Is microfinance really helping the most vulnerable? An empirical test of the effectiveness of the Ghana's Microfinance Policy Reform

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Abstract

The study aims to test the effectiveness of the Ghana Microfinance Policy of 2006 set up to support women and youth through access to credit. Our results show that, after controlling for a large number of variables, female and young entrepreneurs are less likely to be rationed in the access to microcredit and that this is largely determined by the differential treatment that they receive from microfinance institutions. Our analysis using regression decomposition techniques indicates that positive discrimination in favor of women and youth exists. Surprisingly, our results show that government microfinance policy accounts for the most severe rationing behavior towards the targeted groups by the law.

Keywords: Microfinance, Ghana, Credit Rationing, Positive Discrimination, Women and Youth
JEL Codes: D14, G18

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I. Introduction

The microcredit market was originated by the necessity to give access to credit to the most vulnerable population. Microfinance institutions have had a more important role in promoting economic success in those countries where there exist more barriers to credit in the traditional credit sector (Vanroose and D'Espallier, 2013). Since then, the existence of a microcredit market has been proven to be very beneficial by reducing poverty and the income gap between poor and rich people (Hermes, 2014; Boutabba et al., 2020), influences economic growth (Lopatta and Tchilov, 2015), reduces child mortality (Posso and Athukorala, 2018), and increases life satisfaction (Becchetti and Conzo, 2013).

Access to credit in Ghana within the context of Ghana's financial sector reforms have gained much prominence. The National Gender and Youth Policy was developed in 2004 with the overall goal of addressing gender and youth concerns in the national development process; to improve the social, legal, political, and economic well-being of women and youths in particular. While the Government of Ghana established an institutional structure aimed at promoting gender equality, the effectiveness of this goal suffered from weak institutional capacity (GHAMP, 2006). Policy makers in Ghana have now realized that the empowerment of women and youths and access to resources by affirmative action through gender and youth prioritized policies rather than equality is the only way to address the challenges being faced by these groups. According to Ghana's Population and Housing Census (2010), 90.9% of the total female labor force can be found in the private informal sectors, which are discriminated against in the access to formal credit. Compared with their older counterparts, it has been observed that youths in Ghana are 3.5 times more likely to be unemployed (Darvas et al, 2014; Gyampo, 2012; ISSER, 2012). With youth unemployment more than doubling since 1992, various policies have been implemented under various governments with no remarkable success. In a bid to find solutions to the problems confronting these vulnerable groups, youths and women, the Government of Ghana encouraged the promotion and development of the microfinance sector as a method to ensure that women and young entrepreneurs meet their financial demands. Microcredits have therefore become an effective tool to empower women in poor countries, including Ghana.[1]

The Ghana Microfinance Policy (GHAMP), was therefore developed in 2006 as a way of regularizing MFIs' operations in line with the objectives of Ghana's Government to reduce poverty and empower women and young entrepreneurs, who constitute the majority of the working population. Ghana's Microfinance Policy Document emphasizes the need for microfinance

[1] Al-shami et al (2018) find that the access to microcredit affects positively monthly income of women in Malaysia.

institutions to make credit more available and accessible to the vulnerable groups of the society, notably youths and women. Our main objective in this paper is to test whether the GHAMP is effective; that is, we study the extent to which the operations of the microfinance companies are influenced by the GHAMP. The policy, among other matters, entreats microfinance companies to administer comparatively more credit to the vulnerable, irrespective of their individual, firm and economic characteristics. This means that potential differences in credit rationing between men and women and between young and adult entrepreneurs should respond not to differences in their creditworthiness characteristics but to unequal treatment received from the microfinance companies. To test this hypothesis, we rely on the Oaxaca–Blinder decomposition.

Our results show that the rationing behavior of microfinance companies favors women and young entrepreneurs irrespective of whether they are endowed with better creditworthiness than their counterparts. This result indicates that the GHAMP is effective, since microfinance institutions engage in positive discrimination in favor of these two vulnerable groups targeted by the policy.

We structure our paper as follows. In section 2, we discuss some of the governmental initiatives prior to the GHAMP and explain the GHAMP in greater detail. In section 3, we present the data used in this study. Section 4 describes our empirical strategy. In section 5, we report the econometric results. Finally, section 6 concludes and discusses the main implications of our results.

II. Institutional setting and the Ghana Microfinance Policy (GHAMP)

After several unsuccessful governmental initiatives aimed at tackling the employment problems of youths and women in Ghana, in 2006 the Ghana Microfinance Policy (GHAMP) was developed and implemented as the policy guideline for the microfinance intuitions in Ghana. The policy has primary objectives that include the following: to create an enabling environment at the micro and macro levels that supports the operations of the sub-sector, to provide avenues for the sustainable flow of funds, adequate infrastructure and development of human capital, to ensure an integrated and sustainable financial system that reaches and serves the poor, to facilitate activities that ensure consumer protection and to ensure a harmonized and coordinated sub-sector. The overall guiding principle was to introduce the microfinance sub-sector as an integral part of the financial sector development in Ghana. Additional guiding principles adapted from the Consultative Group to Assist the Poor (CGAP, 2006), which informed this policy, were that microfinance is a powerful tool for poverty reduction and economic development, its policies must be result oriented and gender sensitive, adequate institutional arrangements must be put in place to enhance the growth of the sub-sector and microfinance service providers must operate in a competitive and coordinated environment.

The policy direction is to seek to improve and deepen financial intermediation to serve the poor and low-income people by supporting and building an inclusive, sustainable and efficient service system. The policy therefore involves institutional arrangements, coordination and collaboration among the institutions within the sub-sector to minimize duplication and foster the complementarities of the activities undertaken by all the stakeholders within the industry.

The policy mandates microfinance institutions to make microcredit targeted and accessible to those who can use it productively and the service debt. The policy specifically mandates microfinance institutions to provide savings, credit and other financial services to the vulnerable and the marginalized, who, in the context of Ghana, have been identified as women, youths and the physically challenged. The policy, among other aims, seeks to protect potential and actual end users of microfinance products and services from unfair practices, such as exorbitant interest rates, and ensures public disclosure and transparency in the operations of the institutions. With this aim, the Ghana Microfinance Institutions Network was birthed. This entity is an apex body that centralizes data gathering, processing and dissemination. This data is accessible by all stakeholders in the microfinance industry.

To ensure proper and efficient regulation and supervision, all MFIs seeking assistance from the Government of Ghana or donor programs require certification that they are a member in good standing with the respective sub-sector apex organization. All MFI apex bodies are to establish appropriate bye-laws, criteria for registration and standards, which shall be reviewed periodically in accordance with the prevailing circumstances within the economy and in response to international practices and standards. The Government of Ghana, through the Ministry of Finance and Economic Planning, shall monitor as well as provide stakeholders with annual progress reports on the policy through the Microfinance Forum, and, at the end of every three years, the Microfinance Conference must review the policy.

III. Discrimination in loan markets: women and the young in developing countries

One of the reasons why women and young entrepreneurs may experience difficulties in accessing credit is their lack of collateral, which also poses legal obstacles to women and young people starting and running a business. According to a World Bank (2012) report, Women and Business Law, women in Middle East and North African countries have fewer inheritance rights than men. The report also indicated that women own only one percent of the world's property and that, in two-thirds of countries, the legal rights of women decline with marriage. According to Agarwal (2003), biased

inheritance rights often grant land to male relatives, leaving both widows and daughters at a disadvantage. In settings in which adult men are perceived as breadwinners, young people's and women's ability to offer family assets as collateral and their incentives to invest in productive activities are influenced by family dynamics that are likely to prioritize adult men's investments (Ospina, 1998). The above-mentioned factors affect women and young people in the credit market, especially the formal financial markets, as they are used to deny them the amount of credit that they require to run or set up their businesses, thereby making them poorer and vulnerable.

Although various studies have been conducted in the area of credit rationing and access to credit, very few have explained the gender and youth characteristic aspects that influence the discrimination and rationing behavior of MFIs. Most of these studies have also concluded that women and young people are often discriminated against in the credit markets. Khalid et al (2009) observed that, in rural Zanzibar, the factors determining credit constraints were influenced by different characteristics for male and female borrowers. According to them, whereas wealth and risk-bearing factors were significant for male borrowers, income levels were the significant factor for female borrowers. Zeller (1994) observed that young entrepreneurs were more likely to be rationed out of credit in his research on the informal financial markets in Madagascar during the period from 1993 to 1994. In similar research, Pariente (2005) observed that young entrepreneurs are credit constrained compared with their older counterparts in Brazil. Using a sample of entrepreneurs in Ruiri Municipality of Kenya, Phylis et al (2014) observed that women were less likely to obtain the required credit due to their low levels of literacy and lack of ownership of tangible assets and collateral. However, using data from 16 sub-Saharan African countries, Hansen et al (2014) noted that small enterprises owned by female entrepreneurs were less likely to be credit constrained than their male counterparts, while this was reversed for medium-sized enterprises, showing female favoritism for this type of firm. Fletscher (2008) observed that, in eastern Paraguay, women were more likely to be constrained than men and that women's rationing status responded to a different set of factors from men's. In research conducted to determine the extent of women's access to credit constraints in Sri Lanka, Suresh et al (2009) found that gender gaps did not simply mask differences in ability, risk aversion, entrepreneurial attitudes or differences in reporting behavior; there was some evidence that the gender gap was larger in female-dominated industries.

IV. Empirical framework: Testing for positive discrimination in favor of the vulnerable targeted in the Ghana Microfinance Policy 2006

We assume that credit rationing and the factors influencing the credit-rationing behavior of microfinance institutions are determined by the following linear relationship:

$$y_i = \beta' X_i + \varepsilon_i \quad (1)$$

where the outcome y_i is a dummy variable that takes the value one if the loan amount requested is not fully granted and zero otherwise. In equation (1), the matrix X contains a set of variables picking up the creditworthiness of the loan, the borrower's characteristics and the type of microfinance institution granting the loan. The borrower characteristics included in the model are experience (the number of years in business), education (the level of formal education), profession (the business sector), assets (the value of assets of the business), profits (the monthly profits of the business), collateral (the value of collateral), location (the distance from the firm to the microfinance company), the guarantor (an individual taking responsibility for the payment on behalf of the borrower in the case of default), the relationship (whether the borrower has previously contracted a loan with the microfinance company), the purpose (whether the requested loan is meant for the business or another purpose), the maturity (the number of months for the repayment of the loan), savings (whether the borrower has non-mandatory savings with the microfinance company) and the interest rate (the amount of the loan accepted by the borrower).[2] We also control for the type of microfinance institution, comprising savings and loans (microfinance 1, 2 and 3), government microfinance (microfinance 4), the NGO type (microfinance 5, 6, 7, 8 and 9) and community and rural banks (microfinance 10, 11, 12, 13 and 14). The vector β contains the set of parameters to be estimated, and ε is a random term with the standard distributional properties in each case. For the sake of simplicity, and only with an expositional purpose, equation 1 is estimated by means of a linear probability model (hereafter LPM). In this setting, the vector of the estimated parameters β reflects the marginal contribution of each factor to the probability of being credit rationed.

The Ghana Microfinance Policy, among other matters, entreats microfinance companies to give priority to the vulnerable, namely women and youths, in the granting of microcredit. The policy therefore expects microfinance companies to consider women and young entrepreneurs before any other groups of applicants. In other words, we should expect to detect positive discrimination in favor of these vulnerable groups targeted by the GHAMP. We now rewrite equation (1) as follows:

[2] The interest rates vary not across individuals but across MFIs.

$$y_{ij} = \beta_j X_{ij} + \varepsilon_{ij} \quad (2)$$

where in equation (2) the subscript j reflects the belonging to a certain population group, for example male or female borrowers or young or older borrowers. We assume j=m for men and j=w for women, and β_m and β_w are the marginal effects in each case. Discrimination will exist if males and females are treated differently by microcredit institutions in those relevant variables (X_{ij}) determining the rationing of credit, that is, if $\beta_m \neq \beta_w$. The necessary assumption is that the distribution of unobservables ε_{ij} is independent of individual i belonging to group j=m or j=w. In this context, discrimination can be either in favor of or against a specific group. In this study, the hypothesis to be tested is whether the Ghana Microfinance Policy 2006 is effective. In other words, it determines whether positive discrimination exists in favor of the targeted vulnerable groups, namely women and young borrowers, with respect to their male and adult counterparts.

Suppose the coefficients β_{cm} and β_{cw} to be the marginal effect of the collateral on the probability of being rationed for men and women, respectively; positive discrimination in favor of women would require, for each additional unit of collateral, the probability of being rationed to decrease more for women than for men, that is, $|\beta_{cw}| > |\beta_{cm}|$. If a difference in the credit rationing between men and women was observed, in the absence of discrimination ($\beta_m = \beta_w$), then these differences would be attributable to the fact that one group is endowed with a set of characteristics that makes lenders consider the creditworthiness to be better or less risky for one of the two groups, that is, a situation in which the endowments of men (X_{im}) are different from the endowments of women (X_{iw}), hence $X_{im} \neq X_{iw}$.

To carry out our test on the effectiveness of the Ghana Microfinance Policy 2006, we perform the Oaxaca–Blinder decomposition.[3] This method allows us to quantify the role of the observables X_{ij} (endowments) and coefficients β_j (discrimination) in explaining the credit rationing gap between the two groups, namely the vulnerable (v) and the non-vulnerable (nv). With the Oaxaca–Blinder method, we can decompose the estimated gap in credit rationing between the vulnerable (y_v) and the non-vulnerable (y_{nv}) into two components as follows:

[3] See Blinder (1973) and Oaxaca (1973).

$$\hat{Y}_{nv} - \hat{Y}_{v} = (\bar{X}_{nv} - \bar{X}_{v})\hat{\beta}_{v} - \bar{X}_{v}(\hat{\beta}_{nv} - \hat{\beta}_{v}) \quad (3)$$

The left-hand side of Eq. (3) measures the estimated gap in credit rationing between the two groups. The first term on the right-hand side picks up the part of the gap that is attributable to differences in the endowments between the two groups (loan, borrower and lender characteristics), while the second term concerns the part of the gap that is caused by differences in the coefficients (discrimination). The latter identifies the differences in lenders' treatment of the vulnerable and the non-vulnerable.

Given the binary nature of our outcome variable (being rationed or not), we estimate the determinants of the probability of being credit rationed (equation 2) by means of a probit model. In this setting, the linear decomposition presented in equation (3) needs to be manipulated and adapted to a non-linear framework. Thus, following Fairlie (1999), the decomposition equation now becomes the following:

$$\hat{Y}_{nv} - \hat{Y}_{v} = \left[\sum_{i=1}^{N_{nv}} \frac{F\left(X_i^{nv}\hat{\beta}_{v}\right)}{N_{nv}} - \sum_{i=1}^{N_{v}} \frac{F\left(X_i^{v}\hat{\beta}_{v}\right)}{N_{v}} \right] - \left[\sum_{i=1}^{N_{nv}} \frac{F\left(X_i^{nv}\hat{\beta}_{nv}\right)}{N_{nv}} - \sum_{i=1}^{N_{nv}} \frac{F\left(X_i^{nv}\hat{\beta}_{v}\right)}{N_{nv}} \right] \quad (4)$$

where the first term in brackets represents the part of the gap in credit rationing that is due to group differences in distributions of X and the second term represents the part that is due to differences in the group processes determining the levels of Y. In other words, the first term refers to the differences in endowments between the vulnerable (women/young) and the non-vulnerable (men/older), while the second term refers to differences in the treatment received by MFIs between the two groups. F(•) represents the cumulative normal distribution function. If we assume a linear function, then equation (4) becomes the same as equation (3).

It could be the case that there is no gap between the two groups. Accordingly, equation 3 would still be useful for testing for discrimination. It is possible that the differences in the endowments between the two groups will be canceled out by disparate treatment or the other way around. This might explain why there could be no gap in the average outcomes in the presence of discrimination, either in favor of or against a specific population group.

V. The data

The data for the study were gleaned from 14 microfinance companies of the various types of microfinance institutions and consisted of a sample of 1,429 borrowers. The data on these borrowers comprised their individual socio-economic characteristics, the firm and loan characteristics and their status regarding the supply of credit (whether rationed or not rationed) during the period 2012 to 2013. The non-availability of credit bureaus made it difficult to obtain more data on borrowers and hence a large sample size, as this had to be undertaken at the individual microfinance level and depended on the willingness of these microfinance companies to provide such information. Nonetheless, the number of microfinance companies was in accordance with the microfinance types used for the study and fairly distributed based on a mixed market (2012) both at the regional and at the national level. We therefore do not anticipate any bias with regard to our sampling.

Gathering information on borrowers who were turned down during the loan application process was not possible, as loan applications from the microfinance institutions in Ghana begin with informal interactions with the credit officer to ascertain the creditworthiness of the borrower before the application forms are handed to the prospective borrower. If the credit officer finds the borrower to be very risky, the application is turned down and hence no application form is given to the borrower. Therefore, no information on the borrower is gathered. Unfortunately for us, this application process is not registered, so we do not have any data on applications that were turned down. This means that we cannot control for the potential sample selection bias that may appear, because the probability of an application being turned down is not random.

The variables used in the study are divided into three groups: loan characteristics and creditworthiness (maturity, savings, profits, collateral, guarantor, purpose of the loan, previous loans from the MFI and assets), borrower characteristics (age, gender, location of residence, education level and industry of occupation) and MFI characteristics (dummies for each MFI and interest rates). Interest rates are taken as an MFI characteristic and not as a loan characteristic, because each MFI charges the same interest rate on all loans, irrespective of their creditworthiness. In table 1, we define and describe the coding of all these variables as well as reporting the descriptive statistics of our sampled data. It is worth noting that our data confirm the MIX (2012) report on the microfinance market in Ghana, which states that almost 60% of microfinance clients are women both at the regional and at the national level. Comparatively, males are rationed more. This is similar to the observations made by Henrik and John (2011), who noted that women are less likely to be rationed than their male

Table 1: Descriptive Analysis of Data

	Description	Female		Male		Youth		Adult	
Rationed	Borrowers who received only part of the amount requested	279(34.6)		238(38.3)		159(28.8)		358(40.82)	
Business sector of borrower	Commerce	319(39.53)		216(34.73)		236(42.75)		299(34.09)	
	Transport	47(5.82)		36(5.79)		19(3.44)		64(7.30)	
	Manufacturing	84(10.41)		107(17.20)		49(8.88)		142(16.19)	
	Agriculture	243(30.11)		154(24.76)		147(26.63)		250(28.51)	
	Service	114(14.13)		109(17.52)		101(18.3)		122(13.91)	
Borrower's educational level	Tertiary	418(51.8)		296(47.59)		292(52.9)		422(48.12)	
	Secondary	185(22.92)		114(18.33)		103(18.66)		196(22.35)	
	Primary	187(23.17)		180(28.94)		149(26.99)		218(24.86)	
	Illiterate	17(2.11)		32(5.14)		8(1.45)		41(4.68)	
Classification of monthly interest rates	Low (2-3%)	177(21.93)		75(12.06)		80(14.49)		172(19.61)	
	High (3.5-4.5)	630(78.07)		547(87.94)		472(85.51)		705(80.39)	
Guarantor	Guarantor provided	597(73.98)		443(71.22)		423(76.63)		617(70.35)	
Relationship	Borrowed in the past more than once in the same MFI	327(40.52)		253(40.68)		232(42.03)		348(39.68)	
Location	Borrowers closer to the MFI	276(34.2)		239(38.42)		160(29)		355(40.47)	
Experience	Number of years the borrower has been in business	Mean	St.d	Mean	St.d	Mean	St.d	Mean	St.d
		5.31	4.55	5.46	4.36	4.11	2.49	6.16	5.19
Assets value	Value of borrower's assets (dollars)	1179	1053	2135	4231	1295	1423	1784	3566
Profits	Monthly profits declared after tax ($))	163	245	259	488	162	199	231	448
Collateral	Value of collateral provided as security against default ($)	1152	1036	1362	1293	1208	1179	1266	1147
Microfinance1	Savings and Loans	58 (7.19)		73(11.74)		79(14.31)		52(5.93)	
Microfinance2		82(10.16)		34(5.47)		46(8.33)		70(7.98)	
Microfinance3		71(8.80)		54(8.68)		26(4.71))		99(11.29)	
Microfinance4	Governmental	106(13.14)		21(3.34)		54(9.78)		73(8.32)	
Microfinance5	NGO	67(8.30)		33(5.31)		38(6.88)		62(7.07)	
Microfinance6		25(3.10)		75(12.06)		20(3.62)		80(9.12)	
Microfinance7		44(5.4)		56(9.00)		34(6.16)		66(7.53)	
Microfinance8		49(6.07)		57(9.16)		35(6.34)		71(8.10)	
Microfinance9		44(5.45)		62(9.97)		51(9.24)		55(6.27)	
Microfinance10	Rural and Community Banks	41(5.08)		29(4.66)		38(6.88)		32(3.65)	
Microfinance11		47(5.82)		26(4.18)		22(3.99)		51(5.82)	
Microfinance12		44(5.45)		21(3.38)		37(6.70)		28(3.19)	
Microfinance13		81(10.04)		47(7.56)		55(9.96)		73(8.32)	
Microfinance14		48(5.95)		34(5.47)		17(3.08)		65(7.41)	
Observations		807		622		522		877	

counterparts in Ghana. Our data also show that a relatively small number of young borrowers were rationed (28.8%) compared with their adult counterparts (40.82%).

The distribution of borrowers according to sectors shows more women to be in the agriculture and commerce sectors and more men to be in the manufacturing sector. This also confirms the Ghana Living Standard Survey (GLSS6) report of the Ghana Statistical Service, which found comparatively more women in the commerce and agricultural sector and more men in the manufacturing sector. All these figures taken together suggest that our sample is representative of the population of borrowers in Ghana. Proportionately more young borrowers constitute the commerce and service sectors, while relatively more adults are found in the transport and manufacturing sectors. This is not surprising, since youths do not have the necessary capital to venture into the transport and manufacturing sectors, in which startups require huge amounts of capital. More females have attained tertiary education (51.8%), while among their male counterparts only 47.59% have tertiary education. The illiteracy rate for females was only 2.11%, whereas that of males was 5.14%. This gap may be attributed to the Girl Child Education policy and the free compulsory basic education (FCUBE), which were implemented around two decades ago. In the same vein, we find the illiteracy rate for young borrowers to be only 1.45%, whereas that of adults is 4.68%.

On average men and adults have a relatively high value of assets and collateral, but their female and younger counterparts have a relatively low value of assets and collateral. It is therefore not surprising that female and young borrowers provided more guarantors, 74% and 76.6%, respectively, while the figures for their male and adult counterparts were 71% and 70.4%, respectively. This is not surprising, as, in the Ghanaian social and cultural context, family assets and properties are inherited by male members while most of these assets and properties are also entrusted to the head of the households, who can offer them as collateral. Apart from the NGO microfinance type, which served comparatively more adult borrowers, almost the same proportions of young and adult borrowers were served by the other three microfinance types. With regard to the female and male groups, the savings and loans microfinance type served proportionately the same amount of females and males, whereas the government type and the community and rural banks served more women and the NGO type served comparatively more men.

VI. Econometric results

The probability of being rationed

In table 2, we show the estimated effects of the determinants of the probability of being credit rationed. To allow for interpretation, we report the marginal effects instead of the estimated coefficients. The size of the rationing and the direction are determined by the marginal effects and their signs, while the significance or otherwise is determined by their corresponding p-values. Our estimation strategy consists of introducing each set of variables sequentially to see how the membership group dummy (women/young) evolves as we include each group of covariates. We start with the most parsimonious model, which only includes a set of dummy variables identifying the group policy variables (column 1). In columns 2 and 3, we repeat the same sequential procedure, but now we include the individual, firm and loan characteristics. In column 4, we add the dummies for the microfinance companies to test whether we can observe some heterogeneity across them regarding the borrowers who are credit rationed. Our models are estimated through the probit model.

Our general results regarding the probability of being credit rationed support the existing theory and the results of other empirical studies (Alberto et al, 2013; Alexander et al, 2009; Hansen et al, 2014; Khalid et al, 2009), since all the control variables behave according to the expectations. We start by commenting on the results of the models considering the dummies for the policy group variables. In column (1), without other covariates than the youth dummy, the female dummy as a policy variable is negative though not statistically significant. However, with the inclusion of individual characteristics (column 2), the female dummy variable remains negative and becomes statistically significant, though only at the 10% level. Controlling for the creditworthiness of the loan (column 3), the probability of being credit rationed falls by up to 6.7 percentage points for females, and the effect becomes statistically significant at the 5% level. Finally, the probability of being credit rationed falls by almost 8 percentage points for women as we introduce the dummies for the microfinance companies, using the government microfinance company as the base category (column 4). Summing up, in the most parsimonious model in column 1, the female dummy variable is not significant, which indicates the inexistence of a credit rationing gender gap. However, the fact that the marginal effect associated with this variable becomes statistically significant as we control for individual and loan characteristics suggests that the treatment that women receive from microfinance institutions might differ from the treatment received by their male borrower counterparts.

The behavior exhibited by the marginal effect associated with the youth policy variable is, however, quite different from the female case. The effect for the youth dummy is statistically

Table 2: Determinants of the probability of being credit rationed (Probit model)

	(1)	(2)	(3)	(4)
Female	-0.0348	-0.0477*	-0.0676**	-0.0792***
	(0.0258)	(0.0266)	(0.0283)	(0.0298)
Youth	-0.120***	-0.131***	-0.113***	-0.120***
	(0.0255)	(0.0267)	(0.0280)	(0.0289)
Experience		-0.0121***	-0.0145***	-0.0130***
		(0.00306)	(0.00321)	(0.00367)
Secondary		0.0604	0.0186	0.0800*
		(0.0381)	(0.0400)	(0.0461)
Primary		0.0121	-0.0515	-0.0391
		(0.0356)	(0.0362)	(0.0382)
Illiterate		0.260***	0.486***	0.486***
		(0.0795)	(0.0790)	(0.110)
Transport		0.143**	-0.0135	-0.0312
		(0.0621)	(0.0614)	(0.0622)
Manufacturing		-0.0599	-0.0972**	-0.114**
		(0.0431)	(0.0452)	(0.0451)
Agriculture		0.174***	0.190***	0.152***
		(0.0379)	(0.0433)	(0.0455)
Service		-0.0509	0.00422	0.0389
		(0.0399)	(0.0459)	(0.0492)
Collateral			2.60e-05***	1.60e-05**
			(6.65e-06)	(7.56e-06)
Collateral sq.			-7.46e-10***	-5.89e-10**
			(2.46e-10)	(2.71e-10)
Assets value			3.17e-06	1.48e-05***
			(4.46e-06)	(4.85e-06)
Assets value sq.			-5.60e-11	-1.90e-10**
			(6.91e-11)	(7.80e-11)
Declared profits			1.51e-05	2.57e-06
			(2.36e-05)	(2.51e-05)
Declared profits sq.			-1.11e-10	9.64e-10
			(1.85e-09)	(1.95e-09)
Location			0.0236	0.0354
			(0.0288)	(0.0300)
Guarantor			0.273***	0.248***
			(0.0351)	(0.0431)
Relationship			-0.0925***	-0.117***
			(0.0279)	(0.0286)
Purpose			-0.0467	-0.0312
			(0.0309)	(0.0316)
Savings			-0.264***	-0.248***
			(0.0418)	(0.0653)
Maturity			0.0163***	0.0192***
			(0.00310)	(0.00338)

Type of MFI (base *Governmental*)				
Savings and Loans				
MFI 1				-0.172***
				(0.0480)
MFI 2				-0.288***
				(0.0306)
MFI 3				-0.176***
				(0.0464)
NGO				
MFI 5				-0.304***
				(0.0296)
MFI 6				-0.216**
				(0.0908)
MFI 7				-0.101
				(0.0622)
MFI 8				-0.263***
				(0.0343)
MFI 9				-0.0939
				(0.0633)
Rural and Community Bank				
MFI 10				-0.240***
				(0.0427)
MFI 11				-0.0640
				(0.0757)
MFI 12				0.141
				(0.0968)
MFI 13				0.0149
				(0.0637)
MFI 14				-0.0830
				(0.0681)
Observations	1,429	1,429	1,429	1,429

Notes: Significance, * (10%), ** (5%), *** (1%); Marginal effects reported instead of coefficients; standard errors in parentheses.

significant at the 1% level and almost constant across alternative models. In the most parsimonious model reported in column (1), without additional controls to the female dummy, the probability of being credit rationed decreases to 12 percentage points for young borrowers and further to 13 percentage points once we include individual characteristics (column 2). In column (3), after controlling for the creditworthiness of the loan, the probability of being credit rationed for youths decreases to 11.3 percentage points but reduces further to almost 12 percentage points (as in column

1) after including the dummies for the microfinance companies, the government type again being the base category (column 4).

With regard to the borrowers' characteristics, we focus on the results of the full model reported in column (4). We observe that, for each additional year of experience, the probability of being credit rationed decreases by 1.3 percentage points. The probability of being credit rationed increases by 48.6 percentage points for a borrower with no formal education. For borrowers operating in the manufacturing industry, the probability of being credit rationed is 11.4 percentage points smaller. On the contrary, working in the agriculture industry increases borrowers' probability of being credit rationed by 15.2 percentage points.

The amount of a borrower's declared profits in his/her activity turns out not to be statistically significant. However, the amount of collateral and assets exhibits an inverted U-shaped effect on the probability of being credit rationed. For those borrowers who are required to provide a guarantor, the probability of being credit rationed increases by 25 percentage points, because the need for a guarantor indicates that the risk of the loan is perceived to be high by the lender. Having savings or a previous relationship with the lender also significantly decreases the probability of being credit rationed by 25 and 11.7 percentage points, respectively. It is also worth noting that the government MFI is the type that practices credit rationing more intensively. With few exceptions, with respect to other non-governmental MFIs, the probability of being rationed by the government MFI is between 17 and 30 percentage points higher. We find this result to be a little odd, since the government MFI is the one that seems to be acting against the Ghana Microfinance Policy promoted by the Government of Ghana.

Group interaction regressions

In this subsection, we discuss the marginal effects of the coefficients of the various groups. That is, we estimate separate regressions for women and men and for adult and young borrowers. This analysis is carried out to observe the extent to which the estimated marginal effects differ between men and women and between young and older borrowers. Results are reported in Table 3. In the case that discrimination favors female and young borrowers, then this would imply the existence of positive discrimination, and we would be able to conclude that the Ghana Microfinance Policy 2006 is effective.

In Table 3, column (1), we report the marginal effects of our estimation when borrowers are males; column (2) reports the same when borrowers are females, column (3) when borrowers are

adults and column (4) when borrowers are youths. We discuss columns (1) and (2) concurrently, and the same applies to columns (3) and (4). In columns (1) and (2), we observe that the probability of being credit rationed reduces by 14.6 percentage points for female young borrowers, with respect to older females, this effect being statistically significant at the 1% level. For young men, compared with their older male counterparts, the probability of being credit rationed decreases by 8 percentage points, and this effect is only significant at the 10% level. Analogously, among young borrowers, women are 12.7 percentage points less likely to be credit rationed than men, while for older borrowers the gender gap is still negative in favor of women but not statistically significant. These results are quite revealing, since they indicate that young women (the intersection of both targeted groups) constitute the group that has a smaller probability of being credit rationed.

For the sake of brevity, we will not comment on all the results regarding all the variables for all the groups. In all the population groups, the direction and the significance of the effect for most of the variables coincide with the results provided by the pooled model reported in table 2. The first look at the results reported in table 3 suggests that male and female borrowers are treated differently by MFIs in Ghana, since, for a number of variables, the estimated marginal effects appear to be very different between men and women as well as between young and older borrowers. Indeed, the marginal effects associated with most of the microfinance institution dummies are generally statistically significant across the groups and apparently different when we compare men with women and young with older borrowers. To test statistically the extent to which men and women and young and older borrowers are treated differently, we perform the decomposition analysis introduced in section 3, the results of which are presented in the next subsection 4.2.2.

Testing for positive discrimination in favor of women and young borrowers

The results of the decomposition (Eq. 4) are reported in columns (3) and (6) of Table 4. As we already observed in Table 2, the probability of being credit rationed is higher for men than for women, by 3.7 percentage points, though it is not statistically significant. The results of the decomposition reveal that men and women are treated differently by MFIs regarding credit rationing. The endowments component is -0.062. This result indicates that, if both men and women were

Table 3: Interactions of Group Specific Regression (Probit)

	(1) male	(2) female	(3) adult	(4) youth
Female			-0.0448	-0.127***
			(0.0406)	(0.0451)
Youth	-0.0797	-0.146***		
	(0.0486)	(0.0383)		
Experience	-0.0142**	-0.0165***	-0.0158***	0.00312
	(0.00615)	(0.00499)	(0.00438)	(0.00890)
Secondary	0.213**	-0.00904	0.151**	-0.0231
	(0.0876)	(0.0596)	(0.0636)	(0.0636)
Primary	-0.0350	-0.0678	0.00534	-0.0640
	(0.0631)	(0.0503)	(0.0539)	(0.0535)
Illiterate	0.617***	-0.0304	-0.0379	
	(0.0771)	(0.231)	(0.178)	
Transport	0.133	0.000137	-0.0209	-0.143**
	(0.111)	(0.0994)	(0.0824)	(0.0694)
Manufacturing	0.0511	-0.214***	-0.109*	-0.142**
	(0.0895)	(0.0485)	(0.0605)	(0.0576)
Agriculture	0.353***	0.0803	0.0557	0.223***
	(0.0785)	(0.0594)	(0.0602)	(0.0776)
Service	0.0238	0.0590	-0.0354	0.109
	(0.0783)	(0.0692)	(0.0642)	(0.0788)
Collateral	5.06e-06	3.06e-05**	1.69e-05	1.69e-05
	(1.05e-05)	(1.45e-05)	(1.07e-05)	(1.12e-05)
Collateral sq.	-2.45e-10	-1.07e-09	-6.34e-10	-3.39e-10
	(2.79e-10)	(8.02e-10)	(3.88e-10)	(4.32e-10)
Assets value	1.02e-05	2.56e-05***	2.23e-05***	1.35e-05
	(6.61e-06)	(9.58e-06)	(6.54e-06)	(9.96e-06)
Assets value sq.	-1.15e-10	-5.13e-10**	-2.73e-10***	-2.68e-10
	(8.84e-11)	(2.49e-10)	(9.98e-11)	(2.46e-10)
Declared profits	-4.86e-05	3.66e-05	1.51e-05	-5.79e-05
	(3.58e-05)	(4.10e-05)	(3.30e-05)	(5.80e-05)
Declared profits sq.	3.48e-09	-0	-0	9.45e-09
	(2.66e-09)	(3.88e-09)	(2.29e-09)	(8.85e-09)
Location	-0.00988	0.0817**	0.101**	0.00591
	(0.0493)	(0.0414)	(0.0396)	(0.0460)
Guarantor	0.0941	0.387***	0.194***	0.314***
	(0.0746)	(0.0571)	(0.0569)	(0.0791)
Relationship	-0.0603	-0.198***	-0.0902**	-0.210***
	(0.0460)	(0.0399)	(0.0384)	(0.0429)
Purpose	-0.0331	-0.0309	0.0629	-0.0794
	(0.0528)	(0.0437)	(0.0424)	(0.0523)
Savings	-0.403***	0.376	0.0774	-0.251***
	(0.0704)	(0.242)	(0.186)	(0.0335)
Maturity	0.0218***	0.0202***	0.0159***	0.0149**
	(0.00542)	(0.00488)	(0.00414)	(0.00656)

Type of MFI (base *Governmental*)				
Savings and Loans				
MFI 1	-0.230**	-0.216***	-0.143*	-0.206***
	(0.0990)	(0.0521)	(0.0755)	(0.0490)
MFI 2	-0.369***	-0.283***	-0.376***	-0.168***
	(0.0360)	(0.0385)	(0.0284)	(0.0549)
MFI 3	-0.224**	-0.224***	-0.183***	-0.221***
	(0.0982)	(0.0470)	(0.0622)	(0.0349)
NGO				
MFI 5	-0.392***	-0.222***	-0.355***	-0.206***
	(0.0317)	(0.0570)	(0.0342)	(0.0454)
MFI 6	0.0173	-0.337***	-0.404***	-0.0585
	(0.240)	(0.0220)	(0.0435)	(0.190)
MFI 7	-0.313***	-0.0708	-0.195***	-0.0407
	(0.0715)	(0.0873)	(0.0708)	(0.0949)
MFI 8	-0.402***	-0.140**	-0.349***	-0.116
	(0.0383)	(0.0710)	(0.0337)	(0.0710)
MFI 9	-0.174	-0.161**	-0.139*	-0.118
	(0.117)	(0.0713)	(0.0817)	(0.0767)
Rural and Community banks				
MFI 10	-0.321***	-0.229***	-0.206***	-0.241***
	(0.0562)	(0.0553)	(0.0747)	(0.0327)
MFI 11	-0.189	-0.0953	-0.0338	-0.127
	(0.124)	(0.0937)	(0.110)	(0.0792)
MFI 12	0.176	0.101	0.219	-0.0193
	(0.205)	(0.126)	(0.142)	(0.116)
MFI 13	-0.136	0.0721	-0.0365	0.0339
	(0.124)	(0.0818)	(0.0837)	(0.0940)
MFI 14	-0.158	-0.111	-0.0747	-0.179***
	(0.130)	(0.0833)	(0.0918)	(0.0672)
Observations	622	807	877	544

Notes: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Marginal effects reported instead of coefficients.

endowed with the same characteristics ($X_{men}=X_{women}$), the gap would increase to 9.9 percentage points (0.037-(-0,062)) against men. Analogously, the reported discriminatory component is 0.099, almost three times the size of the gap, which indicates that, if men and women were not treated differently ($\beta_{men}=\beta_{women}$), the gap in the probability of being credit rationed would be -6.2 percentage points (0.037-0.099) higher for women than for men. This result clearly indicates that strong positive discrimination exists in favor of women.

For the group of youths, we also observe positive discrimination. The probability of being credit rationed is 12 percentage points smaller for young borrowers than for their older counterparts. The endowments component is practically null (-0.006), which means that youths and older borrowers are endowed essentially with the same characteristics ($X_{youth}=X_{older}$); therefore, the gap is entirely attributable to different treatment by MFIs. If youths and older borrowers were not treated differently by MFIs ($\beta_{youth}=\beta_{older}$), the gap in the probability of being credit rationed would be -0.6 percentage points (0.12-0.126) smaller for older borrowers. That is, the gap would be practically non-existent. This result again indicates strong positive discrimination in favor of young borrowers.

To understand the implications of our results better, we resort to the counterfactual analysis by means of the following expressions:

$$P_{nv}^{v}(y = 1) = \Phi(\bar{X}^{v}\hat{\beta}_{nv}) \quad (5)$$

$$P_{v}^{nv}(y = 1) = \Phi(\bar{X}^{nv}\hat{\beta}_{v}) \quad (6)$$

where $\Phi(\bullet)$ is the cumulative normal distribution of the inner argument, the subscript and superscript *v* refer to the vulnerable targeted group (female/youth) and *nv* refers to the non-vulnerable group (male/older).

With equation (5), we simulate the probability of being credit rationed if the average vulnerable borrower ($\bar{X}^{v}$) is treated as his/her average non-vulnerable counterpart ($\hat{\beta}_{nv}$). Analogously, equation (6) simulates the opposite situation, that is, the probability of being credit rationed if the average non-vulnerable borrower ($\bar{X}^{nv}$) is treated as his/her average vulnerable counterpart ($\hat{\beta}_{v}$). According to the decomposition analysis, what we should expect is that vulnerable borrowers treated as non-vulnerable should increase their probability of being credit rationed, while this probability should decrease for the non-vulnerable if they are treated as being vulnerable. The results of the counterfactual analysis are reported in the last row of table 4.

In column (1), we show the counterfactual for the probability of being credit rationed for female borrowers treated as male borrowers. This counterfactual probability is 0.43, which is 12 percentage points higher than the observed probability for women (0.31). Analogously, if male borrowers are treated as their female counterparts (column 2), their counterfactual probability is 0.324, which is 4 percentage points higher than their observed probability. The counterfactual analysis for

Table 4: Decomposition and Counterfactual Analysis

	(1)	(2)	(3)	(4)	(5)	(6)
	Female	Male		Young	Older	
P(ration=1), observed	0,346	0,383		0,288	0,408	
Gap (Endoments+Discrimination)			0,037			0,12
t-test (H_0: Gap=0)			1,44			4.63***
P(ration=1), predicted	0.310	0,363		0,317	0.392	
Decomposition results						
Endowments			-0,06			-0,006
			-168%			*-5%*
Discrimination			0,099			0,126
			268%			*105%*
Counterfactual analysis						
P(ration=1), counterfactual	0,430	0,324		0,385	0,332	

Notes: *** p<0.01, ** p<0.05, * p<0.1

youths–older borrowers reports similar results. That is, if young borrowers are treated as their older counterparts (column 4), the counterfactual probability of being credit rationed is 0.385, 7 percentage points higher their observed probability (0.317). On the contrary, if older borrowers are treated as their young counterparts (column 5), their probability of being credit rationed is 0.392, 6 percentage points higher than their observed probability (0.332). These results are in line with the evidence of positive discrimination in favor of female and young borrowers. The fact that the counterfactual probabilities for women and young borrowers are higher than their observed probabilities is due to positive discrimination in their favor.

VII. Conclusions and policy implications

Access to credit has become a huge problem for micro and small entrepreneurs. Those who are badly affected by this credit rationing tend to be the vulnerable, who are mostly made up of women and youths, working in both the formal and the informal sectors. Various intervention programs have

aimed to empower the vulnerable through the provision of the necessary resources that will enable them to be employed, earn a sustainable income and live a meaningful and dignified life. One of the major policies aimed at providing access to credit for these vulnerable groups is the Ghana Microfinance Policy, which enjoins the microfinance institutions to give priority to the vulnerable in their administering of credit. Our research was set up to determine the extent to which the operations of the microfinance companies in the microfinance market in Ghana are influenced by the Ghana Microfinance Policy. We observed that, whereas the microfinance companies use individual and loan characteristics to ration credit towards male and adult entrepreneurs, this approach is minimal and relaxed towards female and young entrepreneurs. Thus, the rationing behavior of the microfinance companies favors female and young entrepreneurs, and this favoritism is not influenced by their group endowments but by a positive discrimination towards them promoted by this reform of the Microfinance industry.

Despite the credit-rationing behavior of the microfinance companies is in line with the Ghana Microfinance Policy 2006, access to credit still remains a problem, as not all prospective borrowers are served with the exact loan amount that they require for their business. According to our data, which is drawn by a representative sample of borrowers, still almost 40% of the borrowers are constrained regarding the amount borrowed and granted. According to our results, the Governmental microfinance company is the one who engages in the most severe rationing behavior. This behavior is in contradiction with the fact that the Government is supposed to ensure that the policy will lead to increasing access to credit for micro and small enterprises, especially those in vulnerable groups. This result is even more relevant if we take into account the fact that the government MFI serves not only individual borrowers but also microfinance companies that apply for loanable funds from the Government's microfinance company.

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