MICRO-CREDIT FINANCE AND UNEMPLOYMENT IN SOUTH AFRICA

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Abstract

The South African government has to address high rates of unemployment and whether the provision of micro-credit finance can reduce unemployment. The study analysed the relationship between micro-credit finance and unemployment using quarterly data covering the period from 1994-2014. The study utilized the Vector Error Correction Model (VECM) to provide short run and long run dynamic effects of micro-credit finance on unemployment. The results indicated that micro-credit finance has a negative relationship with unemployment. Therefore, it is recommended that microcredit finance can be used as a tool to reduce unemployment and boost economic growth.

Key words: Micro-credit, unemployment, Vector Error Correction Model

JEL Classification: JEL E24 & E62

1. INTRODUCTION

Over the past decades the South African government has been striving hard for better life of its citizens because of the injustices that were inflicted by the apartheid government. The apartheid era has resulted in a high rate of unemployment and poverty, and the legacy still exists (Frye: 2006). Developing countries like South Africa are faced with many socio economic issues such as high rates of unemployment and poverty. For instance, unemployment rate was around 16% in 1995, increased and reached 30.3% in 2001 and currently it is around 24% (Kyei and Gyekye: 2011; Nkosi: 2015).

There was a debate in Bangladesh in 2013 regarding the use of micro-credit finance to reduce unemployment and poverty (Roodman: 2013). Attali (2010) defines micro-credit finance as a system that can be used to provide small loans to low income earners. Micro-credit is part of the larger microfinance industry, which does not cater for credit only, but also the use of savings, insurance, and other financial means to poor individuals for them to start small businesses and improve their livelihood (Micro:World.org: 2010). Therefore, bringing financial services like micro-credit finance to low earning citizens can create new employment opportunities and therefore reduce unemployment (Latif et al: 2011; ESAF: 2004; Javed et al: 2006; Dauda: 2011; Stanila et al: 2013; Bashir et al: 2012).

Based on empirical research by Bauchet and Morduch (2011), Fridell (2008), Mamun et al (2010) and Isabelle, et al (2007) that micro-credit finance can assist in employment creation, it was interesting to find out if this can be true for South Africa. Some studies indicated that micro-credit can ease the potential to develop micro-enterprises, by developing their well-being, entrepreneurship and create employment (Chowdhury: 2009; Mondal: 2009; Okon et al: 2012; Ndife and Franca: 2013). However, some researchers such as Agbaeze and Onwuka (2014) indicated that micro-credit does not contribute to poverty alleviation. Therefore, this study will contribute to the growing body of research by addressing the inconsistences found in literature when determining the relationship between micro-credit finance and unemployment. The question that comes to mind is whether the provision of micro-credit finance can reduce unemployment in South Africa. The relationship will assist the policy makers to come up with sound and appropriate polices on how to address the problem of unemployment through the use of micro-credit finance. The paper is structured as follows, this section is followed by section 2 theoretical review, section 3 methodology, section 4 results and discussions and the final section concludes.

2. THEORETICAL LITERATURE

The relationship between micro-credit finance and unemployment is based on the loanable fund theory. This theory stipulates that demand and supply of loanable funds is a function of interest rates (Mankiw: 2013).

$$D_{L/S} = f(i) \tag{1}$$

D_L is the demand for loanable funds, D_S is the supply of loanable funds and i is interest rates. The demand for loanable funds arises from investment, hoarding and dissaving and has a negative relationship with interest rates (Armendáriz de Aghion and Morduch: 2005). The supply for loanable funds which arises from savings, dishoarding, disinvestment and bank credit have a positive relationship with interest rates (Ghatak and Guinnane: 1999). According to Nino-Zarazua and Copestake (2009) and Rosenberg (2010), looking at the issue of interest rates and imperfect markets, micro-credit finance should influence unemployment and have a vital effect on the mental models that guide the business decisions of borrowers. Micro-credit finance is provided by financial institutions to rise output, net income, profits, and hence their own welfare (Duvendack et al: 2011).

3. METHODOLOGY

In an attempt to answer the research question of whether there is a relationship between unemployment and micro-credit finance, the following empirical model is specified. The study used secondary quarterly data for the period 1994-2014 which is sourced from the South African Reserve Bank (SARB) publications. The model is specified as follows:

$$UMPL_t = \beta_0 + \beta_1 \text{MICROF}_t\, \beta_2 GDP_t + \beta_3\, \text{FDI}_t + \beta_4\, \text{GOVTX}_t + e_t \qquad (2)$$

Where, UMPL is official unemployment rate in South Africa, MICROF is micro-credit finance which is proxied by the SARB liabilities of non-financial public enterprises: Other short-term loans, GDP is gross domestic product at market prices, FDI is foreign direct investment (Arvanits; 2002), GOVTX is national government expenditure, β_0 is an intercept, β_{1-4} are slope coefficients and e_t represent the error term.

Equation 2 is estimated by applying the econometric techniques such as co-integration tests and the Vector Error Correction Model (VECM). Co-integration is said to exist between two or more non-stationary time series if they possess the same order of integration, and if co-integration exist it can be concluded that there is a long run relationship among variables. The most frequently used test for the co-integration rank is the Johansen co-integration test (Johansen: 1988; Engle and Granger: 1987). If a set of variables are found to have one or more co-integrating vectors, then an appropriate estimation technique like VECM shall be used which adjust to both short run changes in variables and deviations from equilibrium (Engle: 1984; Sims: 1980).

4. RESULTS AND DISCUSSIONS

4.1 . Vector Error Correction Model (VECM)

The analysis began by testing for stationarity, and the Augmented Dickey-Fuller (ADF) and the Phillips Perron (PP) tests were performed (Maddala and Kim: 1998; Phillips and Perron: 1988; Blungmart: 2000). A stationary time series can be defined as one with constant mean, constant variance and constant auto-covariance over time. To estimate a regression model using Vector Error Correction Model (VECM) with a non-stationary time series data would give rise to a spurious regression, biased t-ratios, incorrect inferences and the R-squared would be artificially high (Granger and Newbold: 1974).

Table 1 show the Augmented-Dickey Fuller results and table 2 show the Phillip-Perron results. Variables were found non-stationary in levels and were differenced. The lag length used in the VECM estimation was determined, and the lag length selection criteria reported one as the optimum lag length as chosen by most criteria. Then, the co-integration tests were employed and showed that there is one co-integrating equation implying a long run relationship between micro-credit finance and unemployment (Table 3). This means in the long run, increasing micro-credit finance could help in the reduction of unemployment.

Table 1: The Augmented Dickey Fuller test results

Augmented-Dickey Fuller					
Variable		Intercept	Trend and intercept	None	Order of integration
UNEMP		-2.331494 -9.422212**	-2.375260 -9.387023**	0.111922 -9.463364**	**I(0)** **I(1)**
ML		-0.533757 -9.909476**	-2.142043 -10.03447**	0.397684 -9.832678**	**I(0)** **I(1)**
GDP		7.290515 2.2663262**	-0.656869 -9773813**	17.91092 -0.548585**	**I(0)** **I(1)**
FDI		-2.242717 -13.25354**	-2.378831 -13.19192**	-1.276166 -13.33821**	**I(0)** **I(1)**
GE		-3.326736 -6.998018**	-3.235390 -6.961786**	-0.982922 -7.036833**	**I(0)** **I(1)**
Critical values	1%	-3.511262 -3.512290	-0.072415 -4.073859	-2.593121 -2.593468	
	5%	-2.896779 -2.897223	-3.464865 -3.465548	-1.944762 -1.944811	
	10%	-2.585626 -2.585861	-3.158974 -3.159372	-1.614204 -1.614175	
	Values marked with a** represents significant level and variables at 5%				

Source: Own compilation from SARB data

Table 2: The Phillips Perron Test

Phillips-Perron Test				
Variable	Intercept	Trend & intercept	None	Order of integration
UNEMP	-2.188613 -9.610717**	-2.242120 -9.712267**	0.254377 -9.626135**	I(0) I(1)
ML	-0.404388 -9.911034**	-2.084523 -10.07017**	0.643598 -9.832678**	I(0) I(1)
GDP	7.490717 -6.739083**	-0.635134 -9.815180**	16.58506 -2.232281**	I(0) I(1)
FDI	-4.306186 -17.38229**	-4.358050 -19.08469**	-2.480081 -17.57774**	I(0) I(1)

GE	-9.484567	-9.432244	-3.494851	I(0)
	-20.83872**	-20.69942**	-20.97014**	I(1)
Critical values				
1%	-3.511262	-4.072415	-2.593121	
	-3.512290	-4.073859	-2.593468	
5%	-2.896779	-3.464865	-1.944762	
	-2.897223	-3.465548	-1.944811	
10%	-2.585626	-3.158974	-1.614204	
	-2.585861	-3.159327	-1.614175	
Values marked with a** represents significant level and variables at 5%				

Source: Own compilation from SARB data

Table 3: Johansen cointegration test results- Trace and Eigenvalue

Hypothesized No of CE(S)	Eigenvalue	Trace Statistic	0.05 Critical Value	Max-Eigen Statistic	0.05 Critical Value
None*	0.408507	72.99276	69.81889	43.05869	33.87687
At most 1	0.339328	62.86724	47.85613	29.37659	27.58434
At most 2	0.223909	28.87842	29.79707	20.78585	21.13162
At most 3	0.060227	8.092563	15.49471	5.093552	14.26460
At most 4	0.035913	2.999011	3.841466	2.999011	3.841466

Trace test indicates 1 co-integrating equation at the 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
**Mackinnon-Haug-Michelis(1990) p-values
Source: Own compilation from SARB data

The VECM estimate the effects of explanatory variables where unemployment is the function micro-credit finance, government expenditure, growth domestic product and foreign direct investment. The VECM corrects long run equation through short run adjustments leading the system to short run equation. Table 4 confirms that the error term of the co-integrating equation is negative (-0.029) and significant as indicated by the t statistic close to 2. This means that in the error correction model, variables adjust to long run shocks affecting the natural equilibrium and there is a short run relationship in the series. The estimated equation derived from the normalized co-integration coefficient is as follows (see table 5):

$$UMPL = -0.11 - 9.42LMICROF + 11.88LGDP + 14.47LFDI - 1.22GOVTX \qquad (3)$$

Equation 3 further indicate that there is a negative relationship between micro-credit finance and unemployment. A one unit increase in micro-credit finance will lead to a decrease in unemployment rate by 9,4 units as indicated by the equation estimated from the normalised co-integration coefficients. This is in line with the results obtained by researchers found when empirical literature was reviewed (Bauchet and Morduch: 2011; Theobald: 2012). It can be concluded that an increase in micro-credit finance could lead to a decreases in the rate of unemployment.

Table 4: Summary of the VECM estimates

Variables	Coefficients	Standard error	t-statistics
Co-integrating equation	-0.028893	(0.02081)	[-1.38858]
Constants	-0.114013	(0.08162)	[-1.39685]

Source: Own compilation from SARB data

Table 5: Normalised co-integration coefficients

| The Normalized co-integrating coefficients (standard error in parentheses):			
LMICROF	**LGDP**	**LFDI**	**GOVTX**
9.418359	-11.87860	-14.46707	1.224468
(5.65084)	(6.64502)	(3.59036)	(0.24834)

Source: Own compilation from SARB data

The diagnostic tests in the model are done so that the chosen model is checked for robustness. The study employed Normality Test, Serial Correlation LM test, heteroscedasticity test (Engle: 1984; McCulloch: 1985). For heteroscedasticity the p value of 0.0970 was found indicating that there is no Heteroscedasticity in the residuals. The Jarque Bera normality test indicated a *p* value of 0.257461 meaning that we do not reject the hypothesis and the residuals are normally distributed. The LM test had a p value of 0.093 which is more than 0.05 and therefore we do not reject the hypothesis and conclude that there is no serial correlation within the model.

4.2 Impulse response functions

The impulse response function (IRF) traces out the response of the dependent variable in the VAR system to its own shocks and shocks to each of the variables (Gujarati: 2004). Figure 1 shows the response of unemployment to micro-credit finance of which one standard deviation shock to micro-credit will lead unemployment being zero for first period but from the second period till the fourth period there's an upward trend and a decline towards the tenth period. This indicate a long run stable relationship between unemployment and micro-credit finance.

Figure 1: Impulse response functions
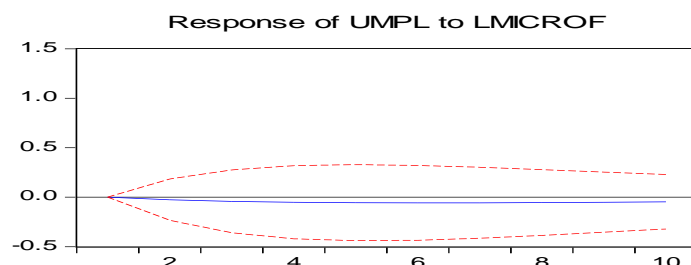
Source: Own compilation from SARB data

4.3. Variance decomposition

Variance decompositions indicate the proportion of the movements in a sequence due to its own shocks versus shocks to the other variables. It shows the fraction of the forecast error variance for each variable that is attributable to its innovations and to innovations in the other variables in the system. The variance decompositions are presented in Table 6 using Choleski decomposition method to identify the most effective instrument to use in targeting each variable of interest. This helps in separating innovations of the endogenous variables into portions that can be attributed to their own innovations and to innovations from other variables.

Table 6: Variance decomposition

PERIOD	S.E.	UMPL	LMICROF	LGDP	LFDI	GOVTX
1	1.243309	100.0000	0.000000	0.000000	0.000000	0.000000
2	1.642401	99.40353	0.024335	0.014465	0.097729	0.459940
3	1.888262	99.20269	0.068143	0.022953	0.195501	0.510716
4	2.055285	99.03796	0.120964	0.030656	0.284243	0.526172
5	2.173913	98.90044	0.175538	0.037571	0.357481	0.528968
6	2.260330	98.78491	0.227462	0.043851	0.415559	0.528220
7	2.324295	98.68866	0.274445	0.049599	0.460733	0.526567
8	2.372150	98.60900	0.315597	0.054907	0.495610	0.524888
9	2.408224	98.54331	0.350877	0.059848	0.522526	0.523442
10	2.435565	98.48917	0.380703	0.064483	0.543377	0.522270

Source: Own compilation from SARB data

Table 5 notes variance decomposition for 10 periods and it also illustrates an effect of each variable towards unemployment fluctuation in the short and the long run. If the second quarter is considered, the impulse or innovation shock, unemployment accounts to 99.4% of

its own shock or fluctuation. However, with shocks for the independent variables, the fluctuations for unemployment are 0.024% for micro-credit finance, 0.014% for GDP, 0.097% for FDI and 0.459 for government expenditure. In the long run that is for period 10, unemployment accounts to 98.5% of the fluctuation. Micro-credit finance in the long run accounts for 0.38% and government expenditure 0.52%. This implies that throughout the whole period of forecast unemployment is influenced by its own shocks in the short run and in the long run.

5.   CONCLUSION

The aim of the study was to investigate whether there is a link between micro-credit finance and unemployment after controlling for other macroeconomic variables such Gross Domestic Product, Foreign Direct Investment and government expenditure, in South Africa in period 1994-2014. The need for this research lied on the fact that South Africa is challenged by high rates of unemployment. The paper addressed this issue by looking at the effects of micro-credit finance on unemployment, so as to alleviate poverty more especially in the previously disadvantaged South African citizens.

Firstly, the test for stationarity was performed and the unit root problem was cleared after first differencing. The Johansen co-integration tests indicated one (1) co-integrating equation among the series. The implication is that the existence of the linear combination among the stationary variables signify the presence of the long run equilibrium. The presence of co-integration led to the computation of the VECM which showed that the beta parameters of the long run equilibrium were significant. Error correction terms, indicated that the variables could adjust to long run innovations affecting natural equilibrium. The estimated model satisfied the stability condition and it was statistically acceptable as it passed the diagnostic tests of normal distribution, no serial correlation and no heteroscedasticity. When impulse response functions were employed there was a long run stable relationship between unemployment and micro-credit finance. Lastly, variance decompositions indicated that unemployment is influenced by its own shocks in the short run and in the long run.

The findings of the study revealed that there is a negative significant relationship between micro-credit finance and unemployment. This implies that the micro-credit finance can be recommended to be a tool for unemployment reduction and can bring positive impacts toward employment creation. Furthermore, the government should uphold growth policies since the result also manifested a strong statistical relationship between unemployment and GDP. Finally, the government should make it easy to assess micro-credit finance and provide education on its management with the intention to fight poverty by creating employment.

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