The Impacts of Improvements in the Delivery of Credit from Formal and Semi-formal Financial Institutions: Evidence from Ghana

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This study examines the impacts of improvements in delivery of credit from formal and semi-formal financial institutions to households in Ghana. My main interest is to exploit plausibly variations in access to credit from these institutions, due to the fact that before the passage of the new financial institution bills such as the Borrowers and Lenders Act, 2008 (Act 773) and the Non-Bank Financial Institutions Act, 2008 (Act 774) in 2008, households in the country could hardly borrow from the formal financial institutions. Particular attention is paid to a number of socioeconomic outcomes, including agriculture, non-farm businesses, and expenditure. This paper documents evidence of a decline in the share of households who have some informal borrowing, reduction in agricultural activities, and increases in non-farm business activities as well as increases in the number of non-farm business employees. This paper also find improvements in consumption, profits (both farm and non-farm activities) and loan repayments.
JEL: (G21, G31, J23, 013, 016, Q12, Q14)

Formal and semi-formal financial institutions (FSFIs) have increasingly become involved in the financing of micro and small enterprises (MSEs). For solving poverty issues, credit delivery plays a major role because it contributes to the development of the MSEs, and improves the living and working conditions of the poor. Notwithstanding, a number of studies on the subject suggest that formal financial institutions show reluctance to extend credit to households as well as MSEs in sub-Saharan Africa (SSA) because of perception of risk, high transaction cost of delivery, and uncertainty (Aryeetey and Udry 1997; Kimuyu and Omiti 2000; Bigsten et al. 2003; Ofei 2004; Beck and Demirguc-Kunt 2006; Abor 2008).

In Ghana, for example, the previous three rounds of the Ghana Living Standards Survey (GLSS) (i.e., GLSS3, GLSS4, and GLSS5) have shown that over 75 percent of loans taken by households were mainly from the informal financial sector (e.g., borrowing from family members, money lenders, etc.). Meanwhile, some existing empirical evidence specifically suggests that a loan from this sector hinders MSEs growth and improvement in the living and working conditions of the poor because it usually comes with a high lending rate

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(Atieno 2001; Bigsten et al. 2003; Steel and Andah 2003).

For progress to be made in the fight against poverty, there is urgent need to expand credit delivery from FSFIs to households. Fortunately, the GLSS6 shows much improvements in the delivery of credit from these institutions to households in Ghana. In contrast to the previous three rounds of the GLSS where credits from the FSFIs to households were less than 10 percent, the GLSS6 shows that about 51 percent of loans taken in the 2012-13 survey year came from formal banks, and savings and loans schemes (Figure 1).[1] The improvements in loans from the FSFIs to households could be attributed to the passage of two new financial institution bills– the Borrowers and Lenders Act, 2008 (Act 773) and the Non-Bank Financial Institutions Act, 2008 (Act 774) in 2008. In this context, households facing constrained access to credit or those who used to borrow from the informal financial sector at higher interest rates may have chosen to borrow from the FSFIs so as to invest more in their businesses and/or on their farms than they would *ex-ante* the passage of Act 773 and Act 774.

However, whether the expansion of credit from the FSFIs to households impact their socio-economic activities positively or negatively remains an open question with significant policy implications. To the extent that the impacts of expanding access to credit on household, especially the poor, are positive or negative (Banerjee, Karlan and Zinman 2015), it is important to comprehensively examine the impacts of improvements in the delivery of credit from these institutions. Recent empirical studies based on randomized controlled trials (RCTs) in different countries have, on one hand, provided evidence that suggest that expanded access to credit (especially, microcredit) has positive impacts on investment in self-employment activities and income. On the other hand, these trails have displayed mixed results on the impacts on consumption and other social indicators (Banerjee et al. 2015; Tarozzi, Desai and Johnson 2015; Attanasio et al. 2015).[2]

The purpose of this paper is to examine the effect of the passage of Act 773 and Act 774 on access to credit, and also study the effect on borrowing from various sources including self-employment activities (farm and non-farm) and consumption. The main thrust here is to exploit plausibly variations in access to credit from FSFIs among households with *ex ante* characteristics. The inefficient credit rationing in Ghana preceding the passage of the new financial institution bills limited the ability of most households and MSEs to borrow from FSFIs and for that matter created plausible exogenous variation in availability of FSFI loans across regions.

In 2008, the Parliament of Ghana enacted Act 773 and Act 774 into law. The former provides a legal framework for the provision of credit including standards of disclosure and provisions for the establishment of a collateral registry, and the

[1]Savings and loan schemes loans are mainly from Micro Finance Institutions (MFIs) licensed by BoG as Non-Bank Financial Institutions (NBFIs).

[2]We refer readers interested in these results to Banerjee, Karlan and Zinman (2015) for a summary.

latter is the main law governing non-banking financial institutions and licensed money lenders in the country. As shown in Figure 1, the implementation of these two laws have led to substantial increases in the share of credit from FSFIs to households. Using household survey data from 1991-1992 to 2012-2013, a pre-policy information (1991-92) on borrowing from formal financial institutions by households at the regional level was used to assign treatment and control regions.

I argue that households in regions with more FSFIs are more likely to benefit from the implementation of these new policies because they are much more exposed to financial services, whereas those in regions with few FSFIs are less likely to benefit, since they are less exposed to financial services. Moreover, many of the FSFIs provide services in urban and periurban areas, with service outlets largely concentrated around the major urban centres of the Greater Accra, Ashanti, and Eastern regions, with little outreach to rural and remote areas (Howard et al. 2000; Nair and Fissha 2010). Therefore, the treatment and control groups could be assigned on these lines.[3] This heterogeneity enables us to use pre-policy information on formal financial institutions' borrowing by households in a difference-in-difference (DID) framework, which exploits the fact that the increased FSFIs loan propensity was much higher amongst households in regions with most formal loan experience. I examine how FSFIs loan take-up changed differentially between treatment and control regions by assigning a region as a treatment region if the number of households who borrowed from formal institutions in the 1991-1992 survey year is greater than or equal six, and likewise assigning a region as a control if the number of households who borrowed from formal institutions is less than six.

The results show that passage of Act 773 and Act 774 had large effects on a large majority of the socio-economic variables examined in this study. In 2012-2013, while households do borrow more from FSFIs, relative to the previous survey years, the overall loan take-up is substantially low (only 11 percent of households borrowed, compared with 29 percent in 1991-1992, 34 percent in 1998-1999, and 27 percent in 2005-2006). In regions assigned to treatment, borrowing prevalence declined by about 5 percentage points relative to the control regions, and I observed no significant difference in overall borrowed amount (though the point estimate is positive). Although the distribution of access to credit indicates that about a third of the households who accessed credit did so through FSFIs, which means this decline in borrowing was due to decline in informal borrowing and loans from formal banks, suggesting substitution of expensive loans for cheaper loans – as I observe an increase in loans from semi-formal financial institutions.[4]

Despite the overall decline in borrowing prevalence, my estimates show large

[3]This argument is supported by the pre-policy implementation data from 1991-1992 to 2005-2006 as they show that households in regions with more FSFIs usually receive more loans from these institutions than those in regions with few FSFIs.

[4]Semi-formal financial institution loans are basically loans from Savings and Loans Schemes, in short, Micro-finance Institution loans.

treatment effects on the key socio-economic variables examined. For instance, the point estimates suggest that access to FSFIs loans decreased households farming activities by 5 percentage points and number of farms by 9 percentage points, but, increased non-farm business activities by 7 percentage points and number of non-farm businesses by roughly 16 percentage points. I also observed significant impacts on farm revenues, non-farm business profits, non-farm business employees, and non-farm business loan repayment among others. Further, I find significant positive treatment effects on annual per capita consumption expenditure: the purchases of either non-food items or food expenditure, which include durables and "temptation goods" such as alcohol and tobacco.

The rest of the paper is organised as follows: Section I describes the financial institution policies in Ghana. Section II provides a description of the data and summary statistics. I include details of the estimation strategy in Section III, where I also describe the results. Section IV concludes.

I. Financial Policies in Ghana

A. Structure of Ghana's Financial Sector

As discussed in Steel and Andah (2003), before the enactment of these new two bills (Act 773 and Act 774), the financial system in Ghana included formal, semi-formal, and informal sectors.

According to the banking laws of Ghana, **formal financial institutions** include banks and NBFIs. These institutions are incorporated under the Companies Code of 1963 (Act 179), which provides them legal identities as limited liability companies, while the Bank of Ghana (BoG) serves as the overall regulatory authority, licensing and supervising them under the Banking Act, 2004 (Act 673) as amended by the Banking (Amendment) Act, 2007 (Act 738) and Act 774. Act 738 introduced three types of banking licenses; General Banking license (for universal and off-shore banking), Class I Banking (for universal banking) and Class II Banking (for off-shore banking). On the other hand, Act 774 migrated savings and loans companies and other NBFIs to the banking regime.

After the enactment of Act 673, Universal Banking replaced the three-pillar banking model (i.e., development, merchant and commercial banking) in Ghana. According to the BoG, the reforms in the banking industry levelled the playing field and opened up the system to competition, product innovation and entry. This led to the number of banks increasing from 19 in 2001 to 26 in 2006. Current BoG records indicate that as of December 2013, 27 banks operating in Ghana had Class I Banking License. These are the Deposit Money Banks (DMBs).[5] In

[5]The DMBs comprised 12 Ghanaian-Owned and 15 foreign-owned banks. The number of branches of DMBs stood at 892 in 2013 (Bank of Ghana 2014).

addition, the BoG has also licensed the ARB Apex Bank,[6] and 140 Rural and Community Banks (RCBs).[7] As of December 2013, out of the total assets of banks and NBFIs, banks accounted for 89.4 percent, of which the total assets of RCBs represented 4.4. For NBFIs, there were 57 registered institutions. They included 31 finance houses, 23 savings and loan companies, 2 leasing companies, and 1 mortgage finance company. The assets of NBFIs constituted about 11 percent of total assets of banks and NBFIs.

The **semi-formal institutions** in Ghana are mostly Credit Unions (CUs) and Financial Non-Governmental Organizations (FNGOs), Microfinance companies and *Susu* companies that are deposit taking as well as money lender companies. Before their migration to the banking regime, these institutions were classified as semi-formal because they were statutory bodies engaging in financial services but were not regulated by the BoG.[8]

After the enactment of Act 774, the BoG on July 2011 issued new Operating Rules and Guidelines for streamlining the activities of the semi-formal financial institutions, including licensing requirements which provide the basis for microfinance sector regulation and supervision. Since then 337 MFIs have been licensed out of which a total of 114 had commenced operations by the end of 2013 (Bank of Ghana 2014). The total assets of MFIs formed 0.7 percent of the total assets of banks, NBFIs and MFIs.

The **informal financial sector** covers actors involved in a range of activities know as *susu*, including savings collectors, rotating savings and credit associations. The sector also includes moneylenders, trade creditors, self-help groups, and personal loans from friends and relatives.

Finally, it should be mentioned that formal financial institutions such as DMBs serve only about 5 percent of households, most of which are in urban areas. Their activities represent about 40 percent of the money supply in the overall financial sector and, with about 60 percent of the money supply outside the formal system – RCBs, savings and loan companies, and other semi-formal and informal financial providers are considered to be key players in addressing the issue of lack of access in the country (Steel and Andah 2003; Nair and Fissha 2010).

B. Borrowers and Lenders Act

Enacted in 2008, Act 773 provides the legal framework for the provision of credit in Ghana, including standards of disclosure and provisions for the establishment of a collateral registry. The act is essential to credit delivery

[6]The ARB Apex Bank Ltd is the mini Central Bank in Ghana for the Rural and Community Banks (RCBs) financed mainly through the Rural Financing Services Project (RFSP), which is a Government of Ghana project to holistically address the operational bottlenecks of the rural financial sector with the aim of broadening and deepening financial intermediation in the rural areas (ARB Apex Bank 2012).

[7]The Rural and Community Banks (RCBs) are generally commercial banks under the banking law, except that they cannot undertake foreign exchange operations, they are fully owned by individual shareholders who are residents of their local catchment areas, and their minimum capital requirement is significantly lower.

[8]See Steel and Andah (2003).

because it gives a detailed description of rights and obligations of borrowers and credit providers. Some of the salient provisions of the act are on consumer protection, pre-agreement disclosure, marketing information, and collateral registry among others.

For instance, on consumer protection, Act 773 provides for the borrowers' right, which include the right to apply for credit, protection against discrimination in respect of credit on grounds of race, sex and ethnicity. Moreover, the act makes provision for the rights of political affiliation, the right to receive documents, and the protection of borrower credit rights and confidentiality, personal information and borrower credit record.

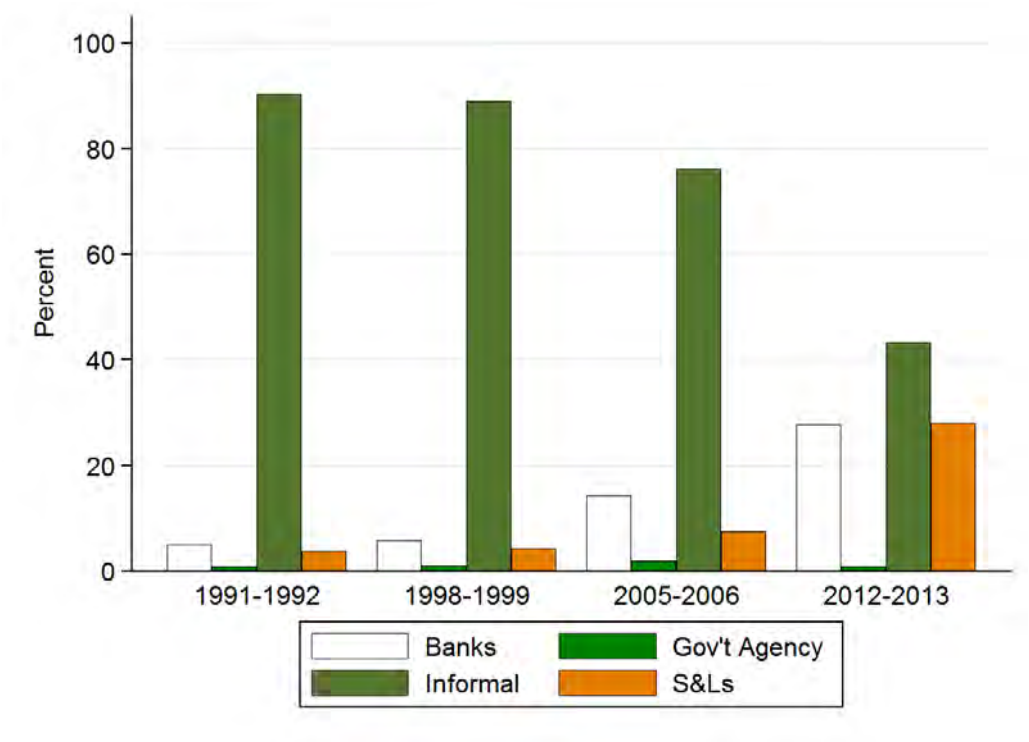


FIGURE 1. : DISTRIBUTION OF SOURCES OF CREDIT 1998/99 – 2012/13

Notes: This figure plots a bar chart of the distribution of access to credit from their sources. Banks represents formal banking institutions, including Commercial Banks, and Rural and Community Banks (RCBs), employer is other formal institution loans from employer (mostly government agencies), and S&Ls represents Semi-formal financial institutions, they include CUs, Microfinance Companies, Financial Non-Governmental Organizations and Susu companies that are deposit taking as well as money lender companies and non-deposit taking Financial NGOs.

For pre-agreement disclosure and marketing information, the Act states that a lender has to provide a prospective borrower with a pre-agreement statement and quotation in the form of a schedule specified in the Act, and also specifies the use

of marketing to induce a person to apply for or obtain credit. Apart from the provision on consumer protect, the Act also established a registry known as the Collateral Registry with the main purpose of registering charges and collaterals created by borrowers to secure credit facilities provided by lenders. According to the BoG, the total volume of registered charges in 2013 was 28,542, while registered collaterals stood at 39,537. The volume of loans secured by the 28,542 charges amounted to GHC16.7 billion.

The new financial laws have contributed to a significant increase in access to credit from FSFIs among households, who had previously relied on informal borrowing as their main source of external financing for their self-employment activities. This is clearly illustrated in Figure 1 which shows the distribution of the sources of household access to credit between 1991-1992 and 2012-2013. This development is very encouraging because it eliminates some of the difficulties inherent in the previous unregulated informal and semi-formal financial institutions, which were ostensibly catering to the financial service needs of the poor and marginalized. Since Figure 1 shows more than 35 percent decline in informal borrowing, my identification strategy considers whether there is a substitution of expensive borrowing with cheaper FSFIs borrowing.

II. Data

To estimate the impacts of improvement in credit delivery from FSFIs to households after the enactment of the new financial laws on a number of socio-economic outcomes, I use the GLSS data from Ghana Statistical Service (GSS). Ghana has conducted six rounds of living standards surveys since 1987. The second, third and fourth rounds, occurred in 1988, 1991-92 and 1998-99 respectively. The fifth round of the GLSS was implemented in 2005-06, while the six round was conducted in 2012-2013. These are nation-wide surveys which collect comprehensive data on topics, including demographic characteristics of the population, education, health, employment and time use, migration, housing conditions and household agriculture. Each round of GLSS has always had a specific focus. In the GLSS5 for instance, Non-Farm Household Enterprises Module was made the focus and additional sections covering Tourism, Migrants and Remittances were introduced. On the other hand, the GLSS6 focused on a Labour Force Survey (LFS) module with additional sections on Child Labour and Household Financial Services. For the purpose of this study, I used the last four rounds of the survey with sample size of 4,521, 5,998, 8,687 and 16,772, respectively. And information on credit was obtained from Section 12 of each survey.

There are several analytical advantages in using the GLSS data. First, each round of the survey contains detailed and relevant information for the analysis. For example, the non-farm household enterprises dataset provides detailed information on firm-specific level characteristics such as output level, revenue, expenses, age and number of employees as well as start-up capital and ongoing financing or working capital sources in the last 12 months. Similarly,

information on household farm activities such as expenses, revenues and others are contained in the agriculture dataset. While the household financial services dataset provides information on sources of households' credit.

Second, the timing (i.e., 6 to 7 years interval) of the survey suits the purpose of this study; in looking at the changes in households' credit constraints and credit sources over time, I consider the last four rounds of the GLSS (i.e., 1991-1992, 19989-1999, 2005-2006, 2012-2013) – while comparison of the last two rounds, in 2005-2006 and 2012-2013, capture the changes in household socio-economic outcomes just before and after the new financial reforms.

Third, the GLSSs survey households in all 10 regions and provide nationally representative samples with the use of sampling weights. Hence, all regressions were estimated using weighted data to ensure that the results provided nationally representative estimates.

Table 1 provides the summary statistics of households in GLSS3. It should be emphasised that the GLSS is a cross-sectional survey. As such this baseline date is used to show a snapshot of households in 1991-1992 survey. This is necessary because our treatment and control regions were assigned base on the availability of FSFIs credit to households in a region as of 1992.[9] I assign a region as treatment region if it had six or more households borrowing from formal banks, and as control region if otherwise. Columns 2 and 3 report statistics for households in regions where formal bank loans were less than six (control regions). Column 4 shows the difference between the mean for households in regions assigned to treatment and the means in column 1. The last column shows the p-values for the test of equality of means.

To convert nominal figures into real figures, I used the 2005 purchasing power parity (PPP)-adjusted exchange rate and the national consumer price index (CPI) data provided by the GSS and setting the data into constant prices of 2005. Hence, all dollar ($) amounts are in 2005 PPP$ exchange rates.

It is evident that households in the treatment and control regions are roughly comparable, as none of the characteristics on household composition, except household head's education, differs significantly between the treatment and control region. However, access to bank credit, bank loan amount, number of farms, land ownership, farm income, are significantly higher, whereas number of businesses, ownership of old business, consumption (total, food and non-food) are significantly lower in the control regions than in the treatment regions. At the baseline, households were large (about 5 members on average), with annual expenditure of about $43 at constant 2005 PPP-adjusted exchange rate, or GHC47 (using 2005 CPI deflator). About half of the household heads had lower levels of schooling.

[9]I used the GLSS 3 as the baseline survey because the first Financial Institutions (Non-Baking) Law (PNDCL 328) was passed in January 1993, and among the institutions registered under the law in 1994 were two savings and loan companies (Aryeetey 1996). Therefore, one could argue there was no savings and loan companies licensed and regulated by the BoG in 1992. Since semi-formal financial institutions were not regulated by the BoG, we use formal bank loans as a proxy for FSFIs loans in GLSS3.

TABLE 1—: GLSS3 SUMMARY STATISTICS

	Control group			Treatment - Control	
	Obs.	Mean	SD	Coeff.	p-value
	(1)	(2)	(3)	(4)	(5)
Household composition					
Household Size	1,783	4.570	2.945	-0.148	0.319
Number of adults ($\geq$ 16years)	1,783	2.331	1.382	-0.110	0.102
Number of children ($\leq$16 years old)	1,783	2.238	2.085	-0.038	0.688
Head's age	1,783	43.998	14.984	0.485	0.416
Head with education	1,783	0.508	0.500	0.129	0.000
Male head	1,783	0.699	0.459	-0.033	0.160
Access to credit					
Banks	1,783	0.008	0.088	0.011	0.001
Gov't agency	1,783	0.003	0.058	-0.002	0.439
Informal loans	1,783	0.240	0.427	0.037	0.088
Savings and loan schemes	1,783	0.008	0.091	0.004	0.235
Any loan	1,783	0.260	0.439	0.050	0.026
Amount borrowed from (2005 PPP$)					
Banks	1,783	0.143	1.924	0.288	0.025
Gov't agency	1,783	0.061	1.456	0.448	0.372
Informal loans	1,783	3.227	25.189	1.050	0.379
Savings and loan schemes	1,783	0.132	2.004	0.522	0.126
Total	1,783	3.897	27.709	2.524	0.092
Amount repaid	1,783	1.650	19.284	0.522	0.486
Self-employment activities last 12 months					
Farm	1,783	0.572	0.489	0.188	0.000
Number of farms	1,783	0.629	0.605	0.266	0.000
Own land	1,783	0.393	0.489	-0.050	0.258
Expenses (2005 PPP$)	1,783	3.865	9.632	0.658	0.178
Total revenue (2005 PPP$)	1,783	26.161	57.857	14.014	0.001
Net revenue (2005 PPP$)	1,783	22.848	56.086	13.232	0.001
Businesses	1,783	0.571	0.495	-0.097	0.000
Number of businesses	1,783	0.593	0.758	-0.115	0.004
Old business	1,783	0.439	0.496	-0.088	0.000
New business	1,783	0.022	0.146	0.007	0.184
Employment (employees)	1,783	0.167	1.973	-0.099	0.075
Expenses (2005 PPP$)	1,783	58.740	203.903	-2.707	0.752
Total revenue (2005 PPP$)	1,783	69.575	238.360	-7.171	0.477
Net Revenue (2005 PPP$)	1,783	10.835	176.870	-4.464	0.444
Consumption (per household per annum)					
Consumption (2005 PPP$)	1,783	42.742	42.893	-5.775	0.022
Food items (2005 PPP$)	1,783	23.633	20.525	-2.640	0.011
Non-food items (2005 PPP$)	1,783	19.108	28.519	-3.134	0.080
Asset index	1,783	2.098	1.665	-0.195	0.102

Notes: This table provides summary statistics of variable means in GLSS3. Sample size is $n = 4,521$, of which 2,738 assigned to treatment and 1,783 assigned to control. Columns 2 and 3 report statistics for households in regions where formal bank loans were less than six. Column 4 shows the difference between the mean for households in regions assigned to treatment and the means in column 1. Column 5 shows the p-values for the test of equality of means, robust to intra-cluster correlation. Bank loans includes loans from private and state banks. Gov't agency loans are basically loans from government special credit schemes, most of which were lunched in 1989. Informal loans are from informal credit markets and they include moneylenders, traders, farmer, relative/friends/neighbour and other informal as classified in the GLSS survey questionnaires. Savings and loan schemes are loans from semi-formal financial institutions loans. In the survey, these institutions are classified together with state and private banks as formal financial institutions. All monetary amounts are in 2005 PPP$ exchange rate. The 2005 PPP exchange rate, according to the GSS is $0.4475822 to GHC 1. Asset index: Calculated for a list of home durable goods. Each asset is given a weight using coefficients of the first factor of principal-component analysis. Each index, for household i, is calculated as the weighted sum of standardized dummies equal to 1 if the household owns the durable good.
Source: GLSS5.

While households in the treatment region are more educated, they engage more in farm activities and less in non-farm business activities–with 85 farms and 48 businesses per 100 households. They have similar business income as households in the control region. In the control regions, total revenues from farm activities were about $26 on average (or GHC 29), while total expenditures were $4 during the 12 months before the interview. Similarly, in control areas, total revenues from business activities amounted to $70, while business expenditures was $59 in the 12 months preceding the survey.

The baseline information also show that only 26 percent of households in the control region borrowed, and the average amount of the outstanding loans (including zeros for nonborrowing households) was less than $2. More than 90 percent of the households borrowed from informal sources (defined as loans from moneylenders, traders, farmer, relatives/friends/neighbours and others), while 3 percent had loans from formal institutions such as private and state banks.

Growth between 1991-1992 and 2012-13

Tables 2, 3, and 4 provide similar key summary statistics for the GLSS4, GLSS5, and GLSS5 samples in the control regions. Comparing the control baseline sample (GLSS3) with the control households in the GLSS4, GLSS5, and GLSS6 samples demonstrate tremendous growth in Ghana between 1992 and 2013. Although for the share of households with at least one outstanding loan, the growth had not been consistent. The share of households with at least one outstanding loan rose from 26 percent at the baseline to 29 percent in GLSS4, but decline to 21 percent in GLSS5 and 8 percent in GLSS6. The consistent decline in the fraction of households with at least one outstanding loan may be consistent to low demand for credit in Ghana;[10] however, some of the key indicators suggest that limited access to credit had serious repercussions on household self-employment activities in the control regions. I observe a decline in non-farm business employment and net revenue. Between 2006 and 2013, the number of business employees, on average, declined from 0.92 to 0.55 employees, while net non-farm business revenue decline from $1,781 to -$36 in the control regions. That not withstanding, it should be emphasised that the share of household with access to formal bank loans rose from 0.8 percent at the baseline to 2.5 percent in GLSS4, 4.7 percent in GLSS5, and 3.7 percent in GLSS6. Similarly, loans from semi-formal financial institutions increased from 0.8 at the baseline to 2.1 in GLSS5. In terms of loan amounts, growth in average loans from formal banks remain consistent over the years: $0.14 at the baseline, $1.6 in GLSS4, $51 in GLSS5 and $174 in GLSS6.

In the control regions, the prevalence of non-farm businesses declined from 57 per hundred households at the baseline to 47 in GLSS4, 46 in GLSS5 and 41 in GLSS6. However, for the treatment regions, after a decline from 56 per hundred household at the baseline to 47 in GLSS4, the prevalence of non-form businesses

[10]Osei-Assibey (2010) finds evidence of voluntary self-exclusion from seeking external finance.

TABLE 2—: GLSS4 SUMMARY STATISTICS

	Control group			Treatment - Control	
	Obs.	Mean	SD	Coeff.	p-value
	(1)	(2)	(3)	(4)	(5)
Household composition					
Household Size	2,299	4.166	2.465	0.191	0.152
Number of adults ($\geq$ 16years)	2,299	2.300	1.317	0.136	0.042
Number of children ($\leq$16 years old)	2,299	1.919	1.749	0.163	0.057
Head's age	2,299	46.007	15.097	-0.283	0.647
Head with education	2,299	0.572	0.495	0.141	0.000
Male head	2,299	0.702	0.457	-0.062	0.006
Access to credit					
Banks	2,299	0.011	0.106	0.014	0.005
Gov't agencies	2,299	0.001	0.036	0.004	0.013
Informal loans	2,299	0.258	0.438	0.078	0.005
Savings and loan schemes	2,299	0.015	0.121	0.000	0.908
Anyloan	2,299	0.286	0.452	0.095	0.001
Amount borrowed from (2005 PPP$)					
Banks	2,299	1.623	21.259	2.877	0.051
Gov't agencies	2,299	0.172	6.810	0.646	0.062
Informal loans	2,299	21.745	118.512	1.309	0.755
Savings and loan schemes	2,299	2.042	26.974	0.241	0.816
Total	2,299	25.582	122.866	5.073	0.288
Amount repaid	2,299	9.550	71.677	3.306	0.164
Self-employment activities last 12 months					
Farm	2,299	0.559	0.497	0.185	0.000
Number of farms	2,299	0.792	0.881	0.252	0.002
Own land	2,299	0.192	0.394	0.130	0.000
Expenses (2005 PPP$)	2,299	74.312	385.180	103.191	0.000
Total farm revenue (2005 PPP$)	2,229	205.895	731.671	82.946	0.007
Net farm revenue (2005 PPP$)	2,299	132.973	612.573	105.467	0.001
Businesses	2,299	0.474	0.499	-0.006	0.817
Number of businesses	2,299	0.450	0.690	-0.012	0.743
Old business	2,299	0.340	0.474	-0.013	0.585
New business	2,299	0.018	0.132	0.004	0.303
Employment (employees)	2,299	0.120	0.965	-0.006	0.874
Expenses (2005 PPP$)	2,299	419.976	1,618.817	-80.369	0.187
Total revenue (2005 PPP$)	2,299	462.186	1,706.344	-69.494	0.346
Net revenue (2005 PPP$)	2,299	42.210	1,209.193	10.875	0.790
Consumption (per household per annum)					
Consumption (2005 PPP$)	2,299	280.556	8282.342	-11.672	0.557
Food items (2005 PPP$)	2,299	158.578	144.389	-0.274	0.979
Non-food items (2005 PPP$)	2,299	121.978	172.121	-11.397	0.280
Asset index	2,299	2.282	1.570	-0.128	0.246

Notes: This table provides summary statistics of variable means in GLSS4. Sample size is $n = 5,998$, of which 2,299 assigned to treatment and 3,699 assigned to control. Columns 2 and 3 report statistics for households in regions where formal bank loans were less than six. Column 4 shows the difference between the mean for households in regions assigned to treatment and the means in column 1. Column 5 shows the p-values for the test of equality of means, robust to intra-cluster correlation. Bank loans includes loans from private and state banks. Gov't agency loans are basically loans from government special credit schemes, most of which were lunched in 1989. Informal loans are from informal credit markets and they include moneylenders, traders, farmer, relative/friends/neighbour and other informal as classified in the GLSS survey questionnaires. Savings and loan schemes are loans from semi-formal financial institutions loans. In the survey, these institutions are classified together with state and private banks as formal financial institutions. All monetary amounts are in 2005 PPP$ exchange rate. The 2005 PPP exchange rate, according to the GSS is $0.4475822 to GHC 1. Asset index: Calculated for a list of home durable goods. Each asset is given a weight using coefficients of the first factor of principal-component analysis. Each index, for household i, is calculated as the weighted sum of standardized dummies equal to 1 if the household owns the durable good.
Source: GLSS4.

TABLE 3—: GLSS5 SUMMARY STATISTICS

	Control group			Treatment - Control	
	Obs.	Mean	SD	Coeff.	p-value
	(1)	(2)	(3)	(4)	(5)
Household composition					
Household Size	3,850	4.558	3.131	-0.638	0.000
Number of adults ($\geq$ 16years)	3,850	2.668	1.626	-0.427	0.000
Number of children ($\leq$16 years old)	3,850	1.959	2.070	-0.207	0.007
Head's age	3,850	45.618	15.404	-0.491	0.284
Head with education	3,850	0.542	0.498	0.199	0.000
Male head	3,850	0.769	0.422	-0.085	0.000
Access to credit					
Banks	3,850	0.028	0.164	0.019	0.001
Gov't agencies	3,850	0.006	0.077	-0.001	0.595
Informal loans	3,850	0.161	0.367	0.080	0.000
Savings and loan schemes	3,850	0.018	0.135	0.003	0.338
Anyloan	3,850	0.213	0.409	0.102	0.000
Amount borrowed from (2005 PPP$)					
Banks	3,850	51.314	1,231.668	5.271	0.808
Gov't agencies	3,850	2.268	45.741	-0.362	0.727
Informal loans	3,850	53.495	672.623	43.162	0.014
Savings and loan schemes	3,850	16.141	240.427	2.740	0.665
Total	3,850	123.217	1,421.232	50.811	0.096
Amount repaid	3,850	35.976	282.928	45.271	0.000
Self-employment activities last 12 months					
Farm	3,850	0.595	0.491	0.081	0.013
Number of farms	3,850	0.761	0.814	0.108	0.030
Own land	3,850	0.478	0.500	-0.091	0.003
Expenses (2005 PPP$)	3,850	124.153	749.514	55.132	0.002
Total revenue (2005 PPP$)	3,850	1,039.803	3,393.271	186.421	0.216
Net revenue (2005 PPP$)	3,850	928.573	3,282.359	130.170	0.364
Businesses	3,850	0.464	0.499	0.009	0.633
Number of businesses	3,850	0.633	0.915	-0.044	0.177
Old business	3,850	0.428	0.495	-0.009	0.595
New business	3,850	0.029	0.167	0.006	0.161
Employment (employees)	3,850	0.922	2.160	-0.073	0.262
Expenses (2005 PPP$)	3,850	1,275.870	7,505.102	-189.837	0.384
Total revenue (2005 PPP$)	3,850	3,056.831	12,151.829	111.601	0.768
Net revenue (2005 PPP$)	3,850	1,780.961	12,036.217	301.438	0.356
Consumption (per household per annum)					
Consumption (2005 PPP$)	3,850	1,356.002	2,060.762	-13.799	0.873
Food items (2005 PPP$)	3,850	667.841	698.563	59.389	0.700
Non-food items (2005 PPP$)	3,850	688.161	1,623.270	-73.188	0.211
Asset index	3,850	2.964	2.026	-0.200	0.034

Notes: This table provides summary statistics of variable means in GLSS5. Sample size is $n = 8,687$, of which 3,850 assigned to treatment and 4,837 assigned to control. Columns 2 and 3 report statistics for households in regions where formal bank loans were less than six. Column 4 shows the difference between the mean for households in regions assigned to treatment and the means in column 1. Column 5 shows the p-values for the test of equality of means, robust to intra-cluster correlation. Bank loans includes loans from private and state banks. Gov't agency loans are basically loans from government special credit schemes, most of which were lunched in 1989. Informal loans are from informal credit markets and they include moneylenders, traders, farmer, relative/friends/neighbour and other informal as classified in the GLSS survey questionnaires. Savings and loan schemes are loans from semi-formal financial institutions loans. In the survey, these institutions are classified together with state and private banks as formal financial institutions. All monetary amounts are in 2005 PPP$ exchange rate. The 2005 PPP exchange rate, according to the GSS is $0.4475822 to GHC 1. Asset index: Calculated for a list of home durable goods. Each asset is given a weight using coefficients of the first factor of principal-component analysis. Each index, for household i, is calculated as the weighted sum of standardized dummies equal to 1 if the household owns the durable good.
Source: GLSS5.

TABLE 4—: GLSS6 SUMMARY STATISTICS

	Control group			Treatment - Control	
	Obs.	Mean	SD	Coeff.	p-value
	(1)	(2)	(3)	(4)	(5)
Household composition					
Household Size	8,074	4.555	2.9561	-0.561	0.000
Number of adults ($\geq$ 16years)	8,074	2.627	1.578	-0.294	0.000
Number of children ($\leq$16 years old)	8,074	1.968	2.007	-0.245	0.000
Head's age	8,074	45.780	15.855	0.118	0.729
Head with education	8,074	0.574	0.494	0.214	0.000
Male head	8,074	0.752	0.432	-0.066	0.000
Access to credit					
Banks	8,074	0.022	0.146	0.015	0.000
Gov't agencies	8,074	0.001	0.027	0.000	0.388
Informal loans	8,074	0.038	0.190	0.016	0.010
Savings and loan schemes	8,074	0.021	0.143	0.017	0.000
Anyloan	8,074	0.081	0.273	0.048	0.000
Amount borrowed from (2005 PPP$)					
Banks	8,074	174.442	2,866.185	76.703	0.113
Gov't agencies	8,074	4.829	218.122	2.882	0.606
Informal loans	8,074	35.398	481.137	67.154	0.000
Savings and loan schemes	8,074	64.577	951.483	114.267	0.008
Total	8,074	279.246	3,058.838	261.007	0.000
Amount repaid	8,074	124.786	918.483	151.854	0.000
Self-employment activities last 12 months					
Farm	8,074	0.607	0.488	0.017	0.427
Number of farms	8,074	1.315	1.373	-0.116	0.056
Own land	8,074	0.437	0.496	-0.086	0.000
Expenses (2005 PPP$)	8,074	1,394.697	6,975.582	351.809	0.261
Total revenue (2005 PPP$)	8,074	3,295.507	10,475.235	2,062.946	0.000
Net revenue (2005 PPP$)	8,074	2,288.581	12,507.208	1,851.991	0.000
Businesses	8,074	0.411	0.492	0.080	0.000
Number of businesses	8,074	0.477	0.734	0.118	0.000
Old business	8,074	0.349	0.477	0.090	0.000
New business	8,074	0.019	0.136	0.012	0.000
Employment (employees)	8,074	0.549	1.296	0.201	0.000
Expenses (2005 PPP$)	8,074	10,270.759	157,766.740	4,774.127	0.030
Total revenue (2005 PPP$)	8,074	10,234.039	75,473.492	8,246.043	0.000
Net revenue (2005 PPP$)	8,074	-36.720	168,730.610	3,471.916	0.154
Consumption (per household per annum)					
Consumption (2005 PPP$)	8,074	6,239.541	7,659.414	694.448	0.005
Food items (2005 PPP$)	8,074	3,128.488	3,500.486	220.498	0.055
Non-food items (2005 PPP$)	8,074	3,111.053	5,029.094	473.950	0.003
Asset index	8,074	3.348	1.799	0.064	0.310

Notes: This table provides summary statistics of variable means in GLSS3. Sample size is $n = 4,521$, of which 2,738 assigned to treatment and 1,783 assigned to control. Columns 2 and 3 report statistics for households in regions where formal bank loans were less than six. Column 4 shows the difference between the mean for households in regions assigned to treatment and the means in column 1. Column 5 shows the p-values for the test of equality of means, robust to intra-cluster correlation. Bank loans includes loans from private and state banks. Gov't agency loans are basically loans from government special credit schemes, most of which were lunched in 1989. Informal loans are from informal credit markets and they include moneylenders, traders, farmer, relative/friends/neighbour and other informal as classified in the GLSS survey questionnaires. Savings and loan schemes are loans from semi-formal financial institutions loans. In the survey, these institutions are classified together with state and private banks as formal financial institutions. All monetary amounts are in 2005 PPP$ exchange rate. The 2005 PPP exchange rate, according to the GSS is $0.4475822 to GHC1. Asset index: Calculated for a list of home durable goods. Each asset is given a weight using coefficients of the first factor of principal-component analysis. Each index, for household i, is calculated as the weighted sum of standardized dummies equal to 1 if the household owns the durable good.
Source: GLSS5.

rose from 47 in GLSS5 to 49 in GLSS6.

On average, total farm revenue increased from around $26 at the baseline to $3,295 in GLSS6, having first increased to $206 in GLSS4 and subsequently to $1,040 in GLSS5. There was consistent growth in farm expenses over the study period of 1991-1992 to 2012-2013. In GLSS6, households engaged in farm activities reported farm expenses of almost $1,395, up from about $4 at the baseline. Business revenues and expenses also recorded rapid growth. On the one hand, it is observed that business owners reported business expenses (working capital) plus investment in assets of about $58 at the baseline; however, in GLSS6, the reported business expenses was $10,270. Growth in business expenses was much more rapid between 2006 and 2013, where business expenses rose from $1,276 to $10,270. On the other hand, total revenue increased from $69 (baseline) to $462 in GLSS4, $3,057 in GLSS5 and $10,234 in GLSS6. Finally, average consumption rose from $43 at the baseline to $281 in GLSS4 to $1,356 in GLSS5 and $6, 240 in GLSS6. The growth in consumption has been consistent and almost equal for both food and non-food consumption items.

In summary, the macroeconomic situation underlying the datasets show that over 20 years of economic reforms and policies in Ghana have in a way been sufficient for spurring economic growth. This is an important feature to keep in mind as it may have effect on the results.

III. Estimation Methodology and Results

A. Estimation Methodology

Since I am using repeated cross-sectional datasets, it impossible for me to look at changes in outcomes at the household level, but because the same regions were surveyed over the years I can control for the presence of time-invariant local-specific fixed effects. To look at the impact of the financial reforms, my econometric framework is established to compare improvement in outcomes of key socio-economic variables between the treatment and control regions before and after the reforms. Hence, I make use of treatment status as defined by variation in households access to credit: whether the household lived in treatment or control region as of 1991-1992. For a given outcome y, the equation being estimated is thus the following:

$$(1)\quad y_{rit} = \beta_0 + \beta_1(Treat_r \times Post_t) + \beta_2 Treat_r + \beta_3 Post_t + X_i^{'}\beta_4 + X_r^{'}\beta_5 + \varepsilon_{rit},$$

where y_{rit} denotes the outcome for household i in region r and time t (where $t = 0$ denotes baseline and t = 1 follow-up). $Post_t = 1$ for observations from GLSS5 (post-reform observations), while $Post_t = 0$ for observations from GLSS5 (pre-reform observation). $Treat_r = 1$ if six or more households in region r received credit from formal institutions in 1991-1992 survey year (treatment group), and

is otherwise equal to 0 (the control group).[11] X_i is a vector of control variables for household characteristics, X_r is a vector of region dummies. The residual ε_{rit} is clustered at the enumeration area within the region. The parameter of interest is β_1, which represents the difference-in-difference effect on outcome variables among households in the treatment regions relative to households in the control regions.

As I evaluate the impact of financial reforms on a large number of outcomes, in the sprite of Banerjee et al. (2015), I account for multiple hypothesis testing. Each table of results focuses on a 'family' of outcomes for which I produce an index, which is the average of the z-scores of each outcome within the family. Although the preceding discussions on the summarize statistics covered the last four rounds of the GLSS, in the regression analyses that follows, I consider only the surveys conducted just before and after the two Acts were enacted. All

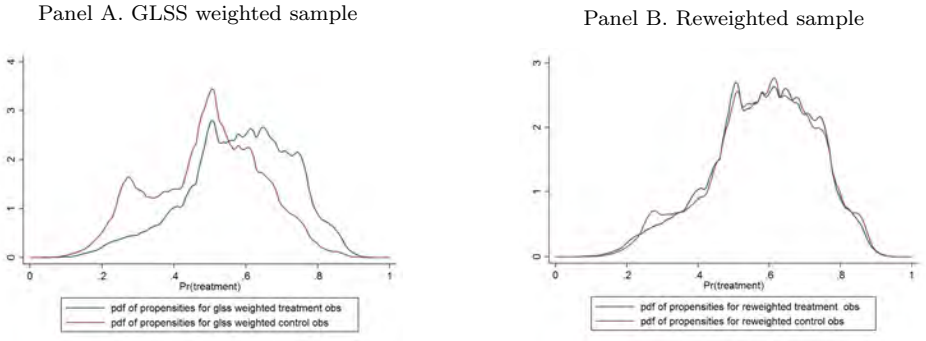


FIGURE 2. : DISTRIBUTION OF ESTIMATED PROPENSITY SCORES

Notes: This figure plots the distribution of estimated propensity scores for our sample using the GLSS sampling weights and propensity score-based weighting technique (reweighted).

the results presented below are weighted. However, to eliminate as much as possible, the issue of selection biases and confounding, the propensity scored-based re-weighting approach proposed by DiNardo, Fortin and Lemieux (1996) was used instead of the GLSS sample weights. Using this approach and the assigned treatment variable, I estimate the probability that an observation is in the GLSS5 or GLSS6, then re-weights the GLSS6's observation by the inverse of the propensity to be observed so that the distribution are nearly equal across the two survey years.

Figure 2 shows the distribution of the estimated propensity scores for the treatment and control groups in our sample. Panel A shows the difference in the distributions when the GLSS survey weights are applied, whereas panel B shows

[11]The distribution of credit from formal financial institutions in 1991-1992 at the regional level are: Western 6, Central 6, Greater Accra 5, Volta 12, Eastern 5, Ashanti 15, Brong Ahafo 13, Northern 0, Upper East 1, and Upper West 2.

the difference in distribution when we use the re-weighting approach. Here the difference is much larger in panel A than in panel B. It is clear from panel B that the re-weighting approach overcomes the limitations by making the two groups similar with to respect observable pre-reform characteristics and thereby allowing the estimation of unbiased treatment effects.

B. Impact on Access to Credit

To estimate the impacts on access to credit and borrowing behaviour I rely on household survey data from GLSS5 (pre-reform observation) and GLSS6 (post-reform observations) that provides self-reported information on loans at the time of the surveys. Table 5 presents the DID results from equation (1), where I control for household and region characteristics. The results show that the reform led to significant decreases in borrowing. Panel A, column 5 shows a 4.6 percentage

Table 5—: Impacts on Borrowing

	Banks (1)	Gov't agencies (2)	Informal sources (3)	S&Ls (4)	All sources (5)
Panel A . Credit access					
Treatment × Post	-0.005	0.004	-0.060***	0.015**	-0.046**
	(0.007)	(0.005)	(0.018)	(0.007)	(0.020)
Observations	25,459	25,459	25,459	25,459	25,459
Control mean	0.024	0.002	0.077	0.020	0.124
Panel B. Loan amounts	Loan amounts (in 2005 PPP$)				
Treatment × Post	25.544	0.367	6.4146	76.758*	109.083
	(65.199)	(6.311)	(25.562)	(38.238)	(80.628)
Observations	25,459	25,459	25,459	25,459	25,459
Control mean	134.691	4.002	41.241	48.938	228.87
Panel C. Index of dependent variables			Any loan		Loan amounts
Treatment × Post			-0.042		0.005
			(0.036)		(0.022)

Notes: The sample is from GLSS5 (pre-reform) and GLSS6 (post-reform). The observations are at the household level. Cluster robust standard errors are in parentheses. The dependent variables in columns 1-5 of panel A are defined as fellows: a dummy for whether the household had an outstanding loan from a bank(column 1), or from government agency (column 2), or from informal sources such as moneylenders, traders, farmers, relatives/friends/neighbour and other informal (column 3), or from savings and loan schemes (column 4), or from any sources (column 5). The dependent variables in columns 1-5 of panel B are the amounts corresponding the loan sources defined in the column headers. Panel C presents the results of the estimation of model 1 using an index of dependent variables as outcome. All monetary values are in 2005 PPP$ exchange rate. The 2005 PPP exchange rate according to figures provided by the GSS is GHC1/ US$0.44758222. All statistics are calculated using sampling weights

***Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

point decreases the likelihood of borrowing from any type of loan, on control average of 12.4 percent.

The figures in panel A, columns 1 and 2, show that the reform barely affected loans from banks and government agencies. Households in treatment regions are 6 percentage points less likely to report being an informal borrower: 1.7 percent versus 7.7 percent (panel A, column 3). Panel A, column 4 shows a 1.5 percentage point increase in the likelihood of borrowing from savings and loan schemes. This result provides some evidence of crowding out of other forms of borrowing (compared with informal borrowing).

Looking at loan amounts, the estimates of Table 5, panel B show increases in the amount borrowed from all sources. The point estimate of the amount borrowed is only significant at the 10 percent level for loans from savings and loan schemes. Considering the absolute value of amount borrowed relative to other loans, it indicates that households in the treatment regions are substituting expensive borrowing with cheaper savings and loan schemes borrowing.

When we look at the indexes of the standardised dependent variables (panel C) we find evidence of decrease in access to credit in the treatment regions, though insignificant. While the index of measures of borrowing prevalence indicates an average decline of 0.04 standard deviations relative to the control regions, the index of measures of loan amount shows no impact.

C. Impacts on Self-Employment Activities: Farm

In Table 6, I examine the impacts of the reform on households' farm activities. In these regressions, I assign zero to those households that do not have a farm, so that these results give us the overall impact of credit on farm activities. I show in the table that with the exception of farm expenses, the impacts on farm activities were significantly different from zero at standard levels. Column 1 shows that the probability that a household engages in a farm activity is significantly different in the treatment and control regions. In comparison, 60 percent of households engaged in farming activities in the year preceding the survey, compared to 55 percent in the treatment regions. Moreover, column 2 indicates that treatment households had less number of farms than control households.

When we look at farm expenses we find that households in the treatment regions have higher input expenses, while not significantly different from zero, the impact is about 3 percent higher than that of the control mean (column 3). Table 6 also shows that there is significant increase in total and net farm revenues (columns 4 and 5). We find an average increase of net farm revenues of \$1,610 in treatment regions, which is almost double, relative to the control mean of \$1,583. In Figure 3 we look at quantile regression for the net farm revenues. The quantile regression shows that the increase in net farm revenues was more skewed to the upper percentiles, since between the tenth and fiftieth, there is no difference between the net farm revenues in the treatment and control regions. The figure indicates that the majority of farm households hardly make any profit, as such they may not qualify for a loan from formal financial institutions, whereas MFIs loan does

TABLE 6—: IMPACTS ON SELF-EMPLOYMENT ACTIVITIES: FARM EXPENSES AND REVENUE

	Has a farm (1)	Number of farms (2)	Expenses on farm (3)	Revenues from farms (4)	Net revenues from farms (5)	Index of dependent variables (6)
treatment × Post	-0.059**	-0.207***	29.87	1,640.28***	1,610.41***	0.016
	(0.025)	(0.057)	(360.06)	(329.70)	(483.794)	(0.018)
Observations	25,459	25,459	25,459	25,459	25,459	25,459
Control mean	0.603	1.136	984	2,567	1,583	

Notes: The sample is from GLSS5 (pre-reform) and GLSS6 (post-reform). The observations are at the household level. Cluster robust standard errors are in parentheses. The outcome variables are set to zero when the household does not operate a farm. Column 6 presents the results of the estimation of model 1 using an index of dependent variables as outcome. All monetary values are in 2005 PPP$ exchange rate. The 2005 PPP exchange rate according to figures provided by the GSS is GHC1/ US$0.44758222. All statistics are calculated using sampling weights

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

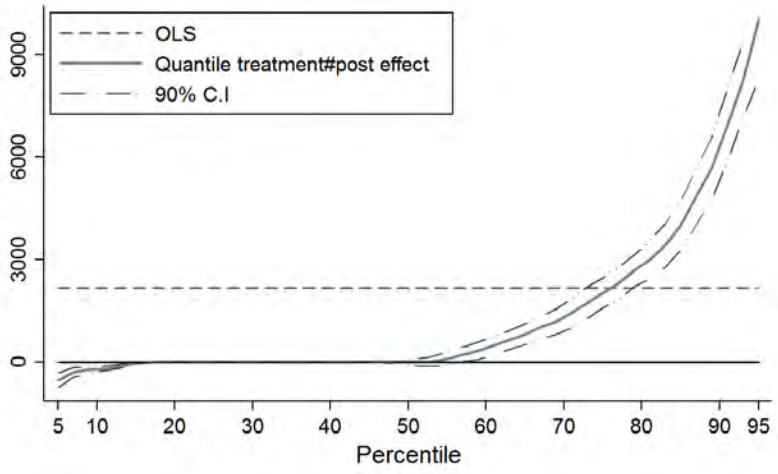


FIGURE 3. : TREATMENT × POST EFFECT ON NET FARM REVENUES

Notes: Net farm revenues defined as the difference between total farm revenue and total input expenses. Confidence intervals are cluster-bootstrapped at the neighbourhood level.

nothing to help them.[12]

D. Impacts on Self-Employment Activities: Businesses

Table 7 shows the DID results comparing business outcomes for households in treatment and control regions. Column 1 indicates that the probability that a household has a non-farm business is significantly different in the treatment and control regions. In the treated regions, 51 percent of households reported having non-farm business in the year preceding the survey, compared to 43 percent in the control regions. Similarly, in the comparison regions, 37 percent of households had an existing business, relative to 45 percent of households in the treatment regions. However, I observed no difference between the treatment and control regions in terms of opening of new businesses, while treatment households were more likely to have more than one business in the past year: 71 per 100 households, versus 53 per 100 households in control regions. Businesses are significantly more likely to have more employees in the treatment regions: the number of employees per business is 0.92 in the treatment regions compared to 0.67 in the control regions (column 5).

Table 7—: Impacts on Self-Employment Activities: Business Expenses and Revenues

	Has non-farm business (1)	Has any old business (2)	Started business last 12 months (3)	Number of non-farm business (4)	Employees (5)	Revenues last 12 months (6)	Expenses last 12 months (7)	Net revenues 12 months (8)	Business loan repaid (9)	Index of variables variables (10)
Treatment × Post	0.082***	0.112***	0.010	0.179***	0.248***	9,412.24***	1,617.81	7,794.43*	5,300.19***	0.062***
	(0.024)	(0.023)	(0.007)	(0.039)	(0.069)	(1,911.37)	(3,571.55)	(3,752.59)	(1,656.96)	(0.017)
Observations	25,459	25,459	25,459	25,459	25,459	25,459	25,459	25,459	25,459	25,459
Control mean	0.428	0.375	0.022	0.527	0.670	7,916	7,366	550	5,307	

Notes: The sample is from GLSS5 (pre-reform) and GLSS6 (post-reform). The observations are at the household level. Cluster robust standard errors are in parentheses. The outcome variables are set to zero when the household does not have a business. Column 6 presents the results of the estimation of model 1 using an index of dependent variables as outcome. All monetary values are in 2005 PPP$ exchange rate. The 2005 PPP exchange rate according to figures provided by the GSS is GHC1/ US$0.44758222. All statistics are calculated using sampling weights

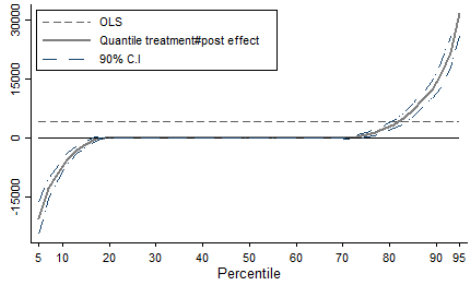
*** Significant at the 1 percent level.
** Significant at the 5 percent level.
* Significant at the 10 percent level.

Table 7 columns 6, 7, 8, and 9 report on business total revenue, input expenses, profits (net revenues) and business loan repayment. Similar to the analysis for farm activities, outcome variables are set to zero when the household does not have a business. Columns 6 and 7 show that total revenues and expenses of businesses in the treatment regions during the past year increased by $9,412 and $1,618 respectively, with only the former being significant at the 1 percent

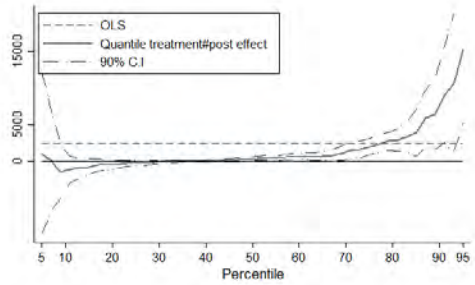
[12] As explained earlier, MFIs loans are from semi-formal financial institutions such as savings and loan companies.

level. The figure for the former corresponds to roughly a 118 percent increase relative to total revenues received by an average comparison household, while the figure for the latter is about an 11 percent increase relative to expenses of the average comparison household in the control regions. Column 8 paints a similar picture with respect to business profits. We see a large and statistically significant increase in business profits, which has a point estimate of $7,794. In

Panel A. Non-farm business net revenue



Panel B. Non-farm new businesses net revenue



Panel C. Non-farm old businesses net revenue

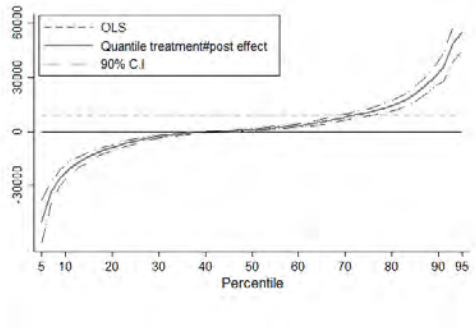


Figure 4. : Treatment × Post on non-farm profits, new businesses profits, and old business profits

Notes: Non-farm new businesses are businesses started less than one year before the survey, while non-farm old business are business started at least more than one year before the survey. Confidence intervals are cluster-bootstrapped at the neighbourhood level.

Figure 4, I provide the results from quantile regressions to examine whether the changes in profit between the treated and control groups are at the tails, in the middle, or throughout the distribution. Figure 4, panel A shows that the positive

increase in business profits is concentrated in the right tail, starting from the eightieth percentile. This figure suggests that there is no significant difference in profits for businesses between the twentieth and seventieth percentiles, while the remaining lower percentiles experienced a reduction in business profits. I consider whether this is different in the case of new and old businesses. Figure 4, panels B and C provide similar quantile regressions results for new and old businesses, respectively. The impacts on non-farm new businesses confirm that profits are more clearly skewed to the right tail of the distribution, and also the fraction of households with any profits is sufficiently lower that the impacts on percentiles up to the fortieth remain under zero with a median of about $390. In contrast, the quantile regressions for old business profits indicate large negative impacts for the lower percentiles and large positive impacts for the higher percentiles, which clearly show once again that the positive increase is concentrated in the right tail, although the median percentile is about $1,000.

E. Impacts on Consumption

Table 8 reports the DID estimates on consumption and asset index. The table shows the effect on total consumption at the household level (column 1), and by type of consumption: food and non-food and asset index (columns 2 to 49).

TABLE 8—: CONSUMPTION (*Per capita, per annum*)

	Total (1)	Food (2)	Non-food (3)	Home durable index (4)	Index of all dependent variables (5)
Treatment × Post	445.04**	23.909	421.13***	0.179**	0.022
	(221.66)	(104.02)	(145.41)	(0.088)	(0.019)
Observations	25,459	25,459	25,459	25,459	25,459
Control mean	4,301	2,152	2,149	3.223	

Notes: The sample is from GLSS5 (pre-reform) and GLSS6 (post-reform). The observations are at the household level. Cluster robust standard errors are in parentheses. Food expenditure includes expenses on alcohol and tobacco. Column 5 presents the results of the estimation of model 1 using an index of dependent variables as outcome. All monetary values are in 2005 PPP$ exchange rate. The 2005 PPP exchange rate according to figures provided by the GSS is GHC1/ US$0.44758222. All statistics are calculated using sampling weights

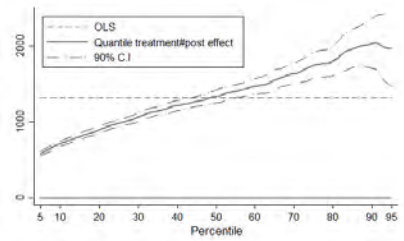
*** Significant at the 1 percent level.
*** Significant at the 1 percent level.
** Significant at the 5 percent level.
* Significant at the 10 percent level.

Columns 1 and 3 show that there is significant difference between treatment and control households in total household expenditure and non-food– per capita. Column 1 shows a statistically significant 10 percent increase in total expenditure per annum: a $445 change (se = 221.66) from the control of $4,301.

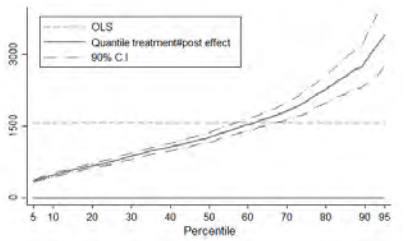
Column 3 shows a statistically significant 19 percent rise in household non-food expenditure: a \$421 change (se = 145.41) from the control group mean of \$2,149. Column 2 shows that there is no significant difference between treatment and control households in food expenditure.[13] Although spending on per capita food expenditure increased by about \$24, it represents about 1 percent of the control mean of \$2,152.

Figure 5 presents quantile regressions estimates for expenditures. Panels A, B, and C confirm the positive results from the DID estimates. The overall pattern suggest statistically significant right-tail increases for food and non-food expenditure as well as total expenditure.

Panel A. Food expenditure



Panel B. Non-food expenditure



Panel C. Total expenditure

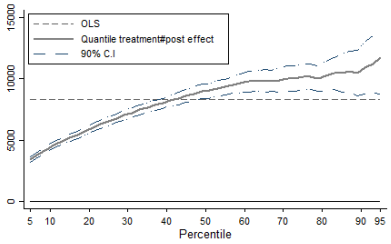


Figure 5. : Treatment and Post Interaction on Total and Inforaml Borrowing

Notes: Food includes expenditure on alcohol and tobacco, while non-food expenditure includes durables and non-durables expenditure items. Confidence intervals are cluster-bootstrapped at the neighbourhood level.

Turning to the home durable index (assets index), I construct an index of key households asset and durable goods which include furniture, sewing machines, refrigerator, electric appliances, computer, and other large electric appliances. In

[13]The 90 percent CIs are (-181, 229).

Table 5, column 4 we find a significant difference between treatment and control households in terms of ownership of these household goods. When we look at the composite index of the standardised outcomes (column 5), we find an average positive impact of 2 percent, but this is not significant.

IV. Conclusion

Act 773 and Act 774 of 2008 are two financial bills that were enacted to reform the financial system of Ghana. The former provides the legal framework for the provision of credit, whereas the latter is the main law governing the NBFIs and licensed money lenders in Ghana. Act 774 migrated semi-formal financial institutions and money lending companies to the formal banking regime. The reform provided the impetus allowing some informal borrowers access to credit from FSFIs for the first time, and thus improving credit delivery from these institutions. This study examines the impacts of the improvements in delivery of credit from FSFIs to households in Ghana. Specifically, I exploit plausibly variations in access to credit from FSFIs, due to the fact that before the reforms, households in Ghana could hardly borrow from formal financial institutions. To do so, pre-reform information on borrowing from formal financial institutions by households at the regional level was used to assign treatment and control regions, I then used DID model to examine the impact of the reform on households access to credit, and the effect on borrowing from various sources, self-employment activities and consumption before and after the reform.

Starting with credit, in contrast to previous surveys, overall demand for credit declined. In 2012-2013, only 10 percent of households borrowed in Ghana.[14] Although many factors may have contributed to the continuous decline in demand for credit in the country, however, this does not appear to be surprising because findings from Osei-Assibey (2010) suggests that voluntary self-exclusion from seeking external finance in Ghana is not only driven by microenterprise or owner's socioeconomic status, but also by their perceived difficulties in accessing external finance and negative cultural-religious biases toward borrowing.[15] Despite the decline in demand for loans, the results suggest improvement in the delivery of credit from FSFIs, as I document evidence of a decline in the share of households who have some informal borrowing, and an increase in the share of households with access to FSFIs loans.[16] My findings seem to suggest that households substitute expensive informal borrowing with cheaper MFIs borrowing.

[14]This is relative to take-up rate of 29 percent, 35 percent and 28 percent in 1991-1992, 1998-1999, and 2005-2006.

[15]Findings from GLSS6 also show that 58 percent of households who accessed formal bank loans provided some kind of collateral, while 61 percent of households who accessed loans from savings and loan companies provided some kind collateral. Thus, household ability to provide collateral for loan plays a key role in access to credit.

[16]Figure 1 shows that more than 50 percent of the loans contracted in 2012-2013 survey year came from formal banks, and savings and loan companies. This is supported by DID results presented in Table 5.

Moreover, I also document clear evidence of significant improvements in most of the key socioeconomic indicators considered in the treated regions. First, the financing reforms have been effective in improving household self-employment activities, including both farm and non-farm activities. Out of 14 outcomes considered for farm and non-farm activities, only four are not significant at the standard levels, most of them are significant at the 1 percent level with clear improvement in households welfare. The null of no impact was rejected for both total far and net farm revenues, household overall ownership (both old and new), number of businesses, business employees, total business revenues, and household business loan repayment at the 1 percent level, with the point estimates indicating increases. However, the null of no impact can only be rejected for net business revenues (profits) at the ten percent points with the point estimate indicating an increase. Thus, we find that the reform which led to improvement in credit from FSFIs to households was associated with more farm and non-farm business creation, even though I observed a decline in the fraction of households engaged in farm activities. Since an increase in the fraction of households having at least one business activity can be seen, this decline could indicate a shift from farm to non-farm business activities.

For those households who have access to credit from FSFIs, the reform succeeded in improving their welfare. Annual consumption, which is a good gauge for overall welfare, increased over time with households in the treated regions having a statistically significant 10 percent increase in total expenditure per capita, per annum, relative to the control group. Moreover, the reforms seem to have much more impact on non-food consumption than food consumption. In particular the results show that non-food expenditure (which has purchases of home durable goods accounting for a larger portion of its component) is significant at 1 percent level. This suggests that households in the treatment regions may have being more willing to finance their consumption of durable goods by borrowing from FSFIs.

In conclusion, one finding of this paper is worthy of note– while the reforms altered the borrowing patterns of households, it did not necessarily induce demand for credit. Therefore, it is important for policy makers to consider addressing financial issues (such as collateral, high interest rate, transaction cost and lack of financial education) that usually constrain households from accessing credit.

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