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**DOES MICROCREDIT REDUCE GENDER GAP
IN EMPLOYMENT? AN APPLICATION
OF DECOMPOSITION ANALYSIS TO EGYPT**

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Working Paper No. 1017

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Abstract

In this paper, we examine the impact of microcredit on labor supply of men and women and subsequently investigate whether microcredit can reduce employment gap between men and women in Egypt. Overall, we show no significant effects of microcredit on labor supply of men. Yet, we find a strong effect on employment of women aged 22 to 65. Borrowing from a microcredit source increases the probability of working for women by 0.071. Since the proportion of working of women was around 2.1%, it implies microcredit can increase the proportion of working of women by around 30 percent. Using decomposition analysis, we find that micro-credit can reduce the employment gap between men and women by 0.43 percentage points. If 20 percent of women obtain microcredit, the employment gap between men and women would be decreased by 4.3 percentage points.

JEL Classifications: J16; J22; H81.

Keywords: microcredit, gender inequality, employment, employment decomposition, Egypt.

ملخص

في هذه الورقة، نقوم بدراسة أثر القروض الصغيرة على عرض العمل من الرجال والنساء، وبالتالي تحقق في ما إذا كانت القروض الصغيرة قادرة على تقليص فجوة العمل بين الرجال والنساء في مصر. وعموماً، لا تظهر أي آثار كبيرة من القروض الصغيرة على المعروض من العمالة من الرجال. ومع ذلك، نجد تأثير قوي على توظيف النساء الذين تتراوح أعمارهم بين 22 إلى 65. الاقتراض من مصدر القروض الصغيرة يزيد من احتمال العمل للنساء بـ 0.071. وبما أن نسبة عمل المرأة نحو 2.1 في المئة، فهذا يعني أن القروض الصغيرة يمكن أن تزيد من نسبة عمل النساء بنسبة 30 في المئة. وباستخدام التحلل، نجد أن القروض الصغيرة يمكن أن تقلل من الفجوة بين بطالة الرجال والنساء بنسبة 0.43 نقطة مئوية. وعليه فإذا حصلت 20 في المئة من النساء على القروض الصغيرة، سوف تنخفض فجوة التوظيف بين الرجال والنساء بنسبة 4.3 نقطة مئوية.

1. Introduction

Gender equality is one of important Millennium Development Goals that countries throughout the world aim to achieve. Elimination of gender inequality is “of genuine interest in itself” (Costa et al., 2009). In addition, it seems that there is a positive relationship between gender equality and economic development. Empirical studies, among others Appiah and McMahon (2002), Klasen (2002), and Klasen and Lamanna (2003), show that gender inequality in education reduces economic growth. Gender inequality in education and health can impede human capital formation and thereby economic growth (Morrison, Raju and Sinha, 2007).

Although gender equality has received a great deal of attention from policymakers as well as researchers, there is still as a large gap between men and women in labor market, especially in Arab societies. According to the World Bank Development Indicators Database, the labor force participation rate (% of population aged 15-64) for male and female was 79% and 55% in 2014, respectively. However, the labor force participation rate for female population in Arab countries was only around 25% (World Bank, 2014). The large gender gap in labor market can result in high gender inequality in economic powers and decisions within communities and families.

An important question is how to increase women’s involvement in economic activities. Women, especially those in poor families, tend to have low education, and as a result find it difficult to get a wage job. Starting household business is challenging because of credit constraints. Commercial banks are not interested in poor clients because of information problems and lack of collateral (Hoff and Stiglitz, 1990; Kochar, 1997; Bell, Srinivasan, and Udry, 1997; Bose, 1998; Boucher, Carter, and Guirking, 2008). Women and poor people can be empowered through improved access to well-functioning and efficient financial services, allowing them to better integrate into the economic activity (Arouri et al., 2014). Governments and NGOs have stepped into the gap and have provided credit to the poor, often at highly subsidized interest rates. Through micro-credit, women might be more involved in economic activities, thereby increasing their economic power and self-confidence within households as well as communities. There is an increasingly number of microcredit programs which are targeted at women (e.g., Kabeer, 2005; Kato and Kratzer, 2013). However, several empirical studies find no effects of micro-credit on households’ outcomes as well as women’s empowerment (e.g., see Goetz and Gupta, 1996; Coleman, 1999; Rahman, 1999; Diagne and Zeller, 2001).

In this study, we will examine whether access to microcredit can help empower women and reduce gender inequality in Egypt using data from the Egypt Labor Market Panel Surveys in 2006 and 2012. More specifically, our study aims to answer the following research questions: (i) What is the access to micro-credit of men and women in Egypt? (ii) To what extent does microcredit increase employment and economic activities of women in Egypt? (iii) Does microcredit reduce the gender inequality in employment?

Egypt is a low middle income country and the largest country in the Arab world with a population of around 90 million. Egypt has been very successful in ensuring school and education for children and there is no difference in school ratio between boys and girls (UNICEF, 2011). However, gender inequality remains a serious problem in Egypt. In 2011, the UNDP's Gender Inequality Index rated Egypt 126th out of 148 countries, with an overall value of 0.59 (1.0 is the most improvement) (UNICEF, 2014). The proportion of employment is substantially higher for men than women. Labor force participation rate for people from 15 years old is 75% for males while it

is only and 22% for females (UNICEF, 2011)¹. Around 40% of women (15-49) still think that a husband can be justified in hitting his wife under certain circumstances (UNICEF, 2011).

To reduce poverty and empowering women, Egypt has implemented microcredit programs. Since 1991, the Social Fund for Development (SFD) has been established to provide microfinance for small enterprises and households (Wesselink, 2011; Taha, 2012). The microcredit is now mainly provided through NGOs, with 80% of the borrowers obtain microcredit from NGOs (Waly, 2010). A large number of micro-credit programs implemented by NGOs have been targeted at the poor women. A crucial question is whether these efforts have been successful in empowering women through improving their employment and economic activities.

Our study is expected to have several scientific and policy contributions. Although, gender inequality and microcredit are very important issues in Egypt, evidence on these issues is very limited. Only one exceptional study is Taha (2001) who analyses the impact of microcredit in Cairo. The author finds that microcredit is not able to enhance women's feelings of empowerment and independence. In this study, we will examine whether microcredit can enhance women's empowerment and reduce gender inequality in access to the labor market in Egypt. Unlike Taha (2001) who focuses on Cairo, we conduct the analysis for the whole country using nationally representative data. Thus, our study is the first attempt to assess the relation between microcredit and women's employment at the national level.

The second contribution of our study is that we not only estimate the effect of microcredit on women's employment outcomes but also examine whether microcredit can reduce the gender inequality in these outcomes. Using the decomposition analysis, we examine whether microcredit can benefit women and reduce the gap between women and men. If we find microcredit can reduce gender gap in outcomes, we can further understand that this reducing gap is due to the difference in accessing to microcredit or the difference in the return to credit between men and women. If the gender gap is reduced mainly by the access to microcredit, more training programs and other related supports should be provided for women so that they can improve the effectiveness of microcredit, that is, increasing return to microcredit. Meanwhile, if the gender gap is reduced mainly by the return to microcredit not by the access to microcredit, it is necessary to increase the program targeting so that microcredit can reach more women.

Finally, the availability of panel data from the Egypt Labor Market Panel Surveys in 2006 and 2012 allows us to use panel techniques to estimate the effects of microcredit. The main advantage of panel data is that it can reduce estimation bias due to omitted time-invariant variables. We also examine whether the effect of microcredit can vary across different value of individual characteristics such as urbanity and education. The findings are expected to be useful for policy recommendation for not only Egypt but also for a wider group of emerging and transition Arab countries.

This paper is structured into seven sections as follows. The second section briefly discusses some theoretical issues on the micro-credit and women empowerment. The third section introduces the data set we will use in our empirical investigation. The fourth section presents the descriptive statistics of micro-credit and employment in Egypt using the Egypt Labor Market Panel Surveys in 2006 and 2012. The fifth and sixth sections present the estimation method and empirical results

¹ Data from World Bank World Development Indicators also show similar estimates of labor force participation of male and female adults in Egypt.

of the impact of micro-credit on employment and gender gap in employment in Egypt. Finally, the seventh section presents conclusions and proposes some policy recommendations.

2. Theoretical Framework

Elimination of gender inequality is “of genuine interest in itself” (Costa, Elydia, and Fábio, 2009). From the economic aspect, there are a large number of empirical studies concluding that gender inequality in education as well as employment hampers economic growth (e.g., Appiah and McMahon, 2002; Klasen, 2002). To reduce gender inequality, economic opportunities and employment must be improved for women (Grown et al., 2005; Gradin et al., 2010). Economic equality for women not only improves their dependence and empowerment (Quimsumbing and Maluccio, 2000) but also prevent women from violence and HIV/AIDS (Panda, 2002; Grown et al., 2005).

A key question is how to empower women in developing countries where they tend to have lower education and less capital than men. Women are more likely to be credit constrained than men, especially in developing countries (Khandker, 1998). Lenders might assess the creditworthiness of borrowers by not only the collateral and their plan but also their demographic characteristics. Especially, when lenders do not have detailed information on borrowers to justify their ability to return loan, lenders will take into account information on demographic characteristics such as age and gender of the borrowers (Arrow, 1973). If lenders have a gender bias in favor of men, for instance for cultural factors, they will be more likely to lend men-owned firms than women-owned firms.

Governments and NGOs have stepped into the gap and have provided microcredit for the poor and women. The channel through which microcredit can help the poor is straightforward. Poor households are often facing capital constraints, and microcredit can relax this constraint. It can help increase production function of the poor households. With additional capita, households can increase their farm production or open non-farm activities. The direct effect of microcredit is to increase income of the poor borrowers. A large number of study show a positive impact of microcredit on income of the poor (e.g., Burgess and Pande, 2002; Binswanger and Khandker, 1995; Khandker, 2003; Khandker and Faruquee, 2003), and a number of cases presented in the review paper of Morduch and Haley (2002).

There are different channels through which microcredit is assumed to benefit particularly women as they constitute as significant part of the beneficiaries (Armendàriz and Murdoch, 2010). Firstly, increased income due to microcredit can help the whole household improve consumption and reduce poverty including women and girls in the households. Pitt and Khandker (1998) find that the microcredit has positive effects on education, for example, girls receive more schooling. Secondly, women can benefit from microcredit by getting more involved in economic activities. They can either spend more time in working with husbands or launch their own non-farm activities. Thirdly, by increasing economic power, women can enhance their confidence and self-esteem and avoid domestic violence. Several studies find a significant effect of microcredit on women’s empowerment in different dimensions such as economic security, family decision power, legal awareness and public participation (Schuler and Hashemi, 1994; Hashemi et al., 1996; Pitt et al. 2003, 2006; Kato and Kratzer, 2013).

However, empirical studies do not always show a positive effect of microcredit on women’s welfare and empowerment. Firstly, many studies indicate that credit programs are not always effective in improving welfare and reducing poverty. For example, Diagne and Zeller (2001) did not find a statistically significant impact of microcredit programs on household income in Malawi.

Similarly, Coleman (1999) found only negligible effects on household welfare of a microcredit program in Thailand, and Morduch (1998) showed that most of potential effects of microcredit from the Grameen bank in Bangladesh were on vulnerability reduction instead of poverty reduction. Secondly, microcredit might increase work burden for women (Vengroff and Creevey, 1994). In some cases, microcredit can, for instance for cultural factors, be controlled by men, and its effect on women's empowerment becomes very limited (Goetz and Gupta, 1996; Rahman, 1999).

Thus, the effect of microcredit on women and gender equality cannot be signed *a priori*. Whether microcredit improves women's empowerment and reduces gender inequality depends on different country contexts, and this requests more empirical studies to better understand the effect of microcredit in developing countries as well as Arab countries.

3. Data

The main data sets used in this study are from the Egypt Labor Market Panel Surveys (ELMPS). These surveys were conducted by the Economic Research Forum (ERF) in cooperation with Egypt's Central Agency for Public Mobilization and Statistics (CAPMAS) in 2006 and 2012. The 1998 ELMPS covered 4,816 households with 23,997 household members. The 2006 ELMPS followed these 4,816 households (who were visited in 1998) including households that split from these households, plus a new sample of 2,500 households. The final sample the 2006 ELMPS is 8,351 households containing 37,140 individuals. The final sample for the 2012 ELMPS include 12,060 households, consisting of 6,752 households from the 2006 sample, 3,308 new households that emerged from these households as a result of splits, and a refresher sample of 2,000 households. Of the 37,140 individuals interviewed in the 2006 ELMPS, 28,770 individual were re-interviewed in 2012 (Assaad and Krafft, 2013).

The ELMPSs contain detailed very rich data on households in Egypt. It contains data on not only labor information of individuals but also living conditions of their households and family members. Information include parental background, education, housing conditions, durable ownership, access to services, residential mobility, migration and remittances, time use, marriage patterns and costs, fertility, women's decision making and empowerment, employment, savings and borrowing, household enterprises, farms and non-farm activities, and income. It's very interesting that there are data on time that family members spend on different housework activities during the past 7 days. There is information on microcredit that households have obtained. However, there is no information on whether microcredit is controlled by men or women within a household.

4. Micro-Credit and Employment in Egypt

4.1 Proportion of household receiving micro-credit

The ELMPSs collect data from credit that households and individuals borrow from different sources. Loan sources include (i) Loans from Nasser Social Bank, (ii) Loans from Agriculture Credit Bank, (iii) Social development funds, (iv) Loans from other public sector banks, (v) Loans from private banks, (vi) NGO's/charitable organizations, (vii) Private Sector Companies, (viii) other sources. In this study, we define micro-credit as loan that households obtained from Nasser Social Bank, Social development funds, or NGO's/charitable organizations. Table 1 shows that the percentage of household receiving microcredit in Egypt was 1.5% in the 2006 ELMPS and 2.1% in the 2012 ELMPS. In 2012, Rural Upper is the region that had the highest proportion of households borrowing from microcredit source, while Alexandria & the Suez Canal Cities and Greater Cairo have the lowest rate of micro-credit recipients.

In the data set, there are no questions on whether microcredit is designed for women. Information on whether loans are controlled by men or women within a household is not available either. To examine how well microcredit reaches women, Figure 1 presents the percentage of men and women in households receiving microcredit. Although, the proportion of women get access to microcredit increased overtime, they were still less likely to get access to microcredit than men.

Microcredit tends to reach middle age and low education households. Households with young and high age head have a lower borrowing rate. Middle age people have higher experiences as well as labors. The lower rate of borrowing among young households might be because of shortage of experiences. Although high age people have experiences, they have low labor supply. In addition, expected return from business for old people is lower than young people. As result, they do not have high motivation to borrow and invest in economic activities.

Households with high education do not borrow from the microcredit source, since microcredit is targeted at the low income households. However very low education households also have a lower borrowing rate, since they might have low capacity of running household business.

4.2 Male and female employment

In this study, we will examine whether the receipt of microcredit can increase labor participation, especially for women. We estimate the impact of microcredit separately for young people aged from 15 to 22 and people aged from 23 to 65. The lower rate of labor force participation happens for young people, since many of them are still attending high school and university. Obtaining high education can reduce household income in the short-run but can increase household income in the long-run because of high opportunity cost but high return of education.

Table 3 presents employment variables of people from 15 to 23 years old in households with and households without microcredit. We measure employment during the past week and employment during the past three months. Findings from the employment status during the past week and the employment status during the past three months are quite similar. In the paper, we will interpret the results using the employment status of one week reference. The analysis using employment variables using the three month reference is presented in Tables A.1 and A.2 in Appendix.

The employment variables include the dummy indicating currently working, working time and wages of working people. Among working people, we break down by wage work, unpaid work and self-employed work. Unpaid work include self-employed work but without payment. Self-employed work includes employers. Work is disaggregated by sectors: farm, manufacture (including mining and construction and other industrial activities), trade, and services.

Women have a lower rate of labor force participation than men. In 2006, the proportion of working for males and females (aged from 15 to 22) was 35.5% and 10.3%, respectively. In 2012, the corresponding numbers were 33.2% and 4.4%. Among working people, females are more likely to have unpaid and self-employed work than males. They also tend to work in farm and service sectors. The working time and wages of women are also lower than those of men.

Table 4 shows a large gap in employment rate between men and women aged 23 to 65. The proportion of working for male and female was 87.2% and 26.8% in 2006, respectively. In 2012, the percentage of working among women was around 20.9%. The working time of working people is lower for women than men. However, there was almost no difference in hourly wage between men and women. The monthly wage of men was higher than that of women since men had more working time than women. Overtime, both men and women move from farm to non-farm sector,

especially service sector. People also tend to have more wage job than self-employed job over time.

More interestingly, it seems that men as well as women with microcredit have a higher rate of labor participation than those without microcredit. People with microcredit tend to have farm and self-employed work.

5. Estimation Methodology

In this study, the main research methods are descriptive statistics and econometrics. Firstly, we will use descriptive statistics to estimate the access to microcredit and gender differences in employment, economic activities and household works. Secondly, we will use regression and decomposition to measure the effect of microcredit on women's outcome and gender inequality in Egypt. Below, we present our proposed econometric model.

Using the individual-level data, we can use the well-known Oaxaca-Blinder decomposition technique to examine the factors associated with the gap in outcomes between women and men. We run separate regressions of outcomes on explanatory variables for males and females:

$$Y_m = \alpha_m + X_m \beta_m + C_m \gamma_m + \varepsilon_m, \quad (1)$$

$$Y_f = \alpha_f + X_f \beta_f + C_f \gamma_f + \varepsilon_f. \quad (2)$$

where Y denotes an outcome of interest such as employment, working and housework activities, C is the dummy variable indicating the borrowing from microcredit sources, X is a vector of control variables including time dummy. Subscripts 'm' and 'f' denote male and female, respectively. Since we estimate equations (1) and (2) using panel data 2006-2012, the X variables include time dummy for the year 2012.

Estimation of equations (1) and (2) can reveal whether microcredit can affect outcomes of women and men. The main problem in estimating these equations is the endogeneity of microcredit. Borrowing can be correlated with unobserved characteristics of households, such as motivation for higher income or abilities in business. Failure to control for such factors leads to biased estimates of program impact: if it is, for example, the better entrepreneurs who take a loan, and we do not directly include information on managerial capacity in our regression (because it is not available). A significant and positive coefficient for program participation is at least partly caused by these capacity differences and not by the program itself.

In this study, we use individual fixed-effects method which relies on the panel nature of the data to avoid endogeneity bias. A main assumption of the fixed-effects method is that unobserved variables that are correlated with both outcome and program variables remained unchanged during the period of consideration 2006-2012, which is covered by the panel. The time-invariant unobserved variables are eliminated in the fixed-effects regression estimation.² After control for observed variables and time-invariant unobserved variables, we expect that the endogeneity bias would be relatively small. One should notice that there is still an endogeneity bias if the unobserved variables affect not only the level of the outcome but also its growth rate. Thus the estimated causal effect of the microcredit should be interpreted with caution.

Next, to investigate whether microcredit can reduce gender inequality in the outcomes, we will use the Oaxaca-Blinder decomposition technique, which is widely used to decompose gaps in the dependent variable between two groups into a gap due to differences in explanatory variables and

² Detailed presentation of the fixed-effects regression can be found in many econometric textbook such as Wooldridge (2010).

a gap due to differences in coefficients of the explanatory variables. The estimator of the gap in an outcome of interest between men and women is presented as follows:

$$\begin{aligned}
\Delta \hat{E}[Y] &= \hat{E}[Y_m] - \hat{E}[Y_f] \\
&= (\hat{\alpha}_m + \bar{X}_m \hat{\beta}_m + \bar{C}_m \hat{\gamma}_m) - (\hat{\alpha}_f + \bar{X}_f \hat{\beta}_f + \bar{C}_f \hat{\gamma}_f) \\
&= (\bar{X}_m - \bar{X}_f) \left(\frac{\hat{\beta}_m + \hat{\beta}_f}{2} \right) + (\hat{\beta}_m - \hat{\beta}_f) \left(\frac{\bar{X}_m + \bar{X}_f}{2} \right) \\
&\quad + (\bar{C}_m - \bar{C}_f) \left(\frac{\hat{\gamma}_m + \hat{\gamma}_f}{2} \right) + (\bar{\gamma}_m - \bar{\gamma}_f) \left(\frac{\bar{C}_m + \bar{C}_f}{2} \right) + (\hat{\alpha}_m - \hat{\alpha}_f),
\end{aligned} \tag{3}$$

whether $\hat{\alpha}$, $\hat{\beta}$ and $\hat{\gamma}$ are estimators of parameters in regression (1) and (2). \bar{X}_m and \bar{X}_f are the average of explanatory variables of male and female, respectively. \bar{C}_m and \bar{C}_f are the average proportion of accessing to microcredit of male and female, respectively.

The first term in the left-hand side of equation (3) is the gender gap in the outcome resulting from the difference in the X characteristics. The second term can be explained as the gender difference in the outcome resulting from the different in returns to the characteristics. The third term is the gender gap in the outcome due to the difference in the access to microcredit between men and women. The fourth term can be explained as the gender difference in the outcome resulting from the different in returns to microcredit. Finally, the fifth term is the difference that is still unexplained by the current models.

6. Empirical Results

This section presents the regressions of employment on access to micro-credit and other control variables. Main determinants of employment are education, working years, age and gender (Mincer and Polachek, 1974). Like an earning function, employment of individuals can depend on their household characteristics (Glewwe, 1991). Thus we include household-level explanatory variables such as household size, proportion of children and elderly in the households, and demography of household head. Labor supply depends on the price of labor. Thus, we include the governorate-level wage. We also include mean wealth index of governorate to control for macroeconomic factors.³ The list and summary statistics of explanatory variables are presented in Table A.3 in Appendix. It should be noted that time-invariant variables such as geographic variables are dropped in the fixed-effect regressions (all time-invariant variables are controlled). We tend to use a small set of explanatory variables which are exogenous to microcredit. According to Angrist and Pischke (2008) and Heckman et al. (1999), control variables should be exogenous to the treatment variable (microcredit in this study).

In each table, we first report findings for the estimation of the impact of microcredit on employment for all people, and then estimate the impact of microcredit on the number of working hours and wages for only working people (that is conditional on having work). Finally, we estimate

³ The 2006 ELMS do not contain full data on income or consumption. To measure welfare of households, we use a wealth index which is weighted average of households' assets with weights computed using a principal components approach, following Filmer and Pritchett (2001). According to this approach, an index is constructed based as principal component of a vector of assets of households, including housing quality variables such as the number of rooms, the materials of the roof, walls, and floors, piped water, telephone, electrical and sewerage systems, and ownership of 23 durable consumer goods. This wealth indexed is standardized so that it has zero mean and standard deviation of one. Higher values of the wealth index mean more assets and better-off living condition.

the impact of microcredit on the probability of having different types of works: wage work, unpaid work, and self-employed works, and the work by sectors: farm, manufacture, trade and services.

Tables 5 and 6 present regressions of employment outcomes of men and women from 15 to 22 years old (this age defined in 2006), respectively. Table 5 shows that there are no significant effects of microcredit on labor supply of men aged 15 to 22. However, there is a negative of microcredit on monthly wages. Possibly, having microcredit people spend less time on wage jobs and more time on self-employed activities. The coefficient of microcredit on self-employed is positive but not significant. There are not significant impacts of microcredit on female aged from 15 to 22 (Table 6).

For men aged 23 to 65, there are no significant effects of microcredit on labor supply (Table 7). However, microcredit tends to move men from wage work to self-employed work. Men in households with microcredit are less likely to participate in labor market than those in households without microcredit. Instead, they tend to have self-employed activities.

Interestingly, we find a strong effect on employment of women aged 22 to 65 (Table 8). Borrowing from a microcredit source increases the probability of working for women by 0.071. Since the proportion of working of women was around 2.1% (Table 4), it implies microcredit can increase the proportion of working of women by around 30 percent. For people who are currently working, there are no effects of microcredit on working time and wages. We examine the impact of types of work and find that the main effect of microcredit is to increase unpaid and self-employed works for women. It increases works in all sectors, but the largest effect for work in trade works. It means that women can open small shops or household business using microcredit.

Table 9 presents the decomposition of the employment gap between males and females aged 23 to 65. The dependent variable is the dummy of current working. The last two columns present the contribution of the difference in explanatory variables and the contribution of the difference in the effect of these explanatory between males and females on the male-female gap in the dependent variable. The difference in access to micro-credit contributes negligibly to the employment gap, since men and women have a very similar rate of access to micro-credit. The return to micro-credit reduces the employment gap by 0.4287 percentage points. This effect is small since only around 2% of women getting access to micro-credit. If 20% of women obtain microcredit, the employment gap between men and women would be decreased by 4.287 percentage points.

Table 9 also shows some interesting findings about the employment gap between men and women in Egypt. The difference in the explanatory variables only contributes to the employment gap between men and women by 3.85 percentage points, while the difference in the returns to these variables reduces the employment gap by -284.36 percentage points. It means that women can have high employment if they are more active in labor participation. The unexplained factors contribute largely to the employment gap: 380.51 percentage points. It means that discrimination and social factors can play an important role in hampering women labor supply.

We tried interactions between microcredit and several variables including urban/rural, age, number of schooling years, married, and household size in the regression of women's working status to test a heterogeneous impact of micro-credit (Table A.4 in Appendix). The urban/rural variable may reflect differences in culture and production behaviors between households. However, all the interactions are not significant. This finding suggests that there is no heterogeneous impact of micro-credit on employment of women.

7. Conclusions

In this study, we examine the impact of microcredit on labor supply of men and women and subsequently investigate whether microcredit can reduce employment gap between men and women in Egypt. The rate of labor force participation is substantially higher for men than women in Egypt. Around 2% of people had access to microcredit in Egypt, and the rural people and low-education people are more likely to receive microcredit than urban and high education people.

Overall, there are no significant effects of microcredit on labor supply of men aged 15 to 22 as well as men aged 23 to 65. However, microcredit tends to move men from wage work to self-employed work. Men in households with microcredit are less likely to participate in labor market than those in households without microcredit. Instead, they tend to have self-employed activities. Interestingly, we find a strong effect on employment of women aged 22 to 65. Borrowing from a microcredit source increases the probability of working for women by 0.071. Since the proportion of working of women was around 2.1%, it implies microcredit can increase the proportion of working of women by around 30 percent. For people who are currently working, there are no effects of microcredit on working time and wages.

We examine the impact of types of work and find that the main effect of microcredit is to increase unpaid and self-employed works for women. It increases works in all sectors, but the largest effect for work in trade works. It means that women can open small shops or household business using microcredit. The return to microcredit reduces the employment gap by 0.4287 percentage points. This effect is small since only around 2% of women getting access to micro-credit. If 20% of women obtain microcredit, the employment gap between men and women would be decreased by 4.287 percentage points.

The finding means the important role of microcredit in increasing the labor participation of women in Egypt. It helps reduce the employment gap between men and women and empower women. Thus, increasing the coverage of microcredit is very important and should be promoted. In addition, vocational training is also important. It can help women manage and increase the effectiveness of microcredit in poverty reduction.

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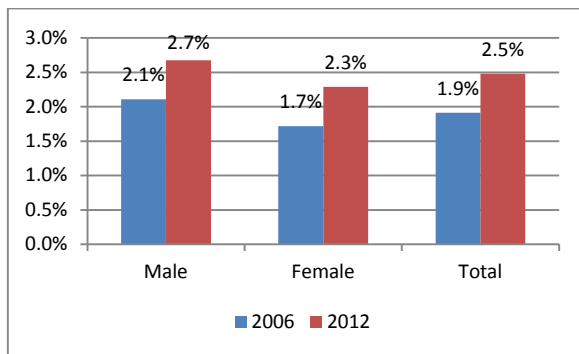
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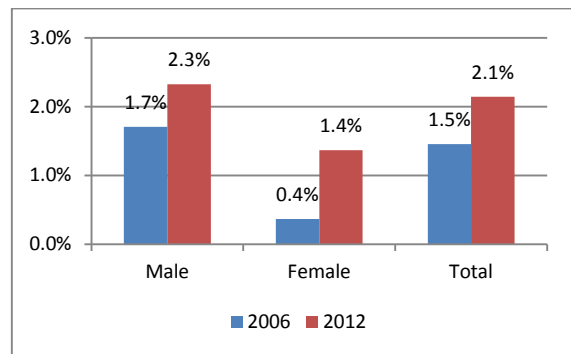
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Figure 1: Percentage of Households and People Receiving Microcredit

% households receiving microcredit by gender of household head



% people aged 15-65 living in a households receiving microcredit



Source: authors' estimation from the 2006 and 2012 ELMPSs

Table 1: Percentage of Households Receiving Micro-Credit by Region in Egypt

Region	2006	2012
Greater Cairo	0.67	1.20
Aix, Sz. Canal Cities	0.48	0.90
Urban Lower	0.48	2.48
Urban Upper	0.67	3.05
Rural Lower	2.19	1.97
Rural Upper	2.41	3.28
Total	1.45	2.14

Source: authors' estimation from the 2006 and 2012 ELMPSs

Table 2: Percentage of Households Receiving Microcredit by Region in Egypt

Characteristics of household head	2006	2012
Age of household head		
16-30	0.42	1.38
31-40	1.44	1.98
41-50	2.31	2.81
51-60	1.55	3.01
61+	0.97	1.47
Education of household head		
Illiterate	1.31	2.12
Reads & Writes	2.49	2.95
Less than Intermediate	1.63	2.40
Intermediate	1.81	2.64
Above Intermediate	1.45	1.66
University & Higher	0.36	0.89
Total	1.45	2.14

Source: authors' estimation from the 2006 and 2012 ELMPSs

Table 3: Employment of People Aged 15-22 (One Week Reference)

Employment variables	Male			Female		
	Not receive micro-credit	Receive micro-credit	Total	Not receive micro-credit	Receive micro-credit	Total
The 2006 ELMPS						
Having worked (yes=1, no=0)	35.2%	47.0%	35.5%	10.1%	18.5%	10.3%
Number of working hours per week (among working people)	49.8	42.5	49.5	39.6	26.5	39.1
Real hourly wage (all jobs)	3.4	3.0	3.4	2.3	1.7	2.3
Real monthly wage (all jobs)	720.4	614.9	717.1	478.8	402.6	478.2
<i>Employment structure by economic activities</i>						
Wage work (yes=1, no=0)	63.6%	43.7%	62.9%	50.3%	11.4%	48.9%
Unpaid work (yes=1, no=0)	29.9%	47.5%	30.5%	43.0%	72.5%	44.1%
Self-employed work (yes=1, no=0)	6.6%	8.8%	6.6%	6.7%	16.1%	7.1%
<i>Employment structure by economic sector</i>						
Farm work	33.7%	50.2%	34.3%	43.6%	83.8%	45.1%
Industrial work	32.4%	13.1%	31.8%	19.3%	10.8%	18.9%
Trade work	17.4%	22.0%	17.5%	14.9%	0.0%	14.3%
Service work	16.5%	14.7%	16.4%	22.3%	5.4%	21.7%
The 2012 ELMPS						
Having worked (yes=1, no=0)	33.1%	37.9%	33.2%	4.4%	5.0%	4.4%
Number of working hours per week (among working people)	46.7	49.7	46.8	40.4	48.3	40.6
Real hourly wage (all jobs)	3.9	3.8	3.9	3.5	1.8	3.5
Real monthly wage (all jobs)	753.6	688.5	751.2	602.3	379.4	592.0
<i>Employment structure by economic activities</i>						
Wage work (yes=1, no=0)	71.3%	78.3%	71.5%	52.6%	97.6%	53.8%
Unpaid work (yes=1, no=0)	22.5%	15.6%	22.2%	39.7%	2.5%	38.8%
Self-employed work (yes=1, no=0)	6.3%	6.1%	6.2%	7.7%	0.0%	7.5%
<i>Employment structure by economic sector</i>						
Farm work	29.5%	14.4%	29.0%	38.7%	2.5%	37.8%
Industrial work	37.3%	48.6%	37.7%	17.5%	31.1%	17.8%
Trade work	16.1%	14.5%	16.1%	18.9%	0.0%	18.4%
Service work	17.0%	22.4%	17.2%	24.9%	66.5%	26.0%

Note: The 2006 wage is measured in 2012 L.E. using CPI.

Source: authors' estimation from the 2006 and 2012 ELMPSs.

Table 4: Employment of People Aged 23-65 (One Week Reference)

Employment variables	Male			Female		
	Not receive micro-credit	Receive micro-credit	Total	Not receive micro-credit	Receive micro-credit	Total
The 2006 ELMPS						
Having worked (yes=1, no=0)	87.2%	88.7%	87.2%	26.6%	39.5%	26.8%
Number of working hours per week (among working people)	51.2	49.2	51.2	38.9	32.7	38.7
Real hourly wage (all jobs)	6.8	15.1	6.9	7.3	4.8	7.3
Real monthly wage (all jobs)	1404.4	3441.7	1428.9	1280.6	839.1	1276.8
<i>Employment structure by economic activities</i>						
Wage work (yes=1, no=0)	67.7%	38.8%	67.1%	55.9%	17.2%	54.9%
Unpaid work (yes=1, no=0)	4.3%	12.9%	4.4%	26.0%	61.9%	26.8%
Self-employed work (yes=1, no=0)	28.1%	48.3%	28.5%	18.2%	20.9%	18.3%
<i>Employment structure by economic sector</i>						
Farm work	20.8%	47.4%	21.3%	32.6%	69.1%	33.5%
Industrial work	25.6%	13.0%	25.3%	7.7%	4.0%	7.7%
Trade work	14.8%	9.2%	14.7%	12.6%	11.2%	12.6%
Service work	38.8%	30.4%	38.7%	47.0%	15.8%	46.3%
The 2012 ELMPS						
Having worked (yes=1, no=0)	87.3%	85.0%	87.3%	20.8%	24.2%	20.9%
Number of working hours per week (among working people)	49.5	50.7	49.6	37.6	37.6	37.6
Real hourly wage (all jobs)	6.7	5.6	6.7	6.5	6.0	6.5
Real monthly wage (all jobs)	1247.2	1032.2	1241.6	1002.4	1014.6	1002.7
<i>Employment structure by economic activities</i>						
Wage work (yes=1, no=0)	73.9%	76.9%	73.9%	69.5%	57.1%	69.2%
Unpaid work (yes=1, no=0)	2.4%	2.9%	2.4%	17.1%	18.3%	17.2%
Self-employed work (yes=1, no=0)	23.7%	20.2%	23.6%	13.4%	24.6%	13.7%
<i>Employment structure by economic sector</i>						
Farm work	17.3%	14.5%	17.2%	18.9%	21.6%	19.0%
Industrial work	30.1%	24.2%	30.0%	7.4%	13.5%	7.5%
Trade work	14.7%	12.0%	14.6%	12.7%	22.1%	13.0%
Service work	37.9%	49.3%	38.2%	61.0%	42.8%	60.5%

Note: The 2006 wage is measured in 2012 L.E. using CPI.

Source: authors' estimation from the 2006 and 2012 ELMPSs.

Table 5: Individual Fixed-Effects of Employment Of Male Aged 15-22

Explanatory variables	Working	Number of working hours	Log of monthly wage	Have wage work	Have unpaid work	Have self-employed work	Have farm work	Have manufac. work	Have trade work	Have service work
Receive microcredit	-0.0155 (0.0685)	-4.3304 (4.3754)	-0.3719** (0.1604)	-0.0411 (0.0724)	0.0126 (0.0407)	0.0129 (0.0250)	0.0041 (0.0605)	0.0080 (0.0701)	-0.0164 (0.0297)	-0.0113 (0.0377)
Number of schooling years	0.0149** (0.0074)	0.9625 (1.4837)	0.0303 (0.0377)	0.0016 (0.0073)	0.0151*** (0.0039)	-0.0019 (0.0032)	0.0057 (0.0041)	-0.0033 (0.0066)	0.0049 (0.0037)	0.0076 (0.0059)
Married (yes=1, no=0)	0.0254 (0.0437)	1.6790 (2.6445)	0.1213 (0.1059)	0.0357 (0.0466)	-0.0191 (0.0351)	0.0089 (0.0267)	-0.0134 (0.0342)	0.0037 (0.0459)	-0.0185 (0.0332)	0.0535 (0.0392)
Household size	0.0041 (0.0073)	0.5684 (0.5352)	0.0479*** (0.0185)	0.0040 (0.0070)	0.0078 (0.0067)	-0.0077** (0.0039)	0.0006 (0.0077)	-0.0046 (0.0059)	0.0080* (0.0043)	0.0001 (0.0051)
Proportion of children below 15 in household	-0.1365 (0.0846)	-7.0559 (5.4449)	-0.4524* (0.2519)	-0.1078 (0.0868)	-0.1248** (0.0557)	0.0961** (0.0454)	-0.0919 (0.0592)	-0.0449 (0.0699)	-0.0601 (0.0529)	0.0604 (0.0647)
Proportion of elderly above 60 in household	0.1592 (0.1153)	-0.9140 (9.8089)	0.3596 (0.4477)	0.1690 (0.1129)	0.0546 (0.0722)	-0.0644 (0.0501)	-0.0656 (0.0759)	-0.0019 (0.1040)	0.1218 (0.0765)	0.1050 (0.0841)
Proportion of female members	-0.0378 (0.1116)	-2.7112 (6.8016)	-0.3552 (0.2676)	-0.1067 (0.1103)	0.0023 (0.0663)	0.0667 (0.0512)	0.0314 (0.0746)	-0.1455 (0.0935)	-0.0143 (0.0705)	0.0906 (0.0904)
Head is male (male=1, female=0)	-0.0708 (0.0451)	2.0641 (3.5315)	0.0423 (0.0977)	-0.1224*** (0.0473)	0.0362 (0.0320)	0.0154 (0.0243)	-0.0120 (0.0414)	-0.0566 (0.0383)	0.0196 (0.0251)	-0.0218 (0.0367)
Age of head	-0.0037** (0.0016)	0.0115 (0.1127)	-0.0091** (0.0039)	-0.0016 (0.0016)	-0.0007 (0.0012)	-0.0013 (0.0009)	-0.0006 (0.0014)	0.0004 (0.0015)	-0.0025** (0.0011)	-0.0009 (0.0013)
Number of schooling years of head	0.0085* (0.0047)	-0.0262 (0.3042)	0.0046 (0.0099)	0.0175*** (0.0045)	-0.0029 (0.0033)	-0.0061** (0.0027)	-0.0008 (0.0038)	0.0081* (0.0044)	0.0043 (0.0033)	-0.0031 (0.0039)
Log of governorate mean wage	-0.0409 (0.0532)	-6.7442* (3.6028)	0.2876 (0.1837)	-0.1356** (0.0542)	0.0442 (0.0417)	0.0505** (0.0254)	0.0141 (0.0425)	0.0536 (0.0464)	-0.0367 (0.0359)	-0.0719* (0.0412)
Governorate mean wealth index	0.0918 (0.1132)	10.4566 (8.0141)	0.6699* (0.3537)	0.0703 (0.1188)	0.0081 (0.0648)	0.0134 (0.0553)	-0.0452 (0.0725)	0.0365 (0.0926)	-0.0057 (0.0887)	0.1062 (0.0918)
Year 2012	0.3208*** (0.0274)	0.0299 (1.5917)	0.2433*** (0.0706)	0.3080*** (0.0271)	-0.0489*** (0.0169)	0.0617*** (0.0127)	0.0151 (0.0193)	0.1490*** (0.0222)	0.0562*** (0.0170)	0.1005*** (0.0198)
Constant	0.7138* (0.3972)	85.7201*** (27.5385)	4.4381*** (1.3509)	1.2908*** (0.4014)	-0.3491 (0.2966)	-0.2278 (0.1900)	0.0198 (0.3039)	-0.1566 (0.3550)	0.3244 (0.2696)	0.5263* (0.3140)
Observations	5238	2858	2162	5238	5238	5238	5238	5238	5238	5238
Number of individuals	2628	2055	1712	2628	2628	2628	2628	2628	2628	2628
R-squared	0.32	0.02	0.17	0.30	0.03	0.05	0.01	0.11	0.04	0.10

Notes: Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: authors' estimation from the 2006 and 2012 ELMPSs.

Table 6: Individual Fixed-Effects of Employment of Female Aged 15-22

Explanatory variables	Working	Number of working hours	Log of monthly wage	Have wage work	Have unpaid work	Have self-employed work	Have farm work	Have manufac. work	Have trade work	Have service work
Receive microcredit	0.0424 (0.0524)	6.4894 (5.4902)	0.0197 (0.1962)	0.0520 (0.0453)	-0.0080 (0.0299)	-0.0016 (0.0301)	-0.0355 (0.0286)	0.0067 (0.0389)	0.0183 (0.0173)	0.0530 (0.0435)
Number of schooling years	0.0268*** (0.0055)	4.9443** (2.4950)	0.1732 (0.1250)	0.0228*** (0.0047)	0.0042* (0.0024)	-0.0002 (0.0008)	0.0040* (0.0022)	-0.0002 (0.0020)	0.0020 (0.0013)	0.0209*** (0.0041)
Married (yes=1, no=0)	-0.0718* (0.0423)	-8.4415 (5.1390)	-0.1300 (0.5350)	-0.0926*** (0.0345)	0.0410** (0.0208)	-0.0202 (0.0127)	0.0033 (0.0367)	-0.0331** (0.0133)	-0.0405** (0.0164)	-0.0015 (0.0176)
Household size	0.0090* (0.0051)	-2.0509** (0.9088)	-0.0063 (0.0864)	0.0046 (0.0040)	0.0048 (0.0033)	-0.0004 (0.0015)	0.0029 (0.0043)	0.0010 (0.0015)	0.0005 (0.0015)	0.0045 (0.0028)
Proportion of children below 15 in household	-0.0624 (0.0579)	5.5777 (9.9893)	-0.4730 (0.7332)	-0.0578 (0.0448)	-0.0063 (0.0372)	0.0018 (0.0130)	-0.0264 (0.0350)	-0.0383* (0.0208)	0.0119 (0.0217)	-0.0096 (0.0386)
Proportion of elderly above 60 in household	0.1199 (0.1282)	-46.2095 (32.3495)	-1.3132 (1.5712)	0.1425 (0.1140)	-0.0581 (0.0560)	0.0356 (0.0310)	-0.0353 (0.0567)	0.0050 (0.0721)	0.0111 (0.0370)	0.1391 (0.0867)
Proportion of female members	-0.1101 (0.0680)	2.9274 (10.5759)	-0.8165 (0.9048)	-0.0782 (0.0565)	-0.0113 (0.0405)	-0.0206 (0.0198)	-0.0180 (0.0401)	0.0069 (0.0287)	-0.0198 (0.0249)	-0.0792* (0.0475)
Head is male (male=1, female=0)	-0.0926*** (0.0326)	-11.4743** (5.4759)	-0.5022 (0.4784)	-0.0971*** (0.0267)	0.0102 (0.0174)	-0.0057 (0.0093)	0.0049 (0.0181)	-0.0287** (0.0124)	-0.0086 (0.0105)	-0.0603*** (0.0231)
Age of head	-0.0014 (0.0014)	0.4980* (0.2690)	-0.0116 (0.0272)	-0.0024** (0.0012)	0.0016** (0.0006)	-0.0006 (0.0005)	-0.0000 (0.0010)	-0.0005 (0.0006)	-0.0001 (0.0005)	-0.0007 (0.0008)
Number of schooling years of head	0.0010 (0.0033)	1.2446** (0.5086)	-0.0236 (0.0310)	0.0012 (0.0029)	0.0000 (0.0018)	-0.0003 (0.0005)	-0.0021 (0.0015)	0.0008 (0.0013)	0.0023 (0.0014)	-0.0001 (0.0023)
Log of governorate mean wage	0.1747*** (0.0504)	6.4589 (8.5148)	-0.4837 (0.4683)	0.0125 (0.0340)	0.1655*** (0.0353)	-0.0033 (0.0090)	0.1697*** (0.0380)	-0.0298* (0.0168)	-0.0111 (0.0127)	0.0459* (0.0273)
Governorate mean wealth index	-0.0757 (0.0849)	19.3855 (16.1469)	1.1348 (1.0505)	0.0072 (0.0735)	-0.0855** (0.0381)	0.0026 (0.0133)	-0.0873* (0.0461)	0.0135 (0.0489)	0.0340 (0.0229)	-0.0359 (0.0474)
Year 2012	0.0731*** (0.0197)	-2.0654 (2.2281)	0.5763*** (0.1953)	0.0704*** (0.0155)	-0.0027 (0.0117)	0.0054 (0.0053)	0.0006 (0.0129)	0.0056 (0.0086)	0.0100 (0.0071)	0.0569*** (0.0120)
Constant	-1.1911*** (0.3617)	-63.6068 (65.9027)	8.7479** (3.4131)	0.0061 (0.2339)	-1.2836*** (0.2626)	0.0864 (0.0640)	-1.1821*** (0.2680)	0.2828** (0.1348)	0.0933 (0.0882)	-0.3851** (0.1884)
Observations	5228	678	452	5228	5228	5228	5228	5228	5228	5228
Number of individuals	2623	605	405	2623	2623	2623	2623	2623	2623	2623
R-squared	0.05	0.37	0.46	0.08	0.04	0.01	0.04	0.01	0.01	0.09

Notes: Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: authors' estimation from the 2006 and 2012 ELMPSs.

Table 7: Individual Fixed-Effects of Employment of Male Aged 23-65

Explanatory variables	Working	Number of working hours	Log of monthly wage	Have wage work	Have unpaid work	Have self-employed work	Have farm work	Have manufac. work	Have trade work	Have service work
Receive microcredit	-0.0403 (0.0305)	0.7585 (1.9263)	-0.0347 (0.1007)	-0.1035*** (0.0343)	0.0370* (0.0202)	0.0262 (0.0246)	-0.0234 (0.0271)	-0.0069 (0.0232)	-0.0206 (0.0183)	0.0106 (0.0389)
Number of schooling years	0.0011 (0.0045)	0.0247 (0.3687)	-0.0384* (0.0220)	0.0077 (0.0075)	-0.0039 (0.0042)	-0.0028 (0.0059)	-0.0058 (0.0048)	0.0018 (0.0055)	-0.0023 (0.0035)	0.0074 (0.0055)
Married (yes=1, no=0)	0.1474*** (0.0257)	0.1534 (1.3629)	0.0622 (0.0718)	0.1989*** (0.0313)	-0.0393*** (0.0152)	-0.0123 (0.0241)	-0.0194 (0.0208)	0.0497* (0.0254)	0.0359** (0.0179)	0.0811*** (0.0280)
Household size	0.0015 (0.0027)	-0.3115 (0.2143)	-0.0026 (0.0108)	-0.0082** (0.0040)	0.0123*** (0.0030)	-0.0026 (0.0036)	0.0054* (0.0031)	-0.0016 (0.0028)	-0.0006 (0.0029)	-0.0017 (0.0033)
Proportion of children below 15 in household	-0.0463 (0.0286)	2.6132 (1.8160)	0.1599 (0.1257)	-0.0375 (0.0392)	-0.0440** (0.0204)	0.0352 (0.0359)	-0.0288 (0.0302)	-0.0190 (0.0353)	-0.0205 (0.0260)	0.0220 (0.0350)
Proportion of elderly above 60 in household	-0.3710*** (0.0518)	-2.5741 (3.3750)	-0.2494 (0.2710)	-0.4030*** (0.0531)	0.0340* (0.0182)	-0.0020 (0.0386)	0.0050 (0.0338)	-0.0965*** (0.0306)	-0.0175 (0.0243)	-0.2620*** (0.0535)
Proportion of female members	-0.0172 (0.0521)	4.9846 (3.2352)	0.1700 (0.1733)	-0.1096* (0.0662)	0.0129 (0.0303)	0.0795 (0.0505)	0.0106 (0.0411)	-0.0392 (0.0512)	-0.0053 (0.0373)	0.0166 (0.0548)
Head is male (male=1, female=0)	0.0053 (0.0314)	2.3717 (1.6406)	-0.1965** (0.0784)	-0.0096 (0.0410)	0.0542** (0.0276)	-0.0393 (0.0367)	-0.0240 (0.0260)	-0.0043 (0.0349)	0.0448* (0.0270)	-0.0112 (0.0303)
Age of head	0.0002 (0.0009)	-0.0538 (0.0523)	-0.0003 (0.0036)	0.0019 (0.0012)	0.0005 (0.0008)	-0.0022** (0.0011)	-0.0012 (0.0010)	0.0007 (0.0010)	0.0005 (0.0008)	0.0002 (0.0011)
Number of schooling years of head	0.0049* (0.0027)	-0.3294** (0.1572)	0.0097 (0.0086)	0.0070* (0.0039)	-0.0024 (0.0026)	0.0003 (0.0031)	-0.0025 (0.0023)	0.0072** (0.0034)	-0.0005 (0.0024)	0.0007 (0.0038)
Log of governorate mean wage	-0.0369 (0.0249)	2.5599* (1.3744)	0.1556* (0.0918)	-0.0793** (0.0339)	-0.0001 (0.0148)	0.0424 (0.0285)	0.0195 (0.0251)	-0.0538** (0.0254)	0.0101 (0.0205)	-0.0127 (0.0264)
Governorate mean wealth index	0.0517 (0.0494)	0.4434 (2.7747)	0.2297 (0.1550)	-0.0255 (0.0675)	0.0052 (0.0275)	0.0721 (0.0566)	-0.0033 (0.0474)	0.1263*** (0.0474)	-0.0110 (0.0395)	-0.0603 (0.0536)
Year 2012	-0.0613*** (0.0091)	-2.2866*** (0.4763)	0.0788*** (0.0298)	-0.0390*** (0.0121)	-0.0173*** (0.0049)	-0.0050 (0.0106)	-0.0270*** (0.0081)	-0.0284*** (0.0096)	-0.0042 (0.0072)	-0.0017 (0.0106)
Constant	1.0136*** (0.1994)	34.4580*** (10.7031)	6.0289*** (0.7172)	0.9330*** (0.2692)	-0.0207 (0.1124)	0.1013 (0.2198)	0.2099 (0.1953)	0.5044** (0.2008)	-0.0145 (0.1578)	0.3138 (0.2126)
Observations	12909	11157	7757	12909	12909	12909	12909	12909	12909	12909
Number of individuals	6466	6128	4753	6466	6466	6466	6466	6466	6466	6466
R-squared	0.08	0.03	0.03	0.05	0.08	0.01	0.02	0.01	0.01	0.03

Notes: Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: authors' estimation from the 2006 and 2012 ELMPSs.

Table 8: Individual Fixed-Effects of Employment of Female Aged 23-65

Explanatory variables	Working	Number of working hours	Log of monthly wage	Have wage work	Have unpaid work	Have self-employed work	Have farm work	Have manufac. work	Have trade work	Have service work
Receive microcredit	0.0708** (0.0343)	-0.0875 (3.1471)	-0.2850 (0.2563)	-0.0033 (0.0151)	0.0318 (0.0286)	0.0424** (0.0182)	0.0215 (0.0307)	0.0113 (0.0077)	0.0311* (0.0163)	0.0069 (0.0109)
Number of schooling years	0.0071 (0.0058)	-0.3857 (0.4554)	0.0448 (0.0293)	0.0056 (0.0048)	0.0013 (0.0028)	0.0002 (0.0020)	0.0018 (0.0030)	-0.0016 (0.0023)	0.0004 (0.0023)	0.0066* (0.0039)
Married (yes=1, no=0)	-0.0163 (0.0285)	2.8293 (3.0472)	-0.0202 (0.1466)	-0.0480** (0.0193)	0.0187 (0.0173)	0.0130 (0.0167)	0.0168 (0.0203)	-0.0162** (0.0077)	0.0012 (0.0130)	-0.0182 (0.0171)
Household size	-0.0005 (0.0038)	-0.6603 (0.7382)	-0.0526 (0.0399)	-0.0060** (0.0025)	0.0047 (0.0037)	0.0007 (0.0016)	-0.0004 (0.0034)	0.0004 (0.0006)	0.0018 (0.0011)	-0.0023* (0.0014)
Proportion of children below 15 in household	0.0169 (0.0370)	4.5489 (4.3464)	0.1673 (0.1898)	0.0052 (0.0227)	-0.0287 (0.0239)	0.0403* (0.0231)	0.0146 (0.0282)	-0.0003 (0.0127)	-0.0189 (0.0178)	0.0215 (0.0202)
Proportion of elderly above 60 in household	-0.0228 (0.0336)	-4.0389 (4.1125)	-0.7921*** (0.2801)	-0.1071*** (0.0220)	0.0626*** (0.0231)	0.0217 (0.0149)	0.0600** (0.0250)	0.0020 (0.0074)	0.0131 (0.0123)	-0.0979*** (0.0202)
Proportion of female members	0.0585 (0.0467)	4.9636 (5.1943)	-0.1416 (0.2621)	0.0360 (0.0310)	-0.0063 (0.0284)	0.0288 (0.0292)	0.0341 (0.0341)	0.0028 (0.0116)	0.0078 (0.0232)	0.0139 (0.0274)
Head is male (male=1, female=0)	-0.0064 (0.0274)	2.1702 (3.3580)	0.2024** (0.0988)	0.0179 (0.0162)	-0.0048 (0.0171)	-0.0195 (0.0180)	-0.0060 (0.0205)	-0.0025 (0.0073)	-0.0130 (0.0142)	0.0151 (0.0142)
Age of head	0.0012 (0.0010)	0.1825 (0.1320)	0.0031 (0.0041)	0.0016*** (0.0006)	0.0005 (0.0007)	-0.0009** (0.0004)	0.0005 (0.0008)	0.0002 (0.0002)	-0.0004 (0.0004)	0.0008* (0.0005)
Number of schooling years of head	0.0008 (0.0027)	0.2034 (0.2608)	-0.0140 (0.0097)	0.0013 (0.0017)	0.0007 (0.0017)	-0.0012 (0.0014)	0.0011 (0.0020)	0.0005 (0.0007)	-0.0014 (0.0011)	0.0006 (0.0015)
Log of governorate mean wage	0.2157*** (0.0319)	-0.0494 (2.4895)	0.3467 (0.2665)	0.0387*** (0.0147)	0.1906*** (0.0266)	-0.0136 (0.0163)	0.1638*** (0.0281)	0.0089 (0.0082)	0.0114 (0.0106)	0.0316*** (0.0133)
Governorate mean wealth index	-0.1275*** (0.0464)	10.6580** (5.0045)	-0.0332 (0.2152)	-0.0235 (0.0300)	-0.0623** (0.0313)	-0.0416* (0.0234)	-0.1022*** (0.0346)	0.0056 (0.0199)	-0.0115 (0.0198)	-0.0195 (0.0220)
Year 2012	-0.0478*** (0.0094)	-2.9800*** (1.0288)	0.1850*** (0.0425)	-0.0037 (0.0056)	-0.0284*** (0.0063)	-0.0156*** (0.0049)	-0.0481*** (0.0069)	-0.0049* (0.0029)	-0.0021 (0.0042)	0.0073 (0.0050)
Constant	-1.3802*** (0.2369)	26.5502 (20.3333)	3.7749* (1.9541)	-0.2182** (0.1111)	-1.3359*** (0.1917)	0.1739 (0.1284)	-1.1317*** (0.2075)	-0.0397 (0.0587)	-0.0223 (0.0871)	-0.1865* (0.0982)
Observations	13551	3248	1994	13551	13551	13551	13551	13551	13551	13551
Number of individuals	6787	2233	1227	6787	6787	6787	6787	6787	6787	6787
R-squared	0.04	0.04	0.08	0.01	0.05	0.01	0.05	0.01	0.01	0.01

Notes: Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: authors' estimation from the 2006 and 2012 ELMPSs.

Table 9: Decomposition of Employment Gap between Male and Female (Aged 23-65)

Variables	X_m	X_f	β_m	β_f	$\frac{(X_m - X_f)^*}{((\beta_m + \beta_f)/2)}$	$\frac{(\beta_m - \beta_f)^*}{((X_m + X_f)/2)}$	Contribution of X (%)	Contribution of β (%)
Receive microcredit	0.0257*** (0.0020)	0.0229*** (0.0019)	-0.0403 (0.0305)	0.0708** (0.0343)	0.0000 (0.0001)	-0.0027** (0.0012)	0.0069 (0.0156)	-0.4287** (0.1887)
Number of schooling years	8.5652*** (0.0984)	5.8750*** (0.1009)	0.0011 (0.0045)	0.0071 (0.0058)	0.0111 (0.0102)	-0.0438 (0.0538)	1.7589 (1.6245)	-6.9648 (8.5597)
Married (yes=1, no=0)	0.8527*** (0.0052)	0.7557*** (0.0066)	0.1474*** (0.0257)	-0.0163 (0.0285)	0.0064*** (0.0019)	0.1316*** (0.0326)	1.0110*** (0.2984)	20.921*** (5.1938)
Household size	5.3314*** (0.0425)	5.0962*** (0.0403)	0.0015 (0.0027)	-0.0005 (0.0038)	0.0001 (0.0006)	0.0107 (0.0232)	0.0184 (0.0892)	1.7067 (3.6887)
Proportion of children below 15 in household	0.2763*** (0.0035)	0.2630*** (0.0034)	-0.0463 (0.0286)	0.0169 (0.0370)	-0.0002 (0.0003)	-0.0170 (0.0128)	-0.0310 (0.0504)	-2.7056 (2.0402)
Proportion of elderly above 60 in household	0.0910*** (0.0029)	0.1304*** (0.0036)	-0.3710*** (0.0518)	-0.0228 (0.0336)	0.0077*** (0.0015)	-0.0386*** (0.0071)	1.2314*** (0.2396)	-6.1281*** (1.1383)
Proportion of female members	0.4655*** (0.0029)	0.5338*** (0.0031)	-0.0172 (0.0521)	0.0585 (0.0467)	-0.0014 (0.0024)	-0.0378 (0.0355)	-0.2244 (0.3866)	-6.0165 (5.6553)
Head is male (male=1, female=0)	0.9312*** (0.0042)	0.7778*** (0.0063)	0.0053 (0.0314)	-0.0064 (0.0274)	-0.0001 (0.0030)	0.0100 (0.0366)	-0.0131 (0.4829)	1.5892 (5.8285)
Age of head	49.386*** (0.1783)	51.279*** (0.1853)	0.0002 (0.0009)	0.0012 (0.0010)	-0.0013 (0.0013)	-0.0482 (0.0647)	-0.2082 (0.1989)	-7.6635 (10.2955)
Number of schooling years of head	7.3497*** (0.1013)	6.6849*** (0.1017)	0.0049* (0.0027)	0.0008 (0.0027)	0.0019 (0.0014)	0.0291 (0.0274)	0.3035 (0.2199)	4.6183 (4.3533)
Log of governorate mean wage	7.0402*** (0.0032)	7.0388*** (0.0030)	-0.0369 (0.0249)	0.2157*** (0.0319)	0.0001 (0.0004)	-1.7781*** (0.2967)	0.0192 (0.0601)	-282.64*** (47.394)
Governorate mean wealth index	0.0170*** (0.0051)	0.0129*** (0.0049)	0.0517 (0.0494)	-0.1275*** (0.0464)	-0.0002 (0.0004)	0.0027** (0.0012)	-0.0247 (0.0651)	0.4252** (0.1915)
Year 2012	0.5001*** (0.0002)	0.4999*** (0.0002)	-0.0613*** (0.0091)	-0.0478*** (0.0094)	0.0000 (0.0000)	-0.0067 (0.0065)	-0.0011 (0.0032)	-1.0728 (1.0381)
Constant			1.0136*** (0.1994)	-1.3802*** (0.2369)				
<i>Decomposition</i>	$\ln(Y_{nm}) - \ln(Y_m)$	Contribution of X	Contribution of β	Contribution of α	Contribution of β & α			
Absolute	0.629 (0.007)	0.024 (0.011)	-1.789 (0.325)	2.394 (0.324)	0.605 (0.013)			
Percentage	100 0	3.85 (1.72)	-284.36 (51.94)	380.51 (51.76)	96.15 (1.72)			

Notes: Robust standard errors in brackets. Standard errors are estimated using bootstrap with 500 replications (standard errors are corrected for sampling weights and cluster correlation). * significantly different from 0 at 10%; ** significant at 5%; *** significant at 1%. Coefficients of regressions in male and female employments are taken from the regression of 'working' in Table 7 and Table 8, respectively.

Source: authors' estimation from the 2006 and 2012 ELMPSs.

Appendices

Table A1: Employment of People Aged 15-22 (Three Month Reference)

Employment variables	Male			Female		
	Not receive micro-credit	Receive micro-credit	Total	Not receive micro-credit	Receive micro-credit	Total
The 2006 ELMPS						
Having worked (yes=1, no=0)	35.9%	50.4%	36.3%	10.3%	18.5%	10.5%
Number of working hours per week	65.2	48.8	64.6	45.8	31.1	45.3
<i>Employment structure by economic activities</i>						
Wage work (yes=1, no=0)	61.4%	42.4%	60.7%	20.0%	4.6%	19.5%
Unpaid work (yes=1, no=0)	32.4%	48.6%	32.9%	77.2%	89.0%	77.7%
Self-employed work (yes=1, no=0)	6.3%	9.1%	6.4%	2.7%	6.4%	2.9%
<i>Employment structure by economic sector</i>						
Farm work	36.4%	50.9%	36.9%	74.7%	90.0%	75.3%
Industrial work	31.4%	11.6%	30.7%	10.6%	7.8%	10.5%
Trade work	16.7%	20.7%	16.9%	5.8%	0.0%	5.6%
Service work	15.5%	16.8%	15.6%	8.9%	2.2%	8.6%
The 2012 ELMPS						
Having worked (yes=1, no=0)	33.8%	37.9%	33.9%	4.6%	5.0%	4.6%
Number of working hours per week	46.9	48.9	47.0	40.4	50.0	40.6
<i>Employment structure by economic activities</i>						
Wage work (yes=1, no=0)	67.1%	78.3%	67.5%	16.1%	43.5%	16.6%
Unpaid work (yes=1, no=0)	27.1%	15.6%	26.8%	81.5%	56.5%	81.1%
Self-employed work (yes=1, no=0)	5.7%	6.1%	5.7%	2.4%	0.0%	2.4%
<i>Employment structure by economic sector</i>						
Farm work	34.2%	14.4%	33.5%	81.0%	56.5%	80.5%
Industrial work	35.1%	48.6%	35.5%	5.5%	13.9%	5.7%
Trade work	14.9%	14.5%	14.9%	6.0%	0.0%	5.9%
Service work	15.9%	22.4%	16.1%	7.5%	29.6%	7.9%

Note: The 2006 wage is measured in 2012 L.E. using CPI.

Source: authors' estimation from the 2006 and 2012 ELMPSs.

Table A2: Employment of People Aged 23-65 (Three Month Reference)

Employment variables	Male			Female		
	Not receive micro-credit	Receive micro-credit	Total	Not receive micro-credit	Receive micro-credit	Total
The 2006 ELMPS						
Having worked (yes=1, no=0)	88.3%	88.7%	88.3%	27.1%	39.5%	27.3%
Number of working hours per week	58.9	56.6	58.9	41.2	32.5	41.0
<i>Employment structure by economic activities</i>						
Wage work (yes=1, no=0)	67.8%	38.8%	67.2%	31.1%	10.0%	30.6%
Unpaid work (yes=1, no=0)	4.3%	12.9%	4.4%	58.6%	77.9%	59.1%
Self-employed work (yes=1, no=0)	28.0%	48.3%	28.3%	10.3%	12.1%	10.3%
<i>Employment structure by economic sector</i>						
Farm work	20.8%	47.4%	21.3%	60.4%	78.1%	60.8%
Industrial work	25.7%	13.0%	25.5%	6.6%	6.3%	6.6%
Trade work	14.8%	9.2%	14.7%	7.0%	6.5%	7.0%
Service work	38.7%	30.4%	38.5%	26.1%	9.1%	25.7%
The 2012 ELMPS						
Having worked (yes=1, no=0)	88.4%	86.0%	88.3%	21.2%	26.0%	21.3%
Number of working hours per week	49.3	50.8	49.3	38.2	43.3	38.3
<i>Employment structure by economic activities</i>						
Wage work (yes=1, no=0)	73.8%	76.4%	73.9%	43.5%	34.6%	43.2%
Unpaid work (yes=1, no=0)	2.5%	3.3%	2.5%	48.0%	47.2%	48.0%
Self-employed work (yes=1, no=0)	23.7%	20.4%	23.6%	8.5%	18.3%	8.8%
<i>Employment structure by economic sector</i>						
Farm work	17.4%	15.2%	17.3%	49.3%	49.5%	49.3%
Industrial work	30.2%	23.8%	30.1%	4.7%	8.2%	4.8%
Trade work	14.7%	12.3%	14.7%	8.0%	16.4%	8.3%
Service work	37.7%	48.8%	38.0%	38.0%	25.9%	37.7%

Note: The 2006 wage is measured in 2012 L.E. using CPI.

Source: authors' estimation from the 2006 and 2012 ELMPSs.

Table A3: Summary Statistics of Explanatory Variables

Variables	The 2006 ELMPSs		The 2012 ELMPSs	
	Mean	Std. Dev.	Mean	Std. Dev.
Number of schooling years	6.555	5.233	8.349	5.181
Married (yes=1, no=0)	0.460	0.498	0.581	0.493
Household size	5.934	2.754	4.814	2.181
Proportion of children below 15 in household	0.295	0.222	0.263	0.235
Proportion of elderly above 60 in household	0.075	0.164	0.116	0.235
Proportion of female members	0.496	0.175	0.503	0.194
Head is male (male=1, female=0)	0.865	0.342	0.837	0.369
Age of head	49.15	12.36	49.98	13.55
Number of schooling years of head	6.239	5.852	7.768	5.723
Log of governorate mean wage	7.073	0.321	7.016	0.161
Governorate mean wealth index	-0.043	0.339	0.046	0.381
Number of observation in panel data	24323		24323	

Source: authors' estimation from the 2006 and 2012 ELMPSs.

Table A4: Individual Fixed-Effects of Employment of Women 23-65 with Interactions

Explanatory variables	Currently working (yes=1, no=0)				
	Model 1	Model 2	Model 3	Model 4	Model 5
Receive microcredit	0.0760*	0.2438*	0.0887*	0.0147	0.1080
	(0.0434)	(0.1392)	(0.0500)	(0.0696)	(0.0732)
Receive microcredit * Urban	-0.0231				
	(0.0489)				
Receive microcredit * Age		-0.0039			
		(0.0029)			
Receive microcredit * The number of schooling years			-0.0036		
			(0.0049)		
Receive microcredit * married (yes=1, no=0)				0.0686	
				(0.0794)	
Receive microcredit * Household size					-0.0067
					(0.0128)
Number of schooling years	0.0071	0.0073	0.0072	0.0072	0.0071
	(0.0058)	(0.0058)	(0.0058)	(0.0058)	(0.0058)
Married (yes=1, no=0)	-0.0166	-0.0170	-0.0163	-0.0180	-0.0159
	(0.0286)	(0.0286)	(0.0285)	(0.0287)	(0.0286)
Household size	-0.0005	-0.0007	-0.0006	-0.0005	-0.0003
	(0.0038)	(0.0038)	(0.0038)	(0.0038)	(0.0039)
Proportion of children below 15 in household	0.0169	0.0175	0.0171	0.0164	0.0164
	(0.0369)	(0.0369)	(0.0370)	(0.0369)	(0.0370)
Proportion of elderly above 60 in household	-0.0225	-0.0233	-0.0224	-0.0222	-0.0227
	(0.0336)	(0.0336)	(0.0336)	(0.0336)	(0.0336)
Proportion of female members	0.0581	0.0577	0.0575	0.0577	0.0599
	(0.0467)	(0.0467)	(0.0467)	(0.0467)	(0.0469)
Head is male (male=1, female=0)	-0.0064	-0.0059	-0.0066	-0.0067	-0.0062
	(0.0274)	(0.0274)	(0.0274)	(0.0274)	(0.0274)
Age of head	0.0012	0.0012	0.0012	0.0011	0.0011
	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)
Number of schooling years of head	0.0008	0.0007	0.0008	0.0008	0.0008
	(0.0027)	(0.0027)	(0.0027)	(0.0027)	(0.0027)
Log of governorate mean wage	0.2156***	0.2145***	0.2157***	0.2156***	0.2164***
	(0.0319)	(0.0319)	(0.0319)	(0.0319)	(0.0320)
Governorate mean wealth index	-0.1276***	-0.1274***	-0.1275***	-0.1283***	-0.1285***
	(0.0464)	(0.0464)	(0.0464)	(0.0464)	(0.0464)
Year 2012	-0.0477***	-0.0474***	-0.0477***	-0.0475***	-0.0477***
	(0.0094)	(0.0093)	(0.0093)	(0.0094)	(0.0094)
Constant	-1.3787***	-1.3716***	-1.3799***	-1.3770***	-1.3860***
	(0.2369)	(0.2370)	(0.2370)	(0.2367)	(0.2378)
Observations	13551	13551	13551	13551	13551
Number of individuals	6787	6787	6787	6787	6787
R-squared	0.04	0.04	0.04	0.04	0.04

Notes: Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: authors' estimation from the 2006 and 2012 ELMPSs.