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**The Universality of Microfinance Operations Model in Eastern Europe and Central Asia:  
Financial Sustainability vs. Poverty Outreach**

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**The Universality of Microfinance Operations Model in Eastern Europe and Central Asia:  
Financial Sustainability vs. Poverty Outreach**

**Abstract**

This paper examines delinquency, profitability, and outreach determinants of microfinance institutions' (MFIs) performance in Russia, the Caucasus, and Central Asia. The estimation is done using the Seemingly Unrelated Regression (SUR) technique. The estimation results suggest that the regions' MFIs are profit-driven but are expected to improve outreach in the long-run.

*Keywords:* Microfinance institution, SUR, Financial sustainability, Delinquency, Profitability, Social outreach

**JEL Classifications:** G20, G21

## **Introduction**

Microfinance is a financial tool developed to spur economic development and promote business engagement of the poor. Due to high exposure to risks and external shocks, the poor often lose their unstable sources of income. As a result, they are considered “non-bankable” by mainstream commercial financial institutions. The goal of microfinance is to make financial services, including microcredit, accessible to the poor.

In Eastern Europe and Central Asia (ECA), microfinance is fairly new phenomenon. First microfinance institutions (MFIs) appeared in the region in the mid 1990s. The disintegration of the USSR led to the decline in income and the disappearance of social welfare system. Assuming \$2/day poverty line, poverty rates increased from 2% to 21% during the period between 1988 and 1998 (Forster et al., 2003). In addition, ethnic conflicts that erupted after the USSR’s dissolution contributed to poverty increase, including the civil war in Russia (North Caucasus region), Georgia, Armenia, and Azerbaijan (Bossoutrot, 2005). The poor in the former USSR region are literate and predominantly well-educated people who were left outside the productive process and were desperately trying to learn how to survive in a raw market structure and disrupted economy (Forster et al., 2003). They are both people fully relying on social welfare benefits and working age individuals, many of them with higher education, looking for jobs (Bossoutrot, 2005).

The ECA microfinance sector is very closely tied to the mainstream financial sector. In several ECA countries, total assets of the microfinance sector are comparable to those of the mainstream financial sector. Furthermore, the ECA MFIs organized as banks are considered to be among the largest providers of financial services in their respective countries. They are also the largest MFIs. Whereas microfinance banks are predominant in Eastern Europe, small non-

bank financial intermediaries mainly operate in Central Asia. The average microfinance bank serves about 65,000 individuals. The interest of commercial banks in microfinance services is reflected in commercial “downscaling” banks that have recently evolved in the sector. They are small outreach MFIs where borrowers comprise only 3% of the clients. The “downscaling” banks provide significantly larger loans (three times larger than those offered by microfinance banks), suggesting that they do not reach the very poor segment of the market (MIX, 2007).

The primary goal of this research is to address the important question of the universality of the microfinance lending model by analyzing the operating environments and operating strategies of microfinance institutions in Eastern Europe and Central Asia.

To accomplish this research goal, the following specific objectives are derived:

1. To determine the homogeneity of operating conditions across regional/country models using Seemingly Unrelated Regression (SUR) techniques that allow the determination of contemporaneous correlation of disturbances among the various regional/country estimating equations.

2. To perform comparative analysis of the performance of microfinance institutions in Eastern Europe (particularly those in Russia and the Caucasus region) and Central Asia (composed of institutions in Kazakhstan, Kyrgyzstan, and Tajikistan) to assess factors responsible for achieving and maintaining financial sustainability and social outreach. Specifically, this study examines how various aspects of MFIs’ operations, including fund sourcing, staffing, and gender policies, affect the loan size, interest, and loan delinquency rates.

The results of this analysis will enable microfinance providers and policy makers to review and possibly revise strategies and policies to improve the efficiency of financial services and effectively address the needs of growing microfinance sectors in their respective countries.

## **Literature Review: MFIs Sustainability vs. Outreach**

MFIs aim at “a double bottom-line” that is a combination of financial and social returns (Brau and Woller, 2004). The tension between sustainability and outreach triggers a serious problem of the “mission drift” that occurs when MFIs, trying to reach financial self-sufficiency, tend to concentrate on relatively low-risk clients that require higher loan amounts, thus limiting their social outreach and drifting away from their true mission of poverty alleviation (Arena, 2008; Augsburg and Fouillet, 2010; Nawaz, 2010). Whereas several studies confirm the existence of the “mission drift” (Cull et al., 2007; Augsburg and Fouillet, 2010; Nawaz, 2010), other studies suggest that financial sustainability and social outreach complement and reinforce each other (Gonzalez and Rosenberg, 2006; Schicks, 2007; Armendáriz and Szafarz, 2011).

The current study approaches the issue of the possible trade-off between financial sustainability and social outreach resulting in the mission drift by investigating the relationship between the interest rate and borrowers’ income, as well as borrowers’ type. In case of a presence of the mission drift, MFIs will charge higher interest to wealthier clients, women, rural borrowers, as well as borrowers, engaged in farming. Furthermore, the study also investigates whether improved profitability, leverage, and delinquency will allow MFIs to operate more efficiently and increase poverty outreach. Such outcome is only plausible in the case of the absence of the mission drift.

Similar to Gonzalez and Rosenberg (2006), in this study, financial sustainability is considered to be the driving force behind the development of the microfinance sectors in Russian and the Caucasus. Financial sustainability of microfinance institutions becomes feasible through loan expansion, loan portfolio diversification, increase in cost efficiency and loan productivity, clients and employees’ training, institutional development, and increase in interest rate to cover

transaction cost of lending (Khalily, 2004). Microfinance entities, incur three major types of costs associated with the provision of a loan: the cost of borrowed funds, the cost of loan default provision, and the transactional cost, including client identification and screening cost, loan application processing cost, loan disbursement cost, repayment collection cost, and the cost, associated with “following up on non-payment.” The transaction cost is the major force pushing micro-loan interest rates up (Shankar, 2007). Charging high interest rates may limit the MFI’s ability to serve the poor or increase the loan default potential, but MFIs have to cover the costs of lending. Conning (1999) concluded that sustainable MFIs servicing poorer borrowers must charge higher interest rates and bear higher administrative costs compared to the MFIs targeting the marginally poor.

The loan delinquency is a measure of the MFI’s credit portfolio quality. Pretes (2002) emphasizes the seriousness of the loan default in the case of business failure or income decline from the MFI’s and borrower perspective. Because the very poor “have a limited ability to assume risk,” they may end up being worse off in the case of business failure (Pretes, 2002). Field and Pande (2008) found that switching to more flexible monthly installment schedules allows MFIs to save significantly on the transaction costs of repayment collection without encountering any added risk of loan default. Shankar (2007) points out that a more flexible payment collection lowers the transaction costs for MFIs, thus enhancing operational self-efficiency and sustainability.

The current study investigates delinquency, a component of financial sustainability, and analyzes the relationship between the delinquency rate and operational efficiency, the interest rate, the average loan amount, specific borrowers’ characteristics, and overall economic conditions. Profit driven MFIs apply strict repayment policies and approach clients more

conservatively, than outreach driven institutions. The comparison of the quality of loan portfolio of MFIs in Russia and the Caucasus will provide the insights into MFIs' operating conditions and show how such conditions, if not homogenous, affect financial sustainability of the institutions.

This study expands upon current empirical work by focusing on the analysis of financial sustainability of MFIs in Russia, the Caucasus, and Central Asia. To perform quality comparative analysis, a broad range of possible factors has been selected to control for socio-economic and political differences between the selected countries and sub-regions, including financial indicators and region-specific demographic, economic, and poverty characteristics.

### **Methodology and Model**

The examination of the MFIs' performance requires the specific analysis framework. The measurement the MFIs' performance involves five major areas: breadth of outreach, depth of outreach, portfolio quality (delinquency), operating efficiency, and profitability (Rosenberg, 2009). The breadth of outreach can be represented by the number of active clients, including borrowers, depositors, clients receiving other financial services, and the number of borrowers' accounts. The depth of outreach is usually defined by a rough proxy of the average outstanding balance as a percentage of per capita GNI. Rosenberg (2009) stresses that small loan amounts do not necessarily imply poor borrowers, while the increase in loan amounts does not manifest the mission drift by the MFI. Therefore, it is more appropriate to use income level of borrowers as a measure of the depth of outreach.

According to Rosenberg, the analysis must also incorporate financial performance indicators. Portfolio quality (loan repayment) is a very important indicator of the MFIs' performance, because high delinquency makes financial sustainability less attainable. The

standard measure of loan delinquency is portfolio at risk beyond 30 days. Common profitability measures include the return on assets and return on equity indicators. Two main indicators that measure operating efficiency are the operating expense ratio and cost per client/loan (Rosenberg, 2009).

The above described framework is of particular interest to this research. Recently, Quayes (2012) examined the issue of the trade-off between outreach, measured as the average loan amount per borrower normalized by gross national income, and financial sustainability, approximated with the operational self sufficiency ratio. The results showed that the depth of outreach and financial performance are not only positively correlated but, when account for dynamic interaction, reinforce each other. The author also asserts that financial sustainability positively affects the depth of outreach. Operationally self-sufficient MFIs provide, on average, smaller loans. However, Quayes noted that the breadth of outreach negatively affects the financial performance. Therefore, contrary to the common beliefs, Quayes argues that policy makers should encourage the financial sustainability drive of MFIs.

Sharing the belief that financial sustainability is crucial under the conditions of shrinking and inconsistent donor aid, Ayayi and Sene (2010) investigate the most relevant factors that promote financial self-sufficiency of MFIs. A high quality credit portfolio, adequate interest rates, and effective management are the three most significant components of the MFIs' financial sustainability, while the client outreach and the age of MFIs affect it marginally. Specifically, Ayayi and Sene state that the portfolio quality as a result of solid credit risk management is the determining factor of financial sustainability, as its respective coefficient possessed the highest absolute value in the estimation results. The authors note that the percentage of women borrowers does not seem to have an effect on financial sustainability. They emphasize that the

application of adequately high interest rates, as a main source of profit, in combination with quality management ensuring adequate cost control and information systems, and effective banking practices, are required to achieve and maintain financial sustainability. Moreover, Ayayi and Sene found that the same major findings are true for the geographical region, credit method, and legal status specifications.

Similar to Ayayi and Sene (2010) and Quayes (2012), in this study financial sustainability of MFIs is considered to be the driving force behind the poverty alleviation objective. The financial sustainability is assessed through portfolio quality (delinquency), profitability, and poverty outreach indicators. Following the methodology, described by (Rosenberg, 2009), Ayayi and Sene (2010), and Barry and Tacneng (2011), the following hypotheses were specified:

- a) first, loan portfolio quality is assessed through the portfolio-at-risk indicator, where the inverse relationship with financial sustainability is assumed, as a significant reduction in the MFI's loan portfolio increases its profits, thus positively affecting financial sustainability of MFIs;
- b) second, profitability is measured with the application of interest rates that directly affect financial sustainability through the generation of adequate profit margins;
- c) finally, poverty outreach, measured as the average loan balance per borrower, is considered to have a positive impact on the financial sustainability of MFIs.

Determining how the described indicators are affected by various external and internal financial (such as socio-economic) forces is crucial for the policy development that, in turn, will enhance MFIs' financial efficiency.

In order to test the assumption whether the MFIs' in the sub-regions (i.e., Russia, Central Asia, and the Caucasus) operate in similar socio-economic conditions, and, thus, can be treated as a single region's MFIs, each equation in the system is estimated using Seemingly Unrelated Regression (SUR) technique (Zellner, 1971). Typically, a SUR system of equations involves several estimating equations for different dependent variables that are suspected to have correlated disturbances. This analysis applies the SUR system differently. A common form of an estimated equation for a variable of interest is used for each system of equations. To recall, the (dependent) variables of interest in this analysis are the portfolio at risk, the gross yield on loan portfolio, and the average loan amount. In each system of equations, each individual equation corresponds to a regional version of the common estimating equation.

An often used specification test for the SUR model is the Breusch-Pagan test of independent errors. The Breusch-Pagan test is used to test the assumption that the errors across equations are contemporaneously correlated. The null hypothesis is the absence of contemporaneous correlation. The alternative hypothesis is contemporaneous correlation. If the BP test suggests independence of the individual regional equations, then OLS procedures are used to separately derive the coefficient estimates. In addition, every equation in the estimation was tested for heteroskedasticity and multicollinearity. While no multicollinearity issue was detected in the estimation, the existing heteroskedasticity problem was controlled with the robust standard error estimation technique. Finally, since the data are estimated as cross-sectional and not as panel with time co-variates, no serious autocorrelation issue is applicable.

For every country/region the following SUR model was specified to account for potentially correlated error terms:

$$(1) Y_i = \alpha + \beta X_i + \varepsilon_i,$$

where Y is a profitability, delinquency, or outreach indicator for  $i_{th}$  region, X is a matrix of exogenous MFI-level and Country/Region-level control variables, and  $\varepsilon_i$  is the error term.

Based on the general model specification above, the final model with three separately estimated equations measuring delinquency, profitability, and outreach, respectively, was specified as follows:

$$(2) \quad PortRisk_i = \alpha_0 - \alpha_1 \ln Loan_i - \alpha_2 Borstaff_i - \alpha_3 Women_i - \alpha_4 \ln Glp_i + \alpha_5 Gpyield_i + \alpha_6 Rur_i - \alpha_7 \ln Inc_i + \alpha_8 Unemp_i + \alpha_9 Agric_i + \varepsilon_i,$$

$$(3) \quad Gpyield_i = \beta_0 - \beta_1 \ln Loan_i - \beta_2 \ln Glp_i - \beta_3 ROE_i + \beta_4 OELP_i + \beta_5 DEratio_i - \beta_6 Women_i - \beta_7 Rur_i + \beta_8 \ln Inc_i - \beta_9 Agric_i + \beta_{10} PortRisk_i + v_i,$$

$$(4) \quad \ln Loan_i = \gamma_0 - \gamma_1 Borstaff_i - \gamma_2 \ln Bor_i - \gamma_3 ROE_i - \gamma_4 DCratio_i - \gamma_5 Women_i - \gamma_6 Rur_i + \gamma_7 \ln Inc_i - \gamma_8 Agric_i - \gamma_9 PortRisk_i + v_i.$$

where  $PortRisk_i$  is a ratio of outstanding principal balance of loans past due more than 30 days to outstanding principal balance of all loans;  $Loan_i$  is the average loan amount per borrower, that along with  $Women_i$ , the percent of women borrowers in each MFI, represents measures of the depth of outreach;  $Bor_i$ , the number of active borrowers, is a measure of the breadth of outreach;  $Gpyield_i$ , a ratio of financial revenue from loan portfolio to the average gross loan portfolio, a proxy variable for the interest rate, which along with  $ROE_i$ , return on equity, represent revenue/profitability measures;  $Borstaff_i$ , the staff efficiency and productivity indicator, is the number of borrowers per staff member; and  $OELP_i$ , operating expense over loan portfolio, is used as an indicator of operational efficiency. In addition,  $Glp_i$ , the gross loan portfolio, is used to control for the size of MFIs, while  $DEratio_i$ , debt to equity ratio,  $DCratio_i$ , deposits to total capital ratio, are incorporated as indicators of financial health of MFIs that capture the funding arrangements considered by the MFIs. This study incorporates country-level controls of the

depth of outreach, such as  $Rur_i$ , the percent of rural population,  $Unemp_i$ , the level of regional unemployment,  $Agric_i$ , the level of agricultural production as a fraction of the total value added in the region's economy (total value added is equivalent to regional gross domestic product less net taxes), and  $Inc_i$ , the average annual per capita income, in all three equations to capture country/region specific socio-economic characteristics. Similar to Barry and Tacneng (2011), lin-log functional form was applied in PortRisk and Gpyield equations, and log-lin specification was used in lnLoan equation, similar to Quayes (2012).

## **Data**

The study uses the financial data for the period 2007-2008 obtained from the Microfinance Information Exchange (MIX Market) online database (2011) and on the regional macroeconomic data obtained from the official national statistical bureaus' reports and databases in Russia, Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, and Tajikistan. The missing values were approximated with those from previous or more recent periods, based on the assumption that they remained constant throughout the years. However, 14 MFIs that account for 8% of total number of observations were excluded from the data set because of the lack of data for 2007 and 2008 or data from other periods to estimate the missing values. The final panel dataset was composed of the financial and macroeconomic data from 73 MFIs in Russia, 39 MFIs in the Caucasus, and 48 MFIs in Central Asia. Because the number of observations for different regions varied, the Bootstrap Excel statistical tool was used to generate the equal amount of observations across the regions (Barreto and Howland, 2006).

Similar to Ayayi and Sene (2010) and Quayes (2012), in this study, the MIX Market data were used to obtain the financial and outreach indicators from 160 MFIs in the selected countries. The included indicators are the portfolio at risk beyond 30 days and the borrowers per

staff member ratio, the return on equity ratio, the operating expense per loan portfolio and the debt to equity ratios, the deposit to total capital ratio, calculated as a ratio of MFI's total deposits to total capital, the average yield on gross portfolio in percent, along with the data on non-ratio-based indicators, such as the average loan amount per borrower, MFI's gross loan portfolio, the number of active borrowers, as well as the percent of women borrowers, calculated as a fraction of total women borrowers in the total number of active borrowers in each institution. The average yield on gross portfolio is used to approximate the average interest rate, charged by MFIs (Srinivasan, 2009).

The current study incorporates region-specific macroeconomic indicators, including the percent of rural population, the level of unemployment, the average annual per capita income in national currency units, and the percent of agricultural output in total value added obtained from the official national statistics to capture the differences in poverty levels. Also, to account for the environment in which the selected MFIs operate, the study includes the general measures of overall socio-economic conditions of the regions (National Statistics Office of Georgia, 2011; National Statistical Service of the Republic of Armenia, 2011; Russian Federation Federal State Statistical Service, 2011; The State Statistical Committee of the Republic of Azerbaijan, 2011; the Agency of Statistics of the Republic Kazakhstan , 2011; the Kyrgyz Republic National Statistical Committee, 2011; the Agency on Statistics under President of the Republic of Tajikistan, 2011).

MIX Market database has all individual currency figures converted into U.S. dollars. In addition, all dollar denominated variables are in 2005 dollars based on U.S. CPI, while non-dollar values of the annual per capita income in each country, before being deflated by CPI, were

first converted into U.S. dollars based on the World Bank official exchange rates of 2007 and 2008 (World Bank, 2011).

## **Results**

In the first stage, each equation was simultaneously estimated for the three regions of the ECA. The Breusch-Pagan  $\chi^2$  statistic was calculated to test the null hypothesis that the error terms are not correlated (Table 1). The results of the tests for the portfolio at risk and the average loan amount per borrower equations failed to reject the null hypothesis, thus suggesting that Russia, Central Asia, and the Caucasus are not homogenous and, therefore, cannot be treated as a single region. In contrast, the test result proved to be significant in the case of interest rate equation, suggesting that the MFIs in the three regions have homogenous interest rate policies. Because the financial sectors of the three regions are young and still in the stage of development, their interest rate policy can be expected to be comparable.

In the second stage, each of the three equations was separately estimated for each country/region (with exception of interest rate equation where the homogeneity of regions' MFIs was confirmed) with OLS RSE procedure that produces identical results as SUR technique while also addressing the issue of heteroskedasticity.

With respect to the portfolio at risk equation, regression results for Russian MFIs, shown in Table 2, suggest significant relationship of the average loan amount, the borrowers per staff ratio, a measure of staff efficiency, and the unemployment level to the portfolio at risk. Specifically, a 10% increase in the loan size decreases the delinquency rate by 3.1%, and 10 points increase in staff efficiency decreases risk by 0.2%, again suggesting that more efficient Russian MFIs have a better loan portfolio quality. In addition, as anticipated, the increase in the unemployment level further increases the risk associated with the loan default in Russia. The

regression results for the Caucasus Region, also depicted in Table 2, showed a significant negative relationship between the borrowers per staff member ration and the portfolio at risk. According to the results, for every 10 points increase in the staff member's efficiency, the portfolio at risk declines by 0.2% in the Caucasus MFIs. Finally, in the case of Central Asia, 10 points increase in the borrowers per staff ratio decreases the risk of default by 0.2%, again suggesting that staff efficiency positively affects the quality of loan portfolio of MFIs in Central Asia. In addition, the increase in income reduces the portfolio at risk. A 10% increase in the average per capita income results in 1.3% decline in the delinquency rate. However, the unexpected directional effect of the unemployment level lowering the risk of default in Central Asia can be a result of questionable official unemployment data values used in the analysis.

Table 3 reports the estimation results of the yield on gross portfolio equation for the combined region of Russia, the Caucasus, and Central Asia. A negative relationship is found between the loan size and the interest rate, where a 10% increase in the loan amount results in 5.2% decline in the interest rate. This result suggests that smaller loans perceived as more risky by the region's MFIs, which is consistent with the earlier explanation that MFIs here lend less to higher risk clients. An inverse relationship was found between the gross loan portfolio, a measure of size, and the interest rate, supporting the hypothesis that as MFIs reach economies of scale, they become more efficient, and, therefore, likely to lower their interest charges to borrowers. On the other hand, it also implies higher interest rates for small loan portfolios, suggesting that when the MFI's operations are small-scale, it charges higher interest because it is less cost efficient, i.e., its marginal costs of supplying a loan are higher than the costs of larger MFIs. This finding is consistent with the earlier stated explanation that MFIs in the region lend less to higher risk clients, which translates into higher interest rates for smaller loans.

A highly significant positive relationship was found between the return on equity and the interest rate. The result provides the evidence of the mission drift in Russian, Caucasian, and Central Asian MFIs. A similar significant positive relationship between the increase in operating expenses and the increase in interest implies that higher interest is needed to cover the extra cost of low operational efficiency of MFIs in the region. Also, consistent with common financial practices, the increase in the portfolio at risk results in the interest rate growth, as MFIs counteract increased delinquency with increased interest rate to cover their losses from loan defaults.

A positive association was established between the share of women and rural borrowers and the yield on gross portfolio (Table 3). A 10% increase in the share of women or rural borrowers resulted in 1.9% or 1.3% increase in the interest rate, respectively. The obtained results suggest that, in Russia, the Caucasus, and Central Asia, lending to women or rural borrowers is associated with higher risk to MFIs. The explanation for this unexpected result lies in the MFIs' perception of women and rural borrowers in the region as those with low or unstable income, which makes them high risk borrowers. In contrast, rural borrowers engaged in agricultural production are considered to be more reliable borrowers than off-farm rural borrowers, as 10% increase in agriculture-related borrowers decreases the interest rate by 4.2%. A plausible explanation is that MFIs see farmers as borrowers with consistent history of employment, income, and marketable asset ownership. In contrast, off-farm rural borrowers are deprived of the permanent employment opportunities as a result of low economic activity in rural areas resulting in higher unemployment levels. Because rural borrowers do not have permanent employment and regular income or liquid assets, they are considered less reliable clientele.

In the average loan amount equation, in case of Russia, *borstaff*, *women*, *lninc*, and *portrisk* found to be significantly related to the average loan amount. Income is positively associated with the loan size (Table 4), while the percentage of women borrowers is inversely related to the loan amount. Borrowers with higher income are served with larger loans, while women borrowers are served with smaller loan amounts. Assuming the reverse relationship between the loan size and outreach, small loan disbursements among women borrowers manifest the increase in the depth of outreach. In addition, the improved staff efficiency positively affects the depth of outreach, and it can be expected that a 10% increase in the borrowers per staff member ratio results in reduced loan size by 3.4%, suggesting that as MFI becomes more efficient it is able to provide more loans to a larger number of poor clients. Similarly, the increased portfolio at risk level results in greater poverty outreach, as MFIs in Russia tend to offer smaller loans to protect themselves from growing risk of loan default. A 10% increase in delinquency rate reduces the loan size by 0.8%, manifesting significant caution on behalf of Russian MFIs that in the long-run results in improved poverty outreach.

In case of the Caucasus, five explanatory variables, such as *borstaff*, *lnbor*, *dcratio*, *rur*, and *lninc* are significantly related to the loan size in the Caucasus region loan size equation (Table 4). The improvement of staff efficiency by 10% results in a 5.3% reduction in the loan amount, which translates into the improved depth of outreach. In addition, the increased number of borrowers, a measure of the breadth of outreach, also positively affects the depth of outreach, where the growth in the number of borrowers by 10% reduces the loan amount by 0.7%, again manifesting the improved poverty outreach by the region's MFIs. On the contrary, the increase in the percentage of rural borrowers, along with the increase in income, translates into larger loan

sizes, thus negatively affecting the depth of outreach. Also, the improved deposit to capital ratio allows Caucasian MFIs to provide larger loans to borrowers, as they accumulate more deposits.

In Central Asia, the increased borrowers per staff ratio, as well as the increased number of total borrowers, both negatively affect the loan size, suggesting that improved productivity and the breadth of outreach promotes increased poverty outreach by Central Asian MFIs. Also, the increase in the return on equity by 10% results in the 0.8% decline of the loan amount, suggesting that as the region's MFIs become more profitable, they tend to increase the depth of outreach. Furthermore, the result implies a complementary relationship between outreach and financial sustainability in Central Asian MFIs. The increase in deposit accumulation results in larger loans provision. The increase in the percentage of women and rural borrowers positively affects outreach, as more women and rural residents receive smaller loans. The income and the loan amount are inversely related, with lower income borrowers receiving larger loans. In contrast, *agric* variable is positively related to the loan size, suggesting that farmers in Central Asia require larger loans to cover the production costs. Moreover, high demand for agricultural products in the region, encouraging investment, induces demand for larger loans.

## **Conclusions**

The collapse of state-ownership, a consequence of the dissolution of the Soviet Union, created new conditions leaving many people jobless. A new era of self-employment and small businesses began throughout the region. Microfinance sector emerged and has become a mechanism of financial support to small entrepreneurs that commercial banks considered “non-bankable.” This study considers financial sustainability the key element of poverty outreach expansion. The objective of the study was a comparative analysis of the performance of MFIs in Russia and the Caucasus to assess and evaluate factors responsible for achieving and maintaining

financial sustainability of MFIs. The analysis focused on three essential measures of the MFIs' performance: loan portfolio quality (delinquency), profitability, and outreach, measured by the portfolio at risk beyond 30 days, the interest rate, and the average loan amount.

The estimation results for the loan portfolio quality suggested that Russian MFIs lend less to high risk borrowers. Furthermore, in Russian, Caucasian, and Central Asian MFIs, the higher borrower-per-staff ratio positively effects the loan portfolio quality. With regard to profitability MFIs in the ECA region are cautious and conservative in the lending decisions. They also suffer from the mission drift. An alarming tendency of the mission drift translates the increase in profitability into the increase in the interest rate. Moreover, the mission drift detracts MFIs from the objective of poverty alleviation at the early stage of development. With respect to outreach, measured by the average loan amount, MFIs in Central Asia are more outreach oriented, whereas MFIs in Russia and the Caucasus possess rather conservative lending practices. However, the ECA MFIs are expected to achieve a greater depth and breadth of outreach upon maturation.

The study has encountered several potentially serious limitations in the data selection process. Specifically, some observations were unusable as a result of limited availability of the location-specific indicators. Also, the proxy in the form of the yield on gross portfolio was used in the absence of data on interest rates.

From the perspective of future research, it is desirable to track how the relatively younger MFIs will weigh between social outreach and financial sustainability goals, as they mature. The contention of the current study is that young ECA MFIs prioritize financial sustainability. However, future research is needed to confirm or reject the current expectation.

## References

Agency of Statistics of the Republic Kazakhstan. Internet site:

<http://www.stat.kz/Pages/default.aspx/> (Accessed August, 2011).

Agency on Statistics under President of the Republic of Tajikistan. Internet site: <http://stat.tj/en/>

(Accessed August, 2011).

Arena, T. 2008. "Social Corporate Governance and the Problem of Mission Drift in Socially-Oriented Microfinance Institutions." *Columbia Journal of Law & Social Problems* 41(3):269-316.

Armendáriz, B., and A. Szafarz. 2011. "On Mission Drift in Microfinance Institutions." In B. Armendáriz and M. Labie, ed. *The Handbook of Microfinance*. Toh Tuck Link, Singapore: World Scientific Publishing Co. Pte. Ltd, pp.341-366.

Augsburg, B., and C. Fouillet. 2010. "Profit Empowerment: The Microfinance Institution's Mission Drift." *Perspectives on Global Development & Technology* 9(3/4):327-355.

Ayayi, A.G., and M. Sene. 2010. "What Drives Microfinance Institution's Financial Sustainability." *Journal of Developing Areas* 44(1):303-324.

Barreto, H., and F.M. Howland. 2006. *Introductory Econometrics: Using Monte Carlo Simulation with Microsoft Excel*. New York: Cambridge University Press.

Barry, T.A., and R. Tacneng. 2011. "Governance and Performance: Evidence from African Microfinance Institutions." Working paper, Laboratoire d'Analyse et Prospective Économiques (LAPE), Université de Limoges, France.

Bossoutrot, S.K. 2005. *Microfinance in Russia: Broadening Access to Finance for Micro and Small Entrepreneurs*. Washington DC: World Bank Publications.

Brau, J.C., and G.M. Woller. 2004. "Microfinance: A comprehensive Review of the Existing Literature." *Journal of Entrepreneurial Finance and Business Ventures* 9(1):1-26.

- Conning, J. 1999. "Outreach, Sustainability and Leverage in Monitored and Peer-monitored Lending." *Journal of Development Economics* 60(1):51-77.
- Cull, R., A. Demirgüç-Kunt, and J. Morduch. 2007. "Financial Performance and Outreach: A Global Analysis of Lending Microbanks." *Economic Journal* 117(1):517.
- Field, E., and R. Pande. 2008. "Repayment Frequency and Default in Microfinance: Evidence from India." *Journal of the European Economic Association* 6(23):501-509.
- Forster, S., S. Greene, and J. Pytkowska. 2003. *The State of Microfinance in Central and Eastern Europe and the New Independent States*. The Consultative Group to Assist the Poor (CGAP). Washington DC.
- Gonzalez, A., and R. Rosenberg. 2006. *The State of Microcredit: Outreach, Profitability and Poverty*. Microfinance Information Exchange, Inc. (MIX) and The Consultative Group to Assist the Poor (CGAP). Washington DC.
- Khalily, M.A.B. 2004. "Quantitative Approach to Impact Analysis of Microfinance Programmes in Bangladesh—What Have We Learned?" *Journal of International Development* 16(3):331-356.
- Kyrgyz Republic National Statistical Committee. Internet site:  
[http://212.42.101.124:1041/stat1.kg/index.php?option=com\\_content&task=view&id=35&Itemid=101](http://212.42.101.124:1041/stat1.kg/index.php?option=com_content&task=view&id=35&Itemid=101) (Accessed August, 2011).
- Microfinance Information Exchange, Inc. (MIX). Washington DC. Internet site:  
<http://www.mixmarket.org/> (Accessed August, 2011).
- National Statistics Office of Georgia. Internet site:  
[http://www.geostat.ge/index.php?action=wnews\\_archive&lang=eng](http://www.geostat.ge/index.php?action=wnews_archive&lang=eng) (Accessed August, 2011).

National Statistical Service of the Republic of Armenia. Internet site:

<http://www.armstat.am/en/?nid=45> (Accessed August, 2011).

Nawaz, A. 2010. "Issues in Subsidies and Sustainability of Microfinance: An Empirical Investigation." Working paper 10/010, Solvay Brussels School of Economics and Management, Centre Emile Bernheim, Université Libre de Bruxelles.

Pretes, M. 2002. "Microequity and Microfinance." *World Development* 30(8):1341-1353.

Quayes, S. 2012. "Depth of Outreach and Financial Sustainability of Microfinance Institutions." *Applied Economics* 44(26):3421.

Rosenberg, R. 2009. *Measuring Results of Microfinance Institutions—Minimum Indicators that Donors and Investors Should Track*. Consultative Group to Assist the Poor (CGAP)/The World Bank. Washington DC, June.

Russian Federation Federal State Statistical Service. Internet site:

<http://gks.ru/wps/wcm/connect/rosstat/rosstatsite.eng/> (Accessed August, 2011).

Schicks, J. 2007. "Developmental Impact and Coexistence of Sustainable and Charitable Microfinance Institutions: Analysing BancoSol and Grameen Bank." *European Journal of Development Research* 19(4):551-568.

Shankar, S. 2007. "Transaction Costs in Group Microcredit in India." *Management Decision* 45(8):1331-1342.

Srinivasan, N. 2009. *Microfinance India: state of the sector report 2008*. New Delhi: Sage Publications Pvt. Ltd.

State Statistical Committee of the Republic of Azerbaijan. Internet site:

<http://www.azstat.org/indexen.php> (Accessed August, 2011).

World Bank Indicators. Internet site: <http://data.worldbank.org/indicator> (Accessed August, 2011).

Zellner, A. 1971. *An Introduction to Bayesian Inference in Econometrics*. New York: John Wiley and Sons.

Microfinance Information Exchange, Inc. (MIX). 2007. *Сравнительный Анализ*

*Микрофинансирования в Восточной Европе и Центральной Азии - 2006г.*

Вашингтон, Ноябрь.

Microfinance Information Exchange, Inc. (MIX). 2007. *Comparative Analysis of Microfinance*

*in Eastern Europe and Central Asia – 2006*. Washington DC, November.

**Table 1.** The Breusch-Pagan Test for Independence for Russia, the Caucasus, and Central Asia

Equation	BP $\chi^2$ statistic	P-value
Portfolio at Risk	3.971	0.2647
Yield on Gross Portfolio	15.759**	0.0013
Average Loan Amount	0.866	0.8336

\*\* significant at the 5% level.

**Table 2.** OLS RSE Regression Results for the Portfolio at Risk

Variable name	Coefficient	RSE	P-value	Coefficient	RSE	P-value	Coefficient	RSE	P-value
	Russia			The Caucasus			Central Asia		
Inloan	-2.045**	0.9441	0.032	-0.732	0.6854	0.288	-0.112	0.2795	0.690
borstaff	-0.025**	0.0111	0.028	-0.021**	0.0094	0.027	-0.019**	0.0091	0.039
women	0.075	0.0784	0.339	0.008	0.0291	0.788	-0.009	0.0177	0.604
lnglp	0.294	0.5669	0.605	0.292	0.2171	0.182	0.106	0.1179	0.369
gpyield	0.048	0.0649	0.459	-0.055	0.0399	0.171	0.027	0.0189	0.150
rur	0.060	0.1159	0.605	-0.043	0.0343	0.217	-0.026	0.2852	0.367
lninc	4.507	4.3936	0.307	0.067	0.5447	0.902	-0.844*	0.4649	0.072
unemp	0.712*	0.4025	0.079	0.011	0.0422	0.791	-0.187**	0.0785	0.019
agric	-0.421	0.3959	0.290	-0.090	0.0706	0.204	-0.005	0.0166	0.767
constant	-28.320	36.6903	0.442	8.335	6.3262	0.190	10.428	4.9051	0.035
R <sup>2</sup>	0.1292			0.0945			0.1374		

\* significant at the 10% level. \*\* significant at the 5% level.

**Table 3.** OLS RSE Regression Results for the Yield on Gross Portfolio

Variable name	Coefficient	RSE	P-value
The ECA region			
lnloan	-2.169*	1.1634	0.063
lnglp	-0.914**	0.4590	0.047
roe	0.008**	0.0026	0.003
oelp	0.228*	0.1305	0.081
deratio	-0.011	0.0091	0.213
women	0.193**	0.0555	0.001
zur	0.129**	0.0649	0.046
lninc	-1.394	1.2231	0.255
agric	-0.422**	0.0791	0.000
portrisk	0.201	0.1399	0.151
constant	61.454	17.2196	0.000
R <sup>2</sup>	0.2926		

\* significant at the 10% level. \*\* significant at the 5% level.

**Table 4.** OLS Regression Results for the Average Loan Amount

Variable name	Coefficient	SE	P-value	Coefficient	SE	P-value	Coefficient	RSE	P-value
	Russia			The Caucasus			Central Asia		
borstaff	-0.004**	0.0008	0.000	-0.006**	0.0015	0.000	-0.012**	0.0030	0.000
lnbor	-0.020	0.0604	0.736	-0.073*	0.0434	0.093	-0.091**	0.0443	0.041
roe	-0.000	0.0002	0.517	0.001	0.0020	0.532	-0.005*	0.0031	0.099
dcratio	0.001	0.0009	0.203	0.232**	0.0961	0.016	0.323**	0.0810	0.000
women	-0.032**	0.0054	0.000	-0.006	0.0044	0.184	-0.009**	0.0038	0.028
rur	-0.010	0.0078	0.201	0.015**	0.0050	0.003	-0.025**	0.0071	0.001
lninc	0.665*	0.3377	0.049	0.454**	0.1638	0.006	-0.255*	0.1528	0.098
agric	-0.012	0.0276	0.677	0.001	0.0131	0.937	0.012**	0.0058	0.047
portrisk	-0.013*	0.0067	0.056	-0.011	0.0152	0.478	0.006	0.0245	0.816
constant	4.692	2.9762	0.115	4.417	1.3201	0.001	11.854	1.0291	0.000
R <sup>2</sup>	0.3775			0.2500			0.3886		

\* significant at the 10% level. \*\* significant at the 5% level.