Determinants of financial inclusion and the impact of COVID-19 in the Latin America and Caribbean

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Abstract

Purpose: The study examines the determinants of financial inclusion and the impact of COVID-19 in the Latin America and the Caribbean during the pandemic.

Methodology: It uses the database from the World Bank's Global Findex 2021 collected during the COVID-19 pandemic on eight Caribbean countries to run *logit* regression to investigate the determinants and how COVID-19 influenced financial inclusion.

Results: On the main determinants, the study found that female and lower income group individuals have low financial exclusion rate though financial inclusion increases with increase income.

Originality of the Paper: The study used data collected during COVID-19 era to investigate how the pandemic affected financial inclusion which is one of the first of its kind.

Keywords: financial inclusion, Latin America and the Caribbean (LAC), individual characteristics, COVID-19
JEL Classification: **G21, O16**

Déterminants de l'inclusion financière et l'impact du COVID-19 en Amérique latine et dans les caraïbes

Résumé

Objectif : L'étude examine les déterminants de l'inclusion financière et l'impact du COVID-19 en Amérique latine et dans les Caraïbes pendant la pandémie.

Méthodologie : elle utilise la base de données du Global Findex 2021 de la Banque mondiale, collectée pendant la pandémie de COVID-19 dans huit pays des Caraïbes, pour exécuter une régression logit afin d'étudier les déterminants et la manière dont la COVID-19 a influencé l'inclusion financière.

Résultats : Concernant les principaux déterminants, l'étude a révélé que les femmes et les individus des groupes à faible revenu ont un faible taux d'exclusion financière, bien que l'inclusion financière augmente avec l'augmentation des revenus.

Originalité du document : L'étude a utilisé des données collectées à l'époque du COVID-19 pour étudier comment la pandémie a affecté l'inclusion financière, ce qui est une des premières du genre.

Mots-clés : inclusion financière, Amérique latine et Caraïbes (ALC), caractéristiques individuelles et COVID-19

INTRODUCTION

Financial services have been provided for people from all walks of life over the years. However, the level of financial inclusion differs from country to country (see Demirgüç-Kunt et al. (2022a) for detail level across the globe). The question that needs to be answered is what makes financial inclusion differ for countries and what benefits do financial inclusion give to the poor? Or put another way, how do the determinants of financial inclusion benefit the poor? There is no straight answer to the question. For example, whereas some studies such as Zins and Weills (2016), Demirgüç-Kunt et al. (2017) and Jungo, Madaleno, and Botelho (2022) claim that financial inclusion is directly related to economic development, Mader (2018) strongly contested the claims and argues that none of the widely cited studies such as King and Levine (1993), Jalilian and Kirkpatrick (2005) and Beck, Demirguc-Kunt and Levine. (2007) did not show how the poor benefited.

Roa (2015) opined that there has not being any specific definition for financial inclusion, and uses the definitions offered by some international institutions such as Global Partnership for Financial Inclusion (GPFI), the Consultative Group to Assist the Poor (CGAP) the Organization for Economic Co-operation and Development (OECD) through the subgroup International Network on Financial Education (INFE), The Alliance for Financial Inclusion (AFI), and other countries in Latin America and the Caribbean (LAC) to report on financial inclusion's definitions to show its multifaceted nature. However, central to all the definitions is the ownership of formal account by the individual. The account ownership implies the holder can transact businesses such as saving, borrowing and insurance as an approved activity. Zins and Weills (2016) probably provide a simple definition to financial inclusion as when an individual holds a bank account with a bank.

The debate on the benefits or otherwise of financial inclusion continue among scholars; whereas Zins and Weill (2016) found that financial inclusion enhances a lot of economic advantages, and Demirgüç-Kunt et al. (2017) list the benefits of financial inclusion to include reducing poverty which contributes to economic growth and development, cautioning that a lot more of the adult population still depend on informal financial services despite the advantages. Aside the "warning", these claims have been contested by studies such as Peebles (2014), Mader (2016, and 2018), Gabor and Brooks (2017) as well as Bateman, Duvendack and Loubere (2019) that actual impact on the poor are not shown by the studies trumpeting the benefits to the economy. Notwithstanding the above argument, the importance of financial inclusion comes to bare as the United Nations has earmarked it as one of the four developmental pillars namely developing a growth strategy spearheaded by employment, consolidation of financial inclusion, developments that targets human investment, and ensuring impact received from win-win strategies (Jungo, Madaleno, and Botelho, 2022). Financial inclusion is of much interest to the World Bank as well; hence from 2011, the bank started to provide data on financial inclusion across the globe. Thus, financial development cannot be achieved without its major component of financial inclusion (Emara and El Said, 2021).

Li and Wong (2018) on their part outlined the major challenges that pose problems to the development of financial inclusion in The Caribbean sub-region to include the smaller nature of the countries and their low protracted rate of growth, huge debt, exposure to external shocks such as natural disasters and not too long ago, banking crises. To some extent, the practice of financial inclusion in the Latin American and the Caribbean (LAC) run smoothly, there are setbacks and differences among the countries (Gershenson et. al, 2021). They opined that the introduction of "Fintech" will help to reduce the challenges and expand financial inclusion. Fintech is simply the use of new technology by individual and firms involving computer and internet among others in the financial arena (for details see He et. al., 2017). Demirgüç-Kunt (2022b) found that in 2021 as a result of COVID-19 pandemic about 6% of adult population in the developing world used digital payment method to settle their utility bills; the rate has however increased after the period. Again, the COVID-19 pandemic aided financial inclusion activities via diverse means across the globe. Here again, the study did not detail how the poor were involved. The bigger problem is as Mader (2016) opined, the empirical studies do not show how the poor individuals benefited from the financial services, but benefits to the economic development are portrayed. This study investigates the determinants of financial inclusion during the COVID era on LAC

countries in general without detailing how the poor were affected, the reason is lack of detail data for analysis.

From the above, it is evident that financial inclusion irrespective of the counter claims is very important and must be used by countries to improve economic development. To understand the level of financial development, eight Caribbean countries with current data provided by the World Bank on financial inclusion is portrayed below. The countries are those with full data from the World Bank per the variables listed.

Table 1: Selected Financial Inclusion Indicators of Some Latin America and the Caribbean Countries

Country	Population Age 15+ million	GNP Per Capita US$	2011	2014	2017	2021	Mobile Money Account (%) 2017	2021	Sample size
Colombia	39.6	5,830.0	30.4	39.0	45.8	59.7	4.7	21.8	1000
Costa Rica	4.0	11,580.0	50.4	64.6	67.8	68.5	-	-	1001
Dominica Republic	7.9	7,270.0	38.2	54.1	56.2	51.3	3.9	7.6	1000
Honduras	6.9	2,190.0	20.5	31.5	45.3	37.8	6.2	8.9	1000
Jamaica	2.3	4,670.0	71.0	78.5	0.0*	73.3	0.0*	2.7	502
Nicaragua	4.7	1,770.0	14.2	19.4	30.9	26.0	3.9	6.6	1007
Panama	3.2	12,420.0	24.9	43.7	46.5	45.0	3.5	-	1002
El Salvador	4.8	3,630.0	13.8	36.7	30.4	35.8	3.5	10.9	1002

Source: World Bank (2022) and Demirgüç-Kunt et al (2022a). * 0.0 as found in the data.

Table 1 portrays global financial inclusion of the percentage of the adult population of 15 and above, for some Caribbean countries and the number of respondents from each country. From the table, apart from Colombia and Costa Rica that show increases in the financial inclusion from 2011 to 2021, the rest have what can be called "rise and fall trend". However, the use of mobile money account appears to be increasing steadily for all the countries, Costa Rica had no data on mobile phone account. The question that emerges is what accounted for the fluctuating nature of financial inclusion in the LAC? To answer this question, first, the study investigates how personal factors affect four key financial inclusion variables namely; possession of a bank account, have a savings account with formal institution, use borrowed amount from the bank and ownership of mobile money account. Second, it examines the relationship between individual characteristics and obstacles to financial inclusion; third, it examines the motives behind savings and credits and how they are related to individual features (irrespective of income levels), as well as different sources of both borrowing and savings. Lastly, it investigates how COVID-19 pandemic impacted on financial inclusion in the LAC.

In the attempt to meet the above objectives, the study uses data from the 2021 World Bank's Global Findex data for analysis. *Logit* model is used to estimate the effects on gender, age, income and education similar to Zins and Weill (2016), though they used *probit* model. The sample used in this study involves eight LAC countries with at least 1000 respondents from each country except Jamaica with 502 respondents as noted in Table 1 above. One contribution of the paper to the existing literature is that it investigates the determinants of financial inclusion in the LAC during the COVID-19 pandemic era. Even though Gershenson et. al, (2021) focused on financial inclusion in LAC, they used the 2014 and 2017 data which were pre-COVID -19 pandemic years to compare financial inclusion across regions. Also, Roa (2015) focused on access, use and quality. The uniqueness of this study is that it uses the 2021 data collected during the COVID-19 pandemic era to investigate the determinants of financial inclusion focusing on the LAC countries. Additionally, it contributes to the literature on major recent related issues on finances with a focus on the LAC during the COVID-19 pandemic era. It attempts to examine how COVID-19 pandemic impacted on financial inclusion.

The rest of the paper is structured as follows. The next section provides literature related to financial inclusion. It is followed by a presentation of descriptive statistics of the sample and the model used;

then, the results and discussions of the estimations based on the regression follows. The last section provides concluding remarks.

LITERATURE REVIEW

This section presents literature review on financial inclusion based on studies across the globe. Though there are diverse studies on financial inclusion, Demirgüç-Kent et al (2022a) presentation of global trend data on financial inclusion from 2011 to 2021 is unique. The data shows that the percentage of adult over 15 years owning an account with a formal financial or other institution under the purview of government regulatory, increased from about 5l % in 2011 to 76% in 2021. The corresponding data for the Latin America and the Caribbean (LAC) countries is from 39% to 73%. At the global level, mobile money account rose from 4.3% to 10.2% between 2017 and 2021. That of LAC countries was from 5.2% to 23.4%. The world leader in the usage of mobile money account is Sub-Sahara Africa from 21% to 33% respectively. As indicated by Demirgüç-Kent et al (2022a and 2022b), though there is a rapid increase in the account ownership for the LAC, and developing countries, they are far below that of the advanced countries (96%). Nevertheless, how the impact of these is felt by the poor is unknown and whereas 31% of the adult population at the world level have saved using an account, that of the LAC is 19%. These are far below the high-income economies of 58%. However, there is no much difference between the world adult population and the LAC who have borrowed formally using credit card, of 30% and 31% respectively in 2021; these are below the advanced countries with 56%. Probably, an impact of COVID-19 in the LAC is the first-time users of digital payment. There were about 15% of LAC population that made digital payment for the first time during the COVID-19 pandemic period to settle utility bills and 14% merchant payment. At the country level as seen from Table 1, financial inclusion varies for the Caribbean countries (Li and Wong, 2018).

The challenges of the financial sector have been examined by some studies across the globe. One of such pioneering work in Africa was by Steel et al (1997) who used 1992 and 1993 data for Ghana, Malawi, Nigeria and Tanzania on informal finance. They found that Africa countries use both formal and informal financial institutions and stated that the challenges of the informal financial sector stem from two main reasons; one is the too much interference by governments in the financial sector, and this leads to a financial sector underdeveloped. The second reason is expensive processes and managerial problems. These are probably reasoning the poor are greatly affected in financial inclusion. As indicated by Zins and Weill (2016), Demirgüç-Kent et al. (2015) have contributed significantly and continue to provide data on global financial inclusion popularly known as World Bank Global Findex Database (see Demirgüç-Kent et al. 2015, 2017, 2022a, and 2022b). Some studies have used the Global Findex Database to investigate characteristics exhibited by individual at the global level, and for a country. For example Allen et al (2016), Demirgüç-Kent and Klapper (2012b), Demirgüç-Kent and Klapper (2013a) were at the global level, Zins and Weill (2016) and Demirgüç-Kent and Klapper (2012a) for Africa , Fungácová and Weill (2015) for China among others. Allen et al (2016) found that rich people, highly educated, grown-up, urban dwellers, people working, and couples were likely to own a formal account. This was not significantly different from Fungácová and Weill (2015) for China, though religion was a factor in the latter. Although, Aterido et al (2013) did not find gender to be a major determinant in Africa, Demirgüç-Kent and Klapper (2012a) as well as Zins and Weill (2016) found otherwise. As noted earlier, studies such as Peebles (2014), Mader (2016, and 2018), Gabor and Brooks (2017) as well as Bateman, Duvendack and Loubere (2019) have strongly contested that these claims have not shown how the poor benefited.

Being poor and a family member owns account, not possessing the required documentation were among the factors found to exclude people from financial transactions (Fungácová and Weill (2015). Other excluding factors are high operation cost, not having collateral security, distance from the institution, high charges in owning an account, and more information needed to open an account ((Zins and Weill, 2016).

Both Dabla-Norris (2015a and 2015b) examined the balance between unequal growth based on the limitation from financial inclusion. The (2015b) was on the LAC; the conclusion was LAC countries has

made some strides but below that of emerging markets in terms of households' financial inclusion. Li and Wong (2018) modelled financial development and inclusion in the Caribbean and concentrated on constraints SMEs encountered though there were some specific issues on households. Jungo, Madaleno and Botelho (2022) compared the impact of financial inclusion and banks competitiveness, stability, and modelled how financial regulation works in Sub-Sahara Africa (SSA) and the LAC. Jungo, Madaleno and Botelho (2021) also compared the correlation between monetary policy and financial inclusion in the SSA and LAC. Didier and Shmukler (2013) concentrated on the future way forward on financial development for the LAC. Rashdan and Eissa (2020) focused on the determinants of financial inclusion in Egypt, and Jayanti, Agusti, and Setiyawati (2021) using Indonesia as a case study focused on barriers to access formal financial services.

DATA

The study used World Bank's 2021 Global Findex dataset for analyse; Demirgüç-Kent et al (2022a, and 2022b) give detail report on the data, and World Bank (2021) provides detailed methodology used for the data collection across the globe. The data collection was carried out in 2021 when the COVI|D-19 pandemic was still lingering on. Available data from the individual in the Caribbean countries is used. It comprises of 1000 respondents from each country, Jamaica has 502 respondents. Although, obtaining data with a sample size of 1000 from different countries with different population has been an issue for people, there appears to be no alternative to the data (Zins and Weill, 2016). Since the data collection used scientific methodology, the sample size will not affect the interpretation of the findings and it can be generalized for the population.

This study has categorized the financial inclusion determinants into five cohorts of dependent variables. First group has four indicators. *Formal account* means the individual responded to the question: Do you have a formal account with a financial institution? A yes was coded 1, otherwise, 0 in the responses. In the same way, *formal savings* means: Do you save with a formal institution? Yes was coded 1, otherwise 0. Answering yes to *taken loan* from formal institution and to the use of *mobile money account* followed same order. Second group are the exclusion factors. This was determined based on a question that was asked respondents as follows: "Please indicate which of the following is a reason why you do not have an account with a formal institution or other related institutions, if one indicates a yes, it was coded 1, and 0 otherwise". Then, the reasons for savings or motivation followed. The question was "in the past 12 months, did you save for the following reason? Each yes answer was coded 1, and 0 else. The borrowing or loan motivation followed the savings pattern. Following these categories, selected indicators in the groups were picked to represent informal financial activities. The last group is the COVID-19 impact. The first question was "Please did you made an online payment for the first time during COVID-19 pandemic?" Yes was coded 1, 0 else. Second question was, "did you pay utility bill during COVID-19 era for the first time using digital means?" A yes answer was coded 1, and 0 otherwise. Table 2 portrays the descriptive statistics of the dependent variables for all the variables used in the estimation. The eight countries used, and the sample sizes are presented in Table 1. From the table, the highest mean is "Account with financial institution" which is 0.4952089, just below the 50% mark and in the financial inclusion category.

Table 2: Descriptive statistics for the dependent variables

Variable **Financial Inclusion**	Obs	Mean	Std. Dev.
Account with financial institution	7,514	.4952089	.5000103
Has savings account	7,514	.3834176	.486251
Has taken credit	7,514	.3505456	.4771726
Has mobile money account	7,514	.1675539	.3734945
Barrier to financial inclusion or factors exclusion people			
Far away	7,514	.0408571	.1979722
Very expensive	7,514	.2045515	.4034004
Lack of documentation	7,514	.2933191	.4553138
Lack of trust	7,514	.1885813	.3912017

Religious reasons	7,514	.1601011	.3667242
No money	7,514	.1080649	.3104831
Use family and friend	7,514	.3167421	.4652369
No financial inst.	7,514	.1349481	.3416909
COVID-19 Effect			
Paid online during COVID-19	7,514	.068938	.2533655
Paid utility digital during COVID-19	7,514	.1038062	.3050293
Saving			
Saved because of old age	7,514	.1836572	.3872301
Saved with financial institution	7,514	.0939579	.2917896
Saved using mobile money account	7,514	.0465797	.2107509
Saved because of informal saving s club	7,514	.0858398	.2801459
Borrowing			
From financial institution	7,514	.1559755	.3628563
From family and friend	7,514	.142667	.3497562
From informal saving club	7,514	.1785999	.3830425

Estimation method

The section is dedicated to the main result from the estimations, the determinants are used as dependent variables as noted above. First, the methodology used is outlined, then, the outcome of the determinants for the various dependent variables listed in Table 2 are presented.

Specification of the model

To help investigate the determinants of financial inclusion in the LAC, the logit model is used as presented below. According to Hosmer and Lemeshow (2000), given *n* independent variables represented by the vector **X**' ($X_1 + X_2 + ,\ldots + X_n$) using the interval scale, then it is depicting conditional probability signifying that the occurrence of the event is denoted by P (Y= 1/x) = π(x) with the logit regression (L·) denoted by the expression

$$Log(\frac{P(X_i=1)}{1-P(X_i=1)}) = \alpha + \beta_1 female + \beta_2 Age + \beta_3 Income + \beta_4 education$$

Where *X* represents financial inclusion variable, *i* represents an individual, *βs* are coefficients to be estimated. As indicated by Amemiya (1981), as well as Hartarska and Nadolnyak (2008), the *logit* regression involving outcomes of individual samples are typically estimated with the maximum likelihood method. Cramer (2007) discusses the robustness of the *logistic* regression or the *logit* model. Next is the discussions of the independent variables presented in Table 3 below.

Table 3: Descriptive statistics for independent variables

Variable	Definition	Obs	Mean	Std. Dev.
Female	Dummy variable Female 1, 0 otherwise	7,514	.3868778	.4870677
Age	Age in years	7,501	41.79136	17.71561
Poorest 20%	Dummy = 1 if in 1st income quintile, 0 otherwise	7,514	.1742081	.3793136
Second 20%	Dummy = 1 if in 2nd income quintile, 0 otherwise	7,514	.1632952	.3696594
Third 20%	Dummy = 1 if in 3rd income quintile, 0 otherwise	7,514	.1829917	.3866855
Fourth 20%	Dummy = 1 if in 4th income quintile, 0 otherwise	7,514	.2118712	.4086612
*Richest 20%	Dummy = 1 if in 5th income quintile, 0 otherwise	7,514	.2676338	.442755
Basic Edu.	Dummy = 1 if individual has at least basic education, 0 otherwise	7,514	.3512111	.4773805
Sec. Edu.	Dummy = 1 if individual has secondary education, 0 otherwise	7,514	.4779079	.4995449
Ter. Edu.	Dummy equal to 1 if individual has tertiary education, 0 otherwise	7,514	.1522491	.3592861

* The 20% richest was dropped from the regression model.

The explanatory variables are the individual characteristics which are portrayed in Table 3 with their definitions. Age represents numbers of years. To ensure that a probable non-linear relationship between age and financial inclusion is controlled, two variables, Age and Age^2 represented Age. For gender, if the respondent is a female, the variable was coded 1 and male 0. There are four groups of income - poorest 20%, second 20%, third 20%, and fourth 20%. The richest category was omitted. In coding the poorest 20% for example, if income of an individual is in the first quintile, it was coded 1 otherwise 0, the rest were coded using the same approach. There were three categories of education; first is those below secondary education denoted as primary (basic) education coded 1, otherwise 0. Secondary and tertiary levels were coded in the same way. Table 3 displays the independent variables (individual characteristics), their definitions and coding, as well as their descriptive statistics.

RESULTS AND DISCUSSIONS

This section presents the results of the estimates obtained from the logit regression based on the equation given under the specification of the model. In each table, the columns are separate model and the individual characteristics as noted are the independent variables. The determinants of financial inclusion in the LAC is first presented; it is followed by what prevents people to be involved in financial inclusion, then further analysis is carried out to help understand rationale behind what drives an individual to be involved in financial inclusion. Here the study looks at two things; motivation to take a loan or save and the different sources of borrowing and savings. Last but not the least, the impact of COVID-19 pandemic on financial inclusion in the LAC is presented.

The Determinants of Financial Inclusion

Table 4 reports the estimates from the *logit* model of the main financial inclusion in the LAC sub-region. The latent variables are *formal account, formal savings, formal credit/loan* and *have mobile account*. From the table, female is negatively related to all the four variables and significant at 1%, thus are financially excluded. In general, being a female means one is financially excluded. Females are those excluded from operating mobile money account, however, this may be voluntary self-exclusion since it is very easy and convenient to operate a mobile money account. This is because the GSMA State of the Industry on mobile money report by Andersson-Manjang and Naghavi (2021) stated that during the COVID-19 pandemic, the mobile money industry withstood disturbance and built toughness.

Table 4: Determinants of Main Financial Inclusion in the LAC

	Formal account	Formal saving	Formal credit/loan	Mobile account
Gender	-.488*** (.052)	-.230*** (.051)	-.222*** (.052)	-.243*** (.064)
Age	.052*** (.007)	-.020*** (.007)	0.056*** (.008)	.010 (.009)
Age^2	-.000*** (.000)	.000 (.000)	-.001*** (.000)	-.000 (.000)
Inc-1 poorest 20%	- .781*** (.080)	-1.029*** (.081)	-.901*** (.084)	.133 (.100)
Inc-2 second 20%	-.573*** (.080)	-.693*** (.041)	-.651*** (.082)	.070 (.103)
Inc-3 third 20%	-.504*** (.077)	-.604*** (.076)	-.400*** (.076)	.016 (.099)
Inc-4 fourth 20%	-.326*** (.073)	-.456*** (.045)	-.329*** (.071)	.142 (.090)
Primary education	.045 (.191)	-.413** (.187)	-.058 (.198)	.225 (.265)
Secondary education	.964 (.190)	.037 (.185)	.103 (.196)	.429 (.264)
Tertiary education	1.920*** (.201)	.529*** (.192)	.445** (.203)	.679** (.271)
Observation	7,501	7,501	7,501	7,501
Pseudo R^2	0.1026	0.0702	0.00559	0.0064
Log likelihood	-4,665.7674	-4,642.5372	-4,588.939	-3,364.0644

This table shows *logit* estimations of the determinants of the key indicators of financial inclusion in LAC. *Formal account, formal saving*, *formal loan and mobile money account* are the dependent variables. Individual characteristics are the dependent variables: Female, age, age^2, income- using 4

dummy variables- and education-using 3 dummy variables- as explained in Table 3. Predicted marginal effects are provided and standard errors are in parentheses.

*** Significance at the 1% level. ** Significance at the 5% level. *Significance at the 10% level.

The relationship with age is mixed. Whereas it has positive and significant with formal account and credit/loan, it is negatively related to formal savings. With education, financial inclusion is associated with higher education, and tertiary education has the highest relation. Education is a major determinant of financial inclusion as seen from the result; it has positive relationship with all the dependent variables. For example, tertiary education is significant for all the factors albeit at different levels. Also, income is a factor that determines financial inclusion. Rising income level reduces financial exclusion for formal account, formal saving and formal credit. With mobile money account, gender is a major discrimination of financial inclusion**.** These findings except the mobile money account are all consistent with Jayanti et al. (2021) for Indonesia, Rashdan and Eissa (2020) for Egypt, Zins and Weill (2016) for Africa and Fungácová and Weill (2015) for China but there was not such gap found by Allen et al (2016) at the global level. Putting all together, in the LAC sub-region, being a male, earning higher income, more educated increases financial inclusion.

Determinants of Barrier to Financial Inclusion

Table 5 presents the factors that serve as the reasons individuals have been excluded from financial activities. As noted by Allen et al (2016) and highlighted by Zins and Weill (2016), it is essential to distinguish between intentional exclusion and unintentional exclusion. Some factors such as non-availability of money, family member owning account religious motives (cultural factor) are classified as deliberately self-excluded barrier. On the other hand, market failures drive unintentional exclusion. For example, the location of the financial institution, requirements needed to open an account and lack of confidence in the financial institutions are barriers classified as self-excluded unintentionally. On their part, Gershenson et. al (2021) looked at the supply-side of financial inclusion barriers and grouped them under monetary and non-monetary.

As seen from the table, whereas distance is a major barrier to financial inclusion for women, cost, lack of documentation, no money and family and friends ownership of account do not bother women as a barrier. Lack of trust and religious reasons are not important barrier to women. With age, cost, lack of trust, no money family and friends and unavailable financial institution are major barriers. Regard to income, distance is the major barrier to financial inclusion. Cost, lack of documentation, lack of trust, religious reasons, no money, as well as family and friends are strongly related to income on financial inclusion in the LAC.

Table 5: Determinants of barrier to financial inclusion in the LAC

	Too Far away	Very expensive	Lack of documentation	Lack of trust	Religious reasons	No money	Use family & friend	No fin.Inst.
Female	-.496***	.174***	.175***		.059	.059	.192**	.430***
.073								
	(.121)	(.062)	(.056)	(.064)	(.067)	(.080)	(.054)	(.071)
Age	.021	-.016*	.002	-.064***	-.008	-.003*	-.022***	-.069***
	(.019)	(.008)	(.008)	(.008)	(.003)	(.011)	(.007)	(.009)
Age^2	-.000	.000	-.000	.001	-9.61E-06	.000	.000	.001
	(.000)	.000	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Inc-1 poorest 20%	-.689***	.871***	.704***		.604***	.309***	.785	.394***
-.179								
	(.206)	(.096)	(.806)	(.100)	(.102)	(.123)	(.084)	(.111)
Inc-2 second 20%	-1.554***	.679***	.559***		.534***	.268***	.617***	.514***
-.039								

	(.297)	(.099)	(.088)	(.102)	(.104)	(.128)	(.084)	(.110)
Inc-3 third 20%	-1.010***	.489***	.523***		.430***	.266***	.420***	.478***	-.074
	(.215)	(.099)	(.086)	(.100)	(.102)	(.129)	(.082)	(.107)
Inc-4 fourth 20%	-.377**	.334***	.328***		.366***	-.107	.283**	.282***	-.009
	(.535)	(.098)	(.084)	(.098)	(.105)	(.127)	(.080)	(.102)
Primary education	-.568	.233	.343*	.102	.097	.279	.535***	-.019	
	(.535)	(.205)	(.185)	(.203)	(.216)	(.281)	(.195)	(.241)
Secondary education	.219	-.329	-.473**	-.477**	-.460**	.064	-.020	-.164	
	(.520)	(.205)	(.185)	(.207)	(.216)	(.282)	(.194)	(.240)
Tertiary education	1.133**	-1.343***		-1.063***	-1.402***	-1.543***	0.673**	-.791***	-1.004***
	(.522)	(.236)	(.209)	(.237)	(.252)	(.312)	(.211)	(.265)
Observation	7,501	7,501	7,501	7,501	7,501	7,501	7,501	7,501	
Pseudo R^2	0.0972	0.0567	0.0711	0.0515	0.0390	0.0320	0.0530	0.0234	
Log likelihood	-1,15.2484		-4,216.8724		-3,170.5471			-4,435.5855	
		- 3583.1861		-3,442.673		2,483.1598		-2,900.0371	

This table shows *logit* estimations of the determinants of barrier to financial inclusion in LAC. *Too far away, very expensive, lack of documentation, lack of trust, religious reasons, no money, use family and friends, and unavailable financial institution* are the dependent variables. Individual characteristics are the dependent variables: Female, age, age^2, income- using 4 dummy variables- and education-using 3 dummy variables- as explained in Table 3. Predicted marginal effects are provided and standard errors are in parentheses.

*** Significance at the 1% level. ** Significance at the 5% level. *Significance at the 10% level.

Education has mixed results. For example, whereas distance is a barrier to an individual with lower education level, it is not a problem for higher educated individual. Financial inclusion being expensive, lack of documentation and trust, religious reasons, no money, unavailable financial institution are not barriers to the educated individual.

It is important to note that these findings are similar to other studies such as Jayanti et al. (2021) for Indonesia, Rashdan and Eissa (2020) for Egypt, Zins and Weill (2016) for Africa, and Fungácová and Weill (2015) for China, and Allen et al (2016) at the global level though some of the indicators do not conform. The reason here is that the non-conformity is due to geographical locations and environmental conditions of these countries across the globe. As an example, here and on gender, Anterido et al. (2013) opined that the discrimination against women is due to cultural factors and that market failures are not responsible. but Demirgue-Kent et al (2013b) think the discrimination is caused by permitted activities, common customs as well as education and engagement in full time employment.

Insights into Drivers of Financial Inclusion in LAC

In this section the study looks at what drives people into being involved in financial inclusion in the LAC with a focus on credit and saving. Thus, in most cases, an individual either takes credit/loan from or save with a financial institution.

Determinants of taking a loan

Table 6 portrays motivation to take a loan by individuals in the LAC. There are three indicators used here based on the data. They are loans obtained from a family member or a friend, loans provided by a financial institution and procuring loan from a savings club.

Table 6: Determinants of motivation to borrow or take a loan in the LAC

	Loan from family/friend	Loan from financial institution	Loan from saving club
Female	-.071 (.069)	.067 (.067)	-.053 (.063)
Age	0.092*** (.012)	.023** (.010)	.007* (.010)
Age^2	-.001 (.000)	-.000 (.000)	-.000 (.000)
Inc-1 poorest 20%	-.751*** (.122)	-.378*** (.109)	-.357*** (.105)
Inc-2 second 20%	-.306*** (.109)	-.100 (.104)	-.094 (.100)
Inc-3 third 20%	-.216** (.101)	-.204 (.098)	.076 (.093)
Inc-4 fourth 20%	-.188** (.093)	-.064 (.093)	.055 (.088)
Primary education	.456 (.355)	.038 (.245)	-.124 (.235)
Secondary education	.880** (.351)	-.144 (.244)	-.030 (.233)
Tertiary education	1.018*** (.356)	-.078 (.254)	-.240 (.244)
Observation	7,501	7,501	7,501
Pseudo R^2	0.0357	0.0126	0.0297
Log likelihood	-2,962.0292	- 3,206.572	-3,417.2847

This table shows *logit* estimations of the determinants of motivation to take a loan in LAC. *Taking loan for medical reasons, from family and friends, from financial institution, and from saving club* are the dependent variables. Individual characteristics are the dependent variables: Female, age, age^2, income- using 4 dummy variables- and education-using 3 dummy variables- as explained in Table 3. Predicted marginal effects are provided and standard errors are in parentheses.

*** Significance at the 1% level. ** Significance at the 5% level. *Significance at the 10% level.

From the table, women will rather take a loan from a financial institution than from family and friends or from a savings club. Though not significant, loan from family and friends and from a savings club is negative and are barrier to financial inclusion, whereas loan from financial institution is positive. Probably, the reason is that they do not want to be disgraced in the society if they are unable to repay, but with the financial institution, it may be relatively difficult to trace defaulters and may not be known by the community that a particular individual has defaulted. Age is positively related to all the variables and is significant at 1% for family and friends, and 10% for savings club. Thus, these variables are not a source of worry at all to people in terms of financial inclusion. Interestingly, to the aged, these variables are all negatively related and thus exclude them.

Financial exclusion decreases with rising income, though it is only the poorest 20% that is significant at 1% level. Again, increasing income reduces financial exclusion in taking loan from a family member or a friend. The result on education is mixed; the highly educated individual prefers to take a loan from a family member or a friend than from a financial institution. Unlike income, the motivation to take credit for various categories of education as found here agree with Zins and Weill (2016). Generally, loans from savings club appear to be not well known to offer credit to individuals. To conclude on motivation to take credit as obtained for the individual characteristics, taking a loan from a financial institution is a major determinant of financial exclusion.

Determinants of saving

The study investigates drivers of savings in this section. Four variables are used in the investigation. They include saving for old age, saving because there is available financial institution, using mobile money account to save and saving with an informal savings club. The estimates obtained from the *logit* regression are presented in Table 7.

Being a women decrease the probability of saving for old age, with a financial institution and using a mobile money account as well as using an informal savings club; unlike the rest the latter is not significant. Apart from age, the saving behaviour from the LAC contradicts what Rashdan and Eissa (2020) found in Egypt where savings using informal saving club was popular.

All the four categories of income are negatively related to old age when it comes to savings on the LAC and are all significant at 1%; however, the financial exclusion decreases with increasing income. For example, whilst the poorest 20% is related by -1.085 to borrow at an old age and thus financially excluded, the fourth 20% is related by -.641. The relationship between income and to save with a financial institution, as well as saving using a mobile money follow the same pattern as that of old age. With education, whereas being educated at the basic level reduces financial inclusion (saving for old age) by - .591 and it is significant at the 1% level, education at the highest level has about 76.4% probability to save for old age. Cleary, education level of an individual determines saving for old age as financial inclusion in the LAC.

Table 7: Determinants of saving motivation in the LAC

	Old age	Financial institution	Mobile money	Informal saving club
Female	-.499*** (.063)	-.239* ** (.083)	-.287** (.114)	-.122 (.085)
Age	.015 (.009)	-.009 (.012)	-.006 (.018)	.035** (.014)
Age^2	-.000 (.000)	.000 (.000)	-.000 (.000)	-.000 (.000)
Inc-1 poorest 20%	-1.085*** (.108)	-1.500*** (.167)	-.890*** (.222)	-.461*** (.148)
Inc-2 second 20%	-.892*** (.105)	-1.315*** (.158)	-.469** (.193)	-.104 (.135)
Inc-3 third 20%	-.991*** (.100)	-.956*** (.129)	-.617*** (.185)	-.054 (.126)
Inc-4 fourth 20%	-.641*** (.084)	-.577*** (.105)	-.225 (.145)	-.005 (.117)
Primary education	-.591** (.235)	-.600*** (.322)	-1.114** (.496)	-.483 (.296)
Secondary education	-.024 (.231)	-.016 (.314)	.207 (.465)	-.230 (.291)
Tertiary education	.764*** (.240)	.511 (.318)	.994** (.470)	-.231 (.304)
Observation	7,501	7,501	7,501	7,501
Pseudo R^2	0.0908	0.0828	0.0893	0.0200
Log likelihood	-3,251.4331	-2,146.2477	-1,285.2869	-2,150.461

This table shows *logit* estimations of the determinants of motivation for saving in LAC. *Saving for old age, available formal institution, because of mobile money and using informal saving club are the* dependent variables. Individual characteristics are the dependent variables: Female, age, age^2, income- using 4 dummy variables- and education-using 3 dummy variables- as explained in Table 3. Predicted marginal effects are provided and standard errors are in parentheses.

*** Significance at the 1% level. ** Significance at the 5% level. *Significance at the 10% level.

The probability to save with a financial institution increases with increase in income and education. Thus, the likelihood to save with a financial institution is – 1.50 in the poorest 20% quintile, - 1.32 in the second 20% quintile and reduces through to - .58 in the fourth quintile, these are all significant at the 1% level. That of education is - .60 with basic education and significant at the 1% level, - .02 for secondary education and .51 at the tertiary level though the last two are not significant. The estimates obtained from saving using a mobile money account follow the same order as saving with a financial institution with a slight change in the third 20% quintile group and the fourth 20% quintile group. Saving using an informal saving club is negatively related to all the variables. This contrasts Zins and Weill (2016) for Africa when they stated that African women were found using informal forms of finance than formal forms. Also it contradicts what Rashdan and Eissa (2020) found for Egypt; they found that Egyptian women used more informal saving than formal savings. Again, it negates what Jayanti et al (2021) found for Indonesia, where they indicated that the people save more using informal forms.

Alternative source of borrowing

The first table is depicting difference sources of borrowing using three variables as seen in Table 8.

Table 8: Different sources of borrowing in the LAC

	From financial institution	From family and friends	Using Mobile money account
Female	-.071 (.069)	-.053 (.063)	-.552** (.248)
Age	.092*** (.012)	.008 (.010)	.094* (.057)
Age^2	-.001*** (.000)	-.000*** (.000)	-.002** (.001)
Inc-1 poorest 20%	-.752*** (.122)	-.357** * (.105)	-1.191** (.497)
Inc-2 second 20%	-.306*** (.109)-	.094 (.100)	-1.215** (.496)
Inc-3 third 20%	-.216** (.101)	.076 (.093)	-.728* (.376)
Inc-4 fourth 20%	-.188** (.093)	.055 (.088)	-.427 (.314)
Primary education	.456 (.353)	-.124 (.235)	-1.016 (.782)
Secondary education	.880** (.351)	-.030 (.233)	-.711 (.740)
Tertiary education	1.018*** (.993)	-.240 (.244)	-.425 (.762)
Observation	7,501	7,501	7,501
Pseudo R^2	0.0357	0.0297	0.0731
Log likelihood	- 2,962.0292	- 3,417.2847	- 363.51296

This table shows *logit* estimations of the different sources of borrowing in LAC. Borrowing from *available formal institution, using mobile money account, from family and friends a*nd *using informal saving club* are the dependent variables. Individual characteristics are the dependent variables: Female, age, age^2, income- using 4 dummy variables- and education-using 3 dummy variables- as explained in Table 3. Predicted marginal effects are provided and standard errors are in parentheses.

*** Significance at the 1% level. ** Significance at the 5% level. *Significance at the 10% level.

Women are more financially excluded accessing loan from financial institution than men. Age is more likely 9.2% to borrow from financial institutions. The financial exclusion reduces with increasing income. Borrowing from financial institutions is for the well-educated individual, the study found that with borrowing from financial institutions, increases in the level of education increases the level of financial inclusion. Using family and friends as a source of borrowing, almost all the variables are negatively related to financial inclusion, it is only the third and fourth incomes quintile and age that are positively related but none is significant; a result that differs from Zins and Weill (2016) for Africa that borrowing from family and friends were positive for the dummy variables from the second to the fourth income quintile. In all, all the three sources of borrowing generally reduces financial inclusion in the LAC except the well-educated individuals who can be said to be able to borrow from financial institutions. The only source of borrowing is from financial institution, and it is for the highly educated individuals.

Alternative source of saving

The study uses three potential sources to investigate which one helps individuals to be financially included. The estimates are presented in Table 9 below.

Table 9: Different sources of saving in the LAC

	Financial institution	Mobile money account	Using informal saving club
Female	-.239*** (.083)	-.287** (.114)	-.122 (.085)
Age	-.009 (.012)	-.006 (.018)	.035** (.014)
Age^2	.000 (.000)	-.000 (.000)	-.001*** (.000)
Inc-1 poorest 20%	-1.500*** (.167)	-.890** * (.222)	-.461*** (.148)
Inc-2 second 20%	-1.315*** (.158)	-.469** (.193)	-.104 (.135)
Inc-3 third 20%	-.956*** (.129)	-.657*** (.185)	-.054 (.126)
Inc-4 fourth 20%	-.557*** (.105)-	.225 (.145)	-.005 (.117)
Primary education	0.600 (.322)	-1.114** (.496)	-.483 (.296)

Secondary education	-.016 (.314)	.207 (.465)	-.210 (.291)
Tertiary education	.511 (.318)	.994** (.470)	-.231 (.304)
Observation	7,501	7,501	7,501
Pseudo R^2	0.0828	0.0893	0.0200
Log likelihood	- 2,146.2477	- 1,285.2869	- 2,150.461

This table shows *logit* estimations of the different sources of saving in LAC. *Saving for available formal institution, using mobile money account* and *using informal saving club* are the dependent variables. Individual characteristics are the dependent variables: Female, age, age^2, income- using 4 dummy variables- and education-using 3 dummy variables- as explained in Table 3. Predicted marginal effects are provided and standard errors are in parentheses.

*** Significance at the 1% level. ** Significance at the 5% level. *Significance at the 10% level.

All the three sources of alternative saving listed here do not promote financial inclusion. Using financial institution favours only the highly educated individuals; it is .51 though it is not significant. Being a woman means you will not be able to save with a financial institution. With all the quintile income groups, the probability to save using financial institution as a source of savings increase when the individual's income increases. Using mobile money account as a source of saving, the estimates show negative relationship with all the individual characteristics except secondary and tertiary education levels. Compared to financial institutions, the highly educated individual prefers saving using a mobile money account. A possible reason here could be the flexibility involved in operating mobile money account as indicated by Andersson-Manjang and Naghavi (2021).

IMPACT OF COVID-19 PANDEMIC ON FINANCIAL INCLUSION IN THE LAC

This section investigates how the COVID-19 pandemic impacted on financial inclusion in the LAC. The pandemic took the world unprepared and affected all facets of life. Indeed, it brought innovations into the known way of doing things. Physical meeting became virtual meetings and teaching at the lecture halls in person were abandoned to online lectures and so on. A caution here is that some groups probably were using the digital payment before the pandemic and might have affected the responses here. With the advent of the pandemic, it became dangerous to freely move around; people were restricted in movement as lockdowns became the order of the day for countries around the world. However, financial transactions must go on to ensure daily needs are met. As a result, digital payments and payment online among others became popular. The World Bank Global Findex Data in 2021 had a section on these variables.

In view of this, this study examines how individuals from the LAC used payment online and digital payment to meet their daily needs. Two questions were, during the COVID-19 pandemic time, did you use online payment for the first time? And did you pay utility bill using digital payment for the first time during the COVID-19 pandemic?

Table 10 presents the estimates of these two variables on the individual characteristics. The result shows that female is negatively related to online payment for the first time during the pandemic. Increases in income increases financial inclusion. Thus, as income increases, the financial exclusion reduces and are all significant at 1%. The result on education is mixed. Whereas primary education is negative, secondary education is positive though none is significant. However, highly educated individual is positively related and significant at 1 % level. This means that during the pandemic period, individuals who had completed tertiary education were those that made online payment for the first time. Pay utility for the first time during the pandemic followed the same pattern as the online payment. The difference is where primary education is positively related, and secondary education and tertiary education are positively related and significant at 1%. All the income quintiles are negatively related and are significant at 1%, here also, increase in income reduces financial exclusion. The impact on the pandemic show that highly educated individuals were those that made use of payment online and paid utility on digital platforms for the first time during the pandemic era. The

COVID-19 pandemic only helped highly educated to become more financially included at the expense of the other individual characteristics.

Table 10: Determinants of COVID-19 impact on financial inclusion in the LAC

	Paid on line first time during COVID-19 pandemic	Paid utility digital first time during COVID-19 pandemic
Female	-.462** * (.094)	-.560*** (.079)
Age	-.285 (.015)	-.038*** (.011)
Age^2	-.000** (.000)	.000 (.000)
Inc-1 poorest 20%	-.694*** (.167)	-.658*** (.139)
Inc-2 second 20%	-.498*** (.169)	-.455*** (.134)
Inc-3 third 20%	-.435*** (.144)	-.501*** (.123)
Inc-4 fourth 20%	-.406*** (.128)	-.364*** (.106)
Primary education	-.021 (.470)	.699 (.594)
Secondary education	.698 (.463)	1.808*** (.588)
Tertiary education	1.401*** (.467)	2.590*** (.591)
Observation	7,501	7,501
Pseudo R^2	0.0602	0.0896
Log likelihood	-1,763.4695	-2,273.2853

This table shows *logit* estimations of the determinants of COVID-19 impact on financial inclusion in LAC. *Made online payment first time during COVID-19 and made utility bill digital payment for the first time during COVID-19 are* the dependent variables. Individual characteristics are the dependent variables: Female, age, age^2, income- using 4 dummy variables- and education-using 3 dummy variables- as explained in Table 3. Predicted marginal effects are provided and standard errors are in parentheses.

*** Significance at the 1% level. ** Significance at the 5% level. *Significance at the 10% level.

CONCLUSION

Compared to the rest of the world, LAC countries have low financial inclusion. Since financial inclusion helps reduce poverty and increase economic growth, it is important to investigate drivers of financial inclusion. Using the 2021 World Bank Findex Global Data, this study investigated the determinants of financial inclusion in the LAC during the pandemic and the impact of COVID-19 on financial inclusion using eight LAC countries with the available data in the Findex Global Data base. *Logit* was used to estimate effects of the dependent variables on individual characteristics. Below is a summary of the findings.

Firstly, the study found that a man who is rich and more educated has an advantage of financial inclusion than a woman. Though mobile money account ownership is not well patronized, women were the most disadvantaged. Secondly, distance is a major barrier to financial inclusion for women, whereas cost, lack of documentation, no money and family and friends ownership of account does not bother women as a barrier in the LAC. Lack of trust and religious reasons are less important barrier to women. Regard to income, distance is the major barrier to financial inclusion. Apart from location of a financial institution being far away from people, education (in particular more educated individuals) do not have problems with financial inclusion.

Thirdly, it was expected that informal savings and borrowing were to have much impact on the individual, the study found that the usage do not support financial inclusion and are neither alternative sources of borrowing nor savings. For instance, being a woman decreases the probability of saving for old age, with a financial institution and using a mobile money account as well as using an informal savings club.

Last but not the least, during the COVID-19 pandemic, it was the highly educated individual that made use of online payment and paid utility bill using digital platforms. Flowing from the above findings, the study believes that it is important for policy makers to come out with policies in specific direction to help those avoided by financial inclusion. Plan and implement measures that will help reduce financial exclusion in the LAC. In the light of this, the study recommends more efforts be made to bring financial services closer to the people to increase financial inclusion. Also, people must be encouraged to use both online and digital payment system to increase financial inclusion.

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