Financial Sector Development, Gender Parity, and Poverty Reduction: Theoretical and Empirical Evidences

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Abstract

This paper evaluates the impact of financial sector development on poverty decomposed by gender, in rural Cameroon. Several works have highlighted the impact that financial sector development could have on economic growth and poverty reduction. The incorporation of gender considerations in this paper helps to fine-tune the targeting of the effects. In this regard, a decomposition of effects was undertaken, notably income growth effects on male and female heads of household and inter-gender income inequality effects. We arrive at the conclusion that financial sector development produces a positive impact on income growth for both male and female heads of household, and reduces inter-gender inequalities. However, the impact on income growth and inequalities is non-linear. The paper further concludes that financial sector development produces a positive but non-linear impact on gender inequality and poverty reduction in rural Cameroon.

Keywords: Financial sector development, Poverty, Inequality, Growth, Gender, Discrimination, and Kuznets U.

1. Introduction

In Cameroon, 3.5 percent of persons living in female-headed households have access to formal credit compared to 5.5 percent for those living in male-headed households (Government of Cameroon 2003). This leads to the observation that, on the whole, a small proportion of people have access to formal credit. Specifically, women have less access to formal credit than men.

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Thus, 60 percent of men have access to credit compared to 25 percent of women and 15 percent for constituted groups[4]. Furthermore, the financial sector has evolved from one in which commercial banks were the main player to a broader sector that includes microfinance institutions. The latter operate in a decentralised manner, compared to commercial banks.

With regard to performance, microfinance institutions still have a limited impact on the Cameroonian economy, both in terms of deposits and credit. The volume of deposits and shares collected represents 3.2 percent of all bank deposits in the country. Excluding the CAMCCUL network, this rate stands at only 0.7 percent.

The loans outstanding to the decentralised financial systems account for two percent of total credit in the Cameroonian economy. This drops to 0.3 percent if CAMCCUL is excluded. The situation raises questions about the manner in which financial services are organised in Cameroon.

Apart from these two financial actors, there is another informal actor – the "tontines" and associations. The coexistence of the "tontine" system, microfinance institutions, and a few commercial banks helps to boost the action and intervention capacity of the financial sector through diverse services, and promotes the income accumulation process in rural areas. However, the development of this sector does not in any way imply that credit allocation and savings collection mechanisms function without difficulties. Consideration of financial sector development reveals its relevance in our study in terms of its impact on the lives of the poor by incorporating gender considerations.

Several studies have developed an impact analysis of financial sector development on growth and economic development (Ang 2007; DFID 2004; De Gregorio and Guidotti 1995; King and Levine 1993; Greenwood and Jovanovic 1990, etc.), but very few have conducted an impact analysis of poverty (Kpodar 2006). Even less are studies on the analysis of the impact of the financial sector development on gender-related poverty. Already in the early 20th Century, Schumpeter (1912) indicated the importance that finance could have on the investment mechanism, particularly in relation to the adoption of new production methods. In his analysis, he placed special emphasis on institutions and not on individuals, as actors for driving growth. Such institutions contribute through the development and adoption of innovations and technical progress.

This fails to take into consideration the role that an individual may have in managing such institutions. In this study, finance sector development focuses on access to credit by the rural poor, for financing productive investments that contribute to poverty reduction and economic development, bearing in mind that the rural poor account for over half of the rural population as revealed by household surveys conducted in Cameroon in 1996 and 2001, respectively. In 1996, the rural poor constituted 59.6 percent of the rural

4. Statistics from Microfinance Support Programme document: Pre-Appraisal Report, September 2000

population, while the urban poor represented 41.4 percent of the urban population. In 2001, the figures were 49.9 percent for rural poor against 22.1 percent for urban poor. In 2007, the urban poor represented 12.2 percent against 55.5 percent of rural poor (INS 2008).

Financial sector development can help facilitate the adoption of improved technologies by the poor. A point to note is that agriculture is a major contributor to the GDP of many Africa countries in general, and Cameroon in particular. As McKinnon (1973) points out, a farmer needs to borrow to acquire new equipment. As such, the financial intermediary facilitates investment in new technologies, which contributes to increased productivity and income for farmers. Financial sector development, which depends on the mobilisation of savings for increased credit availability, is thus also enhanced. This development can be achieved through the specific and targeted diversification of financial actors as well as through an expanded range of financial services offered.

The main objective of this study is to assess the impact of financial sector development on poverty reduction by gender in rural areas, in terms of improved access to credit. Specifically, the study involves analysis of the impact of financial sector development on the production of women and men. It also involves assessing the impact of financial sector development on inter-gender income inequalities.

For the purpose of our study, we constructed several indices, including the gender parity index for access to credit, the financial sector development index, and the inter-gender income inequalities index. We then assessed the determinants of gender parity in access to credit, based on a simple linear model estimated using ordinary least squares.

Subsequently, a semi-logarithmic model was estimated using the instrumental variables method to assess the impact of the financial sector development on the income growth of both male and female heads of household. To assess the impact of financial sector development on inter-gender income inequalities, the approach we adopted draws on the method developed by Oaxaca (1973) and Blinder (1973), which incorporates an estimation based on the differential between men and women[5]. This modelling incorporates the semi-logarithmic logic using ordinary least squares as the estimation method. The study reveals that poor male heads of household and poor female heads of household are at an absolute disadvantage in terms of access to credit. For both poor males and poor females, the rate of access to credit is less than 10 percent.

Relatively, poor female heads of household and poor male heads of household have unequal access to rural credit – 3.7 percent for the women as against 4.6 percent for the men. The determinants for this gender disparity in

5. Oaxaca (1973) and Blinder (1973) conducted a study on discrimination by showing how the characteristics of each individual can have an impact on the earnings of men and women.

access to credit in rural Cameroon are education level, household size, and income level.

Other aspects highlighted during the surveys were institutional and socio-economic factors. Institutional factors include the inflexibility of banks and the charging of inaccessible interest rates. Socio-economic factors include fear, lack of information, and type of society**.** In terms of the impact of financial sector development on gender poverty, we establish that it produces a positive impact on the income growth of male and female heads of household, as well as on the reduction of inter-gender inequalities. However, this impact on both income growth and inequalities follows a non-linear trend. We can therefore say that financial sector development produces a positive impact, with a non-linear trend, on gender poverty reduction in rural Cameroon.

This paper is divided into four sections. Section 2 presents a definition of the concept of financial sector development and a theoretical and empirical analysis of the indirect impact of financial sector development on gender poverty. Section 3 discusses the different indices constructed in our study, the econometric models, and related estimation methods. Section 4 presents the empirical results relating to the impact of financial sector development on gender poverty, while highlighting the determinants of gender disparity in access to credit in rural Cameroon. Section 5 is devoted to the summary and main conclusions of our study.

2. Conceptual Framework and Literature Review

In her analysis, Robinson (1952) emphasises that in a financial system, when demand for financial services is significant in a context of economic growth, there is an increase in financial institutions and financial products and services (Ang 2007). She considers financial development an expansion of the financial system, characterised by increased demand for financial services and increased financial institutions. In his analysis, Turunç (1999) dissociates the concept of exogenous financial development (supply of financial services) from endogenous financial development (demand for financial services). According to him, a financial system is said to be developed only if it ensures the running of an efficient and open-ended payment system, mobilises savings, and improves its allocation to investment.

However, studies conducted in 2004 by Britain's Department for International Development (DfID) reveal that there is no accepted definition for understanding the concept of financial sector development. For Ang and Mackibbing (2005), a system is said to be financially developed if it is capable of ensuring the mobilisation of private savings, effective resource allocation, increased liquidity, risk diversification, reduced information and transaction costs, proposal of an alternative or collection of funds through individual household savings, and undistributed corporate profits. Other authors, for

instance Gurley and Shaw (1955), Goldsmith (1969), and Hicks (1969), follow this logic in analysing financial system development.

They argue that financial development is very important in the economic growth process. Therefore, the concept of financial development is not limited only to the expansion of the financial system in terms of demand for financial services and financial institutions, but also incorporates the concept of financing policy applied within the financial institution. We observe through these different approaches that the financial development concept reflects the demand and supply for financial services approach through institutions that are established and the financial services proposed. It is true that in a given economy, all these characteristics may be found. But that does not imply in any way that the financial sector is fully developed.

The completeness of financial sector development lies in the fact that there is an effective transmission channel between financing need, represented by the demand for financial services, and financing capacity, represented by the supply of financial services. The transmission channel could therefore be analysed in terms of the degree of credit accessibility. Having thus presented the different approaches to financial development and after considering the degree of accessibility as a barometer of financial sector development, we come up with an appropriate definition of this concept in the context of our study. The development of the financial sector can be viewed as an increase in the percentage of accessibility to financial services (allocated to productive investment) for deprived persons or groups of persons through improvement of the mechanism for collecting private savings and allocating credit, while minimising the main costs associated with informational asymmetries.

Furthermore, we must emphasise that poverty variation depends on two factors, (Datt and Ravallion 1992, and Kakwani 1993) namely: (1) Increase in the average income of the population with relative distribution of unchanged revenue; and (2) with unchanged average income, redistribution of income to the poor, resulting in a multiplier effect that allows increased income levels for the poor and thus reduces existing inequalities. It must be pointed out that financial development can contribute effectively to poverty reduction if it contributes beyond growth (increased average income of population with relative continuous distribution) to positively reduce income inequalities (redistribution of income to the poor with unchanged average income). However, financial development can have a direct impact on poverty reduction (Kpodar 2006).

Taking into account these two direct and indirect effects, we come up with the following representation:

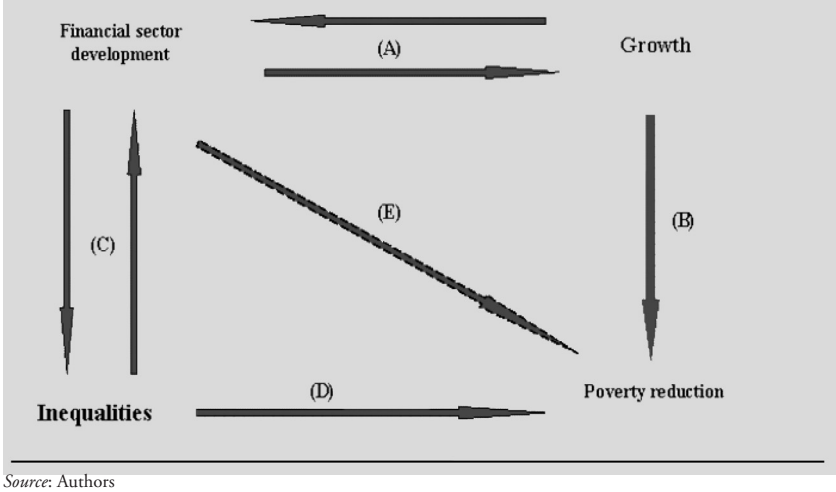
Three main axes emerge from the Chart:

– (A) + (B) represent the indirect impact of financial development on poverty reduction based on economic growth

– (C) + (D) represent the indirect effect of financial development on poverty reduction based on inequalities

– (E) represents the direct impact of inequalities on poverty reduction

Chart 1. ***Direct and Indirect Impact of Financial Sector Development on Poverty Reduction***



Source: Authors

In developing countries, investors are at the same time savers. Given that the financial system is characterised by low levels of external financing, any accrual of major expenditure envisaged first calls for an increase in the necessary real cash reserves. According to the "threshold effect" (Kpodar 2006), it is assumed that as and when the financial system develops, it may extend its services to the poor. Consequently, it is necessary that the financial system reaches a certain threshold of development to provide cost-effective services to the poor[6]. With regard to the indirect effect that falls within the scope of our analysis, the growth effect reflecting a positive impact of financial sector development on production through improved combination of factors of production is presented.

The results we draw from these different analyses are obtained by considering the poor as a whole. There is no gender specification that allows targeted assessment of the financial sector's impact on poor men and poor women, and according to the differential that may exist between these two sub-groups. In that regard, we use the studies conducted by King and Levine (1993), Levine *et al.* (1999), among others, which allow us to analyse the impact of financial sector development on economic growth. These studies were conducted mostly at the macro-economic level. None specifically assesses the impact of such financial sector development on household income growth and its connection with gender.

6. This is consistent with the non-linear relationship between financial sector development and inequalities, developed by Greenwood and Jovanovic in 1990. In that regard, they represent an inverted U-shape relationship, which draws on the 1955 study by Kuznets. According to this relationship, there is a stage from which financial development has a positive effect on the problem of reducing inequalities.

A targeted gender-based analysis of economic growth may help to better determine the needy and to further develop pro-poor growth policies. In terms of analysis of the impact of financial sector development on inter-gender income inequalities, studies by Greenwood and Jovanovic (1990), Galor and Zeira (1993), and even Banerjee and Newman (1993), shed light on the type of relationship between financial development and income inequalities. This type of relationship is assessed according to the Kuznets (1995) hypothesis, which establishes the existence of an inverted U-shaped relationship between income distribution and economic development. Greenwood and Jovanovic (1990) come to the conclusion that there is an inverted U-shaped relationship between financial development and income inequalities.

Galor and Zeira (1993) or Banerjee and Newman (1993) in turn establish the existence of an inverse linear relationship between the two variables considered. It must be noted that in the same vein, Zchicheng (2006) conducted a similar study in the Chinese rural sector and also arrived at the conclusion that there was an inverse linear relationship between financial development and rural inequalities. Studies have also been conducted in Cameroon relating to the decomposition of inequalities and poverty, such as those undertaken by Baye and Fambon (2002), which examine the characteristics of inequalities in Cameroon and its decomposition via the generalised entropy class of indices. Fambon (2005) conducted a study on the dynamics of poverty in Cameroon, while highlighting the link between economic growth, poverty, and inequality.

According to this study, poverty is largely a rural phenomenon. To assess the relationship between poverty, inequality, and economic growth, Kakwani (1993) developed the decomposition method in his study. Fambon (2005) reached the conclusion that the absolute value of elasticity in relation to expenditure is greater than unity. In addition, poverty elasticity in relation to expenditure and the Gini index is higher in urban areas than in rural areas. Studies conducted by Chameni (2006) use as inequality evaluation index, the coefficient of variation squared, in order to propose a new decomposition by comparing the entropy method to the Dagum method.

These studies permit better understanding of poverty and income inequalities in Cameroon. The outcome can lead to the formulation of appropriate economic policies to ease the problem. We note, however, the limited availability of studies that incorporate the issue of gender-related poverty. This study is geared towards improved impact analysis through the gender targeting of the most deprived poor groups. Thus, in addition to highlighting the link between inter-gender inequalities and poverty reduction, the study also focuses on the role of financial sector development and other variables that may contribute to combating poverty from a gender perspective. This will help fine-tune the formulation of economic policies for the most needy.

3. Description of Econometric Models

Two types of data were collected in the rural areas: Primary data and secondary data. The primary data was collected through interviews and preliminary investigations conducted at Ndele (Centre Region) and Santchou (West Region) under the partnership funding research project[7] conducted at IRAD (Institut de Recherche Agricole pour le Developpement). The secondary data was drawn from the database of the second Cameroon Household Survey (ECAM II) conducted in 2001. Our sample consisted mainly of 84 districts in Cameroon via cross-sectional analysis. The population considered is the population located below the defined poverty line. The poverty line was determined by the median income value calculated using the ECAM II database.

The resulting total expenditure, based on annual well-being, is in the range of CFAF 1.5 million annually, which is equivalent to CFAF 125,050 monthly. A household falling below CFAF 125,050 of total monthly expenditure is considered poor. The logic of the empirical analysis is based on the fact that men and women are highlighted separately throughout the calculations. The two main characteristics of the population selected are the standard of living and request for commercial credit (whether obtained or not). The data from ECAM II conducted in 2001 was mainly intended to assess the standard of living of the Cameroonian population. Several fields relating to specific aspects of the Millennium Development Goals were covered in the survey.

Most of the data collected was qualitative. Very little quantitative information was used in the survey. In order to conduct the appropriate analysis for our study, we carried out a proportional transformation of variables for individuals benefiting from a service obtained or offered. Using the ECAM II database, a financial sector development indicator was constructed. It takes into account the level of income and that of credit granted. The income variable is a proxy for assessing household production in the various districts that make up our sample. The credit variable used is that of commercial credit obtained in the last 12 months, which is measured in terms of the proportion of the sub-group under consideration, (male or female heads of household) that obtained credit. This proportion is divided by the income share of the sub-group (male or female heads of household) in district j under consideration, and estimated in relation to the total income of the sample. Thus, our financial development indicator is equal to:

DFIN = (Proportion of sub-group having obtained credit in area j/
Proportion of sub-group income in relation to total income of area j)

7. PRP funding is one of the 12 projects of the REPARAC (Renforcement des partenariats dans la recherche agronomique au Cameroun) mother project, which contributes to the promotion of action research and in partnership with the population of the various targeted localities.

The indicator calculated captures approximately financial sector development in terms of accessibility to credit for poor male and female heads of household. This gives an idea of the share of poor women/poor men's access to credit in relation to their level of production, which is captured from their income level. The presentation of our methodology is based on the following logic: First is the variables used (3-1), followed by the method of assessing the issue of gender disparity in access to credit in rural areas (3-2). A methodological analysis of the effect of financial sector development on gender production then follows (3-3). Lastly, an analysis of the impact of financial sector development on inter-gender income inequalities (3-4) is carried out.

3.1. Presentation of variables used

Table 1 in annex summarises the definition and description of each variable used in our work.

3.2. Gender parity in credit accessibility in rural areas

Consideration of credit access parity was carried out in two stages. The first stage involved assessing whether or not there was parity in access to credit by clearly specifying the sub-group with the least access. The second stage involved determining the factors that contributed to marginalising this sub-group in gaining access to credit. Two types of data were collected for the purpose of the study. First, the secondary data collected from the ECAM II database was used to calculate the Gender Parity Index (GPI) expressed in terms of proportion, to determine whether women had less access to credit or not compared to men. The method used in this study to detect credit constraint was the direct approach[8]. It can highlight the fact that a person obtained credit or otherwise. Thus, drawing on the logic of the Status of Women Index (SWI), which is a component of the African Gender and Development Index (AGDI), we constructed the GPI, which is a proportion calculated and presented as follows (Baye 2007):

$$GPI = \begin{cases} I_1 I_2^{-1} & \text{If the factor is a source of utility} \\ I_1^{-1} I_2 & \text{If the factor is a source of disutility} \end{cases} \quad (1)$$

I_2 = represents the proportion of yes equivalent to the corresponding access to credit services for women.
I_2 = represents the proportion of yes equivalent to the corresponding access to credit for men. To come to a decision, we have the following pointers:
If $GPI <$ $\Rightarrow$ Poor women have less access to credit than poor men.

8. This approach was developed in the study by Godquin (2006), which sought to determine whether a person is constrained or not, in access to credit.

If $GPI = 1 \Rightarrow$ There is parity in terms of accessibility between poor men and poor women.
If $GPI > 1 \Rightarrow$ Poor men have less access to credit than poor women.

After studying the degree of poor women's accessibility to credit compared to that of poor men, using this index, further analysis was necessary. It involved studying econometrically possible contributory factors to the marginalisation of women or men's access to financial services. The model used was the simple linear regression, and the estimation method applied was that of ordinary least squares, with j representing the district under consideration.

$$IPG_j = \alpha_0 + \alpha_1 EDU_j + \alpha_2 NPERS_j + \alpha_3 TER_j + \alpha_4 SUB_j + \alpha_5 S_j + \alpha_6 TACT_j + \alpha_7 AGE_j + \alpha_8 Y_j + \alpha_9 NEN_j + \mu_j \quad (2)$$

α_b represents the parameters to be estimated, and μ the error term and the different variables to be estimated, as defined in Table 1.

3.3. Impact of financial sector development on gender production

This involved assessing the trend of the relationship between financial sector development in terms of improved access to financial services and the level of production in rural Cameroon. The level of production was estimated from the income level of the household head. Since the income level is a difficult variable to capture, adoption of a proxy (the total annual consumption expenditure) was preferred. The linear model was used to carry out this econometric study. The study applied the level of production of men and women, which could be quantified using the income level of the poor, as the dependent variable. A proxy used to measure the production of the household head was the estimated monthly total household expenditure. Concerning the explanatory variables, these were mainly the financial sector development indicator, designated DFIN; the type of activity undertaken, designated TACT; the level of education, designated EDU; the level of subsidies and aid received, designated SUB; the possession of farmed land, designated LND; the number of hours worked, designated NHT; the number of persons in the household, designated NPERS and obtaining credit, designated CRE. The model for both poor male and female heads of household to be estimated was as follows:

$$\ln Y_j = \beta_0 + \beta_1 DFIN_j + \beta_2 DFIN_j^2 + \beta_3 EDU_j + \beta_4 EDU^2{}_j + \beta_5 NHT_j + \beta_6 S_j + \beta_7 TACT_j + \beta_8 NPERS_j + \beta_9 SUB_j + \beta_{10} CRE_j + \beta_{11} TER_j + \varepsilon_j \quad (3)$$

β_b represents the parameters to be estimated, and ε the error term and the different independent variables as defined in Table 1. The method adopted for the purpose of our study was that of instrumental variables, which defines an instrument as a proxy to resolve the potential problem of endogeneity in the model thus defined. The use of this method in our study highlights the

factors that could significantly and independently alter financial sector development. The instrument used in our study was that of ethno-linguistic fragmentation, which uses as a proxy, the number of households considered in District j. The hypothesis testing carried out for this specific evaluation was the following: "*There may be a non-linear relationship between financial sector development and the level of gender production in rural Cameroon"*. The assumptions of this test were:

$$\begin{cases} H_0 : \beta_1 = 0; \beta_2 = 0 \\ H_1 : \beta_1 < 0; \beta_2 > 0 \end{cases} \quad (4)$$

3.4. Impact of financial sector development on inter-gender income inequalities

To measure the impact of financial development on gender inequalities, it is useful to first present the index that is used to capture the gender inequalities. This is followed by a presentation of the model to be estimated, and the hypotheses made. To calculate the Gini index by gender, the decomposition method according to the Shapley Value approach, which permits differentiation of the Gini Between and Gini Within, with the sum of the two components giving the Gini total, was used. The decomposition developed by Shorrocks (1999), using the studies by Shapley (1953) in game theory, considers only two components of the total Gini index. These two components are inter-group inequalities and intra-group inequalities. By eliminating the intra-group inequalities and calculating only inter-group inequalities, an income vector $I(\mu_1, \mu_2, ..., \mu_g)$ is used, where each individual has an average income for each group designated μ_g. We therefore have the following mathematical formulation for the inter-group inequalities.

$$G^{S}_{\text{int}\,er} = 0.5\left[I(Y) - I\left(Y\left(\mu/\mu_g\right)\right) + I\left(\mu_g\right) - I(\mu)\right] \quad (5)$$

This leads us to establish the model to be estimated as follows:

$$\ln G^{S}_{\text{int}\,er\,j} = \gamma_0 + \gamma_1 \Delta DFIN_j + \gamma_2 \Delta DFIN^2_j + \gamma_3 \Delta EDU_j + \gamma_4 \Delta EDU^2_j + \gamma_5 \Delta SUB_j + \gamma_6 \Delta TER_j + \gamma_7 \Delta TACT_j + \gamma_8 \Delta NEN_j + \gamma_9 \Delta CRE_j + \gamma_{10} \Delta S_j + \nu_j \quad (6)$$

γ_b represents the parameters to be estimated, and v the error term and the independent variables as defined in Table 1. This approach incorporates an evaluation based on the differential between men and women. It draws on the method developed by Oaxaca (1973) and Blinder (1973), who conducted a study on disparity by showing how the characteristics of each individual can have an impact on men and women's earnings. The estimation method used in this study was the least squares method. The hypothesis to be tested was as follows: "*There may be an inverse relationship between financial development and gender inequalities in rural Cameroon."*

$$\begin{cases} H_0 : \gamma_1 \geq 0 \\ H_1 : \gamma_1 < 0 \end{cases} \quad (7)$$

The statistics used is that of Student's t-test**.** According to the decision rule, if $t_{cal} > t_{lu}$, then we reject the null hypothesis. This is because there may indeed be an inverse relationship between financial development and inter-gender inequalities. We could therefore conclude that the more the financial system develops in a society, the lesser the inter-gender income inequalities.

4. Empirical Results

The statistical analysis of our variables is presented in Table 2 of the annex. For proper analysis of the results, we will discuss the statistical and empirical analysis highlighting the issue of credit accessibility under section 4-1, followed by a presentation analysing the impact of financial sector development on the production of men and women (section 4-2). Lastly, we will present the results of the evaluation of the impact of financial sector development on inter-gender inequalities (section 4.3).

4.1. Statistical and empirical analysis of credit accessibility

Based on the statistical analysis that allowed us to calculate the Gender Parity Index (GPI), we observed that in rural Cameroon, for all persons that obtained credit, we had a proportion of 3.7 percent of female heads of household with access to credit against 4.6 percent of male heads of household. The proportion turned out to be very low in both sub-groups – men and women. The percentages are well below 10 percent. This can be interpreted as a low incidence of access to credit in the lives of the poor. By making a comparison between men and women, we observe, nonetheless, that men have a relatively higher incidence of access to credit than women in the rural areas. By calculating the ratio of the two rates, from which the GPI is derived, we obtain the following result: GPI =0.804<1. From this result, we can state that women have less access to credit than men in rural Cameroon.

This result is further consolidated through the interviews conducted among smallholder families in Cameroon's Centre and West Regions. In the West Region, specifically at Bangangte and Santchou, we observed that most of the poor experience difficulty in obtaining credit from commercial banks and microfinance institutions (MFIs). In these two regions, the principle of individually requesting credit from MFIs and the few existing commercial banks rarely occurs. It is the collective principle that prevails through the Community Groups (GIC). This allows both men and women smallholders to have access to credit from these approved establishments.

It is also important to note that within these GICs, men represent the sub-group that is most knowledgeable about the mechanisms of access to credit, despite the fact that they work together with women. This stems in part from the culture of the West, which accords a special place to men and characterises them as being the torch-bearers of productive activities of the family. The women are expected to be submissive wives who must expect everything from their husbands who work for them. As such, they are limited to small gardening activities around the house. When women ask for a loan, they hand over the amount granted to the husband to manage. Most of the credit that women request for is sourced from rural tontines and associations, as well as from individuals. In particular, women are not really informed about the existing mechanisms for obtaining loans from microfinance institutions and the few commercial banks dealing in microfinance.

However, in Cameroon's Centre Region, particularly Ndele, Nguelmedouka, and Kokoa, it is observed that within the existing GICs, the principle of applying for credit is not really carried out collectively. The primary objective of these GICs is the sale of their produce collectively as a way of dealing with the problems associated with looking for outlets. They are unlike the GICs in Western Cameroon, which have a twofold objective: To obtain credit collectively for redistribution, and to sell their produce collectively. The communal principle was previously tested in this area, but it did not produce any significant results in terms of the running of credit establishments and the resumption of farming activities. For instance, the communal principle was tried out in the Ndele area, albeit unsuccessfully, and was replaced by the individual principle operated by the association called ADEAC (Association pour le Développement intégral des Agriculteurs du Centre).

The determination of significant contributory factors that reduce poor women's access to credit was obtained from the results drawn from the calculation of the equation (2) presented in Table 3:

Table 3. ***Marginalising Factors of Access to Credit***

Dependent Variable: GPI	Coefficient	Standard error	t	P>|t|
SUB	**0.565**	**0.843**	**0.67**	**0.505**
S	**-0.144**	**0.472**	**0.30**	**0.761**
EDU	**0.144****	**0.053**	**2.60**	**0.012**
AGE	**-0.016**	**0.013**	**-1.22**	**0.225**
Y × 10^{-10}	**0.545*****	**0.101**	**5.38**	**0.000**
NEN	**0.020**	**0.173**	**0 .12**	**0.907**
NPÊS	**-0.220****	**0.110**	**-2.00**	**0.050**
LND	**-0.421**	**0.516**	**-0.81**	**0.418**
TACT	**-0.008**	**0.581**	**-0.01**	**0.989**
Cons	**-1.734**	**0.936**	**1.85**	**0.068**
Observation number = 79; F (9.69) = 8.62; Prob > F= 0.000; R^2 = 0.5292; R^2ajusted =0.468; *** significant at 1%; ** significant at 5% and * significant at 10%				

Source: Authors
NB: See definition of variables in Table 1 of annex

Among the estimated explanatory variables, only the NPERS (number of persons in the household), EDU (level of education) and Y (income level of women) variables are significant. This suggests that an increase in the number of persons living in households headed by poor women translates into a reduction in the value of the Gender Parity Index by about 22 percent. The reduction in the value of the Gender Parity Index contributes to removing its value to 1, which represents a parity situation, and from where we deduce an accentuation in the degree of credit access disparity experienced by women. The number of persons therefore produces a negative impact on gender parity in terms of credit accessibility in rural Cameroon. On the other hand, we observe two variables that produce a positive effect on reducing the gender disparity in credit access. They are the level of education and the level of income.

Thus, a one percent increase in the level of education for women could translate into a 14.4 percent increase in the value of the Gender Parity Index. Similarly, a one percent increase in the income level of poor female heads of household could translate into a slight marginal increase in the value of the Gender Parity Index, in the range of $0.545*10^{-10}$ percent. This contributes to a weak convergence of the value of the Gender Parity Index to 1, which represents a parity situation between poor male and female heads of household. This increase corresponds to a drop in the degree of disparity in credit accessibility experienced by rural women. This analysis helps to highlight the issue of improved income levels as it relates not only to gender, but also to issues of education and family size in Africa, which can greatly affect the effectiveness of the financial sector's action in terms of the accessibility and allocation of its services.

4.2. Analysis of the impact of financial sector development on gender production

In this section, we will present a separate analysis of the strata of poor male heads of household compared to that of poor female heads of household.

4.2.1. *Financial Sector Development and Production of Poor Male Heads of Household*

Regarding men's production, it is accepted based on the significance of coefficients DFIN and $DFIN^2$ that there is a non-linear relationship between the two variables (Table 4). We observe that the financial sector development coefficient sign ($-0,753*10^{-3}$) is negative. This suggests that the development of the financial sector does not produce a positive effect on the level of men's production in rural areas. It rather produces negative effects on their level of production. This negative effect may be partly explained by the low accessibility of the rural population to credit. Yet access to credit is beneficial for poor

Table 4. ***Financial Sector Development and Men's Production***

Dependent Variable: lnYMen	Coefficient	Standard Error	t	P>|t|
DFIN × 10^{-3}	-0.753***	0.210	-3.59	0.001
$DFIN^2$ × 10^{-10}	0.737***	0.259	2.85	0.006
EDU	-0.357	0.336	-1.06	0.291
LND	-2.577	3.248	-0.79	0.430
NHT	-0.644*	0.360	-1.79	0.078
S	1.27	1.730	0.70	0.484
TACT	-0.865	1.650	-0.52	0.602
NPERS	0.557	0.398	1.40	0.167
SUB	1.024	1.946	0.53	0.600
CRE	17.363***	5.268	3.30	0.002
EDU2	0.020	0.030	0.67	0.506
Cons	0.601	3.242	0.19	0.853
Observation number: 81; F(11,69) = 1.42; Prob > F = 0.1821; *** significant at 1%, **significant at 5% and *significant at 10%. Variables: dfin, $dfin^2$edu LND nht s tact npers sub cre edu2 Instruments: nh nh2				

Source: Authors
NB: See definition of variables in Table 1 of annex

men as revealed by the credit variable with a coefficient of 17.363, which proves to be significant at one percent.

Regarding the relationship between financial sector development and men's production, we note that there is a breaking point at which the trend is reversed and the coefficient squared of financial sector development is positive at $0.737*10^{-10}$. This leads to the observation that given its low impact, an improvement in the operating mechanism of the financial sector may have a positive effect on the production level of rural poor men, and thus enable them to marginally improve their level of income. As other explanatory variables, the number of hours of work can also help to explain the variations of rural men's production. It has a negative effect on rural men's production. This can be understood in the sense that men derive very little benefit from it, and devoting more hours to work may possibly contribute to reducing their income.

Thus, the time spent by rural men on various activities does not help improve their standard of living in terms of increased income levels. This can be explained by the quality of activity considered and the manner they manage their time efficiently in the production system. With regard to the type of relationship between financial sector development and poor men's production, we may consider the existence of a non-linear relationship between the two variables, based on Kuznets U curve, which in our model, implies that the coefficient DFIN is negative and $DFIN^2$ is positive. We can deduce, therefore, that at a stage of the sector's development, there is a breaking point from which the development of the financial sector will become more beneficial for poor male heads of household in rural areas. This

must be triggered by several factors as well as those that promote the development of human capital.

4.2.2. Financial Sector Development and Production of Poor Female Heads of Household

The results of the estimates of this relationship are highlighted in Table 5.

Thus, the coefficient of the variable DFIN is negative and equal to $-0.320*10^{-3}$. Consequently, we obtain a positive effect of financial sector development on the level of production of poor rural women through variable DFIN2, which is positive. However, the negative impact is more pronounced among female family heads. This adverse situation can be attributed to several factors, including: (1) The high degree of uncertainty relating to the output of rural activities, which are mainly in the agricultural sector; (2) the practice of usurious rates that hinder the demand for credit and limits the opportunities for investment in more productive activities; and (3) the low activity of microfinance institutions among the poor. Other factors to be noted with female family heads are problems of education and their household size (mentioned in the analysis of factors hindering female heads of household from access to credit).

Furthermore, for men, obtaining credit produces positive externalities on the level of production of poor rural women. However, the contribution of the credit accessibility variable is low among men compared to that of women, representing a value of 17.363 compared to 50.317, respectively.

Table 5. ***Financial Sector Development and Production of Women***

Dependent Variable: lnYWomen	Coefficient	Standard Error	t	P>|t|
DFIN × 10^{-3}	-0. 320*	0.174	-1.84	0.070
DFIN × 10^{-10}	0.735*	0.408	1.80	0.076
EDU	-0.191	0.393	0.49	0.629
LND|	-1.077	1.128	0.95	0.343
NHT	-0.169	0.218	-0.78	0.441
S	1.124	1.302	-0.86	0.391
TACT	-0.665	1.616	-0.41	0.682
NPERS	0.151	0.294	0.51	0.611
SUB	0.245	2.16	0.11	0.910
CRE	50.317***	15.860	3.17	0.002
Edu2	-0.009	0.057	0.15	0.881
Cons	-5.101***	1.794	-2.84	0.006
Observation number: 78; F(11,66) = 1.49; Prob > F = 0.156; *** significant at 1%, **significant at 5% and *significant at 10%. Variables: dfin, $dfin^2$edu LND nht s tact npers sub cre edu2 Instruments: nf nf2				

Source: Authors
NB: See definition of variables in Table 1 of annex

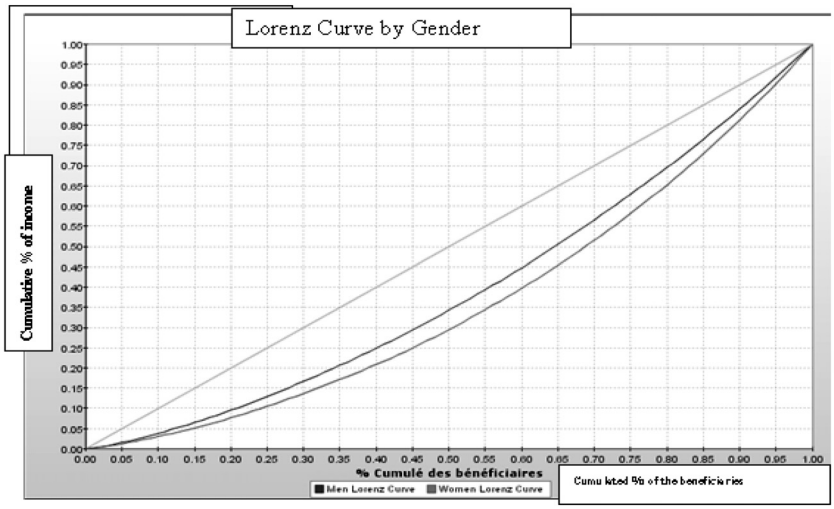
This further explains why financial sector development action is greater among women than men. In terms of the relationship with Kuznets' (1955) U curve, we observe that the coefficient signs are those obtained, i.e., the financial development coefficient is negative, while that of the financial development coefficient squared is positive. On this basis, we can conclude that there is a non-linear relationship between financial sector development and the level of women's production.

We can also similarly deduce that at a stage of the sector's development, there is a breaking point from which the development of the financial sector will be of more benefit for poor female heads of household in rural areas. This must be triggered by several factors. They include those that promote the development of human capital as well as the size of the households they run.

4.3. Empirical analysis of impact of financial sector development on inter-gender inequalities

The Lorenz Curve on rural inter-gender income is represented in Chart 2. From it, we observe that inequalities between women are more pronounced in relation to inequalities in the men stratum. The women's Lorenz Curve is farthest from the right of the 45° line. This means that 50 percent of women have 30 percent of combined incomes, while 50 percent of men have 35 percent of combined incomes, representing a five percent gap between men and women. The representation of the inter-gender inequalities is the area between the men's Lorenz Curve, marked in blue and represented as the internal curve in our chart, and the women's Lorenz Curve, marked in red and which is the external curve.

Chart 2. ***Lorenz Curve by Gender in Rural Areas***



Source: Authors

Table 6. ***Results of Estimating the Impact of Financial Sector Development on Inter-Gender Inequalities in Rural Cameroon***

Dependent Variable: Lnginter	Coefficient	Standard Error	Student's t	P>|t|
$\Delta DFIN \times 10^{-2}$	0.200**	0.076	2.380	0.020
$\Delta DFIN^2 \times 10^{-11}$	-0.412**	0.172	-2.400	0.019
ΔCRE	-3.156	2.538	-1.24	0.218
ΔSUB	0.144	1.634	0.09	0.931
ΔS	2.134***	0.798	2.670	0.009
ΔEDU	0.232***	0.082	2.840	0.006
ΔTER	-0.235	0.707	-0.330	0.740
ΔTACT	1.438*	0.734	1.960	0.054
CONST	-4.805***	0.260	-18.490	0.000
Observation number = 84; F (8.75) = 3.87; Prob > F = 0.0007; R^2 = 0.2922; *** Significant at 1%; ** Significant at 5%; *Significant at 10%				

Source: Authors
NB: See definition of variables in Table 1 of annex

With regard to the analysis of the impact of financial sector development and inter-gender inequalities, we obtained the results presented in Table 6. First, the variables that influence inter-gender inequalities are the financial sector development differential, the financial sector development differential squared, the savings differential, the education differential, and the type of activity differential. The last variable is significant at 10 percent and is represented by a positive sign in our study. This suggests that the type of activities engaged in by rural male heads of household is more lucrative than those of female heads of household. This can be explained by the fact that female heads of household in rural areas engage in sustenance activities or activities that provide just the necessities of life. If they should move towards undertaking activities that provide higher marginal returns, this could help them improve their income levels and reduce the gap between them and male heads of household.

This is only possible if special emphasis is placed on improving the education level of female heads of household and raising the rate of savings they devote to more lucrative activities. We observed in our results that these two variables are significant at one percent, and their respective coefficients show a positive sign. This also suggests that savings pattern and education level are two endogenous aspects that can be attributed more to male than female heads of household in rural Cameroon.

With regard to our financial development variable, the result that emerges is that this factor is not very conducive for female heads of household in rural Cameroon. However, based on our results, we observe that there is a breaking point from which financial sector development will be conducive for female heads of household, and will help to effectively reduce the existing inter-gender inequalities between men and women. This analysis is highlighted by the $\Delta DFIN$ and $\Delta DFIN^2$ coefficients, which are both significant at

five percent and positive and negative respectively, in our estimation. This reveals a Kuznets U-curve relationship between the financial sector development variable and inter-gender inequalities.

5. Conclusion

This paper set out to assess the impact that financial sector development can have on the gender poverty reduction process in rural Cameroon. It involved determining explicitly the type of relationship that may exist between financial sector development and gender poverty reduction in rural Cameroon. To carry out the study, two effects were highlighted. On the one hand, the effect of financial sector development on the production levels of men and women, and on the other hand, the effect that financial sector development may have on the level of rural inter-gender income inequality.

First, we must emphasise that financial sector development in rural areas is considered as an improvement in the percentage of access to financial services (allocated to productive investment) for deprived persons or group of persons, provided by financial actors such as "tontines" and associations, and to some extent by microfinance establishments and a few banks. We started by examining the issue of gender disparity in access to financial services in rural areas. The result obtained shows that female heads of household appear to be the sub-group of the population that experiences the problem of unequal access to financial services. The factors that contribute to the marginalisation of female heads of household are the level of education and household size. Thus, the higher the education level of women family heads, the lesser they are limited in accessing financial services. Furthermore, the larger the size of their household the more they are limited in accessing financial services. Improving consideration of these two factors in the living conditions of women could ultimately help improve the issue of rural financial sector development.

It is important to note, however, that at this stage of development of the financial sector in rural areas, its possible impact on men and women's production has been assessed. Consequently, we have observed that men and women do not really benefit in the short-term from financial sector development. Instead, there are negative effects on the level of production of both men and women. Nonetheless, in the long-term, financial development contributes positively to the gender-based production process in rural Cameroon. In terms of parity, this contribution is more significant among female heads of household than among male heads of household. This suggests that action to improve the financial structure in rural areas could have a positive impact in the long-term on the gender-based production process.

Such action could include measures to promote much more extensive activity by MFIs among the poor and the neediest, to improve their level of income. The ensuing inference is that of the existence of a Kuznets U-shaped

relationship between financial sector development and the level of production of male and female heads of household. With regard to the impact of financial sector development on inter-gender inequalities, we highlighted five significant factors, namely the financial sector development differential, the financial sector development differential squared, the savings differential, the education differential and the type of activity differential. The existence of a non-linear Kuznets inverted U-shaped relationship between financial sector development and inter-gender inequalities in rural Cameroon was inferred from the results.

There is also a positive relationship between the education differential and inter-gender inequalities. Overall, we can say that financial sector development has a positive impact on poverty, depending on gender. Following the trend highlighted, we suggest the conclusion that there is a non-linear relationship between financial sector development and poverty reduction in rural areas. Consequently, to reduce poverty in rural Cameroon, it is advisable first and foremost to: (1) Stimulate more the collection of savings from female heads of household; (2) promote improvement of girls' education and set up technical assistance programmes for female heads of household in rural Cameroon. The importance of the issue of women's education is enhanced by the position adopted for women's education by organisations such as WHO, UNDP and even the World Bank; and (3) facilitate the integration and guidance of poor female heads of household towards more lucrative activities.

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Annex

Table 1. *Definition and Description of Variables Used*

Variables	Definition	Description
GPI	Gender Parity Index	Continuous
AGE	Average age of male or female heads of household by district	Continuous
EDU	Number of years of education of men or women	Discrete
NEN	Average number of children of male or female heads of household by district	Discrete
NPERS	Average number of persons in household of men or women by district	Discrete
S	Proportion of male or female heads of household with savings in each district	Continuous
SUB	Proportion of male or female heads of household who have obtained an allocation in each district	Continuous
TACT	Proportion of male or female heads of household engaged in activities (farming, trade, livestock rearing, fishing)	Continuous
LND	Proportion of male or female heads of household with a cultivated plot of land	Continuous
Y	Income ratio of male or female heads of household in District j over total income of all districts	Continuous
LnYmen	Logarithm of income ratio of male heads of household in District j over total income of all districts	Continuous
lnYwomen	Logarithm of income ratio of female heads of household in District j over total income of all districts	Continuous
DFIN	Financial development index for male or female heads of household	Continuous
$DFIN^2$	Financial development index squared for male or female heads of household	Continuous
EDU^2	Average number of years of education squared of male or female heads of household	Discrete
NHT	Average number of hours of work of male or female heads of household by district	Continuous
CRE	Proportion of male or female heads of household having obtained commercial credit in each district	Continuous
lnGinter	Natural logarithm of Gini inter-gender index	Continuous
ΔDFIN	Indicator of financial development differential between men and women	Continuous
$\Delta DFIN^2$	Indicator of financial development differential squared between men and women	Continuous
ΔCRE	Differential between men and women of the proportion of persons having obtained commercial credit	Continuous
ΔSUB	Differential between men and women of the proportion of persons with access to allocations and assistance	Continuous
ΔS	Differential between men and women of the proportion of persons with savings	Continuous
ΔEDU	Differential between men and women of average number of years of education	Continuous
ΔTER	Differential between men and women of the proportion of persons with cultivated plot of land	Continuous
ΔTACT	Differential between men and women of the proportion of persons engaged in farming, fishing and livestock rearing activities	Continuous

Table 2. *Results of Descriptive Statistics*

Variables	Minimum	Maximum	Average	Standard Deviation
1. GPI	0	5	0.459	1.035
2. lnGinter	– 6.908	0	– 4.112	1.106
3. DFIN	0	108455.555	2498.379	11991.508
4. $DFIN^2 \times 10^{11}$	0	0.118	0.015	0.013
5. EDU	0.091	9.95	5.319	2.556
6. EDU^2	0.008	99.003	34.756	25.671
7. LND	0	1	0.756	0.245
8. NHT	4.179	13	7.170	1.389
9. S	0	0.846	0.275	0.199
10. TACT	0.05	1	0.717	0.215
11. NPERS	2.546	7.654	4.796	1.067
12. SUB	0	0.963	0.092	0.151
13. AGE	28.6	56.235	43.614	5.986
14. $Y \times 10^2$	0.05	4.65	1.2	0.9
15. lnYmen	-6.739	-3.112	-4.810	0.692
16. lnYwomen	-7.496	-3.069	-4.810	0.995
17. NEN	0.455	4.923	2.184	0.815
18. CRE	0	0.571	0.047	0.078
19. ΔDFIN	-402950,194	14096,901	-4151,340	44087,781
20. $\Delta DFIN^2$	$-0{,}18 \times 10^{-10}$	198722605	-2138200459	19636544237
21. ΔCRE	-0.217	0.12	0.008	0.057
22. ΔSUB	-0.25	0.289	0.036	0.084
23. ΔS	-0.4	0.536	0.055	0.152
24. ΔEDU	-4.909	6.929	2.395	1.672
25. ΔTER	-0.211	0.84	0.089	0.193
26. ΔTACT	-0.728	0.636	-0.079	0.197

Source: Authors
NB: See Table 1 for definition of variables