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BANKING ON HER: THE EFFECTS OF MICROFINANCE ON
WOMEN'S AUTONOMY IN DEVELOPING ECONOMIES

A Capstone Experience/Thesis Project Presented in Partial Fulfillment
of the Requirements for the Degrees of Bachelor of Science and Bachelor of Arts
with Mahurin Honors College Graduate Distinction
at Western Kentucky University

By

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ABSTRACT

Once applauded as a way to empower the world's poorest, and in particular benefit women, the practice of microfinance is now perceived with a much more cautious and nuanced lens. Some perspectives state that microfinance improves women's lives and uplifts communities, while others claim that it increases over-indebtedness and does not provide a viable path to escape poverty. In order to determine if microfinance is an effective use of resources to empower women, this paper analyzes the relationship between women's autonomy and microfinance to provide further insight into its proposed positive and negative effects. Using ordinary least squares regression analysis, the study analyzes data from 45 different developing countries using data from the World Bank and the United Nations. Autonomy is operationalized in a variety of ways to test for robustness, such as female secondary school enrollment, women participating in decision-making, and female unemployment and labor force participation rates. Findings show that microfinance has little positive effect, if any, on women's autonomy, with the percent of female borrowers being the only significant microfinance-related influence. Even then, this variable only affects female secondary school enrollment and the poverty headcount ratio. This study contributes to the body of literature focusing on women's empowerment and microfinance to help determine future policy approaches.

Keywords: Microfinance, Women, Autonomy, Empowerment, Developing Economies

I dedicate this thesis to my parents, Dr. Grady H. and Cindi Pare, and my brother, Granite Pare, who continually encourage, support, and inspire me. Thank you for believing in my ambitions and dreams. I love you more than I can express. To Daddy—thank you for engaging in conversations about life, work, and purpose with me. To Bubba—thank you for passing on your love for service, learning, and leadership to me. To Granite—thank you for endlessly uplifting me. Also, I dedicate this work to my dearest friends, who are true and constant kindred spirits in life.

Finally, I mark this epoch in my life by dedicating this thesis to the literary heroines who understand my feelings, teach me about life, and compel me to be my best. To quote Anne Shirley in *Anne of Green Gables*, “Oh, it’s delightful to have ambitions. I’m so glad I have such a lot. And there never seems to be any end to them—that’s the best of it. Just as soon as you attain to one ambition you see another one glittering higher up still. It does make life so interesting.” To everyone who has supported my dreams and goals—thank you for helping make life interesting.

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SECTION ONE: OVERVIEW OF MICROFINANCE AND PREVIOUS RESEARCH

Introduction

This study analyzes the effects of microfinance on women's autonomy using data from 45 different developing countries. Using ordinary least squares regression analysis, and after multiple checks for robustness, the study finds that microfinance has limited positive effects, if any at all, on women's autonomy in developing economies. This interesting finding suggests that there may be better, more cost-effective methods to improve women's autonomy within developing economies than through microfinance, contrary to the original narrative surrounding microfinance.

Once applauded as a way to empower the world's poorest, the practice of microfinance is now perceived with a much more cautious and nuanced lens. Microfinance "specializes in providing small loans and other financial services even to the world's most destitute" (Kota, 2007). This lending practice was once touted as a way to specifically affect and empower women, and international organizations celebrated its implementation. The International Labor Organization (2008) notes that many microfinance institutions focus on female clients, and that therefore many women benefit from the practice. This is considered especially important, as according to the World Bank (2020) gender overview, gender inequality is still a prevalent issue that affects the world today, stating that critical gaps remain in the divide between men and women.

However, does microfinance truly uplift the women it advertises itself as empowering? Since its arrival on the international scene as a way to decrease poverty and

empower women, microfinance practices have faced scrutiny, with some people questioning how effective the programs really are. Microfinance now has numerous more negative undertones. Dina Pomeranz writing for Ernst and Young (2014) states that microfinance has not been demonstrated to decrease poverty and increase income in most situations. Furthermore, microfinance lenders often charge exorbitant interest rates and become quite rich at the expense of the impoverished people they are supposed to be helping, which seems contradictory (Bateman & Chang, 2012). Microfinance lenders may charge interest rates of over 30%, with rates of 75% to 100% very common, according to a Wall Street Journal article by Yee (2015). Supporters of microfinance argue that these rates are reasonable, as the loans themselves are small, so it takes less time to pay back the debt. Additionally, supporters say that these loans help development, as the essence of microfinance is providing financial inclusion to unserved or underserved markets (Ledgerwood, 1999). In order to gain a better perspective on microfinance, it is important to consider its history and origins.

Microfinance is defined by Ledgerwood in the World Bank Microfinance Handbook (1999) as, "...The provision of financial services to low-income clients, including the self-employed. Financial services generally include savings and credit; however, some microfinance organizations also provide insurance and payment services" (p. 1). The generic term "microfinance" covers a variety of financial services to low-income individuals, but it is commonly used to mean the more specific term "microcredit," which is a small loan, or "microloan," that is given to low-income individuals to fund a small, income-generating activity (Bateman & Chang, 2012). For

simplicity, this paper will use the term microfinance instead of microcredit to follow mainstream terminology.

Microfinance's popularity peaked in the late 1990s and early 2000s, with 2005 being dubbed the "International Year of Microcredit" by the United Nations Economic and Social Council (United Nations, 2004). The United Nations Secretary General at the time, Kofi Annan, stated, "Microfinance has proved its value, in many countries, as a weapon against poverty and hunger. It really can change peoples' lives for the better—especially the lives of those who need it most" (United Nations, 2004). This positive perspective on microfinance was also shared by its founder, Muhammad Yunus. Yunus, who won the Nobel Peace Prize in 2006 in tandem with the Grameen Bank for contributions to microfinance, believes that access to credit is a human right (Nobel Prize, 2007). Yunus founded the Grameen Bank in Bangladesh, which branded itself the "Bank for the Poor," with over seven million borrowers served at the time of the Nobel Prize awarding in 2006 (Nobel Prize, n.d.). The bank's programs focus heavily on women, with 95% of loans going to women or groups of women (Nobel Prize, n.d.). This statistic is especially noteworthy, as according to the United Nations Capital Development Fund (UNCDF), an important component of women's economic empowerment is financial inclusion (United Nations Capital Development Fund, 2020). Due to this, many people celebrated microfinance, or more specifically microlending programs, as a way to empower women. Loaning to women was also considered less risky with more payoff, as women tend to reinvest in their families and communities more than men and default on loans less than men (International Labor Organization, 2008).

Since microfinance is publicized as a way to empower women, but research shows it may not be all that effective, it is important to consider the impacts of the policy on the women it was supposed to help the most. As countries become more and more developed through initiatives such as microfinance ventures, it is important to think about how women will not be left behind in this process. Some women do not even have access to a financial institution of any sort. In a case study by the UNCDF, women in Myanmar had misconceptions about banks, such as that they were a space for only men or that people were required to have a formal sector job in order to open up a bank account (United Nations Capital Development Fund, 2020). This needs to change, as achieving women's economic equality also benefits businesses and the economy (United Nations, 2018). When women are more independent, this benefits everyone. It is generally agreed that women's empowerment empowers everyone, but the methods and approaches to achieve that empowerment differ. In the following literature review, the author will highlight previous research on women, microfinance, and empowerment.

Literature Review

Due to the notoriety of microfinance and its impacts, especially on women, significant research exists in this field. However, there is still much left to learn, as previous studies have found conflicting results (Banerjee et al., 2015; Bateman & Chang, 2012; Goetz & Gupta, 1996; La Rocque, 2015; Murshid, 2018). Additionally, many previous studies provide case-by-case analyses of microfinance successes and failures in individual countries (Al-Mamun et al., 2014; Banerjee et al., 2015; International Finance Corporation, 2014; Pitt et al., 2003; Rahman et al., 2016; Saxena, 2014). Few global studies have been done on the topic; this paper seeks to help fill that gap in the literature.

Both general analyses and case studies have shown positive, neutral, or negative outcomes of microfinance. Following are studies with neutral or negative outcomes from microfinance.

One such study is an honors thesis by La Rocque (2015). This paper outlines the issue of women's empowerment and microfinance. Unlike many other previous studies, La Rocque (2015) takes a broad quantitative approach, using data from the World Bank's MIX Market to analyze the relationship between microfinance and women's autonomy. La Rocque (2015) finds that there is no significant positive effect—and possibly even a negative effect—of microfinance on women's empowerment. This is found through a regression analysis of microfinance development's impact on factors such as girls' school enrollment and ratio of boys to girls enrolled in secondary school, as well as an analysis of microfinance on women's financial independence. In a paper by Bateman and Chang (2012), the authors qualitatively discuss and analyze the negative components of microfinance, concluding that the microfinance model demonstrates notable limitations to foster development. The authors suggest other potential alternatives, including financial cooperatives, credit unions, and building societies (Bateman & Chang, 2012).

Furthermore, a randomized evaluation study by Banerjee et al. (2015), found no impact of microcredit on women's empowerment or human development outcomes in a study in India. Their study also concluded that even if borrowers, especially women, do open their own businesses, microcredit does not seem to propel people out of poverty based on the new funding to start their enterprises. Banerjee et al. (2015) also notes that profits for most businesses did not significantly increase, except for those already in a higher profitability percentile. Among a representative sample of 6,150 married women

in Bangladesh, Murshid (2018) concluded that empowerment and microfinance participation are not highly associated with each other.

Other possible detrimental outcomes of microfinance from studies include increased domestic violence for women who are poor but who have relatively higher income statuses, increased over-indebtedness or financial vulnerability of borrowers, higher rates of violence, and increased financial and work burdens on women (Murshid et al., 2016; Schicks, 2014; Garikipati, 2008; Rahman, 1999). There also exists the likelihood that women do not maintain control over the income from the loan, with male relatives instead controlling the funds (Goetz & Gupta, 1996). Therefore, even if microfinance empowers women, some women may be excluded from these effects once a husband or other dominant male figure controls the funds due to the patriarchal structure of the societies in which they exist (Goetz & Gupta, 1996).

Several well-known examples of the failures of microfinance exist. At a macro level, Morocco; Nicaragua; Bosnia and Herzegovina; and Andhra Pradesh, India are some of the most prominent. Morocco experienced a microfinance crisis in 2009, primarily due to one irresponsible institution, resulting in defaults on loans nationwide, especially from clients with two or more loans. Leading up to this implosion, “rapid growth, aggressive competition, poor lending discipline, accompanied by poor governance, and lax controls” contributed to the failure (International Finance Corporation, 2014, p. 4). In Nicaragua in 2009 and 2010, the microfinance industry faltered due to a movement called “No Pago” or “No Payment.” This movement involved thousands of borrowers refusing to pay back their loans (Center for Financial Inclusion, 2011). When coupled with political interference and the international financial downturn

at the time, this caused institutions to lose liquidity and popularity. Nicaragua experienced a significant microfinance crisis with more than 100,000 clients (around 31% of total clients at the time) no longer receiving credit (Center for Financial Inclusion, 2011). As yet another example of how microfinance can turn negative, in Bosnia and Herzegovina, the microfinance sector grew rapidly after the late 1990s. Unfortunately, “a flood of liquidity, along with low financial literacy...resulted in multiple borrowing and subsequent over-indebtedness” (International Finance Corporation, 2013, p. 2). Over ten percent of the country’s population, or almost 300,000 people, are microfinance borrowers. Clearly, over-indebtedness is a pressing problem. When coupled with the 2008 financial crisis, the microfinance industry in Bosnia and Herzegovina lost investor trust.

Another negative example of microfinance is in Andhra Pradesh, India. In 2010, Andhra Pradesh had one third of all Indian microfinance borrowers, or around ten million people. In 2006, the state government closed 50 branches of two major microfinance organizations in Krishna, which was the first of the problems, citing abusive recovery techniques, unreasonable interest rates, and taking clients from government programs. After this, institutions vowed to improve their practices and formed groups, but reports of abusive practices surfaced in the media. From the crisis, over 70 suicides were said to be connected to people’s inability to repay loans (Saxena, 2014). In an attempt to combat unethical recovery practices, such as publicly shaming clients, and address oversupply, the Indian government implemented a new rule called the Andhra Pradesh Microfinance Institutions (Regulation of Money Lending) Ordinance which required all microfinance institutions to register with the government. Institutions also had to report what interest

rates they charged, where they were operating, and what systems they used for both operation and recovery. Institutions upholding coercive recovery practices received penalties. The mandate also set limits on total interest charged and forbade institutions from offering several loans to one client (Saxena, 2014). Loans and recovery largely stopped after the ordinance, as political leaders also encouraged borrowers to not pay back the loans. This led to a drastic decrease in recovery rates from 99% to 20%. Additionally, those who did not pay back their loans became ineligible for future credit.

Saxena (2014) explains that this situation is considered a crisis for several reasons, including that, “several people killed themselves because they were unable to repay loans,” the new ordinance “reduced confidence in [microfinance institutions],” the state government harmed citizens’ long-run interests by encouraging them to not pay back loans “as they became non-viable clients,” and this problem spurred the Reserve Bank of India “to develop much-needed regulation and policy reforms” (pp. 62-63). While lessons and improvements to microfinance may have sprung from these various crises, these numerous negative examples show how microfinance can be detrimental to communities and countries. Whether causing overindebtedness or leading to suicides, microfinance’s dark underside should not be ignored.

On the other hand, however, there are also numerous studies demonstrating positive effects of microfinance. In a study of Malaysian microfinance and women’s empowerment, Al-Mamun et al. (2014) determined that in a Malaysian urban setting, a local microcredit program positively influenced women’s empowerment, including women’s participation in household economic decision making, economic security, control over resources and family decisions, mobility, and legal awareness. This study

used a cross-sectional design and the average effect of treatment of treated analysis on data collected from interviews with 242 clients at eight randomly selected branches of the chosen microfinance program. Another study by Pitt et al. (2003) analyzing results of 1,798 households surveyed in Bangladesh found that, “Credit program participation leads to women taking a greater role in household decision making, having greater access to financial and economic resources, having greater social networks, having greater bargaining power compared with their husbands, and having greater freedom of mobility” (p. 2). In other studies, such as that by Sarumathi and Mohan (2011), the authors consider the effects of microfinance on women’s psychological, social, and economic wellbeing. This study used structured interviews with 181 participants selected by cluster sampling from six areas in Pondicherry, India. Sarumathi and Mohan (2011) determined that participating in a microfinance self-help group program improves women’s psychological wellbeing, such as their confidence, self-worth, and courage, as well as their economic development, education level, and awareness about the environment.

Several notable success stories of microfinance exist. On a country-wide level, Bangladesh and Bolivia stand out. In Bangladesh, where microfinance primarily began, the Grameen Bank and Muhammad Yunus provided credit to those who previously could not access it. According to a study by Rahman et al. (2016), Bangladesh is a success story for microfinance primarily due to the active community participation, such as strong relationships between clients and lenders. This mutual trust helps build meaningful connections in the communities the institutions serve. A vice president of community development at the Federal Reserve Bank of St. Louis writes about the Grameen Bank, “The bank was designed with an intentional focus to continually understand the people

the organization serves” (Davis, 2011). Grameen Bank serves over 8.1 million people across 80,000 villages. Some of the women who received loans used the funds to open street markets, buy livestock, acquire sewing machines, or open small businesses, such as a vehicle repair shop or neighborhood bio-gas plant (Davis, 2011). The model represented by the Grameen Bank in Bangladesh inspired the microfinance craze that spread across the world.

As another example of positive microfinance, Morpeth and de Angulo write for the global nonprofit Accion that BancoSol, the world’s first commercialized, regulated bank that is dedicated to small and micro entrepreneurs, serves nearly one million people in Bolivia, of which almost half are women (2018). While it had a rocky start, Bolivia’s microfinance sector has developed well. BancoSol is the largest microfinance bank in Bolivia, and it serves over one million clients in saving, borrowing, and microinsurance, with a delinquency rate of less than one percent. Compared to world microfinance interest rates of anywhere up to 80%, Bolivia’s average remains remarkably low at 13.5%. Accion also notes that the microenterprise sector grows at 5% annually and almost 67% of Bolivians work in the informal economy (Morpeth & de Angulo, 2018) The microfinance industry in Bolivia, and in particular BancoSol, are excellent examples of microfinance success.

When addressing the issues of economic development and women’s empowerment as a whole, Duflo (2012) notes that the two are intertwined, with women’s empowerment increasing as development improves; creating more equality between genders also improves economic development. This study draws from this important mission of improving economic development and gender equality, and it distinguishes

itself from previous literature by the methods used and indicators selected to measure autonomy. Therefore, in order to further add to the literature, this paper will analyze the relationship between microfinance and women's autonomy.

Definition of Autonomy

Previous literature uses differing proxies to represent autonomy or empowerment. In the Stanford Encyclopedia of Philosophy, Christman (2020) defines autonomy as the following:

Individual autonomy is an idea that is generally understood to refer to the capacity to be one's own person, to live one's life according to reasons and motives that are taken as one's own and not the product of manipulative or distorting external forces, to be in this way independent. (para. 1)

Within studies on microfinance and women's autonomy or empowerment, this concept is operationalized in various ways. Murshid (2018) uses three factors to represent empowerment when studying if microfinance participation increases women's empowerment in Bangladesh. The author uses a dichotomous dependent variable for empowerment based on participants' responses to questions inquiring about their decision-making power, autonomy, and justification of partner violence. All three criteria are considered to determine if a woman is empowered. If women responded that they participated in various decision-making processes, whether jointly with someone else or completely on their own, based on a series of questions, they were determined to have autonomy. Secondly, if women responded that they were able to seek health care services on their own, the study determined they had autonomy. The last component of justification of partner violence asked women if they felt wife beating was permissible

under any of several various circumstances, and if the women felt so, they were denoted as justifying partner violence (negatively affecting the status of empowered). These three different representations of empowerment as used by Murshid (2018) capture potential effects of microfinance on different factors all contributing to women's empowerment. By specifically selecting these variables, Murshid (2018) embodies empowerment in a more nuanced approach that incorporates three different criteria for a woman to be considered empowered, but this study still only describes empowerment in terms of how a woman exists in relation to others.

Other studies use different variables to represent empowerment or autonomy. Another study by Goetz and Gupta (1996) uses control over resources to define empowerment, based on an analysis of 275 loans from four different microfinance groups. Steele et al. (1998) focus on household decision-making, treatment by husband, perspective on children's education and age at marriage, and mobility to represent empowerment in a quasi-experimental study of 6,456 women in Bangladesh. Mahmud et al. (2012) use self-esteem, mobility, decision-making, and control over resources to represent empowerment. This thesis project draws its definition of autonomy from these studies, and in defining autonomy, it incorporates variables previously used to define empowerment, as well as those already traditionally used to describe autonomy. The paper also incorporates variables such as female labor force participation, female unemployment, and poverty in order to incorporate alternative perspectives on autonomy.

SECTION TWO: DATA, ANALYSIS, AND RESULTS

Data and Methodology

As no single database includes all of the variables needed, this study uses the World Bank Microfinance Information Exchange (MIX) Market database, the World Bank Gender Statistics database (which includes data from the Demographic Health Surveys), the World Bank Poverty and Equity database, the World Bank World Development Indicators database, the United Nations Human Development database, and the Pew Research Center Religion database. The MIX Market database is the world's largest database on microfinance. Countries were included in the study if in the MIX Market database they had 20 or more observations from microfinance institutions within the country in order to focus on countries with well-established microfinance programs. Each of these individual observations was combined to create a country-level datapoint for each of the 45 countries. Countries are included from Latin America, South America, Asia, Africa, and Europe. The full list of countries included is: Afghanistan, Azerbaijan, Bangladesh, Bolivia, Brazil, Bulgaria, Burkina Faso, Benin, Burundi, Cambodia, Cameroon, China, Colombia, Côte d'Ivoire, Ecuador, Ethiopia, Georgia, Ghana, Guatemala, Honduras, India, Indonesia, Kazakhstan, Kenya, Kyrgyz Republic, Lao PDR, Mali, Mexico, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Peru, Philippines, Russian Federation, Rwanda, Senegal, Sri Lanka, Tajikistan, Tanzania, Togo, Uganda, Uzbekistan, and Vietnam.

Figure 1. Map showing countries with data included in study.



Each numeric variable is the five-year average of the observation, most of which are from 2014-2018, as those are the most recent dates with consistent observations. For variables related to microfinance, such as Gross Loan Portfolio/Population by Hundred Thousand, an earlier five-year time period from 2009-2013 is used to be able to test if the results from microfinance take time to surface. These variables are clearly noted as being earlier years. Due to the limitations of data from developing countries, the number of observations vary from 35-45 for each variable, with two exceptions being lower, which are the Share of Female Owned Businesses and Women Participating in the Three Major Decisions, at 14 and 24 observations, respectively. As needed to account for differences across countries, variable data are either scaled to population size, per capita, in percentages, or are dummy variables.

For visual representation of the data, histograms showing frequency are included below for the microfinance-related variables, as well as the dependent variable of female secondary school enrollment used in the main regression. For each variable, summary statistics are also provided below, divided into independent and dependent variables.

Figure 2. Histogram showing frequency of Active Borrowers per 100,000 People, 2009-2013 Average.

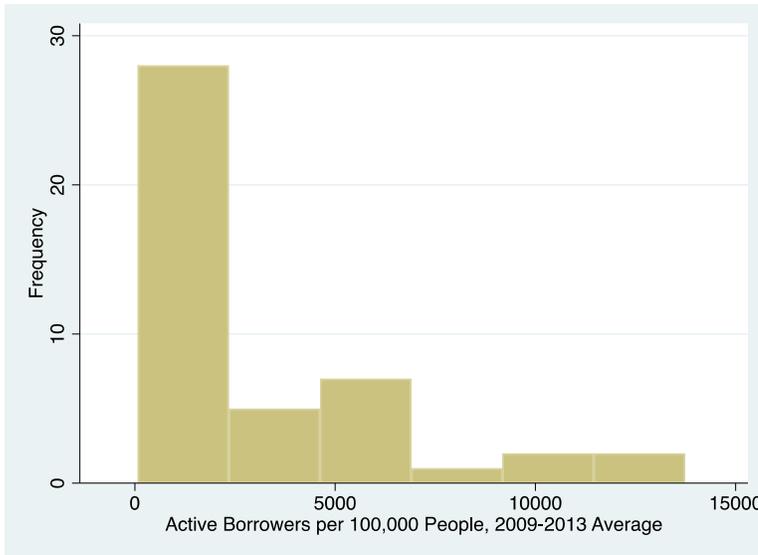


Figure 3. Histogram showing frequency of Gross Loan Portfolio per 100,000 People, 2009-2013 Average.

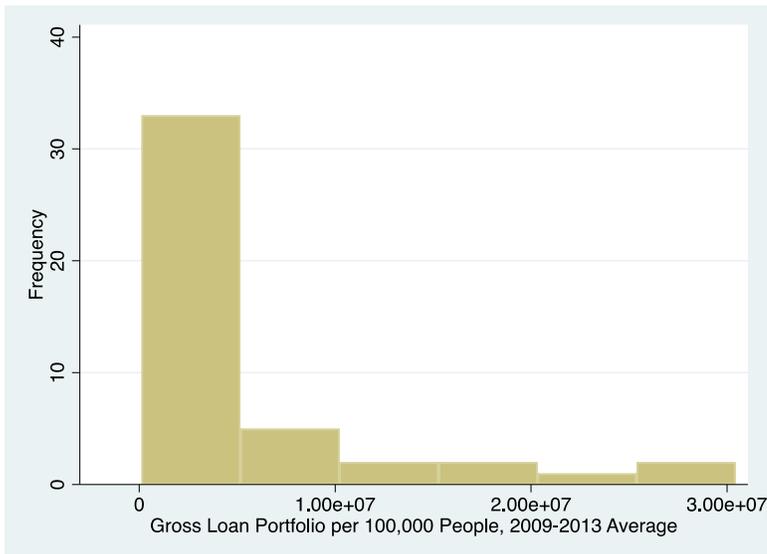


Figure 4. Histogram showing frequency of Percent of Female Borrowers, 2009-2013 Average.

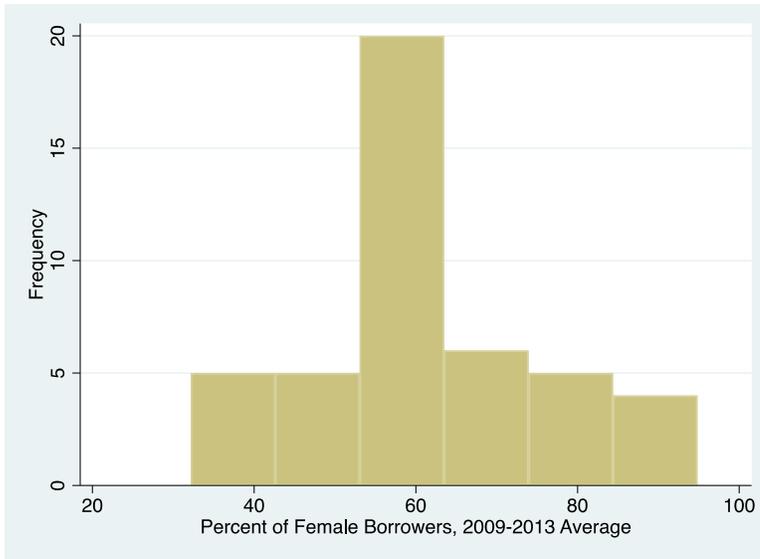


Figure 5. Histogram showing frequency of Secondary School Enrollment, Female (% net) 2014-2018 Average.

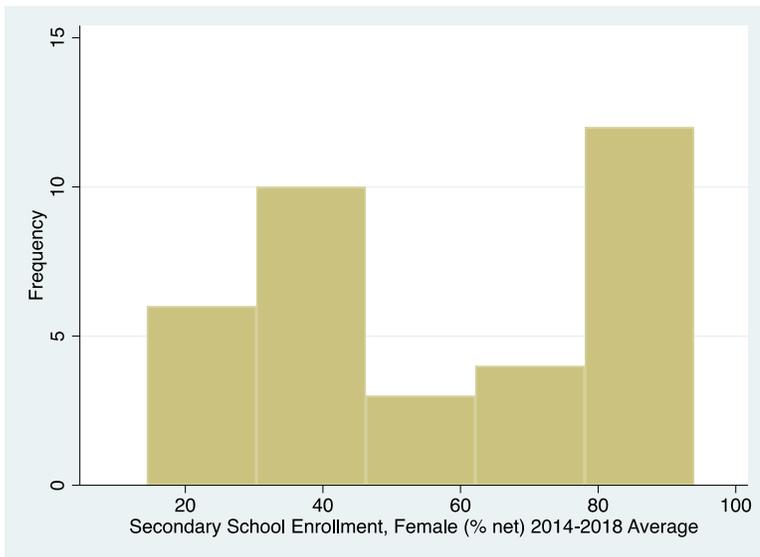


Table 1. Summary statistics of dependent variables.

Descriptive Statistics					
Variable	Obs	Mean	Std. Dev.	Min	Max
Secondary School Enrollment, Female (% net) 2014-2018 Average	35	58.041	25.375	14.403	93.958
Women Participating in the Three Decisions (% of Women Age 15-49) 2014-2018 Average	24	49.597	20.718	9.94	86.3
Share of Female Business Owners (% of Total Business Owners) 2014-2018 Average	14	17.731	8.85	1.395	33.11
Labor Force Participation Rate, Female (% of Female Population Ages 15+) 2014-2018 Average	45	56.546	16.549	19.745	83.882
Unemployment, Female (% of Female Labor Force) 2014-2018 Average	45	5.189	3.409	.402	14.248
Poverty Headcount Ratio at \$1.90 a Day (2011 PPP) (% of Population) 2014-2018 Average	35	17.505	18.942	0	56.5

Table 2. Summary statistics of independent variables.

Descriptive Statistics					
Variable	Obs	Mean	Std. Dev.	Min	Max
Active Borrowers per 100,000 People, 2009-2013 Average	45	2944.407	3387.082	69.301	13734.244
GDP Per Capita, PPP, Constant 2017 Int'l Dollars, 2014-2018 Average	45	7516.317	6310.495	808.228	25989.199
Gross Loan Portfolio per 100,000 People, 2009-2013 Average	45	4662663	7327747	112863	30441124
Percent of Female Borrowers, 2009-2013 Average	45	61.076	14.937	32.156	94.832
Percent of Population with Some Secondary Education, Females Age 25+, 2014-2018 Average	43	46.519	31.33	3.94	99.9
Muslim Majority Country	45	.311	.468	0	1
Law Grants Spouses Equal Authority Over Assets in Marriage	45	.933	.252	0	1

The data are analyzed with Stata using ordinary least squares (OLS) regression. Previous studies have used similar approaches of regression analysis when studying microfinance. La Rocque (2015) used an OLS regression model to analyze the relationship between various components of microfinance and enrollment in school as a measure of women's empowerment and independence. In addition to other methods, Cull et al. (2009) also utilize OLS in a model estimation studying financial self-sufficiency, outreach, and bank supervision variables when analyzing microfinance outreach and profitability. Using logit and probit regression models with a binary dependent variable,

Amin et al. (2017) study how status as a nonprofit-type or bank-type institution affects microfinance institutions' social and financial success.

In this study, several different dependent variables are used in order to test for robustness, providing more reliable results by comparing different dependent variables that each could represent a measure of autonomy. In using several dependent variables to measure autonomy or empowerment, this paper follows examples set by studies from La Rocque (2015), Murshid (2018), Steele et al. (1998), Goetz and Gupta (1996), and Mahmud et al. (2012). Previous literature uses female education-related variables to determine empowerment or autonomy (Hanmer & Klugman, 2016; Hossain & Hoque, 2015; La Rocque, 2015; Rather, 2016; Steele et al., 1998). Therefore, the primary regression focuses on female secondary school enrollment as the dependent variable to determine to what extent microfinance-related variables can explain women's autonomy. To test for robustness, additional regressions are included with dependent variables related to women participating in the three main decisions (which are decisions related to one's own health care, major household purchases, and visiting family), women's unemployment, women's labor force participation, the share of female-owned businesses, and country poverty levels. Independent variable controls, accounting for concepts such as gross domestic product (GDP) per capita adjusted for purchasing power parity (PPP) and female education levels are included, as well, to control for the existing development of a country and the level of women educated already.

Two additional independent variables are included to account for legal authority over assets in marriage and to control for effects of religion. Goetz and Gupta (1996) suggest that the effects of microfinance can be lost if husbands take over their wives'

loans, resulting in a lack of empowerment. While a legal variable may not entirely capture this concept, as the law may say that spouses control assets equally, but in practice the husband controls it, this variable is still included to control for the effects as much as possible. A dummy variable showing if a country is majority Muslim, meaning 50% or more of the population identifies as Muslim, is also included. In Islam, certain requirements must be met for loans and financial services to be considered Sharia compliant, and there exist entire financial services sectors focused on compliance with Islamic religious law (Kustin, 2015). However, this study makes no distinction between compliant and non-compliant microfinance institutions, even within majority-Muslim countries, so this variable is added to help control for any restrictions on microfinance that could affect the results.

The main regression estimated is:

$$\begin{aligned}
 \text{Female Secondary School Enrollment}_i = & \alpha + \beta_1 \text{GDP Per Capita PPP}_i + \\
 & \beta_2 \text{Active Borrowers}_i + \beta_3 \text{Gross Loan Portfolio}_i + \beta_4 \text{Female Borrowers}_i + \\
 & \beta_5 \text{Female Secondary Education}_i + \varepsilon_i \quad (1)
 \end{aligned}$$

where GDP Per Capita PPP is GDP Per Capita, PPP, in Constant 2017 International Dollars, 2014-2018 Average; Active Borrowers is Active Borrowers per 100,000 People, 2009-2013 Average; Gross Loan Portfolio is Gross Loan Portfolio per 100,000 People, 2009-2013 Average; Female Borrowers is Percent of Female Borrowers, 2009-2013 Average; and Female Secondary Education is Percent of Population with Some Secondary Education, Females Age 25 and Over, 2014-2018 Average.

The dependent variable of female secondary school enrollment embodies a widely seen practice of using education to measure empowerment or autonomy (Hanmer & Klugman, 2016; Hossain & Hoque, 2015; La Rocque, 2015; Rather, 2016; Steele et al., 1998). Education is known to be a positive influence on women's autonomy, wellbeing, empowerment, and success. According to the World Bank (2021), women with increased

education generally do not marry as young, are more knowledgeable about healthcare and nutrition, have fewer and healthier children, earn increased incomes, and participate more in the labor market. Each of these are generally seen as positive outcomes. In this study, secondary school enrollment is specifically selected as it is a higher level of schooling that fewer women receive, compared to only primary school. Only 45% of countries have achieved gender parity for lower secondary education, and even fewer for upper secondary, at 25% (United Nations International Children’s Emergency Fund, n.d.). This shows that on average, only 35% of countries demonstrate gender parity for secondary education overall, compared with 66% for primary education (United Nations International Children’s Emergency Fund, n.d.). While there is definitely room to improve parity for primary education, this emphasizes the importance of achieving greater equality in secondary education as a key means for girls’ and women’s autonomy. Therefore, this dependent variable was selected for the primary regression estimated as seen above.

As previously explained, to test for influence of religious restrictions on lending money and the legal authority of spouses over assets in marriage, two additional independent variables were added, as shown by the following regression estimated:

$$\begin{aligned}
 \text{Female Secondary School Enrollment}_i = & \alpha + \beta_1 \text{GDP Per Capita PPP}_i + \\
 & \beta_2 \text{Active Borrowers}_i + \beta_3 \text{Gross Loan Portfolio}_i + \beta_4 \text{Female Borrowers}_i + \\
 & \beta_5 \text{Female Secondary Education}_i + \\
 & \beta_6 \text{Muslim Majority}_i + \beta_7 \text{Assets Marriage Law}_i + \varepsilon_i
 \end{aligned} \tag{2}$$

where Muslim Majority is Muslim Majority Country, taking the value of one if 50% or more of the country is Muslim and zero if not, as of 2017; and Assets Marriage Law is Law Grants Spouses Equal Authority Over Assets in Marriage, taking the value of one if the law makes such a provision and zero if not.

Analysis and Results

After analyzing the data, the results show minimal effects, if any, from microfinance on women's autonomy. The results of these estimated regressions are below, and a discussion follows each.

Table 3. Main regression estimates.

VARIABLES	(1) Secondary School Enrollment, Female (% net) 2014-2018 Average	(2) Secondary School Enrollment, Female (% net) 2014-2018 Average
Active Borrowers per 100,000 People, 2009-2013 Average	0.000508 (0.000743)	0.000513 (0.000788)
GDP Per Capita, PPP, Constant 2017 Int'l Dollars, 2014-2018 Average	0.00116*** (0.000331)	0.00116*** (0.000367)
Gross Loan Portfolio per 100,000 People, 2009-2013 Average	4.94e-07 (3.19e-07)	4.80e-07 (3.46e-07)
Percent of Female Borrowers, 2009-2013 Average	0.264* (0.133)	0.257* (0.145)
Percent of Population with Some Secondary Education, Females Age 25+, 2014-2018 Average	0.517*** (0.0663)	0.518*** (0.0704)
Muslim Majority Country		0.398 (3.504)
Law Grants Spouses Equal Authority Over Assets in Marriage		1.898 (5.539)
Constant	6.985 (8.058)	5.548 (9.066)
Observations	34	34
R-squared	0.918	0.918
Adjusted R-squared	0.9028	0.8961

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: In this study, a country is considered to be a Muslim majority country if 50% or more of people are Muslim, as of 2017.

The main regression estimated, which focuses on female secondary school enrollment, shows a small effect of microfinance-related variables on the dependent variable. The coefficients in Column (1) for Active Borrowers and Gross Loan Portfolio are not significant at any level. However, the coefficient of 0.264 in Column (1) for

Percent of Female Borrowers is weakly significant, implying that on average and *ceteris paribus*, for each unit increase of the percent of female borrowers, the percent of females enrolled in secondary school increases by 0.264 percentage points. Once the religious and legal variables are added in, the coefficient remains similar, at 0.257 and still weakly significant. As neither the variables Muslim Majority Country or Assets Marriage Law are significant at any level in these estimations, the discussion of these regressions will focus on the main regression found in Column (1) instead of the regression in Column (2) that includes the religious and legal variables. Both GDP Per Capita, PPP and Female Secondary Education are strongly significant with coefficients of 0.00116 and 0.517, respectively. This shows that both how much a country produces in a given year per capita, adjusted for purchasing power parity, and the percent of women age 25 and over with some secondary education are positively correlated with increasing female secondary school enrollment, widely accepted as a positive influence on both girls' and women's autonomy.

The adjusted R-squared for the estimations is also high, with both rounded to at or above 0.90, suggesting that the line is a good fit. Overall, this main regression shows that out of the microfinance-related variables, the percent of female borrowers is the only influence estimated to affect female school enrollment and therefore women's autonomy.

To see if microfinance's influence on women's autonomy is captured through other dependent variables used to operationalize the concept, five additional dependent variables are also estimated for robustness. Each regression is estimated both with and without the additional two independent religious and legal variables, as well. In the following regressions estimated for robustness, the majority of microfinance-related

variables again are not significant in contributing to women's autonomy, as defined by any of the dependent variables used to represent the concept. The first set of these regressions without the additional variables is:

$$\begin{aligned} \text{Women Decision Making}_i = & \alpha + \beta_1 \text{GDP Per Capita PPP}_i + \\ & \beta_2 \text{Active Borrowers}_i + \beta_3 \text{Gross Loan Portfolio}_i + \beta_4 \text{Female Borrowers}_i + \\ & \beta_5 \text{Female Secondary Education}_i + \varepsilon_i \end{aligned} \quad (3)$$

$$\begin{aligned} \text{Female Business Owners}_i = & \alpha + \beta_1 \text{GDP Per Capita PPP}_i + \\ & \beta_2 \text{Active Borrowers}_i + \beta_3 \text{Gross Loan Portfolio}_i + \beta_4 \text{Female Borrowers}_i + \\ & \beta_5 \text{Female Secondary Education}_i + \varepsilon_i \end{aligned} \quad (4)$$

$$\begin{aligned} \text{Female Labor Force Participation}_i = & \alpha + \beta_1 \text{GDP Per Capita PPP}_i + \\ & \beta_2 \text{Active Borrowers}_i + \beta_3 \text{Gross Loan Portfolio}_i + \beta_4 \text{Female Borrowers}_i + \\ & \beta_5 \text{Female Secondary Education}_i + \varepsilon_i \end{aligned} \quad (5)$$

$$\begin{aligned} \text{Female Unemployment}_i = & \alpha + \beta_1 \text{GDP Per Capita PPP}_i + \beta_2 \text{Active Borrowers}_i + \\ & \beta_3 \text{Gross Loan Portfolio}_i + \beta_4 \text{Female Borrowers}_i + \\ & \beta_5 \text{Female Secondary Education}_i + \varepsilon_i \end{aligned} \quad (6)$$

$$\begin{aligned} \text{Poverty}_i = & \alpha + \beta_1 \text{GDP Per Capita PPP}_i + \beta_2 \text{Active Borrowers}_i + \\ & \beta_3 \text{Gross Loan Portfolio}_i + \beta_4 \text{Female Borrowers}_i + \\ & \beta_5 \text{Female Secondary Education}_i + \varepsilon_i \end{aligned} \quad (7)$$

where Women Decision Making is Women Participating in the Three Decisions (% of Women Age 15-49) 2014-2018 Average; Female Business Owners is Share of Female Business Owners (% of Total Business Owners) 2014-2018 Average; Female Labor Force Participation is Labor Force Participation Rate, Female (% of Female Population Ages 15+) 2014-2018 Average; Female Unemployment is Unemployment, Female (% of Female Labor Force) 2014-2018 Average; and Poverty is Poverty Headcount Ratio at \$1.90 a Day (2011 PPP) (% of Population) 2014-2018 Average.

Once the religious and legal variables are added, the regressions estimated are:

$$\begin{aligned} \text{Women Decision Making}_i = & \alpha + \beta_1 \text{GDP Per Capita PPP}_i + \\ & \beta_2 \text{Active Borrowers}_i + \beta_3 \text{Gross Loan Portfolio}_i + \beta_4 \text{Female Borrowers}_i + \\ & \beta_5 \text{Female Secondary Education}_i + \\ & \beta_6 \text{Muslim Majority}_i + \beta_7 \text{Assets Marriage Law}_i + \varepsilon_i \end{aligned} \quad (8)$$

$$\begin{aligned} \text{Female Business Owners}_i = & \alpha + \beta_1 \text{GDP Per Capita PPP}_i + \\ & \beta_2 \text{Active Borrowers}_i + \beta_3 \text{Gross Loan Portfolio}_i + \beta_4 \text{Female Borrowers}_i + \\ & \beta_5 \text{Female Secondary Education}_i + \\ & \beta_6 \text{Muslim Majority}_i + \beta_7 \text{Assets Marriage Law}_i + \varepsilon_i \end{aligned} \quad (9)$$

$$\begin{aligned} \text{Female Labor Force Participation}_i = & \alpha + \beta_1 \text{GDP Per Capita PPP}_i + \\ & \beta_2 \text{Active Borrowers}_i + \beta_3 \text{Gross Loan Portfolio}_i + \beta_4 \text{Female Borrowers}_i + \\ & \beta_5 \text{Female Secondary Education}_i + \\ & \beta_6 \text{Muslim Majority}_i + \beta_7 \text{Assets Marriage Law}_i + \varepsilon_i \end{aligned} \quad (10)$$

$$\begin{aligned} \text{Female Unemployment}_i = & \alpha + \beta_1 \text{GDP Per Capita PPP}_i + \beta_2 \text{Active Borrowers}_i + \\ & \beta_3 \text{Gross Loan Portfolio}_i + \beta_4 \text{Female Borrowers}_i + \\ & \beta_5 \text{Female Secondary Education}_i + \\ & \beta_6 \text{Muslim Majority}_i + \beta_7 \text{Assets Marriage Law}_i + \varepsilon_i \end{aligned} \quad (11)$$

$$\begin{aligned} \text{Poverty}_i = & \alpha + \beta_1 \text{GDP Per Capita PPP}_i + \beta_2 \text{Active Borrowers}_i + \\ & \beta_3 \text{Gross Loan Portfolio}_i + \beta_4 \text{Female Borrowers}_i + \\ & \beta_5 \text{Female Secondary Education}_i + \\ & \beta_6 \text{Muslim Majority}_i + \beta_7 \text{Assets Marriage Law}_i + \varepsilon_i \end{aligned} \quad (12)$$

where all variables follow the descriptions as listed for previous regressions.

Table 4. Robustness regression estimates.

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Women Participating in the Three Decisions (% of Women Age 15-49) 2014-2018 Average	Share of Female Business Owners (% of Total Business Owners) 2014-2018 Average	Labor Force Participation Rate, Female (% of Female Population Ages 15+) 2014-2018 Average	Unemployment, Female (% of Female Labor Force) 2014-2018 Average	Poverty Headcount Ratio at \$1.90 a Day (2011 PPP) (% of Population) 2014-2018 Average
Active Borrowers per 100,000 People, 2009-2013 Average	-3.57e-05 (0.00216)	0.00213 (0.00200)	-0.000830 (0.00144)	0.000229 (0.000285)	-3.91e-05 (0.000999)
GDP Per Capita, PPP, Constant 2017 Int'l Dollars, 2014-2018 Average	0.00199 (0.00193)	0.00109* (0.000470)	3.56e-05 (0.000592)	2.00e-05 (0.000117)	-0.000595 (0.000384)
Gross Loan Portfolio per 100,000 People, 2009-2013 Average	1.24e-06 (1.91e-06)	-5.34e-07 (8.68e-07)	6.74e-07 (6.47e-07)	-1.09e-07 (1.28e-07)	-4.16e-07 (4.22e-07)
Percent of Female Borrowers, 2009-2013 Average	0.290 (0.396)	-0.00637 (0.210)	-0.0415 (0.241)	-0.0784 (0.0476)	-0.334* (0.187)
Percent of Population with Some Secondary Education, Females Age 25+, 2014-2018 Average	0.0392 (0.224)	-0.0500 (0.101)	-0.154 (0.120)	0.0305 (0.0237)	-0.373*** (0.0864)
Constant	19.77 (22.98)	9.081 (11.98)	65.10*** (14.75)	8.240*** (2.919)	61.99*** (10.96)
Observations	22	12	43	43	33
R-squared	0.285	0.598	0.103	0.168	0.744

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: Results using a variable of Gross Loan Portfolio/GDP instead of Gross Loan Portfolio/100,000 People are the same except in the Female Unemployment regression, Percent of Female Borrowers becomes weakly significant, in the Poverty Headcount Ratio regression, GDP Per Capita PPP becomes weakly significant, and in the Women Decision Making regression, GDP Per Capita PPP becomes weakly significant.

The above table shows the regressions estimated for each of the additional dependent variables, without the religious or legal independent variables. Compared to the previous regressions focusing on female secondary school enrollment, these estimations have much lower R-squareds, suggesting that these dependent variables are not explained well by these independent variables, with the exception of the share of female business owners and the poverty headcount ratio. In the above regressions estimated, only two variables are significant. The percent of female borrowers is weakly significant in affecting the poverty headcount ratio, and the coefficient is shown as negative, at -0.334. This suggests that as more women borrow, poverty rates decrease, which is in line with the expected result based on theory. This finding supports the idea that microfinance leads to autonomy, empowerment, and better lives, as decreased poverty is a development goal. Strongly significant for the same dependent variable of poverty headcount ratio is the percent of population with some secondary education, female, ages 25 and over. This coefficient is also negative, at -0.373. Based on theory, more women having higher levels of education should decrease poverty, so this regression follows the expectation of theory. However, again, the majority of microfinance-related variables are not significant at any level, with the exception of the percent of female borrowers.

Table 5. Robustness regression estimates with added variables for religion and law.

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Women Participating in the Three Decisions (% of Women Age 15-49) 2014-2018 Average	Share of Female Business Owners (% of Total Business Owners) 2014-2018 Average	Labor Force Participa- tion Rate, Female (% of Female Population Ages 15+) 2014-2018 Average	Unemploy- ment, Female (% of Female Labor Force) 2014-2018 Average	Poverty Headcount Ratio at \$1.90 a Day (2011 PPP) (% of Population) 2014-2018 Average
Active Borrowers per 100,000 People, 2009-2013 Average	0.00161 (0.00189)	0.00185 (0.00123)	-0.000216 (0.00135)	0.000176 (0.000282)	0.000181 (0.00102)
GDP Per Capita, PPP, Constant 2017 Int'l Dollars, 2014-2018 Average	0.00248 (0.00161)	0.00115** (0.000298)	-0.000331 (0.000563)	5.61e-05 (0.000117)	-0.000699* (0.000395)
Gross Loan Portfolio per 100,000 People, 2009-2013 Average	-2.65e-08 (1.73e-06)	-6.54e-07 (5.44e-07)	2.28e-07 (6.25e-07)	-7.70e-08 (1.30e-07)	-5.97e-07 (4.48e-07)
Percent of Female Borrowers, 2009-2013 Average	0.00255 (0.355)	-0.101 (0.153)	-0.232 (0.235)	-0.0643 (0.0489)	-0.386* (0.192)
Percent of Population with Some Secondary Education, Females Age 25+, 2014-2018 Average	0.0578 (0.190)	-0.0270 (0.0660)	-0.0841 (0.114)	0.0229 (0.0236)	-0.356*** (0.0883)
Muslim Majority Country	-25.20** (8.740)	-10.10** (3.321)	-16.67*** (5.812)	2.045* (1.209)	-4.526 (4.541)
Law Grants Spouses Equal Authority Over Assets in Marriage	-3.858 (14.61)	0.716 (6.205)	8.848 (10.11)	1.264 (2.103)	7.139 (6.605)
Constant	45.80* (21.52)	18.61* (7.843)	73.38*** (15.37)	5.672* (3.198)	59.97*** (11.67)
Observations	22	12	43	43	33
R-squared	0.590	0.899	0.274	0.256	0.760

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In this final version of the regressions, the additional dependent variables for robustness are again estimated, with the independent variables accounting for religious and legal implications also incorporated. Once these are added, several more variables are significant, but the percent of female borrowers remains the only microfinance-related variable to be significant, even though it is weakly so, with a coefficient of -0.386 for the estimated regression's dependent variable of poverty headcount ratio. This suggests that increasing the percent of female borrowers decreases the number of people in poverty, on average and holding all else constant, which again follows theory and is closely aligned with findings from the previous regression. Interestingly, the added Muslim Majority Country variable is significant at some level in each of the estimated regressions, except for the poverty headcount ratio. These estimates show that if a country is majority Muslim, on average and holding all else constant, the percent of women participating in the three major decisions decreases by 25.20 percentage points, the share of female-owned businesses decreases by 10.10 percentage points, the female labor force participation rate decreases by 16.67 percentage points, and the percent of females unemployed increases by 2.045 percentage points. This variable helps control for the influence that religion and religious culture can have on the variables to be studied.

Additionally, females with some secondary education remains strongly significant in influencing poverty headcount ratio, with a coefficient of -0.356. The GDP per capita, adjusted for PPP, also becomes weakly significant, and it has a coefficient of -0.00067, showing that on average and holding all else constant, higher GDP per capita in PPP terms decreases poverty, which makes theoretical sense. GDP per capita adjusted for PPP also is estimated to be significant at a level of $p < 0.05$ when affecting the share of female

owned businesses, with a coefficient of 0.00115. However, due to data limitations, there are only 12 observations for the share of female businesses, so while this finding is interesting, it is not reliable enough given the data restrictions.

Interestingly, based on all of the regressions estimated above, the number of active borrowers per 100,000 people and the gross loan portfolio per 100,000 people are both not significant in any of the regressions. Neither of these variables, both of which show the reach and size of the microfinance sector in a country and could be hypothesized to increase women's autonomy, is significant at any level in influencing female school enrollment, women participating in the three decisions, share of female business owners, female labor force participation, female unemployment, and the poverty headcount ratio. This finding shows that microfinance may not be the miracle to empower women and eradicate poverty as it originally was touted to be.

However, there is a possible explanation for why microfinance does not seem to improve women's autonomy. It could be that the effects from microfinance take more years, or even generations, to surface than this study accounted for in using averages from 2009-2013 for microfinance-related variables to analyze their influence on outcomes averaged across 2014-2018. If microfinance's impact were to take much longer to surface, then this study would not be entirely capturing its effects. Additionally, microfinance may only be effective on a case-by-case or country-by-country basis. There may be certain contexts or situations where specific factors exist to result in microfinance's success that are not seen across numerous countries, so that a multi-country study does not pick up any positive effects.

Overall, though, from these regressions and based on the numerous different dependent variables incorporated for robustness, this study concludes that microfinance provides little positive effect, if any effect whatsoever, on women's autonomy in developing economies. The only microfinance-related independent variable that demonstrated itself to be significant on multiple occasions is the percent of female borrowers, which is only weakly significant. Therefore, while microfinance may have some influence on women's autonomy when high percentages of female borrowers exist, there is a severely limited positive effect shown through this study. The only outcomes that the percent of female borrowers is estimated to affect at a significant level are female secondary school enrollment and poverty headcount ratio. While these outcomes are not inconsequential, it should be asked if the expense, time, and resources invested in microfinance with hopes of improving women's autonomy could be better allocated elsewhere to achieve the same goals.

SECTION THREE: LIMITATIONS, FUTURE RESEARCH, AND ECONOMIC CONSIDERATIONS

Conclusion

This thesis project utilizing a quantitative analysis of microfinance and women's autonomy significantly contributes to the research in this sphere, adding to the body of literature surrounding microfinance in a unique way. There exist copious amounts of case studies or country-specific research papers focusing on women and microfinance, but there are far fewer studies focusing on microfinance's effects on women across numerous countries. From these studies, even fewer analyze the topic with a quantitative approach. By using this analysis and incorporating numerous dependent variables for robustness, this paper helps fill a gap in the literature. Using data drawn from numerous World Bank and United Nations databases, among others, this thesis project finds that microfinance has minimal effects, if any, on women's autonomy, even when measured across a range of dependent variables for robustness.

Due to the nature of data from developing countries, this study has several potential limitations. Since each variable used is a five-year average, some nuances of the effects may not be picked up on in the analysis. Additionally, some variable observations were missing, and so some of the variables did not have as many observations as would be optimal. Specific variables that would be beneficial to include did not have enough observations to be reliably incorporated, for example, the share of women business owners or the percent of internet users that are women. There may additionally be

omitted variable bias, as there could potentially be explanatory variables left out, such as international aid funds.

In the future, this research could be expanded in several ways. Other variables could be included to help account for any omitted variable bias in this study. Another way the research could be expanded is through using time series data to better analyze the nuanced effects of microfinance and women's autonomy. A time series study could capture lags in the impacts from microfinance and incorporate another layer of analysis. Furthermore, future research could include more countries in the study. Given that this paper only included countries with twenty or more individual data points to be combined for a country-wide level, another paper could include every country available or determine a different metric for including country observations. Lastly, future studies could look at individual-level observations instead of country-level data points.

This study is especially relevant as society, institutions, and governments consistently focus on how to improve women's lives, reduce poverty, and develop economies. Microfinance may be seen as a powerful tool to help do so, and this research helps demonstrate that its charm may only be surface level. Before institutions and organizations continue to pour millions of dollars into microfinance, they should view the situation through the lens of economics and ask if the marginal benefit outweighs the marginal cost. There may be more cost-efficient approaches to empower women than microfinance, and these deserve further research, exploration, and consideration.

Based on this thesis project, microfinance does not appear to be a widely effective approach to increase women's autonomy and therefore improve their lives. This confirms what many previous studies on the topic have found, and it also contrasts with many

anecdotes and microfinance institutions' stories. If available, additional research across countries with more data could help further analyze the effects of microfinance on women's autonomy in developing economies.

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