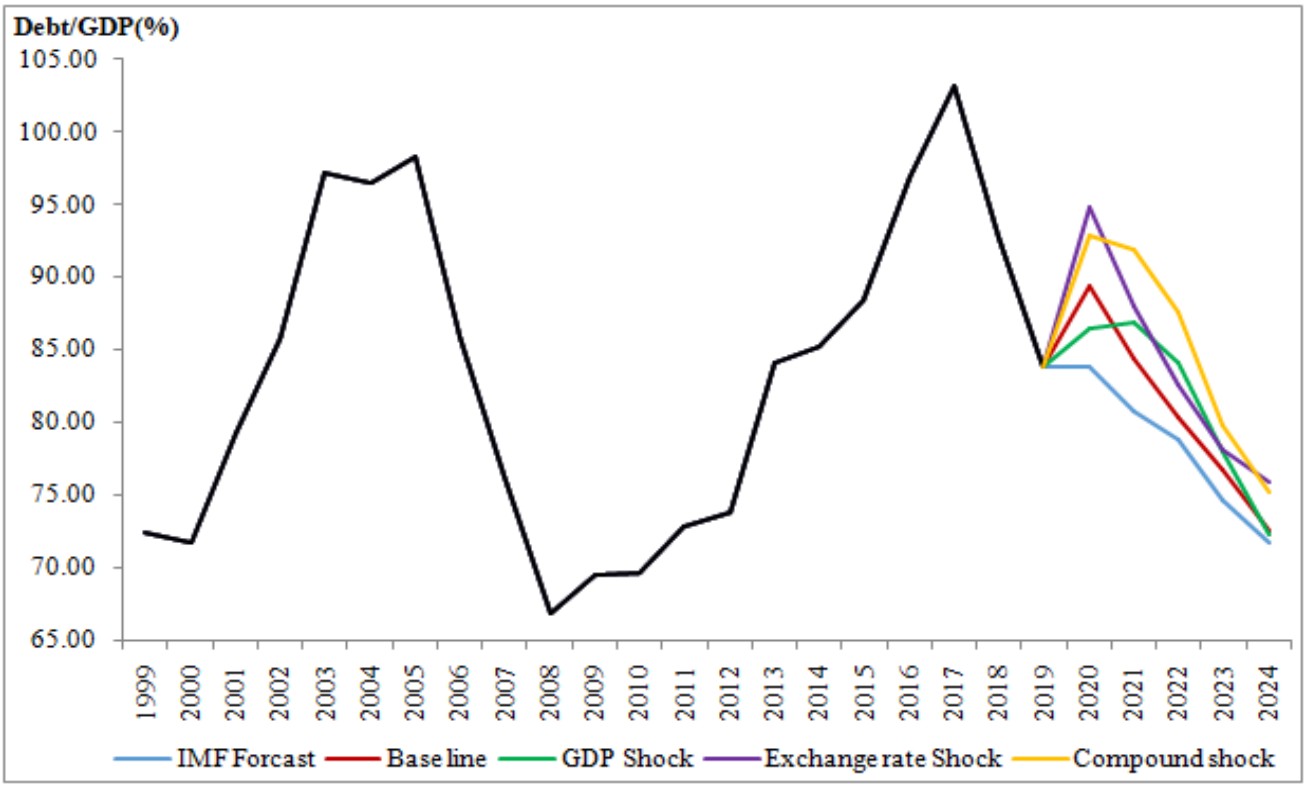
Scenario	Description
IMF Forecast	Represents the IMF forecast presented in world economic outlook (WEO) for October 2019.
Baseline	Represents the forecast based on the previously mentioned model specification.
GDP Shock	Represents the forecast under GDP shock scenario. The scenario assumes that the GDP growth will slow down to only 2% in 2020, and recover gradually to be 2.8%, 3.7%, 4.6%, and 5.5%, respectively, from 2021 to 2024.
Exchange rate Shock	Represents the forecast under Exchange rate shock scenario. The scenario assumes that the Exchange rate will depreciate by 70% in 2020 and recover gradually by 5% from 2021 to 2024.
Compound Shock	Represents the forecast under a compound shock; the GDP shock and Exchange rate shock.

Figure (6) and table (6) show the forecast of the different scenarios over the period from 2020 to 2024. The level of general government debt as a percentage of GDP is expected to exceed the IMF forecast over the whole forecasted period and under the different scenarios.

Table (7): Egypt general government debt to GDP forecast (2020 - 2024)

Year	IMF Forecast	Base line	GDP Shock	Exchange rate Shock	Compound Shock
2020	83.80	89.39	86.42	94.82	92.83
2021	80.68	84.35	86.88	87.91	91.82
2022	78.73	80.28	84.08	82.51	87.49
2023	74.59	76.74	78.02	78.03	79.82
2024	71.65	72.56	72.25	75.90	75.18

Source: Author Calculations



Source: International Moneatry Fund, World Economic Outlook, IMF, October 2019
Author Calculations

Figure (7): Egypt general government debt to GDP forecast from 2020 to 2024

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Even though the general government debt as a percentage of GDP is expected to spike in 2020 under different scenarios, it's also expected to decrease gradually over the following four years to return to its down turn pass.

The compound shock scenario is expected to have the most severe effect on the general government debt as a percentage of GDP, followed by the Exchange rate shock and the GDP shock, respectively.

VII. Conclusion and Policy Recommendations

The paper used two approaches to identify the main drivers that influence Egypt's general government debt level as a percentage of GDP. The first approach is the IMF tool for debt sustainability analysis that is applied over the period from 2005 to 2018. The results indicate that the factors that lead to an increase in the debt level are primary balance, the residuals, the change in the exchange rate, and other debt creating flows, respectively. On the other hand, the factors that lead to a descending in the debt level are real GDP growth and interest rate, respectively.

The second approach is a multiple regression model that estimates the effect of these factors on the level of general government debt level as a percentage of GDP over the period from 1999 to 2019. The model results indicate that the stock of debt is the most important factor that elevates the debt level as a percentage of GDP, followed by the exchange rate. Moreover, the factors that scale down the debt level as a percentage of GDP are real GDP growth, interest rate, and primary balance, respectively. These findings correspond to the results of (Alnashar, 2019) study.

Additionally, the paper introduces a forecast for the general government debt level as a percentage of GDP over the medium term for the period from 2020 to 2024. The forecasting model expects that the general government debt as a percentage of GDP is going to spike in 2020 and then decrease gradually in the following four years. The forecast shows that the exchange rate scenario will lead to the highest increase in the debt level, followed by the compound shock. However, compound shock has the most severe effect on the medium term.

This means that Egypt general government debt is still subject to several significant risks, including the exchange rate risk, since the external component of debt is continuing to rise since the launching of the economic reform program in 2016 (WB, 2019), in addition to the rollover risk, as the short term component has grown steadily over the study period (Mossallem, 2017). Furthermore, debt service is still very high and has put a high burden on the budget, in addition to the risk of contingent liabilities, the slowdown of the momentum of reforms, and the decline of economic growth. (IMF, 2018)

Based on the factors that affect Egypt general government debt, the study introduces the following recommendations to policy makers:

1- The government securities market is under developed and needs to be improved to reduce the cost and risk of refinancing. (Mosler et al., 2017)
2- Keeping the momentum of fiscal consolidation through further improvements in tax collection, more control over the increase in the compensations of employees, in addition to keeping the subsidy at the minimum.
3- Initiating negotiations with financial institutions and development partners to consider debt relief arrangements and swapping part of the debt to development projects. (Massoud, 2014)
4- Since a considerable part of government, debt is held by the central bank, applying a zero interest on this debt may have a positive impact on the government's fiscal position.
5- Reducing public sector debt through swapping governments' equity in some public enterprises and state-owned companies with debt owed by social Insurance Fund, banking sector, and National investment bank. (Abdu, 2019)

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Utilisation Des TIC et Performance Des IMF au Cameroun

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Abstract- The objective of this study is to analyze the effect of the adoption of ICT on the MFI performance in Cameroon. To achieve this objective, we used a hypothetic-deductive method. A questionnaire carried out amongst a sample of 107 MFI in Cameroon has permitted to collect data which were analyzed using SPSS 20 software. The results of ANOVA tests firstly show that MFI performance depends on their level of adoption of ICT, and secondly that the performance of MFI increases even more when the adoption of ICT is accompanied with organizational changes such as the training of employee on the use of ICT and the restructuring of the enterprise after adopting ICT.

Keywords: *performance - degree of adoption – ICT - MFI.*

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Utilisation Des TIC et Performance Des IMF au Cameroun

Lemadjio Marlyse α & Imelé Tsafack Stephanie Julienne σ

Résumé- **L'objectif de cette étude est d'analyser l'effet de l'adoption des TIC sur la performance des IMF au Cameroun. Pour ce faire, une démarche hypothético-déductive a été empruntée. Une enquête par questionnaire menée auprès d'un échantillon de 107 IMF au Cameroun a permis de collecter des données qui ont été analysées avec le logiciel SPSS 20.Les résultats des tests de l'ANOVA montrent premièrement que la performance des IMF dépend de leur niveau d'adoption des TIC et deuxièmement, que la performance des IMF s'améliore lorsque l'adoption des TIC est accompagnée des changements organisationnels tels que la formation des employés à l'usage des TIC et la restructuration de l'entreprise après adoption d'une TIC.**

Motsclés: performance - niveau d'adoption – TIC - IMF.

Abstract- **The objective of this study is to analyze the effect of the adoption of ICT on the MFI performance in Cameroon. To achieve this objective, we used a hypothetic-deductive method. A questionnaire carried out amongst a sample of 107 MFI in Cameroon has permitted to collect data which were analyzed using SPSS 20 software. The results of ANOVA tests firstly show that MFI performance depends on their level of adoption of ICT, and secondly that the performance of MFI increases even more when the adoption of ICT is accompanied with organizational changes such as the training of employee on the use of ICT and the restructuring of the enterprise after adopting ICT.**

Keywords: performance - degree of adoption – ICT - MFI.

I. Introduction

Dès le début du XXI[ème] siècle, l'accélération et la généralisation d'adoption des TIC[1] va être l'un des faits marquants les plus impressionnants. Précédemment désignées par le vocable NTIC[2], les TIC constituent l'ensemble des techniques utilisées dans le traitement et la transmission des informations, principalement de l'audiovisuel, de l'informatique, et des télécommunications (Poullard, 2000). Dans les pays développés ainsi que dans les pays émergents et en voie de développement, ces outils se sont imposées comme l'un des principaux vecteurs de l'activité économique et sociale en donnant la possibilité à un nombre croissant de personnes d'être connectées. À ce sujet, le rapport de l'UIT[3] de fin 2012, révèle que les nouvelles technologies au cours de ces dernières années ont continué à se développer de manière constante à travers le monde, comme en témoigne la progression de tous les indicateurs clés. Ces indicateurs clés sont : le nombre de foyers ayant accès à l'Internet, le nombre d'abonnés à large bande mobile et fixe, nombre d'abonnés à la téléphonie fixe et mobile, etc. Bien que le développement des TIC soit réel dans tous les secteurs d'activité, leur utilisation reste inégale entre pays développés et pays en développement (Abdenour et Matouk, 2014). Comme le montre le rapport de l'UIT (2012)[4], dans de nombreux pays, notamment ceux en voie de développement, on assiste encore à la persistance d'inégalités d'usages des TIC. À titre illustratif, dans les pays en voie de dével oppementle nombre d'abonnés à la large bande fixe (Internet haut débit) est de 5 pour 100 habitants tandis celui des pays développés est de 25 pour 100 habitants[5].En dépit des inégalités d'utilisation des TIC entre pays développés et pays en développement, tous les secteurs de l'économie ont connu des changements importants dans les processus de production et de distribution des biens et services par suite de l'adoption croissante de ces nouvelles technologies. Cependant, selon l'OCDE (2003), le secteur des services financiers est le secteur le plus susceptible d'utiliser les technologies de réseau et aussi celui le plus susceptible d'utiliser les combinaisons de différentes technologies de réseau. Cela montre que les entreprises de ce secteur à l'instar des Institutions de Microfinance (IMF ou EMF pour la suite) sont de gros consommateurs d'informations et qu'ils sont donc potentiellement les plus à même de tirer parti des profits générés par l'utilisation des TIC (Maliranta et Rouviren, 2004).

L'utilisation des TIC dans les transactions financières pour améliorer les performances est un fait réel pour l'ensemble des opérateurs du secteur de la microfinance. En effet, le recours aux TIC par les établissements financiers leurs permet de réaliser efficacement et rapidement plusieurs tâches tels que le traitement centralisé des transactions effectuées par les succursales, le traitement des demandes d'emprunt, l'exploitation des guichets automatiques et la gestion

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[1] TIC signifie Technologies de l'Information et de la Communication.
[2] NTIC signifie Nouvelles Technologies de l'Information et de la Communication.
[3] L'Union Internationale de Télécommunications a pour objectifs d'établir des données concernant le secteur des télécommunications dans le monde. Il est considérée comme la principale source d'informations sur la normalisation, la réglementation et la technologie des télécommunications (voir UIT, « Une société de l'information pour tous – le rôle de la statistique dans la réalisation de cet objectif, 2003).
[4] Voir UIT(2012) "Mesurer la société de l'information".
[5] Ces chiffres proviennent du rapport de l'UIT (2012).

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des transferts de fonds électroniques. Le CGAP (2004) précise également que les TIC peuvent aider les EMF à améliorer leur efficacité, avoir plus d'exactitude dans les opérations financières, augmenter la transparence et atteindre de nouveaux clients. Dans un tel contexte, l'intégration des microfinances dans ce vaste réseau devient une solution pour réduire et surpasser les difficultés dont ils font face dans leurs activités quotidiennes, et par conséquent améliorer leurs performances (CGAP, 2004).

Compte tenu de l'importance de l'utilisation des TIC dans les transactions financières, il importe dans la présente étude de s'interroger sur l'effet de l'adoption de ces outils sur la performance des IMF au Cameroun. Missaoui (2011) entend par "adoption des TIC", l'acquisition, l'implantation réussie et l'utilisation de ces outils par l'entreprise. Pour nous, le terme «adoption des TIC» est employé pour désigner *la décision d'utiliser une TIC* et son achat subséquent. De ce fait, nous considérons les termes «adoption des TIC » et «utilisation des TIC» comme synonymes dans ce développement. Les termes «TIC», ou «NTIC», considérés comme des synonymes dans ce développement désignent les technologies dites de première génération (téléphone fixe) ou celles dites de nouvelles génération (téléphone mobile, ordinateur, intranet, Internet, etc.). Cette précision faite sur les trois concepts principaux de notre étude éviterait toute confusion ou autres débats scientifiques liés à ces termes principaux : adoption, utilisation, et TIC.

La question du lien entre les TIC et la performance des entreprises n'est pas nouvelle car ellea longtemps fait l'objet de plusieurs débats mitigés. Ce questionnement a été vulgarisé par le paradoxe de productivité des TIC énoncé par Solow (1987): «*On voit les ordinateurs partout sauf dans les statistiques de la productivité*»[6]. En effet en ce qui concerne le lien entre les TIC et la performance d'entreprise, plusieursétudes, réalisées aussi bien dans les pays développés (Brynjolfsson et Hitt, 2000; Balwin et Sabourin, 2002; Baldwin et al., 2004; Leforestier, 2006; Becalli 2007, etc.) que ceux en voie de développement (Massaoui, 2011; Gnansounou, 2010 ; Aubert et al., 2009) soulignent un effet positif alors que d'autres se basent sur le concept de paradoxe de productivité et soulignent l'effet négatif de l'adoption des TIC sur la performance. A cause de ces résultats contradictoires et toujours pas généralisables, le paradoxe de la productivité est encore présent dans les esprits, du moins, en ce qui concerne les PED (Pilat, 2004). Au Cameroun, une telle étude dans le domaine des EMF est presque inexistante. Nous avons donc souhaité, après avoir effectué une revue de la littérature approfondie sur ce sujet, réaliser une étude empirique pour examiner l'effet de l'utilisation des TIC sur la performance des EMF camerounaises. C'est pour cette raison quedans le contexte d'un PED, nous tentons de nous positionner dans le débat de la relation TIC et performance en dépassantla posture de lien direct entre les TIC et la performance pour prendre également en compte les variables intermédiaires qui jouent un grand rôle lors de l'adoption d'un TIC. Pour cela, ce travail est structuré en trois sections. La première section est consacrée à la revue de la littérature théorique et empirique sur les points de vue contrastés des deux courants de pensée sur la relation adoption des TIC et performance de l'entreprisse. La deuxième présente le design de recherche utilisée et les résultats sont discutés dans la section trois.

II. Revue de la Litterature Sur L'adoption des tic Dans les Entreprises

L'analyse de la relation entre adoption des TIC et performance des entreprises a fait l'objet de nombreux travaux scientifiques (Follaci, 2005) et cela à tous les niveaux: macro, méso et microéconomique. Afin de ressortir les éléments de littérature sur ces travaux scientifiques, nous allons d'abord dans le premier point de cette section nous consacrer à une présentation des principales approches d'évaluation de la contribution des TIC à la performance des entreprises. Ensuite, la revue de la littérature sera centrée sur les débats scientifiques qui se sont intéressés à la relation TIC et performance des entreprises.

a) L'ancrage théorique

Dans la littérature, divers travaux analysent le lien entre TIC et performance d'entreprise, qui est un sujet de recherche complexe récurrent dans le domaine des SI. Cette complexité apparaît à travers la diversité des cadres théoriques mobilisés dans les différentes contributions. De manière plus précise, trois principaux modèles ou courants ont étudiés tous les trois la relation entre les investissements en TIC et la performance de l'entreprise. Il s'agit des modèles de causalités, des modèles processuels, et des modèles intégrateurs.

b) Les modèles de causalité

Les premiers travaux portant sur l'étude du lien entre les TIC et la performance des entreprises relèvent des modèles causals, impliquant un lien direct entre les TIC et la performance. Le modèle causal cherche à étudier la relation de cause à effet entre les variables indépendantes (telles que les investissements en TIC ou encore les budgets informatiques) et des variables dépendantes (telle que la performance).Ainsi, à la seconde moitié des années quatre-vingt et des années quatre-vingt-dix, plusieurs chercheurs étudient le lien

[6] Il s'agit de l'idée largement répandue aux USA et dans les autres pays développés au cours des années 1980 et 1990 ; idée selon laquelle des investissements accrus dans les TIC ne se traduisaient pas par une amélioration de la productivité (Pilat, 2004).

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entre les investissements en TIC et la performance opérationnelle ou financière. La performance est mesurée de manière quantitative avec par exemple le retour sur investissement, la part de marché ou la productivité (Strassman, 1985). Les résultats de ces études s'avèrent très divers et parfois même contradictoires. C'est ce que l'on appelle « paradoxe de la productivité » ou « paradoxe de Solow », en référence à Solow qui a fait la remarque suivante : *« On voit des ordinateurs partout, sauf dans les statistiques de productivité »*[7].En effet, les études de Robert Solow (1987) ont mis en évidence une corrélation inverse entre les investissements informatiques et la productivité du travail aux États-Unis entre 1973 et 1995. D'une manière générale, les recherches ont par la suite montré qu'il existait une corrélation globalement positive entre les investissements en TIC et la productivité, et malgré les interrogations sur la mesure de la rentabilité, on peut aujourd'hui soutenir que les TIC contribuent tant à la croissance du PIB qu'à l'accroissement de la productivité du travail. C'est la fin du paradoxe de Solow. Dès lors, plusieurs chercheurs, adoptant différentes théories, mettent en œuvre le modèle causal : il s'agit principalement de *théorie économique de production, de la théorie économique de l'information et de la la décision, de la théorie de l'avantage compétitif, et de la théorie du consommateur.*

Pour la théorie économique de production, l'investissement en TIC est considéré comme un « *input* » de la fonction de production de l'entreprise (Raymond, 2002).Cette théorie permet de répondre à la question suivante : la productivité des entreprises peut-elle croitre suite à des investissements en TIC ? Cette théorie suppose que pour un niveau donné d'*output*, l'accroissement des bénéfices sous forme de réduction des coûts de production peut être engendré par la baisse des prix des TIC (Brynjolfson et Hitt, 1996).Il s'agit des travaux qui ont suivi le paradoxe de Solow. L'objet principal de ces travaux est donc d'expliquer les variations dans l'*output* en trouvant la forme de fonction économique qui convient le mieux aux TIC en tant qu'*input.* Dans la recherche en système d'information où il s'agit de relier statistiquement un ensemble de mesures de l'investissement de l'entreprise en TIC à un autre ensemble de mesure de la performance de l'entreprise, ce modèle est très utilisé (Missaoui, 2009).Cependant, pour cette théorie, la performance se limite à l'analyse de la productivité de l'entreprise suite aux investissements en TIC. Selon le type de fonction de production[8] choisi, les données collectées et la définition retenue de la productivité, ces travaux ont abouti à des résultats difficiles à généraliser (Missaoui, 2009).

En intégrant des variables intermédiaires telles que le taux de roulement des stocks, et la mise sur le marché de nouveaux produits, les partisans de la théorie économique de l'information et de la décision examinent le processus par lesquels l'investissement en TIC se transforme en performance. Dans ce cas, plusieurs niveaux d'analyse (l'individu, le groupe, le secteur de l'entreprise, etc.) et différentes dimensions (performance relationnelle, concurrentielle, etc.) permettent d'étudier la performance. La démarche de cette approche consiste en la recherche d'identification d'une forme de la fonction économique qui convient le mieux à expliquer la variance de l'output induit par l'adoption des TIC et ceci à travers l'analyse de la relation entre la productivité et l'investissement réalisé en TIC. L'existence d'une relation positive entre l'amélioration de la productivité et l'investissement réalisé en TIC a été vérifiée dans les résultats de quelques études empiriques (voir Brynjolfsson et Hitt, 1996). Cependant, d'autres travaux empiriques, à l'instar de (Loveman, 1994; Mahmood, 1994; Morrison et Berndt 1990), ont généralement rejeté l'existence d'une telle relation ou du moins, ils ont mis en cause sa robustesse. En effet, pour ces auteurs, la réponse à la question « est ce que les bénéfices attendus en TIC ont été réalisés ? » dépend de la capacité de mise en place d'un modèle orienté processus pour comprendre les impacts des TIC, ainsi d'une approche scientifique pour mesurer les conséquences économiques de l'investissement dans les TIC. Autrement dit, les auteurs qui penchent leurs réflexions sur la relation investissement en TIC - performance obéissent strictement à la rationalité économique qui est déterminée par les coûts d'investissement. Toutefois, les études de ces chercheurs présentent quelques limites. Selon Mebarki (2013), deux critiques profondes suffisent pour contester cette approche et justifier sa révision. La première, n'accepte pas les mesures qu'elle utilise pour la performance qui sont de nature agrégée et n'arrivent pas à cerner clairement les effets médiateurs, plus qualitatifs, comme l'amélioration de la qualité des produits, l'amélioration des processus et l'augmentation de la flexibilité. La deuxième approche a trait au fait qu'elle n'accorde que peu d'attention sur ce dont les utilisateurs doivent faire comme déterminant potentiel de succès des TIC dans l'organisation. Cette approche est touchée fondamentalement par ces deux critiques qui s'enracinent dans la spécificité des TIC.

La théorie du consommateur s'insère dans le cadre de l'approche microéconomique. Elle vise à analyser l'impact des TIC sur la performance globale de l'économie à travers les impacts positifs sur la consommation (identification des surplus consommateurs). De ce fait, elle évalue le bénéfice total apporté par les achats du consommateur. Dans le cas

[7]« You can see the computer age everywhere but in the productivity statistics », Robert Solow, 1987.Voir annexe1 pour plus de details.

[8] La fonction de production est la formule qui permet de calculer la production en fonction des ressources utilisées de l'entreprise traditionnellement le capital et le travail.

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spécifique des TIC, des bénéfices nets pour les consommateurs (ménages ou entreprises) sont engendrés grâce à la baisse du coût des ordinateurs par différents ordres de grandeur (Missaoui 2009). De manière plus claire, en situation d'équilibre entre l'offre et la demande dans un marché, une baisse du prix de l'*input* (dépenses en TIC) peut entrainer une hausse des dépenses dans cet *input* et par conséquent une augmentation du surplus du consommateur sans que celui-ci n'augmente pour autant le montant total de ses dépenses. Ainsi, l'hypothèse qui émane de cette théorie stipule qu'au fur et à mesure que le prix des TIC baisse, le surplus du consommateur crée par les TIC est positif et augmente dans le temps.

Des arguments aux termes desquels les investissements en TIC avaient un impact significatif sur l'*output* des entreprises sont mis en avant par Brynjolfson et Hitt (1996). Au final, en utilisant l'approche en termes de surplus du consommateur, Brynjolfson et Hitt (1996) estiment que le bénéfice total pour le consommateur est substantiel. Il est nécessaire de prendre en compte le fait que ces résultats s'appliquent à un concept abstrait qui n'a de réelle signification dans l'économie réelle : « l'entreprise moyenne». Une multitude d'entreprises ont sans aucun doute effectuées des investissements non productifs en TIC alors que ces dernières apparaissent comme ayant été productives pour cette « l'entreprise moyenne». Parallèlement, alors qu'il n'y avait pas une contribution discernable aux profits effectués par « l'entreprise moyenne», le niveau élevé d'erreurs standards concernant les estimations suggèrent que certaines entreprises parvenaient à obtenir des avantages compétitifs substantiels tandis que d'autres non.

Les résultats des chercheurs qui analysent le lien direct entre les TIC et la performance de l'entreprise sont dans l'ensemble positifs. Cependant, ils présentent quelques limites: Premièrement, la performance est comprise au sens quantitatif de productivité. Deuxièmement, l'unité d'analyse agrégée est l'organisation. Pour pallier à ces limites, la deuxième approche utilisée pour contrer le « paradoxe de la productivité » est introduite. Cette approche, qui s'attache à analyser le lien indirect entre les investissements en TIC et la performance à travers l'amélioration des processus organisationnels relève des modèles processuels qui seront présentés ci-après.

i. *Les modèles processuels*

Plutôt que de se baser sur les déterminants exogènes (variables indépendantes), le modèle processuel se propose d'analyser le processus par lequel les TIC contribuent à la performance de l'entreprise. Les partisans du modèle processuel examinent les événements qui, suite à l'introduction d'une technologie ont permis de contribuer à la performance de l'entreprise, pour expliquer la performance. Les modèles processuels de recherche ont conduit à des travaux pouvant recouvrir:

- *Divers impacts intermédiaires:* ces impacts sont des variables qui, selon Barua et ali (1995)[9] peuvent être quantitatives (Exemple : le taux de roulement des stocks, le prix relatif et la qualité des produits) ou encore qualitatives comme dans les travaux de Vandenbosh et Huff (1997)[10] qui étudient comment l'utilisation des TIC améliore le processus de veille stratégique du dirigeant, pour, in fine, impacter la performance organisationnelle.
- *Diverses mesures de la performance:* comme pour les variables intermédiaires, la mesure de la performance pourra être quantitative et/ou qualitative. Précisons que cette mesure de la performance va généralement au-delà de la seule productivité et prend en compte plusieurs dimensions.
- *Divers niveaux d'analyse:* l'individu, le groupe, l'organisation, l'industrie voire le pays sont les différentes unités d'analyse considérées par les modèles processuels. Ces derniers ont la possibilité de travailler sur des unités d'analyse mixte. Ceci est avantageux dans la mesure où la mise en place d'une technologie à un endroit de la chaîne logistique, peut générer de la valeur à un autre endroit et à des niveaux distincts (par exemple au niveau individuel et au niveau organisationnel).
- *Diverses méthodologies de recherche:* l'étude de cas, les enquêtes, les études longitudinales ou encore les études à base de données secondaires permettent d'appréhender la dynamique des modèles processuels.

Plusieurs chercheurs (Giddens, 1984 ; Wernerfelt, 1984; Barney, 1991 et Raymond, 2002, etc.) prônent l'utilisation des modèles processuels bien qu'ils ne soient pas très répandu dans la recherche en système d'information. En fait, la fidélité empirique vis-à-vis des processus de l'entreprise est caractérisée par ces modèles. Les investissements en TIC vont alors être transformés en performance grâce à ces processus de l'entreprise (Raymond, 2002).Les courants de pensées basés sur ce modèle sont principalement: *le courant sociotechnique, le courant structurationniste, l'approche des ressources, l'approche des capacités dynamiques etl'approche des cœurs de compétence « cor ecompetence».*

Le courant sociotechnique considère que, dans un contexte organisationnel donné, l'organisation comme un ensemble de sous-systèmes en interaction, où le sous-système technologique et le sous-système

[9] Barua et ali (1995) cités par Missaoui, 2011.
[10] Vandenbosh et Huff (1997)[10]cités par Folacci, 2005.

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social sont inter-reliés (Kéfi et Kalika, 2004). Plusieurs travaux de l'évaluation des systèmes d'information ont beaucoup mobilisé ce courant. Parmi les principaux apports de ce courant, on note:

- l'établissement d'une démarche d'évaluation des TIC basée sur l'examen de la relation entre l'acteur et la technologie.
- L'introduction de la notion d'adéquation (alignement au fit) entre les sous-systèmes de l'entreprise, notamment entre le sous-système technique et le sous-système social (Missaoui, 2009).

Ainsi, le grand mérite de ce courant est d'avoir pu réconcilier l'objet technique et le sujet individuel. Cependant, le fait de ne pas avoir clairement défini les mécanismes d'interaction entre la technologie et l'acteur constitue l'une de ses limites (Kéfi et Kalika, 2004).

L'apport majeur du courant structurationniste aux travaux relatifs à l'évaluation des TIC, porte sur l'analyse approfondie des mécanismes d'interaction entre la technologie et l'acteur. Basé sur la théorie sociale de la structuration de Giddens (1984), ce courant se propose d'apporter un éclairage sur le dualisme entre la structure et l'acteur pour établir une nouvelle relation de dualité où l'acteur et la structure se trouvent dans une relation d'interdépendance réciproque. À cet effet, dans la notion de structure Giddens (1984) distingue deux différentes dimensions lesquelles sont d'une part d'ordre matériel et observable et d'autre part d'ordre virtuel de modes de structuration engagés de façon récursive dans la reproduction de pratiques situées dans le temps et dans l'espace. Cette définition de Giddens (1984) présente donc deux notions indissociables qui sont l'action et la structure. Même si Giddens (1984) insiste dans ses travaux, sur la construction sociale des propriétés structurelles, il ne néglige pas la dimension matérielle de ces structures qu'il présente comme des propriétés institutionnelles sous la forme de modèles régularisés et identifiables.

Les origines de l'approche basée sur les ressources (encore appelé Ressource-Based) se trouvent dans les bases du management stratégique avec les premiers travaux de Barnard (1938) et Chandler (1957)[11]. Ces travaux portaient sur les capacités de l'entreprise à utiliser ses ressources et sur la création de la performance économique. Cette approche apparaît comme une critique des travaux dominants de l'époque c'est-à-dire de l'approche « structure-comportement-performance» présentée par Porter (1980). En effet, dans l'approche de Porter, les ressources n'ont pas de valeur en elles-mêmes : leur valeur dépend de la manière dont elles s'insèrent dans la structure industrielle et de la manière dont elles vont contribuer positivement à la réussite d'une stratégie particulière. Les ressources dont disposent un concurrent et la manière de les combiner sont la cause qui l'empêche de pénétrer un marché et non pas un environnement, donc la performance de l'entreprise ne peut s'expliquer uniquement par les caractéristiques de son industrie (Wernerfelt, 1984).

Les travaux de Nelson et Winter(1982), Amit et Schoemaker (1993), puis Teece et al (1997)[12] ont permis de développer une analyse des caractéristiques clés des capacités dynamiques des entreprises à créer et à utiliser des ressources (Sanchez, 2000). Ainsi, Teece et al. (1997)[13] définissent les capacités dynamiques comme l'aptitude de l'entreprise à intégrer, construire et reconfigurer des compétences internes et externes faites de divers usages de ressources spécifiques à l'entreprise. En associant les concepts de ressources et de capacités dynamiques, Amit et Schoemaker (1993)[14] utilisent le terme d'actif stratégique pour désigner « *l'ensemble des ressources et capacités difficiles à échanger et à imiter, rares, appropriables et spécialisées qui confèrent un avantage compétitif de l'entreprise*». Nelson et Winter (1982)[15] supposent que les savoir-faire d'une entreprise sont inscrits dans les routines organisationnelles, définies comme les activités répétitives qu'elle développe lors de l'usage des ressources spécifiques.

L'application du concept du «core competence» introduit par Prahalad et Hamel en 1990 peut être considérée comme une nouvelle manière d'identifier les sources d'avantages concurrentiels (Missaoui, 2009). En effet, ces auteurs expliquent que *la compétence clé est un domaine d'expertise qui résulte de l'harmonisation de technologies et d'une activité professionnelle complexe*. Autrement dit, le « cœur de compétence» correspond au savoir-faire de l'entreprise, grâce auquel elle acquiert son avantage concurrentiel. Hamel et Heene (1994)[16] ont proposé une théorie plus intégrée du management stratégique, fondée sur la notion de compétence organisationnelle. Ils suggèrent que le concept de compétence puisse alimenter une nouvelle approche théorique susceptible de nous éclairer sur la manière dont le maintien et la constitution d'un avantage compétitif dépendent des capacités de l'entreprise à gérer la création et l'utilisation des ressources de savoir.

Les approches par variables intermédiaires ont fait l'objet de nombreuses contributions tant dans le secteur industriel que dans celui des services (Barua et al., 1991). Cependant, si ces approches permettent de «

[11] Barnard, C. (1938), The function of executive; Chandler, A.(1962), Stategic and structure, Cités par Barney(1991).

[12] Teece, D., Pisano, G. and Shuen, A. (1997), op cit; Amit, R. and Schoemaker, P (1993), Strategic assets and organizational rent, Strategic management journal et Nelson, R. and Winter, S. (1982), An evolution theory of economic change. Cités par Sanchez (2000).

[13] Teece, D., Pisano, G. and Shuen, A. (1997) Op. cit.

[14] Amit et Schoemake r (1993) Op. cit.

[15] Nelson, R. and Winter, S. (1982) Op. cit.

[16] Hamel, G. and Heene, A. (1994), Competence based competition, john wiley & sons, cité par Missaoui (2009).

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mieux » localiser les effets des TIC sur la performance des firmes, elles ne permettent pas réellement de mettre en avant les mécanismes se déroulant à l'intérieur des entreprises. Elles substituent au concept de productivité s'effectuant à un niveau global, un périmètre d'évaluation de la performance de nature plus locale. Ainsi, comme le suggère Monod (2002), ce mécanisme d'influence des TIC sur la performance des entreprises peut être mis en évidence par une relation indirecte se situant à un niveau plus spécifique et qui intéresse plus particulièrement les sciences de gestion.

c) *TIC et performance de l'entreprise : un débat toujours d'actualité*

Un certain nombre d'études ont proposé une synthèse des premières publications sur les TIC, la productivité et les performances de l'entreprise (Pilat, 2004). Plusieurs de ces études ont trouvé que la productivité n'est pas influencée, ou alors elle est influencée négativement par les TIC. Les impacts limités des TIC observés dans ces premières études ont contribué à ce que l'on a appelé le « paradoxe de la productivité » (Voir annexe 1). Dès lors, ce fameux paradoxe de Solow (1987): «*On voit les ordinateurs partout sauf dans les statistiques de la productivité*» va susciter l'attention de plusieurs chercheurs qui, dans leurs nombreuses études se sont succédés pour tenter de démontrer l'existence d'un lien entre l'adoption des TIC et la performance de l'entreprise. La synthèse des résultats de ces recherches souligne des résultats mitigés et parfois, même, contradictoires. Comme le souligne (Reix, 2002, Missaoui, 2009). Ainsi, Brynjolfson (1993) dans sa revue de la littérature relative au paradoxe de la productivité, conclut qu'un manque de preuves ne suppose pas nécessairement une absence d'impact des investissements en TIC sur la productivité. Cette conclusion est d'autant plus pertinente puisqu'on relève dans la littérature quelques travaux qui ont confirmé le paradoxe de Solow et d'autres qui ont infirmé ledit paradoxe.

i. *Quelques travaux ayant confirmé le paradoxe de la productivité*

Au cours des années 90, aucune relation (ou une relation négative) entre les TIC et la performance a été trouvé dans plusieurs études. À titre d'exemple, Lucas dans son étude portant sur 165 succursales d'une banque californienne(1975), a trouvé que l'utilisation du système d'information n'était pas un facteur explicatif de la performance. Il découvre par contre une faible relation entre la performance et l'utilisation du SI quand il porte son analyse dans le secteur de l'habillement. Turner (1985) dans une étude sur 58 banques, conclut que «de manière inattendue, aucune relation n'a été trouvée entre la performance organisationnelle et la proportion de ressources allouées au traitement de l'information». Strassman (1985) au cours de la même année fait une étude sur le secteur des services et ne trouve aucune relation significative entre les entreprises ayant une performance élevée et les investissements en TIC. Cette conclusion est renchérie par Baiely (1986) qui a argumenté que la corrélation entre la productivité et l'investissement dans les ordinateurs est négative. En outre, il a montré que l'investissement dans les TIC n'a pas aidé à améliorer la productivité américaine entre les années 1970 et 1993.Cette conclusion est partagée également par Roach (1987) qui, de son côté, a noté que l'utilisation des ordinateurs a augmenté dans le secteur bancaire d'une façon considérable mais n'a pas mené à l'amélioration de la productivité des travailleurs. Roach (1988) prolonge son travail au niveau macroéconomique sur le secteur des services et arrive à la conclusion que la productivité nationale au cours des années 1980 aux États-Unis n'a pas été améliorée par les investissements massifs en TIC.

L'impact des TIC sur la productivité dans le secteur industriel est étudié par Loveman (1994). Il parvient à conclure que les investissements marginaux auraient bien fait de ne pas être dépensé dans les TIC. Berndt et Morisson (1995) ont affirmé que cet investissement a un effet très négligeable sur la productivité. Dans ce sens, Markus et Soh (1993) ont trouvé que la majorité des banques américaines n'ont pas réalisé des bénéfices financiers suite à l'investissement dans les TIC pendant les années 80. Ils ont ajouté que les banques (de petite taille) ne montrent aucune relation significative entre l'investissement dans les TIC et la performance. Quant aux grandes banques, elles ont enregistré des rendements négatifs après leur investissement dans les TIC. Au même son de cloche, Greenan et Horty (2002) ont menés leurs études sur un échantillon d'entreprises industrielles françaises, et sont arrivés à la conclusion que lorsque l'informatisation n'est pas complétée par des changements organisationnels, alors, son impact sur la performance des entreprises est négatif. Les résultats des travaux de Monod (2002) épousent cette conclusion dans l'étude la relation entre les applications Internet, la croissance et le profit des PME. En effet, les résultats de ce chercheur montrent l'absence d'impact direct des applications Internet sur la performance de l'entreprise. Cependant, à travers une utilisation spécifique d'Internet par des PME industrielles, fournisseur spécialisé et de haute technologie, une influence indirecte des TIC est mise en évidence.

Parallèlement à ces études qui semblent montrer que l'investissement en TIC, bien que probablement nécessaire, n'est pas une source de performance pour les entreprises, d'autres études ont été en mesure d'identifier une influence positive des investissements en TIC.

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ii. *Quelques travaux ayant infirmé le paradoxe de la productivité*

Ici nous allons nous attarder sur deux approches qui ont tous les deux validées l'existence d'un lien positif entre les TIC et la performance.

iii. *Lien direct entre les TIC et la performance*

S'inscrivant majoritairement dans le cadre de la littérature de nature déterministe, les approches directes de la relation TIC/performance sont quantitativement majoritaires. Au niveau de l'entreprise, des études récentes (Gnansounou, 2010; aubert et al ; 2009; Brynjolfsson et Hitt, 2004, etc.) apportent des éléments de conclusion qui montrent que l'adoption des TIC peut avoir une incidence positive sur la performance de l'entreprise OCDE (2003). Les conclusions de ces études varient. De leur part, Brynjolfsson et Hitt (2000), ont exploité la relation entre l'investissement dans les ordinateurs et l'amélioration de productivité de l'entreprise. Ils ont utilisé des techniques comptables sur un échantillon de 600 grandes entreprises américaines pour la période allant de 1987 à 1994. Ils ont abouti aux résultats suivants : D'une part l'investissement dans les ordinateurs a une relation positive et significative avec la productivité (en utilisant un modèle de différence d'une année). D'autre part, les rendements des ordinateurs sont deux à cinq fois meilleurs à travers les sept ans pris en considération.

Dans un travail plus récent, Brynjolfsson et Hitt (2003) ont estimé une fonction de production sur un panel de 600 grandes entreprises américaines. Ils ont détecté un effet positif de l'investissement dans les TI sur la croissance de la productivité. Ils ont alors spécifié que cet investissement mène à l'augmentation de la productivité. Même si des différences méthodologiques existent entre ces différentes études, elles ont présenté des informations très compatibles concernant l'accélération de la croissance suite à l'investissement dans les TIC. Dans ce contexte, Bresnahan et al. (2003) ont abouti à une corrélation positive entre l'investissement dans les TIC et la productivité. Cette affirmation est la conclusion la plus vulgaire de la plupart des études réalisées au niveau de l'entreprise, montrant que la productivité des entreprises qui utilisent les TIC est meilleure que celle des entreprises qui ne les utilisent pas (Brynjolfsson et Hitt, 2000; Balwin et Sabourin, 2002; Baldwin et al., 2004; Leforestier, 2006; Becalli 2007). De plus, entre 1988 et 1997, l'écart entre les entreprises utilisatrices des technologies et celle ne les utilisant pas s'est accentué, une croissance relative plus élevée des premières ayant été enregistré que les autres (OCDE, 2003).

L'OCDE (2003) montre aussi que certaines technologies de l'information et des communications sont plus importantes que d'autres pour améliorer la productivité, notamment les technologies des réseaux de communication. Ces résultats sont confirmés par Baldwin et al. (2004) qui ont trouvé des éléments convaincants indiquant qu'au Canada, l'adoption ou l'utilisation des TIC par les entreprises leur permet d'atteindre de meilleures performances. Ceci dit, une croissance plus forte de la productivité du travail durant les années 90 est liée à l'utilisation accrue des TIC de pointe. Baldwin et Sabourin (2002) dans une autre étude concernant le Canada, ont observé qu'une proportion considérable des parts de marché avait été transférée des entreprises en déclin vers les entreprises en croissance au cours de la décennie. Dans le même temps, les entreprises en croissance augmentaient leur productivité, contrairement aux entreprises en déclin. Les entreprises utilisatrices des TIC ou combinant plusieurs technologies de différentes catégories étaient celles dont la productivité relative augmentait le plus, et les gains ainsi enregistrés se traduisaient par des progressions de parts de marché. De façon convaincante, Maliranta et Rouvinen (2004) dans une étude concernant la Finlande ont montré que les TIC ont une incidence sur la productivité. Il en ressort le gain de productivité pour le personnel équipé de TIC varie de 8 % à 18% (ce qui correspond à une élasticité de 5 à 6 % du capital de TIC) lorsque les effets liés à la branche et à la période, les spécificités de l'entreprise et des travailleurs utilisant les TIC sont pris en compte. Cet effet est plus important dans les entreprises nouvellement crées et dans le secteur de producteurs de TIC, notamment dans les services producteurs de TIC (Pilat, 2004).

Les TIC sont généralement plus utilisés dans certaines branches des services que dans l'industrie manufacturière (OCDE, 2003). En plus, les mêmes technologies ne sont pas utilisées dans tous les secteurs. En réalité, ce sont les services financiers qui utilisent le plus les TIC dans de nombreux pays. Des données concernant le Royaume-Uni donnent à penser que le secteur le plus susceptible d'utiliser des technologies de réseau est celui de l'intermédiation financière (OCDE, 2003). C'est également ce secteur qui est le plus susceptible d'utiliser des combinaisons de différentes technologies de réseau. Cela montre que ce secteur est un gros consommateur d'informations et qu'il est donc potentiellement le plus à même de tirer parti des profits générés par l'utilisation des TIC.

Avec un même point de vue, Maliranta et Rouviren (2004) montrent que dans le secteur des services financiers, le gain de productivité du travail induit par les TIC semble plus marqué que dans l'activité manufacturière. Leforestier (2006) a montré, à partir d'une analyse micro-économétrique fondée sur l'estimation d'une relation technologique, que la productivité des entreprises françaises avait été meilleure sur la période 2002-2004 suite à l'utilisation accrue des TIC par ces derniers. Dans le même sens Becalli (2007) a trouvé un lien positif entre l'investissement total en TIC et la performance, et ceci à

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travers une étude faite sur le secteur bancaire européen. Il démontre également l'influence positive de l'investissement dans les services technologiques sur les profits bancaires. Dans un travail plus récent, Gnansounou (2010) montre que l'utilisation intensive des TIC peut accentuer également les effets de réseau tels que la réduction des coûts de transaction et l'accélération de l'innovation. D'où une amélioration de la productivité multifactorielle. Kossai et Piget (2012) précisent dans leur étude que « quel que soit le modèle utilisé : régression linéaire à variables muettes puis causalité au sens de Granger, test de Kruskal-Wallis et test de Welch; la rentabilité économique nette moyenne dépend du niveau de TIC ».

En somme, plusieurs études au niveau de l'entreprise ont confirmé que l'utilisation des TIC a un impact positif sur la performance et la productivité (Brynjolfsson et Hitt, 2000; Balwin et Sabourin, 2002; Baldwin et al.,2004; Leforestier, 2006; Becalli 2007; Gnansounou, 2010; Kossai et Piget, 2012, etc.). Toutefois les données d'autres études suggèrent que le lien entre TIC et productivité existe, mais qu'il n'est pas direct :les gains se produisent principalement lorsque cette adoption est accompagnée d'autres changements et investissements complémentaires.

iv. *Les analyses en termes de variables intermédiaires*

Malgré le nombre d'études et de preuves empiriques présentées sur l'incidence des TIC sur la performance ces dernières années, l'importance relative des différents canaux par lesquels les TIC influent sur la productivité laisse encore plusieurs questions à débattre notamment sur l'importance du rôle joué par les facteurs complémentaires dans l'explication des contributions des TIC dans la performance. Dans l'ensemble, la littérature sur la performance et l'investissement dans les TIC nous permet de conclure quelques faits essentiels. Tout d'abord, la plupart des études montrent un impact positif, important et significatif des investissements dans les TIC sur la performance. Cependant, il est important de mentionner que cette littérature se réfère dans la plupart des cas à des moyennes et grandes entreprises. Deuxièmement, la littérature comprend également d'autres facteurs qui peuvent amplifier l'impact des investissements en TIC ou qui peuvent être complémentaires. En effet, les études empiriques montrent que, bien qu'il soit possible d'envisager une incidence positive de l'investissement en TIC, cet impact est lié aux complémentarités avec le capital humain, les changements organisationnels et les innovations. À cet effet, certains auteurs ont souligné que pour avoir un impact sur la performance des entreprises, les investissements dans les TIC doivent être combinés avec des investissements complémentaires dans les pratiques de travail, le capital humain et la restructuration des entreprises (Missaoui, 2009; Crespi et al., 2007; Brynjolfsson et Hitt, 2003).

En s'inscrivant dans cette volonté d'analyse globale et de compréhension du lien entre TIC et productivité en entreprise, Stratopoulos et Dehning (2000) trouvent que les entreprises qui investissent dans les TIC et qui maitrisent l'utilisation des TIC performent mieux financièrement. Dans cette même posture, Askenazy (2000) a montré l'existence d'un impact négatif des TIC sur les performances des entreprises lorsqu'il n'y a pas de changement organisationnel qui accompagne l'adoption des TIC. Au même son de cloche (Gollac et al, 2000) concluent dans leur étude que dans les entreprises où l'adoption des TIC s'est accompagnée de changements organisationnels et d'amélioration des niveaux de qualification des travailleurs, l'effet de ces dernières sur la productivité est plus marqué. Les conclusions de Hempell et al. (2002) sont similaires et montrent que les entreprises ayant une expérience innovante sont particulièrement bien préparées à faire un usage productif des TIC en introduisant des innovations complémentaires appropriées.

L'OCDE (2003) approuve également ces conclusions en montrant que les incidences des TIC se concrétisent principalement ou uniquement quand l'investissement dans les TIC s'accompagne d'autres changements et investissements tels que les qualifications, les effets sur la concurrence, le facteur temps, les facteurs liés à l'organisation, l'innovation, la taille et l'âge de l'entreprise. Brynjolfsson et Hitt (2003) renchérissent ces conclusions en démontrant que le rendement de l'investissement dans les TIC ne se produit pas immédiatement, mais avec un décalage de temps important. Bertschek et Kaiser (2004) ont montré que les TIC ont des effets indirects sur la productivité en permettant la réorganisation du travail et le changement organisationnel, en insistant sur de fortes complémentarités entre ces investissements. L'étude de Kalika (2006) montre que les entreprises pour lesquelles l'introduction des TIC a été accompagnée de changements d'organisation et de stratégie sont celles qui fournissent les scores d'amélioration des performances les plus forts. Cela signifie donc que les sources de performance se trouvent dans les changements de stratégie et d'organisation résultant des TIC. Ko et Osei-Bryson (2006) en étudiant les conditions sous lesquelles l'effet des TIC peut créer de la valeur pour l'entreprise concluent qu'en investissant dans les TIC, il faut également investir dans le capital physique et dans le capital humain pour maximiser le rendement sur l'investissement. Atzeni et Carboni (2006), évoquent également l'engagement de l'entreprise envers les investissements complémentaires en capital physique, en formation continue de la main-d'œuvre et en processus d'affaires comme condition nécessaire à la matérialisation des bénéfices potentiels associés aux TIC. En adoptant aussi une posture

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intermédiaire, Aubert et al. (2009) affirment qu'il semble que l'effet des TIC sur la performance ne puisse se faire sentir qu'en présence d'investissements complémentaires (notamment en capital humain et en réorganisation du savoir et des processus) malgré leur potentiel évident de création de valeur".

Après avoir observé les différents débats autour du paradoxe de Solow, nous constatons que les conclusions sont mitigés : certaines études ne voient aucune corrélation entre les TIC et la performance de l'entreprise (Greenan et Horty, 2002; Loveman, 1994; Roach, 1988, etc.), d'autres études trouvent l'existence d'un lien positif entre les TIC et la performance (Kossai et Piget, 2012; Gnansounou, 2010; Becalli , 2007; Leforestier, 2006; Maliranta et Rouviren , 2004; etc.) et d'autres études nuancent ces résultats en montrant que le lien entre TIC et productivité existe, mais qu'il n'est pas direct : les gains se produisent principalement lorsque l'adoption des TIC est accompagnée d'autres changements et investissements tels que la formation de la main d'œuvre et d'autres changements organisationnels ((Aubert et al. 2009; Missaoui, 2009; Atzeni et Carboni 2006 ; Brynjolfsson et Hitt, 2003 ; OCDE, 2003 ; Gollac et al, 2000 ; Askenazy, 2000, etc.).Malgré tout, on observe d'une part que la plus part des études recensées identifient une relation positive entre les TIC et la performance de l'entreprise et d'autre part que malgré le potentiel évident de création de valeur des technologies de l'information, il semble que leur effet ne puisse se faire sentir qu'en présence d'investissements complémentaires, notamment en capital humain et en réorganisation du savoir et des processus. Ces conclusions nous amène à formuler les hypothèses suivantes.

III. Design de la Recherche

À travers cette section, nous présentons les données de cette étude, le choix des variables et le modèle économétrique utilisé.

a) Données

Les données utilisées dans ce travail sont issues d'une enquête conduite auprès d'un échantillon d'EMF dont les directions générales sont localisées au Cameroun. Les entreprises visées par cette enquête sont les EMF indépendants du Cameroun[17]. Ils sont choisis délibérément en fonction de critères préalablement définis. Les données sont collectées entre Juillet 2016 et Mars 2018 au moyen d'un questionnaire. Le taux de réponse a atteint 80%, soit un échantillon de 107 EMF. Le questionnaire est construit sur la base des questionnaires élaborés par des organisations de microfinance, institutions internationales et des enquêtes portant sur les mêmes thèmes (Missaoui, 2011; Gnansounou, 2010 ; Follaci, 2005).

b) Spécifications des variables d'étude

Nous voulons dans cette étude étudier le lien entre les TIC et la performance. De ce fait, la performance *(PERF)* représente la variable dépendante et le*niveau d'utilisation des TIC(NATIC)* la variable indépendante. L'introduction des variables médiatrices (formation des employés et restructuration de l'entreprise après adoption d'un TIC) nous permettra de vérifier l'existence d'un lien indirect entre les TIC et la performance.

i. *Spécification de la variable endogène: La performance*

Comme nous l'avons dit précédemment, la principale variable endogène est la performance (*PERF*). Plusieurs auteurs sont d'accord qu'aucune approche n'est supérieure à l'autre et ses auteurs soutiennent l'intérêt de l'adoption d'une approche subjective pour mesurer la performance (Missaoui, 2009). De ce fait, pour analyser l'influence du niveau d'utilisation des TIC sur la performance des EMF, nous avons utilisé une approche subjective pour mesurer la performance de l'EMF. Ce choix s'explique par la difficulté d'obtenir habituellement les informations comptables et financières, notamment dans les pays sous-développés où les entreprises du secteur financier communiquent très difficilement leurs chiffres.

Le nombre d'indicateurs de performance que nous avons choisi reflète la double identité financière et sociale des EMF et la catégorisation de la performance de Raymond (2002). Chemin faisant, nous avons emprunté aux travaux de Microrate & Inter American Development Bank (2003) et de Gauzente (2000), le résultat net et la part de marché comme indicateurs de la performance financière. Nous nous sommes également appuyées sur l'étude de Ktat (2004) et de Messomo (2017) pour choisir la qualité de service offert aux clients, le nombre de client et la durée de traitement des données comme indicateurs de la performance sociale.

ii. *Choix des variables explicatives*

La variable explicative de cette étude est le niveau d'utilisation des TIC. Comme Gnansounou (2010) et Fambeu (2015), nous avons élaboré une typologie des outils TIC utilisés dans les EMF. Cette typologie nous a permis de classer les entreprises de notre échantillon en six catégories en fonction de leur niveau d'utilisation des TIC:

[17] Les EMF indépendants sont ceux qui appartiennent à la 1ère, 2ième, ou 3ième catégorie et ne sont pas regroupés en réseau.

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$$y_{i=}\begin{cases} \text{NATIC=0 si pas d'usage des TIC (aucune utilisation)} \\ \text{NATIC=1 si un type d'usage des TIC (niveau très faible)} \\ \text{NATIC=2 si deux types d'usage des TIC (niveau faible)} \\ \text{NATIC=3 si trois types d'usage des TIC (niveau moyen)} \\ \text{NATIC=4 si quatre types d'usage des TIC (niveau élevé)} \\ \text{NATIC=5 si cinq types d'usage des TIC (niveau très élevé)} \end{cases}$$

Les types d'usage des TIC pour l'échange des informations sont : la messagerie téléphonique, l'Internet, l'Intranet, l'Extranet et le site web[18]

iii. *Choix des variables médiatrices*

La revue de la littérature révèle que, plusieurs études empiriques montrent que bien qu'il soit possible d'envisager un impact positif de l'utilisation des TIC, cet impact est lié aux complémentarités avec le capital humain, les changements organisationnels et les innovations. Dans ce sens certains auteurs ont souligné que pour avoir un impact sur la performance des entreprises, l'utilisation des TIC doit être combiné avec des investissements complémentaires dans les pratiques de travail, le capital humain et la restructuration des entreprises (Missaoui, 2009; Crespi et al., 2007; Brynjolfsson et Hitt, 2003). Au regard des points de vue de ces auteurs, nous relevons deux variables médiatrices dont nous utilisons pour déterminer leurs effets sur la relation utilisation des TIC et performance. Ces variables sont: la restructuration de l'entreprise et la formation des employés à l'utilisation des TIC.

L'ensemble des différentes variables utilisées sont résumées dans le tableau ci- après:

Tableau 1: Résumé des variables de notre étude

Variables		Définition	Mesure
Explicative:	NATIC	Scores du niveau d'utilisation des TIC	0= pas d'usage; 1=un type d'usage 2=deux types d'usage ; 3=trois types d'usage; 4=quatre types d'usage ; 5=cinq types d'usage
Expliquée: La performance, mesurée par plusieurs variables	AUGCLI	Nombre de client	1=En baisse2= Stable3= En hausse
	QUALSERCLI	Qualité de services rendus aux clients	1=En baisse2= Stable3= En hausse
	REDUCTEM	Réduction du temps de traitement des données	1=En baisse2= Stable3= En hausse
	RESULNET	Résultat net	1=En baisse2= Stable3= En hausse
	PARMAR	Part de marché	1=En baisse2= Stable3= En hausse
Médiatrices: Nouvelles pratiques organisationnelles	FOREMP	Formation des employés à l'utilisation des TIC	0= non 1= oui
	RESTEN	Restructuration de l'entreprise après acquisition d'un outil TIC	0= non 1= oui

Source: Construction des auteurs

[18] L'ordinateur est une technologie de base et comme tel, il est considéré comme un acquis dans les EMF car l'utilisation d'internet, intranet, site web ne peut être .possible que s'il y'a présence d'un ordinateur.

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c) *Méthode d'estimation : Régression catégorielle avec le test de l'ANOVA*

S'agissant de la démarche analytique de ce travail, notre attention s'est portée sur la régression catégoriel leavec le test de l'ANOVA. Le choix de la régression catégorielle s'explique par la nature de nos variables. La variable explicative (NATIC) est une variable qualitative multinomiale ordonnée et les composantes de la variable expliquée (PERF) sont des variables qualitatives d'échelle. La deuxième est attribuable à la distribution de nos variables. Compte tenu de la taille de notre échantillon qui est supérieur à 30, nous pouvons conclure que nos variables sont approximativement normalement distribuées. Or d'un point de vue strictement méthodologique, le test de l'ANOVA se fonde sur l'hypothèse que les différents échantillons à comparer suivent la même distribution ou qu'ils ont des distributions avec la même médiane.

IV. Résultats

Après la présentation de la méthodologie retenue pour notre recherche dans la section précédente, il est question dans cette section de montrer les résultats issus de notre investigation sur le terrain. Compte tenu du fait que toutes les variables de cette étude ne sont pas de même nature, nous avons mené des analyses de normalité des variables dépendantes et de comparabilité des sous échantillons avant de procéder aux tests des hypothèses. À la suite de ces analyses préalables, nous nous sommes intéressés aux hypothèses de liens entre chaque composante de la performance et le niveau d'utilisation des TIC en passant d'abord par une approche causale et ensuite par celle de l'approche par les variables intermédiaires.

a) *Analyses préalables*

Pour faire une bonne interprétation des résultats des tests statistiques, il est toujours nécessaire de passer par des études préalables telles que: l'étude de la normalité des distributions et des tableaux de corrélation.

Le tableau du test de normalité de Kolmogorov montre que toutes nos variables ne sont pas normalement distribuées. Mais compte tenu de la taille de notre échantillon qui est supérieur à 30, nous pouvons conclure que nos variables sont approximativement normalement distribuées.

La littérature a montré que la majorité des études recensées (Kossai et Piget, 2012; Gnansounou, 2010; Becalli, 2007; Leforestier, 2006; Maliranta et Rouviren, 2004 ; etc) identifient une relation positive entre l'utilisation des TIC et la performance de l'entreprise. Afin de vérifier l'existence d'un tel lien dans le cas des IMF camerounaises, nous nous sommes appropriés d'une première technique qui est celle de l'étude de corrélations entre les variables. Le tableau 2 ci-dessous présente la matrice de corrélation entre les différentes variables de l'étude.

Tableau 2: Matrice de corrélations de Spearman

Variables	NATIC	AUGCLI	REDUCTEM	QUALSERCLI	RESULNET	PARMAR	FOREMP	RESTEN
Natic	1	0,711*	-0,043	0,609 **	0,547**	0,639**	0,325	0,283
AUGCLI	0711*	1-	0,354	0,174	0,284	0,156	0,281**	0,264
REDUCTEM	0,043	- 0,354	1	- 0,147*	- 0,53	-0,185	-0,078	- 0, 056
QUALSERCLI	0,609 **	0,174*	-0,147*	1	0,713***	0,216	0,172**	0,311
RESULNET	0,547 **	0,284	-0,531	0,713***	1	0,128	0,214	0, 034 **
PARMAR	0,639**	0,156	-0,185	0, 216	0,128	1	0,583 ***	0,191
FOREMP	0,325	0,281**	-0,078	0, 172**	0,214	0,583***	1	0,383
RESTEN	0,283	0,264	- 0, 056	0,311	0, 034**	0,191	0,383	1

*(***, ** et * signifient que la corrélation est significative au seuil de 1%, 5%, et 10%)*

À la lecture de ce tableau, on constate des corrélations entre les variables relatives à la performance des IMF et l'adoption des TIC. On remarque que le nombre de client, laqualité des services rendus aux clients, le résultat net et la part de marché ont un lien significatif avec le niveau d'adoption des TIC. Par ailleurs, le temps de traitement des données a plutôt un lien non significatif avec le niveau d'adoption des TIC. Au regard de l'existence de corrélations entre toutes nos variables, nous rejetons l'hypothèse nulle d'absence de relation entre le niveau d'utilisation des TIC et les autres variables. Ensuite, nous acceptons l'hypothèse alternative d'existence de liens significativement positifs entre NATIC et le nombre de client, la part de marché, le résultat net et la qualité de service offert aux clients.

Pour ce qui est de l'auto corrélation entre les différentes variables explicatives, les coefficients de corrélation entre les variables doivent être au préalable étudiés afin de s'assurer que les variables entrant dans le modèle ne sont pas colinéaires. Le tableau ci-dessus présente les inter corrélations entre toutes les variables concernées par l'étude. Ce tableau montre que certaines variables sont fortement corrélées (AUGCLI, QUALSERCLI, RESULNET et PARMAR), d'autres moyennement corrélées (FOREMP, RESTEN) et d'autres faiblement corrélées (REDUCTEM) avec NATIC. Ces

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corrélations sont toutes inférieures au seuil de 0,80, valeur au-delà de laquelle la colinéarité est considérée comme problématique (Cerdin, Colle et Peretti, 2005). En outre, les corrélations entre les variables indépendantes ne dépassent jamais 0,8, ce qui est satisfaisant ; la condition d'indépendance entre les variables indépendantes est donc respectée.

Pour approfondir les résultats ci-dessus, il est nécessaire de procéder au test de l'ANOVA.

b) Liens entre le niveau d'adoption des TIC et la performance: Résultats du test de l'ANOVA

Après avoir effectué des analyses préalables, nous avons testé plusieurs modèles sous SPSS 20avec le test d'ANOVA. Les différentes équations donnent des estimations statistiquement significatives et conformes à la majorité de nos hypothèses.

i. *Liens directs entre le niveau d'utilisation des TIC et la performance*

Les données du tableau 3 ci-dessous présentent les résultats des tests relatifs à la première hypothèse: *La performance des EMF dépend de leur degré d'utilisation des TIC.*

Tableau 3: Résultats du test de l'ANOVA de liens directs entre le niveau d'utilisation des TIC et la performance

	Libellé	Coefficients standardisés		D	Prob.
		Bêta	Ecart type		
NATIC	NATIC et variation du nombre de client	0,099	0,195	10,256	0,005
	NATIC et variation de la qualité de service rendue aux clients	0,161	0,175	0,845	0,040
	NATIC et variation de la durée du temps de traitement des données	-0,260	0,133	3,828	0,053
	NATIC et variation du résultat net	0,111	0,179	2,386	0,043
	NATIC et variation de la part de marché	0,057	0,216	1,071	0,041

Les résultats de ce tableau nous permettent de conclure que:

- qu'à un seuil de signification de 1% (p=0,005), il existe une relation significative entre le niveau d'utilisation des TIC et le nombre de client. Le coefficient de NATIC est positif, on en déduit donc que la relation entre le niveau d'utilisation des TIC et le nombre de client est positive. Ceci nous amène à affirmer que *Plus les EMF utilisent les TIC, plus leur nombre de client augmente*. De ce fait, une augmentation du niveau d'utilisation des TIC d'une unité pour toutes choses restant égales par ailleurs contribuera de 0,099 à la variation du nombre de client.
- qu'à un seuil de signification de 5% (p=0,040), il existe une relation significative entre le niveau d'utilisation des TIC et la qualité de service rendue aux clients. Le coefficient de NATIC est positif (0,161), ce qui signifie que la relation entre le niveau d'utilisation des TIC et la qualité de service rendue aux clients est positive. Ceci nous amène à affirmer que *Plus les EMF utilisent les TIC, plus bonne est la qualité de service rendue aux clients*.
- qu'il n'existe pas une relation significative entre le niveau d'utilisation des TIC et la durée du temps de traitement des données (P=0,053>0, 05). Ceci ne nous permet pas de conclure que le niveau d'utilisation des TIC a une influence sur la durée de traitement des données.
- qu'il existe une relation significative et positive entre le niveau d'utilisation des TIC et la variation du résultat net (P=0,043 et coef=0,111). Ainsi, une augmentation du niveau d'utilisation des TIC d'une unité, toute chose égale par ailleurs, contribuera à la variation du résultat net de 0,111. Nous pouvons donc dire que *plus les EMF utilisent les TIC, plus leur résultat net s'améliore*.
- qu'il existe une relation significative et positive entre le niveau d'utilisation des TIC et la variation de la part de marché (P=0,041 et coef=0,057).En effet, un niveau d'utilisation élevé des TIC d'une unité, toute chose égale par ailleurs, contribuera à la variation de la part de marché de 0,057. Ceci nous permet d'affirmer que *Plus les EMF utilisent les TIC, plus leur part de marché s'accroît.*

En somme, le test de l'ANOVA montre que le niveau d'utilisation des TIC a une influence significative et positive sur la variation du nombre de client, de la qualité de service offerts aux clients, du résultat net et de la part de marché. À ce stade de validation empirique, nous pouvons déjà conclure que l'utilisation des TIC augmente le nombre de client, améliore la qualité de service offert aux clients, le résultat net, la part de marché, et donc la performance de l'IMF. Ce résultat corrobore les travaux de plusieurs auteurs qui ont infirmés le paradoxe de productivité. Nous faisons référence plus principalement aux travaux de Gnansounou (2010), Aubert et al (2009), Brynjolfsson et

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Hitt (2004) qui ont montré dans leurs résultats que l'utilisation des TIC a un impact positif sur la performance de l'entreprise. Ce résultat concorde aussi avec les études de Kossai et Piget (2012) qui précisent que « quel que soit le modèle utilisé: régression linéaire à variables muettes puis causalité au sens de Granger, test de Kruskal-Wallis et test de Welch; la rentabilité économique nette moyenne dépend du niveau de TIC ».

ii. *Liens entre le niveau d'utilisation des TIC et la performance :prise en compte des variables intermédiaires*

Ici, nous voulons voir si les variables médiatrices (formation des employés et restructuration de l'entreprise) ont un effet significatif sur le lien niveau d'utilisation des TIC et performance. Pour cela, nous introduisons ces variables dans les équations des différents modèles effectués précédemment. Les résultats de ces estimations nous semblent très pertinents. Les données du tableau 4 et 5 ci-dessous présentent les résultats de ces tests relatifs à la seconde hypothèse: *L'effet des TIC sur la performance s'améliore lorsque son utilisation s'accompagne de nouvelles pratiques organisationnelles.*

iii. *Effet du médiateur « formation des employés » sur la relation niveau d'utilisation des TIC - performance*

L'introduction de la variable médiatrice « formation des employés » dans la relation directe utilisation des TIC et performance, nous conduit à des résultats plus significatifs présentés dans les tableaux 4 ci-dessous.

Tableau 4: Liens entre le niveau d'utilisation des TIC et la performance : prise en compte de la variable « formation des employés »

Libellé		Coefficients standardisés		D	Prob.
		Bêta	Ecart type		
Effet de 'formation des employés' sur la relation NATICetnombre de client	FOREMP	0,091	0,134	0,458	0,500
	NATIC	0,597	0,178	11,191	0,001
Effet de 'formation des employés' sur le lien NATIC et qualité de service rendue aux clients	FOREMP	0,079	0,133	1,353	0,054
	NATIC	0,649	0,203	10,267	0,002
Effet de 'formation des employés' sur le lien NATIC et durée du temps de traitement des données	FOREMP	-0,222	0,125	3,137	0,079
	NATIC	0,500	0,079	40,234	0,000
Effet de 'formation des employés' sur la relation NATIC et résultat net	FOREMP	0,078	0,134	0,341	0,561
	NATIC	0,449	0,124	13,077	0,000
Effet de 'formation des employés' sur la relation NATIC et part de marché	FOREMP	0,080	0,157	1,259	0,083
	NATIC	0,412	0,258	2,544	0,040

La prise en compte de la variable médiatrice « formation des employés » dans les résultats des tests d'ANOVA sur la relation directe utilisation des TIC et performancenous montre qu'hormis la variable « durée du temps de traitement des données », la formation des employés à l'utilisation des TIC a un effet positif et significatif sur la relation niveau d'utilisation des TIC et les autres variables de la performance (nombre de client, qualité de service offerts aux clients, résultat net et part de marché). En effet, à travers le tableau 4 on constate d'abord que la significativité des modèles a augmenté (Probpasse de 0,005 à 0,001, de 0,040 à 0,002, de 0,043 à 0,000 et de 0,057 à 0, 412 respectivement) ensuite, on remarque que le coefficient de NATIC a également augmenté (*Coef* NATIC passe de 0,099 à 0,597, de 0,161 à 0,649, de 0,111à 0,449 et de 0,057 à 0,412respectivement).Ce constat montre bien que le lien entre utilisation des TIC et le nombre de clients, la qualité des services rendus aux clients, le résultat net et la part de marché augmente plus lorsque l'utilisation des TIC est accompagnée d'une formation continue des employés.

Les résultats du tableau 4 viennent confirmer les travaux de l'OCDE (2002) qui affirme que ″les gains se produisent principalement ou uniquement, lorsque cette adoption est accompagnée d'autres changements et investissements tels que la formation de la main d'œuvre et d'autres changements organisationnels″. Ces résultats sont aussi similaires avec ceux de Ko et Osei-Bryson (2006) qui, en étudiant les conditions sous lesquelles l'effet des TIC peuvent créer de la valeur pour l'entreprise, concluent qu'en investissant dans les TIC, il faut également investir dans le capital physique et dans le capital humain pour maximiser le rendement sur l'investissement. Enfin, ces résultats rejoignent ceux d'Atzeni et Carboni (2006) qui soulignent que l'engagement de l'entreprise envers les investissements complémentaires en capital physique, en formation continue de la main-d'œuvre est nécessaire à la matérialisation des bénéfices potentiels associés aux TIC.

Après avoir étudié l'impact de la formation des employés sur la relation niveau d'utilisation des TIC-performance, nous passons à l'étude de l'effet de la

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variable médiatrice « restructuration de l'entreprise » sur la relation niveau d'utilisation des TIC – performance.

iv. *Effet du médiateur "Restructuration de l'entreprise" sur la relation niveau d'utilisation des TIC - performance*

La prise en compte de la variable médiatrice "formation des employés" dans la relation utilisation des TIC et performance, nous conduit à des résultats pertinents présentés dans les tableaux 5 ci-dessous.

Tableau 5: Liens entre le niveau d'utilisation des TIC et la performance : prise en compte de la variable « Restructuration de l'entreprise »

Libellé		Coefficients standardisés		D	Prob.
		Bêta	Ecart type		
Effet de 'restructurtion de l'entreprise' sur la relation NATIC etnombre de client	RESTEN	0,028	0,096	0,088	0,767
	NATIC	0,648	0,178	13,239	0,000
Effet de 'restructurtion de l'entreprise' sur le lien NATIC et qualité de service rendue aux clients	RESTEN	0,079	0,133	1,353	0,054
	NATIC	0,649	0,203	10,267	0,002
Effet de 'restructurtion de l'entreprise' sur le lien NATIC et durée du temps de traitement des données	RESTEN	-0,190	0,118	2,602	0,079
	NATIC	0,418	0,119	12,254	0,000
Effet de 'restructurtion de l'entreprise' sur la relation NATIC et résultat net	RESTEN	0,018	0,138	0,017	0,896
	NATIC	0,537	0,091	34,439	0,000
Effet de 'restructurtion de l'entreprise' sur la relation NATIC et part de marché	RESTEN	0,063	0,123	0,262	0,054
	NATIC	0,591	0,104	32,165	0,000

Ce tableau nous présente des résultats similaires au tableau 4:

- La restructuration de l'entreprise a un impact positif et significatif sur la relation niveau d'utilisation des TIC et variation du nombre de client. En effet, l'introduction de la variable RESTEN dans le premier modèle augmente la significativité (Prob passe de 0,005 à 0,000) et le coefficient de NATIC qui passe de 0,099 à 0,648. Ceci, nous permet d'affirmer que le niveau d'utilisation des TIC a une influence positive et plus significative sur la variation du nombre de client lorsqu'il est accompagné par une restructuration de l'entreprise.
- L'ajout de la variable médiatrice RESTEN dans la relation niveau d'utilisation des TIC et variation de la qualité de service rendue aux clients nous donne des résultats plus significatifs. En effet, on constate d'abord que la significativité de ce modèle a augmenté (Prob passe de 0,040à 0,002), ensuite on remarque que le coefficient de NATIC a également augmenté (*Coef*[19] NATIC passe de 0,161 à 0,649.Ceci montre que la restructuration de l'entreprise après adoption des TIC a un impact positif et significatif sur la relation niveau d'utilisation des TIC et qualité de service rendue aux clients.
- La prise en compte de la variable médiatrice RESTEN dans la relation niveau d'utilisation des TIC et durée de traitement des données ne permet pas d'obtenir un modèle plus significatif (Prob=0,079>0,05) donc, la restructuration de l'entreprise n'a pas d'effet significatif sur le lien niveau d'utilisation des TIC et durée de traitement des données.
- Ce tableau nous montre que l'insertion de la variable RESTEN dans la relation niveau d'utilisation des TIC et résultat net permet d'obtenir une significativité plus élevée du modèle avec un coefficient plus élevé de NATIC (*Coef* NATIC passe de 0,111 à 0, 537, soit une augmentation de 0,426 unité). Ces résultats permettent de déduire que la restructuration de l'entreprise a un impact positif et plus significatif sur la relation niveau d'utilisation des TIC et part de marché.
- La restructuration de l'entreprise a un impact positif et significatif sur la relation niveau d'utilisation des TIC et part de marché. En effet, l'introduction de la variable RESTEN dans ce modèle augmente la significativité (Prob passe de 0,043 à 0,000) du modèle et le coefficient de NATIC qui passe de 0,057 à 0,591. Ceci, nous amène à affirmer que le niveau d'utilisation des TIC a une influence positive et plus significative sur la variation de la part de marché lorsqu'il est accompagné par une restructuration de l'entreprise.

De manière brève, les résultats des tests d'ANOVA sur les différents modèles nous indique que la restructuration de l'entreprise après adoption des TIC a un impact positif et significatif sur la relation niveau d'utilisation des TIC et nombre de client, qualité de service rendue aux clients, résultat net et part de

[19] Coefficient

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marché, et par conséquent sur la performance. En d'autres termes, L'effet des TIC sur la performance augmente plus lorsque leur adoption est accompagnée d'une restructuration de l'entreprise. Ce résultat vient confirmer les travaux de (Missaoui, 2009; Crespi et al., 2007; Brynjolfsson et Hitt, 2003) qui soulignent que pour avoir un impact sur la performance des entreprises, les investissements dans les TIC doivent être combinés avec des investissements complémentaires dans les pratiques de travail, le capital humain et la restructuration des entreprises. Notre résultat épouse aussi le point de vu d'Aubert et al. (2009) qui affirment que, "malgré le potentiel évident de création de valeur des technologies de l'information, il semble que leur effet ne puisse se faire sentir qu'en présence d'investissements complémentaires, notamment en capital humain et en réorganisation du savoir et des processus".

Globalement, les résultats dégagés de l'étude de la relation entre l'utilisation des TIC et la performance montrent bien que le niveau d'utilisation des TIC affecte positivement lenombre de client, la qualité de service rendue aux clients, le résultat net, la part de marché, et par conséquent la performance. Il est néanmoins nécessaire d'accompagner cette utilisation par des pratiques organisationnelles (formation des employés et restructuration de l'entreprise) pour bénéficier d'un effet plus significatif de l'utilisation de ces outils.

V. Conclusion

Cette étude réalisée auprès de 107 IMF camerounaises vise à examiner la relation entre l'utilisation des TIC et la performance des IMF camerounaises. Cette relation a été examinée à travers deux approches différentes à savoir : celle de la théorie du consommateur qui s'insère dans le cadre de l'approche causale (microéconomique) et qui vise à identifier l'impact des TIC sur la performance à travers les impacts positifs sur la consommation. Ensuite, nous nous sommes basés sur la théorie de la structuration de Giddens (1987) qui tient compte de la liberté des acteurs dans les organisations et de l'influence des structures sociales sur les acteurs.

Les résultats du test de l'ANOVA nous montrent l'importance du rôle joué par les TIC dans les IMF camerounaises. En effet, les résultats de notre recherche montrent que le niveau d'utilisation des TIC par les IMF a un effet positif sur leurs performances (nombre de client, qualité de service rendue aux clients, part de marché et résultat net). En outre, la prise en compte des pratiques organisationnelles de l'entreprise (formation des employés et restructuration de l'entreprise après adoption d'un TIC) améliore légèrement la relation entre ces deux variables. Ceci, nous amène à nous poser la question de savoir si l'approche processuelle explique mieux la relation entre les TIC et la performance. Compte tenu du fait que nous n'avons utilisé que deux variables des pratiques organisationnelles et une approche subjective pour mesurer la performance, il serait intéressant dans les recherches futures devoir si la prise en compte de plus de variables se rapportant aux pratiques organisationnelles et l'utilisation d'une approche objective pour mesurer la performance de l'IMF permet d'aboutir aux mêmes conclusions que celles dégagées dans cette étude.

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Effectiveness of Micro-Credit Programs in Socio-Economic Development: A Study on Selected NGOs in Bangladesh

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Abstract- Non-governmental Organizations (NGOs) evolved in Bangladesh with the commitment of bringing positive social change and attaining balanced socio-economic development through the disbursement of micro-credit among the marginal people in society. The main intention of the study is to assess the impact of micro-credit on the overall socio-economic development of micro-credit receivers. The Chi-square ($\chi 2$) and Multinomial Logistic Regression techniques have applied on primary data collected from 260 beneficiaries of micro-credit of ASA and BRAC NGOs in the Mymensingh district of Bangladesh. The $\chi 2$ analysis shows that the amount of micro-credit taken has a significant positive impact on respondents' type of home, sanitation facilities, ownership of other household assets, health service received, yearly income, expenditure, and savings, and participation in family's decision making, whereas an insignificant relationship is observed for occupational status, children education, ownership of land and livestock, sources of drinking water, economic solvency, and social status of the respondents.

Keywords: *micro credit, socio-economic development, NGOs, and Bangladesh.*

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Effectiveness of Micro-Credit Programs in Socio-Economic Development: A Study on Selected NGOs in Bangladesh

Touhidul Islam [α], Dr. Razu Ahmed [σ] & Kohinur Aktar [ρ]

Abstract- Non-governmental Organizations (NGOs) evolved in Bangladesh with the commitment of bringing positive social change and attaining balanced socio-economic development through the disbursement of micro-credit among the marginal people in society. The main intention of the study is to assess the impact of micro-credit on the overall socio-economic development of micro-credit receivers. The Chi-square ($\chi 2$) and Multinomial Logistic Regression techniques have applied on primary data collected from 260 beneficiaries of micro-credit of ASA and BRAC NGOs in the Mymensingh district of Bangladesh. The χ^2 analysis shows that the amount of micro-credit taken has a significant positive impact on respondents' type of home, sanitation facilities, ownership of other household assets, health service received, yearly income, expenditure, and savings, and participation in family's decision making, whereas an insignificant relationship is observed for occupational status, children education, ownership of land and livestock, sources of drinking water, economic solvency, and social status of the respondents. The results of multinomial logistic regression revealed that the micro-credit programs of NGOs played a significant role in marginal socio-economic development than the adequate and safe socio-economic development of micro-credit receivers in the study area. In this respect, to ascertaining desired socio-economic development in the rural area of Bangladesh, NGOs should be given priority on creating jobs or self-employment, monitoring proper use of micro-credit, women empowerment, arranging training and awareness programs on different social issues including education and health among the micro-credit receivers through establishing appropriate coordination among the various NGOs working in a locality regarding their programs, policies and service delivery mechanism.

Keywords: micro credit, socio-economic development, NGOs, and Bangladesh.

I. Introduction

NGOs are those organizations, which are involved in the development or welfare-oriented activities (Begum, Zaman and Khan, 2004). NGOs are engaged with the different development projects at the grass-root level. It is an association organized voluntarily through the initiative of dedicated persons committed to well being of the society. NGOs, although work outside the government structure but are within the legal framework of the country (Rahman, 1993 cited by Begum, Zaman and Khan, 2004). As third sector at present NGOs have come forward to provide social services to people of this country. It has achieved greater success in the case of developing the socio-economic condition in remote rural areas. The main aim of NGOs is to flourish the socio-economic situation, becoming very close to the government, and working as a service provider besides the government. Sometimes, many government departments hire NGOs to deliver their services (Islam, 2016). This sector in Bangladesh is an inseparable part of society. NGOs universally recognized for their exceptional ability to reach the grassroots. (Haider, 2013)

Bangladesh is an agricultural country where agriculture sector plays a vital role in augmenting economic growth. According to Food and Agriculture Organization (FAO), per capita arable land was 11.90 decimals in the year 2015 which is decreasing gradually with the increase of population and other use of agricultural land for different purposes like industrialization, urbanization, development works of government, etc. With this increased population, the country has also been facing massive challenges of feeding them or even to support their livelihood sustainably (Hassan and Forhad, 2013). On the other hand, this rural agro-based country, unfortunately, has failed to create rewarding employment opportunities for its vast population. Considering these overall situations, the NGOs are working on poverty eradication by directly involving the poverty-stricken inhabitants (Roy, Raquib and Sarker, 2017).

NGOs are evolved in Bangladesh with the commitment of positive social change through the implementation of their effective micro-credit program among the poor and marginal people of the society. NGOs work with those people who are mostly hardcore poor and who have hardly access and opportunities for improving their living status and standards (Hassan and Forhad, 2013). It sometimes, as a part of civil society, almost capable of meeting the needs of poor people strengthening social development, and keeping a role to make a bridge between local people and government about their rights and claims (Hassan, 2015). Moreover,

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NGOs usually create employment in two ways. First of all, they employ their organization since they also need human resources to operate. Secondly, through providing loans and management assistance to the individuals, it creates new employment opportunity (Begum, Zaman and Khan, 2004). Nowadays, NGOs are the main channel for catching the attention of both national and international donor agencies for Bangladesh. Additionally, international donors and agencies have been recognized NGOs as a fertile place for their development program (Islam, 2016).

The NGOs are involved with different functions like micro-credit/ micro-finance (Haider, 2013; Begum, Zaman, and Khan, 2004; Islam, Khatun, Hossain, and Alom, 2012; Hassan, 2015; Islam, 2016; Ramakrishna, 2013), healthcare (Haider, 2013; Begum, Zaman, and Khan, 2004; Hassan, 2015; and Islam, 2016), family planning (Haider, 2013), legal aid (Haider, 2013; Islam, Khatun, Hossain, and Alom, 2012), non-formal education (Haider, 2013; Islam, Khatun, Hossain, and Alom, 2012; Begum, Zaman, and Khan, 2004; Hassan, 2015, Kumari, 2013), nursery development (Islam, Khatun, Hossain, and Alom, 2012; Begum, Zaman, and Khan, 2004), entrepreneurship development (Islam, Khatun, Hossain, and Alom, 2012; Ramakrishna, 2013), handicraft (Begum, Zaman, and Khan, 2004), agricultural extension (Islam, 2016), human rights (Islam, 2016), mobilize of resources (Kumari, 2013), fisheries, livestock and poultry (Hossain and Mijan, 2018), etc. Among them, micro-credit is the important one, and it also boosts up other functions because of smooth operations of many of these functions directly linked with funding. Micro-credit can play an important role in positive changes in socio-economic development by creating the facility of funding. So the present study is an attempt to assess the role of micro-credit for the socio-economic development of rural people in Bangladesh.

II. Literature Review

Some of the vital studies that have reviewed under different perspectives of NGOs are presented below by placing the most recent at first.

Debnath, Rahman, Acharjee, Latif, and Wang (2019) tried to identify the determinants of microcredit accessibility by rural women households and its impact on rural women empowerment in Bangladesh by applying descriptive statistics and binary logistic regression techniques on collected primary data. The study observed an inverse relationship between annual income and accessibility to the microcredit program. In contrast, a significant positive relationship observed between family size and accessibility to the microcredit program. The study also found a positive and significant impact of microcredit on augmenting women empowerment. It recommended to review loan products by putting more emphasis on higher income group women by the micro-credit providers in Bangladesh.

Huque (2017) critically explored the effectiveness of micro-credit programs for urban women in Bangladesh based on the qualitative approach. The study observed that economic empowerment and involvement in the decision-making process tremendously brought some positive transformation in the urban lives of the women with the help of the micro-credit program of NGOs in Dhaka city.

Roy, Raquib, and Sarker (2017) claimed that NGOs played a crucial role in attaining sustainable economic growth and socio-economic development in Bangladesh through the disbursement of microcredit among the poor segment of the society. It also creates awareness, organizes marginal people in society, and makes them development-oriented.

Khan and Rahman (2016) using the logistic regression techniques found that the factors like age, marital status, number of children living in the household, place of residence, geographical location, education, partner's education, and the wealth index are leading to women for involvement in economic activities in Bangladesh. The study claimed that women's participation in economic activities and NGO activities have a positive impact on family, community, and country levels.

Gamage, Kuruppuge, and Nedelea (2016) made an effort to find out the socio-economic determinants of the well-being of urban households in Sri-Lanka using descriptive statistics and logistic regression techniques. The study explored that the savings with the formal financial sector, participation in the community activities, and network with the outside community have a positive and significant effect on the well-being of households.

Roy and Biswas (2016) explored the role of microcredit on education in Bangladesh by applying the chi-square test and binary logistic regression analysis on collected primary data. The finding of the study was that microfinance positively creates an impact on the education of Bangladesh through the reduction of drop-out possibility.

Alam, Hamid, and Roy (2015) tried to investigate the role of microcredit in enhancing women empowerment in the south-west region of Bangladesh by using the Cumulative Empowerment Index (CEI) and multiple linear regression model on collected data from 80 microcredit takers and 80 non-microcredit takers. Based on CEI, the study found that the microcredit taker women are economically more empowered than the non-microcredit taker women and based on multiple linear regression model, the study explored that, contribution to household income, monthly investment, and the new addition to asset ownership of the respondents have a statistically significant effect on women empowerment. Though women empowerment

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status regarding microcredit taking produced a statistically insignificant result, the study identified positive impact on the economic empowerment of women in the study area.

Islam, Ahmed, and Alam (2014) examined the impact of micro-credit on the empowerment of rural women in Bangladesh by applying OLS (Ordinary Least Square) regression analysis on collected primary data and found that microcredit program positively associated with women's economic decision making, household decision making, freedom of physical movement, ownership of property, and political and social awareness.

Slathia, Nain, Sharma, Ali, Chahal, and Kumar (2014) claimed that the micro-credit programs of NGOs for small farmers, education and health services, rural women empowerment, etc. have contributed to enhancing the socio-economic status of micro-credit receivers in India.

Haidar (2013) studied to examine the impact of NGOs on the socio-economic situation of the poor in Bangladesh and by employing Chi-square technique on primary data observed that the socio-economic circumstance of the poor in both urban and rural area has developed through the implementation of different types of socio-economic programs by the NGOs.

Khatun, Islam, and Majumder (2012) examined the impact of micro-credit on poverty alleviation in Bangladesh using binary logistic regression and multinomial logistic regression analysis. The study found that the micro-credit receivers were able to alleviate their poverty through the proper use of loan of NGOs.

Islam, Khatun, and Alom (2012) tried to evaluate the micro-credit programs of BRAC, Grameen Bank, PROSHIKA, ASA, SSS, and TMSS by applying logistic regression model on collected primary data from micro-credit receivers and found that NGO membership, amount of loan taken and experience of poverty alleviation are the three significant determinants of micro-credit programs for reducing poverty in the study area.

Ahsan (2005) evaluated the impact of micro-credit of ASA, BRAC, and Grameen Bank to reduce poverty in Bangladesh. The study explored that NGOs have contributed a positive and significant role in reducing poverty by providing micro-credit among poor people. The study claimed that by receiving micro-credit, creditors have been able to engage with income-generating activities that help to increase rural employment and rapidly reduce rural poverty in the study area.

Rahman (2005) tried to find the dynamics of NGOs in Pakistan and observed that NGOs are growing in both number and size as the third sector of society through the contribution in poverty alleviation, rural development, and policy advocacy in the field of the environment through the implementation of microcredit programs. The author mentioned those socio-economic indicators of Pakistan are little appreciable and require NGOs' involvement in social welfare and development.

Bennett (1998) explored the role of NGOs in rural development of Pakistan. The study mentioned that NGOs are playing a crucial role, especially for agricultural development, through successful cooperation with local communities and government.

The reviewed literature in the study provides a idea that all over the world NGOs involve with different developmental activities, and there are thousands number of researches have conducted on distinct topics of NGOs like poverty alleviation, women empowerment, education, micro-credit, etc. As micro-credit works as a backup of all other socio-economic development functions so in this paper, the researchers deal with the role of micro-credit in the socio-economic development of the loan receivers. Since several NGOs are conducting micro-credit activities in the Mymensingh district of Bangladesh, researchers of the study are interested in exploring the role of microcredit in the socio-economic development of loan receivers in the study area.

III. Rationale of the Study

Poverty in Bangladesh has declined remarkably, and the international institutions recognized the progress in poverty alleviation. For poverty eradication in Bangladesh, it is necessary for the expansion of loan amount and loan activities, and in many cases, NGOs (micro-credit programs) are more successful in some aspects of development where the government is playing a secondary role (Begum, Zaman and Khan, 2004). NGOs are evolved in Bangladesh with the commitment of positive social change through the implementation of their effective micro-credit program among the poor and marginal people of the society. The micro-credit programs have played a crucial role in creating self-employment among the rural unemployed men and women by providing a small amount of capital to invest in cultivation, fisheries, poultry business, handicrafts, cottage industry, etc. The study evaluates the impact of micro-credit programs in the socio-economic progress of the loan receivers in the Mymensingh district of Bangladesh through the comparison of their development of before and after involving with NGOs. The endeavor of the study is to identify the real scenario of the role of micro-credit in the balanced socio-economic development in the study area. The study will add value in the field of NGO and micro-credit with the contemporary literature. Moreover, from the findings of the study, policy planners also will get guidelines about the amount of loan amount which facilitates the loan receivers.

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IV. The Objective of the Study

The core objective of the study is to explore the role of micro-credit in the socio-economic development of Bangladesh. To attain the main goal following specific objectives are set out-

i. to explore the role of micro-credit in the socio-economic development of the micro-credit receivers in Bangladesh, and
ii. to give some potential recommendations for increasing the effectiveness of micro-credit for socio-economic development.

V. The Methodology of the Study

The study deals with the role of micro-credit in the socio-economic development of the loan receivers. In this regard, the study mainly based on primary data. A total of 260 repondents were selected from ASA and BRAC by simple random sampling technique. A survey conducted on the 260 (130 from ASA and 130 from BRAC) loan receivers from 13 Upazila of Mymensingh district of Bangladesh trough structured interview. Collected data have processed through SPSS (Statistical Packages for the Social Sciences), Version-20.0. The study employed statistical tools like Chi-square (χ^2) test and Multinomial Logistic Regression Model for examining the role of micro-credit in the socio-economic development of the Mymensingh district of Bangladesh.

a) Chi-square (χ^2) test

The χ^2 test is one of the simplest nonparametric tests in statistics that applies to compare more than two variables for a randomly selected data. The expected frequencies are calculated based on the conditions of the null hypothesis. The rejection of the null hypothesis depends on the differences in actual value and expected value. The formula for computing χ^2 is-

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

with (r-1)(c-1) degrees of freedom.

Where, O is the observed frequency, E is the expected frequency, r is the number of rows, and c is the number of columns. The greater the value of χ^2, the larger would be the discrepancy between observed and expected frequencies. If the calculated value of χ^2 is greater than the table value, the difference between the theory and observation is considered to be significant. On the other hand, if the calculated value of χ^2 is less than the table value, the difference between the theory and observation is not considered significant or, p-value is ≤ 0.05, null hypothesis rejected, otherwise accepted. (Gupta and Gupta, 2008-2009). In this study, the χ^2 has applied on the data of after joining NGOs, to identify and analyze the association of independent variable (amount of loan taken) and the selected socio-economic development indicator variables.

b) Multinomial Logistic Regression Model

The study has made an effort to find out the role of micro-credit in the socio-economic development of the loan receivers by considering socio-economic development as a dependent variable and name of the NGOs, amount of loan taken, involvement period with NGOs and number of earning family members as the predictors. The socio-economic development has measured by constructing a socio-economic development index (SEDI) by combining the development of the respondents' socio-economic variables after involving with NGOs, like- the occupation of respondents, the role of NGOs on respondents' children education, ownership of land, type of home, sanitation facilities, sources of drinking water, ownership of livestock, ownership of other household assets, health service received, yearly income, yearly expenditure, yearly savings, participation in family's decision making, economic solvency, social status of the respondents. The SEDI has coded into three categories, viz marginal socio-economic development (1), adequate socio-economic development (2), and safe socio-economic development (3). The respondents who got SEDI$\leq$5, 5$<$ SEDI$\leq$10, and SEDI$>$10 are marked as marginal socio-economic development, adequate socio-economic development, and safe socio-economic development, respectively. Since the dependent variable (Socio-economic Development) has divided into three categories, the study has employed a multinomial logistic regression model. The multinomial logistic regression model for a dependent variable with *J* categories suggests estimating *J-1* logit equations, where each equation is a linear function that models the logarithm of the probability of having a response *j* to a predetermined baseline category *J*. Hence, the study has developed the following two logit equations of the multinomial logistic regression model by considering safe socio-economic development (3) as the reference category.

The logit equation for marginal socio-economic development (1):

$$logit\ (Y_1) = \ln\left[\frac{P(Y=1|X)}{P(Y=3|X)}\right] = \beta_{13} + \sum_{k=1}^{K} \beta_{1k} X_k \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

The logit equation for adequate socio-economic development (2):

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$$logit\ (Y_2) = \ln\left[\frac{P(Y=2|X)}{P(Y=3|X)}\right] = \beta_{23} + \sum_{k=1}^{K} \beta_{2k} X_k \ \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where Y represents the dependent variable, X_k are the independent variables (predictors) with $k = 1, 2, \cdots$, K and β_k are the logit coefficients. In the study, the results of the multinomial logistic regression model has interpreted in terms of predicted probability computing from the corresponding estimated coefficients.

VI. Analyses and Interpretation of the Estimated Results

a) Chi-square (χ^2) test

A Chi-square test is applied to find out the impact of micro-credit in terms of the loan amount on socio-economic development indicators. Among the 260 respondents, 44.20 percent, 45.80 percent, and 10.00 percent have taken loans from NGOs within the range of below 1 lakh, 1 lakh to 5 lakhs, and ≥ 5 lakhs, respectively. The results of the χ^2 test are interpeted as follows-

Table No. 1: Respondents Occupational Status by Amount of Loan Taken

		Occupational Status						Total
	Category	Job	Business	Cultivator	Housewife	Day laborer	Others	
Amount of Loan Taken	Below 1 Lakh	4 (3.50) (40.00)	7 (6.10) (36.80)	3 (2.60) (37.50)	87 (75.70) (45.30)	5 (4.3) (45.5)	9 (7.80) (45.00)	115 (100) (44.20)
	1-5 Lakhs	5 (4.20) (50.00)	9 (7.60) (47.40)	5 (4.20) (62.50)	86 (72.30) (44.80)	4 (3.40) (36.40)	10 (8.40) (50.00)	119 (100) (45.80)
	≥ 5 Lakhs	1 (3.80) (10.00)	3 (11.50) (15.80)	0 (0.00) (0.00)	19 (73.10) (9.90)	2 (7.70) (18.20)	1(3.80) (5.00)	26 (100) (10)
	Total	10 (3.80) (100)	19 (7.30) (100)	8 (3.10) (100)	192 (73.80) (100)	11 (4.20) (100)	20 (7.70) (100)	260 (100) (100)
$\chi^2 = 4.0$					df = 10		Significance = 0.94	

Source: Authors' calculation from survey data

Note: Figures in the parentheses denote percentage to the total

Table No. 1 shows the occupational status of the respondents by the total amount of loan taken. Among the 260 respondents, 3.80 percent are job holders, 7.30 percent businessman, 3.10 percent Cultivator, 73.80 percent housewife, 4.20 percent day laborer, and 7.70 percent engaged with other professions. From the analysis insignificant relationship found between occupational status and total amount of loan taken, i.e., χ^2 (df = 10, N = 260) = 4.0, p = 0.94. It indicates the total amount of loan taken has no significant positive impact on respondents' occupational status.

Table No. 2: Role of NGO on Child Education by Amount of Loan Taken

		Role of NGO on Child Education		Total
	Category	No	Yes	
Amount of Loan Taken	Below 1 lakh	29 (25.20) (46.80)	86 (74.80) (43.40)	115 (100) (44.20)
	1-5 lakhs	28 (23.50) (45.20)	91 (76.50) (46.00)	119 (100) (45.80)
	≥ 5 lakhs	5 (19.20) (8.10)	21 (80.80) (10.60)	26 (100) (10.0)
	Total	62 (23.80) (100)	198 (76.20) (100)	260 (100) (100)
$\chi^2 = 0.43$		df = 2		Significance = 0.80

Source: Authors' calculation from survey data

Note: Figures in the parentheses denote percentage to the total

Table No. 2 depicts the role of NGOs on child education by the total amount of loan taken. Among the 260 respondents, 76.20 percent agreed that NGOs have a positive role in child education, where 23.80 percent not agreed regarding the issue. From the analysis insignificant relationship found between role of NGOs on child education and amount of loan taken, i.e., χ^2 (df= 2, N = 260) = 0.43, p = 0.80.

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Table No. 3: Ownership of Land by Amount of Loan Taken

		Ownership of Land			Total
	Category	0-10 Decimal	10-20 Decimal	≥20 Decimal	
Amount of Loan Taken	Below 1 lakh	57 (49.60) (51.60)	31 (27.00) (39.70)	27 (23.50) (60.00)	115 (100) (44.20)
	1-5 lakhs	64 (53.80) (46.70)	39 (32.80) (50.00)	16 (13.40) (35.60)	119 (100) (45.80)
	≥ 5 lakhs	15 (61.50) (11.70)	8 (30.80) (10.30)	2 (7.70) (4.40)	26 (100) (10.00)
	Total	137 (52.70) (100)	78 (30.00) (100)	45 (17.30) (100)	260 (100) (100)
$\chi^2 = 6.24$			df = 4	Significance = 0.18	

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

Table No. 3 discloses the ownership of land by the amount of loan taken. Among the 260 respondents, 52.70 percent, 30.00 percent, and 17.30 percent hold land ownership within 0-10 decimal, 10-20 decimal, and ≥20 decimal, respectively. The analysis reve aled insignificant relationship between ownership of land and amount of loan taken, i.e., χ^2 (df = 4, N = 260) = 6.24, p = 0.18.

Table No. 4: Type of Home by Amount of Loan Taken

		Type of Home			Total
	Category	Kacha	Adha Pacca	Pacca	
Amount of Loan Taken	Below 1 lakh	66 (57.40) (49.30)	26 (22.60) (33.30)	23 (20.00) (47.90)	115 (100) (44.20)
	1-5 lakhs	64 (53.80) (47.8)	38 (31.90) (48.70)	17 (14.30) (35.40)	119 (100) (45.80)
	≥ 5 lakhs	4 (15.40) (3.00)	14 (53.80) (17.90)	8 (30.80) (16.70)	26 (100) (10.0)
	Total	134 (51.5) (100)	78 (30.00) (100)	48 (18.50) (100)	260 (100) (100)
$\chi^2 = 18.05$			df = 4	Significance = 0.00	

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

Table No. 4 shows the type of home by the amount of loan taken. Among the 260 respondents, 51.50 percent, 30.00 percent, and 18.50 percent were lived in *kacha, adhapacca,* and *pacca* house, respectively. The analysis revealed highly significant relationship between type of home and amount of loan taken, i.e., χ^2 (df = 4, N = 260) = 18.05, p = 0.00.

Table No. 5: Sanitation Facilities by Amount of Loan Taken

		Sanitation Facilities		Total
	Category	Kacha	Pacca	
Amount of Loan Taken	Below 1 lakh	48 (41.70) (42.10)	67 (58.30) (45.90)	115 (100) (44.20)
	1-5 lakhs	59 (49.60) (51.80)	60 (50.40) (41.90)	119 (100) (45.80)
	≥ 5 lakhs	7 (26.90) (6.10)	19 (73.10) (13.00)	26 (100) (10.0)
	Total	114 (43.80) (100)	146 (56.20) (100)	260 (100) (100)
$\chi^2 = 4.82$			df = 2	Significance = 0.09

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

Table No. 5 shows the sanitation facilities by the amount of loan taken. Among the 260 respondents, 43.80 percent, and 56.20 percent used *kacha, and pacca* sanitation facilities. The analysis revealed significant relationship between sanitation facilities and amount of loan taken, i.e., χ^2 (df = 2, N = 260) = 4.82, p = 0.09 at 10 percent level of significance.

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Table No. 6: Sources of Drinking Water by Amount of Loan Taken

		Sources of Drinking Water		Total
	Category	Others	Tube-well	
Amount of Loan Taken	Below 1 lakh	3 (2.60) (100)	112 (97.40) (43.60)	115 (100) (44.20)
	1-5 lakhs	0 (0.00) (0.00)	119 (100) (27.60)	119 (100) (45.80)
	≥ 5 lakhs	0 (0.00) (0.00)	26 (100) (10.10)	26 (100) (10.0)
	Total	3 (1.2) (100)	257 (98.80) (100)	260 (100) (100)
$\chi^2 = 2.83$		df = 2	Significance = 0.15	

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

Table No. 6 depicts the sources of drinking water by the amount of loan taken. Among the 260 respondents, 98.8 percent and 1.20 percent used drinking water from tube-well and other sources, respectively. The analysis identified the insignificant relationship between sources of drinking water and amount of loan taken, i.e., χ^2 (df = 2, N = 260) = 2.83, p = 0.15.

Table No. 7: Ownership of Livestock by Amount of Loan Taken

		Ownership of Livestock			Total
	Category	0-20 Thousand	20-40 Thousand	≥40 Thousand	
Amount of Loan Taken	Below 1 lakh	54 (47.00) (40.30)	24 (20.90) (41.40)	26 (32.20) (54.40)	115 (100) (44.20)
	1-5 lakhs	67 (56.30) (50.00)	27 (27.70) (46.60)	25 (21.00) (36.80)	119 (100) (45.80)
	≥ 5 lakhs	13 (50.00) (9.70)	7 (26.90) (12.10)	6 (23.10) (8.80)	26 (100) (10.0)
	Total	134 (51.50) (100)	58 (22.30) (100)	68 (26.20) (100)	260 (100) (100)
$\chi^2 = 4.26$			df = 4	Significance = 0.37	

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

Table No. 7 shows the ownership of livestock by the amount of loan taken. Among the 260 respondents, 51.50 percent, 22.30 percent, and 26.20 percent retained the ownership of livestock within 0-20 thousand, 20-40 thousand and 20≥40 thousand, respectively. The analysis found insignificant relationship between ownership of livestock and amount of loan taken, i.e., χ^2 (df = 4, N = 260) = 4.26, p = 0.37.

Table No. 8: Other Household Assets by Amount of Loan Taken

		Other Household Assets			Total
	Category	0-20 Thousand	20-40 Thousand	≥40 Thousand	
Amount of Loan Taken	Below 1 lakh	48 (41.70) (52.20)	32(27.80) (37.70)	35 (30.40) (42.20)	115 (100) (44.20)
	1-5 lakhs	40 (33.60) (43.50)	43 (36.10) (50.60)	36 (30.30) (43.40)	119 (100) (45.80)
	≥ 5 lakhs	4 (15.40) (5.30)	10 (38.50) (11.80)	12 (46.20) (14.50)	26 (100) (10.0)
	Total	92 (35.40) (100)	85 (32.70) (100)	83 (31.90) (100)	260 (100) (100)
$\chi^2 = 7.72$			df = 4	Significance = 0.10	

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

Table No. 8 shows the other household assets by the amount of loan taken. Among the 260 respondents, 35.5 percent, 32.70 percent, and 31.90 percent kept up other household assets within 0-20 thousand, 20 - 40 thousand and ≥40 thousand, respectively. The analysis found significant relationship between other household assets and amount of loan taken i.e., χ^2 (df = 4, N = 260) = 7.72, p = 0.10. It indicates the amount of loan taken has a significant positive impact on other household assets of the respondents at a 10 percent level of significance.

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Table No. 9: Respondents' Received Health Services by Amount of Loan Taken

		Health Services		Total
	Category	Unregistered Doctor	Registered Doctor	
Amount of Loan Taken	Below 1 lakh	30 (26.10) (56.60)	85 (73.90) (41.10)	115 (100) (44.20)
	1-5 lakhs	21 (17.60) (39.60)	98 (82.40) (47.30)	119 (100) (45.80)
	≥ 5 lakhs	2 (7.70) (3.80)	24 (92.30) (11.60)	26 (100) (10.0)
	Total	53 (20.40) (100)	207 (79.60) (100)	260 (100) (100)
$\chi^2 = 5.34$		df = 2	Significance = 0.07	

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

Table No. 9 shows the health services by the amount of loan taken. Among the 260 respondents, 79.60 percent and 20.4 percent received health services from registered and unregistered doctors, respectively. The analysis identified the significant relationship between health services and amount of loan taken, i.e., χ^2 (df = 2, N = 260) = 5.43, p = 0.07. It indicates the amount of loan taken has a significant positive impact on health services taken by the respondents at a 10 percent level of significance.

Table No. 10: Yearly Income by Amount of Loan Taken

		Yearly Income			Total
	Category	Below 50 Thousand	50-100 Thousand	≥100 Thousand	
Amount of Loan Taken	Below 1 lakh	21 (18.30) (63.60)	34 (29.60) (45.30)	60 (55.20) (39.50)	115 (100) (44.20)
	1-5 lakhs	12 (10.10) (36.40)	37 (31.10) (49.30)	10 (58.80) (46.10)	119 (100) (45.80)
	≥ 5 lakhs	0 (0.00) (0.00)	4 (15.40) (5.30)	22 (86.60) (14.50)	26 (100) (10.0)
	Total	33 (12.70) (100)	75 (28.80) (100)	152 (58.50) (100)	260 (100) (100)
$\chi^2 = 12.43$			df = 4	Significance = 0.01	

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

Table No. 10 discloses the yearly income of the respondents' by the amount of loan taken. Among the 260 respondents, 12.70 percent, 28.80 percent, and 58.50 percent generated yearly income within 0-50 thousand, 50-100 thousand, and ≥100 thousand, respectively. The analysis revealed significant relationship between yearly income and amount of loan taken, i.e., $\chi 2$ (df = 4, N = 260) = 12.43, p = 0.01. It indicates the amount of loan taken has a significant positive impact on the yearly income of the respondents.

Table No. 11: Yearly Expenditure by Amount of Loan Taken

		Yearly Expenditure			Total
	Category	Below 40 Thousand	40-80 Thousand	≥80 Thousand	
Amount of Loan Taken	Below 1 lakh	21 (18.30) (63.60)	35 (39.90) (41.10)	59 (47.80) (41.70)	115 (100) (44.20)
	1-5 lakhs	12 (10.10) (36.40)	48 (40.30) (50.50)	59 (49.60) (44.40)	119 (100) (45.80)
	≥ 5 lakhs	0 (0.00) (0.00)	8 (30.80) (8.40)	18 (69.20) (13.60)	26 (100) (10.0)
	Total	33 (12.70) (100)	95 (36.50) (100)	132 (50.80) (100)	260 (100) (100)
$\chi^2 = 9.65$			df = 4	Significance = 0.05	

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

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Table No. 11 discloses yearly expenditure of the respondents' by the amount of loan taken. Among the 260 respondents, 12.70 percent, 36.50 percent, and 50.80 percent yearly expend within 0-40 thousand, 40-80 thousand, and ≥80 thousand, respectively. The analysis revealed significant relationship between yearly expenditure of the respondents' and amount of loan taken, i.e., χ^2 (df = 4, N = 260) = 9.65, p = 0.05. It indicates the amount of loan taken has a significant positive impact on the yearly expenditure of the respondents.

Table No. 12: Yearly Savings by Amount of Loan Taken

		Yearly Savings			Total
	Category	Below 10 Thousand	10-20 Thousand	≥ 20 Thousand	
Amount of Loan Taken	Below 1 lakh	42 (36.50) (56.00)	39 (39.90) (36.80)	34 (29.60) (43.00)	115 (100) (44.20)
	1-5 lakhs	31 (26.10) (41.30)	57 (47.90) (53.80)	31 (26.10) (29.20)	119 (100) (45.80)
	≥ 5 lakhs	2 (7.70) (2.70)	10 (38.50) (9.40)	14 (53.80) (17.70)	26 (100) (10.0)
	Total	75 (28.8) (100)	106 (40.80) (100)	79 (30.40) (100)	260 (100) (100)
$\chi^2 = 15.02$			df = 4	Significance = 0.00	

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

Table No. 12 expresses the yearly savings of the respondents by the amount of loan taken. Among the 260 respondents, 28.8 percent, 40.80 percent, and 30.40 percent yearly saved within 0-10 thousand, 10-20 thousand, and ≥20 thousand, respectively. The analysis revealed a highly significant relationship between yearly savings of the respondents and the amount of loan taken, i.e., χ^2 (df= 4, N = 260) = 15.02, p = 0.00. It indicates the amount of loan taken has a significant positive impact on the yearly savings of the respondents.

Table No. 13: Participation in Family's Decision Making by Amount of Loan Taken

		Participation in Family's Decision Making		Total
	Category	No	Yes	
Amount of Loan Taken	Below 1 lakh	4 (3.50) (28.60)	111 (96.50) (45.10)	115 (100) (44.20)
	1-5 lakhs	10 (8.40) (71.40)	109 (96.60) (44.30)	119 (100) (45.80)
	≥ 5 lakhs	0 (0.00) (0.00)	26 (100) (10.6)	26 (100) (10.0)
	Total	14 (5.40) (100)	246 (94.60) (100)	260 (100) (100)
$\chi^2 = 4.43$		df = 2	Significance = 0.10	

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

Table No. 13 displays respondents' participation in the family's decision making by the amount of loan taken. Among the 260 respondents, 94.6 percent agreed that they are participating in the family's decision making where 5.40 percent disagreed regarding the issue. The analysis found significant relationship between respondents' participation in the family's decision making and amount of loan taken, i.e., χ^2 (df = 2, N = 260) = 4.43, p = 0.10. It indicates the amount of loan taken has a significant positive impact on respondents' participation in family's decision making at a 10 percent level of significance.

Table No. 14: Economic Solvency by Amount of Loan Taken

		Economic Solvency		Total
	Category	No	Yes	
Amount of Loan Taken	Below 1 lakh	1 (0.90) (25.00)	114 (99.10) (44.50)	115 (100) (44.20)
	1-5 lakhs	3 (2.50) (75.00)	116 (97.50) (45.30)	119 (100) (45.80)
	≥ 5 lakhs	0 (0.00)	26 (100)	26 (100)
		(0.00)	(10.20)	(10.0)

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	Total	4 (1.50) (100)	256 (98.50) (100)	260 (100) (100)
$\chi^2 = 1.50$		df = 2	Significance = 0.47	

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

Table No. 14 depicts respondents' economic solvency by the amount of loan taken. Among the 260 respondents, 98.50 percent agreed that they are economically solvent after taking loans from NGOs, where only 1.50 percent disagree regarding the issue. The analysis identified insignificant relationship between respondents' economic solvency and amount of loan taken, i.e., χ^2 (df = 2, N = 260) = 1.50, p = 0.47. It indicates the amount of loan taken has no significant positive impact on respondents' economic solvency.

Table No. 15: Respondents' Social Status by Amount of Loan Taken

		Respondents' Social Status				Total
	Category	Not Increased	Increased Financial Solvency	Increased Employment Facilities	Increased Empowerment	
Amount of Loan Taken	Below 1 lakh	2 (1.70) (66.70)	96 (83.5) (44.40)	14 (12.20) (41.20)	3 (2.60) (42.90)	115 (100) (44.20)
	1-5 lakhs	1 (0.80) (33.30)	99 (83.20) (45.80)	15 (12.60) (44.10)	4 (3.40) (57.10)	119 (100) (45.80)
	≥ 5 lakhs	0 (0.00) (0.00)	21 (80.80) (9.70)	5 (19.20) (14.70)	0 (0.00) (0.00)	26 (100) (10.0)
	Total	3 (1.20) (100)	216 (83.10) (100)	34 (13.10) (100)	7 (2.70) (100)	260 (100) (100)
$\chi^2 = 2.51$				df = 6	Significance = 0.87	

Source: Authors' calculation from survey data
Note: Figures in the parentheses denote percentage to the total

Table No. 15 depicts the respondents' social by the amount of loan taken. Among the 260 respondents, 83.10%, 13.10%, and 2.70% said that increased financial solvency, increased employment facilities, and increased empowerment respectively, where only 1.20% claimed that their social status do not increase with the involvement with NGO. From the analysis insignificant relationship found between respondents' social status and amount of loan taken, i.e., $\chi 2$ (df = 6, N = 260) = 2.51, p = 0.87. It indicates the amount of loan taken has no significant positive impact on respondents' social status.

b) Multinomial Logistic Regression Analysis

This section analyses the estimated result of the Multinomial Logistic Regression Model for socio-economic development. The results are presented in table no. 16 and table no. 17.

Table No. 16: Estimated Multinomial Logistic Regression Model for Socio-economic Development

Odds	Variables	Coefficients	Standard Error	Wald Statistic	P-Value	Odds Ratio
$\frac{P(Yi = Marginal\ Socio-economic\ Development)}{P(Yi = Safe\ Socio-economic\ Development)}$	Intercept	-1.93	0.96	4.03	0.04	
	Name of NGOs:					
	ASA	-0.76	0.42	3.29	0.07	0.47
	BRAC (r)					1.00
	Amount of Loan:					
	Below 1 Lakh	2.53	0.99	6.57	0.01	12.58
	1 Lakh - 5 Lakhs	1.96	0.89	4.84	0.03	7.09
	Above 5 Lakhs (r)					1.00
	Involvement Period with NGOs:					
	Below 5 Years	0.14	0.71	0.04	0.85	1.15
	5 Years - 10 Years	0.47	0.68	0.47	0.49	1.60
	Above 10 Years (r)					1.00
	Number of Earning Members in the Respondent's Family:					

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	1 - 2 Members Above 2 Members (r)	1.18	0.50	5.65	0.02	3.26 1.00
$\frac{P(Yi = Adequate\ Socio-economic\ Development)}{P(Yi = Safe\ Socio-economic\ Development)}$	Intercept	-0.30	0.67	0.20	0.66	
	Name of NGOs:					
	ASA BRAC (r)	-0.13	0.39	0.11	0.74	0.88 1.00
	Amount of Loan:					
	Below 1 Lakh 1 Lakh - 5 Lakhs Above 5 Lakhs (r)	0.54 0.17	0.70 0.58	0.60 0.09	0.44 0.77	1.71 1.19 1.00
	Involvement Period with NGOs:					
	Below 5 Years 5 Years - 10 Years Above 10 Years (r)	0.44 0.61	0.63 0.61	0.49 1.02	0.48 0.31	1.55 1.85 1.00
	Number of Earning Members in the Respondent's Family:					
	1 - 2 Members Above 2 Members (r)	1.31	0.44	8.62	0.00	3.69 1.00

Source: Authors' calculation from survey data
Note: 'r' indicates the reference category

Table no. 16 displays the estimated results of the multinomial logistic regression model and helps to identify the significant determinants of the socio-economic development of the loan receivers. The results show that the type of NGOs, amount of loan, and number of earning members in the respondents' family are significant determinant for marginal socio-economic development comparing to safe socio-economic development. But only the number of earning members in the respondents' family is the significant determinant for adequate socio-economic development comparing to safe socio-economic development. However, the study calculates predicted probability for the socio-economic development of the loan receiver corresponding to the estimated coefficients of the multinomial logistic regression model based on the reference respondents' categories. The results of the predicted probabilities in percentages are shown in the following table no. 17.

Table No. 17: Predicted Probabilities (Percentage) for Degree of Change in Socio-economic Development from Multinomial Logistic Regression Model

Variables	Marginal Socio-economic Development	Adequate Socio-economic Development	Safe Socio-economic Development (r)
Name of NGOs: ASA BRAC (r)	3.93 92.74	38.00 7.03	58.08 0.23
Amount of Loan: Below 1 Lakh 1 Lakh – 5 Lakhs Above 5 Lakhs (r)	 44.42 99.33 92.74	 31.15 0.40 7.03	 24.43 0.27 0.23
Involvement Period with NGOs: Below 5 Years 5 Years – 10 Years Above 10 Years (r)	 7.14 8.91 92.74	 49.78 81.64 7.03	 43.08 9.44 0.23
Number of Earning Members in the Respondent's Family: 1 – 2 Members Above 2 Members (r)	 11.19 92.74	 65.09 7.03	 23.73 0.23

Source: Authors' estimation from the result of the Multinomial Logistic Regression Model.
Note: 'r' indicates the reference category.

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Respondents from BRAC, amount of loan above 5 Lakhs, involvement period with NGOs above 10 years, and more than 2 earning members in the respondent's family are considering as the reference respondents for estimating the multinomial logistic regression model in the study. The estimated probabilities in table no.17 reveal that reference respondents have an estimated 92.74 percent, 7.03 percent, and 0.23 percent probability of marginal socio-economic development, adequate socio-economic development, and safe socio-economic development, respectively. The estimated probabilities of the multinomial logistic regression model show that the different NGOs have significant impacts on socio-economic development. The study found a 3.93 percent decrease in the probabilities of respondents having marginal socio-economic development if the respondents belong to ASA. As compared to the BRAC, the respondents from ASA having adequate and safe socio-economic development have a substantial 30.97 percent and 58.57 percent point increase in the probability of adequate and safe socio-economic development, respectively.

The study found a significant impact of the loan amount on the socio-economic development of the respondents. The probability of respondents having marginal socio-economic development increases if the respondents receive loan more BDT1 Lakh to BDT5 Lakhs and decrease if the loan amount is below BDT1 Lakh. In contrast, the study observed that the probability of adequate and safe socio-economic development decreases with the increase in loan amount that indicates micro-credit play an crucial role in marginal socio-economic development than that of adequate and safe socio-economic development. The involvement period with NGOs is a key factor in understanding the impact of micro-credit on socio-economic development. The study found that the probability of marginal socio-economic development increases with the increase in involvement period with NGOs. The probability of respondents having adequate and safe socio-economic development largely increased by 74.23 percent points and 24.20 percent points if the respondents involve with NGOs 5 years to 10 years and below 5 years, respectively. The study also explored that the probability of marginal development increases with the increase in the number of earning members in the respondent's family. The respondents having adequate and safe socio-economic development have the probability of adequate and safe socio-economic development are 65.09 percent and 23.73 percent, if the number of earning members in the respondent's family is less than 2 members.

From the analysis of the estimated probabilities of the multinomial logistic regression model, the study finally observed that micro-credit program has a profound impact in marginal socio-economic development than the adequate and safe socio-economic development with the increase in the loan amount, involvement period with NGOs and increased number earning members in the micro-credit receiver's family.

VII. Conclusion and Recommendations

The main intention of the study is to diagnose the impact of micro-credit on the socio-economic development of the loan receivers involved with ASA and BRAC. Based on the χ^2 analysis the article explored that the total amount of micro-credit has a significant positive impact on respondents' type of home, sanitation facilities, ownership of other household assets, health service received, yearly income, yearly expenditure, yearly saving, and participation in family's decision making, whereas an insignificant relationship is observed on respondents' occupational status, children education, ownership of land, sources of drinking water, ownership of livestock, economic solvency, and social status. The application of multinomial logistic regression model found that the type of NGOs, amount of loan and number of earning members in the respondents' family are significant determinants for marginal socio-economic development comparing to safe socio-economic development. In contrast, the number of earning members in the respondents' family is only the significant determinants for adequate socio-economic development comparing to safe socio-economic development. From the estimated probabilities of multinomial logistic regression, the study finally detected that the micro-credit program has a greater role in marginal socio-economic development than the adequate and safe socio-economic development of the micro-credit receivers.

Based on the findings, the study outlines the following recommendations-

To attain desired socio-economic development in the rural area of Bangladesh, NGOs should be given priority on creating jobs or self-employment, monitoring proper use of micro-credit, women empowerment, arranging training and awareness programs on different social issues including education and health issues among the respondents and also their family members.

Many respondents claimed that they do not get enough time between loan received and starting repayment. So the NGOs should allow reasonable time before starting repayment installments of the loans.

Most of the respondents claimed that the interest rate of micro-credit is too high. So the interest rate should be reduced as much as possible for the betterment of the micro-credit receivers that may lead to an increase in the number of micro-credit receivers as well as increase the amount of disbursement of micro-credit.

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Proper coordination should establish among various NGOs working in a locality regarding their programs, policies, and service delivery mechanism.

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Virus and Economy

By Dr. Satyanarayan Mahapatra
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Abstract- The paper explored the impact of corona virus pandemic and its impact on the global economy. How this virus affected the life of common people and how their life is miserable. The people are struggling to sustain their life in developing and underdeveloped countries. The economy is completely shattered and people are out of a job due to strict lockdown declared by the countries. Particularly in developing countries this virus attack and lockdown has affected the common people and these people are migrating to their native villages for searching of food and shelter.

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Virus and Economy

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Introduction

Nobody thought that the world economy would be severely affected by a virus attack. In the twentieth-century we heard about the economic crisis in 1930, the economic crisis during World War I & II, the oil crisis in the seventies, the Asian currency crisis, and the global financial crisis in the early twenty first-century. The last hundred years the world rapidly progressing, and lots of inventions and discoveries happened during this period. We developed many useful things and achieved many goals. We send humanity to space, to the moon, and to solve many mysteries about the universe. We developed a lot in information technology. Our civilization is proud of the scientific development. Our civilization credited with all kinds of development. All our development proved wrong when suddenly a virus attack the world. Nobody ever thought and imagine that one day a virus will capture the entire world. In twenty-first century when we talk about genetic engineering, biotechnology, internet, digitization, etc, our globe is affected by a virus which is very small and tiny particle unable to see in naked eye killing people on earth. Economists worldwide never predicted that a virus could impact the world economy. If we analyze previous academic works in the economy we will not find any research papers which will show that there is a relationship between virus and economics. This is now true, and we have to accept that besides other factors, there is another uncertain factor called virus, which can impact the economy of the world and the nation. If people are dying today, then the academic community, universities, and multinational pharmaceutical companies should be blamed. They are responsible for the current crisis. People are dying just like insects. When SARS virus discovered very early in twenty first century then why no efforts made by the scientist and pharmaceutical companies to develop vaccine and drugs to cure the disease? It is the failure of the academic community and pharmaceutical companies. Pharmaceutical companies are more interested in manufacturing those medicines which are very profitable and earn revenue for the companies. Pharmaceutical companies R&D are busy developing new medicines and got patented for high blood pressure, diabetes, gastro, neurology, etc. but least-concerned to develop vaccines or medicines to save people on earth. Everybody is busy in making money, but nobody made efforts to protect the world and the common people. We never expected and predicted that the world economy would crash not due to any war but because of a virus. The World is under lockdown, and all the economic activities have come to *stand still*. Stock markets are opening every day, but the indices are highly volatile, and the investors are unable to understand what to do in this situation. Crude oil is at the lowest level, and OPEC basket also quoting low. What will happen to the future of crude oil prices is difficult to predict. A similar case is with gold, silver, and other metal prices. Investors worldwide are confused about where to make investment and to have a sustained return. Every sector of industries are suffering. The rich countries and the countries that rank high in the human development index are suffering more with a virus attack than the developing countries. More people are dying in rich countries, and how many people will die, nobody knows? When will this virus disappear from the globe is uncertain? Today it is proved that the virus is more deadly and lethal than the nuclear weapons. The countries those who possess nuclear weapons do not require to kill the enemy or to destroy the countries. Countries should stop spending money on military weapons, and these weapons are now no longer necessary. Today every country is fighting with virus, and this is a war against nature. To conquer this war, we do not need military weapons, but we need weapons of medicines and vaccines that can save many precious human lives. Human beings should understand this theory very quickly to protect human life and the world economy, but the solution to this problem is not visible. Are we seriously thinking of stopping this virus? The MNCs, private sector companies, public sector companies, research laboratories, and research institutes are all seem defunct. How will this killing explained? Are these dead natural phenomenon? No one has the answer to explain this question. Every country is suffering today, and they are fighting a war that they do not know whether they will win or lose. This is a war against protecting human life and protecting the

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economy. The economy of each country is devastated and shattered. The people are hungry and lost their job due to pandemic. Their earning is stopped and has no money to feed their family. Due to lockdown in the countries, people in many countries, particularly in developing countries and underdeveloped countries, are fighting for survival. The real threat to life is not the virus, but the real threat is hunger. This hunger is going to kill many innocent people. In India, the daily labors and casual labors are migrating to their villages with the hope that they can survive. Since there is no work and no earning due to lockdown; therefore these workers and their families are going back to their villages. Once upon a time, rural people migrated to the cities for searching for jobs and livelihood, but today same people leaving everything and going back to their native places. Though these people are going back to their villages the irony is their own people and village panchayat not allowing them to enter into the village and demanding to produce medical certificate whether you are free from the Covid-19 virus. These people are facing a very pathetic situation for survival. Both sides, there is a threat to their life. Threat from corona infection and the threat of hunger where they will go? Even they cannot go to their native village. Innocent people are suffering because of foreign returned Indians or foreigners who are the main cause of the spreading virus in India. Why are these people should suffer when they have no-fault? Where will they go, and what will be their future? Is this meaning of globalization? People who are well settled with their families in the urban areas are suddenly jobless and unemployed. How the economic cycle will explain this situation? Can we explain the current economic crisis of the world with the help of the economic cycle or trade cycle? No economic theory can explain the current economic crisis. Let us analyze the various economic impact on common people and grass-root people. People who live on hand to mouth and earning their bread and butter. The earning of these people are associated with various means such as transportation systems (train services, public transport, etc.). Indian railways giving scope to a large number of people for earning directly and indirectly, but due to lockdown, the train services completely stopped except goods train. Many businesses are linked to rail transport, and state transport services, and people do business due to the movement of passengers, whether it is the railway platform, inside the train, bus stand, etc. Many poor people do their business due to passengers and they're earning linked to these services. Suddenly closing of the services, the business comes to stand still, and all are affected. The Government has not taken notice of this business while declaring lockdown. This is one example, and there are many such examples of business which are close down due to lockdown and revival of these businesses is very difficult. In India the earning of so many people is linked with this business. The government should seriously think about these people though some NGOs and relief agencies are helping, but this help is very minuscule. It is not in India may be happening in other developing and *under developed* countries. Rich people are in a comfortable zone, but poor people are suffering. Why every time-poor people should suffer. If we are in a democratic society and believe in the constitution, then all people are equal irrespective of their color, caste, and income. Therefore all types of people should be protected, but certain sections people in society are in danger. It is more critical than *corona virus* attack. No doubt one day, the world will win the war against the virus, but can these people who are severely affected will bounce back. Will they able to come back to the mainstream of life. We always appreciate ourselves that we are highly civilized, but still tribes who live in jungles, and we criticize them that they are uncivilized and do not understand the civilization culture, but today, they are safer and have no threat from *corona virus*. They are more intelligent and isolated from the modern and dirty civilized world. These uncivilized people are safer than the so-called civilized world. Their trust in nature and following nature's law protecting them against all threats. We never respected nature and never followed the law of nature. Our food habits and *life style* destroying us. We should learn from this uncivilized society. People at the bottom of the society are suffering, and their plight cannot be mitigated by the capitalism model. If not then why are we encouraging this type of economic system? Which benefits the one percent of the population? Right now socialism concept should strictly be implemented, and at least the majority section of the population will be benefitted by socialism. The job, income, and family will be protected. Socialism can save the world, not capitalism. The developing countries should encourage the socialistic economic model instead of the capitalism model. This model is the right model not only for developing countries but also for developed countries. Socialism is always criticized by most of the economist and *policy makers*. Today people need job protection, timely payment of salary, social security benefits, etc. to face this crisis, and only socialism can save the people at this juncture. The government of each country should come forward and protect the people because in the private sector people are asked to go on leave without salary or with a salary cut. In most of the private sector except few in numbers, people are on leave without salary. Today people need money for food to feed their family. This is giving additional burden and family are in distress due to a shortage of money and a shortage of food. In most developed countries which adopting the capitalism model economy, the unemployment rate is rising and more, and more people are jobless even in the United States job situation is very critical. People are struggling to sustain their life. How long this pandemic

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situation will continue in this world, nobody knows, but human and humanity should survive. Therefore there is a greater need for socialism. Capitalism cannot solve the problem of labor migration and food security. Children and adults are dying of hunger. Nobody knows what the law of nature has decided about the fate of the people and the future of the world. This virus attack has stopped the source of income for everyone. The person who is selling tea, street vendors, fruits and vegetable sellers, toys sellers, and *business men* running hotels, restaurants, gym, multiplexes, etc. are all sitting idle with no income. The crisis is going from bad to worse, and during a crisis you need money. Every essential item is now costly, and to buy these goods, you need cash. The government should come forward to help these people. The government should have a proper plan to tackle this situation. Simply declaring lockdown will not solve the problem. It may decrease the virus infection, but at the same time, the life of common man and economic activities will be pathetic.

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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.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

Tips for writing a good quality Management Research Paper

Techniques for writing a good quality management and business 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 management and business 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.



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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.

19. 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.

20. 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.

21. 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.

22. 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.

23. 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.

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.

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.



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- 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.

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.



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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.

Please read the following rules and regulations carefully before submitting your research paper to Global Journals Inc. to avoid rejection.

Segment draft and final research paper: You have to strictly follow the template of a research paper, failing which your paper may get rejected. You are expected to write each part of the paper wholly on your own. The peer reviewers need to identify your own perspective of the concepts in your own terms. Please do not extract straight from any other source, and do not rephrase someone else's analysis. Do not allow anyone else to proofread your manuscript.

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Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals.

Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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