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Micro-Loans and Household Economies: Evidence in Indonesia

Suratini

Abstract

Micro-loans intended to improve household economies are a fascinating subject for research because a comparative analysis of before and after taking micro-loans would result in a bias selection. Households have different prior conditions from one another, so the difference found during the study is not entirely due to receiving micro-loans. There is a risk of moral hazard risk due to asymmetric information. This research adopts the double difference (DD) fixed effects method to estimate the extent of micro-loans' impact. Results indicate that micro-loans are significantly influencing the household economies. The impact size was relatively small that it was not apparent during regression. As an implication, micro-loans intended for productive purposes can help improve household economic conditions. Effective and sustainable monitoring and counsel can minimize the risk of moral hazard.

Keywords: micro-loans, household economies, asymmetric information

Abstrak

Pinjaman mikro untuk memperbaiki kondisi ekonomi rumah tangga menarik diteliti, karena analisis perbandingan sebelum dan setelah menerima pinjaman mikro memunculkan seleksi bias. Kondisi setiap rumah tangga tentunya tidak mungkin sama sebelumnya, sehingga perbedaan kondisi tersebut berarti tidak sepenuhnya akibat pinjaman mikro yang diterima rumah tangga. Terdapat risiko moral hazard karena adanya informasi tidak sempurna. Menggunakan metode double difference (DD) untuk mengestimasi besarnya dampak pinjaman mikro.Hasilnya menunjukkan pinjaman mikro secara nominal signifikan. Dampak yang ditimbulkan relatif kecil sehingga tidak tampak saat regresi. Implikasinya pinjaman mikro untuk tujuan produktif dapat membantu memperbaiki kondisi ekonomi rumah tangga. Pengawasan dan pendampingan secara efektif dan berkelanjutan dapat meminimalkan risiko adanya moral hazard.

Kata Kunci: pinjaman mikro, ekonomi rumah tangga, informasi tidak simetris

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Introduction

Micro-loans, or relatively small-sized loans, are intended for members of society who are poor or of low income. The micro-loans aimed at enabling them to increase earnings through improvement in productivity, thus reducing poverty. The Indonesian government has stipulated the types of institutions legally permitted to provide micro-loan services through Law Number 1 of the year 2013 on microfinance institutions. This Law defines a micro-loans institution as one that offers micro-scale savings and expenditure services for the public, expands job opportunities, and acts as an instrument of distribution and improvement of public income, as well as improving welfare in poor and low-income families. Micro-loans, therefore, has the characteristics of being user-friendly and having low transaction cost.

Indonesia has varying types of microfinance institutions offering microloan services that broadly classified into three categories: the formal institutions consisting of banks and non-banks, the semi-formal, and the informal microfinance institutions. Laws Number 10 of year 1998 and Number 23 of year 1999 on Banking in Indonesia stipulate the Indonesian Central Bank's authority to classify micro finance institutions into two types: bank and non-bank institutions. Banks that can issue micro-loans are private banks, state-owned Regional Development Banks, domestic private banks, foreign and mixed-ownership banks, and the Community Loans Banks. As for the non-banking institutions, they consist of cooperatives, savings and loans units, village loans institutions, Islamic microfinance institutions (called the BMT or Baitul Mal wat Tanwil), civil society organizations or NGOs, and government programs such as community small business loans, urban poverty alleviation projects, etc.

A study by Kundu (2011) explains the role of microfinance intervention in alleviating poverty in India. According to the survey, the Indian government had started microfinance programs for women in rural areas with a scheme called Swarnajayanti Grameen Swarojgari Yojana (SGSY) through a group/collective loan system (Kundu, 2011). The loans could be used as work capital to start or develop activities that would provide income and economic stability for the debtors. Customers of a microfinance group periodically save an amount of money in a shared account as the revolving fund that could be used to finance customers' consumption needs and short-term production needs. The empirical finding supported by Robinson (2002), Cospetake (2002), Shahidur (2005), Weele and Weele (2007), Kai and Hamori (2009), Shirazi and Khan (Winter, 2009), Tadeschi and Karlan (2010), Leikem (2012), and Clement and Terande (2012), who prove that microfinance programs could effectively improve income and reduce poverty. According to Osotimehin and Babatunde (2011), one of the factors influencing microfinance target attainment among the poor in society is the magnitude of the loan. Another finding is an indication that microfinance target attainment powered by the real degree of effective loans, the average loan size, the loan cost, the degree of loan repayment, and the salary paid to employees. Another study by Abiola (2011) uses the binary logit regression model to prove the impact of microfinance by analyzing independent variables consisting of earnings, business location, entrepreneurship, and gender. Also in support of this finding is Afrin et al (2010), Emeka and Noruwa (2012), and AsadEjaz and Ramzan (2012); who posit that, in principle, microfinance cannot only lower the level of poverty but also develop entrepreneurship.

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According to Holvoet (2004), the provision of loans to households could well influence access to education for children. However, it also depends on how the household makes use of the loan, in the sense of whether it is for productive purposes or only for consumptive purposes. Ultimately loan provision is found to influence child education. Subsequently, according to Waheed (Summer, 2009), education, in addition to micro-loans, also affects the improvement of the household condition.

Furthermore, several empirical studies observe that a recurring problem in the microloan market in developing countries is the high degree of asymmetric information. This issue in turn leads to the risk of moral hazard in the form of loan misuse or repeated loans (multiple loans for a singular purpose), that could potentially increase consumption with no improvement in income. Such a condition would inevitably not reduce poverty in the household. According to Simtowe, et al. (2006), the moral hazard risk is dominant in microfinance. Their analysis indicates that the microfinance institution could not depend solely on efforts to reduce the risk of moral hazard but should also manage the risk of the repeated loan or multiple loans due to asymmetric information received by debtors. Gine et al (2010) similarly support that the existence of asymmetric information causes the risk of adverse selection; which is more dominant than the risk of moral hazard. Minimizing the risk requires identifying specific features from future debtors; such as their characteristics, business experience, and assets in possession. Contrary to this, Bhinadi (2009) offers a system of scoring loans as an instrument to minimize loan risks.

Nevertheless, there are differences in opinion concerning microfinance about poverty. Husein and Jiwani (2008) posit that the right way to overcome the problem of reducing poverty is still a subject for debate. Mallick (2002) argues that the common views on micro-loans are overly exaggerated and offers findings of considerable negative impacts. Johnson (2004) proves that microfinance tends to make relatively well-off only nearly 50% of the microloan receivers from 1999 to 2003. This issue because the loan product design offered was not flexible, and customers of the institution in question were taking multiple loans and causing loan defaults. Imoisi and Opara (2014) suggest that microloan programs offered by governments have not yet shown any positive impacts on the livelihoods of citizens compared to those provided by private institutions.

Using the discussion above as a foundation, we can see that previous research on micro-loans provision as a means to help improve household economic conditions have identified various problems that are of interest for further studies. In the case of Indonesia, it is particularly interesting to examine micro-loans about the intention and purpose of Law Number 1 of the Year 2013. This act is to improve the income and welfare of poor members of society. Could micro-loans offered by both bank and non-bank finance institutions factually help change the condition of households from poor into not poor, or is such a change not only influenced by the micro-loans received but also because of the presence of a control variable affecting it?

Method

The theoretical framework of this research based on the theory presented by Shahidur (2005). The Double Difference (DD) fixed effects method was used to test the effect of micro-loans on household welfare. The reason for opting this technique was the unobserved heterogeneity

factor found in the year 2000's loans, which were time-invariant and were impossible to capture in independent variables. To make an estimation using the panel regression method, Haussmann test was first conducted, which showed a prob > chi2 value of 0.000, thus < 0.05. With this result, the fixed effects method was deemed more appropriate for this study compared to random effects.

The treatment group (T=1) of this study consists of type 1 and type 2 households that received loans in 2000, while the control group (T=0) comprises households that did not take loans in 2000: type 3 and type 4 households. This research uses the year 2000 as a starting year because the impact of loans made that year would be in effect several years after. For this reason, the year 2000 was set as the starting year (t0 or 2000=0) and 2007 the ending year (t1 or 2007=1).

The model used in this study is as follows:

$$Y_{it} = \alpha + \beta_1 t_1 + \delta T_i * t_1 + \sum_{k=1}^{n} \beta_k X_{kit} + \alpha_1 + v_j + \in_{it}$$

where

Y_{it} : Household economies to be measured in 6 parameters consisting of Asset (AS), consumption expense (PK), food consumption (CF), non-food consumption (CNF), and per capita expense (PCE). i = Individual or household index, and t = time index.

t : Time index, $t = \begin{Bmatrix} 1 = 2007 \\ 0 = 2000 \end{Bmatrix}$

T : Dummy treatment variable, where

$$T = \begin{Bmatrix} 1 = takingloansin\ 2000 \\ 0 = nottakingloansin\ 2000 \end{Bmatrix}$$

X: A set of household characteristics and other control variables such as head of household's age, head of household's education, number of household members, number of non-household members, types of collateral, types of loan providers, education expenses, health expenses, etc.

α : Unobserved characteristics on a household level.

v : Unobserved characteristics on a community level.

Result and Discussion

The data analyzed in this study taken from the Indonesian Family Life Surveys (IFLS) in 2000 and 2007.The level of observation is the level of households with a sample totaling in 23,005 households. The sample size for the year 2000 is 10,045 households, and the sample size for 2007 is 12,960 households. The research used the panel household data so that only the households recorded in 2000 and 2007 sampled. Households are appearing in just one round not included in the analysis. From the study, a panel household sample of 8,683 households obtained. The sample households are grouped into four household types as presented in Table 1. To convince that the fixed effects (FE) method is more appropriate for this analysis, a Chow test and a Hausman test conducted. The impact of micro-loans in 2000 on the total household income in 2007 measured at 3% difference in income improvement between the treatment group and the control group, but the regression results did not show the change (See Table 2).

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Table 1. Matrix of the Household Type Distribution

Year 2000	Year 2007	
	Loan (K)	No Loan (TK)
Loan (K)	584 (tipe 1)	1,278 (tipe 2)
No Loan (TK)	965 (tipe 3)	5,856 (tipe 4)

Source: processed data

This result confirms a finding by Weele and Weele (2007) who adopted multiple linear regression methods to conclude that use of micro-credits in Honduras could increase income when spent on investments. Also, Waheed (2009) also established that micro-credits for long-term investments such as cattle farming and purchase of agricultural tools could significantly increase household income in Pakistan.

Table 2. The Impact of Micro-loans in 2000 on The Total Household Income in 2007

Variables	Real values		Nominal values	
	Coefficient	SD	Coefficient	SD
Year 2007	-0.063	(0.066)	0.279***	(0.072)
Taking loans in 2007	-0.446***	(0.147)	-0.418***	(0.147)
Under 40 percentile PCE	-0.245**	(0.097)	-0.244**	(0.097)
City	0.173	(0.152)	0.162	(0.152)
Sumatera	0.705	(0.782)	0.706	(0.779)
Other than Sumatera, Java, Bali	1.598	(1.479)	1.550	(1.474)
Productive	0.151	(0.186)	0.159	(0.185)
Education expenses in households with loans	0.000	(0.000)	0.000	(0.000)
With collateral	-0.131	(0.194)	-0.146	(0.194)
Tenure	0.011***	(0.004)	0.011***	(0.004)
Windfall income	0.005	(0.009)	0.007	(0.010)
Moral hazard	-0.061**	(0.025)	-0.062**	(0.025)
Non-formal loans	-0.298	(0.217)	-0.302	(0.217)
Bank	-0.055	(0.193)	-0.049	(0.192)
Head of household's age	0.036***	(0.005)	0.036***	(0.005)
Head of household's education	0.065***	(0.020)	0.064***	(0.020)
Household size	0.500***	(0.030)	0.497***	(0.029)
Working	7.017***	(0.132)	6.985***	(0.131)
Education expenses	-0.042***	(0.006)	-0.040***	(0.006)
Health expenses	0.001	(0.009)	0.000	(0.009)
Household's social activities	0.360***	(0.043)	0.361***	(0.042)
Social activities	0.027**	(0.011)	0.026**	(0.011)
Constant	-2.153***	(0.813)	-2.379***	(0.795)
Observations	17,366			
R-squared	0.306			
Number of hhid	8,683			
Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1				

Results of a regression analysis on the impact of micro-loans in 2000 on household income in 2007 indicate that an improvement in total revenue had occurred by 2007 compared to how it was in 2000. Though income improvement had in reality occurred by 2007 compared to how it was in 2000, the development was relatively small so that the coefficient did not indicate a significant difference. The impact of micro-loans in 2000 on asset value in 2007 proved that an improvement in household asset had occurred on average by 2007 compared to how it was in 2000 (See Table 3). However, the analysis on the impact of micro-loans in 2000 on assets in 2007 indicates no significant influence.

Table 3. The Impact of Micro-loans in 2000 on Asset Value in 2007

Variables	Real values		Nominal values	
	Coefficient	SD	Coefficient	SD
Year 2007	0.561***	(0.031)	1.071***	(0.034)
Taking loans in 2007	-0.029	(0.070)	-0.026	(0.069)
Under 40 percentile PCE	-0.304***	(0.046)	-0.303***	(0.046)
City	-0.145**	(0.072)	-0.142**	(0.072)
Sumatera	0.753**	(0.372)	0.742**	(0.368)
Other than Sumatera, Java, Bali	-0.231	(0.703)	-0.230	(0.697)
Productive	-0.019	(0.088)	-0.017	(0.087)
Education expenses in households with loans	-0.000*	(0.000)	-0.000*	(0.000)
With collateral	0.167*	(0.092)	0.166*	(0.092)
Tenure	0.002	(0.002)	0.002	(0.002)
Windfall income	0.011**	(0.004)	0.010**	(0.004)
Moral hazard	0.009	(0.012)	0.009	(0.012)
Non-formal loans	-0.035	(0.103)	-0.036	(0.102)
Bank	0.054	(0.092)	0.056	(0.091)
Head of household's age	0.021***	(0.002)	0.021***	(0.002)
Head of household's education	0.056***	(0.009)	0.056***	(0.009)
Household size	0.168***	(0.014)	0.167***	(0.014)
Working	0.259***	(0.063)	0.257***	(0.062)
Education expenses	-0.009***	(0.003)	-0.009***	(0.003)
Health expenses	-0.006	(0.004)	-0.006	(0.004)
Household's social activities	0.168***	(0.020)	0.169***	(0.020)
Social activities	0.018***	(0.005)	0.018***	(0.005)
Constant	11.155***	(0.387)	10.795***	(0.376)
Observations	17,366			
R-squared	0.116			
Number of hhid	8,683			
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

On the other hand, the impact of micro-loans in 2000 on total household consumption expenditure in 2007 measured by analyzing real and average values of consumption

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expenditures in 2000 and 2007 in both treatment and control households. The result is an increase in consumption expenditure amounted to a 9% increase in the treatment households. Results of a regression analysis on the impact of micro-loans in 2000 on consumption expenditure in 2007 showed a rise in household consumption expenditure of between the 9% until 12% at the period of 2000 to 2007 (See Table 4).

Table 4. The Impact of Household Micro-loans on Total Consumption Expenditure

Variables	Real values		Nominal values	
	Coefficient	SD	Coefficient	SD
Year 2007	-0.292***	(0.024)	-0.598***	(0.026)
Taking loans in 2007	-0.022	(0.053)	-0.025	(0.054)
Under 40 percentile PCE	0.526***	(0.035)	0.529***	(0.035)
City	0.103*	(0.055)	0.103*	(0.055)
Sumatera	-0.535*	(0.283)	-0.543*	(0.285)
Other than Sumatera, Java, Bali	0.058	(0.535)	0.066	(0.539)
Productive	-0.069	(0.067)	-0.070	(0.068)
Education expenses in households with loans	0.000**	(0.000)	0.000**	(0.000)
With collateral	0.058	(0.070)	0.058	(0.071)
Tenure	-0.003*	(0.001)	-0.003*	(0.001)
Windfall income	-0.016***	(0.003)	-0.016***	(0.003)
Moral hazard	0.002	(0.009)	0.003	(0.009)
Non-formal loans	-0.144*	(0.079)	-0.146*	(0.079)
Bank	0.098	(0.070)	0.098	(0.070)
Head of household's age	-0.002	(0.002)	-0.002	(0.002)
Head of household's education	-0.021***	(0.007)	-0.022***	(0.007)
Household size	-0.144***	(0.011)	-0.145***	(0.011)
Working	-0.004	(0.048)	-0.005	(0.048)
Education expenses	0.020***	(0.002)	0.020***	(0.002)
Health expenses	0.054***	(0.003)	0.056***	(0.003)
Household's social activities	1.365***	(0.015)	1.360***	(0.015)
Social activities	0.080***	(0.004)	0.083***	(0.004)
Constant	-6.891***	(0.294)	-6.646***	(0.291)
Observations	17,366			
R-squared	0.594			
Number of hhid	8,683			
Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1				

The researcher presumes that the impact was relatively small so that it was not seen during regression. Meanwhile, the increase occurring in the treatment group is even lower in level compared to that of the control group, proven by a negative coefficient of -0.02; although the difference is not significant. It is in line with the previous table showing that the increase in the treatment group was lower compared to that of the control group. As for

the impact of household micro-loans in 2000 on food consumption expenditure in 2007, the researcher records an increase in food consumption expenditures in both treatment and control groups with a difference of minus 3%. Results of regression analysis show an increase in household food consumption expenditures of between 4 to 7% in the period of 2000 to 2007. The regression results did not show the change (Table 5). The researcher presumes that the impact was relatively small so that it not seen during regression. Meanwhile, the increase happening to the treatment group even lower compared to that of the control group.

Table 5. The Impact of Household Micro-loans onFood Consumption Expenditure

Variables	Real values		Nominal values	
	Coefficient	SD	Coefficient	SD
Year 2007	-0.337***	(0.024)	-0.587***	(0.027)
Taking loans in 2007	-0.024	(0.054)	-0.026	(0.054)
Under 40 percentile PCE	0.519***	(0.036)	0.523***	(0.036)
City	0.118**	(0.056)	0.117**	(0.056)
Sumatera	-0.532*	(0.287)	-0.541*	(0.289)
Other than Sumatera, Java, Bali	0.242	(0.543)	0.249	(0.547)
Productive	-0.063	(0.068)	-0.064	(0.069)
Education expenses in households with loans	0.000	(0.000)	0.000	(0.000)
With collateral	0.013	(0.071)	0.013	(0.072)
Tenure	-0.002	(0.002)	-0.002	(0.002)
Windfall income	-0.017***	(0.003)	-0.017***	(0.004)
Moral hazard	0.002	(0.009)	0.002	(0.009)
Non-formal loans	-0.139*	(0.080)	-0.141*	(0.080)
Bank	0.097	(0.071)	0.097	(0.071)
Head of household's age	-0.002	(0.002)	-0.002	(0.002)
Head of household's education	-0.022***	(0.007)	-0.023***	(0.007)
Household size	-0.118***	(0.011)	-0.119***	(0.011)
Working	-0.002	(0.048)	-0.002	(0.049)
Education expenses	0.013***	(0.002)	0.014***	(0.002)
Health expenses	0.049***	(0.003)	0.051***	(0.003)
Household's social activities	1.290***	(0.016)	1.286***	(0.016)
Social activities	0.072***	(0.004)	0.075***	(0.004)
Constant	-6.128***	(0.298)	-5.936***	(0.295)
Observations	17,366			
R-squared	0.554			
Number of hhid	8,683			
Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1				

Analysis on the impact of micro-loans in 2000 on non-food consumption expenditures in 2007 shows an increase in non-food consumption expenditures amounted 19% in control households. Results of the regression analysis on the impact of micro-loans in 2000 on household non-food consumption expenditures in 2007 shows an increase in household non-

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food consumption expenditures at between 13% until 19% in the period of 2000 to 2007, but regression results did not show it and even showed a negative coefficient (Table 6). The researcher presumes that the impact was relatively small so that it was not shown during regression. Meanwhile, the increase in the treatment group was lower compared to that of the control group.

Table 6. The Impact of Micro-loans on Non-Food Consumption Expenditure

Variables	Real values		Nominal values	
	Coefficient	SD	Coefficient	SD
Year 2007	-0.161***	(0.023)	-0.437***	(0.026)
Taking loans in 2007	-0.027	(0.052)	-0.031	(0.053)
Under 40 percentile PCE	0.442***	(0.034)	0.445***	(0.035)
City	0.080	(0.054)	0.079	(0.054)
Sumatera	-0.574**	(0.277)	-0.583**	(0.279)
Other than Sumatera, Java, Bali	-0.102	(0.524)	-0.093	(0.527)
Productive	-0.075	(0.066)	-0.076	(0.066)
Education expenses in households with loans	0.000***	(0.000)	0.000***	(0.000)
With collateral	0.094	(0.069)	0.093	(0.069)
Tenure	-0.003**	(0.001)	-0.003**	(0.001)
Windfall income	-0.011***	(0.003)	-0.011***	(0.003)
Moral hazard	0.003	(0.009)	0.003	(0.009)
Non-formal loans	-0.135*	(0.077)	-0.137*	(0.077)
Bank	0.091	(0.068)	0.091	(0.069)
Head of household's age	-0.002	(0.002)	-0.002	(0.002)
Head of household's education	-0.016**	(0.007)	-0.017**	(0.007)
Household size	-0.145***	(0.010)	-0.146***	(0.011)
Working	0.006	(0.047)	0.005	(0.047)
Education expenses	0.029***	(0.002)	0.030***	(0.002)
Health expenses	0.059***	(0.003)	0.062***	(0.003)
Household's social activities	1.297***	(0.015)	1.292***	(0.015)
Social activities	0.085***	(0.004)	0.088***	(0.004)
Constant	-7.053***	(0.288)	-6.827***	(0.284)
Observations	17,366			
R-squared	0.596			
Number of hhid	8,683			
Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1				

Analysis on the impact of micro-loans in 2000 on PCE in 2007 indicates an increase in PCE amounted to 17% in control households. The number shows growth in PCE for both treatment and control households with a difference amounting to 2%. Results of regression analysis on the impact of micro-loans on PCE shows an increase in household PCE of around 17 to 19% during the period of 2000 to 2007. But, the regression results did not show the change and even showed a negative coefficient (Table 7). Meanwhile, the increase in the treatment group was also lower compared to that of the control group.

Table 7. The Impact of Micro-loans on PCE

Variables	Real values		Nominal values	
	Coeffecient	SD	Coefficient	SD
Year 2007	-0.168***	(0.019)	-0.286***	(0.021)
Taking loans in 2007	-0.015	(0.042)	-0.017	(0.042)
Under 40 percentile PCE	0.235***	(0.027)	0.239***	(0.028)
City	0.101**	(0.043)	0.101**	(0.043)
Sumatera	-0.553**	(0.221)	-0.562**	(0.223)
Other than Sumatera, Java, Bali	0.025	(0.418)	0.031	(0.422)
Productive	-0.044	(0.052)	-0.046	(0.053)
Education expenses in households with loans	0.000***	(0.000)	0.000***	(0.000)
With collateral	0.064	(0.055)	0.063	(0.055)
Tenure	-0.003**	(0.001)	-0.003**	(0.001)
Windfall income	-0.013***	(0.003)	-0.013***	(0.003)
Moral hazard	0.001	(0.007)	0.001	(0.007)
Non-formal loans	-0.106*	(0.061)	-0.108*	(0.062)
Bank	0.067	(0.054)	0.068	(0.055)
Head of household's age	-0.003**	(0.001)	-0.003**	(0.001)
Head of household's education	-0.021***	(0.006)	-0.021***	(0.006)
Household size	-0.314***	(0.008)	-0.315***	(0.008)
Working	-0.032	(0.037)	-0.033	(0.038)
Education expenses	0.011***	(0.002)	0.012***	(0.002)
Health expenses	0.042***	(0.003)	0.044***	(0.003)
Household's social activities	1.093***	(0.012)	1.091***	(0.012)
Social activities	0.060***	(0.003)	0.063***	(0.003)
Constant	-4.958***	(0.230)	-4.884***	(0.228)
Observations	17,366			
R-squared	0.605			
Number of hhid	8,683			
Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1				

The findings of this research have proven that micro-loans have real effects on the increase in income, asset value, food and non-food consumption levels, and household per capita expenditures. Although these results differ from other studies in that they provide evidence on the relatively small effects of micro-loans, they are not factually different. Another proof is the change in household conditions in the treatment group. This result means there is an indication of moral hazard from debtors. In line with the findings of Simtowe et al. (2006), moral hazard can lead to behavior change in debtors. In this study, the moral hazard variable is significant in income, which also proves an increase of income after receiving micro-loans. Shahidur (2005) also revealed that micro-loans could increase household per capita consumptions.

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Conclusion

Based on results obtained from the double difference (DD) analysis method, the impact of micro-loans on income change is proven to be unnoticeable and even comes out as a negative in coefficient. An increase occurs in total income with a coefficient of nominal values, but in real value terms the coefficient is not significant, it is negative. Moreover, about the impact of micro-loans on household asset value, an increase occurs in both nominal and real ways. The effect of micro-loans on total income is not significant. In treatment households, the impact was even lower in degree compared to that of control households. The impact of micro-loans on total consumption expenditures proves to have undergone no noticeable change in both nominal and real values. About these findings, the change in the treatment households is lower in degree compared to that of the control households; with an insignificant difference.

There is no noticeable change in the impact of micro-loans on food consumption expenditures. The difference in the treatment households is lower in degree compared to that of the control households. There is also no noticeable change in the impact of micro-loans on non-food consumption expenditures. This result is also the case with a change in the treatment households, being lower in degree compared to that of the control households with an insignificant difference. Debtors exposed to a moral hazard risk that can lead to behavior change after receiving the micro-loans. As a suggested solution, it is essential to implement effective and sustainable monitoring to minimalize this risk.

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