COUNTRY-LEVEL IMPACT OF INFORMATION AND COMMUNICATIONS TECHNOLOGY ON MICROFINANCE

An Undergraduate Research Scholars Thesis

by

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ABSTRACT

Country-Level Impact of Information and Communications Technology on Microfinance.
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This paper examines the link between information and communications technology and microfinance performance. Information and communications technology, or ICT, could potentially provide a breakthrough for microfinance in terms of increasing its accessibility while also helping microfinance become more sustainable and self-sufficient. We used measures such as operational self-sufficiency and average interest rate to measure MFI (microfinance institution) performance. We used number of mobile phone subscriptions, number of telephone subscriptions, internet usage data, and fixed broadband data to measure information and communications technology capital. Data on macroeconomic indicators such as real GDP growth, inflation, and labor force participation were included to control for a country's macroeconomic performance. We obtained a time series dataset including microfinance data, information and communications technology data, and macroeconomic data starting from the year 2000 throughout 2013 which includes annual data for each country in the regression. We found that ICT variables have a significant impact on reducing operating costs for MFIs as well as increasing average loan size and decreasing the average interest rate charged per loan.

CHAPTER I

INTRODUCTION

This paper examines the relationship between microfinance and information and communications technology, or ICT. ICT could potentially be an important factor in promoting microfinance and increasing access to more borrowers. We believe that ICT innovation could also cut costs for microfinance institutions, or MFIs, by automating jobs that are particularly labor-intensive. In addition, ICT innovation could allow MFIs to screen customers better to mitigate risks and store credit information on borrowers.

We wish to test the impact of ICT capital on microfinance performance to determine the link between the two variables. Research in this area can be very important for public policymakers in developing countries in terms of how scarce resources should be allocated.

There has not been any significant research done on the topic of microfinance and ICT innovation. Research does exist, however, on the link between ICT innovation and developing countries. Results suggest that developing countries should invest more on ordinary capital first in order to see gains from IT capital investment, but that developed countries with mature ordinary capital should focus on IT investment (Dewan and Kraemer). Dewan and Kraemer, experts in IT capital innovation, argue that basic capital investment must be in place before a country invests in ICT capital because developing countries cannot fully absorb the gains of ICT without the necessary level of basic capital accumulation.

Our research differs because it focuses specifically on microfinance performance, and looks at the impact of ICT specifically on microfinance clients and institutions, so the results might be different when observing this specific group. Our paper is one of the first of its kind in the emerging field of ICT and microfinance. Kaufmann and Riggins wrote a paper on the possibilities of future research relating to the field of microfinance and ICT. Previous research exists on the link between macroeconomic indicators and microfinance performance, but it fails to include ICT variables, which we believe have become significant enough to impact microfinance performance at the country level (Ahlin et al., 2010).

The main motivation for this paper was the fact that there has not been any recent work done in the field of microfinance and information and communications technology. Microfinance institutions around the world have responded to new technologies such as mobile phones and the internet and have incorporated these technologies to streamline their services. In addition, the clients of microfinance institutions have also benefited greatly from these advances in technology. We find that technology has assisted clients in not only interacting with their respective microfinance lender, but has also had a significant impact on the outreach and profitability of their individual projects and businesses.

Mobile banking is becoming increasingly popular with some microfinance institutions, especially those in countries with existing mobile banking infrastructure. In Kenya, an MFI called Faulu Kenya partnered with Safaricom, the leading mobile network operator in the country (Kabir, McKay, and Rotman). Faulu allowed its customers to repay loans using the mobile banking technology that it adopted. This meant that there was no longer a compelling

need to have weekly group meetings, and loan officers were no longer needed to make frequent trips to remote villages to collect payments. In addition to making payments on their loans, clients even used other mobile banking services such as wiring money to relatives in other parts of Kenya via mobile. This shows that not only are clients open to mobile banking, but they are also quite technologically savvy, quelling any fears that those in developing countries would be unwilling to adopt technology typically used in the Western world.

Evidence from Brazil's Banco Central do Brasil offers compelling evidence for other banking institutions to adopt information and communications technology to make their business more efficient and attract more clients in underserved areas (Diniz, Marlei, and Ewandro). Banco Central do Brasil has adopted the idea of correspondent banking, where banks can downscale their financial services and offer financial services from supermarkets, drug stores, and post offices. Banco Central do Brasil partnered with Banco Palmas, a Brazilian microfinance institution, and allowed them access to Banco Central's ICT technology. Banco Palmas was allowed to use Banco Central's ATM machines as well as adopt their mobile phone technology that automates payments and financial transactions for borrowers. The growth of correspondent banking in Brazil has allowed Brazilian banks to expand in areas that were recently inaccessible to financial services.

Our aim is to determine whether ICT has had a significant impact on the growth and sustainability of microfinance. We believe that ICT has had a significant impact on the sustainability, outreach, and performance of microfinance due to emerging technologies such as the internet and mobile phones.

Our results show that ICT has had a significant impact on the efficiency of microfinance. The implications of our results could be very important regarding government policy, NGO spending in developing countries, and overall technological development in the developing world as a way to alleviate poverty. The results also suggest the adoption of new and innovative strategies for MFIs to expand their services and become more profitable.

CHAPTER II

METHODS

The data used in this project was obtained from the World Bank database as well as the MIX Market website. Macroeconomic data and ICT data are from the World Bank and microfinance data is from MIX Market. Overall, there were 62 countries in the regression spanning a time period of 13 years, from 2000 to 2013. The data is annual, which allows us to capture long term impacts among the variables.

Microfinance institutions from MIX Market were only included in our regression if they were rated either four diamonds or five diamonds by MIX Market. MIX Market gives a rating of 1-5 diamonds for each microfinance institution. MFIs receiving four or five diamonds indicates that the institution has their financial statements audited by a third-party accounting firm. The omission of 1-3 diamond institutions was done to ensure that our dataset was as accurate as possible. In addition, countries were only included in our dataset if they had four or more years of observations reported. Microfinance data was grouped together by country, meaning that MFIs from the same country were grouped together for each observation in each different year. The grouping by country allows us to cluster MFIs and capture the macroeconomic effects for each country accordingly.

Macroeconomic data and ICT data were reported to the World Bank from various agencies around the world that collect such data. For example, data for ICT variables were compiled by the World Bank but obtained originally from the International Telecommunications Union. We

believe that this data is very reliable, and so there was no need for omission of any data points in regards to data from this source.

Our regression measures microfinance performance for each country *i* at time period *t.* Our dependent variable is microfinance performance and our independent variables are macroeconomic variables and information and communications technology variables. Macroeconomic variables were included as a control in our study, since it was previously measured how microfinance is affected by macroeconomic variables. Our aim is to measure whether information and communications technology has a more significant impact on microfinance other than macroeconomic variables, which is why we include macroeconomic variables. Omitted variable bias is minimized with these controls in our regression.

Our dataset is country level panel data. We ran a time fixed effects regression to control for variables that may naturally change or evolve over time. This reduces the possibility of skewed or inaccurate results due to certain naturally occurring trends in our data that are not caused by our independent variables. We also calculated robust standard errors to reduce the potential of heteroskedasticity as we believe that provides more accurate results than the standard ordinary least squares method. Finally, we clustered the standard errors both by country and by continent to allow for arbitrary correlation within each respective cluster. We also ran a median regression, or quantile regression, to estimate results in a way that is less susceptible to outliers. Quantile regressions minimize the sum of absolute residuals rather than the sum of squared residuals.

The microfinance variables in our regression include operational self-sufficiency, loan loss expense rate, PAR-30, average interest rate, average cost of funds, interest markup, cost per dollar loaned, cost per borrower, average loan size, assets per loan, and active borrowers. Operational self-sufficiency is measured by dividing financial revenue by financial expense and other expenses accrued by the MFI. Loan loss expense rate is measured by dividing loan loss provision expense by average gross loan portfolio. PAR-30 is the individual value of each loan at risk for more than thirty days. Average interest rate was measured by dividing financial revenue with average gross loan portfolio. Average cost of funds was calculated by dividing financial expense by average gross loan portfolio. Interest markup is the difference between average interest rate and average cost of funds. Cost per dollar loaned is calculated by dividing operating expense with average gross loan portfolio. Cost per borrower is calculated by dividing operating expense by the number of active borrowers. Average loan size is calculated by dividing the average gross loan portfolio by the average number of active borrowers. Assets per loan is calculated by dividing total of all net asset accounts by gross loan portfolio.

Information and communications technology data is measured by fixed broadband connections, telephone lines, mobile phone subscriptions, and internet users for each country. Each variable is adjusted for the population of each country, meaning that ICT data we used was all relative to each country. This gives us a more accurate measure of the data and we are able to control for each country's population.

The exclusion of microfinance variables from the right hand side of our equation was mainly to ensure that collinearity was not an issue. In the Ahlin paper, microfinance variables are included

on both sides of their equation, and we believe that doing so skews the results of some regressions, which is why we decided to omit them as independent variables. [1]

[1]Outliers presented a challenge for our regression results, so we omitted outliers for each regression to minimize errors in our results. We sorted residuals for each regression we ran and dropped data points that were too extreme and skewed our results. In addition to sorting and predicting residuals, countries with abnormal results were dropped from the regression. For example, Zimbabwe was dropped from our dataset because they were outliers in nearly every category for ICT data as well as macroeconomic data. Similar cases were also dropped.

CHAPTER III

RESULTS

The results from the regressions were almost unanimous in suggesting that telephone lines and mobile phone subscriptions specifically have a statistically significant impact on microfinance performance in terms of lowering costs. It is evident why perhaps telephone lines and mobile phone subscriptions were more significant than both fixed broadband subscriptions and internet users per 1000 people for most regressions. Telephone and mobile phone technology is perhaps a more basic and accessible form of information and communications technology, as evidenced by the data, and it appears as though it has a profound impact on microfinance performance. To summarize our results very briefly, our findings suggest that it would be wise to make sure that microfinance institutions equip their clients with a means of communication, and telephones seem to be the best and most efficient manner to achieve those goals.

Operating Expense

Telephone lines and mobile phone subscriptions both have an inverse relationship with operating expense, meaning the more accessible phones are to microfinance clients, the lower the microfinance institution's operating expenses. Telephone lines and mobile phone subscriptions were both statistically significant at the 5% level. A 1% increase in telephone subscriptions is associated with a 0.421% decrease in operating expense. It is interesting to note that the only macroeconomic variable to be statistically significant was domestic credit to the private sector, which is statistically significant at the 5% level and is inversely related with operating expense. This suggests that countries with higher rates of domestic credit as a percent of GDP have more

advanced financial systems, and thus operating expenses for microfinance institutions could be lower.

Operational Self Sufficiency

Telephone lines were found to be positively related to operational self-sufficiency, meaning that MFIs in countries with more advanced telephone infrastructure were able to be more self-sufficient. The key macroeconomic determinant to operational self-sufficiency of an MFI was GDP growth. This suggests that one of the keys to the long term success of a microfinance institution might lie in the country in which it is located. For example, a country experiencing high economic growth and a rise in income for its citizens would expect to have a thriving and more self-sufficient microfinance sector.

Loan Loss Rate

Loan loss expense rate was found to be statistically significant with no macroeconomic variables or ICT variables. Loan loss expense rate is defined as the difference between write-offs and the value of loans recovered. The absence of statistical significance here suggests that loan loss rate is more of an issue that is associated with the borrower side rather than the microfinance institution itself. That is, no matter how efficient or well-run an MFI is, it cannot take into account whether all their borrowers will be able to repay their loans or not. This is associated with the moral hazard as well as adverse selection that an MFI faces when trying to determine whether or not to give out a loan to a client, since they have imperfect information on their clients.

Portfolio at Risk > 30 days

Portfolio at risk, or PAR-30, measures the value of outstanding loans that have one or more installments past due after 30 days. Again, telephone lines were inversely related to PAR-30, suggesting that access to telephone lines reduces PAR-30 for MFIs. Other strong indicators were income per capita, GDP growth, and manufacturing, which were all inversely related to PAR-30. Higher income per capita and GDP growth lead to lower amounts of outstanding loans, which is fairly intuitive since we can assume citizens of a country experiencing economic growth would be more likely to repay their loans on time. It is interesting to note that an increase in manufacturing jobs also led to a decrease in PAR-30.

Gross Loan Portfolio

Gross loan portfolio was only found to be statistically significant using the quantile regression model. All ICT variables were positively related to gross loan portfolio, suggesting that an increase in ICT advancement leads to an increase in the amount of money that an MFI loans out. This could be attributed to the increasing outreach an MFI might have given the correct technology. However, the fact that it was not significant using the time fixed effects model possibly suggests that the link is not that strong. [2] Manufacturing was inversely related to gross loan portfolio. This is consistent with the thinking that an increase in manufacturing jobs in a country leads to a decrease in clients for an MFI, which would decrease gross loan portfolio.

[2] Results were only included in our study if they were significant for both the time fixed effects model as well as the quantile regression model. Gross loan portfolio was the only dependent variable to be statistically significant for one model and not the other. All other results are significant for both models to ensure reliability and accuracy of results. Unreported results are available from the author upon request.

Average Interest Rate

Average interest rate was found to be inversely related to both telephone lines as well as mobile phone subscriptions. From previous results, we can imply that ICT variables help reduce the operating costs of an MFI, and those savings might be passed on to the borrowers in the form of lower interest rates. A 1% increase in telephone subscriptions is associated with a 0.83% decrease in the interest rate charged by an MFI, while a 1% increase in mobile phone subscriptions is associated with a 0.131% decrease in interest rate. Income per capita was also found to be inversely related to the average interest rate that an MFI charged. The evidence here could be circular in the fact that countries where citizens have a higher income are able to repay their loans at a higher overall rate, which would then encourage MFIs to lower their interest rates.

Cost per Dollar Loaned

Costs per dollar loaned was inversely related to both telephone lines and mobile phone subscriptions at the 1% significance level, and is perhaps the most telling evidence of ICT making microfinance more efficient and cost-effective. Again, no macroeconomic indicators were significant at any level to suggest that it could also play a part in bringing down costs for microfinance institutions. Cost per dollar loaned is essentially an alternative ways of expressing operating expenses for a microfinance institution, and it is no surprise that they are affected by phones. The reason for this relationship suggests that telephone/mobile phone communication between MFIs and their clients are bringing down costs significantly. Loan officers might make fewer trips to small, remote villages to communicate with their clients and receive updates,

which is fairly common practice for MFIs. We believe that the reoccurring relationship between phones and costs for microfinance institutions is too large to ignore.

Average Loan Size

Average loan size was highly significant at the 1% level for all four ICT variables. A 1% increase in telephone subscriptions is associated with a $41.10 increase in average loan size. We were surprised to find that fixed broadband subscriptions are associated with the largest increase in loan size. A 1% increase in broadband subscriptions is associated with a $178 increase in loan size. This implies that MFIs located in countries with more advanced ICT infrastructure are able to give out larger loans, possibly due to the fact that they have more returning customers. MFIs typically give their first-time clients a predetermined amount for their first loan and graduate them to larger loans with a repeat history of repayment. This is an incentive for clients to pay off their loans in the early stages of their relationship with an MFI to be able to obtain larger sums of money in the future. It is also beneficial for MFIs since the clients that graduate to larger loans are fairly reliable, so it is profitable for both sides and offers incentives to both parties simultaneously. The relationship between ICT and average loan size means that clients and MFIs that have access to advanced ICT technology are much more likely to do business together over the long run. This could be due to the fact that it is easier for a client to communicate with his/her loan officer and make timely payments. Income per capita was also found to be positively related to average loan size, which implies that countries with relatively wealthier clients receive larger loan sizes.

CHAPTER IV

CONCLUSION

In our study, we examined microfinance data, macroeconomic data, and information and communications technology data to determine whether ICT has an impact on microfinance.

We found that information and communications technology can be very useful for microfinance institutions in their attempt to cut down costs, which could in turn give them the ability to reach out to more clients and offer lower interest rates while keeping their profits and sustainability at healthy levels.

Telephone lines and mobile phone subscriptions were shown to be very effective in keeping operating expenses and costs for borrowers and clients low. This could be due to the fact that the very nature of lending changes with the use of technology such as phones. Loan officers might have to make less frequent trips to remote villages to interact and keep up with their clients. Also, some MFIs have adopted modern techniques such as mobile banking that allows their clients to make financial payments by phone rather than in person.

The most eye-opening piece of evidence for ICT adoption by MFIs is perhaps the relationship between average interest rates and average loan sizes with ICT variables. MFIs are oftentimes competing against each other to offer lower interest rates to their clients, and those that adopt ICT technology such as correspondent banking or mobile banking are cutting significant operating costs, which could allow for a larger margin to lower interest rates. In addition, as we

have found, ICT innovation plays a vital role in keeping clients with MFIs over the long run, which is beneficial for both clients and MFIs themselves. Microfinance institutions would much rather give out loans to clients that have a strong history of repayment since they have already overcome the issues of adverse selection and moral hazard with repeat borrowers.

Our results suggest that MFIs should adopt new technologies such as mobile banking or correspondent banking and offer those services to their clients. While it might be a little costly to implement at first, our research suggests that microfinance institutions become more self-sufficient and have lower operating costs after adopting these new technologies.

Government policy implications of our research suggest that it is beneficial for governments to invest in basic ICT infrastructure, especially phone technology. Our research suggests even those in poverty can benefit from advancements in technology. Money set aside for economic development might be well spent on advancing the ICT infrastructure of a country.

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APPENDIX

Table 1: Summary Statistics

VARIABLES	(1) N	(2) Mean	(3) Standard Deviation	(4) Minimum	(5) Maximum
Gross Domestic Product Growth (%)	906	5.133	4.026	-15.09	34.50
Income per Capita	909	2,406	2,751	110.2	15,732
Labor Force Participation Rate (%)	465	61.72	10.24	30	93
Manufacturing	804	3.516×10^{10}	1.535×10^{11}	2.127×10^{7}	2.331×10^{12}
Domestic Credit (%)	868	31.44	26.73	0.198	167.5
Services (%)	842	51.99	9.575	13.25	72.61
Industry (%)	842	28.84	9.215	6.940	70.22
Foreign Direct Investment (%)	905	3.975	4.601	-2.757	45.15
Inflation (%)	850	8.503	22.57	-8.283	513.9
GINI	336	43.59	9.581	24.24	67.40
Private Credit Bureau Coverage (%)	644	16.89	26.73	0	100
Internet Users (%)	887	12.85	15.36	0.00456	67.90
Fixed Broadband Subscriptions (%)	805	1.750	3.447	0	18.97
Telephone Lines (%)	884	9.255	9.292	0	39.35
Mobile Phone Subscriptions (%)	888	45.95	42.22	0	185.8
MFI Count	643	10.57	10.85	2	99
Operational Self Sufficiency (%)	643	111.723	20.836	14.06	278.51
Financial Revenue (%)	643	27.821	10.818	5.13	68.75
Financial Expense (%)	634	4.617	2.703	0.09	20.23
Gross Loan Portfolio	643	1.164×10^{7}	2.805×10^{7}	14,446	4.120×10^{8}
Operating Expense (%)	643	27.7960	21.5183	1.43	233.76
Active Borrowers	643	17,000	23,770	134.5	275,808
Assets	643	1.518×10^{7}	3.604×10^{7}	42,691	5.651×10^{8}
Portfolio at Risk > 30 Days (%)	630	4.408	4.2278	0.01	43.29
Loan Loss Expense (%)	502	2.523	24.9845	-1.47	558.4
Interest Rate Markup (%)	634	2.1099	12.4776	0.0048	271.1492
Cost per Dollar Loaned	643	0.5026	3.8377	0.0004	63.9627
Cost per Borrower	643	97.921	371.9919	0.4400	5372.093
Average Loan Size	643	961.9	1,358	32.39	15,594
Average Interest Rate (%)	643	26.82	153.9	0.0632	3,349
Average Cost of Funds	634	3.315	26.78	0.0144	637.2

Table 2: Operating Expense

VARIABLES	(1) Time Fixed Effects	(2) Median Regression
GDP	-0.293	-0.0941
	(0.227)	(0.162)
Inflation	-0.0701	0.287***
	(0.0612)	(0.0947)
Domestic Credit	-0.0974*	-0.0904***
	(0.0529)	(0.0282)
Mobile Phones	-0.0728***	-0.0460***
	(0.0250)	(0.0174)
Constant	36.59***	25.10***
	(3.639)	(1.751)
Observations	580	580
Number of Countries	62	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Operating Expense

VARIABLES	(1) Time Fixed Effects	(2) Median Regression
GDP	-0.229	-0.0250
	(0.227)	(0.149)
Inflation	-0.0159	0.279***
	(0.0569)	(0.0880)
Domestic Credit	-0.185***	-0.0653**
	(0.0369)	(0.0258)
Telephone Lines	-0.421***	-0.304***
	(0.122)	(0.0702)
Constant	39.07***	24.87***
	(3.718)	(1.550)
Observations	576	576
Number of Countries	62	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Operational Self-Sufficiency

VARIABLES	(1) Time Fixed Effects	(2) Median Regression
GDP	0.664***	0.838***
	(0.226)	(0.157)
Inflation	0.158	-0.110
	(0.150)	(0.0927)
Domestic Credit	0.0476	-0.0127
	(0.0664)	(0.0272)
Telephone Lines	0.413**	0.261***
	(0.190)	(0.0739)
Constant	101.3***	106.6***
	(3.677)	(1.633)
Observations	576	576
Number of Countries	62	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Portfolio at Risk > 30 Days

VARIABLES	(1) Time Fixed Effects	(2) Median Regression
GDP	-0.105**	-0.101**
	(0.0492)	(0.0394)
Inflation	-0.0266	-0.0408*
	(0.0211)	(0.0223)
Income	0.000380***	0.000295***
	(0.000133)	(8.65e-05)
Manufacturing	-0***	-0
	(0)	(0)
Telephone Lines	-0.0927**	-0.0957***
	(0.0373)	(0.0240)
Constant	5.076***	4.714***
	(0.450)	(0.366)
Observations	532	532
Number of Countries	59	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Cost per Dollar Loaned

VARIABLES	(1) Time Fixed Effects	(2) Median Regression
GDP	0.00608	-0.000207
	(0.00699)	(0.000909)
Private Credit	0.000102	-8.25e-05
	(0.000431)	(0.000161)
Inflation	0.00290	0.00121*
	(0.00235)	(0.000665)
Mobile Phones	-0.00143***	-0.000467***
	(0.000343)	(0.000104)
Constant	0.156***	0.0671***
	(0.0450)	(0.0107)
Observations	492	492
Number of Countries	62	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: Cost per Dollar Loaned

VARIABLES	(1) Time Fixed Effects	(2) Median Regression
GDP	0.00801	0.000679
	(0.00718)	(0.000935)
Private Credit	-0.000629	-0.000162
	(0.000497)	(0.000167)
Inflation	0.00366	0.00154**
	(0.00243)	(0.000701)
Telephone Lines	-0.00630***	-0.000915**
	(0.00186)	(0.000445)
Constant	0.132***	0.0386***
	(0.0452)	(0.00973)
Observations	487	487
Number of Countries	62	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Average Interest Rate

VARIABLES	(1) Time Fixed Effects	(2) Median Regression
Income	-0.000220	0.000477**
	(0.000438)	(0.000204)
Private Credit	-0.0110	-0.0180
	(0.0313)	(0.0186)
Inflation	0.208	0.0655
	(0.194)	(0.0707)
Mobile Phones	-0.131***	-0.0635***
	(0.0402)	(0.0129)
Constant	18.02***	7.466***
	(3.353)	(0.932)
Observations	492	492
Number of Countries	62	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Average Interest Rate

VARIABLES	(1) Time Fixed Effects	(2) Median Regression
GDP	-0.0506	0.0571
	(0.538)	(0.107)
Domestic Credit	0.198	-0.0248
	(0.311)	(0.0186)
Inflation	0.410	0.107*
	(0.338)	(0.0636)
Telephone Lines	-0.831**	-0.107**
	(0.340)	(0.0507)
Constant	16.44**	6.487***
	(6.742)	(1.119)
Observations	576	576
Number of Countries	62	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10: Average Loan Size

VARIABLES	(1) Time Fixed Effects	(2) Median Regression
GDP	-34.49	-12.74
	(24.39)	(9.193)
Private Credit	9.809	-1.451
	(6.141)	(1.647)
Inflation	-12.84**	-9.368
	(6.440)	(6.891)
Telephone Lines	41.10**	56.05***
	(17.32)	(4.380)
Constant	745.4***	348.0***
	(225.9)	(95.72)
Observations	487	487
Number of Countries	62	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11: Average Loan Size

VARIABLES	(1) Time Fixed Effects	(2) Median Regression
GDP	-21.51	2.226
	(21.68)	(10.27)
Private Credit	5.797	0.368
	(4.973)	(1.824)
Inflation	-9.902	-4.589
	(6.073)	(7.515)
Mobile Phones	8.122***	10.07***
	(2.065)	(1.176)
Constant	646.4***	127.0
	(203.2)	(120.8)
Observations	492	492
Number of Countries	62	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12: Average Loan Size

VARIABLES	(1) Time Fixed Effects	(2) Median Regression
GDP	-18.03	-4.350
	(20.14)	(11.74)
Private Credit	5.062	1.183
	(5.094)	(2.073)
Inflation	-5.777	-4.273
	(5.148)	(8.683)
Internet Users	29.20***	36.47***
	(7.784)	(3.603)
Constant	620.1***	223.3*
	(181.6)	(127.6)
Observations	490	490
Number of Countries	62	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13: Average Loan Size

VARIABLES	(1) Time Fixed Effects	(2) Median Regression
GDP	-10.81	-5.197
	(17.07)	(10.12)
Private Credit	0.815	1.934
	(5.546)	(1.730)
Inflation	-3.914	-4.353
	(4.187)	(7.385)
Fixed Broadband Users	178.0***	202.2***
	(47.96)	(13.33)
Constant	730.7***	378.1***
	(172.6)	(101.7)
Observations	471	471
Number of Countries	62	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1