THE UNIVERSALITY OF THE MICROFINANCE OPERATIONS MODEL: A COMPARATIVE ANALYSIS OF MICROFINANCE INSTITUTIONS IN EASTERN EUROPE, CENTRAL ASIA, AND INDIA

by

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(Under the Direction of Cesar L. Escalante and Wojciech J. Florkowski)

ABSTRACT

The dissolution of the Soviet Union and the collapse of state-ownership launched a new era of self-employment and small businesses throughout the region. Microfinance has become a mechanism of financing small entrepreneurs that mainstream banks considered "non-bankable." This research addresses the important question of the universality of the microfinance lending model by analyzing the operating environments and operating strategies of microfinance institutions (MFIs) in several regions of Eastern Europe, Central Asia, and India. The analysis focuses on three essential components of MFIs' performance: loan portfolio quality (delinquency), profitability, and outreach. The empirical results suggest that no universal model is applicable for MFIs in different regions and countries. Indian MFIs are more outreach oriented, whereas Eastern European and Central Asian (ECA) MFIs are more conservative and primarily driven by the financial bottom-line. However, the ECA MFIs are expected to achieve greater poverty outreach upon maturation.

INDEX WORDS: Microfinance sector, Microfinance institution, Financial sustainability, Social outreach, Seemingly Unrelated Regression estimation, Eastern Europe and Central Asia, India

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DEDICATION

Dedicated to my parents, Ihor Sheremenko and Dali Shengeliia, my sister Yana Sheremenko, and my beloved George Kazarian, for their love and support.

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INTRODUCTION AND BACKGROUND

1.1. Introduction

Microfinance, a well-known financial tool for poverty alleviation, was developed to spur economic development and to promote business engagement of the poor in remote and least-advantaged areas of the developing world. Because poor people are more exposed to risks and external shocks of losing their often times unstable sources of income, than marginally poor or non-poor individuals, they are considered "non-bankable" by mainstream financial institutions, such as commercial banks. As a result, the poor are deprived of access to financial services that banking institutions provide. Therefore, the goal of microfinance is to make major financial services, including microcredit, accessible to the poor who, although they have skills and willingness to work, require a loan to meet capital investment requirements in the form of new equipment, adequate volume and quality of raw materials, and other inputs.

Being excluded from mainstream financial services due to the absence of physical collateral and savings, poor households have traditionally dealt with risk and uncertainty through borrowing from family members, friends, and informal moneylenders. However, family and friends financing is usually a one-time solution only, while informal financing, although more reliable, is very expensive as a result of enormous interest charged by informal moneylenders. In contrast, the introduction of microfinance and the development of microcredit and microfinance programs allowed poor households worldwide to obtain an efficient risk management tool that

can significantly improve their well-being in the long-run (Brau and Woller, 2004; Bossoutrot, 2005).

In developing countries, microcredit programs operate under the assumption that micro-loans they provide are the only formal financing mechanism available to meet the needs of micro-entrepreneurs. Therefore, micro-borrowers have a strong sense of obligation to repay their loans, which along with the imposed discipline of loan repayment, enables them to build a credit history and to open access to traditional capital markets (Pretes, 2002).

Microcredit programs are designed to distribute and collect small short-term loans, as well as to provide the financial and organizational activities associated with these lending operations. In contrast, microfinance programs provide a complex of financial services, including credit, savings, insurance, along with community development services, such as health education and business development training (Brau and Woller, 2004; Qudrat-I Elahi and Lutfor Rahman, 2006). From the lending perspective of microfinance, two major types of loans are typically offered to the poor worldwide: business loans and consumption/emergency loans. Although a lion's share of loans provided by microfinance institutions (MFIs) are small business loans, significant demand exists for consumption and emergency loans in developing countries (Brau and Woller, 2004). The average micro-loan amount ranges from $50 to $150 distributed at typically high interest rates averaging at about 35%. High interest rates charged for microcredit is associated with higher operating costs of reaching out to the poor. However, though higher than the rates charged by mainstream banking sector, microcredit interest rates are modest in comparison to those charged by local moneylenders. As a result, typical repayment rates on micro-loans are usually above 95%, while some reach as high as 100% (Greene and Gangemi, 2006; Augsburg and Fouillet, 2010).

Surprisingly enough, in addition to loans, there is a market for savings in microfinance, where apart from voluntary savings, many MFIs have established "forced savings programs" that require their clients to save a certain amount in a set period of time. The forced savings serve as "cash collateral" and promote financial discipline among clients (Brau and Woller, 2004).

As microfinance operations proliferate across several regions of the world, it is logical to assume that the operating challenges that MFIs face are influenced by peculiar demographic, social, behavioral, and economic characteristics of each regional or country location. This research addresses the important question on the universality of the microfinance lending model by analyzing the operating environments and operating strategies of MFIs in several regions. The following sections in this chapter will help develop a clearer understanding of the goals and objectives of this research. The basic MFI paradigm, including its two-pronged goals of financial sustainability and social outreach, will be discussed in the first few sections. The latter sections in this chapter will then provide an overview of the MFI operations in the study's regions of interest. The discussion will lead to the formulation of the primary goal of the study, addressing the case for regional, instead of universal, models of microfinance operations.

1.2. The Group Lending Scheme in Microfinance

Because micro-loan borrowers have no traditional collateral, most MFIs instead apply more innovative lending techniques in the form of social collateral, such as group lending to reduce the risks and costs of making loans. Group lending is based on joint liability notion, under which each member of the group is held responsible for other group members' loans. If one member fails to repay a loan, the other group members are required to cover his/her loan with their own resources, otherwise they will not receive any loans in the future. Therefore, it is in every member's best interest to make sure that the other members do not default on their loans

(Stiglitz, 1990; Wenner, 1995; Al-Sultan, 1997; Gomez and Santor, 2001; Woolcock, 2001; Karnani, 2007).

With regard to group lending, there exist two different ways of organizing MFIs activity that have resulted in the formation of two distinct group systems for micro-financial services. One of them is the Grameen Bank System ("the Grameen System"), widespread in Bangladesh and more than twenty countries in South America, Africa, and Eastern Europe. The other group system is the Self-Help Groups System ("the SHG System"), dominant in India and less so in Indonesia, parts of South East Asia and Africa (Harper, 2002).

In the Grameen System, borrowers are organized into groups of five members, and then, the clusters of five to seven such groups are formed into each MFI. Each member has individual savings and credit accounts with the MFI, allowing him/her to make regular savings, given fixed compulsory schedule, and to take regular loans. Under the Grameen System, MFIs dependent on low or no-cost foreign donations with only about 20% of funds generated through members' savings. Although the interest rate charged by MFIs varies depending on a country, its minimum estimate is about 24%, but often times it is substantially higher, reaching 48% per year (Morduch and Rutherford, 2003).

In the SHG System, borrowers form a self-help group of up to 20 members, contribute regular savings payments to the SHG, and then begin to borrow individually from the SHG, on terms and at interest rates developed within the group. Next, in order to generate funds for its members and to qualify for a bank loan, the group opens a savings account in the SHG's name with the MFI, which in turn grants a loan to the SHG. In essence, the SHG is an autonomous financial organization, a micro-bank that performs all necessary savings and lending operations on its own terms. The members have their accounts with the SHG, not with the MFI, since it

does not directly deal with the members. The MFIs normally lend to SHGs at about 12% interest rate, while the SHG members choose to charge themselves from 12% to 60% interest. The repayment rates are high, normally above 95% (Harper, 2002).

Although the majority of micro-loans are composed of group loans, individual loans are more common in Eastern Europe and Russia, in particular (Baum and Sapundzhieva, 2008). Individual lending is provided through direct monitoring, regular repayment schedules, and non-refinancing threat practices (Armendariz de Aghion and Morduch, 2000).

1.3. Client Targeting

Another distinct feature of microfinance is "client targeting" that is performed through "gender targeting" and "poverty targeting." Gender targeting implies focusing on female rather than male borrowers, as women are perceived to invest more in business establishment and family well-being, whereas men are more prone to consume the loans rather than invest the money for future benefit. In addition, with higher repayment rates than men, women represent a smaller credit risk category for MFIs. (Pitt and Khandker, 1998; Brau and Woller, 2004; Engler, 2009; D'Espallier et al., 2011). Furthermore, MFIs around the globe tend to target specifically women in order to promote gender equality, which, as studies suggest, has positive effects on the community. The World Bank official reports indicate that countries with gender inequality and women discrimination issues are also those with high poverty levels and weak economic growth (Cheston and Kuhn, 2002). Poverty targeting, accomplished through lending to the very poor rather than marginally poor, is in turn, directly associated with the depth of the social outreach of MFIs, which can be contradictory to the financial sustainability paradigm (Brau and Woller, 2004).

According to the type of institution, in contrast to the popular opinion suggesting that most MFIs operate as NGOs, state-owned MFIs along with Indian SHGs (the majority of SHGs are funded by state banks) together serve roughly 60% of total borrowers, while NGO MFIs account for less than 25% of the borrowers. The rest of the micro-clientele is served by commercial banks and other private financial entities (Gonzalez and Rosenberg, 2006).

1.4. Financial Sustainability

Unlike most microcredit programs that are funded by non-governmental organizations, non-profit in nature and dependent on external funding, microfinance programs are profit-driven with the goal of becoming self-sufficient and financially sustainable (Brau and Woller, 2004; Qudrat-I Elahi and Lutfor Rahman, 2006). Nevertheless, many MFIs cannot be considered sustainable (about 70% of all MFIs), since they are small start-up organizations that are unable to cover their costs. Most of them heavily rely on external funds provided by international donors and foreign and local governments (Brau and Woller, 2004; Hermes and Lensink, 2011). On the other hand, MFIs that have achieved financial sustainability (1-2% of all MFIs) tend to be, on average, larger, more mature, and regulated organizations that provide loans to marginally poor borrowers rather than to poor and very poor individuals (Simanowitz, 2002; Scully, 2004; Karnani, 2007; Hermes and Lensink, 2011). Such MFIs gain economies of scale by providing larger loans to the marginally poor or non-poor. This leads to a hypothesis that the very poor will be omitted by MFIs that seek financial sustainability, as such MFIs will not be able to achieve enough depth to reach borrowers in the desperate need of credit. (Navajas and Schreiner, 2000; Karnani, 2007; Schäfer et al., 2010).

1.5. Social Outreach Capabilities Optimization

Despite the obvious growth of microfinance in developing countries, the demand for its services continues to greatly outpace the growth in supply. In fact, the gap between the two is so big, that current supply levels will have to increase by several multiples to satisfy the needs of all the poor worldwide. The only possible way for the microfinance sector to achieve its goal is by gaining economies of scale. However, becoming large-scale operators requires sufficient amounts of external funds, as well as technological advances only available in mainstream financial sector (Bossoutrot, 2005; Buyske, 2007). Despite the negative attitudes of commercial banks towards providing loans to the poor, who are largely considered to be the high risk borrowers, microfinance programs have shown to be the ones with high returns and high repayment rates. Moreover, the unique lending techniques applied by MFIs, such as group lending practices, have proven to be highly efficient. Observed low delinquency and high efficiency of MFIs worldwide have shown that microfinance has a potential to be profitable.

Although engaging in microfinance activity requires a substantial amount of financial and human capital resources, time, and dedication, there are opportunities for financial sustainability and profitability for both microfinance institutions and their clients (Valenzuela, 2002). As a result, microfinance is receiving more attention from the mainstream finance than ever before, because the attractiveness of micro-lending services is growing for commercial banks. However, to facilitate the process of mainstream finance engagement in microfinance, a change must be made in the way the traditional financial industry perceives the poor. In addition, partnerships with MFIs and similar entities can become a way to expand in the new market of the very poor and poor clients though carefully defined group targeting with identified borrowers' specific

needs and tailored financial services. Furthermore, interest rates should be revised, particularly for the poor in the least-advantageous countries (Knight et al., 2009).

Nevertheless, the results of a vast majority of studies show that in more than thirty years of their existence, MFIs have proven to have a significant positive impact on economic development of the least-advantaged regions in such developing countries, as in Bangladesh, India, Indonesia, China, Sri Lanka, as well as countries in Africa and Central and South America, by improving the overall well-being of poor households and creating new employment opportunities for the poor (Navajas and Schreiner, 2000; Brau and Woller, 2004; Mosley and Steel, 2004; Knight et al., 2009). However, for these goals to be achieved, microfinance must target the most financially excluded individuals and communities; must have a positive impact on the labor market, where the financed self-employed individuals remain employed permanently; and must be financially sustainable, which implies that loans must be eventually paid back (Mosley and Steel, 2004).

1.6. The Case for Regional Models of Microfinance

Although a fairly new phenomenon, microfinance has become so popular that it is now an integral part of the financial sector of almost every developing country. There are only few countries without sizable number of MFIs operating on their territory. Microfinance is dominant in Asia in terms of both the number of borrowers and per capita income. Seven out of every eight microfinance borrowers are Asian. They receive twice as much microcredit, in terms of total loan disbursement, as borrowers in any other region. In contrast, microfinance sectors in the Middle East and North Africa, as well as those in Eastern Europe and Central Asia, are relatively small as a result of a later start of microfinance in those regions (Gonzalez and Rosenberg, 2006). In 2005, there were 86 million borrowers, served by MFIs throughout the globe, who received

approximately $15 billion in micro-loans for the purposes of micro-business development and consumption smoothing. In 2009, the total number of microfinance clients surpassed 100 million mark (Cull et al., 2011). The amount of loans, however, varied from just a few dollars to several thousand dollars in different parts of the world (Bossoutrot, 2005), suggesting that the development of microfinance has not been a uniform process throughout the world, but, rather, every country or region has created its own unique microfinance sector, given its economic, social, political, and cultural backgrounds. Therefore, it is important to compare the evolution and current state of microfinance in the countries with long history of micro-lending practices, such as India, to that in the less experienced countries of Eastern Europe and Central Asia.

Microfinance brings financial services to the world's least-advantageous, namely the poor. However, who are considered to be poor? How can one determine whether a person is poor or not? Is there, in fact, a global definition of poverty? Are poor people in different countries equally poor? Do they possess universal characteristics worldwide? The answers to these questions will help uncover the true forces lying behind the developmental differences of microfinance sectors in selected countries and regions.

There are several definitions of poverty. Some define it as the lack of physical means necessary for survival, while others look at the minimum of calorie intake. Economists define it in monetary terms, with the poor being people whose income or consumption is below the predefined poverty line. However, the level that delineates the poor from the non-poor is a source for disagreement among the economists. For instance, the United Nations use "one-dollar-a-day" poverty line, whereas the World Bank uses two distinguishing amounts: "one-dollar-a-day" and "two-dollars-a-day." An additional concern lies in defining the specific base year, in which the one or two dollar amounts are measured after adjusting for inflation. Depending on the

definition, including the income level and the base year, the number of the poor and respective poverty rates will differ (Sala-i-Martin, 2006).

Overall, there has been a positive trend in poverty alleviation worldwide, with China and India contributing most to the decline of global income inequality. For instance, assuming $1.5/day poverty line, in South Asia, the poverty rates dropped from 30 to 2.5% from 1970 to 2000, an equivalent of 145 million people, with most of the decline attributed to the India's economic growth, which accelerated in the 1980s and still continues. As a result, poverty from being mainly "an Asian phenomenon" forty years ago, when 87% of the world's poor lived in East and South Asia, turned into "an African phenomenon," with 68% of the poor living in Africa, as compared to 18% in Asia in 2005. The success of Asian countries was a result of the promotion of literacy among population, supported by overall economic growth (Sala-i-Martin, 2006).

Eastern Europe and Central Asia (ECA), however, has a different background. From 1970 to 1985, when much of the region was a part or controlled by the USSR, the war on poverty was viewed as successful, with only 369,000 people living below the subsistence minimum. During that period, the poverty rates had declined from the already low 1.3% in 1970 to 0.4% in 1980 and remained at that level until the late 1980s (Sala-i-Martin, 2006). With the disintegration of the USSR, the decline in income, massive unemployment, and the disappearance of social guarantees deteriorated the living conditions in the region to such extent that, in the next five year period, poverty headcount reached 1.9 million (five time the number of the poor in 1985), and then more than doubled in 2000, reaching unprecedented 4.4 million. Although poverty increased dramatically, the level of income initially was high enough to keep the poverty rate (at $1.5/day poverty line) under 1% (Sala-i-Martin, 2006; Buyske, 2007). However, assuming

$2/day poverty line, poverty rates increased from 2% to 21% during the period between 1988 and 1998 (Forster et al., 2003), suggesting a highly asymmetrical distribution of income in the ECA region. Similar to other developing regions, poverty in the ECA region is more widespread in remote rural areas, as well as so-called "single industry" areas. It is estimated that the poverty rate in rural areas reaches 30% compared to 15% in urban communities, thus making poverty roughly twice as prevalent there. In addition, another reason that contributed to poverty increase is ethnic conflicts that erupted after the USSR's dissolution, including the civil war in Russia (North Caucasus region), Georgia, Armenia, and Azerbaijan (Bossoutrot, 2005). The poor in the ECA region are not the same as the poor in East and South Asia. Unlike the Eastern and South Asian poor, who are mostly uneducated, often times illiterate, semiskilled individuals, the poor in the ECA 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. As a result, it is not unusual to see former scientists, professors, and engineers engaging in retail trade or driving a cab to support their family's well-being (Forster et al., 2003). Overall, the poor households in the ECA region consist of both people fully relying on social welfare benefits and working age individuals, many of them with higher education, looking for jobs. Together they constitute the region's "new poor" (Bossoutrot, 2005).

However, there are some characteristics that the ECA poor share with those in the rest of the world. The characteristics are insufficient or irregular income, primarily earned in an informal sector, lack of assets, and a limited access to financial services. Furthermore, even though the average loan size differs significantly between the two regions, the loan methodology, i.e., the overall lending policy, is very similar (Bossoutrot, 2005; Buyske, 2007). Given the information on poverty trends and developments in different regions of the world, a comparative

discussion of the microfinance sectors of the regions, as well as separate countries, can explain how the poverty conditions, along with overall economic, political, and cultural differences, affected the evolution and current state of microfinance.

1.6.1. The Indian Microfinance Experience

In India, microfinance was first introduced in the early 1980s through the formation of self-help groups, that were organized by social-development NGOs to assist the poor with generating means of future income through regular savings contribution and loan disbursements (Morduch and Rutherford, 2003; Siriaram and Upadhyayula, 2004). Over the years, microfinance has become a vital dynamic part of Indian financial system, where SHGs and MFIs under different organizational forms were adopted, including not-for-profit companies and for-profit financial companies, local area banks, cooperative banks and societies, public societies and trusts (Siriaram and Upadhyayula, 2004; M-Cril and MIX, 2007). Today, Indian microfinance sector is based on home-grown SHGs and MFIs that replicate "Grameen System" from Bangladesh Model, with most of new MFIs following Grameen System approach for its perceived growth acceleration and fast progress towards financial sustainability (M-Cril and MIX, 2007). SHG groups are linked to MFIs and commercial banks that utilize them to deliver the financial services for the India's poor, where commercial banks account for a significant part of the lending activities. SHG – bank linkage (the linkage between SGH and the banking sector) is also established with regional rural banks and cooperative banks. With regard to microfinance institutions, the majority of large MFIs operate as for-profit non-banking finance companies, while 70 percent of all Indian MFIs are organized in the form of societies and trusts (Srinivasan, 2009; Srinivasan and Kamath, 2009).

The accurate statistics on the number of microfinance institutions currently present in India are unavailable. In 2008, it was estimated there were between 800 and 1200 active institutions. India's microfinance institutions provide a comprehensive set of services, including lending, savings, insurance services, and business development educational and training services. With regard to micro-credit services, the average loan term is short and usually does not exceed one year; the average loan amount in both MFIs and SHGs ranges from $80 to $150 per borrower at an average interest rate between 21% and 30%, indicating social focus of Indian MFIs. (Srinivasan, 2009; Nagadevara, 2010). However, due to fairly easy accessibility of micro-loans, the clients tend to borrow from several sources to smooth their consumption or timing of loan payments, and to maintain the necessary cash flow, thus contributing to a problem of higher loan default rates. Although often times the tendency to borrow from multiple sources indicates the existence of defaults on earlier received loans (Hoff and Stiglitz, 1998; Srinivasan and Kamath, 2009; Augsburg and Fouillet, 2010; Schäfer et al., 2010).

In 2009, Indian MFIs served more than 85 million borrowers across the country, illustrating the scope of outreach of the microfinance sector. The outreach of savings is considered to be greater, but difficult to estimate due to poor organization of data on savers among clients. The estimation process is further complicated by the existence of multiple savings accounts that are typical for savings operations in India. More than 80% of the clientele are women. While targeting women is a great achievement of Indian MFIs, targeting the poor is not. Only 51% of the borrowers are considered poor. The number of non-poor clients exceeds that of the poor individuals in five out of eight MFIs, and ranges from 42 to 88% of their respective clientele. This is a result of higher regular savings requirements, along with higher risks and

additional costs of expansion into remote areas that makes it difficult to reach the extremely poor (Srinivasan, 2009; Nagadevara, 2010).

Despite its obvious growth, the Indian microfinance sector has encountered several obstacles primarily associated with the lack of available funds and human capital, contributing to high risks and costs, along with the lack of government policy support. Among them the most important is the issue of funding, associated with limited access to commercial funds for non-profit SHGs and poor fund support to for-profits MFIs. In India, commercial banks do not display long-run interest in MFIs activities because the only collateral they receive are MFIs' book debts. As a result, MFIs are highly leveraged in India; and with the debt to equity ratio close to 15, leverage ratios are possibly the highest in the world. Because the borrowed funds' dependence is so strong, it is affecting the profitability of the institutions, as well as the depth of the outreach (Srinivasan, 2009). In addition, the dependence on donor funds and subsidies used to be high among Indian MFIs, but it is rapidly declining. In 2003 the donated equity composed about 47% of MFI's net worth. It dropped to 8% and then to 3.4% in 2005 and 2007, respectively (Sinha and Sinha, 2002; M-Cril and MIX, 2007). Currently, 90% of MFIs' funding comes from domestic sources, including bank loans, investments, and government funding (Miller, 2006; Nagadevara, 2010). Therefore, given both reduced amounts of subsidies and bank loans, MFIs need to look for ways to attract more deposit funds to regain financial health (Srinivasan, 2009).

1.6.2. The Eastern Europe and Central Asia Microfinance Perspective

The decline in state-ownership that followed from the dissolution of the Soviet Union launched a new era of self-employment and small businesses throughout the region. Microfinance has become a mechanism of financial support to small entrepreneurs that

commercial banks considered “non-bankable” (Buyske, 2007). MFIs in the ECA region are much younger than those in South Asia and Africa. The average age of an MFI is seven years in the ECA, with the oldest institution operating only for 16 years (MIX, 2007). Apart from significantly larger loan amounts, the distinct feature of microfinance in the region is its concentration on “the financially underserved” rather than on “the long-term poor.” As a result, there is a tendency among microfinance specialists not to consider the region’s microfinance services as “real microfinance.” However, there is more to microcredit that makes it part of microfinance than simply the size of the loan. Microfinance mechanism can be effectively applied to the borrowers with larger credit needs that were deprived the access to mainstream credit. Its purpose is to provide access to financing that was otherwise beyond a borrower’s reach. A highly-educated retail trader or a taxi driver with a doctoral degree in mathematics is likely to have different abilities, inspirations, and earning potential than “an illiterate weaver” (Buyske, 2007).

Another distinct characteristic of the microfinance sector of the ECA region is its small outreach. The lower relative importance of the outreach function results from a low population density (below 20 people per square mile). It is only 1/10 of the population density in South Asia (MIX, 2007).

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. In 2006, the growth of

microfinance sector was largely driven by the increase in the outreach of MFIs organized as microfinance banks (61% increase in outreach) and non-banking financial institutions (36% increase in outreach). However, the most numerous players in the ECA microfinance market are non-bank MFIs (NBFIs), particularly, credit unions/cooperatives. Although there are fewer numbers of microfinance banks in the region, they are equivalent to NBFIs in the number of clients. 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. Given the tendency of MFIs to switch to for-profit institutions, the number of NGOs and government funded NBFIs is becoming very limited. The largest number of NGOs operates in Russia. Only two thirds of government funded institutions remained in Russia. On the contrary, in Kazakhstan, the government funded MFI is the second largest provider of financial services (MIX, 2007; Sapundzhieva and Tomilova, 2010).

The majority of the ECA MFIs focus on the micro-credit services. Here, microfinance banks and credit unions are more successful in comparison to "downscaling" commercial banks. MFIs in the region use standard microfinance methodology in lending services by lending to groups of borrowers as well as offering individual loans. Based on the region and provider type, loan sizes range from several hundreds to $10,000 and more. Loan repayment rates are high, usually above 95%, and MFIs' portfolio quality is higher than in other regions of the globe (Bossoutrot, 2005).

Although micro-banks and credit unions show great loan service performance, they experience more difficulties in attracting deposits. The average deposit amount for both microfinance banks and credit unions is approximately $800. The deposit amount indicates that the microfinance banks reach typical clientele for the ECA microfinance sector. In commercial and microfinance banks, the number of savers usually exceeds that of the borrowers. In contrast, in credit unions, the gap between savers and borrowers is slightly smaller. While credit unions together with banks provide all deposit services in the market, non-bank MFIs are unable to accumulate the deposit funds due to legislative restrictions that prohibit non-banking institutions to mobilize deposits. However, in some ECA countries, such as Kyrgyzstan and Tajikistan, the legislation allows NBFIs to engage in deposit services by means of "a limited deposit-taking license" if they satisfy the equity capital and high staff expertise requirements. As a result, few NBFIs that engage in savings services, fail to reach micro-clients if the institutions' deposit amount exceeds $20,000. Overall, only 41% of the microfinance banks' deposits are retail deposits. Deposits made by corporations, various financial institutions, and governments represent 57% and the average deposit amount is approximately $68,000. The legislative restrictions, along with the lack of experience in attracting and accumulating deposits, resulted in the continuing dependence (most MFIs initially relied on donors' financial support for their development) of the majority of small MFIs on external sources of financing. Thus, the need for international and domestic support of donors, investors, and local governments remains strong. (MIX, 2007; Sapundzhieva and Tomilova, 2010).

Considering that the leverage ratio is close to 7, the significant amount of the lending activity of region's MFIs is still largely financed by donors and other microfinance investors. There can be several possible explanations for the trend in external dependency. First, small

deposit amounts, mobilized by MFIs, are simply insufficient for them to rely solely on internal funding. Second, depositors have a greater trust in commercial banks than they do in microfinance banks, thus leaving them no choice but to remain dependent on external funds. Finally, the very existence of donor funding of microfinance banks contributes to the lack of incentive to introduce small-scale savings products to their clients (MIX, 2007).

Among the countries of the ECA region, of particular interest to this study are Russia, the Caucasus countries and the selected Central Asian countries. The Caucasus countries include Armenia, Azerbaijan, and Georgia. The Central Asian countries of interest are Kazakhstan, Kyrgyzstan, and Tajikistan.

1.6.2.1. Microfinance in Russia

In Russia, approximately 2,000 MFIs provide services to 700,000 clients, both savers and borrowers. All four main types of MFIs operate in Russia: commercial downscaling banks and microfinance banks, not-for-profit NGO MFIs, rural credit cooperatives, and credit unions (i.e., credit consumer cooperatives and credit consumer societies), and state funds (i.e., government funded NBFIs). Commercial "downscaling" banks mostly serve urban communities with consumer (household goods loans and/or mortgage loans) and small-business loans. In fact, many borrowers use consumer loans to finance their business current needs. However, because consumer loans' interest rate is often higher than that of micro-loans offered by micro-banks, many of micro-entrepreneurs and individuals starting a new business prefer micro-loans to consumer loans. "Downscaling" banks primarily serve small and medium entrepreneurs, thus targeting not the poor, but the financially underserved. In 2007, the average loan amount offered by average commercial downscaling program exceeded $15,000. Credit unions serve two-thirds of the microfinance borrowers in Russia. Microfinance and "downscaling" banks reach 15% of

total borrowers, who receive two thirds of the microfinance sector's total loan portfolio. In fact, the majority of Russian MFIs are small credit cooperatives. Rural credit cooperatives mostly serve farmers and rural entrepreneurs, while credit unions are more urban oriented. With about 80% of financial sector concentrated in Moscow region, cooperatives expand their outreach by opening new branches in remote rural areas, where the presence of banks is limited. There is a positive trend in the number of cooperatives in Southern Russia. NGO MFIs are mainly targeting micro-entrepreneurs engaged in retail trade, primarily women, and, to a lesser degree, manufacturing entrepreneurs. In 2007, the average loan amount offered by non-profit MFIs was about $5,000, as compared to $700 average loan balance of Central Asian and Caucasian countries. However, its median equivalent did not even reach $3,500. The interest rate varies from 18% to 72%. Despite the growth of micro-credit services, the supply of loans covers about 5% of the market, indicating a great growing potential for the sector (Bossoutrot, 2005; Baum and Sapundzhieva, 2008).

In Russia, microfinance is primarily focused on micro-credit, while savings, insurance, and micro-leasing services are only marginally offered by Russian MFIs. Unlike in Central Asia and the Caucasus, group lending scheme is not widespread in Russia. On the contrary, Russian MFIs mostly deal with individual loans. This creates upward pressure on operating costs, negatively affecting institutions' financial health. As a result, most Russian MFIs are scaling up by diversifying their services through the introduction of new products. In addition, NGO MFIs are gradually transforming into more formal institutions with decreased donor funding. Other Russian MFIs explore partnership opportunities with commercial banks to become more sustainable and less dependent on donors' subsidies, while increasing their poverty outreach to match the existing demand (Bossoutrot, 2005; Baum and Sapundzhieva, 2008).

1.6.2.2. Microfinance in Central Asia

The Central Asian microfinance sector is young. The average age of a typical MFI is 11 years. The sector experienced a rapid growth. In 2006, there were 1,100 MFIs. About 1,000 of the MFIs operate in Kazakhstan and Kyrgyzstan providing financial services to more than 500,000 individuals, who represent a small fraction of the 28% of the population in Central Asia living below the poverty line. The vast majority of MFIs are small institutions with limited outreach. The region's microfinance sector is highly concentrated with 3% of all MFIs servicing more than 55% of total clientele (Gol and Tomilova, 2008).

The majority of micro service providers belong to non-bank (NBFIs) and NGO MFIs that serve 62% of micro entrepreneurs in the region. "Downscaling" commercial banks, microfinance banks, and credit unions also play a significant role in the market. In fact, "downscaling" banks and micro-banks alone serve more than 25% of the total regional clientele. However, because micro- and "downscaling" banks provide larger loan balances to fewer wealthier clients, they serve a different target market. The Central Asian MFIs continue to rely on donor and commercial funds in their development. However, since 2006, two major sources of funds for MFIs have been foreign microfinance investors and local commercial banks. Together all MFIs reach less than 3% of the region's (including Kazakhstani, Kyrgyzstani, and Tajikistani) poor, thus indicating an enormous opportunities for microfinance growth in Central Asia (Gol and Tomilova, 2008).

1.6.2.3. Microfinance in the Caucasus Region

In the Caucasus region, microfinance began its existence only in the mid-nineties. In Armenia, most of MFIs operate as NGOs that concentrate on providing loans to urban clients, predominantly women, engaged in small trade. Armenian MFIs are small scale institutions that

primarily rely on donor support for their development. With donor subsidies becoming limited, MFIs have to look for other sources of funding. Armenian MFIs primarily engage in microcredit, while other financial services remain in the process of development. In 2004, the average loan size was $560 at interest rates above 40%. Charging high interest rates along with sourcing cheap donor funds allow MFIs to reach financial sufficiency. The larger MFIs provide group loans, while smaller ones offer individual loans to small entrepreneurs. In addition, commercial banks provide credit services to small entrepreneurs, offering larger loans ranging from $300 to $3,000. Together all Armenian MFIs serve about 23,000 clients and 82% of the clients are served by NGO MFIs. The microfinance sector is highly concentrated with the three largest MFIs serving 84% of total clientele. The future development of microfinance sector is limited as a result of the restrictive and poorly defined legal environment that does not allow MFIs to mobilize deposits, leaving them dependent on donor subsidies and commercial funds from banks and foreign investors. While most MFIs focus on highly populated areas filled with small businesses and farms, the poor sparsely populated remote areas remain excluded from microfinance services. Overall, Armenian MFIs are only able to meet less than half of existing demand for financial services, suggesting opportunities for growth in terms of scale and outreach (Dalyan and Matt, 2006).

In Azerbaijan, 16 microfinance institutions, including commercial "downscaling" banks, non-bank credit organizations, and credit unions, provide services to more than 200,000 individuals in 61 out of 77 administrative districts of the country. Three largest MFIs serve 64% of total borrowers with banks responsible for 15% of country's clientele. The majority of Azerbaijani MFIs provide loans to groups of borrowers and practice mixed gender policies, while some focus mainly on women (80% of their borrowers are women). The average loan

amount for NGO MFIs is close to $960, while commercial banks offer larger loans of approximately $1,800. Deposit mobilization is out of reach for all non-bank MFIs due to existing limits in legislative regulations. However, their credit products are highly diversified and range from consumer and micro-business household loans, seasonal loans, and leasing services. Unlike MFIs in other countries of the Caucasus region, Azeri MFIs do not depend on donor funds, but rather on commercial foreign funding that accounts for 95% of total MFIs' funding (Sapundzhieva and Rasulova, 2009).

In Georgia, microfinance movement began to grow in the mid-nineties. The Georgian microfinance sector consists of MFIs organized as commercial banks, non-profit MFIs (unions and foundations), and credit unions. As of 2003, non-profit MFIs, initially created as humanitarian aid projects with microcredit components, served about 70% of total micro-borrowers in the country through the provision of individual loans to predominantly urban clients mainly engaged in retail trade and services, about 62% of whom were women. As a result, a large number of rural poor remain deprived of access to financial services. In fact, in 2004, non-bank MFIs and commercial banks together reached only about 30% of the potential clientele. In Georgia, average micro-loan amount ranges from $500 to $700. Although most Georgian MFIs are small with limited infrastructure (apart from largest MFIs with large branch network, smaller MFIs are limited to a network of three offices) and outreach, they generate enough revenue to become, on average, operationally and financially self-sufficient. Despite the operational and financial self-sufficiency, they fail to attract commercial equity funding and continue to depend on foreign donors to support their lending activities. Because of restrictions on deposit generation, non-bank MFIs do not collect deposits. In addition, there is little demand for savings

services among their clients, which creates a disincentive for MFIs to transform into micro-banks and continues dependence on donor funding (Pytkowska and Gelenidze, 2005).

The microfinance sector of the Caucasus region as a whole is characterized by strong dependence on foreign donor funding (with the exception of Azerbaijan), predominant focus of MFIs on microcredit products, limited ability to mobilize deposits due to regulatory restrictions, and small scale and outreach of MFIs that creates excess demand for microfinance services in remote rural areas.

Microfinance sectors in the ECA indicate strong potential for growth with demand for microfinance services largely exceeding supply in each sub-region. However, as foreign donor funding continues to decline, the issue of financial sustainability is becoming more acute. MFIs are forced to scale up by forming partnerships with commercial banks or by merging with each other. They have to transform into formal financial institutions to access new funding sources, such as savings, investments, and public funds, to support their growth and development aimed at the extension of poverty outreach into most remote and rural areas of the region (Bossoutrot, 2005; Baum and Sapundzhieva, 2008).

1.7. Research Goals and Objectives

The primary goal of this research is to determine the universality of an MFI operating model, possibly fashioned after the more established and proven Indian model, regarded as the benchmark by virtue of their relatively more longitudinal wealth of MFI operating experiences. Three relatively newer entrants to the global MFI industry – Russia, the Caucasus Region, and Central Asia – are considered in this study for purposes of comparison with the more mature (experienced) Indian MFI model. This study's primary hypothesis supports the case for a regional or location-specific MFI operating model that is dependent on the level of institutional

maturity. Specifically, recalling MFI's two-pronged objectives of financial sustainability and social outreach, this study contends that younger MFIs may tend to be more concerned with attaining financial sustainability than mature well-developed institutions. Younger ECA MFIs will only be able to emulate the Indian example of promoting the two-pronged goals simultaneously only after significant operating maturity has been attained.

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 India vs. MFIs 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 of MFIs in the ECA. 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.

1.8. Thesis Organization

The remaining part of the thesis is organized as follows. Chapter 2 provides a review of the existing literature devoted to the analysis of MFIs' financial performance, including the assessment of the "mission drift" concern in microfinance and the existence of the trade-off

between the outreach and financial sustainability. Chapter 3 outlines the methodology used in the analysis and develops a seemingly unrelated regression (SUR) model and OLS model with Robust Standard Errors technique. In addition, chapter 3 provides a description of data sample selection process and a description of the variables. Chapter 4 presents the empirical results of the estimation process. Finally, Chapter 5 provides conclusions and policy implications of the results.

CHAPTER 2

LITERATURE REVIEW

Over the past thirty years, microfinance has evolved from a socially oriented movement to a subsector of the economy driven by financial standards and economic profits in the hopes of expanding poverty outreach to the extent where the global supply of microfinance services will finally match the existing demand capacity. For the majority of MFIs, the necessity to reach out to a larger number of the poor worldwide translates into the need to scale up, while preventing their costs from reaching prohibitive levels. The MFIs' "ability to self-finance" is essential for attaining this goal (Honohan, 2004). That is why many microfinance organizations worldwide explore new sources of funding, as well as new financial products and channels of their distribution. Other MFIs transform into formal financial institutions, such as banks, allowing them to provide credit operations and to mobilize deposits (Bossoutrot, 2005).

2.1. The Dual Goals of Financial Sustainability and Social Outreach: Competing or Complementary?

In microfinance literature, there are two rather opposite views on the importance of financial sustainability for the successful development of microfinance institutions, shared by two distinct groups of microfinance researchers and practitioners: institutionists, the proponents of "financial systems approach," and welfarists, the supporters of "poverty lending approach." The first group of scholars stresses that the institutional sustainability is a key determinant of the depth of MFI's social outreach. The financial self-sufficiency is the essential element of

sustainability. The institutionists stress that donor financing is more uncertain and quickly loses its focus, as opposed to financing obtained from the commercial sector. According to the institutionists, MFIs will be able to achieve a greater scale of outreach, if capital markets provide them with funds necessary to gain self-sufficiency in exchange for monetary returns.

On the contrary, the welfarists argue that microfinance is designed to provide credit to the poor. According to the welfarists, MFIs should practice subsidized interest rates in lending to the poor to effectively diminish poverty. The welfarists further believe that MFIs can be sustainable without being financially self-sufficient. They view donor subsidies as a form of equity and MFI donors as "social investors," whose goal is not to generate profits but to support the expansion of the poverty outreach.

According to the welfarists, "social investors" are ready to except zero returns on investment in exchange for an "intrinsic social return." Although both groups of scholars agree that social outreach is crucial, the welfarists are less willing to sacrifice the depth of social outreach for a higher level of sustainability, than the institutionists (Hollis and Sweetman, 1998; Woller et al., 1999; Morduch, 2000; Robinson, 2001; Hermes, 2007). In the literature, the debate between the two approaches is often referred to as "microfinance schism," which is centered around the debate of the implications of financial self-sufficiency on the depth of poverty outreach. According to the generally excepted consensus, a certain trade-off exists between financial sustainability and social outreach (Von Pischke, 1996; Morduch, 2000).

The combination of several factors peculiar to microfinance, such as high fees and interest rates along with high reliability of borrowers, has led to realization that microfinance can be profitable business activity. The gradual commercialization of the global microfinance, that followed, pulled the "microfinance schism" debate out of the theoretical framework into a more

practical setting. The most important question imposed by microfinance researchers and practitioners is whether it is "appropriate to make money by serving the poor." According to Buyske (2007), given the shrinkage of international donor funds, microfinance institutions will only be able to provide their services to the poor by remaining profitable. Although it is obvious that the social goal of reaching out to a greater number of people worldwide is unattainable if based solely on subsidies, microcredit organizations emerged as a result of the failure of commercial finance to provide services to the poor. Therefore, the author admits that some MFIs may never become profitable and will always rely on donor assistance. The MFIs serving the very poor with a wide range of services, including basic financial services as well as educational and training services, will never be able to fully recover their costs. Similarly, small-scale MFIs due to a number of factors, including specific geographic characteristics and/or narrowly defined group targeting, will never achieve economies of scale. However, with more MFIs worldwide becoming financially sustainable, more donor funds can be channeled to the MFIs that, due to above described reasons, will never survive on their own.

In fact, Gonzalez and Rosenberg (2006), when investigating the potential for conflict between profitability and outreach, found no evidence that drive for financial sustainability limits the ability of a MFI to reach poorer individuals. The authors found very week correlation between a smaller loan balance, as a measure of the depth of outreach, and the return on assets. In addition, they point out that there are numbers of MFIs that are highly profitable, and yet serve the very poor. Also, due to the absence of competition, not-for-profit MFIs, on average, tend to be more profitable than their for-profit peers. The explanation of this phenomenon lies within the very nature of microfinance. Unlike humanitarian organizations, MFIs are created to be sustainable, with the interest for every loan turned into capital to support the next loan and, if

possible, profit. In addition, contrary to international donors, the commercial sector can provide MFIs with significantly more capital that millions of the poor worldwide so desperately require (Gonzalez and Rosenberg, 2006).

Unlike mainstream financial institutions driven solely by financial profits, MFIs aim at "a double bottom-line" that is a combination of financial and social returns (Brau and Woller, 2004; Sen, 2008). However, many microfinance practitioners wonder whether both of them are equally important. Several recent studies investigating the existence of the trade-off between the profitability and the depth of outreach have repeatedly acknowledged the presence of such a trade-off in favor of the financial bottom-line. One of these studies performed by Cull et al. (2007) provided systematical examination of financial performance and outreach based on the data collected from 124 microfinance institutions in 49 countries. The empirical results of the study suggested that MFIs focused on individual loans' provision showed higher levels of profitability. Furthermore, the fraction of poor and female borrowers in the loan portfolio of the surveyed institutions was lower than that of the MFIs more concentrated on group lending. The authors further found that "individual-based MFIs" tended to focus more on wealthier clients, whereas "the group-based MFIs" were more prone to poorer clientele, thus providing evidence in favor of the presence of the trade-off between sustainability and outreach.

In the more recent study, Cull et al. (2011) empirically investigate how the regulatory supervision that allows MFIs to collect deposits and extend their financial services affects MFIs' financial performance and outreach. Along with the obvious benefits of deposit mobilization, the prudential regulation and supervision results in higher costs of lending for MFIs, thus potentially affecting their bottom-line, as well as outreach. Based on data for 245 leading MFIs in 67 countries, the authors showed that supervision was positively associated with the average loan

amount and negatively associated with the percentage of women borrowers, thus putting negative pressure on the poverty outreach. Therefore, according to the results of the study, although offering deposit services increases MFI's self-efficiency and broadens its breadth of outreach through enhanced lending capacity, it reduces the depth of outreach, which again suggests the existence of the trade-off.

Similar to Gonzalez and Rosenberg (2006) and Buyske (2007), in this study, financial sustainability is considered to be the driving force behind the development of the microfinance sectors in the ECA region. Younger MFIs have to achieve economies of scale to operate efficiently and to reach greater social outreach upon maturation.

2.2. The Trade-off in Microfinance

Investigating the presence of the trade-off, Chahine and Tannir (2010) assessed the need for NGO MFIs to transform into "transformed microfinance institutions (TMFIs)," i.e., banks and non-bank financial institutions (NBFIs). By testing for the improved social and financial performance of a selected sample of TMFIs, the authors found that the transformation resulted in greater TMFIs' breadth of outreach, higher financial sustainability due to achieved cost economies of scale and scope, and improved capital structure based on a greater debt financing dependence at the expense of decreased depth of poverty outreach. The authors further stated that NGOs were financially better-off by transforming into banking institutions as opposed to NBFIs. However, Chahine and Tannir fairly noted that, while commercial banks possessed more efficient credit allocating mechanisms, they were also more selective with regard to clientele, thus causing even greater damage to the depth of social outreach.

Hermes et al. (2011) used a stochastic frontier analysis to verify the existence of the trade-off between the MFI's cost efficiency, as a measure of sustainability, and the depth of

outreach, expressed in terms of the average loan amount and the percent of women borrowers. Using data from 435 MFIs, Hermes et al. found strong evidence of negative relationship between the outreach and the efficiency. Specifically, MFIs with both lower average loan balances and a greater number of women borrowers were shown to be less efficient. The obtained results remained robustly significant after the addition of a number of control variables. Therefore, the authors claimed that the only way for a MFI to become efficient was by shifting its focus on less poor clients.

Similar to Hermes et al. (2011), Manos and Yaron (2009) found that the trade-off between sustainability and outreach exists in the short-run. However, the authors stress that in the long-run both sustainability and outreach will be improved due to gains in economies of scale, innovations, and the development of new operational modes.

Although there is a significant amount of literature devoted to the sustainability vs. the outreach debate, little is said about the actual size of the trade-off. Galema and Lensink (2011) made an attempt to measure the extent of the trade-off by using data on 800 MFIs from different regions for the period from 1997 to 2008. The authors empirically analyzed how much of returns social investors were willing to sacrifice, or how much of an increase in the risk they were willing to tolerate, to extend the poverty outreach. The authors found that although the trade-off was not significant for the loan amount of $180 and above, it was larger for average loans of a smaller amount. Given the obtained results, Galema and Lensink concluded that the trade-off was particularly larger for the very poor, MFIs potentially most targeted clientele.

Likewise, Edward and Olsen (2006) used local data on micro-finance in southern Andhra Pradesh District in India to examine the trade-off between sustainability and outreach. The authors found that the financial sustainability paradigm of micro-finance currently dominates

anti-poverty and empowerment paradigms, imposing an obvious threat of the potential exclusion of the very poorest in the micro-finance groups from financial services.

The analysis of the trade-off between financial sustainability and social outreach is of particular interest to this study. Younger MFIs are suspected to be more driven by financial bottom-line than more mature institutions. Therefore, there is a possibility that the ECA MFIs will tend to limit the scale of poverty outreach by targeting marginally poor or non-poor borrowers to receive greater profits. This study examines the trade-off between profitability and the depth of outreach by analyzing the relationship between the interest rate and the average loan amount and the share of women and rural borrowers.

2.3. The Mission Drift

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). Several studies have examined the issue of the mission drift of the MFIs. For instance, in his study, Arena (2008) describes three major problems associated with the mission drift: "classic," "debt trap," and "contextual" problems.

The "classic" mission drift problem originates from the MFIs' profitability drive, which results in MFIs forgoing their initial goal of lending to the poorest. Lending to the very poor requires significant amounts of small loans accompanied by higher per-loan costs with limited returns. As result, the financial sustainability pursuit can make MFIs to shift their focus towards less-poor clients who can handle larger, more profitable loans.

The "debt trap" mission drift problem occurs when, in the pursuit of larger loans with high returns, MFIs provide loans to clients who cannot really afford them, thus contributing to a loan default issue.

The "contextual" mission drift problem is centered on technical aspects of credit services that undermine social, cultural, and economic factors in a community. Specifically, "contextual" problem implies that MFIs irresponsibly extend loans triggering undesired social outcomes, such as “violence against women, reinforced patriarchy, dependency, alienation, or unsustainable market dependency” (Arena, 2008).

According to Arena, the last two problems are the result of the lack of knowledge of borrowers’ needs, poor planning, and weak internal control on behalf of field-loan officers who disregard MFI policies trying to improve their results. In contrast, the author states that the "classic" mission drift problem is the result of a policy decision of the MFI’s board. According to the author, in the case of “progressive lending”, such policy change is justified. “Progressive lending” implies providing larger loans to borrowers as their incomes and thus credit needs increase as a result of the productive use of previous loans. “Progressive lending” by MFIs is in line with the social impact paradigm of microfinance. Further, as suggested by Arena, some MFIs simply prefer to serve wealthier clients. For such institutions, classic mission drift is not a problem, since they have a different mission. Nevertheless, the author stresses that the majority of MFIs do encounter the “classic” mission drift problem.

Arena further argues that MFIs can overcome the issue of “classic” mission drift with the help of social corporate governance mechanisms. According to the author, it is possible to maintain a social focus and to meet financial sustainability requirements, thus relieving the tension between outreach and sustainability. The author further states the principles of social

corporate governance that, if followed closely, will help to minimize and potentially eliminate the mission drift concern of microfinance organizations. The principals include but are not limited to the clear communication of social objectives within the organization, the use of employee and client incentives, the development of an efficient internal system of control, the existence of the permanent social independent director, the use of "social audits," and clients' engagement as shareholders.

In the similar fashion, Hartarska (2005), using survey data, investigated the effects of governance mechanisms on financial and social performance of MFIs in Central and Eastern Europe and Newly Independent States. The author defined governance mechanisms as the means by which donors and investors control the appropriate usage of funds according to their intended purposes. Hartarska examined all key mechanisms of an effective governance framework (except for institutional and managerial ownership due to data limitations), including board and board structure (size and composition), CEO (manager) and director (board member) compensation, auditing, information, and the market for corporate control. The author found that various governance mechanisms impact outreach and sustainability differently. In particular, according to Hartarska, external governance mechanisms, such as government regulation and rating, had no impact on sustainability and marginally affected the outreach with only auditing improving the breadth of outreach. However, the author found the board to be an effective internal governance mechanism, as MFIs with local boards proved to be more sustainable. In addition, board diversity proved to have a positive effect on outreach and sustainability. Specifically, Hartarska argued that donor representatives, although improved the depth of outreach, negatively affected the breadth of outreach and sustainability, whereas financiers were more concerned with sustainability. With regard to board size and independence, Hartarska

argued that larger boards and boards with higher proportion of insiders performed worse financially. The author further noted that performance-based compensation was not an effective control tool, as underpaying managers resulted in the reduced poverty outreach.

There are a number of studies devoted to the analysis of the mission drift phenomenon in modern microfinance. For instance, Nawaz (2010) investigated the relationship between sustainability and efficiency of microfinance institutions. The author found that more funds were directed to the MFIs that served larger loans to more well-off borrowers at higher interest rates. The author also discovered that larger loans were mainly disbursed among male borrowers, while women borrowers were served with smaller loans at higher interest rates, thus providing empirical evidence of the mission drift phenomenon.

Furthermore, Augsburg and Fouillet (2010) explored the extent of donors' influence and the role of international organizations in driving microfinance institutions away from the objective of serving the poor. While investigating the microfinance crisis of 2006 in Andra Pradesh District in India, the authors discovered that the mission drift led to the implementation of questionable practices by some MFIs, such as harsh loan recovery techniques. Some of the techniques that were used to "persuade" a defaulter to pay the loan included public humiliation, harassment, and even physical force. While ensuring the financial health, such techniques deteriorated the MFIs' social outreach objective.

In contrast, Mersland and Strom (2010) performed panel data analysis using the average loan size, MFIs lending methodology, the main market, and gender as the mission drift measures. The authors found no evidence of the increase of the average loan size, as well as no evidence of growing individual loan disbursement trend in the microfinance industry overall, suggesting no evident mission drift problem. In fact, according to Armendáriz and Szafarz

(2011), the mission drift occurs when an MFI finds it more financially reasonable to reach out to unbanked wealthier borrowers, while limiting access to credit for the poor. However, similar to Arena, Armendáriz and Szafarz agree that "progressive lending" to clients that grow their businesses and require larger loans does not cause the mission drift. The authors also point out that "cross-subsidization" that implies providing credit services to unbanked wealthier individuals to generate funds to finance a greater number of poor borrowers who require smaller loans, is also in line with the main objective of microfinance.

Unlike what most studies suggest, Armendáriz and Szafarz argue that the classic mission drift problem is not driven by the transaction cost minimization objective, because transaction costs do not increase the loan size, given that all loans are identical. Instead, the authors argue that socially-oriented microfinance institutions can potentially deviate from their primary objective by extending loans due to the combination of factors, including the MFIs' mission, the differences in cost of lending between poor and marginally poor borrowers, and the region-specific borrower characteristics. The authors emphasize that a thin line exists between the mission drift and cross-subsidization. Armendáriz and Szafarz note that large MFIs serving a significant number of both poor and wealthier borrowers are not necessarily guilty of drifting from the poverty-alleviation mission. The authors argue that the MFIs' commitment to poverty reduction is compatible with "a side business" with marginally poor borrowers, because marginally poor clients provide the potential for cross-subsidization. The authors further assert that institutions operating in regions with relatively small number of very poor individuals are unfairly considered the institutions that deviate from the social objectives. For instance, the scope for cross-subsidization in South America and the ECA region is much higher, as most countries in the two regions have a higher average per capita GDP. As a result, MFIs' borrowers

are, on average, relatively wealthier in the two regions. Armendáriz and Szafarz believe that the existing empirical studies that fail to distinguish between the mission drift and cross-subsidization are misleading to donors and socially responsible foreign investors looking to efficiently allocate the funds to bring financial services to the poor.

In contrast, according to Karnani (2007), microcredit does "more harm than good to the poor." The author argues that borrowers are worse-off by participating in the microcredit program, if the return on investment is less than the interest they have to pay for the loan. Karnani claims that the vast majority of the poor worldwide have no specialized skill, creativity, or vision of how to grow their businesses. Therefore, poor borrowers end up competing with each other in "entry-level trade," where they are only able to generate scanty incomes.

However, in the ECA and South America regions, where micro-entrepreneurs are more capable of succeeding in growing businesses, microcredit's high interest rates are considered a reasonable pay for the provided financial opportunity. This in turn creates incentives for MFI's to grow larger to be able to reach more clients and generate more profits.

In addition to the analysis of the trade-off, the current study also approaches the issue of 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.

2.4. The Relationship between Subsidies and Sustainability

As noted earlier, many MFIs continue to receive subsidies from international donors, governments, and NGOs that increasingly require transparency with regard to the subsidies' effects on the MFIs' performance. Since for many small MFI's, subsidies are necessary to keep them alive, there is a possibility that subsidization may negatively reflect on the institutions' efficiency. To address the issue, Hudon and Traca (2011) examined the relationship between subsidies and sustainability of MFIs. The authors combined 100 MFIs' financial statements data from two major rating agencies to create a unique microfinance ratings dataset that they used to obtain evidence of a significant positive association between the intensity of subsidy and the efficiency of MFIs. However, the authors emphasize the presence of a threshold effect, which suggests that subsidy intensity beyond a certain level, compromises MFIs' efficiency. Therefore, according to Hudon and Traca, subsidizing MFIs does not compromise efficiency of the microfinance institutions, as long as subsidies remain moderate. In fact, "smart subsidies," such as subsidies for the new branch openings and staff training subsidies, will improve the MFI's overall performance (Hermes and Lensink, 2011; Hudon and Traca, 2011).

In contrast, Nawaz (2010), in his empirical analysis of the subsidy and sustainability relationship, found that microfinance subsidization resulted in increased cost-inefficiency and lower productivity of MFI's personnel. Moreover, the author showed that small loans' provision, as a measure of greater outreach, to relatively greater number of poor borrowers resulted in the increase in profitability, lowering the MFIs' dependence on subsidy, and therefore, suggesting no evidence of the sustainability and outreach trade-off.

Examining the developmental impact of sustainable MFIs that are independent from donor funding vs. charitable MFIs that depend on subsidies, Schicks (2007) performed the case

studies of BancoSol, one of the most successful sustainable banks in Bolivia, and the Grameen Bank, the most well-known charitable MFI in Bangladesh. Schicks argues that BancoSol has reached a significant size, as a private bank. However, the breadth of its outreach has compromised its depth, as BancoSol only serves urban communities with relatively wealthier clients. Nonetheless, the author stresses that the MFI's clients are still considered too poor to be served by traditional banks, and thus are in need of microfinance. Schicks argues that the MFI has enough social impact to positively affect the economic development of its servicing area.

As for the Grameen MFI, although it has not yet achieved full financial sustainability, MFI's charitable attitude has not compromised its growth. By operating in rural Bangladesh and targeting relatively poor clients with few business opportunities (at times, the MFI provides its services to beggars and supports charitable activities with zero financial returns), the MFI has achieved a significant depth of outreach among the poorest in the region. Therefore, the author stresses that both sustainable and charitable MFIs promote the economic development of the communities they serve and, therefore, both deserve to continue their existence in the future. Schicks' case studies confirmed the necessity of both the institutionists' approach, arguing in favor of the necessity of sustainable MFIs, and the welfarists' approach, advocating for charitable MFIs. However, the author emphasized that their coexistence, accompanied by increasing competition for borrowers, can lead to increasing default rates due to multiple borrowings of the mutual clients and, therefore, to raising interest rates. To address this issue, Schicks emphasizes the importance of a well-designed institutional setting as the multiple borrowings eliminating mechanism. According to the author, the controlled use of subsidization and the introduction of information sharing institutions between MFIs can eliminate "overindebtedness and oversubsidization of clients." The author assures that the cooperation of

different types of institutions can be mutually beneficial and reinforce the positive developmental role of microfinance.

The provision of microfinance to the poor will be no longer possible when non-sustainable MFIs stop receiving cheap or free donor funds. According to Khalily (2004), only the notion of sustainability makes MFIs cost efficient and competitive, thus ensuring the continuity in the financial service provision to the poor. The author stresses that poor households will be ultimate beneficiaries of MFIs' achieved financial sustainability. In contrast, Khalily argues that the dependence on cheap funds distorts the efficient allocation and the distribution of funding, increases operating and default costs, and affects lender's viability. Moreover, the author points out that the absence of ownership-based incentive results in higher expenditure preferences of top management of more subsidized MFIs, compared to those of the management of less subsidized institutions. Khalily found that the average employee's salary of the more subsidy-dependent MFIs is higher than that of less-subsidy dependent institutions.

Although the issue of subsidization is not directly addressed in the current study, similar to Khalily (2004), Schicks (2007), Arena (2008), and Armendáriz and Szafarz (2011), the inefficient provision of subsidies is believed to negatively affect financial sustainability. Efficient allocation of subsidies is possible, when more efficient MFIs are allowed to pursue financial sustainability objective, as a necessary condition for improved poverty outreach. Moreover, the financial sustainability is an indispensable condition of the growth of microfinance industry as a whole.

2.5. Financial Sustainability Strategies

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). Charging high interest rates may result in the decline of MFI's ability to serve the poor, who will no longer be able to afford the loan, and in the increase of the loan default potential. Nevertheless, MFIs have to charge high interest rates in order to cover the costs of lending. In addition to being considered "high-risk" financing, micro loans are very expensive to provide. All lending institutions, including 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." Whereas the first two types of costs are proportional to the loan amount, the transaction cost is not. In fact, the transaction cost plays the major role in driving micro-loan interest rates up (Shankar, 2007).

Many of the very poor live in remote areas with limited infrastructure making them physically hard to reach. For most MFIs clients' remoteness translates into high and sometimes prohibitive transaction costs. In fact, according to Goodwin-Groen (2002) and Shankar (2007), in the percentage terms, the transaction cost for a micro-loan is typically higher than that of a regular size loan. For instance, assuming $25 cost per loan, for a $100 micro-loan, the cost makes up 25% of the loan, whereas for a $10,000 loan, the cost is only 0.25%. In practice, the gap in percentage cost between micro and mainstream financing is even larger as a result of higher risk (micro borrowers have no collateral and no credit history) and greater number of social and geographical impediments, such as clients' illiteracy and remoteness. As Goodwin-Groen further points out, "it is expensive to go to these clients' doorsteps and intensively monitor repayments." As a result, the author emphasizes that the majority of non-bank MFIs struggle to

generate enough profits, which in turn further reinforces the issue of high interest rates. Therefore, in order to be able to provide credit services, MFIs have to charge high interest rates.

In addition to the popular opinion that interest rates must increase to allow for a greater outreach, many MFIs have discovered that raising interest rates also improves the quality of the services. Furthermore, unlike typical commercial interest rates simply reflecting borrower's credit cost, in micro-lending, interest rates perform another important task as an incentive mechanism (Morduch and Rutherford, 2003). Because the poor consider the access to financial services far more important than the costs associated with the services, they are willing to pay higher costs. More often than not, microcredit is the only opportunity to receive a loan, as well as to build a strong credit history for the poor. This fact alone creates a strong incentive to make the payments on time (Goodwin-Groen, 2002; Robinson, 1996).

In the study on MFI's outreach and sustainability, Conning (1999) investigated the ways how MFIs can maximize their social impact by targeting maximum amount of the poor and still achieve financial-sustainability. The results of his analysis suggested that sustainable MFIs servicing poorer borrowers must charge higher interest rates and bear higher administrative costs compared to the MFIs targeting the marginally poor.

For a MFI to be considered profitable, the interest rate must cover the costs of providing the loan (Von Pischke, 1996). However, both the interest and the cost have to be efficiently applied. Goodwin-Groen suggests that donors can help MFIs to become more efficient by avoiding setting caps on interest rates for MFIs, as these decisions are best made from inside by the MFI's managers. Moreover, according to the authors, interest rates that prohibit MFIs from recovering the costs will lead to MFIs' failure. Similar to Arena and Hartarska, Goodwin-Groen argue that donors can provide technical support to MFIs, control the transparency of MFIs'

financial statements, as well as provide industry infrastructure support, including the provision of credit bureaus' and auditor training services. In particular, credit bureaus can assist MFIs by reducing the credit worthiness assessment costs, while audit services can help them to develop transparent financial statements. Finally, the authors assert that the institutional diversity in the microfinance sector is crucial, as it guarantees that borrowers have different credit options.

Therefore, international donors can contribute to the development of more efficient microfinance sector that will not need to charge prohibitive interest rates to remain profitable. The biggest challenge facing the global microfinance industry lies in lowering the costs and the interest rates for micro-loans as a way to achieve a higher level of self-efficiency.

From the financial performance perspective, a number of studies examine the loan delinquency issue, as a measure of the MFI's credit portfolio quality. For instance, Pretes (2002), in his study of the MFIs' financial performance, emphasizes the seriousness of the loan default that becomes an issue in the case of business failure or income decline, not only from the MFI's perspective, but also from the standpoint of the borrower. Because the very poor "have a limited ability to assume risk," they may end up being worse off in the case of business failure (Hulme and Mosley, 1996; Johnson and Rogaly, 1997; Pretes, 2002).

In the study on the affects of the repayment frequency on the loan default, Field and Pande (2008), consider the ways to lower the transaction cost for micro-lending. The authors argue that due to the high potential of loan default, most MFIs design credit contracts with weekly repayment schedule, where the first payment is due almost immediately after the disbursement of a loan. Weekly repayment schedule results in higher transaction costs per loan, compared to monthly repayment option. While economic theory suggests that a MFI' clients will benefit from a less frequent repayment schedule and the repayment capacity will improve over

time, many microfinance providers see the frequent repayment discipline as crucial tool in the loan default prevention (Field and Pande, 2008). However, Field and Pande found that switching to more flexible monthly installment schedules will potentially allow MFIs to save significantly on the transaction costs of repayment collection without encountering any added risk of loan default. Likewise, Shankar (2007) points out that a more flexible payment collection lowers the transaction costs for MFIs, thus enhancing operational self-efficiency and sustainability.

Finally, Hauge (2010) used survey data gathered from agricultural credit groups and households in Chile to analyze several aspects of group control, including group incentives, actions, and composition, as well as group attitudes towards risk, over delinquency. The author found that group maturity and cohesion improves its ability to select reliable group members, which secures timely repayments and reduces delinquency. In contrast, group size and heterogeneity found to have no effect on loan delinquency. With regard to risk management, Hauge emphasized that average group investment returns and the access to risk-reducing irrigation systems better predicted low delinquency than household deviation from average group returns. The result showed a greater importance of risk management techniques for the reduction of delinquency in group lending.

The current study investigates the issue of delinquency as one of the components of financial sustainability by analyzing the relationship between the delinquency rate and operational efficiency, the interest rate, the average loan amount, specific borrowers' characteristics, and overall economic conditions. More 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 the ECA and India will provide the

insights into MFIs' operating conditions and show how such conditions, if not homogenous, affect financial sustainability of the institutions.

Overall, as microfinance continues to expand to new regions and areas worldwide, more profit-driven MFIs successfully manage to reach the social bottom-line. About 44% of all borrowers worldwide are served by profitable MFIs. Only one eighth of borrowers receive financial services from government funded MFIs. Profitable NGOs and banks serve about three fifth of total clientele (Gonzalez and Rosenberg, 2006). Nevertheless, the role of international donors and investors, as development mentors, continues to be important. Governments can also contribute to the development of microfinance sector by providing strong legislative and infrastructure base, in addition to financial support, that will allow MFIs to function more efficiently. According to Mendoza and Vick (2010), a combination of private and public efforts, with the private sector providing product and process innovations and the public sector performing the development role, are extremely important for the dynamic and stable growth of microfinance.

Given the specifics of the clientele in the ECA region, the dominant position of the financial sustainability paradigm with the emphasis on cross-subsidization versus subsidy dependence is well justified. Many MFIs in the region do not need to be dependent on donor support to achieve greater poverty outreach. Instead, they can contribute to the development of microfinance by striving for financial independence, thus allowing region's less successful MFIs to receive a greater amount of much needed donor subsidy.

This study expands upon current empirical work by focusing on the analysis of financial sustainability of MFIs in the ECA region, particularly in Russia, Central Asia, and the Caucasus, and India. To perform quality comparative analysis, a broader range of possible factors,

including financial indicators and region-specific demographic, economic, and poverty level characteristics, are incorporated in the analysis to control for socio-economic and political differences between the selected countries and sub-regions.

CHAPTER 3

METHODOLOGY AND DATA MEASUREMENTS

3.1. Theoretical Framework of the MFI Performance Analysis

When examining the MFIs' performance, the specific analysis framework is generally applied. Rosenberg (2009) defines five major areas that need to be addressed when measuring the performance of MFIs: breadth of outreach, depth of outreach, portfolio quality (delinquency), operating efficiency, and profitability. The breadth of outreach can be represented by the number of active clients, including borrowers, depositors, and clients receiving other financial services. Another measure of the breadth of outreach is the number of accounts, often used when the exact number of clients is impossible to calculate. The depth of outreach is usually defined by a rough proxy of the average outstanding balance as a percentage of per capita GNI. However, the author stresses that small loan amounts do not necessarily imply poor borrowers, as well as 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 financial performance indicators must also be incorporated in the analysis. Portfolio quality in the form of 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. In microfinance analysis, monthly repayment schedule is largely assumed. However, loans at risk and the annual loan loss rate are also applicable measures of delinquency. Profitability is often measured with

return on assets and return on equity indicators. However, the author argues that, that the profitability indicators need to be adjusted to account for subsidies, received by many MFIs. The subsidy-adjusted indicators include financial self-sufficiency, adjusted return on assets, and the subsidy dependence index. Finally, there are two main indicators that measure operating efficiency: the operating expense ratio and cost per client/loan. According to the author, all the indicators together comprise a minimum that should be included in the empirical analysis of the MFIs' overall performance.

The above described framework was applied by the majority of the empirical studies on financial sustainability and outreach. Among them, the most recent study conducted by Quayes (2012) is of particular interest to this research. Based on cross-sectional financial and outreach data from 702 MFIs in 83 countries, the author 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. According to Quayes, the results of Logit Model and Three-Stage Least Squares estimation, used to address the endogeneity issue, both showed that the depth of outreach and financial performance are not only positively correlated but, when account for dynamic interaction, reinforce each other. Quayes found that 1% decrease in the loan size increased the MFI's probability of becoming self-sufficient by 3.68%. 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 beliefs of many microfinance scholars, 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), used the data from 217 MFIs in 101 countries distributed by region, including the South America-Caribbean, the Eastern Europe-Central Asia, the Sub-Saharan Africa, the Southeast Asia and the Pacific, and the Middle East-North Africa regions, and by the MFI's type, such as a bank, a NGO, a NBFI, a savings and credit cooperative, and a rural bank, over the period from 1998-2006, to investigate the most relevant factors that promote financial self-sufficiency of MFIs. The authors found that 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. However, the authors note that the percentage of women borrowers doesn't seem to have an effect on financial sustainability. Overall, the authors 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.

3.2. Methodology and Model

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, because 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.

For every country/region of interest in this study (i.e., Russia, Central Asia, the Caucasus, and India), the following model was specified:

(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 ε_i is the error term.

Based on the general model specification above, three equations accounting for sustainability measures were generated for every region:

(2) $PortRisk_i = F(Loan_i, Borstaff_i, Women_i, Glp_i, Gpyield_i, Rur_i, Inc_i, Unemp_i, Agric_i),$

(3) $Gpyield_i = G(Loan_i,\ Glp_i,\ ROE_i,\ OELP_i,\ DEratio_i,\ Women_i,\ Rur_i,\ Inc_i,\ Agric_i,\ PortRisk_i)$,

(4) $Loan_i = Z(Borstaff_i,\ Bor_i,\ ROE_i,\ DCratio_i,\ Women_i,\ Rur_i,\ Inc_i,\ Agric_i,\ PortRisk_i)$

where $PortRisk_i$ represents portfolio at risk beyond 30 days, a ratio of outstanding principal balance of loans past due more than 30 days to outstanding principal balance of all loans, which is a commonly used measure of portfolio quality in microfinance literature; $Loan_i$ is the average loan amount per borrower, that along with $Women_i$, the percent of women borrowers in each MFI, represents typical 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, represents yield on gross portfolio used as 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 to the above listed typical indicators of financial performance analysis, 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 in the analysis as potentially relevant indicators of financial health of MFIs that capture the funding arrangements considered by the MFIs. Unlike the previous literature, 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.

The final model with three separately estimated equations measuring delinquency, profitability, and outreach, respectively, was specified as follows:

(5) $$PortRisk_i = \alpha_0 - \alpha_1 lnLoan_i - \alpha_2 Borstaff_i - \alpha_3 Women_i - \alpha_4 lnGlp_i + \alpha_5 Gpyield_i + \alpha_6 Rur_i - \alpha_7 lnInc_i + \alpha_8 Unemp_i + \alpha_9 Agric_i + \varepsilon_i,$$

(6) $$Gpyield_i = \beta_0 - \beta_1 lnLoan_i - \beta_2 lnGlp_i - \beta_3 ROE_i + \beta_4 OELP_i + \beta_5 DEratio_i - \beta_6 Women_i - \beta_7 Rur_i + \beta_8 lnInc_i - \beta_9 Agric_i + \beta_{10} PortRisk_i + \nu_i,$$

(7) $$lnLoan_i = \gamma_0 - \gamma_1 Borstaff_i - \gamma_2 lnBor_i - \gamma_9 ROE_i - \gamma_5 DCratio_i - \gamma_1 Women_i - \gamma_{10} Rur_i + \gamma_{12} lnInc_i - \gamma_{11} Agric_i - \gamma_6 PortRisk_i + \upsilon_i$$

where, similar to D'Espallier et al. (2011) and 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).

3.2.1. Expected Directional Effects on the Portfolio Risk

In the equation 5, following the methodology of D'Espallier et al. (2011), the interest rate is expected to have a positive effect on the portfolio at risk, because the increase the interest rate constitutes higher risk of loan default. In contrast, the average loan size and the number of borrowers per staff member are expected to negatively affect delinquency. Larger loans are normally offered to more reliable borrowers. Similarly, higher employee productivity is associated with lower probability of loan default, while the growth of MFI's gross loan portfolio, implying the increase of MFI's size, could affect loan delinquency both ways. Its negative effect can be argued given the possibility that larger MFIs can afford more efficient risk-control tools, because larger loan portfolios produce larger revenues that could enhance an MFI's capability in

investing in the risk-control and more efficient monitoring devices or loan monitoring schemes. On the other hand, a larger loan portfolio can potentially lead to difficulties in effectively monitoring borrowers, in addition to the greater moral hazard risks. Women are generally perceived to be more trusted borrowers than men. Therefore, the increase in the number of women clients is also expected to be inversely related to the delinquency rate. Additionally, as borrower's income increases, they become less vulnerable to external shocks, making them more reliable clients, and, thus, negatively affecting the loan default rate. Because the main source of income is employment, the increase in the unemployment level must have an opposite effect on delinquency. Finally, the more rural borrowers and farmers are served by a MFI, the higher the probability of their potential default, as people in rural areas tend to be poorer than urban residents, and they are more vulnerable to external shocks, making them a high risk clientele. Similarly, lending to farmers has historically been associated with higher risk given the conventional view that farming is exposed to additional risks peculiar to the industry and more uncertain operating conditions (D'Espallier et al., 2011).

3.2.2. Expected Directional Effects on Loan Pricing

Results of the study by Ayayi and Sene (2010) suggest that, in the equation 6, an increase in the loan balance should trigger a decline in the interest rate, because MFIs tend to lend less to higher risk clients. Furthermore, the growth in profitability and size must allow an MFI to charge lower interest due to the economies of scale. In contrast, an increase in operating expenses will result in charging higher interest to cover the extra cost of declining operational efficiency. Similarly, increases in the leverage level will result in higher interest, as MFIs will need to generate more income to cover the increased cost of debt servicing. An increase in the loan default rate is anticipated to positively affect the interest rate. On the contrary, an increase in the

poverty outreach through lending to clients who live in rural areas, as well as to farmers and women, should be associated with lower interest charged, unless a trade-off exists between the MFI's profitability and outreach. Although, the increase in income is expected to lead to borrowers receiving larger loans at a more favorable interest rate, the opposite can be quite possible, in case MFIs encounter the mission drift issue by charging higher interest to wealthier clients (Ayayi and Sene, 2010).

3.2.3. Expected Directional Effects on the Borrower's Loan Amount

In the equation 7, following the methodology developed by Quayes (2012), the average loan balance is considered to be an inverse of poverty outreach. Therefore, a negative parameter coefficient of the average loan amount is expected to have a positive effect on the outreach. With this regard, an increase in the number of borrowers, including women and rural borrowers (farmers and those engaged in off-farm activities) should expand the MFI's outreach, whereas an increase in the borrower's income is expected to limit it. Improved profitability, leverage, and delinquency should positively affect the MFI's outreach efforts in the long-run. However, as a result of the mission drift or progressive lending and cross-subsidization an MFI may purposely choose not to serve the very poor (Quayes, 2012).

3.2.4. Testing for Differences in Regional Operating Environments

In order to test the assumption whether the MFIs' in the sub-regions (i.e., Russia, Central Asia, and the Caucasus) within Eastern Europe and Central Asia operate in similar socio-economic conditions, and, thus, can be treated as a single region's MFIs when compared to developed Indian institutions, each equation in the system is estimated using Seemingly Unrelated Regression (SUR) technique. The SUR was developed by Zellner (1962), Zellner

(1963), and Zellner (1971), and successfully evaluated by many researchers including Binkley and Nelson (1988), Fiebig (2001), and Alaba et al. (2010).

The SUR system assumes that for each individual observation *i* there is M cross-sectional units, each with its own linear regression model (Greene, 2003):

$$(8) \qquad y_{ij} = X_{ij}\,\beta_{j} + \varepsilon_{ij}, \qquad i=1, \ldots, N, j=1, \ldots, M.$$

The distinct property of the SUR model is that it allows nonzero covariance between error terms ε_{ij} and ε_{ik} for a given individual *i* across equations *j* and *k*:

$$(9) \qquad Cov(\varepsilon_{ij}, \varepsilon_{ik}) = \sigma_{ij}$$

$$(10) \qquad Cov(\varepsilon_{ij}, \varepsilon_{i'k}) = 0 \qquad if\ i \neq i'.$$

This study employs the *sureg* procedure available in Stata which uses the asymptotically efficient, feasible generalized least-squares algorithm developed in Greene (2003). The resulting GLS estimator, which was designed to address heteroskedastic and autocorrelated disturbances, is given by the following:

$$(11) \qquad \beta = [X'\Omega^{1}X]^{-1} X'\,\Omega^{1} y = [X'\,(\Sigma^{1} \otimes I)\,X]^{-1} X'\,(\Sigma^{1} \otimes I)\,y.$$

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. To illustrate this approach, let us consider the portfolio at risk system of equations, which shall be defined in SUR as follows:

(12) $PortRisk_{iIN} = \alpha_{0IN} - \alpha_{1IN} lnLoan_{iIN} - \alpha_{2IN} Borstaff_{iIN} - \alpha_{3IN} Women_{iIN} - \alpha_{4IN} lnGlp_{iIN} + \alpha_{5IN} Gpyield_{iIN} + \alpha_{6IN} Rur_{iIN} - \alpha_{7IN} lnInc_{iIN} + \alpha_{8IN} Unemp_{iIN} + \alpha_{9IN} Agric_{iIN} + \varepsilon_{iIN}$,

(13) $PortRisk_{iRU} = \alpha_{0RU} - \alpha_{1RU} lnLoan_{iRU} - \alpha_{2IN} Borstaff_{iRU} - \alpha_{3RU} Women_{iRU} - \alpha_{4RU} lnGlp_{iRU} + \alpha_{5RU} Gpyield_{iRU} + \alpha_{6RU} Rur_{iRU} - \alpha_{7RU} lnInc_{iRU} + \alpha_{8RU} Unemp_{iRU} + \alpha_{9RU} Agric_{iRU} + \varepsilon_{iRU}$,

(14) $PortRisk_{iCA} = \alpha_{0CA} - \alpha_{1CA} lnLoan_{iCA} - \alpha_{2CA} Borstaff_{iCA} - \alpha_{3CA} Women_{iCA} - \alpha_{4CA} lnGlp_{iCA} + \alpha_{5CA} Gpyield_{iCA} + CARur_{iCA} - \alpha_{7CA} lnInc_{iCA} + \alpha_{8CA} Unemp_{iCA} + \alpha_{9CA} Agric_{iCA} + \varepsilon_{iCA}$,

(15) $PortRisk_{iCS} = \alpha_{0CS} - \alpha_{1CS} lnLoan_{iCS} - \alpha_{2CS} Borstaff_{iCS} - \alpha_{3CS} Women_{iCS} - \alpha_{4CS} lnGlp_{iCS} + \alpha_{5CS} Gpyield_{iCS} + \alpha_{6CS} Rur_{iCS} - \alpha_{7CS} lnInc_{iCS} + \alpha_{8CS} Unemp_{iCS} + \alpha_{9CS} Agric_{iCS} + \varepsilon_{iCS}$

where the additional subscripts *IN*, *RU*, *CA*, and *CS* are the country/region identifiers for India, Russia, the Caucasus, and Central Asia, respectively. This version of the SUR method is designed to address the basic goal of the research: to determine whether the MFI operating environments in the countries/regions present a homogenous set of constraints and/or opportunities, in addition to differences in operating strategies, management styles, attitudes towards borrowers, and institutional goals of MFIs at different stages of operating maturity.

Some microfinance researchers, including Ferro-Luzzi and Weber (2006) and Armendáriz et al. (2010), applied the SUR method to address the issue of correlated error terms

in the analysis of the performance of microfinance institutions. Specifically, Armendáriz et al. pointed out that MFIs' performance is possibly affected by "institutional and macroeconomic factors" specific to countries where the institutions operate. Given the emphasis of the current study on the comparative analysis of four regions/countries' microfinance institutions, the SUR estimation was performed in several stages. Recognizing the gap in operating experiences or maturity between MFIs in India and the three other regions, the first stage is the investigation of homogeneity of operating conditions in Russia, the Caucasus, and Central Asia. The SUR models for pairings of regions among the three locations are then estimated to determine any possible homogeneity of conditions between the more specific regional pairings. Eventually, the three regions are included in a SUR model involving India.

3.2.5. Independence and Other Diagnostic Tests

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. For a two equation SUR model, the test statistic is the following Lagrange multiplier statistic that has a chi-square distribution with 1 degree of freedom.

(16) $LM = Tr_{12}^2 \sim \chi^2(1)$ where $r_{12}^2 = (\sigma_{12})^2 / (\sigma_{11}\sigma_{22})$

where T is the sample size, σ_{12} is the sample covariance of the errors for the two equations, and σ_{11} and σ_{22} are the sample error variances for the two equations. This test statistic can be generalized for more than two equations.

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 heteroskedasicity and multicollinearity. While no multicollinearity issue was detected in the estimation, the existing heteroskedasicity problem was controlled with the robust standard error estimation technique (see Appendices B, C, and D). Finally, since the data are estimated as cross-sectional and not as panel with time co-variates, no serious autocorrelation issue is applicable.

3.3. Data

The study is based on the financial data 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 India, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Armenia, Azerbaijan, and Georgia for the period from 2007 to 2008. This particular period was chosen for the analysis as the vast majority of MFIs had most of the data available in 2007 and 2008. 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, 17 MFIs that account for 6.85% of total number of observations were excluded from the analysis due to the absence of variables' values in 2007 and 2008 with no data from other periods. In addition, due to the absence of data on the financial indicators and the regional macroeconomic indicators in Turkmenistan and Uzbekistan, the two countries were excluded from the analysis, leaving Kazakhstan, Kyrgyzstan, and Tajikistan to represent the Central Asia region in the study. Given the above stated limitations, the final panel dataset was composed of the financial and macroeconomic data from 71 MFIs in India, 73 MFIs in Russia, 39 MFIs in the Caucasus, and 48 institutions in Central Asia. As 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 Manos and Yaron (2009), Ayayi and Sene (2010), Cull et al. (2011), Hermes et al. (2011), and Quayes (2012), in this study, the MIX Market data were used to obtain the financial and outreach indicators from 231 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. As in India Microfinance Sector Report of 2008 (Srinivasan, 2009), in this study, the average yield on gross portfolio is used to approximate the average interest rate, charged by MFIs.

Unlike other similar studies that entirely focused on financial data, the current study incorporates region-specific macroeconomic indicators, including the percent of rural population, the level of unemployment (in percent), 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 statistical bureaus of individual countries 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.

In case of India, rural population data were obtained from the Census of India 2011 (Chandramouli, 2011). Specifically, the unemployment level and the average regional income, approximated with the average minimum wage in rupees, were calculated based on Indian Ministry of Labour and Employment (2011) statistics, while regional data on agriculture as a

percent of net regional GDP were obtained from the Reserve Bank of India's Handbook of Statistics on Indian Economy (Mohanty, 2011).

In case of Russia, region specific data on rural population, along with the unemployment level, the average per capita monetary income in rubles, and agriculture as a percent of total value added were obtained from the Russian Federation Federal State Statistical Service (2011).

With regard to the Central Asia region, for Kazakhstan, regional data on rural population, as well as the level of unemployment and the average per capita nominal income in tenge (country's monetary unit), were obtained from the Agency of Statistics of the Republic Kazakhstan (2011), while the data on the value of agricultural sector in total value added were obtained from the Agency of Statistics of the Republic Kazakhstan annual publication "Regions of Kazakhstan in 2009" (Smailov, 2010). For Kyrgyzstan, the regional data on rural population, the official level of unemployment, the average annual per capita monetary income in som (country's monetary unit), and regional data on agriculture as a percent of total value added were obtained from the Kyrgyz Republic National Statistical Committee's (2011) annual publications. Finally for Tajikistan, the regional data on rural population, along with the level of unemployment, and the annual per capita monetary income in somoni (country's monetary unit), calculated as a weighted average of annual nominal employees' salary and annual pension, and country level data on agriculture as a percent of total value added (due to the absence of regional data equivalent) were obtained from the annual publications of the Agency on Statistics under President of the Republic of Tajikistan (2011).

As for the Caucasus region, in the case of Armenia, the regional macroeconomic indicators were retrieved from the National Statistical Service of the Republic of Armenia (2011). Unfortunately, no regional data were located for agricultural output as a percent of total

value added, and the country level data were used as proxies. In addition, the average annual per capita wage (in drams) indicator was used to approximate the average annual income per capita. All regional macroeconomic data for Azerbaijan came from The State Statistical Committee of the Republic of Azerbaijan (2011). Because only country level data were available on the per capita income in million manat (country's monetary unit) and on agriculture as a percent of total value added, they were approximated for regional data. Finally, for Georgia, all regional statistics were obtained from National Statistics Office of Georgia (2011). However, since regional data on the average per capita income (in gel) were not found, country level data were used to approximate the amount of annual per capita income.

In addition to the above mentioned limitations, because the official unemployment levels obtained from the statistical sources in Kyrgyzstan, Armenia, and Azerbaijan were inadequately describing the unemployment situation in the countries in 2007 and 2008, the annual World Bank country- level unemployment data for 2007 and 2008 were used to scale up the regional data obtained from the countries' official sources.

MIX Market database has converted all individual currency figures 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).

3.3.1. The Descriptive Statistics of the Data

Appendix A provides the descriptive statistics of the variables used in the analysis. The average share of rural population in regions served by Indian and Central Asian MFIs in the sample is 67% and 73%, respectively. In contrast, in Russia and in the Caucasus, the average

share of rural population served by MFIs is 32% and 40%, respectively. Therefore, Indian and Central Asian MFIs are expected to have a greater depth of outreach, than MFIs in Russia and the Caucasus. On average, Indian MFIs in the sample have 90% of women borrowers, while Russian, Caucasian, and Central Asian MFIs serve 60%, 37%, 53% of women borrowers, respectively. The percentage share also indicates that Indian MFIs could be expected to have a greater depth of outreach, compared to the ECA MFIs. The average loan balance per borrower in Indian MFIs in the sample is $110, whereas in Russian, Caucasian, and Central Asian MFIs the mean loan size is $1,878; $1,209; and $1,353; respectively. Based on the loan size, Indian MFIs are also expected to have a greater outreach, compared to the ECA MFIs. The average interest rate charged by Indian MFIs in the sample is 24%, compared to 39%, 34%, and 39% interest, respectively, charged by MFIs in Russia, the Caucasus, and Central Asia. The difference in the interest rate charged by Indian and other MFIs suggests that the ECA MFIs are more profit driven than Indian institutions. Also, the average portfolio at risk ratio for Indian, Caucasian, and Central Asian MFIs in the sample ranges between 2.2-2.4%. In contrast, Russian MFIs show, on average, higher portfolio at risk measure of 6.6%. Therefore, Russian MFIs are expected to be more concerned with staffing policies and repayment control techniques, resulting in more conservative lending practices.

CHAPTER 4

ESTIMATION RESULTS

4.1. SUR Test for Independence: Summary of Results

In the first stage, each equation was simultaneously estimated for the three regions of the ECA. The Breusch-Pagan χ^2 statistic was calculated to test the null hypothesis that the error terms are not correlated. 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. In the next stage, each out of the first two equations was estimated for each of the four regions, including India, using the SUR technique. For the interest rate equation, however, data from the three regions were merged into a single dataset and then used in the estimation against India, applying the SUR estimation technique. Similar to Ferro-Luzzi and Weber (2006), in that stage, the Breusch-Pagan test results suggested the absence of correlation between the error terms of equations representing four regions and two regions, respectively, thus allowing for separate estimation of the equation for every region using the OLS Robust Standard Error (RSE) procedure. The OLS RSE is used to address the encountered heteroskedasticity. In the first stage, a number of SUR models with different regional combinations were estimated for delinquency,

profitability, and outreach equations in order to test for the independence between the regions' MFIs (Appendices B, C, and D).

Table 4.1.1. The Breusch-Pagan Test for Independence Results for the Portfolio at Risk Equation

Country/Region	BP χ^2 statistic	P-value
Russia – Caucasus – Central Asia	3.971	0.2647
India – Russia – Caucasus – Central Asia	4.986	0.5457
India – Russia	0.995	0.3186
India – Caucasus	0.000	0.9924
India – Central Asia	0.020	0.8868
Russia – Caucasus	0.004	0.9501
Russia – Central Asia	0.766	0.3814
Caucasus – Central Asia	3.200*	0.0736
India – Caucasus – Central Asia	3.221	0.3588

*significant at the 10% level.

In the loan portfolio quality equation (table 4.1.1.), the independence tests produced insignificant results, suggesting that none of the regions' MFIs, except the Caucasus and the Central Asian institutions, have correlated disturbances. Therefore, the equations for the Caucasus and Central Asia should be separately analyzed in the comparative estimation procedure. Apparently, MFIs in the two regions possess different portfolio quality control techniques due to, possibly, varying socio-economic, political, and cultural backgrounds of each

region/country. The exceptions were MFIs in the Caucasus and the Central Asia regions. The independence test result was significant, suggesting that the institutions in the two regions share common portfolio quality management tools different from those operating in other regions considered in the current study. The result suggesting some dependence between the two regions is not surprising because microfinance sectors of the two regions are relatively young and, thus, less developed, compared to the sectors of India or Russia. Moreover, the clientele, especially in less developed areas of the two regions, where most MFIs operate, shares similar characteristics, including low income levels, high unemployment, a great percentage of rural population, and more acute gender inequality issues. Given the similarity of the borrowers' profile, it is reasonable to expect MFIs in the Caucasus and Central Asia to apply similar repayment management techniques to control the quality of the loan portfolio.

The BP test result for the profitability equation is highly significant, suggesting that MFIs' lending policies in Russia, the Caucasus, and Central Asia are homogenous (table 4.1.2.). In other words, the microfinance institutions in all three regions share the same approach to the interest rate establishment.

Table 4.1.2. The Breusch-Pagan Test for Independence Results for the Yield on Gross Portfolio Equation

Country/Region	BP χ^2 statistic	P-value
Russia – Caucasus – Central Asia	15.759**	0.0013
India – All†	0.561	0.4537

** significant at the 5% level. † All is defined as a single region consisting of Russia, the Caucasus, and Central Asia.

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. Similar average interest rate level of 34-39% is also found in the interest rate descriptive statistics of the data (Appendix A).

However, when tested as a single region against India, the test result proved to be insignificant, suggesting that Indian MFIs and institutions in Russia, the Caucasus, and Central Asia charge interest differently. Supposedly, Indian MFIs are more outreach driven, whereas MFIs in the selected ECA countries increasingly become for-profit institutions. The difference in the emphasis on outreach vs. financial sustainability between MFIs in India and the ECA explains the differences in lending policies between the countries.

Table 4.1.3. The Breusch-Pagan Test for Independence Results for the Average Loan Amount Equation

Country/Region	BP χ^2statistic	P-value
Russia – Caucasus – Central Asia	0.866	0.8336
India – Russia – Caucasus – Central Asia	7.038	0.3173
India – Russia	5.493**	0.0191
India – Caucasus	0.181	0.6705
India – Central Asia	0.498	0.4802
Russia – Caucasus	0.054	0.8161
Russia – Central Asia	0.358	0.5495
Caucasus – Central Asia	0.454	0.5006
India – Caucasus – Central Asia	1.133	0.7691

** significant at the 5% level.

With regard to the outreach component of the MFIs' performance (table 4.1.3), the independence test results are insignificant in all cases except for Indian and Russian MFIs. The homogeneity of MFI lending policies with respect to the loan size in the two countries can be explained as follows. Russian MFIs, being more experienced and more developed than Caucasian and Central Asian institutions, evolve and become comparable to Indian MFIs in the amount of loans they provide to their clients. In contrast, MFIs in the Caucasus and the Central Asia regions are younger and, therefore, approach the issue differently by providing larger loans in order to generate profits necessary for the future growth.

4.2. OLS Estimation Results Summary

In the second stage, given the heterogeneity of the four country/regions (equations 5 and 7) and two regions (equation 6) detected in the first stage, each of the three equations was separately estimated for each country/region with OLS procedure. Although SUR model produced identical results, OLS RSE procedure was applied to address the issue of heteroskedasticity.

4.2.1. The Portfolio at Risk Model Results

With respect to the equation 5, each country/region (i.e., India, Russia, the Caucasus, and Central Asia) was estimated using OLS RSE technique to control for heteroskedasicity. In addition, each equation was tested for multicollinearity. The Variance Inflation Factor (VIF) values obtained for all independent variables are found to be less than 10 in the four equations. The result rules out any serious multicollinearity in the portfolio at risk equation (Appendix E).

Table 4.2.1. reports the results of the equation 5 for India. Three estimated coefficients, i.e., women borrowers, the interest rate, and rural borrowers engaged in farming activities are significantly related to the portfolio at risk. In particular, the proportion of women borrowers is

negatively related to the portfolio at risk. Specifically, a 10% increase in the percentage of female borrowers decreases *portrisk* by approximately 0.4%. Contrary to the expectation that lending to farmers is associated with higher risk, the increase in the number of borrowers, engaged in agricultural production, reduces risk associated with loan default for Indian MFIs. In fact, a 10% increase in borrowers engaged in farming results in 1.5% reduction in risk. Another unexpected significant result is the confirmed inverse relationship between the interest charged and the risk of default. The result suggests that a 10% interest increase decreases the portfolio at risk by 0.7%. According to the obtained result, the more profitable Indian MFI becomes, the more efficiently it operates and, thus, the less risk it bears.

Table 4.2.1. OLS Regression Results for the Portfolio at Risk for India

Variable name	Coefficient	Robust standard error	P-value
lnloan	0.503	0.9002	0.577
borstaff	0.001	0.0020	0.613
women	-0.042*	0.0245	0.092
lnglp	-0.333	0.2801	0.236
gpyield	-0.074**	0.0339	0.030
rur	0.002	0.0906	0.985
lninc	-0.636	2.0589	0.758
unemp	-0.067	0.2088	0.749
agric	-0.156**	0.0675	0.022
constant	18.544	19.5386	0.344

* significant at the 10% level. ** significant at the 5% level. $R^2 = 0.0934$.

Unlike in case of India, regression results for Russian MFIs, shown in table 4.2.2, 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.

Table 4.2.2. OLS Regression Results for the Portfolio at Risk for Russia

Variable name	Coefficient	Robust standard error	P-value
lnloan	-2.045**	0.9441	0.032
borstaff	-0.025**	0.0111	0.028
women	0.075	0.0784	0.339
lnglp	0.294	0.5669	0.605
gpyield	0.048	0.0649	0.459
rur	0.060	0.1159	0.605
lninc	4.507	4.3936	0.307
unemp	0.712*	0.4025	0.079
agric	-0.421	0.3959	0.290
constant	-28.320	36.6903	0.442

* significant at the 10% level. ** significant at the 5% level. $R^2 = 0.1284$.

The regression results for the Caucasus Region, depicted in table 4.2.3, 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.

Table 4.2.3. OLS Regression Results for the Portfolio at Risk for the Caucasus

Variable name	Coefficient	Robust standard error	P-value
lnloan	-0.732	0.6854	0.288
borstaff	-0.021**	0.0094	0.027
women	0.008	0.0291	0.788
lnglp	0.292	0.2171	0.182
gpyield	-0.055	0.0399	0.171
rur	-0.043	0.0343	0.217
lninc	0.067	0.5447	0.902
unemp	0.011	0.0422	0.791
agric	-0.090	0.0706	0.204
constant	8.335	6.3262	0.190

** significant at the 5% level. $R^2 = 0.0923$.

Finally, in the case of Central Asian MFIs, the borrowers per staff ratio, the average per capita income, and the unemployment level are significantly related to the portfolio at risk (table 4.2.4). In particular, 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 4.2.4. OLS Regression Results for the Portfolio at Risk for Central Asia

Variable name	Coefficient	Robust standard error	P-value
lnloan	-0.112	0.2795	0.690
borstaff	-0.019**	0.0091	0.039
women	-0.009	0.0177	0.604
lnglp	0.106	0.1179	0.369
gpyield	0.027	0.0189	0.150
rur	-0.026	0.2852	0.367
lninc	-0.844*	0.4649	0.072
unemp	-0.187**	0.0785	0.019
agric	-0.005	0.0166	0.767
constant	10.428	4.9051	0.035

* significant at the 10% level. ** significant at the 5% level. $R^2 = 0.1374$.

Overall, in India, women and farmers are considered to be less risky borrowers, whereas, in Russia, larger loans are found to greatly reduce loan delinquency. Therefore, Russian MFIs tend to lend less to clients considered high risk, providing the evidence of the mission drift.

Furthermore, Russian, Caucasian, and Central Asian MFIs indicated that higher borrower-staff ratio results in less risky loan portfolio. The coefficients are quite robust with estimated value - 0.2% in all three regions, suggesting that MFIs here prioritize staffing and

careful monitoring, that is they tend to hire more staff when they anticipate larger numbers of highly risky borrowers among their target clientele.

4.2.2. The Loan Pricing (Gross Portfolio Yield) Model Results

With respect to the equation 6, given the homogeneity of Russian, Caucasian, and Central Asian MFIs, confirmed by the BP independence test, a new joint dataset was created to represent the region. It was estimated against Indian dataset using OLS RSE technique to control for heteroskedasicity. Both equations in the system were tested for multicollinearity. The Variance Inflation Factor (VIF) values obtained for all independent variables are found to be less than 10 in the two equations, which rules out any serious multicollinearity issue in the yield on gross portfolio equation (Appendix F).

Table 4.2.5. reports the results of the equation 6 for India. Among the explanatory variables the return on equity, the operating expense per loan portfolio, the average annual per capita income, and the portfolio at risk beyond 30 days are significantly related to the yield on gross portfolio. Surprisingly, a 10% increase in the risk of default results in 2% decline in the interest rate, suggesting that high interest rate is charged to low risk borrowers. Although not consistent with traditional banking principle, it could indicate that Indian MFIs' principle involves having good borrowers subsidize high risk borrowers. In fact, significant positive association between income and the yield on gross portfolio, suggesting that higher income borrowers are charged with higher interest, only confirms the cross-subsidization hypothesis. On the other hand, the tendency to charge high interest rate to low risk borrowers can also constitute the mission drift.

Another unexpected result is a significant positive relationship between the return on equity and the interest rate, which can be considered the evidence of the mission drift in Indian

MFIs, where drive for profitability overwhelms the initial purpose of poverty outreach. The mission drift can be the reason why MFIs that become more profitable still want to charge more from their borrowers.

Table 4.2.5. OLS Regression Results for the Yield on Gross Portfolio for India

Variable name	Coefficient	Robust standard error	P-value
lnloan	-0.258	0.8416	0.760
lnglp	0.082	0.3599	0.819
roe	0.012*	0.0073	0.088
oelp	0.104**	0.0485	0.032
deratio	0.001	0.0041	0.854
women	0.007	0.0209	0.733
rur	-0.052	0.0748	0.489
lninc	3.840*	2.1639	0.077
agric	0.105	0.1711	0.538
portrisk	-0.209**	0.0947	0.028
constant	-3.601	19.0735	0.850

* significant at the 10% level. ** significant at the 5% level. $R^2 = 0.0504$.

In contrast, quite expectedly, a highly significant positive relationship was found between the increase in operating expenses and the increase in the interest charged by MFIs. A 10% increase in the operating expense per loan portfolio ratio results in 1% interest growth. The result simply shows that higher interest is needed to cover the extra cost of declining operational efficiency of the MFIs.

Table 4.2.6 reports the estimation results of the equation 6 for the combined region of Russia, the Caucasus, and Central Asia, where all independent variables except the debt to equity ratio and the average per capita income are significantly related to the interest rate. 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.

Table 4.2.6. OLS Regression Results for the Yield on Gross Portfolio for Russia, the Caucasus, and Central Asia

Variable name	Coefficient	Robust standard error	P-value
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
rur	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

* significant at the 10% level. ** significant at the 5% level. $R^2 = 0.2926$.

As a result, higher interest rates are charged on smaller loans. 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 4.2.6.). 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.

Overall, MFIs in Russia, the Caucasus, and Central Asia consider women and rural borrowers less attractive clients than MFIs in India. Also, they are more cautious and conservative in the lending decisions when compared to Indian MFIs. Nevertheless, MFIs in both regions suffer from the mission drift issue with the growing profitability being directly translated into increased interest. The mission drift represents a big concern not only for India, but even more so for the younger growing microfinance sectors of Russia, the Caucasus, and Central Asia, because while striving to protect and improve the financial bottom-line, the MFIs seem to de-emphasize their mission of poverty alleviation.

4.2.3. The Loan Amount Model Results

In the equation 7, each of four country/regions was estimated using OLS procedure. However, only the equation for India was estimated with the OLS RSE technique, because the presence of heteroskedasicity was not confirmed in other country/region equations. The test for multicollinearity using the Variance Inflation Factor (VIF) found that all values obtained for the independent variables were less than 10 in the four equations ruling out any serious multicollinearity issue in the average loan amount equation (Appendix G).

Table 4.2.7 reports the results of the equation 7 for India. *Lninc* and *agric* are the two independent variables significantly related to the average loan amount. Contrary to the expectations, borrowers with less income are eligible for larger loans. In fact, a 10% increase in the annual per capita income decreases the loan size by 5%, suggesting that Indian MFIs are ready to accept higher risks in return for greater poverty outreach, ceteris paribus. Another plausible explanation is that as incomes grow the demand for MFIs services decreases, resulting in smaller loan disbursements.

Table 4.2.7. OLS Regression Results for the Average Loan Amount for India

Variable name	Coefficient	Robust standard error	P-value
borstaff	-0.000	0.0001	0.446
lnbor	0.136	0.0233	0.560
roe	0.000	0.0002	0.692
dcratio	-0.000	0.0005	0.749
women	-0.009	0.0062	0.126
rur	-0.017	0.0113	0.134
lninc	-0.504**	0.2396	0.037
agric	0.032**	0.0138	0.020
portrisk	0.004	0.0191	0.816
constant	9.398	2.1730	0.000

** significant at the 5% level. $R^2 = 0.1540$.

Meanwhile, the increase in the number of rural borrowers engaged in farming results in greater loan amounts. Indian farmers receive larger loans, which is a striking difference when

compared to the perceptions in Russia and in the Caucasus. Although the growing loan amount is the evidence of the reduced depth of outreach, it can be argued that for farmers larger loan amounts are needed to finance the burden of sizable input costs, including the costs of buying/renting equipment, acquiring fertilizers, fuel, and seeds/livestock.

In the 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 4.2.8.), while the percentage of women borrowers is inversely related to the loan amount. The results match the expectations, where 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.

Table 4.2.8. OLS Regression Results for the Average Loan Amount for Russia

Variable name	Coefficient	Standard error	P-value
borstaff	-0.004**	0.0008	0.000
lnbor	-0.192	0.0626	0.759
roe	-0.000	0.0002	0.548
dcratio	0.001	0.0009	0.215
women	-0.032**	0.0056	0.000
rur	-0.010	0.0081	0.218
lninc	0.671*	0.3500	0.057
agric	-0.012	0.0286	0.687
portrisk	-0.013*	0.0069	0.069
constant	4.641	3.0842	0.135

* significant at the 10% level. ** significant at the 5% level. $R^2 = 0.3730$.

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.

According to the results in table 4.2.9., five explanatory variables are significantly related to the loan size in the Caucasus region loan size equation. They include *borstaff, lnbor, dcratio, rur,* and *lninc*. 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 – a good justification for deposit generation.

Table 4.2.9. OLS Regression Results for the Average Loan Amount for the Caucasus

Variable name	Coefficient	Standard error	P-value
borstaff	-0.006**	0.0015	0.000
lnbor	-0.073*	0.0450	0.107
roe	0.001	0.0020	0.557
dcratio	0.234**	0.0996	0.020
women	-0.006	0.0045	0.206
rur	0.015**	0.0052	0.004
lninc	0.453**	0.1697	0.009
agric	0.001	0.0136	0.943
portrisk	-0.100	0.0157	0.509
constant	4.413	1.3680	0.002

* significant at the 10% level. ** significant at the 5% level. $R^2 = 0.2498$.

Table 4.2.10 provides the results of the estimation for the Central Asia region. Here, all independent variables, except the portfolio at risk, proved to be significantly related to the loan amount. In particular, 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.

Table 4.2.10. OLS Regression Results for the Average Loan Amount for Central Asia

Variable name	Coefficient	Standard error	P-value
borstaff	-0.012**	0.0030	0.000
lnbor	-0.091**	0.0443	0.041
roe	-0.005*	0.0031	0.099
dcratio	0.323**	0.0810	0.000
women	-0.009**	0.0038	0.028
rur	-0.025**	0.0071	0.001
lninc	-0.255*	0.1528	0.098
agric	0.012**	0.0058	0.047
portrisk	0.006	0.0245	0.816
constant	11.854	1.0291	0.000

* significant at the 10% level. ** significant at the 5% level. $R^2 = 0.3886$.

With regard to the average loan amount, Indian MFIs tend to prioritize the outreach objective over the goal of financial sustainability, by providing risky larger loans to lower income clients. Similarly, Central Asian MFIs improve poverty outreach by providing small loans to women and rural borrowers and larger loans to farmers, because the latter require greater

loan amounts to cover high input costs. Moreover, Central Asian institutions also tend to be less conservative when providing loans to clients. The more profitable and efficient they become the greater outreach they tend to achieve.

Similar to institutions in India and Central Asia, Russian MFIs offer smaller loan mounts to women, suggesting the increase of poverty outreach. MFIs in the Caucasus region prioritize all rural borrowers, whereas Indian and Central Asian MFIs favor farmers more.

In contrast to Indian and Central Asian MFIs, Russian and Caucasian MFIs prefer wealthier clients, suggesting that the latter are more conservative and risk-averse when providing loans to clients. Nevertheless, the more efficient they become, the greater poverty outreach they achieve.

The MFIs in the Caucasus and Central Asia also share similar characteristics. The increased breadth of outreach positively affects the depth. Additionally, greater deposit accumulation allows larger loan disbursements by MFIs in the two regions.

Overall, the MFIs in India and, increasingly so, in Central Asia become more outreach oriented, while Russian and Caucasian MFIs approach lending to the poor cautiously. However, over time they are expected to follow the path of established Indian institutions. For the Caucasian and Central Asian MFIs, the major force behind the described development process will be deposit accumulation, as a more secure way of becoming financially independent and sustainable organizations.

4.3. Additional Regression Results for the Significant SUR Models

According to the results of the Breusch-Pagan Test of Independence for the average loan amount equation, the Indian and Russian MFIs found to be homogenous with regard to their lending policies. The result suggests that MFIs in both countries should have comparable

practices for the loan size determination. In order to account for the detected dependency, the average loan amount equation was estimated with SUR procedure, using data from India and Russia.

4.3.1. SUR Results for the Average Loan Amount for India and Russia

Variable name	Coefficient	Standard error	P-value
	India [a]		
borstaff	-0.000	0.0002	0.630
lnbor	0.015	0.0329	0.652
roe	0.000	0.0004	0.620
dcratio	-0.001	0.0011	0.673
women	-0.009**	0.0025	0.000
rur	-0.015*	0.0092	0.097
lninc	-0.473*	0.2638	0.073
agric	0.034**	0.0163	0.037
portrisk	0.002	0.0106	0.844
constant	9.020	2.0687	0.000
	Russia [b]		
borstaff	-0.004**	0.0007	0.000
lnbor	-0.010	0.0593	0.865
roe	-0.000	0.0002	0.747
dcratio	0.001	0.0009	0.138
women	-0.031**	0.0053	0.000
rur	-0.009	0.0076	0.243
lninc	0.603*	0.3325	0.070
agric	-0.027	0.0271	0.323
portrisk	-0.013**	0.0065	0.039
constant	5.192	2.9298	0.076

* significant at the 10% level. ** significant at the 5% level. [a] $R^2 = 0.1550$. [b] $R^2 = 0.3730$.

The statistically significant results in table 4.3.1 suggest that the Indian and Russian MFIs prefer to offer smaller loan amounts when the share of women borrowers increases. The result shows that women in both countries subscribe to the retail nature of MFI lending, i.e., they borrow small loans, but are still able to use them to make their businesses flourish.

Nevertheless, the MFIs in the two countries do not agree on income determinants of the loan size. India MFIs lend higher loan amounts to low income borrowers, while Russian MFIs tend to offer larger loans to higher income clients, suggesting that Russian institutions are more cautious and profit-driven in making their lending decisions than Indian MFIs, which supports earlier provided results of OLS estimation.

CHAPTER 5

CONCLUSIONS AND IMPLICATIONS

The collapse of state-ownership, a consequence of the dissolution of the Soviet Union, led to the emergence of a new class of poor, the so called "new poor." The change of the socio-economic and political environment created new conditions. A new era of self-employment and small businesses began throughout the region. Microfinance has become a mechanism of financial support to small entrepreneurs that commercial banks considered "non-bankable." Because microfinance sector in the region is a fairly new phenomenon, many MFIs rely heavily on international donors' funding for their development. However, as international donor funding diminishes worldwide, the issue of MFIs' financial sustainability has become increasingly acute. The MFIs feel the need to scale up through partnership formations with commercial banks or merges with other MFIs. The transformation into formal financial institutions is necessary to access new funding sources, such as savings, investments, and public funds, to support their growth and development and to expand poverty outreach into most underserved, remote, and rural areas of the region.

This study considers financial sustainability the key element of poverty outreach expansion. Therefore, the objective of the study was to perform a comparative analysis of the performance of MFIs in India, developed and experienced institutions, vs. young MFIs in the ECA region and 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 possible universality of the microfinance operations model was assessed by the Breusch-Pagan test of independent errors that was applied to test the assumption whether the MFIs' in the ECA region operate in similar socio-economic conditions, compared to Indian institutions. The results of the independence tests for the portfolio at risk, the interest rate, and the loan size suggest that the universal model is unsuitable for the analysis of MFIs' performance in different regions and countries. With respect to profitability, even though MFIs in the ECA region showed to have similar interest related policies, the Indian MFIs proved to approach charging the interest rate differently. Mature Indian MFIs charge, on average, lower interest, compared to younger and less developed ECA institutions that need to charge higher interest to cover the costs and support their growth. With regard to delinquency and outreach, MFIs in all regions use different repayment management tools and lending techniques. Therefore, when formulating policies intended to improve the efficiency of financial services and effectively address the needs of growing microfinance sectors, government policy makers should account for country/region specific differences, affecting microfinance sectors in different regions.

The estimation results for the loan portfolio quality, measured by the portfolio at risk beyond 30 days, suggested that MFIs in India favor women and farmers as more reliable borrowers. In contrast, Russian MFIs tend to be more cautious by lending less to high risk borrowers. Furthermore, in Russian, Caucasian, and Central Asian MFIs the higher borrower-per-staff ratio has positive effect on the quality of loan portfolio. By prioritizing staffing and careful monitoring practices, the ECA MFIs act more cautiously and conservatively, and, thus, more profit-driven, in comparison to Indian institutions.

With regard to profitability, measured by the yield on gross portfolio, the ECA MFIs consider women and rural borrowers high risk clientele. They are also more cautious and conservative in the lending decisions than Indian MFIs that mostly serve women and rural clients. However, an alarming tendency of the mission drift affecting the ECA and Indian MFIs translates the increase in profitability into the increase in the interest rate. The existence of the mission drift is especially harmful for younger, less developed MFIs of the ECA region. The focus on the financial sustainability objective detracts the ECA MFIs from the objective of poverty alleviation at the early stage of development. It also makes the drive towards greater outreach significantly more challenging for the ECA institutions, in comparison to the initially balanced double bottom-line objective of Indian MFIs.

With respect to outreach, measured by the average loan amount, MFIs in India and in Central Asia are more outreach oriented, while MFIs in Russia and the Caucasus possess more conservative lending practices. However, with time the ECA MFIs are expected to follow the path of more established Indian institutions. According to the obtained results, the major force behind the development of MFIs in the Caucasus and Central Asia will be deposit accumulation.

Overall, the results of the analysis of financial sustainability and social outreach show that Indian MFIs are more outreach oriented, whereas the ECA MFIs are more conservative and thus more driven by the financial bottom-line. 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 incomplete financial data submission on behalf of MFIs, as well as 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. This study mostly focuses on the lender's perspective of microfinance. However, as more year- and location-specific data sources for variables become available, more elaborate research of the borrowing side of the microfinance model will be possible. In addition, the inclusion of a greater number of MFIs from other countries of the ECA region, particularly from Turkmenistan and Ukraine, will allow a more comprehensive analysis of the ECA microfinance region.

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 mature Indian MFIs are able to emphasize the outreach objective, while younger ECA MFIs prioritize financial sustainability. Although the ECA MFIs are expected to follow the path of Indian institutions, future research is needed to confirm or reject the current expectation.

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APPENDICES

Appendix A. Variable Description and Simple Statistics

Below located tables provide a detailed description of the three dependent and the explanatory variables used in the analysis for MFIs in all regions or countries, including India, Russia, the Caucasus, and Central Asia.

1. The Description and Simple Statistics of Variables Included in the Model for India

Variable Name	Variable Description	Mean	Standard Deviation	Minimum	Maximum
Rur	Rural population (percent)	66.62	0.73	51.55	88.70
Unemp	Level of unemployment (percent)	7.84	0.28	2.41	22.10
Agric	Agricultural output in total value added (percent)	20.72	0.37	14.41	31.18
Inc	Average annual per capita income (dollars)	1,031.92	1.02	461.92	2,479.59
Loan	Average loan amount per borrower (dollars)	110.05	1.05	14.55	1,729.25
Glp	Gross loan portfolio (dollars)	5,224,860.29	1.15	97,694.55	439,068,426.36
Borstaff	Borrowers per staff member ratio	251.78	17.49	31.00	1,863.00
Deratio	Debt to equity ratio	20.75	8.11	-228.66	1,097.75
Bor	Number of active borrowers (people)	48,144.55	1.15	812.00	3,520,826.00
OELP	Operating expense per loan portfolio (percent)	14.43	1.59	0.85	187.08
Portrisk	Portfolio at risk beyond 30 days (percent)	2.41	0.39	0.00	43.15
ROE	Return on equity (percent)	13.00	9.81	-1,258.17	212.17
Dcratio	Deposit to total capital (percent)	4.69	3.63	0.00	530.23
Women	Women borrowers (percent)	90.74	1.72	3.50	100.00
Gpyield	Average yield on gross portfolio (percent)	23.76	0.81	0.32	81.95

Source: MIX Market (2011); Labour Bureau of India (2011); Census of India (2011); the Reserve Bank of India (2011).
Note: All dollar values are real, 2005 base.

2. The Description and Simple Statistics of Variables Included in the Model for Russia

Variable Name	Variable Description	Mean	Standard Deviation	Minimum	Maximum
Rur	Rural population (percent)	31.92	1.27	0.00	73.78
Unemp	Level of unemployment (percent)	7.12	0.19	0.77	14.89
Agric	Agricultural output in total value added (percent)	8.39	0.40	0.00	19.80
Inc	Average annual per capita income (dollars)	5,010.61	1.02	2,938.87	15,452.70
Loan	Average loan amount per borrower (dollars)	1,878.46	1.10	162.73	35,274.55
Glp	Gross loan portfolio (dollars)	1,469,225.08	1.15	6,055.66	1,659,389,385.45
Borstaff	Borrowers per staff member ratio	86.05	8.72	13.00	627.00
Deratio	Debt to equity ratio	32.14	9.54	-327.12	871.26
Bor	Number of active borrowers (people)	784.44	1.11	95.00	64,056.00
OELP	Operating expense per loan portfolio (percent)	17.40	0.93	2.09	63.07
Portrisk	Portfolio at risk beyond 30 days (percent)	6.59	0.93	0.00	86.54
ROE	Return on equity (percent)	94.61	40.67	-653.99	3,806.35
Dcratio	Deposit to total capital (percent)	28.86	8.82	-269.89	789.96
Women	Women borrowers (percent)	60.37	1.17	12.82	86.00
Gpyield	Average yield on gross portfolio (percent)	39.09	1.40	15.21	91.52

Source: MIX Market (2011); Russian Federation Federal State Statistical Service (2011).
Note: All dollar values are real, 2005 base.

3. The Description and Simple Statistics of Variables Included in the Model for the Caucasus

Variable Name	Variable Description	Mean	Standard Deviation	Minimum	Maximum
Rur	Rural population (percent)	40.08	1.46	0.00	64.79
Unemp	Level of unemployment (percent)	14.55	0.90	2.18	39.91
Agric	Agricultural output in total value added (percent)	10.61	0.53	0.01	20.82
Inc	Average annual per capita income (dollars)	1,670.21	1.04	574.44	3,531.44
Loan	Average loan amount per borrower (dollars)	1,209.26	1.10	80.19	19,161.32
Glp	Gross loan portfolio (dollars)	6,016,148.30	1.21	26,844.34	284,726,177.27
Borstaff	Borrowers per staff member ratio	88.92	4.77	3.00	259.00
Deratio	Debt to equity ratio	3.32	0.22	0.01	15.35
Bor	Number of active borrowers (people)	3,934.36	1.18	50.00	104,910.00
OELP	Operating expense per loan portfolio (percent)	21.74	1.88	1.92	157.66
Portrisk	Portfolio at risk beyond 30 days (percent)	2.26	0.46	0.00	36.46
ROE	Return on equity (percent)	9.37	3.56	-288.93	78.90
Dcratio	Deposit to total capital (percent)	0.36	0.07	0.00	4.87
Women	Women borrowers (percent)	37.29	1.57	1.94	99.51
Gpyield	Average yield on gross portfolio (percent)	33.71	1.29	9.17	84.11

Source: MIX Market (2011); the National Statistical Service of the Republic of Armenia (2011); the State Statistical Committee of the Republic of Azerbaijan (2011); National Statistics Office of Georgia (2011); the World Bank (2011).
Note: All dollar values are real, 2005 base.

4. The Description and Simple Statistics of Variables Included in the Model for Central Asia

Variable Name	Variable Description	Mean	Standard Deviation	Minimum	Maximum
Rur	Rural population (percent)	73.41	1.02	45.88	92.00
Unemp	Level of unemployment (percent)	8.55	0.23	5.54	23.30
Agric	Agricultural output in total value added (percent)	25.81	1.24	0.88	60.91
Inc	Average annual per capita income (dollars)	351.15	1.05	109.74	668.17
Loan	Average loan amount per borrower (dollars)	1,352.56	1.10	252.73	18,132.08
Glp	Gross loan portfolio (dollars)	1,560,157.13	1.19	56,203.77	132,103,293.64
Borstaff	Borrowers per staff member ratio	45.12	2.57	3.00	150.00
Deratio	Debt to equity ratio	2.54	0.28	-4.09	35.76
Bor	Number of active borrowers (people)	1,507.05	1.19	33.00	90,686.00
OELP	Operating expense per loan portfolio (percent)	24.41	1.34	4.18	79.40
Portrisk	Portfolio at risk beyond 30 days (percent)	2.29	0.27	0.00	25.42
ROE	Return on equity (percent)	15.52	2.11	-104.98	143.29
Dcratio	Deposit to total capital (percent)	0.33	0.08	0.00	4.85
Women	Women borrowers (percent)	52.84	1.66	7.09	98.98
Gpyield	Average yield on gross portfolio (percent)	38.94	1.24	9.64	114.18

Source: MIX Market (2011); the Agency of Statistics of the Republic Kazakhstan (2011); the Kyrgyz Republic National Statistical Committee's (2011); the Agency on Statistics under President of the Republic of Tajikistan (2011); the World Bank (2011).
Note: All dollar values are real, 2005 base.

Appendix B. SUR Test for Independence Results for the Portfolio at Risk

1. Seemingly unrelated regression for Russia, the Caucasus, and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
portrisk_ru	**146**	**9**	**10.50716**	**0.1287**	**21.90**	**0.0092**
portrisk_cs	**146**	**9**	**5.309932**	**0.0923**	**16.21**	**0.0626**
portrisk_ca	**146**	**9**	**3.037364**	**0.1374**	**22.68**	**0.0070**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
portrisk_ru						
lnloan_ru	-2.024484	1.308018	-1.55	0.122	-4.588153	.5391846
borstaff_ru	-.0251234	.0101275	-2.48	0.013	-.0449728	-.0052739
women_ru	.0687412	.0720746	0.95	0.340	-.0725224	.2100047
lnglp_ru	.3055502	.6923168	0.44	0.659	-1.051366	1.662466
gpyield_ru	.0512152	.0620696	0.83	0.409	-.0704389	.1728693
rur_ru	.0658688	.1059959	0.62	0.534	-.1418793	.2736169
lninc_ru	5.192921	4.091878	1.27	0.204	-2.827013	13.21286
unemp_ru	.696477	.4465786	1.56	0.119	-.1788009	1.571755
agric_ru	-.382529	.3380714	-1.13	0.258	-1.045137	.2800786
_cons	-34.56414	36.85953	-0.94	0.348	-106.8075	37.67922
portrisk_cs						
lnloan_cs	-.7278523	.4511428	-1.61	0.107	-1.612076	.1563714
borstaff_cs	-.0223158	.0084344	-2.65	0.008	-.0388469	-.0057847
women_cs	.0080804	.023502	0.34	0.731	-.0379826	.0541434
lnglp_cs	.225352	.2061058	1.09	0.274	-.1786079	.6293118
gpyield_cs	-.0566121	.0305313	-1.85	0.064	-.1164523	.003228
rur_cs	-.0408095	.0273856	-1.49	0.136	-.0944844	.0128654
lninc_cs	.4806353	.9065631	0.53	0.596	-1.296196	2.257466
unemp_cs	.0068819	.044655	0.15	0.878	-.0806403	.0944042
agric_cs	-.0817815	.0739599	-1.11	0.269	-.2267402	.0631773
_cons	6.334242	7.59157	0.83	0.404	-8.544961	21.21345
portrisk_ca						
lnloan_ca	-.1523493	.2712366	-0.56	0.574	-.6839632	.3792647
borstaff_ca	-.0181709	.0095296	-1.91	0.057	-.0368487	.0005069
women_ca	-.0118184	.0130175	-0.91	0.364	-.0373323	.0136955
lnglp_ca	.1144285	.1297537	0.88	0.378	-.1398841	.368741
gpyeild_ca	.0284432	.0179075	1.59	0.112	-.0066548	.0635412
rur_ca	-.0207755	.0251155	-0.83	0.408	-.070001	.02845
lninc_ca	-.9228492	.5074315	-1.82	0.069	-1.917397	.0716983
unemp_ca	-.1720103	.0937983	-1.83	0.067	-.3558515	.0118309
agric_ca	-.0057591	.0196433	-0.29	0.769	-.0442593	.0327411
_cons	10.64952	4.73795	2.25	0.025	1.363306	19.93573

Correlation matrix of residuals:

	portrisk_ru	portrisk_cs	portrisk_ca
portrisk_ru	1.0000		
portrisk_cs	0.0052	1.0000	
portrisk_ca	-0.0724	-0.1481	1.0000

Breusch-Pagan test of independence: chi2(3) = **3.971**, Pr = **0.2647**

2. Seemingly unrelated regression for Russia and the Caucasus

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
portrisk_ru	**146**	**9**	**10.50453**	**0.1292**	**21.60**	**0.0102**
portrisk_cs	**146**	**9**	**5.303669**	**0.0945**	**15.33**	**0.0824**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
portrisk_ru						
lnloan_ru	**-2.059112**	**1.31128**	**-1.57**	**0.116**	**-4.629173**	**.5109482**
borstaff_ru	**-.0245771**	**.0101515**	**-2.42**	**0.015**	**-.0444736**	**-.0046806**
women_ru	**.074669**	**.0722366**	**1.03**	**0.301**	**-.0669122**	**.2162502**
lnglp_ru	**.2970124**	**.6940081**	**0.43**	**0.669**	**-1.063218**	**1.657243**
gpyield_ru	**.0475609**	**.0622183**	**0.76**	**0.445**	**-.0743847**	**.1695065**
rur_ru	**.0609195**	**.1062562**	**0.57**	**0.566**	**-.1473389**	**.2691779**
lninc_ru	**4.501378**	**4.102529**	**1.10**	**0.273**	**-3.539431**	**12.54219**
unemp_ru	**.7084674**	**.4476257**	**1.58**	**0.113**	**-.168863**	**1.585798**
agric_ru	**-.4217469**	**.3389219**	**-1.24**	**0.213**	**-1.086022**	**.2425279**
_cons	**-28.15041**	**36.95503**	**-0.76**	**0.446**	**-100.5809**	**44.28012**
portrisk_cs						
lnloan_cs	**-.735336**	**.4557517**	**-1.61**	**0.107**	**-1.628593**	**.1579209**
borstaff_cs	**-.0210336**	**.0085234**	**-2.47**	**0.014**	**-.0377392**	**-.0043279**
women_cs	**.0077022**	**.0237584**	**0.32**	**0.746**	**-.0388635**	**.0542679**
lnglp_cs	**.2913035**	**.2082929**	**1.40**	**0.162**	**-.116943**	**.69955**
gpyield_cs	**-.0557438**	**.030835**	**-1.81**	**0.071**	**-.1161792**	**.0046917**
rur_cs	**-.0427582**	**.0276617**	**-1.55**	**0.122**	**-.0969742**	**.0114578**
lninc_cs	**.0665866**	**.9157873**	**0.07**	**0.942**	**-1.728323**	**1.861497**
unemp_cs	**.0111895**	**.0450945**	**0.25**	**0.804**	**-.077194**	**.0995731**
agric_cs	**-.0909314**	**.0747103**	**-1.22**	**0.224**	**-.2373609**	**.055498**
_cons	**8.413262**	**7.668665**	**1.10**	**0.273**	**-6.617045**	**23.44357**

Correlation matrix of residuals:

	portrisk_ru	portrisk_cs
portrisk_ru	**1.0000**	
portrisk_cs	**0.0052**	**1.0000**

Breusch-Pagan test of independence: chi2(1) = **0.004**, Pr = **0.9501**

3. Seemingly unrelated regression for India, Russia, the Caucasus, and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
portrisk_in	**146**	**9**	**4.521398**	**0.0934**	**15.70**	**0.0733**
portrisk_ru	**146**	**9**	**10.50894**	**0.1284**	**22.67**	**0.0070**
portrisk_cs	**146**	**9**	**5.309927**	**0.0923**	**16.21**	**0.0625**
portrisk_ca	**146**	**9**	**3.037329**	**0.1374**	**22.67**	**0.0070**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
portrisk_in						
lnloan_in	.5725827	.6985424	0.82	0.412	-.7965353	1.941701
borstaff_in	.0009599	.0018933	0.51	0.612	-.0027509	.0046707
women_in	-.0433478	.020023	-2.16	0.030	-.0825922	-.0041033
lnglp_in	-.3275106	.2601672	-1.26	0.208	-.837429	.1824077
gpyield_in	-.0725958	.0402037	-1.81	0.071	-.1513936	.006202
rur_in	-.0086824	.0826445	-0.11	0.916	-.1706627	.1532979
lninc_in	-.7302808	2.155462	-0.34	0.735	-4.954909	3.494347
unemp_in	-.0775092	.144805	-0.54	0.592	-.3613218	.2063035
agric_in	-.1374908	.1278692	-1.08	0.282	-.3881098	.1131282
_cons	19.30506	17.70548	1.09	0.276	-15.39703	54.00716
portrisk_ru						
lnloan_ru	-2.021159	1.303929	-1.55	0.121	-4.576814	.5344954
borstaff_ru	-.0251233	.010095	-2.49	0.013	-.0449092	-.0053374
women_ru	.0803316	.0718488	1.12	0.264	-.0604894	.2211526
lnglp_ru	.3724416	.6901337	0.54	0.589	-.9801956	1.725079
gpyield_ru	.045407	.061892	0.73	0.463	-.075899	.166713
rur_ru	.0717854	.1056821	0.68	0.497	-.1353478	.2789186
lninc_ru	4.917095	4.080913	1.20	0.228	-3.081349	12.91554
unemp_ru	.7628982	.4452295	1.71	0.087	-.1097355	1.635532
agric_ru	-.3998228	.3370748	-1.19	0.236	-1.060477	.2608316
_cons	-34.17826	36.7579	-0.93	0.352	-106.2224	37.86589
portrisk_cs						
lnloan_cs	-.7278437	.4511427	-1.61	0.107	-1.612067	.1563798
borstaff_cs	-.0223152	.0084344	-2.65	0.008	-.0388464	-.0057841
women_cs	.0080978	.023502	0.34	0.730	-.0379652	.0541608
lnglp_cs	.225407	.2061057	1.09	0.274	-.1785528	.6293668
gpyield_cs	-.0566098	.0305313	-1.85	0.064	-.1164499	.0032304
rur_cs	-.0408149	.0273856	-1.49	0.136	-.0944898	.01286
lninc_cs	.4807792	.906563	0.53	0.596	-1.296052	2.25761
unemp_cs	.0068789	.044655	0.15	0.878	-.0806434	.0944011
agric_cs	-.0818419	.0739599	-1.11	0.268	-.2268007	.0631168
_cons	6.332384	7.591569	0.83	0.404	-8.546817	21.21158
portrisk_ca						
lnloan_ca	-.1520969	.2712309	-0.56	0.575	-.6836996	.3795059
borstaff_ca	-.0181073	.0095295	-1.90	0.057	-.0367847	.0005701
women_ca	-.0116456	.0130173	-0.89	0.371	-.037159	.0138678
lnglp_ca	.1143492	.1297514	0.88	0.378	-.1399589	.3686573
gpyeild_ca	.0284108	.0179071	1.59	0.113	-.0066865	.0635081
rur_ca	-.020945	.0251151	-0.83	0.404	-.0701696	.0282796
lninc_ca	-.9279684	.507421	-1.83	0.067	-1.922495	.0665586
unemp_ca	-.1715101	.0937965	-1.83	0.067	-.3553479	.0123277
agric_ca	-.0056652	.019643	-0.29	0.773	-.0441647	.0328343
_cons	10.67384	4.737847	2.25	0.024	1.387832	19.95985

Correlation matrix of residuals:

	portrisk_in	portrisk_ru	portrisk_cs	portrisk_ca
portrisk_in	1.0000			
portrisk_ru	-0.0825	1.0000		
portrisk_cs	-0.0008	0.0052	1.0000	
portrisk_ca	0.0118	-0.0724	-0.1481	1.0000

Breusch-Pagan test of independence: chi2(6) = **4.986**, Pr = **0.5457**

4. Seemingly unrelated regression for Russia and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
portrisk_ru	**146**	**9**	**10.50712**	**0.1287**	**21.86**	**0.0093**
portrisk_ca	**146**	**9**	**3.035621**	**0.1384**	**23.23**	**0.0057**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
portrisk_ru						
lnloan_ru	**-2.038722**	**1.308038**	**-1.56**	**0.119**	**-4.602429**	**.5249861**
borstaff_ru	**-.0250961**	**.0101276**	**-2.48**	**0.013**	**-.0449459**	**-.0052463**
women_ru	**.0686151**	**.0720757**	**0.95**	**0.341**	**-.0726506**	**.2098807**
lnglp_ru	**.3115048**	**.6923261**	**0.45**	**0.653**	**-1.045429**	**1.668439**
gpyield_ru	**.0506168**	**.0620705**	**0.82**	**0.415**	**-.0710391**	**.1722727**
rur_ru	**.0665826**	**.1059974**	**0.63**	**0.530**	**-.1411684**	**.2743336**
lninc_ru	**5.175886**	**4.091935**	**1.26**	**0.206**	**-2.844159**	**13.19593**
unemp_ru	**.6936395**	**.446585**	**1.55**	**0.120**	**-.181651**	**1.56893**
agric_ru	**-.3833032**	**.3380764**	**-1.13**	**0.257**	**-1.045921**	**.2793144**
_cons	**-34.36367**	**36.86004**	**-0.93**	**0.351**	**-106.608**	**37.88068**
portrisk_ca						
lnloan_ca	**-.1078678**	**.2740912**	**-0.39**	**0.694**	**-.6450766**	**.4293411**
borstaff_ca	**-.0181884**	**.0096317**	**-1.89**	**0.059**	**-.0370661**	**.0006893**
women_ca	**-.0090676**	**.013147**	**-0.69**	**0.490**	**-.0348352**	**.0167001**
lnglp_ca	**.1071973**	**.1310438**	**0.82**	**0.413**	**-.1496438**	**.3640384**
gpyeild_ca	**.0261062**	**.0180968**	**1.44**	**0.149**	**-.0093628**	**.0615752**
rur_ca	**-.023154**	**.0253694**	**-0.91**	**0.361**	**-.0728772**	**.0265691**
lninc_ca	**-.8139202**	**.5123485**	**-1.59**	**0.112**	**-1.818105**	**.1902644**
unemp_ca	**-.1951283**	**.0947909**	**-2.06**	**0.040**	**-.3809151**	**-.0093416**
agric_ca	**-.0082175**	**.019852**	**-0.41**	**0.679**	**-.0471267**	**.0306916**
_cons	**10.17537**	**4.783844**	**2.13**	**0.033**	**.7992136**	**19.55154**

Correlation matrix of residuals:

	portrisk_ru	portrisk_ca
portrisk_ru	**1.0000**	
portrisk_ca	**-0.0724**	**1.0000**

Breusch-Pagan test of independence: chi2(1) = **0.766**, Pr = **0.3814**

5. Seemingly unrelated regression for the Caucasus and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
portrisk_cs	**146**	**9**	**5.309915**	**0.0923**	**16.29**	**0.0611**
portrisk_ca	**146**	**9**	**3.037535**	**0.1373**	**23.00**	**0.0062**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
portrisk_cs						
lnloan_cs	-.73112	.4511495	-1.62	0.105	-1.615357	.1531169
borstaff_cs	-.0222783	.0084345	-2.64	0.008	-.0388097	-.0057469
women_cs	.0079147	.0235023	0.34	0.736	-.038149	.0539784
lnglp_cs	.2250619	.2061088	1.09	0.275	-.1789039	.6290277
gpyield_cs	-.0572866	.0305317	-1.88	0.061	-.1171277	.0025544
rur_cs	-.0409507	.027386	-1.50	0.135	-.0946263	.012725
lninc_cs	.4771492	.9065757	0.53	0.599	-1.299707	2.254005
unemp_cs	.0068529	.0446557	0.15	0.878	-.0806707	.0943765
agric_cs	-.0826114	.073961	-1.12	0.264	-.2275723	.0623495
_cons	6.428304	7.591675	0.85	0.397	-8.451105	21.30771
portrisk_ca						
lnloan_ca	-.1562901	.2718774	-0.57	0.565	-.6891602	.3765799
borstaff_ca	-.019018	.009553	-1.99	0.047	-.0377416	-.0002944
women_ca	-.0119329	.0130501	-0.91	0.361	-.0375106	.0136448
lnglp_ca	.113571	.1300819	0.87	0.383	-.1413848	.3685267
gpyeild_ca	.029704	.0179494	1.65	0.098	-.0054761	.0648841
rur_ca	-.0234012	.0251779	-0.93	0.353	-.072749	.0259465
lninc_ca	-.9527164	.5086408	-1.87	0.061	-1.949634	.0442011
unemp_ca	-.1636327	.0940313	-1.74	0.082	-.3479305	.0206652
agric_ca	-.0025043	.0196935	-0.13	0.899	-.0411028	.0360941
_cons	10.8976	4.748831	2.29	0.022	1.590058	20.20513

Correlation matrix of residuals:

	portrisk_ru	portrisk_ca
portrisk_ru	1.0000	
portrisk_ca	-0.0724	1.0000

Breusch-Pagan test of independence: chi2(1) = **3.200**, Pr = **0.0736**

6. Seemingly unrelated regression for India and Russia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
portrisk_in	146	9	4.521382	0.0934	15.65	0.0746
portrisk_ru	146	9	10.50744	0.1287	22.46	0.0075

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
portrisk_in						
lnloan_in	.5765044	.6985587	0.83	0.409	-.7926455	1.945654
borstaff_in	.0009578	.0018933	0.51	0.613	-.0027531	.0046687
women_in	-.0432049	.0200235	-2.16	0.031	-.0824502	-.0039596
lnglp_in	-.3254019	.2601721	-1.25	0.211	-.8353299	.1845261
gpyield_in	-.0727066	.0402045	-1.81	0.071	-.1515061	.0060928
rur_in	-.0088763	.0826463	-0.11	0.914	-.1708601	.1531074
lninc_in	-.7087883	2.155505	-0.33	0.742	-4.933501	3.515925
unemp_in	-.0761219	.1448082	-0.53	0.599	-.3599408	.207697
agric_in	-.1375102	.1278718	-1.08	0.282	-.3881343	.1131139
_cons	19.09752	17.70587	1.08	0.281	-15.60534	53.80038

portrisk_ru						
lnloan_ru	**-2.041461**	**1.307136**	**-1.56**	**0.118**	**-4.6034**	**.5204787**
borstaff_ru	**-.0246161**	**.0101186**	**-2.43**	**0.015**	**-.0444482**	**-.0047839**
women_ru	**.0867694**	**.0720082**	**1.20**	**0.228**	**-.0543641**	**.227903**
lnglp_ru	**.3613455**	**.6917959**	**0.52**	**0.601**	**-.9945496**	**1.717241**
gpyield_ru	**.0423965**	**.0620385**	**0.68**	**0.494**	**-.0791967**	**.1639897**
rur_ru	**.0662538**	**.1059384**	**0.63**	**0.532**	**-.1413818**	**.2738893**
lninc_ru	**4.235748**	**4.091413**	**1.04**	**0.301**	**-3.783274**	**12.25477**
unemp_ru	**.7783189**	**.4462601**	**1.74**	**0.081**	**-.0963348**	**1.652973**
agric_ru	**-.4382038**	**.3379123**	**-1.30**	**0.195**	**-1.1005**	**.2240922**
_cons	**-27.98852**	**36.85201**	**-0.76**	**0.448**	**-100.2171**	**44.24008**

Correlation matrix of residuals:

	portrisk_in	portrisk_ru
portrisk_in	**1.0000**	
portrisk_ru	**-0.0825**	**1.0000**

Breusch-Pagan test of independence: chi2(1) = **0.995**, Pr = **0.3186**

7. Seemingly unrelated regression for India and the Caucasus

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
portrisk_in	**146**	**9**	**4.520207**	**0.0939**	**15.12**	**0.0877**
portrisk_cs	**146**	**9**	**5.303655**	**0.0945**	**15.22**	**0.0849**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
portrisk_in						
lnloan_in	**.5035218**	**.7006034**	**0.72**	**0.472**	**-.8696356**	**1.876679**
borstaff_in	**.0010146**	**.0018993**	**0.53**	**0.593**	**-.002708**	**.0047372**
women_in	**-.0416425**	**.0200838**	**-2.07**	**0.038**	**-.0810061**	**-.0022789**
lnglp_in	**-.3333414**	**.2610003**	**-1.28**	**0.202**	**-.8448925**	**.1782097**
gpyield_in	**-.0743429**	**.0403289**	**-1.84**	**0.065**	**-.1533862**	**.0047003**
rur_in	**.0018184**	**.0828993**	**0.02**	**0.982**	**-.1606612**	**.1642981**
lninc_in	**-.6334665**	**2.162227**	**-0.29**	**0.770**	**-4.871353**	**3.60442**
unemp_in	**-.0670702**	**.1452549**	**-0.46**	**0.644**	**-.3517646**	**.2176241**
agric_in	**-.1561157**	**.1282753**	**-1.22**	**0.224**	**-.4075308**	**.0952993**
_cons	**18.52566**	**17.75889**	**1.04**	**0.297**	**-16.28112**	**53.33244**
portrisk_cs						
lnloan_cs	**-.7318363**	**.4557573**	**-1.61**	**0.108**	**-1.625104**	**.1614316**
borstaff_cs	**-.0210759**	**.0085235**	**-2.47**	**0.013**	**-.0377818**	**-.0043701**
women_cs	**.0078108**	**.0237587**	**0.33**	**0.742**	**-.0387555**	**.0543771**
lnglp_cs	**.2914218**	**.2082953**	**1.40**	**0.162**	**-.1168294**	**.699673**
gpyield_cs	**-.0549568**	**.0308353**	**-1.78**	**0.075**	**-.115393**	**.0054793**
rur_cs	**-.0425661**	**.027662**	**-1.54**	**0.124**	**-.0967827**	**.0116505**
lninc_cs	**.0671**	**.9157979**	**0.07**	**0.942**	**-1.727831**	**1.862031**
unemp_cs	**.0112014**	**.045095**	**0.25**	**0.804**	**-.0771833**	**.0995861**
agric_cs	**-.0901257**	**.0747112**	**-1.21**	**0.228**	**-.236557**	**.0563055**
_cons	**8.339535**	**7.668754**	**1.09**	**0.277**	**-6.690946**	**23.37002**

Correlation matrix of residuals:

	portrisk_in	portrisk_cs
portrisk_in	**1.0000**	
portrisk_cs	**-0.0008**	**1.0000**

Breusch-Pagan test of independence: chi2(1) = **0.000**, Pr = **0.9924**

8. Seemingly unrelated regression for India, the Caucasus, and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
portrisk_in	**146**	**9**	**4.520221**	**0.0939**	**15.22**	**0.0850**
portrisk_cs	**146**	**9**	**5.309912**	**0.0923**	**16.29**	**0.0610**
portrisk_ca	**146**	**9**	**3.037554**	**0.1373**	**22.97**	**0.0063**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
portrisk_in						
lnloan_in	.5022259	.7005585	0.72	0.473	-.8708434	1.875295
borstaff_in	.0010322	.0018992	0.54	0.587	-.0026902	.0047545
women_in	-.04186	.0200825	-2.08	0.037	-.0812211	-.002499
lnglp_in	-.3368333	.2609836	-1.29	0.197	-.8483517	.1746852
gpyield_in	-.0741491	.0403264	-1.84	0.066	-.1531874	.0048891
rur_in	.0023455	.0828938	0.03	0.977	-.1601233	.1648144
lninc_in	-.6580395	2.162092	-0.30	0.761	-4.895661	3.579583
unemp_in	-.069298	.145245	-0.48	0.633	-.353973	.215377
agric_in	-.1562965	.1282667	-1.22	0.223	-.4076946	.0951016
_cons	18.75309	17.75776	1.06	0.291	-16.05147	53.55765
portrisk_cs						
lnloan_cs	-.7309785	.4511493	-1.62	0.105	-1.615215	.153258
borstaff_cs	-.0222786	.0084345	-2.64	0.008	-.0388099	-.0057472
women_cs	.0079462	.0235023	0.34	0.735	-.0381175	.0540099
lnglp_cs	.2251243	.2061087	1.09	0.275	-.1788413	.6290899
gpyield_cs	-.0572798	.0305317	-1.88	0.061	-.1171208	.0025613
rur_cs	-.0409607	.027386	-1.50	0.135	-.0946364	.0127149
lninc_cs	.4774763	.9065753	0.53	0.598	-1.299379	2.254331
unemp_cs	.0068524	.0446557	0.15	0.878	-.0806712	.0943759
agric_cs	-.0827063	.073961	-1.12	0.263	-.2276671	.0622546
_cons	6.423932	7.591671	0.85	0.397	-8.45547	21.30333
portrisk_ca						
lnloan_ca	-.1567833	.2718594	-0.58	0.564	-.6896178	.3760513
borstaff_ca	-.0189204	.0095524	-1.98	0.048	-.0376428	-.000198
women_ca	-.0116623	.0130492	-0.89	0.371	-.0372383	.0139137
lnglp_ca	.1138558	.1300736	0.88	0.381	-.1410839	.3687955
gpyeild_ca	.0296951	.0179482	1.65	0.098	-.0054828	.064873
rur_ca	-.0236034	.0251763	-0.94	0.348	-.0729479	.0257412
lninc_ca	-.9602721	.5086079	-1.89	0.059	-1.957125	.036581
unemp_ca	-.1630533	.0940251	-1.73	0.083	-.3473392	.0212326
agric_ca	-.0022662	.0196922	-0.12	0.908	-.0408621	.0363298
_cons	10.92677	4.748527	2.30	0.021	1.619827	20.23371

Correlation matrix of residuals:

	portrisk_in	portrisk_cs	portrisk_ca
portrisk_in	1.0000		
portrisk_cs	-0.0008	1.0000	
portrisk_ca	0.0118	-0.1481	1.0000

Breusch-Pagan test of independence: chi2(3) = **3.221**, Pr = **0.3588**

9. Seemingly unrelated regression for India and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
portrisk_in	**146**	**9**	**4.520221**	**0.0939**	**15.22**	**0.0850**
portrisk_ca	**146**	**9**	**3.035198**	**0.1386**	**23.47**	**0.0052**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
portrisk_in						
lnloan_in	**.5028439**	**.7005588**	**0.72**	**0.473**	**-.870226**	**1.875914**
borstaff_in	**.0010277**	**.0018992**	**0.54**	**0.588**	**-.0026947**	**.0047501**
women_in	**-.0418486**	**.0200825**	**-2.08**	**0.037**	**-.0812097**	**-.0024876**
lnglp_in	**-.3371303**	**.2609837**	**-1.29**	**0.196**	**-.848649**	**.1743884**
gpyield_in	**-.0741901**	**.0403264**	**-1.84**	**0.066**	**-.1532284**	**.0048482**
rur_in	**.0024309**	**.0828938**	**0.03**	**0.977**	**-.160038**	**.1648998**
lninc_in	**-.6535353**	**2.162093**	**-0.30**	**0.762**	**-4.891159**	**3.584089**
unemp_in	**-.0694243**	**.1452451**	**-0.48**	**0.633**	**-.3540994**	**.2152509**
agric_in	**-.1562673**	**.1282667**	**-1.22**	**0.223**	**-.4076655**	**.0951309**
_cons	**18.71929**	**17.75776**	**1.05**	**0.292**	**-16.08529**	**53.52386**
portrisk_ca						
lnloan_ca	**-.1123166**	**.2747199**	**-0.41**	**0.683**	**-.6507578**	**.4261247**
borstaff_ca	**-.0189491**	**.0096547**	**-1.96**	**0.050**	**-.0378719**	**-.0000263**
women_ca	**-.0088991**	**.013179**	**-0.68**	**0.500**	**-.0347295**	**.0169312**
lnglp_ca	**.1065663**	**.1313666**	**0.81**	**0.417**	**-.1509075**	**.3640401**
gpyeild_ca	**.0273649**	**.0181379**	**1.51**	**0.131**	**-.0081847**	**.0629145**
rur_ca	**-.0260236**	**.0254308**	**-1.02**	**0.306**	**-.075867**	**.0238197**
lninc_ca	**-.8516706**	**.5135351**	**-1.66**	**0.097**	**-1.858181**	**.1548396**
unemp_ca	**-.1861288**	**.09502**	**-1.96**	**0.050**	**-.3723646**	**.0001069**
agric_ca	**-.0046847**	**.0199013**	**-0.24**	**0.814**	**-.0436905**	**.0343212**
_cons	**10.45675**	**4.794516**	**2.18**	**0.029**	**1.059668**	**19.85383**

Correlation matrix of residuals:

	portrisk_in	portrisk_ca
portrisk_in	**1.0000**	
portrisk_ca	**0.0118**	**1.0000**

Breusch-Pagan test of independence: chi2(1) = **0.020**, Pr = **0.8868**

Appendix C. SUR Test for Independence Results for the Yield on Gross Portfolio

1. Seemingly unrelated regression for Russia, the Caucasus, and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
gpyield_ru	**146**	**10**	**11.70483**	**0.5153**	**181.81**	**0.0000**
gpyield_cs	**146**	**10**	**13.96119**	**0.1897**	**35.52**	**0.0001**
gpyeild_ca	**146**	**10**	**13.08043**	**0.2314**	**47.67**	**0.0000**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
gpyield_ru						
lnloan_ru	-2.960376	1.221578	-2.42	0.015	-5.354625	-.5661273
lnglp_ru	-.0045061	.7365564	-0.01	0.995	-1.44813	1.439118
roe_ru	.0049276	.0026295	1.87	0.061	-.0002262	.0100813
oelp_ru	.8929539	.0950489	9.39	0.000	.7066614	1.079246
deratio_ru	.0048436	.0109291	0.44	0.658	-.016577	.0262643
women_ru	-.0563372	.0771136	-0.73	0.465	-.2074771	.0948027
rur_ru	.1926935	.1020133	1.89	0.059	-.0072489	.392636
lninc_ru	-.918435	4.348216	-0.21	0.833	-9.440781	7.603911
agric_ru	-.2677707	.3592064	-0.75	0.456	-.9718022	.4362609
portrisk_ru	.0476914	.0872082	0.55	0.584	-.1232336	.2186164
_cons	52.3228	38.82953	1.35	0.178	-23.78167	128.4273
gpyield_cs						
lnloan_cs	-3.958615	1.065119	-3.72	0.000	-6.04621	-1.87102
lnglp_cs	.3998544	.5506183	0.73	0.468	-.6793376	1.479046
roe_cs	.0671449	.028211	2.38	0.017	.0118524	.1224373
oelp_cs	.0571793	.0537973	1.06	0.288	-.0482615	.1626201
deratio_cs	-.4013691	.4613451	-0.87	0.384	-1.305589	.5028508
women_cs	.0007195	.0613048	0.01	0.991	-.1194357	.1208748
rur_cs	-.1087696	.0730585	-1.49	0.137	-.2519617	.0344225
lninc_cs	-2.382851	2.329396	-1.02	0.306	-6.948382	2.182681
agric_cs	-.4942349	.1855738	-2.66	0.008	-.8579528	-.130517
portrisk_cs	-.1764873	.2123577	-0.83	0.406	-.5927007	.2397261
_cons	82.68415	18.77067	4.40	0.000	45.8943	119.474
gpyeild_ca						
lnloan_ca	.4415448	.9810077	0.45	0.653	-1.481195	2.364285
lnglp_ca	-.6877264	.5526111	-1.24	0.213	-1.770824	.3953715
roe_ca	.0600994	.0430878	1.39	0.163	-.0243511	.1445499
oelp_ca	.2793361	.0720407	3.88	0.000	.1381388	.4205333
deratio_ca	.3568085	.3271797	1.09	0.275	-.284452	.9980691
women_ca	.1052151	.0542022	1.94	0.052	-.0010193	.2114495
rur_ca	.1791979	.1050701	1.71	0.088	-.0267358	.3851316
lninc_ca	-4.465434	2.113011	-2.11	0.035	-8.606859	-.324009
agric_ca	-.1095552	.082044	-1.34	0.182	-.2703584	.051248
portrisk_ca	.3050666	.3435868	0.89	0.375	-.3683511	.9784843
_cons	46.49403	18.52415	2.51	0.012	10.18736	82.8007

Correlation matrix of residuals:

	gpyield_ru	gpyield_cs	gpyeild_ca
gpyield_ru	**1.0000**		
gpyield_cs	**-0.1784**	**1.0000**	
gpyeild_ca	**-0.2720**	**0.0461**	**1.0000**

Breusch-Pagan test of independence: chi2(3) = **15.759**, Pr = **0.0013**

2. Seemingly unrelated regression for India and the ECA region

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
gpyield_in	**320**	**10**	**10.56947**	**0.0504**	**17.69**	**0.0605**
gpyield_all	**320**	**10**	**13.91657**	**0.2926**	**133.63**	**0.0000**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
gpyield_in						
lnloan_in	**-.2456281**	**.9729204**	**-0.25**	**0.801**	**-2.152517**	**1.661261**
lnglp_in	**.060828**	**.3591323**	**0.17**	**0.866**	**-.6430584**	**.7647144**
roe_in	**.0127596**	**.0076165**	**1.68**	**0.094**	**-.0021685**	**.0276877**
oelp_in	**.1075207**	**.0345478**	**3.11**	**0.002**	**.0398082**	**.1752332**
deratio_in	**.0007024**	**.0063684**	**0.11**	**0.912**	**-.0117793**	**.0131842**
women_in	**.0062637**	**.0270048**	**0.23**	**0.817**	**-.0466647**	**.0591922**
rur_in	**-.0554686**	**.0766754**	**-0.72**	**0.469**	**-.2057496**	**.0948123**
lninc_in	**3.847426**	**2.442141**	**1.58**	**0.115**	**-.939083**	**8.633936**
agric_in	**.1072205**	**.1349635**	**0.79**	**0.427**	**-.1573031**	**.3717441**
portrisk_in	**-.2086659**	**.1339934**	**-1.56**	**0.119**	**-.4712881**	**.0539564**
_cons	**-3.141126**	**20.77928**	**-0.15**	**0.880**	**-43.86777**	**37.58552**
gpyield_all						
lnloan_all	**-2.192977**	**.7674501**	**-2.86**	**0.004**	**-3.697152**	**-.6888025**
lnglp_all	**-.9163789**	**.437254**	**-2.10**	**0.036**	**-1.773381**	**-.0593769**
roe_all	**.0075872**	**.0031627**	**2.40**	**0.016**	**.0013885**	**.0137859**
oelp_all	**.2326291**	**.0503434**	**4.62**	**0.000**	**.1339578**	**.3313004**
deratio_all	**-.0117462**	**.0133707**	**-0.88**	**0.380**	**-.0379522**	**.0144598**
women_all	**.1932212**	**.0444015**	**4.35**	**0.000**	**.106196**	**.2802465**
rur_all	**.1255743**	**.0601555**	**2.09**	**0.037**	**.0076717**	**.2434769**
lninc_all	**-1.409413**	**.9680224**	**-1.46**	**0.145**	**-3.306702**	**.4878761**
agric_all	**-.419395**	**.1032581**	**-4.06**	**0.000**	**-.621777**	**-.2170129**
portrisk_all	**.2005476**	**.0961033**	**2.09**	**0.037**	**.0121886**	**.3889067**
_cons	**61.88607**	**12.32388**	**5.02**	**0.000**	**37.7317**	**86.04044**

Correlation matrix of residuals:

	gpyield_in	gpyield_all
gpyield_in	**1.0000**	
gpyield_all	**-0.0419**	**1.0000**

Breusch-Pagan test of independence: chi2(1) = **0.561**, Pr = **0.4537**

Appendix D. SUR Test for Independence Results for the Average Loan Amount

1. Seemingly unrelated regression for Russia, the Caucasus, and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnloan_ru	**146**	**9**	**.8629921**	**0.3773**	**89.32**	**0.0000**
lnloan_cs	**146**	**9**	**.9869771**	**0.2498**	**49.86**	**0.0000**
lnloan_ca	**146**	**9**	**.8807559**	**0.3887**	**93.64**	**0.0000**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnloan_ru						
borstaff_ru	-.0034827	.0007552	-4.61	0.000	-.0049629	-.0020026
lnbor_ru	-.0196729	.0603087	-0.33	0.744	-.1378757	.0985299
roe_ru	-.0001504	.0001985	-0.76	0.449	-.0005395	.0002388
dcratio_ru	.0012461	.0008893	1.40	0.161	-.0004969	.0029892
women_ru	-.0320833	.0053736	-5.97	0.000	-.0426155	-.0215512
rur_ru	-.0101082	.0077654	-1.30	0.193	-.025328	.0051116
lninc_ru	.6482694	.3373755	1.92	0.055	-.0129744	1.309513
agric_ru	-.0119269	.0275431	-0.43	0.665	-.0659104	.0420565
portrisk_ru	-.0125085	.0066597	-1.88	0.060	-.0255612	.0005442
_cons	4.866263	2.972849	1.64	0.102	-.9604138	10.69294
lnloan_cs						
borstaff_cs	-.0062355	.0014927	-4.18	0.000	-.0091612	-.0033099
lnbor_cs	-.0724532	.0433561	-1.67	0.095	-.1574296	.0125232
roe_cs	.0013383	.0019558	0.68	0.494	-.0024951	.0051717
dcratio_cs	.2309117	.0959588	2.41	0.016	.0428359	.4189875
women_cs	-.0056574	.0043781	-1.29	0.196	-.0142383	.0029234
rur_cs	.0149312	.0049889	2.99	0.003	.0051533	.0247092
lninc_cs	.4735376	.1635941	2.89	0.004	.1528991	.7941762
agric_cs	.001324	.013111	0.10	0.920	-.0243732	.0270211
portrisk_cs	-.0116872	.0151859	-0.77	0.442	-.041451	.0180766
_cons	4.269237	1.318389	3.24	0.001	1.685241	6.853232
lnloan_ca						
borstaff_ca	-.0126341	.0028723	-4.40	0.000	-.0182636	-.0070045
lnbor_ca	-.0869024	.0426774	-2.04	0.042	-.1705485	-.0032562
roe_ca	-.0049456	.0029603	-1.67	0.095	-.0107477	.0008566
dcratio_ca	.3222226	.0779842	4.13	0.000	.1693764	.4750688
women_ca	-.0085168	.0037116	-2.29	0.022	-.0157915	-.0012421
rur_ca	-.0239438	.0068811	-3.48	0.001	-.0374306	-.0104571
lninc_ca	-.2780683	.1471192	-1.89	0.059	-.5664168	.0102801
agric_ca	.0113312	.0055631	2.04	0.042	.0004278	.0222347
portrisk_ca	.0054142	.023573	0.23	0.818	-.040788	.0516163
_cons	11.92014	.9908674	12.03	0.000	9.978076	13.86221

Correlation matrix of residuals:

	lnloan_ru	lnloan_cs	lnloan_ca
lnloan_ru	1.0000		
lnloan_cs	0.0192	1.0000	
lnloan_ca	-0.0495	-0.0557	1.0000

Breusch-Pagan test of independence: chi2(3) = **0.866**, Pr = **0.8336**

2. Seemingly unrelated regression for India, Russia, the Caucasus, and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnloan_in	**146**	**9**	**.5898659**	**0.1540**	**29.62**	**0.0005**
lnloan_ru	**146**	**9**	**.8659816**	**0.3730**	**91.83**	**0.0000**
lnloan_cs	**146**	**9**	**.9869843**	**0.2498**	**49.81**	**0.0000**
lnloan_ca	**146**	**9**	**.8808057**	**0.3886**	**94.82**	**0.0000**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnloan_in						
borstaff_in	-.0001259	.0002401	-0.52	0.600	-.0005964	.0003446
lnbor_in	.0156411	.0328371	0.48	0.634	-.0487185	.0800007
roe_in	.0001892	.0004139	0.46	0.648	-.0006219	.0010004
dcratio_in	-.000506	.00113	-0.45	0.654	-.0027207	.0017087
women_in	-.0094214	.002453	-3.84	0.000	-.0142291	-.0046137
rur_in	-.0151083	.0091935	-1.64	0.100	-.0331273	.0029107
lninc_in	-.498895	.2632646	-1.90	0.058	-1.014884	.0170942
agric_in	.0349348	.0163147	2.14	0.032	.0029587	.066911
portrisk_in	.0018164	.0105643	0.17	0.863	-.0188893	.0225221
_cons	9.158655	2.064749	4.44	0.000	5.111822	13.20549
lnloan_ru						
borstaff_ru	-.0034168	.0007419	-4.61	0.000	-.0048709	-.0019627
lnbor_ru	-.011142	.0592156	-0.19	0.851	-.1272024	.1049185
roe_ru	-.0000865	.000195	-0.44	0.657	-.0004686	.0002956
dcratio_ru	.0013655	.0008739	1.56	0.118	-.0003474	.0030783
women_ru	-.0310961	.0052811	-5.89	0.000	-.0414469	-.0207453
rur_ru	-.008999	.0076365	-1.18	0.239	-.0239663	.0059683
lninc_ru	.58121	.3322024	1.75	0.080	-.0698948	1.232315
agric_ru	-.0270463	.0270571	-1.00	0.318	-.0800772	.0259847
portrisk_ru	-.0134716	.0065421	-2.06	0.039	-.026294	-.0006493
_cons	5.403809	2.926821	1.85	0.065	-.3326552	11.14027
lnloan_cs						
borstaff_cs	-.0061823	.0014914	-4.15	0.000	-.0091054	-.0032591
lnbor_cs	-.0772624	.0433192	-1.78	0.074	-.1621665	.0076416
roe_cs	.0013525	.0019543	0.69	0.489	-.0024779	.005183
dcratio_cs	.2353993	.095885	2.46	0.014	.0474682	.4233304
women_cs	-.0055415	.0043747	-1.27	0.205	-.0141157	.0030327
rur_cs	.0148503	.0049847	2.98	0.003	.0050804	.0246202
lninc_cs	.4652212	.1634682	2.85	0.004	.1448295	.7856129
agric_cs	.0010831	.0131	0.08	0.934	-.0245923	.0267585
portrisk_cs	-.0115426	.0151729	-0.76	0.447	-.0412808	.0181957
_cons	4.36544	1.317379	3.31	0.001	1.783424	6.947456
lnloan_ca						
borstaff_ca	-.0125725	.0028685	-4.38	0.000	-.0181946	-.0069504
lnbor_ca	-.087519	.04262	-2.05	0.040	-.1710526	-.0039854
roe_ca	-.0048964	.0029568	-1.66	0.098	-.0106916	.0008989
dcratio_ca	.3293586	.0778823	4.23	0.000	.176712	.4820052
women_ca	-.0083382	.0037069	-2.25	0.024	-.0156036	-.0010729
rur_ca	-.0242654	.0068725	-3.53	0.000	-.0377353	-.0107955
lninc_ca	-.2801843	.1469344	-1.91	0.057	-.5681703	.0078018
agric_ca	.0112567	.005556	2.03	0.043	.0003672	.0221462
portrisk_ca	.0054715	.023541	0.23	0.816	-.0406679	.051611
_cons	11.94713	.9896103	12.07	0.000	10.00753	13.88673

Correlation matrix of residuals:

	lnloan_in	lnloan_ru	lnloan_cs	lnloan_ca
lnloan_in	**1.0000**			
lnloan_ru	**0.1940**	**1.0000**		
lnloan_cs	**-0.0352**	**0.0192**	**1.0000**	
lnloan_ca	**-0.0584**	**-0.0495**	**-0.0557**	**1.0000**

Breusch-Pagan test of independence: chi2(6) = **7.038**, Pr = **0.3173**

3. Seemingly unrelated regression for Russia and the Caucasus

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnloan_ru	**146**	**9**	**.8628569**	**0.3775**	**87.97**	**0.0000**
lnloan_cs	**146**	**9**	**.9868614**	**0.2500**	**48.38**	**0.0000**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnloan_ru						
borstaff_ru	**-.0035438**	**.000756**	**-4.69**	**0.000**	**-.0050257**	**-.002062**
lnbor_ru	**-.0203809**	**.0603717**	**-0.34**	**0.736**	**-.1387072**	**.0979455**
roe_ru	**-.0001288**	**.0001988**	**-0.65**	**0.517**	**-.0005183**	**.0002608**
dcratio_ru	**.0011335**	**.0008903**	**1.27**	**0.203**	**-.0006114**	**.0028784**
women_ru	**-.0314902**	**.0053794**	**-5.85**	**0.000**	**-.0420337**	**-.0209467**
rur_ru	**-.009948**	**.007774**	**-1.28**	**0.201**	**-.0251848**	**.0052888**
lninc_ru	**.6650445**	**.3377493**	**1.97**	**0.049**	**.003068**	**1.327021**
agric_ru	**-.0114926**	**.027574**	**-0.42**	**0.677**	**-.0655367**	**.0425516**
portrisk_ru	**-.0127543**	**.0066671**	**-1.91**	**0.056**	**-.0258215**	**.000313**
_cons	**4.691587**	**2.976162**	**1.58**	**0.115**	**-1.141583**	**10.52476**
lnloan_cs						
borstaff_cs	**-.0061076**	**.0014949**	**-4.09**	**0.000**	**-.0090375**	**-.0031777**
lnbor_cs	**-.0730342**	**.0434188**	**-1.68**	**0.093**	**-.1581336**	**.0120651**
roe_cs	**.0012234**	**.0019587**	**0.62**	**0.532**	**-.0026156**	**.0050623**
dcratio_cs	**.2316902**	**.0960951**	**2.41**	**0.016**	**.0433473**	**.4200331**
women_cs	**-.0058199**	**.0043845**	**-1.33**	**0.184**	**-.0144134**	**.0027736**
rur_cs	**.0149509**	**.0049959**	**2.99**	**0.003**	**.0051591**	**.0247428**
lninc_cs	**.4536446**	**.1637996**	**2.77**	**0.006**	**.1326032**	**.774686**
agric_cs	**.00104**	**.0131282**	**0.08**	**0.937**	**-.0246909**	**.0267709**
portrisk_cs	**-.0107785**	**.0152072**	**-0.71**	**0.478**	**-.040584**	**.0190271**
_cons	**4.417304**	**1.32011**	**3.35**	**0.001**	**1.829936**	**7.004673**

Correlation matrix of residuals:

	lnloan_ru	lnloan_cs
lnloan_ru	**1.0000**	
lnloan_cs	**0.0192**	**1.0000**

Breusch-Pagan test of independence: chi2(1) = **0.054**, Pr = **0.8161**

4. Seemingly unrelated regression for Russia and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnloan_ru	**146**	**9**	**.8629677**	**0.3774**	**89.86**	**0.0000**
lnloan_ca	**146**	**9**	**.8806766**	**0.3888**	**92.95**	**0.0000**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnloan_ru						
borstaff_ru	-.0035152	.0007553	-4.65	0.000	-.0049956	-.0020348
lnbor_ru	-.0186729	.0603161	-0.31	0.757	-.1368903	.0995446
roe_ru	-.0001466	.0001986	-0.74	0.460	-.0005358	.0002426
dcratio_ru	.001262	.0008894	1.42	0.156	-.0004813	.0030053
women_ru	-.032123	.0053743	-5.98	0.000	-.0426565	-.0215895
rur_ru	-.0101399	.0077663	-1.31	0.192	-.0253617	.0050818
lninc_ru	.6525497	.3374175	1.93	0.053	-.0087765	1.313876
agric_ru	-.0119958	.0275467	-0.44	0.663	-.0659864	.0419947
portrisk_ru	-.0124158	.0066606	-1.86	0.062	-.0254703	.0006386
_cons	4.828484	2.973223	1.62	0.104	-.9989251	10.65589
lnloan_ca						
borstaff_ca	-.01258	.0028764	-4.37	0.000	-.0182176	-.0069423
lnbor_ca	-.0872153	.0427395	-2.04	0.041	-.1709833	-.0034474
roe_ca	-.0050891	.0029646	-1.72	0.086	-.0108996	.0007214
dcratio_ca	.3220763	.0780972	4.12	0.000	.1690086	.4751439
women_ca	-.0086923	.0037166	-2.34	0.019	-.0159767	-.0014078
rur_ca	-.0241518	.0068909	-3.50	0.000	-.0376577	-.010646
lninc_ca	-.2604192	.1473256	-1.77	0.077	-.549172	.0283336
agric_ca	.0118698	.0055712	2.13	0.033	.0009504	.0227892
portrisk_ca	.0058006	.0236047	0.25	0.806	-.0404638	.052065
_cons	11.82855	.9921717	11.92	0.000	9.88393	13.77317

Correlation matrix of residuals:

	lnloan_ru	lnloan_ca
lnloan_ru	**1.0000**	
lnloan_ca	**-0.0495**	**1.0000**

Breusch-Pagan test of independence: chi2(1) = **0.358**, Pr = **0.5495**

5. Seemingly unrelated regression for the Caucasus and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnloan_cs	**146**	**9**	**.9869574**	**0.2498**	**50.12**	**0.0000**
lnloan_ca	**146**	**9**	**.880721**	**0.3887**	**93.62**	**0.0000**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnloan_cs						
borstaff_cs	-.006247	.0014929	-4.18	0.000	-.0091731	-.003321
lnbor_cs	-.0724498	.0433617	-1.67	0.095	-.1574372	.0125376
roe_cs	.0013179	.0019561	0.67	0.500	-.002516	.0051518
dcratio_cs	.2331458	.0959711	2.43	0.015	.045046	.4212456
women_cs	-.0056108	.0043786	-1.28	0.200	-.0141928	.0029712
rur_cs	.0150839	.0049895	3.02	0.003	.0053046	.0248631
lninc_cs	.4731948	.1636143	2.89	0.004	.1525166	.7938729
agric_cs	.0012379	.0131128	0.09	0.925	-.0244627	.0269385
portrisk_cs	-.0113929	.0151879	-0.75	0.453	-.0411607	.0183749
_cons	4.264567	1.318549	3.23	0.001	1.680258	6.848877
lnloan_ca						
borstaff_ca	-.0124249	.0028754	-4.32	0.000	-.0180605	-.0067894
lnbor_ca	-.0909168	.0427244	-2.13	0.033	-.1746552	-.0071784
roe_ca	-.004959	.0029636	-1.67	0.094	-.0107676	.0008496
dcratio_ca	.3235909	.0780697	4.14	0.000	.170577	.4766047
women_ca	-.0084009	.0037158	-2.26	0.024	-.0156837	-.0011181
rur_ca	-.024423	.0068887	-3.55	0.000	-.0379245	-.0109214
lninc_ca	-.2730656	.1472855	-1.85	0.064	-.5617398	.0156087
agric_ca	.0110473	.0055692	1.98	0.047	.0001319	.0219627
portrisk_ca	.0053095	.0235979	0.22	0.822	-.0409416	.0515606
_cons	11.94713	.9919371	12.04	0.000	10.00297	13.89129

Correlation matrix of residuals:

	lnloan_cs	lnloan_ca
lnloan_cs	1.0000	
lnloan_ca	-0.0557	1.0000

Breusch-Pagan test of independence: chi2(1) = **0.454**, Pr = **0.5006**

6. Seemingly unrelated regression for India and Russia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnloan_in	146	9	.5895055	0.1550	28.55	0.0008
lnloan_ru	146	9	.8660218	0.3730	91.68	0.0000

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnloan_in						
borstaff_in	-.0001158	.0002405	-0.48	0.630	-.0005873	.0003556
lnbor_in	.0148565	.0329008	0.45	0.652	-.0496279	.0793409
roe_in	.0002059	.0004147	0.50	0.620	-.000607	.0010187
dcratio_in	-.0004779	.0011322	-0.42	0.673	-.0026971	.0017412
women_in	-.009506	.002458	-3.87	0.000	-.0143236	-.0046883
rur_in	-.0153015	.009211	-1.66	0.097	-.0333548	.0027518
lninc_in	-.4727767	.2637694	-1.79	0.073	-.9897552	.0442018
agric_in	.0341034	.0163469	2.09	0.037	.002064	.0661428
portrisk_in	.002088	.0105855	0.20	0.844	-.0186592	.0228353
_cons	9.020123	2.068716	4.36	0.000	4.965514	13.07473

lnloan_ru						
borstaff_ru	-.0035185	.0007427	-4.74	0.000	-.004974	-.0020629
lnbor_ru	-.0100725	.0592717	-0.17	0.865	-.1262429	.106098
roe_ru	-.0000631	.0001951	-0.32	0.747	-.0004455	.0003194
dcratio_ru	.001296	.0008748	1.48	0.138	-.0004186	.0030106
women_ru	-.0306824	.0052864	-5.80	0.000	-.0410436	-.0203213
rur_ru	-.0089217	.0076443	-1.17	0.243	-.0239043	.0060609
lninc_ru	.6027886	.3325439	1.81	0.070	-.0489855	1.254563
agric_ru	-.0267465	.0270849	-0.99	0.323	-.0798318	.0263389
portrisk_ru	-.0135277	.0065488	-2.07	0.039	-.0263631	-.0006922
_cons	5.191789	2.929846	1.77	0.076	-.5506042	10.93418

Correlation matrix of residuals:

	lnloan_in	lnloan_ru
lnloan_in	**1.0000**	
lnloan_ru	**0.1940**	**1.0000**

Breusch-Pagan test of independence: chi2(1) = **5.493**, Pr = **0.0191**

7. Seemingly unrelated regression for India and the Caucasus

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnloan_in	**146**	**9**	**.5885781**	**0.1577**	**27.93**	**0.0010**
lnloan_cs	**146**	**9**	**.9868932**	**0.2499**	**48.71**	**0.0000**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnloan_in						
borstaff_in	-.0000976	.0002447	-0.40	0.690	-.0005772	.000382
lnbor_in	.0132035	.0334854	0.39	0.693	-.0524267	.0788336
roe_in	.0000601	.0004222	0.14	0.887	-.0007674	.0008877
dcratio_in	-.0001882	.001153	-0.16	0.870	-.002448	.0020716
women_in	-.009629	.0024998	-3.85	0.000	-.0145285	-.0047294
rur_in	-.0169153	.0093523	-1.81	0.071	-.0352455	.001415
lninc_in	-.5108965	.2682241	-1.90	0.057	-1.036606	.0148131
agric_in	.0321535	.0166227	1.93	0.053	-.0004264	.0647334
portrisk_in	.004213	.0107727	0.39	0.696	-.0169011	.0253271
_cons	9.452361	2.102718	4.50	0.000	5.33111	13.57361
lnloan_cs						
borstaff_cs	-.0060779	.0014942	-4.07	0.000	-.0090065	-.0031492
lnbor_cs	-.0769361	.0434007	-1.77	0.076	-.1619999	.0081276
roe_cs	.0011963	.001958	0.61	0.541	-.0026413	.0050339
dcratio_cs	.2391144	.0960595	2.49	0.013	.0508411	.4273876
women_cs	-.0056677	.0043829	-1.29	0.196	-.0142581	.0029227
rur_cs	.0151062	.0049939	3.02	0.002	.0053184	.0248941
lninc_cs	.4459593	.1637352	2.72	0.006	.1250441	.7668744
agric_cs	.0007284	.0131227	0.06	0.956	-.0249916	.0264484
portrisk_cs	-.0101639	.0152008	-0.67	0.504	-.0399569	.0196291
_cons	4.491615	1.319597	3.40	0.001	1.905253	7.077977

Correlation matrix of residuals:

	lnloan_in	lnloan_cs
lnloan_in	**1.0000**	
lnloan_cs	**-0.0352**	**1.0000**

Breusch-Pagan test of independence: chi2(1) = **0.181**, Pr = **0.6705**

8. Seemingly unrelated regression for India and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnloan_in	**146**	**9**	**.5886455**	**0.1575**	**27.53**	**0.0011**
lnloan_ca	**146**	**9**	**.8806534**	**0.3888**	**94.00**	**0.0000**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnloan_in						
borstaff_in	-.0001165	.0002445	-0.48	0.634	-.0005956	.0003626
lnbor_in	.0149871	.033452	0.45	0.654	-.0505777	.0805519
roe_in	.0000649	.0004218	0.15	0.878	-.0007618	.0008916
dcratio_in	-.0001853	.0011519	-0.16	0.872	-.0024429	.0020724
women_in	-.0092777	.0024971	-3.72	0.000	-.0141719	-.0043834
rur_in	-.0170483	.0093416	-1.82	0.068	-.0353575	.0012609
lninc_in	-.5212097	.2679581	-1.95	0.052	-1.046398	.0039786
agric_in	.0333942	.016604	2.01	0.044	.0008509	.0659376
portrisk_in	.0044266	.0107621	0.41	0.681	-.0166667	.02552
_cons	9.460125	2.100603	4.50	0.000	5.343019	13.57723
lnloan_ca						
borstaff_ca	-.0123463	.0028749	-4.29	0.000	-.0179811	-.0067115
lnbor_ca	-.0908475	.0427177	-2.13	0.033	-.1745727	-.0071222
roe_ca	-.0050565	.0029636	-1.71	0.088	-.0108651	.0007521
dcratio_ca	.330245	.0780605	4.23	0.000	.1772493	.4832408
women_ca	-.008399	.003715	-2.26	0.024	-.0156803	-.0011176
rur_ca	-.0248928	.0068881	-3.61	0.000	-.0383931	-.0113924
lninc_ca	-.2575426	.1472679	-1.75	0.080	-.5461823	.0310971
agric_ca	.0115719	.0055688	2.08	0.038	.0006573	.0224865
portrisk_ca	.0056827	.0235913	0.24	0.810	-.0405555	.0519209
_cons	11.87139	.9917292	11.97	0.000	9.927634	13.81514

Correlation matrix of residuals:

	lnloan_in	lnloan_ca
lnloan_in	**1.0000**	
lnloan_ca	**-0.0584**	**1.0000**

Breusch-Pagan test of independence: chi2(1) = **0.498**, Pr = **0.4802**

9. Seemingly unrelated regression for India, the Caucasus, and Central Asia

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnloan_in	**146**	**9**	**.5886812**	**0.1574**	**28.19**	**0.0009**
lnloan_cs	**146**	**9**	**.9869577**	**0.2498**	**50.21**	**0.0000**
lnloan_ca	**146**	**9**	**.880833**	**0.3886**	**94.84**	**0.0000**

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnloan_in						
borstaff_in	-.0001138	.0002443	-0.47	0.641	-.0005926	.0003651
lnbor_in	.0146249	.0334302	0.44	0.662	-.050897	.0801469
roe_in	.000054	.0004215	0.13	0.898	-.0007721	.0008801
dcratio_in	-.0002033	.001151	-0.18	0.860	-.0024593	.0020527
women_in	-.0093911	.0024954	-3.76	0.000	-.0142821	-.0045002
rur_in	-.0168392	.0093365	-1.80	0.071	-.0351383	.00146
lninc_in	-.5295237	.2677878	-1.98	0.048	-1.054378	-.0046693
agric_in	.0332609	.0165938	2.00	0.045	.0007377	.0657841
portrisk_in	.0041814	.0107546	0.39	0.697	-.0168973	.0252601
_cons	9.52097	2.099281	4.54	0.000	5.406455	13.63548
lnloan_cs						
borstaff_cs	-.0062072	.0014918	-4.16	0.000	-.0091311	-.0032832
lnbor_cs	-.0767321	.0433311	-1.77	0.077	-.1616594	.0081952
roe_cs	.001321	.0019549	0.68	0.499	-.0025105	.0051525
dcratio_cs	.238484	.0959096	2.49	0.013	.0505047	.4264633
women_cs	-.0054875	.0043758	-1.25	0.210	-.014064	.003089
rur_cs	.015063	.0049861	3.02	0.003	.0052905	.0248355
lninc_cs	.4658942	.163509	2.85	0.004	.1454225	.786366
agric_cs	.0009874	.0131036	0.08	0.940	-.0246953	.02667
portrisk_cs	-.0111287	.0151772	-0.73	0.463	-.0408754	.0186179
_cons	4.347013	1.317704	3.30	0.001	1.764362	6.929665
lnloan_ca						
borstaff_ca	-.0124086	.0028704	-4.32	0.000	-.0180345	-.0067828
lnbor_ca	-.0904382	.0426488	-2.12	0.034	-.1740283	-.0068481
roe_ca	-.004906	.002959	-1.66	0.097	-.0107054	.0008935
dcratio_ca	.3307116	.0779354	4.24	0.000	.177961	.4834622
women_ca	-.0082104	.0037095	-2.21	0.027	-.015481	-.0009399
rur_ca	-.0246778	.0068773	-3.59	0.000	-.038157	-.0111985
lninc_ca	-.2763828	.1470398	-1.88	0.060	-.5645756	.01181
agric_ca	.0110136	.0055598	1.98	0.048	.0001165	.0219106
portrisk_ca	.0053037	.0235561	0.23	0.822	-.0408655	.0514728
_cons	11.9687	.9902888	12.09	0.000	10.02777	13.90963

Correlation matrix of residuals:

	lnloan_in	lnloan_cs	lnloan_ca
lnloan_in	**1.0000**		
lnloan_cs	**-0.0352**	**1.0000**	
lnloan_ca	**-0.0584**	**-0.0557**	**1.0000**

Breusch-Pagan test of independence: chi2(3) = **1.133**, Pr = **0.7691**

Appendix E. Heteroskedasticity and Multicollinearity Tests for the Portfolio at Risk

1. OLS Regression for India: Breusch-Pagan Test and Variance Inflation Factor Results

Source	SS	df	MS
Model	308.987116	9	34.3319018
Residual	2983.11116	136	21.9346409
Total	3292.09827	145	22.704126

Number of obs =	146
F(9, 136) =	1.57
Prob > F =	0.1317
R-squared =	0.0939
Adj R-squared =	0.0339
Root MSE =	4.6834

portrisk_in	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnloan_in	.5031157	.7259043	0.69	0.489	-.9324041	1.938635
borstaff_in	.0010173	.0019679	0.52	0.606	-.0028744	.0049089
women_in	-.041655	.0208091	-2.00	0.047	-.0828063	-.0005036
lnglp_in	-.3331026	.2704257	-1.23	0.220	-.8678859	.2016808
gpyield_in	-.0743384	.0417853	-1.78	0.077	-.1569715	.0082946
rur_in	.0017581	.0858931	0.02	0.984	-.1681006	.1716169
lninc_in	-.6359994	2.240311	-0.28	0.777	-5.066351	3.794352
unemp_in	-.0669548	.1505005	-0.44	0.657	-.3645787	.230669
agric_in	-.1560982	.1329077	-1.17	0.242	-.4189313	.106735
_cons	18.54456	18.40021	1.01	0.315	-17.84297	54.9321

1.1 estat hettest

```
Breusch-Pagan / Cook-Weisberg test for
          heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of portrisk_in

         chi2( 1)      =    42.64
         Prob > chi2   =    0.0000
```

1.2 estat vif

Variable	VIF	1/VIF
rur_in	3.79	0.264176
agric_in	2.40	0.417378
lninc_in	1.98	0.504437
unemp_in	1.66	0.602897
lnloan_in	1.44	0.693240
lnglp_in	1.38	0.725896
women_in	1.24	0.806512
borstaff_in	1.14	0.874966
gpyield_in	1.11	0.903202
Mean VIF	1.79	

2. OLS Regression for Russia: Breusch-Pagan Test and Variance Inflation Factor Results

Source	SS	df	MS
Model	**2389.45619**	**9**	**265.495132**
Residual	**16110.366**	**136**	**118.458574**
Total	**18499.8222**	**145**	**127.584981**

Number of obs = **146**
F(9, 136) = **2.24**
Prob > F = **0.0229**
R-squared = **0.1292**
Adj R-squared = **0.0715**
Root MSE = **10.884**

portrisk_ru	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnloan_ru	**-2.045087**	**1.358651**	**-1.51**	**0.135**	**-4.731901**	**.6417277**
borstaff_ru	**-.0246098**	**.0105182**	**-2.34**	**0.021**	**-.0454101**	**-.0038094**
women_ru	**.0751626**	**.0748462**	**1.00**	**0.317**	**-.0728504**	**.2231756**
lnglp_ru	**.2937847**	**.7190789**	**0.41**	**0.684**	**-1.128238**	**1.715807**
gpyield_ru	**.0482179**	**.0644659**	**0.75**	**0.456**	**-.0792674**	**.1757032**
rur_ru	**.0601806**	**.1100948**	**0.55**	**0.586**	**-.1575385**	**.2778997**
lninc_ru	**4.507546**	**4.250732**	**1.06**	**0.291**	**-3.898534**	**12.91363**
unemp_ru	**.7115956**	**.4637964**	**1.53**	**0.127**	**-.2055899**	**1.628781**
agric_ru	**-.4210472**	**.3511658**	**-1.20**	**0.233**	**-1.115499**	**.2734045**
_cons	**-28.32008**	**38.29003**	**-0.74**	**0.461**	**-104.0409**	**47.40077**

2.1 estat hettest

Breusch-Pagan / Cook-Weisberg test for
heteroskedasticity
Ho: Constant variance
Variables: fitted values of portrisk_ru

chi2(**1**) = **198.72**
Prob > chi2 = **0.0000**

2.2 estat vif

Variable	VIF	1/VIF
agric_ru	**3.60**	**0.277916**
rur_ru	**3.50**	**0.286097**
lnloan_ru	**2.72**	**0.367485**
lninc_ru	**1.92**	**0.521963**
lnglp_ru	**1.77**	**0.565548**
borstaff_ru	**1.50**	**0.665464**
gpyield_ru	**1.45**	**0.690738**
unemp_ru	**1.43**	**0.698512**
women_ru	**1.38**	**0.724514**
Mean VIF	**2.14**	

3. OLS Regression for the Caucasus: Breusch-Pagan Test and Variance Inflation Factor Results

Source	SS	df	MS
Model	**428.458357**	**9**	**47.6064841**
Residual	**4106.79797**	**136**	**30.1970439**
Total	**4535.25632**	**145**	**31.2776298**

Number of obs = **146**
F(9, 136) = **1.58**
Prob > F = **0.1282**
R-squared = **0.0945**
Adj R-squared = **0.0345**
Root MSE = **5.4952**

portrisk_cs	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnloan_cs	**-.7316309**	**.472216**	**-1.55**	**0.124**	**-1.665467**	**.2022051**
borstaff_cs	**-.0210711**	**.0088314**	**-2.39**	**0.018**	**-.0385356**	**-.0036065**
women_cs	**.0078313**	**.0246167**	**0.32**	**0.751**	**-.0408499**	**.0565124**
lnglp_cs	**.2915336**	**.2158174**	**1.35**	**0.179**	**-.1352584**	**.7183257**
gpyield_cs	**-.0549689**	**.0319489**	**-1.72**	**0.088**	**-.1181498**	**.008212**
rur_cs	**-.0426058**	**.028661**	**-1.49**	**0.139**	**-.0992846**	**.0140731**
lninc_cs	**.0674357**	**.94887**	**0.07**	**0.943**	**-1.809012**	**1.943884**
unemp_cs	**.011208**	**.0467236**	**0.24**	**0.811**	**-.0811907**	**.1036067**
agric_cs	**-.0901904**	**.0774092**	**-1.17**	**0.246**	**-.2432718**	**.0628911**
_cons	**8.33523**	**7.945695**	**1.05**	**0.296**	**-7.377865**	**24.04832**

3.1 estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of portrisk_cs

chi2(**1**) = **106.68**
Prob > chi2 = **0.0000**

3.2 estat vif

Variable	VIF	1/VIF
lnloan_cs	**1.40**	**0.714321**
borstaff_cs	**1.25**	**0.802298**
unemp_cs	**1.24**	**0.807405**
rur_cs	**1.23**	**0.813166**
gpyield_cs	**1.19**	**0.842391**
lninc_cs	**1.17**	**0.855632**
lnglp_cs	**1.16**	**0.859926**
agric_cs	**1.16**	**0.860657**
women_cs	**1.05**	**0.951242**
Mean VIF	**1.21**	

4. OLS Regression for Central Asia: Breusch-Pagan Test ance Inflation Factor Results

Source	SS	df	MS
Model	**216.446734**	**9**	**24.0496372**
Residual	**1345.0026**	**136**	**9.88972502**
Total	**1561.44934**	**145**	**10.7686161**

Number of obs =	**146**
F(9, 136) =	**2.43**
Prob > F =	**0.0135**
R-squared =	**0.1386**
Adj R-squared =	**0.0816**
Root MSE =	**3.1448**

portrisk_ca	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnloan_ca	**-.1118195**	**.2846597**	**-0.39**	**0.695**	**-.6747514**	**.4511124**
borstaff_ca	**-.0190475**	**.0100039**	**-1.90**	**0.059**	**-.0388309**	**.000736**
women_ca	**-.0091727**	**.0136558**	**-0.67**	**0.503**	**-.0361779**	**.0178325**
lnglp_ca	**.1062702**	**.1361192**	**0.78**	**0.436**	**-.1629138**	**.3754542**
gpyeild_ca	**.0273745**	**.0187941**	**1.46**	**0.148**	**-.0097919**	**.0645409**
rur_ca	**-.0258209**	**.0263508**	**-0.98**	**0.329**	**-.0779313**	**.0262894**
lninc_ca	**-.8440374**	**.5321145**	**-1.59**	**0.115**	**-1.896326**	**.2082515**
unemp_ca	**-.1867196**	**.0984578**	**-1.90**	**0.060**	**-.3814258**	**.0079867**
agric_ca	**-.0049258**	**.0206214**	**-0.24**	**0.812**	**-.0457058**	**.0358542**
_cons	**10.42755**	**4.967976**	**2.10**	**0.038**	**.6030729**	**20.25202**

4.1 estat hettest

Breusch-Pagan / Cook-Weisberg test for
heteroskedasticity
Ho: Constant variance
Variables: fitted values of portrisk_ca

chi2(**1**) = **42.49**
Prob > chi2 = **0.0000**

4.2 estat vif

Variable	VIF	1/VIF
rur_ca	**1.56**	**0.640922**
lnloan_ca	**1.52**	**0.658758**
borstaff_ca	**1.42**	**0.704675**
agric_ca	**1.39**	**0.718606**
lninc_ca	**1.24**	**0.806220**
lnglp_ca	**1.22**	**0.818753**
gpyeild_ca	**1.16**	**0.861427**
unemp_ca	**1.14**	**0.877207**
women_ca	**1.10**	**0.906788**
Mean VIF	**1.31**	

Appendix F. Heteroskedasticity and Multicollinearity Tests for the Yield on Gross Portfolio

1. OLS Regression for India: Breusch-Pagan Test and Variance Inflation Factor Results

Source	SS	df	MS
Model	1900.07034	10	190.007034
Residual	35746.4502	309	115.684305
Total	37646.5205	319	118.014171

Number of obs = 320
F(10, 309) = 1.64
Prob > F = 0.0938
R-squared = 0.0505
Adj R-squared = 0.0197
Root MSE = 10.756

gpyield_in	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnloan_in	-.2576826	.9909196	-0.26	0.795	-2.207486	1.692121
lnglp_in	.08228	.365767	0.22	0.822	-.6374291	.8019891
roe_in	.0124434	.0077575	1.60	0.110	-.0028208	.0277076
oelp_in	.1044445	.0351876	2.97	0.003	.035207	.173682
deratio_in	.0007496	.0064863	0.12	0.908	-.0120133	.0135125
women_in	.0071365	.0275045	0.26	0.795	-.0469832	.0612562
rur_in	-.0518618	.0780941	-0.66	0.507	-.2055253	.1018017
lninc_in	3.840377	2.487329	1.54	0.124	-1.053867	8.734621
agric_in	.1054713	.1374641	0.77	0.444	-.1650128	.3759554
portrisk_i	-.2087926	.136474	-1.53	0.127	-.4773284	.0597433
_cons	-3.601165	21.1638	-0.17	0.865	-45.24457	38.04224

1.1 estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of gpyield_in

chi2(1) = 32.18
Prob > chi2 = 0.0000

1.2 estat vif

Variable	VIF	1/VIF
oelp_in	1.29	0.775511
roe_in	1.28	0.779044
rur_in	1.26	0.792404
agric_in	1.14	0.873836
lninc_in	1.13	0.882126
women_in	1.08	0.923158
lnloan_in	1.06	0.939334
deratio_in	1.06	0.945169
lnglp_in	1.05	0.949514
portrisk_in	1.03	0.973355
Mean VIF	1.14	

2. OLS Regression for the ECA region: Breusch-Pagan Test and Variance Inflation Factor Results

Source	SS	df	MS
Model	25633.6369	10	2563.36369
Residual	61971.181	309	200.553984
Total	87604.8179	319	274.623254

Number of obs =	320
F(10, 309) =	12.78
Prob > F =	0.0000
R-squared =	0.2926
Adj R-squared =	0.2697
Root MSE =	14.162

gpyield_all	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnloan_all	-2.169253	.7816354	-2.78	0.006	-3.707254	-.6312518
lnglp_all	-.9138864	.4453518	-2.05	0.041	-1.790192	-.0375806
roe_all	.0076243	.0032212	2.37	0.019	.001286	.0139627
oelp_all	.2284491	.0512743	4.46	0.000	.1275582	.3293401
deratio_all	-.0114142	.013618	-0.84	0.403	-.0382099	.0153816
women_all	.193442	.045223	4.28	0.000	.104458	.2824259
rur_all	.1299316	.0612695	2.12	0.035	.0093735	.2504897
lninc_all	-1.394024	.9859453	-1.41	0.158	-3.33404	.5459917
agric_all	-.4216862	.1051712	-4.01	0.000	-.6286285	-.2147439
portrisk_all	.2011211	.0978839	2.05	0.041	.0085177	.3937245
_con	61.4541	12.55205	4.90	0.000	36.7558	86.15239

2.1 estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of gpyield_all

chi2(1) = 77.61
Prob > chi2 = 0.0000

2.2 estat vif

Variable	VIF	1/VIF
rur_all	3.30	0.303047
lninc_all	2.20	0.455330
agric_all	2.18	0.458417
roe_all	1.85	0.540339
deratio_all	1.84	0.542078
lnglp_all	1.30	0.771291
lnloan_all	1.26	0.793311
women_all	1.20	0.835610
oelp_all	1.15	0.866800
portrisk_all	1.09	0.913789
Mean VIF	1.74	

Appendix G. Heteroskedasticity and Multicollinearity Tests for the Average Loan Amount

1. OLS Regression for India: Breusch-Pagan Test and Variance Inflation Factor Results

Source	SS	df	MS
Model	9.47113273	9	1.05234808
Residual	50.5754519	136	.371878323
Total	60.0465846	145	.414114377

Number of obs =	146
F(9, 136) =	2.83
Prob > F =	0.0044
R-squared =	0.1577
Adj R-squared =	0.1020
Root MSE =	.60982

lnloan_in	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
borstaff_in	-.0001009	.0002537	-0.40	0.692	-.0006025	.0004008
lnbor_in	.0136043	.0347138	0.39	0.696	-.0550445	.082253
roe_in	.0000702	.0004377	0.16	0.873	-.0007955	.0009358
dcratio_in	-.0001737	.0011953	-0.15	0.885	-.0025376	.0021901
women_in	-.0095175	.0025916	-3.67	0.000	-.0146425	-.0043925
rur_in	-.0171204	.0096946	-1.77	0.080	-.0362919	.0020512
lninc_in	-.5037126	.2780605	-1.81	0.072	-1.053594	.0461689
agric_in	.0323208	.0172319	1.88	0.063	-.0017564	.066398
portrisk_in	.0044524	.0111683	0.40	0.691	-.0176336	.0265383
_cons	9.398311	2.179816	4.31	0.000	5.087593	13.70903

1.1 estat hettest

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of lnloan_in

         chi2(1)      =    75.30
         Prob > chi2  =    0.0000
```

1.2 estat vif

Variable	VIF	1/VIF
rur_in	2.84	0.351580
agric_in	2.38	0.420952
lninc_in	1.80	0.555156
lnbor_in	1.26	0.791636
women_in	1.13	0.881568
borstaff_in	1.12	0.892736
portrisk_in	1.10	0.905643
dcratio_in	1.07	0.932670
roe_in	1.05	0.953309
Mean VIF	1.53	

2. OLS Regression for Russia: Breusch-Pagan Test and Variance Inflation Factor Results

Source	SS	df	MS
Model	**65.931483**	**9**	**7.32572034**
Residual	**108.695595**	**136**	**.799232317**
Total	**174.627078**	**145**	**1.20432468**

Number of obs = **146**
F(9, 136) = **9.17**
Prob > F = **0.0000**
R-squared = **0.3776**
Adj R-squared = **0.3364**
Root MSE = **.894**

lnloan_ru	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
borstaff_ru	**-.0035818**	**.0007835**	**-4.57**	**0.000**	**-.0051312**	**-.0020324**
lnbor_ru	**-.0191919**	**.0625619**	**-0.31**	**0.759**	**-.1429118**	**.1045281**
roe_ru	**-.0001239**	**.000206**	**-0.60**	**0.548**	**-.0005312**	**.0002834**
dcratio_ru	**.0011496**	**.0009226**	**1.25**	**0.215**	**-.0006749**	**.0029741**
women_ru	**-.0315248**	**.0055747**	**-5.66**	**0.000**	**-.0425491**	**-.0205006**
rur_ru	**-.0099786**	**.0080561**	**-1.24**	**0.218**	**-.02591**	**.0059528**
lninc_ru	**.6706641**	**.3500042**	**1.92**	**0.057**	**-.0214905**	**1.362819**
agric_ru	**-.0115464**	**.0285748**	**-0.40**	**0.687**	**-.0680548**	**.044962**
portrisk_ru	**-.0126492**	**.0069091**	**-1.83**	**0.069**	**-.0263123**	**.001014**
_cons	**4.640951**	**3.084154**	**1.50**	**0.135**	**-1.458151**	**10.74005**

2.1 estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of lnloan_ru

chi2(**1**) = **0.73**
Prob > chi2 = **0.3913**

2.2 estat vif

Variable	VIF	1/VIF
agric_ru	**3.53**	**0.283190**
rur_ru	**2.77**	**0.360499**
lninc_ru	**1.93**	**0.519430**
roe_ru	**1.86**	**0.537960**
dcratio_ru	**1.76**	**0.569636**
borstaff_ru	**1.24**	**0.809176**
lnbor_ru	**1.19**	**0.842550**
women_ru	**1.13**	**0.881161**
portrisk_ru	**1.10**	**0.905031**
Mean VIF	**1.83**	

3. OLS Regression for the Caucasus: Breusch-Pagan Test and Variance Inflation Factor Results

Source	SS	df	MS	Number of obs = 146
				F(9,136) = 5.04
Model	47.3926561	9	5.26585068	Prob > F = 0.0000
Residual	142.186006	136	1.04548534	R-squared = 0.2500
				Adj R-squared = 0.2004
Total	189.578662	145	1.30743905	Root MSE = 1.0225

lnloan_cs	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
borstaff_cs	-.0061188	.0015491	-3.95	0.000	-.0091823	-.0030554
lnbor_cs	-.0730296	.0449946	-1.62	0.107	-.1620092	.0159501
roe_cs	.0011962	.0020298	0.59	0.557	-.0028179	.0052102
dcratio_cs	.2342209	.0995821	2.35	0.020	.0372912	.4311507
women_cs	-.0057728	.0045436	-1.27	0.206	-.0147582	.0032125
rur_cs	.0151303	.0051772	2.92	0.004	.004892	.0253685
lninc_cs	.453078	.1697417	2.67	0.009	.1174036	.7887525
agric_cs	.0009665	.0136047	0.07	0.943	-.0259376	.0278706
portrisk_cs	-.0104325	.0157592	-0.66	0.509	-.0415972	.0207322
_cons	4.412881	1.367998	3.23	0.002	1.707582	7.118179

3.1 estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of lnloan_cs

chi2(1) = 0.01
Prob > chi2 = 0.9203

3.2 estat vif

Variable	VIF	1/VIF
rur_cs	1.16	0.862822
lnbor_cs	1.14	0.873492
borstaff_cs	1.11	0.902775
lninc_cs	1.08	0.925715
portrisk_cs	1.08	0.928218
dcratio_cs	1.07	0.932818
roe_cs	1.05	0.948103
agric_cs	1.04	0.964698
women_cs	1.03	0.966711
Mean VIF	1.09	

4. OLS Regression for Central Asia: Breusch-Pagan Test and Variance Inflation Factor Results

Source	SS	df	MS
Model	**72.0521741**	**9**	**8.00579712**
Residual	**113.218216**	**136**	**.832486879**
Total	**185.27039**	**145**	**1.27772682**

Number of obs =	**146**
F(9, 136) =	**9.62**
Prob > F =	**0.0000**
R-squared =	**0.3889**
Adj R-squared =	**0.3485**
Root MSE =	**.91241**

lnloan_ca	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
borstaff_ca	**-.0123648**	**.0029836**	**-4.14**	**0.000**	**-.018265**	**-.0064645**
lnbor_ca	**-.0913293**	**.0443337**	**-2.06**	**0.041**	**-.1790019**	**-.0036566**
roe_ca	**-.0051057**	**.0030752**	**-1.66**	**0.099**	**-.0111871**	**.0009757**
dcratio_ca	**.3234739**	**.0810097**	**3.99**	**0.000**	**.1632723**	**.4836756**
women_ca	**-.0085779**	**.0038553**	**-2.22**	**0.028**	**-.016202**	**-.0009537**
rur_ca	**-.0246428**	**.0071478**	**-3.45**	**0.001**	**-.0387781**	**-.0105076**
lninc_ca	**-.2550007**	**.152825**	**-1.67**	**0.098**	**-.5572214**	**.0472199**
agric_ca	**.0115865**	**.005779**	**2.00**	**0.047**	**.0001582**	**.0230147**
portrisk_ca	**.0056974**	**.024484**	**0.23**	**0.816**	**-.0427212**	**.054116**
_cons	**11.85453**	**1.029151**	**11.52**	**0.000**	**9.81932**	**13.88974**

4.1 estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of lnloan_ca

chi2(**1**) = **1.28**
Prob > chi2 = **0.2579**

4.2 estat vif

Variable	VIF	1/VIF
borstaff_ca	**1.50**	**0.666872**
lnbor_ca	**1.48**	**0.674785**
rur_ca	**1.36**	**0.733226**
agric_ca	**1.30**	**0.770225**
lninc_ca	**1.22**	**0.822751**
dcratio_ca	**1.13**	**0.881590**
portrisk_ca	**1.12**	**0.889373**
roe_ca	**1.07**	**0.937819**
women_ca	**1.04**	**0.957667**
Mean VIF	**1.25**	