

***Microfinance Programmes: An Effective Poverty Reduction Tool or An
Oversold Illusion? South-eastern Europe Experience.***

Name: Asja Karanusic

Student Registration Number: 1801672

Supervisor: Dr. Lingqing Jiang

EC831 Project Economics

Department of Economics, University of Essex

29/04/2022

Word count: 6290

Abstract

This study provides new empirical evidence on the relationship between microfinance and poverty at the macro-economic level, based on panel data of five upper-middle-income countries over a 2006-2018 period. Controlling for the endogeneity of gross loan portfolio using the 2SLS estimation method, we find that the volume of microfinance activity is inversely associated with the poverty headcount. The study also concludes that the gender aspect of microfinance, that is, the proportion of female microloan borrowers, is not as relevant in South-eastern Europe. The results suggest that microfinance is an effective poverty reduction tool, with the caveat that it should be adapted to different socio-cultural and economic contexts.

Contents

1. Introduction	4
2. Literature review	5
2.1. Quasi-experimental designs.....	5
2.2. Randomised control trials	6
2.3. Comparative Analysis of South Asia and South-eastern Europe	7
2.4. Summary	8
3. Data.....	8
3.1. Data Description	8
3.2. Variable Description.....	9
3.3. Descriptive Statistics	10
4. Analysis and Results	11
4.1. Empirical Methodology.....	11
4.2. Adequacy Tests	12
4.3. Empirical Results	13
5. Limitations of the Study	15
6. Conclusion	15
7. References	16

1. Introduction

The microfinance movement has brought institutional novelty to the traditional banking industry. Built on the premise that low-income households can be offered business loans with reasonable risk and under ethical lending practices, it offers an alternative to contentious aid programmes, often creating dependencies and disincentives. The increasingly polarised opinions on the relationship between microfinance and poverty have spurred academic interest in the empirical analyses, resulting in a growing number of studies. However, economists have reached no strong consensus so far, and this relationship is still a subject of debate at the time of writing this paper.

Therefore, one might wonder about the justification for conducting yet another research, and the answer is that this study provides three novel contributions to the existing literature:

1. It analyses the relationship between microfinance and poverty at a macroeconomic level, whereas previous studies overwhelmingly looked at it from a microeconomic perspective.
2. Our geographical focus is South-eastern Europe, a region with a highly active microfinance sector, subject to little formal assessment so far. Contrarily, earlier papers prevalently researched South Asia.
3. Microfinance was introduced into South-eastern Europe as a part of an international aid package aimed at the region after a series of armed conflicts and the transition from planned to the market economy. Hence this region offers a unique economic context for assessing the poverty-alleviating potential of microfinance institutions.

According to most previous literature, microfinance loans yield powerful effects on poverty when extended to women. However, these studies were conducted at a household level and primarily concentrated in South Asia. Therefore, the following paper attempts to contribute to the literature by examining the impacts of microfinance on poverty levels in five South-eastern European countries: Bulgaria, Montenegro, North Macedonia, Romania, and Serbia.

Recognising the problem of endogeneity between gross loan portfolio and poverty levels, we apply a Two-Stage Least Squares (2SLS) estimation method to analyse panel data covering the 2006-2018 period, using a five-year lag of gross loan portfolio as an instrument. In addition, results from pooled OLS and Fixed Effects have been added to provide additional value to our discussion. In aggregate, we found that the volume of microfinance activity reduced poverty headcount. However, the gender component of microfinance is not as strong as in South Asia, which we attributed mainly to the differences in the social context and economic history.

This paper begins by summarising and reviewing the current literature. Section 2 presents the contributions and limitations of the existing studies, along with commentary on the most common methodologies: quasi-experimental designs and randomised control trials. Afterward, we explain why and how the literature on the microfinance sector in Asia is relevant to the South-eastern European experience. Subsequently, Section 3 describes the data and variables used in the empirical analysis and presents summary statistics. Section 4 outlines the paper's methodology and adequacy tests conducted, and assesses the findings with reference to the current empirical literature. Section 5 discusses the limitations of the study, and lastly, Section 6 presents conclusions and implications for future policymaking.

2. Literature review

The main appeal of microfinance lies in the belief that it effectively reaches the poor and enables them to improve their socioeconomic status through building small-scale enterprises. Consequently, it has been the focus of a vast body of literature, thoroughly examining effects on poverty alleviation. However, for the reasons that we will discuss later in this paper, there has been no firm consensus among economists on the relationship between microfinance institutions (in further text, MFIs) and their clients' economic welfare.

Until the late 1990s, proof of the impact on poverty alleviation was based mainly on non-experimental methods and anecdotal evidence (Armendáriz de Aghion and Morduch 2005, p.199). The latter has been selectively handpicked from a large population of borrowers, often by agents with potential conflicts of interest, such as MFIs and their investors. Therefore, anecdotal evidence is biased to present the impact of microfinance in a misleading light and cannot substitute sound econometric analysis. Non-experimental studies have been conducted to offer a more scientific alternative; however, the naturally occurring data on microfinance is non-random, making such methods unreliable when establishing causality. For example, MFIs operate in villages selected according to criteria that might affect outcomes of interest, and eligibility to borrow is often subject to cut-offs based on land ownership or income level.

Similarly, clients self-select into the programmes based on observable and unobservable traits. It is possible to empirically control for observable characteristics such as age and education; however, unobservable characteristics like intrinsic ability are virtually impossible to measure, leading to biased estimates of impact when directly comparing borrowers and non-borrowers in participating villages (Coleman, 2006). Therefore, to distinguish causal from selection effects of microfinance, it is necessary to control for potential biases from client selection, self-selection, and other endogeneity problems (Roodman and Morduch, 2014).

Keeping this in mind, research in the past two decades can be broadly divided into two categories, according to methodology: (i) quasi-experimental designs (Pitt and Khandker (1998), Khandker (2005), Imai *et al.* (2010)); and more recently (ii) randomised control trials (Augsburg *et al.* (2012), Banerjee *et al.* (2015)).

2.1. Quasi-experimental designs

A common theme throughout papers is that microcredit promotes welfare through entrepreneurial activity, especially for female borrowers. The underlying assumption is that microfinance allows women to empower themselves through generating profits and subsequently increase their health and education spending, thus transferring resources to elevate the whole family out of poverty. For example, Pitt and Khandker (1998) conduct an observational study of 87 villages in Bangladesh in 1991/2, assessing the effectiveness of three major microcredit programmes. Using a quasi-experimental survey and fixed-effects analysis to account for endogeneity, they investigate impacts on borrowers' welfare as measured by income, education, and household expenditure. Results suggest that credit has a measurable effect on these outcomes, particularly when provided to women. More specifically, Pitt and Khandker (1998) find that annual household consumption increases by 18 taka for every 100 taka borrowed by a female client, in comparison with only 11 taka when the client is male.

However, as discussed above, non-experimental studies often suffer from endogeneity problems and biased estimates. Pitt and Khandker (1998) rely on exogenously set land ownership cut-off when estimating programme impact to circumvent identification problems. It is essential to know that this

method is based on the premise that eligibility requirements are strictly enforced, which is not the case with microfinance programmes (Morduch, 1998). Using the same household survey from 1991/2 alongside a 1998/9 follow-up, Khandker (2005) expand the study to the time-varying impacts of microcredit. Panel data helps understand whether obtained results are robust in the long run, alongside providing an alternative estimation method.

Concurring with Pitt and Khandker (1998), Khandker (2005) finds the volume of microcredit has a negative causal effect on poverty, both on the household and village level. However, the relationship is more robust for money lent to women, and the spillover effects from participants to non-participants are more substantial for extreme than moderate poverty. In particular, Khandker (2005) concludes that microcredit accounts for 40% of the observed local poverty alleviation despite diminishing returns. This suggests that microfinance reduces individual participants' poverty and indirectly helps non-participants by improving the local economy.

In 2014, Roodman and Morduch replicate Pitt and Khandker (1998) and Khandker (2005) using the same data and applying the Two-Stage Least Squares (2SLS) estimation method. They argue that mistargeting issues such as inconsistent enforcement of the eligibility criteria invalidate their results. In particular, 203 out of 905 client households' land ownership in the 1991/2 sample exceed the cut-off (Roodman and Morduch, 2014). Therefore, statistical evidence backing claims that the extremely poor disproportionately benefit from microfinance programmes is not robust.

Similarly, Imai *et al.* (2010) investigate the impact of access to business microloans on the national poverty level, using large-scale household data from India. They develop a treatment effects model, accounting for the endogenous binary treatment effects and sample selection bias. Results demonstrate measurable effects of MFIs on poverty reduction, supporting the findings of Pitt and Khandker (1998) and Khandker (2005). As an additional discovery, Imai *et al.* (2010) observe a critical difference between households in rural and urban areas. The impact of microfinance in rural areas is more significant if offered for productive purposes, whereas in the urban areas, not specifying a loan purpose yields a more significant effect. This unique contribution highlights the importance of geographical context when assessing microcredit programmes.

2.2. Randomised control trials

Recently, randomised control trials (RCTs) gained ground against non-experimental methods. Augsburg *et al.* (2012) study over 14 months the population of loan applicants who would have been rejected under the eligibility criteria of a major Bosnian MFI. They randomly allocate loans to a subset of this group, assessing the effects on poverty reduction, educational participation, and the supply of teenage labour. Results contradict Pitt and Khandker (1998) and Khandker (2005). While the loans increased entrepreneurial activity, there has been no effect on business profitability and household income. However, the observation period is only 14 months, limiting the findings to the short term. It may be the case that the increase in income takes longer to realise.

A critical new finding is the reduction in school attendance of children aged 16 to 19 as a by-product of increased business activity. The children are a source of affordable labour compared to hires from the external market; hence the price effect incentivises the parents to favour their children's internal labour against education. Consequently, microfinance could decrease future generations' educational participation and thus negatively affect poverty levels in the long run. However, Augsburg *et al.* (2012) use randomisation at the individual level. Therefore, they do not consider the spillover effects of microfinance and possibly underestimate its indirect impact.

In a similar fashion, Banerjee *et al.* (2015) employ a randomised control trial to investigate the effect of microfinance on poverty reduction. However, their approach differs because they use a randomised programme placement design instead of randomising at an individual level. Fifty-two out of 104 of the impoverished neighbourhoods in the Indian city of Hyderabad are randomly selected as a new operating site of a major MFI, while the remainder constitute a comparison group. Moreover, unlike Augsburg *et al.* (2012), Banerjee *et al.* (2015) recognise that some of the effects are realised only in the medium run, thus observing the households for 3 to 4 years after implementing the programme.

Banerjee *et al.* (2015) conclude that, although microfinance does not increase consumption levels in the medium run, it impacts its intertemporal composition. Namely, households in treatment areas decrease expenditure on immediate utility in favour of durable goods used for either business expansion or quality of life improvement. However, the average business is still not generating substantial profit, with the average profit increase largely skewed by bigger businesses in >85th percentile (Banerjee *et al.*, 2015). The disadvantage of their design is that it does not eliminate the endogeneity problem; programme placement is randomised, but clients still self-select into the programme, making any statistical comparison with non-clients invalid.

As demonstrated above, evidence from quasi-experimental and RCT studies vary according to methodology and chosen outcome variables. However, the common denominator in these papers is that they analyse microfinance through a microeconomic lens. On the other hand, Imai *et al.* (2012) offer a macroeconomic perspective. Using cross-country and panel data over the 2003-2007 period, they produce empirical evidence on the effect of microfinance on poverty. By investigating the relationship between MFI's gross loan portfolio per capita and Foster–Greer–Thorbecke poverty indices, which put more weight on the poverty of the poorest within a group, they also capture inequality. To account for the endogeneity of gross loan portfolio (GLP), they employ the Instrumental Variable (IV) estimation technique in addition to Ordinary Least Squares (OLS). According to Imai *et al.* (2012): "Here the endogeneity is associated with the bi-causal relationship between gross loan portfolio and poverty levels in a country. This reverse causality from poverty to gross loan portfolio may arise, for example, if poverty-oriented development partners and governments provide more funds to MFIs located in poorer countries." Therefore, they use a 5-year lag of GLP as instruments for GLP in the poverty equation.

Contrary to the evidence from recent RCT micro-level studies, Imai *et al.* (2012) find that microfinance significantly affects macro-level poverty alleviation. Countries with higher GLP have lower poverty levels, holding all else constant. Moreover, Imai *et al.* (2012) establish that the relationship still holds when the poverty headcount ratio is replaced by the poverty gap as the dependant variable, implying that microfinance also reduces inequality. Therefore, this study concludes that recent scepticism about microfinance is not backed by empirical evidence, arguing that the flow of development funds into MFIs is an effective poverty alleviation policy.

2.3. Comparative Analysis of South Asia and South-eastern Europe

Most contemporary empirical research focuses on South Asia, which poses an important question about its relevance to South-eastern Europe. While the model pioneered by the Grameen bank is often replicated cross-culturally (Auwal, 1996), the structural conditions of Grameen's native country, Bangladesh, have influenced the evolution of its services. Professor Yunus, the organisation's founder, recognised that exploitative money lenders were the poor population's sole source of financing. Hence the introduction of MFIs was a vast improvement for a population accustomed to borrowing and paying interest rates to meet their basic needs (Ghodsee, 2003). In contrast, South-

eastern European societies were built upon the foundation of Marxist philosophy, which viewed such practices negatively.

Furthermore, in South Asia, microloans are typically utilised to facilitate self-employment through microenterprises like street vending, therefore successfully decreasing unemployment when the local economy does not provide enough jobs. The case is the opposite in SE Europe, as the former communist regime mainly focused on industrial production and guaranteed jobs through worker unions. Therefore, self-employment to meet basic needs was, and to an extent still is, a foreign concept to the population accustomed to having them met by the state for free (Ghodsee, 2003).

Lastly, gender is a critical component of MFI programmes, with studies such as Pitt and Khandker (1998) finding that lending to women amplifies the poverty-alleviating effects of microfinance. This phenomenon is usually explained by the lack of reliable alternative credit sources for women and female empowerment through income generation. However, South-Eastern Europe had already experienced a comparatively high standard of women's social and economic emancipation before the arrival of microfinance (Cipruš and Vukojević, 2011). Therefore, it is plausible to assume that extending microloans to women will not have as profound an effect in this region as in South Asia.

2.4. Summary

In conclusion, the effect of microfinance on poverty and closely related outcomes such as education and labour participation has been extensively examined over the past few decades. However, the literature yields mixed and often contradicting evidence that varies depending on the research method, estimation technique, and authors' definition of what constitutes a successful microfinance programme. Moreover, many of the studies have focused on microeconomic impacts, omitting broad macro-level effects as a result. At the same time, they mainly researched countries in South Asia. Although microfinance designs are similar throughout the world, and thus the results of these studies could be extrapolated to other geographies, South-eastern Europe offers a unique geopolitical context. Namely, most MFIs in this region emerged in the late 1990s (Kraemer-Eis and Conforti, 2009) in the aftermath of events that fundamentally changed its social and economic environment, such as the Yugoslav Wars and the transition from centrally planned to full-market economies.

3. Data

3.1. Data Description

The present study uses panel data covering five upper middle income countries over the 2006-2018 period: Bulgaria, Montenegro, North Macedonia, Romania, and Serbia. Our panel compiles the statistics generated from three World Bank databases. The Microfinance Information Exchange (MIX) Market provides data on microfinance institutions' outreach and financial performance, while The World Development Indicators (WDI) and Poverty and Equity databases include information on gender equality and poverty at a country level.

There are a few reasons why the 2006-2018 period is well-suited for this analysis. Firstly, the existing research mainly analyses short- and medium-term effects of microfinance on poverty (e.g., Pitt and Khandker (1998), Augsburg *et al.* (2012), Banerjee *et al.* (2015)). Contrariwise, a thirteen-year timespan should allow us to gauge the relationship between microfinance and poverty in the long run. Another unique feature of our data compared to the current literature is that it covers the post-2012 period, while most previous analyses covered the 2000-2012 period (e.g., Augsburg *et al.* (2012), Imai *et al.* (2012)).

A final descriptive comment relates to the sample selection and size. Microfinance penetrated North Macedonia, Montenegro, and Serbia in the aftermath of the destructive Yugoslav Wars of the 1990s that virtually destroyed the local economies (Janićijević and Petković, 2011). The countries of Croatia and Bosnia-Herzegovina, which also participated in the abovementioned wars and transitioned from the worker self-managed socialism to a market economy, are excluded from the analysis due to data constraints. Instead, the analysis includes Bulgaria and Romania, as the microfinance activities there commenced during the same period and with the same goal – supporting the development of the private sector during the transition away from the planned economy and reducing poverty through aiding small-scale enterprises (Pop and Buys 2015, p.310-311). In total, 65 observations are collected for each variable.

3.2. Variable Description

The continuous dependent variable poverty headcount ratio (*povhead*) represents the percentage of the country's population that lives below the national poverty line. It is computed based on the population-weighted subgroup estimates from surveys of a nationally representative sample of households. One might question the motivation for using national poverty lines instead of the \$5.50 a day poverty line typically applied to the countries classified as 'Upper Middle Income,' and the answer is that they are more consistent with the country's specific economic and social circumstances.

With a view to measuring microfinance activities in a country, this study includes the natural logarithm of gross loan portfolio (*logGLP*). It is a reliable measure of the funds distributed to households, as it entails the total outstanding loan balance of the current client base. Moreover, data standardisation is a crucial step in econometric analysis, as it facilitates a meaningful comparison of benchmark indicators (MIE, 2004). Accordingly, GLPs of 46 individual MFIs, adjusted by MIX for write-offs and inflation, have been aggregated for each country.

Another independent variable in the poverty equation is domestic credit provided by banks to the private sector, expressed as a percentage of GDP (*Domcred*). It refers to the volume of depository institutions' financial resources provided to the private sector, which is highly relevant to explaining poverty reduction. Namely, private sector development is crucial for poverty alleviation, primarily when initiatives are directed toward socially beneficial purposes (McKague *et al.*, 2015).

As discussed in the literature review (see section 2), much of the preceding research finds that lending to women amplifies the positive effects of microfinance. To investigate whether this relationship holds for South-eastern Europe, our analysis includes variable *GEN*, the gender inclusion indicator constructed from the percentage of active female borrowers out of the total number of active clients of each MFI. To aggregate it at a country level for each year *t*, we weight it by the institution's gross loan portfolio, using the formula below:

$$GEN_{it} = \sum_i^n \frac{MFI_GLP_{jt}}{GLP_{it}} FEMB_{jt}$$

GEN_{it} = proportion of women in the MFI client base of a country *i*

MFI_GLP_{jt} = gross loan portfolio of an MFI *j*

GLP_{it} = gross loan portfolio of a country *i*

$FEMB_{jt}$ = share of active female borrowers in the client base of an MFI *j*

Lastly, the poverty equation includes the natural logarithm of gross domestic product per capita (logGDPPC), a core indicator of economic well-being and average living standard within a country, expressed in terms of the constant 2015 U.S. dollar to adjust for inflation.

3.3. Descriptive Statistics

Table 1 presents summary statistics for variables used in the main equation (poverty equation). As the data contains no extreme outliers compared to the mean, and no other data quality issues have been detected, no observation from the original sample is excluded from the analysis. Therefore, the number of observations (65) is consistent across all variables.

Table 1 - Summary Statistics¹

<i>Variable²</i>	<i>Median</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Poverty headcount (%)	22.60	20.61	6.16	4.90	27.00
Log of gross loan portfolio (\$)	19.24	18.42	1.88	12.40	20.45
Log of GDP per capita (\$)	8.73	8.72	0.23	8.20	9.28
Domestic credit by banks to the private sector (%)	46.51	46.87	13.47	25.73	86.45
GEN (%)	42.04	41.79	13.48	8.38	63.44

¹ All statistics have been rounded to two decimal places

² Units of measurement are in parentheses

Source: Author's compilation from Poverty and Equity, MIX, and WDI datasets.

The mean poverty headcount ratio across our five countries is 20.61%, which could be expected given the region's predeceasing series of armed conflicts and ongoing economic transition. Out of the 65 data points collected, Montenegro in 2008 has the lowest poverty headcount at 4.90%, right after the declaration of independence. This number significantly deviates from the mean across all observations; however, it does not accurately picture Montenegrin poverty levels. With the onset of the financial crisis, it rose rapidly, fluctuating around the 24% mark from 2012 to the end of our observation period.

The average share of active female MFI clients stands at 41.79%, with the median of 42.04% not considerably deviating from the mean. This suggests the symmetrical distribution of the data, which was expected due to the gender aspect of the widely implemented microfinance models. Namely, many MFIs in the region were based on the Grameen model, setting gender targets for the provision of their microloans or even specialising in disbursing microcredit to women, as is the case of *Žene za žene* (Women for Women). Notwithstanding, the minimum value of 8.38%, found in Romania in 2014, demonstrates that the implementation of gender targets is not ubiquitous.

While a thorough investigation into the reasons behind such a low proportion of female borrowers in this particular country and year is out of the scope of this study, a few potential explanations can be suggested. For instance, MFIs could have composed sector-based rather than gender-based targets, thus inadvertently concentrating their resources in a male-dominated area of economic activity, such as farming. This is a plausible possibility, given that microcredit providers in Romania tended to target family associations and individual farmers around that point in time (Pop and Buys 2015, p.311). This is, however, an outlying data point, as the proportion of active female borrowers

in Romania steadily grew from 2014 onwards. It closely approached the overall mean value of 41.79% towards the end of our observation period, reaching a peak of 39.38% in 2018.

4. Analysis and Results

4.1. Empirical Methodology

The main question addressed in this paper is whether empirical data supports the thesis that the volume of microfinance activity has an inverse causal relationship with the poverty level. The model extends that proposed by Imai *et al.* (2012); their empirical specification relates poverty headcount with several explanatory variables, including gross loan portfolio, domestic credit provided by banks, and GDP per capita. Our specification takes a similar format, with the main difference being an additional variable GEN, which boosts the explanatory power of the model by allowing us to measure the effects of extending microloans to women (for a more detailed variable description, see section 3.2). Moreover, their analysis covers developing countries worldwide, while ours focuses on South-eastern Europe; hence we dropped the regional dummy variable. Therefore, the main equation is as follows:

$$Pov_{it} = \beta_0 + \beta_1 \log (GLP)_{it} + \beta_2 \log (GDPPC)_{it} + \beta_3 Domcred_{it} + \beta_4 GEN_{it} + u_{it} \quad (1)$$

With $i \in \{1,2,3,4,5\}$ denoting a country and $t \in \{2006, 2007...2018\}$ denoting time.

The outcome variable pov_{it} denotes the poverty headcount ratio of the country i at year t . It depends upon the natural logarithm of the gross loan portfolio, the natural logarithm of GDP per capita, domestic credit by banks, proportion of women in the MFI client base of a country, an intercept β_0 , and an unknown component comprised of an independently and identically distributed (i.i.d.) error term u_{it} . The latter captures the explanatory variables not included in the model and the measurement errors that may have occurred.

Similar to Imai *et al.* (2012), we adopt the central multiple linear regression (MLR) model, estimated using both Ordinary Least Squares (OLS) and Instrumental Variable (IV), that is, Two-Stage Least Squares (2SLS). Therefore, our regression analysis involves two stages.

Firstly, the gross loan portfolio is estimated using the instrumental variable and other regressors from Equation (1), as follows:

$$\log (GLP)_{it} = \pi_0 + \pi_1 lag5yrsGLP_{it} + \pi_2 \log (GDPPC)_{it} + \pi_3 Domcred_{it} + \pi_4 GEN_{it} + v_{it} \quad (2)$$

Equation (2) is a reduced form that tests for the presence of endogeneity in our specification and the suitability of the chosen instrument. $lag5yrsGLP$ stands for the lag of the 5-year average of gross loan portfolio, weighted by the number of MFIs in the respective country, and v_{it} denotes the i.i.d. error term.

In the second stage, we estimate poverty headcount ratio by the predicted value of $\log (GLP)$ and other explanatory variables from Equation (1):

$$Pov_{it} = \beta_0 + \beta_1 \log (\widehat{GLP})_{it} + \beta_2 \log (GDPPC)_{it} + \beta_3 Domcred_{it} + \beta_4 GEN_{it} + \varepsilon_{it} \quad (3)$$

The application of IV is necessary because the gross loan portfolio is likely to be endogenous in Equation (1). The endogeneity here is due to the bi-causality between the gross loan portfolio and poverty headcount: the reverse relationship might stem from, for instance, governments and international development organisations extending more funds to MFIs operating in countries with higher poverty levels.

A valid instrument needs to meet both exclusion and relevance criteria. That is to say, it needs to be exogenous in Equation (1) but must be either positively or negatively related to the endogenous explanatory variable log (GLP) (Wooldridge 2015, p.497). We assume that *Lag5yrsGLP*, therefore, fulfils the criteria for an appropriate instrument; it is plausible that it is correlated with the log of GLP while having no ceteris paribus effect on the poverty headcount ratio.

A final descriptive comment relates to the regression estimation methods applied. Although this study focuses mainly on 2SLS, we will also report results from pooled OLS and FE (Fixed Effects) and compare them to 2SLS to provide additional value to our discussion.

4.2. Adequacy Tests

Before estimating the model, we undertake a few preliminary tests to ensure that it is adequately specified and meets our assumptions. If the case is the opposite, we can implement corrective procedures before running the regressions.

Firstly, we run a Wu-Hausman test for the exogeneity of regressors in the main model (Equation 1) to check if there is statistical evidence for the endogeneity of *lag5yrsGLP*. As the null hypothesis is rejected at 5% significance, we confirm the assumption that the 2SLS estimation method is more appropriate for our analysis than OLS.

Wu-Hausman test, however, does not provide any insight into the quality of the chosen instrument. Furthermore, a weak, or only marginally valid instrument, can cause biased estimates of explanatory variables and hypothesis tests with large size distortions (Stock and Yogo, 2002). Therefore, we conduct the Weak Instrument test to confirm if the *lag5yrsGLP* meets the instrument criteria outlined in section 4.1. Having rejected the null hypothesis at a 5% significance level, we can move forward with the assumption that *lag5yrsGLP* is sufficiently strong.

Table 2 – Test Results

	<i>Wu-Hausman</i>	<i>Weak Instrument</i>
H ₀	All explanatory variables are exogenous	<i>Lag5yrsGLP</i> is a weak instrument
Test statistic	5.6150 with (1,59) d.f.	7.1670 with (1,60) d.f.
<i>p</i> -value	0.02109	0.0096
H ₀ rejected at 5% significance	Yes	Yes

4.3. Empirical Results

Table 3 presents our regression results, with each model taking poverty headcount as the dependent variable. Regressions (3) and (4) values for constant denote the overall intercept and are the weighted means of fixed effects.

Table 3 – Results based on panel data regressions (dependent variable: poverty headcount ratio)

<i>Explanatory variables</i>	<i>Pooled OLS</i>	<i>2SLS</i>	<i>Fixed effect: time</i>	<i>Fixed effect: country</i>
	(1)	(2)	(3)	(4)
Log of gross loan portfolio	-1.086** (0.460)	-4.125*** (1.372)	-0.338 (0.628)	-0.710 (0.545)
Log of GDP per capita	-1.515 (5.162)	-20.339** (9.480)	-4.545 (5.864)	-8.415*** (2.556)
Domestic credit by banks to the private sector	-0.108* (0.057)	-0.057 (0.060)	-0.111* (0.065)	-0.214** (0.090)
GEN	-0.095 (0.089)	-0.393** (0.154)	-0.108 (0.100)	-0.012 (0.088)
Constant	62.865 (52.634)	293.014** (110.821)	76.186 (58.418)	75.176 (22.191)
<i>Statistics</i>				
Number of observations	65	65	65	65
R-squared	0.1908	0.2313	0.1221	0.2820
F-statistic	3.5367	4.514	1.6693	4.3193

Standard errors are in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All analysis is conducted using ceteris paribus assumption. Conducting a t-test, there is statistically significant evidence against the null hypothesis, which states that the coefficient is equal to zero at a specified p-value.

Both Pooled OLS and 2SLS specifications show that the GLP is significantly and negatively associated with the poverty headcount ratio, which is consistent with our hypothesis that the provision of microfinance reduces poverty levels. For instance, because GLP is defined in log, we observe that a 10% increase in the gross loan portfolio of a country reduces poverty headcount by an average of 0.1086% in the case of pooled OLS (see column (1) of Table 3). More importantly, 2SLS estimation corroborates this result and finds an even stronger effect of a 0.4125% decrease in poverty.

Therefore, even when the endogeneity of the gross loan portfolio is accounted for, the inverse relationship between the volume of microfinance activity in and poverty headcount is statistically significant. We concur with Miled and Rejeb (2015) in stating that “a country [region] with a higher MFIs’ gross loan portfolio tends to have a lower poverty headcount ratio after controlling for the effects of other factors influencing it.”

As expected, GDP per capita is negatively correlated to poverty and displays a 5% significance when estimated by 2SLS, which is the central focus of our model. We estimate a 2.0339% decrease in poverty

for each 10% increase in GDPPC, and a similar, albeit weaker relationship is observed at 1% significance when applying the country Fixed Effects method (see columns (2) and (4) of Table 3). This result is not surprising, given that GDP per capita is a widely accepted measure of poverty among economists. However, on its own, it is not a reliable indicator of poverty reduction, as a vast body of empirical literature agrees that GDP growth is distribution neutral (Jamal 2006, Causa *et al.* 2017). Therefore, it is plausible to suspect that GDP per capita might overestimate the standard of living within a country and thus underestimate the proportion of the population living in poverty. This provides the economic justification for including domestic credit provided to the private sector by banks in our regression.

As explained in section 3.2, private sector development is highly relevant for explaining poverty levels, which our empirical findings confirm. Specifically, Domcred exhibits a statistically significant negative relationship with poverty headcount in three out of four specifications, at a 10% level using pooled OLS and time FE and 5% using country FE. Corroborating the findings of Abosedra *et al.* (2016), we conclude that financial sector development is an essential indicator of poverty reduction, which is plausible given that broader availability of credit services can allow the poor to participate in the economy by allowing them to start businesses or expand consumption.

Lastly, the proportion of women in the MFI client base at a country level also negatively correlates with the poverty headcount. Notwithstanding, only when applying the 2SLS method is the relationship significant at a 5% level. This unique variable is underrepresented in the macro-level literature, which can likely be attributed to sampling selection and data constraints. Namely, most papers focusing on the relationship between microfinance and poverty on a country level use a larger sample than our study, often including more than 40 countries (Imai *et al.* 2012, Miled and Rejeb 2015). Therefore, it is plausible to assume that data availability issues prevented the authors from adding a gender component to their analyses.

Nevertheless, micro-level empirical literature overwhelmingly confirms the negative relationship between extending microfinance to women and poverty levels (Pitt and Khandker 1998, Khandker 2005). Although our study confirms their findings on the direction of the relationship, the estimated strength differs. According to our estimates, for every 1% increase in the proportion of women receiving microloans, the poverty headcount will decrease by only 0.393%.

The weakness of the relationship and its statistical insignificance in three out of our four estimation methods are not surprising, although they contradict the above-cited research. As outlined in the literature review (see section 2), most studies on the gender aspect of microfinance have been conducted in South Asia. At the same time, we focus exclusively on South-eastern Europe, which provides a distinct socioeconomic context, particularly regarding gender equality. Namely, prior to the introduction of microfinance programmes, this region had already attained a relatively high standard of women's economic empowerment (Cipruš and Vukojević, 2011). Although poverty was widespread due to conflict and economic transition, women were accustomed to comparatively equal access to economic opportunities as men; hence microfinance did not have the profound effect it had in South Asia.

Moreover, the economic history of South-eastern Europe is not conducive to a thriving microfinance sector. Due to conflicts and economic transition, the region experienced high unemployment and weak purchasing power during the early 2000s. Therefore, according to Cipruš and Vukojević (2011), competition from imported goods and the removal of tariffs and quotas that had earlier protected local production created an adverse environment for newly established micro businesses. As microfinance is primarily targeted at women, this can offer further economic insight to explaining our low estimated coefficient.

A more direct comparison of our GEN coefficient with previous studies on the gender component of microfinance in South-eastern Europe is not possible at the time of writing, as in-depth independent research dedicated to this topic remains absent.

5. Limitations of the Study

One of the most prominent critiques of microfinance is that it does not effectively reach the population living in severe poverty (e.g. Mosley, 2001). However, the present paper focuses only on the incidence of poverty without considering its depth and severity. Therefore, this project could be extended or improved by running additional regressions, with poverty gap (depth) and poverty gap squared (severity) as dependent variables and comparing the results to the poverty headcount equation.

Furthermore, we analyse the effect of microfinance solely through the scale of its activities, while the performance of the provided financial services is not considered. Therefore, it is plausible that the negative relationship between gross loan portfolio and poverty headcount would not hold had the poor-quality MFIs been eliminated. Hence, if future researchers in the field design a practical framework for classifying MFIs according to quality at the macro level, we suggest they repeat our project using the same panel data.

Similarly, our research covers two EU member countries and three non-members; Romania and Bulgaria, who accessed the block in 2007, at the beginning of our observation period, and Serbia, Montenegro, and North Macedonia, who were not members at the time of writing. Therefore, the study could be built-upon by differentiating the countries according to their EU-membership status. While there are numerous econometrically-viable ways to conduct such analysis, we suggest the Blinder–Oaxaca decomposition, a statistical technique that, in a counterfactual manner, decomposes the differences in means based on linear regression models. This method could produce a meaningful discussion on the poverty alleviation effect of EU membership and accompanying access to resources such as European Regional Development Fund.

Finally, as we concentrate our research on exclusively one small region of the world, our number of observations is only 65, following five countries over 13 years. From the econometric perspective, this is the most apparent shortfall of the study, as most previous literature includes a larger sample of countries; although they look at shorter time periods, their observation number greatly exceeds 65.

6. Conclusion

This paper examines the relationship between the volume of microfinance and poverty at a macroeconomic level. Panel data covering five South-eastern European countries over the 2006–2018 period were compiled from three World Bank data bases. The aim of the study was to provide empirical evidence for the causal relationship between gross loan portfolio and poverty headcount ratio. Particular caution was given to handling endogeneity caused by the bi-causal relationship between the two, hence 2SLS estimation was applied.

The findings confirm an inverse association between the scale of microfinance activity and poverty headcount ratio, consistent with Imai *et al.* (2012) whose specification the present project is based on. Nevertheless, gender variable differentiates this study from other macro-level studies, as the previous literature had studied gender only from a micro-perspective. The author confirms their hypothesis that lending to women in South-eastern Europe does not yield a considerable effect on poverty, given that the socio-cultural dynamics differ from South Asia.

In summary, empirical evidence does not support the assertions that microfinance is “oversold” and “just provides an illusion of economic progress”. This study concludes that microfinance is an effective poverty alleviation tool, and thus justifies the flow of development resources into microfinance institutions. However, it recommends the future policymakers to consider the economic history and socio-cultural dynamics of the country rather than implementing a uniform model across diverse contexts.

7. References

Abosedra, S., Shahbaz, M. and Nawaz, K. (2016). Modeling causality between financial deepening and poverty reduction in Egypt. *Social Indicators Research*, 126(3), pp.955-969.

Armendáriz de Aghion, B. and Morduch, J. (2005). *The Economics of Microfinance*. Cambridge, Massachusetts: The MIT Press.

Augsburg, B., De Haas, R., Harmgart, H. and Meghir, C. (2012). Microfinance at the margin: experimental evidence from Bosnia and Herzegovina. *Available at SSRN 2021005*.

Auwal, M.A. (1996). Promoting microcapitalism in the service of the poor: The Grameen model and its cross-cultural adaptation. *The Journal of Business Communication (1973)*, 33(1), pp.27-49.

Banerjee, A., Duflo, E., Glennerster, R., and Kinnan, C. (2015). The Miracle of Microfinance? Evidence from a Randomized Evaluation. *American Economic Journal: Applied Economics*, 7(1), pp. 22-53.

Causa, O., Hermansen, M., Ruiz, N. (2017) *Does growth lead to inequality? It depends*. Available at: <https://oecdecoscope.blog/2017/01/10/does-growth-lead-to-inequality-it-depends/> (Accessed: 20 April 2022).

Cipruš, V., Hughes, L. and Vukojević, M. (2011). Gender and microfinance in Southeastern Europe: a critical view. *Confronting Microfinance: Undermining Sustainable Development*, p.207.

Coleman, B.E. (2006). Microfinance in Northeast Thailand: Who benefits and how much?. *World development*, 34(9), pp.1612-1638.

Ghodsee, K. (2003). Rethinking development templates: Women and microcredit in post-socialist South-eastern Europe. *Anthropology of East Europe Review*, 21(2), pp.65-71.

Imai, K.S., Arun, T. and Annim, S.K. (2010). Microfinance and household poverty reduction: New evidence from India. *World development*, 38(12), pp.1760-1774.

Imai, K.S., Gaiha, R., Thapa, G. and Annim, S.K. (2012). Microfinance and poverty—a macro perspective. *World development*, 40(8), pp.1675-1689.

Jamal, H. (2006.) Does inequality matter for poverty reduction? Evidence from Pakistan's poverty trends. *The Pakistan development review*, pp.439-459.

Janićijević, Nebojša, and Goran Petković. "Microfinance in Serbia." *Confronting Microfinance: Undermining Sustainable Development* (2011): 125.

Khandker, S.R. (2005). Microfinance and poverty: Evidence using panel data from Bangladesh. *The world bank economic review*, 19(2), pp.263-286.

Kraemer-Eis, H. and Conforti, A. (2009). *Microfinance in Europe—A market overview* (No. 2009/01). EIF Working Paper.

- McKague, K., Wheeler, D. and Karnani, A. (2015). An integrated approach to poverty alleviation: roles of the private sector, government, and civil society. In *The business of social and environmental innovation* (pp. 129-145). Springer, Cham.
- Microfinance Information Exchange (2004). *Benchmarking Microfinance in Eastern Europe and Central Asia*. Washington, DC: MIX Market.
- Miled, K.B.H. and Rejeb, J.E.B. (2015). Microfinance and poverty reduction: A review and synthesis of empirical evidence. *Procedia-Social and Behavioral Sciences*, 195, pp.705-712.
- Morduch, J. (1998). Does microfinance really help the poor?: New evidence from flagship programs in Bangladesh. *Research Program in Development Studies*, Woodrow School of Public and International Affairs.
- Mosley, P. (2001). Microfinance and poverty in Bolivia. *Journal of development studies*, 37(4), pp.101-132.
- Pitt, M.M. and Khandker, S.R. (1998). The impact of group-based credit programs on poor households in Bangladesh: Does the gender of participants matter?. *Journal of political economy*, 106(5), pp.958-996.
- Pop, C. and Buys, P. (2015). Microfinance in Romania. *Contemporary legal and economic issues*, 5, pp.307-341.
- Roodman, D. and Morduch, J. (2014). The impact of microcredit on the poor in Bangladesh: Revisiting the evidence. *Journal of Development Studies*, 50(4), pp.583-604.
- Stock, J.H. and Yogo, M. (2002). Testing for weak instruments in linear IV regression. National Bureau of Economic Research.
- Wooldridge, J.M. (2015). *Introductory econometrics: A modern approach*. Cengage learning.