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ACCESS TO FINANCIAL SERVICES AND INCOME INEQUALITY: A PANEL DATA ANALYSIS

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May 31, 2021

Abstract

The allocation of capital through finance alters economic opportunities. Access and use of financial services allow individuals to facilitate their daily payment transactions, think for the long term through borrowing and savings, or manage unexpected emergencies. Extending financial access universally should arguably benefit those on the lower end of the income distribution. Accordingly, this paper investigated the relationship between financial inclusion and income inequality using panel data of select countries for the period 2000–2017.

Keywords: income inequality, financial inclusion

JEL classification: G53, D63

Economic indicators show that poverty rates are declining globally; however, a significant portion of the global population still struggles to achieve minimum standards of living. In reducing poverty, the financial market enables funds and resources to be allocated efficiently to their most productive use. However, due to market imperfections, a certain segment of the population remains unserved from formal financial institutions.

Financial inclusion is a state where everyone has access to financial products and services such as bank accounts, loan borrowings, insurance, investment products, and remittance and payment services, to serve their needs and help improve people's lives. It facilitates day-to-day monetary transactions, gives opportunities to save and make investments, and provides access to credits and loans, which can be used by individuals and small firms for business expansion and other income-generating activities. More importantly, for the underprivileged, direct access to financial services helps them cope with unexpected shocks or emergencies.

Most of the theoretical and empirical papers explaining the finance-inequality relationship suggest that financial development help reduce income inequality (Park & Mercado, 2015), whereas other works have suggested an inverted u-shaped form of relationship. Nonetheless, policymakers have recognized the importance of financial inclusion as a key element in achieving the global development agenda of shared prosperity. In turn, the World Bank has committed to enable a billion people to have access to financial accounts using interventions anchored by their Universal Financial Access initiative.

Given the premise above, this study will explore the link between financial inclusion and income inequality using panel data of select countries from 2000–2017. After the introduction, section two is a discussion of the existing literature on the topic. The third section presents the theoretical framework, data used, and methodology used. The fourth section explores the results of the model, and the final section summarizes, highlighting the conclusions suggested by the results.

Review of Related Literature

Most literature have focused on the role of fiscal policies in reducing excessive inequality either through redistribution instruments (e.g., taxes and transfers) or social policies (e.g., education and health programs). Recently, there is growing interest in the impact of financial development/inclusion on income inequality (Herrero & Turegano, 2015). For low-income individuals, the lack of financial access hinders them from smoothing their lifetime income-savings path. Therefore, providing access and use of financial services arguably helps the underprivileged to widen their opportunities and consequently escape poverty.

In this section, we review the concepts related to financial inclusion, the empirical factors/determinants which affect financial inclusion, and the relationship between financial inclusion, poverty, and income inequality.

Definition, Measurement, and Determinants of Financial Inclusion

Financial inclusion has been defined and measured in various ways in the existing literature. The World Bank (2014) defined financial inclusion as the share of households and firms that use financial services. Honohan (2008) defined it as the portion of the adult population with access to formal financial service. On the other hand, Amidžić et al. (2014) described financial inclusion as an economic state where nobody is denied access to primary financial services.

In terms of measurement, early studies used proxy variables to measure a financial index, such as the number of accounts in a financial institution. Sarma (2008) was one of the first to calculate a financial inclusion index to capture the various aspects of financial inclusion in one variable and compare financial inclusion among countries at certain time periods. Sarma's index is based on three dimensions of accessibility, availability, and usage of financial services with resulting values between zero to one. Amidžić et al. (2014) presented an improved composite index by including a weighting scheme for the variables and used two dimensions: (a) outreach and (b) use of financial services. Meanwhile, Park and Mercado (2018) constructed an index of financial inclusion using a multidimensional approach with normalized weights.

In terms of the determinants of financial inclusion, empirical studies have shown diverse results. Sarma and Pais (2011) showed that income measured by per capita GDP, adult literacy, level of urbanization, ICT connectivity, and a sound banking system positively affects financial inclusiveness, especially the poor and social minorities. Omar and Inaba (2020) showed that financial inclusion in developing countries could influence poverty and income inequality under the following conditions: (a) when a country imposes effective governance and a strong rule of law; (b) when financial institutions are developing policies that benefit the underbanked and underserved segment of the population; (c) when institutions are building awareness and financial literacy among many people including those from the lower-income groups; (d) when the economy of developing countries expand; and (e) by improving connectivity in road networks as well as information and communication infrastructure.

A research study by Allen et al. (2016) found that for some nations, the financial inclusion level is significantly influenced by the financial structure in terms of availability of financial products and ease of opening accounts and getting credit. Meanwhile, Evans and Adoye (2016), who focused on African countries, illustrated that the determining factors of financial inclusion vary among emerging and

developing countries but have common factors such as the size of the economy, income level of the population, internet access, and financial literacy rates among adults.

Relationship Between Financial Inclusion, Poverty, and Income Inequality

The early theoretical works of Galor and Zeira (1993) and Banerjee and Newman (1993) provided the framework for the relationship between finance and income inequality. They asserted that broader access to finance helps low-income households access education and provide business opportunities that increase income. On the other hand, Greenwood and Jovanovic (1990) suggested that the relationship is an inverted u-shape. Accordingly, they found that in the early stages of a country's development, financial inclusion would lead to greater inequality and that only as it further develops will finance lead to a more equal distribution of wealth and reduction of poverty. Subsequently, most empirical studies have shown that a high degree of financial inclusion contributes to reducing poverty and lowering income inequality.

Research done by Mookerjee and Kalipioni (2010) showed that an increase in bank branches per capita, rise in the number of bank ATMs, easing of documentation requirements for opening bank accounts, and reducing credit constraints significantly improve the financial standing of individuals, particularly in developing countries. Park and Mercado (2015, 2018) had two papers measuring the effect of financial inclusion and income inequality. The first focused on 37 Asian developing countries, whereas the second comprises a cross-country analysis of 151 countries. Both papers found evidence that countries with high financial inclusion have lower income inequality and poverty rates.

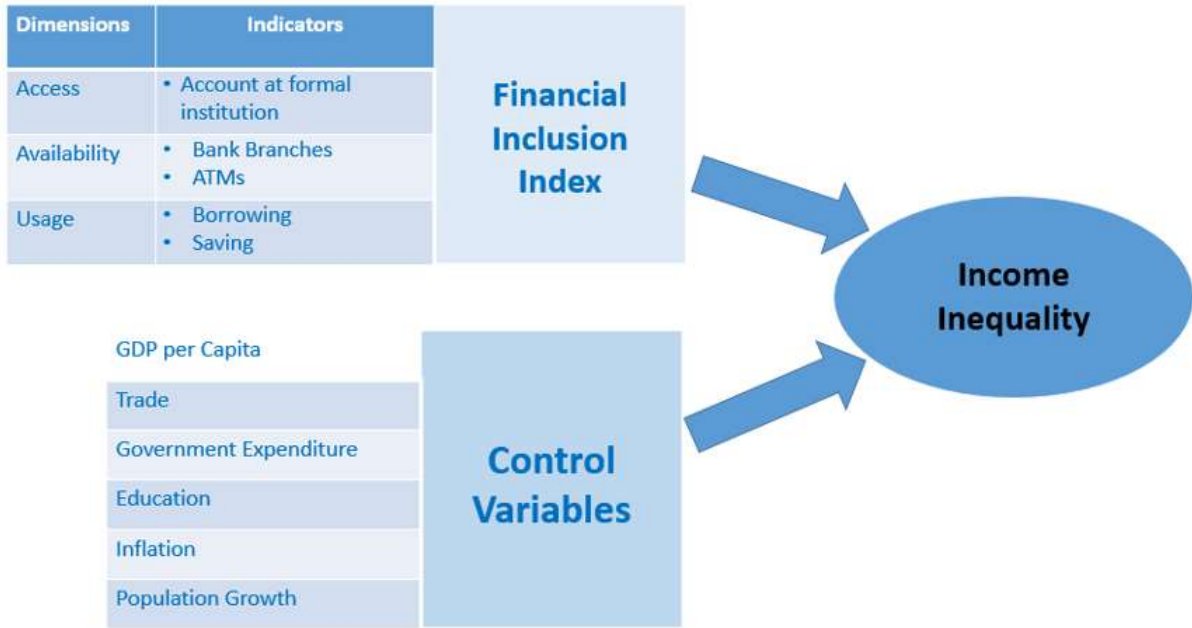
Further, Herrero and Turegano (2015) compared income inequality to various measures such as fiscal redistribution, economic openness, and level of credit to the private sector. The study also included measures of financial inclusion in the form of access to banking products and services (bank accounts, savings, loans), wide availability of ATMs, and credits given to small and medium-sized enterprises. Herrero and Turegano (2015) found that strengthening financial inclusion measures to increase the participation of households, low-income groups, and small businesses in the formal economy have a more significant impact in curbing income inequality as compared to the impacts of fiscal policies that are focused mainly on economic growth. Honohan (2008) concluded that although increased financial inclusion among lower-income groups is important in reducing inequality, it will not translate to a significant reduction in poverty rate unless financial development is focused on growth that impacts the poor. Meanwhile, Aslan et al. (2017) showed that a significant share of inequality is driven by gender differences in access to financial services and found that closing gender gaps in financing opportunities and removing barriers to access financial products could lead to more equal income distribution and better economic growth at the country level.

The various works cited in this section serve as guidance for this study, where the goal is to demonstrate the broad relationship between financial inclusion and income inequality among various countries around the world.

Theoretical Framework and Methodology

This section presents an econometric model to analyze the impact of financial inclusion on income inequality. We describe where the data was obtained for our dependent and independent variables with reference to existing literature. Further, we construct a simplified financial inclusion index that will be used as a measure for the main topic of interest in this paper. The theoretical framework of our study is shown in Figure 1:

Figure 1
Theoretical Framework



Accordingly, a regression analysis will be employed to investigate the relationship between financial inclusion and income inequality using the fixed effects estimation method. The regression equation takes the following form:

$$Gini_{it} = \beta_0 + \beta_1 FII_{it} + \sum_{k=i}^K \delta_k X_{k,i,t} + \alpha_i + \epsilon_{i,t} \quad (1)$$

Where: Gini refers to Gini coefficient; β_0 is the intercept term; β_1 is the coefficient of the Financial Inclusion Index (FII); and δ_k are the coefficient of the control variables $X_{k,i,t}$, which are found common in the finance and inequality literature (Aslan et al., 2017; Chu & Chu, 2018; Park & Mercado, 2018; Herrero & Turegano, 2015; Demir et al., 2020; Omar & Inaba, 2020).

The control variables include *lngdp* which is the log of Gross Domestic Product (GDP) per capita, *trade* which refers to a country's total exports and imports as a percentage of GDP, *govtexp* refers to total government spending as a percentage of GDP, which is a proxy for the redistribution policy of the government, *educ* refers to secondary school completion rate, *inf* refers to the inflation rate, and *popgrwth* refers to the growth rate of the population. The literature has established *lngdp*, *trade*, *govtexp*, and *educ* as factors that decrease income inequality, whereas *inf* and *popgrwth* are variables that widen income inequality.

Data

For our dependent variable, the main measurement of income inequality is the Gini coefficient, with a value of zero denoting for perfect equality and 100 for perfect inequality. The data for Gini coefficients are extracted from the Standardized World Income Inequality Database (SWIID), which incorporates comparable Gini measurements of disposable income for 198 countries from 1960 to 2019. Meanwhile, for the control variables, the data from World Development Indicators (WDI) Database was used.

Because of the limited number of observations available for the financial inclusion variables, our data will be collected from 2000 to 2017. The source and summary statistics of the variables used in the estimation are reported in Annex A.

Construction of a Financial Inclusion Index (FII)

As discussed in the review of related literature, there are different definitions of financial inclusion, including how they are measured in the existing literature. This study will adopt the approach of Sarma (2008) in the creation of a financial inclusion index (FII). Creating an FII is desirable to standardize the measure of financial inclusion across economies and to make easier cross-country comparisons. The data used will be lifted from the Global Findex Database (GFD), which is a data set from a survey of 150,000 adults on their saving, borrowing, and payments profile. Our index for financial inclusion will combine the approaches of Sarma (2008), Omar and Inaba (2020), Park and Mercado (2018), and the United Nations Development Programme (UNDP).

The financial inclusion dimension of access, availability, and usage (Sarma, 2008) will be used in this study, whereas the list of indicators for each dimension uses the work of Park and Mercado (2018) and Omar and Inaba (2020) as the base. Details are shown in Table 2:

Table 1

Three Dimensions and Corresponding Indicators for the FII

Dimension	Indicator
Access	Number of bank accounts per 1,000 adults
Availability	Number of bank branches per 100,000 adults ATMs per 100,000 adults
Usage	Bank deposits as a percentage of GDP Credit to the private sector as a percentage of GDP

The access dimension is intended to reflect the number of individuals that have formal accounts in the financial system. The availability dimension indicates whether financial services are widely available geographically in the form of branches and ATMs. The usage dimension measures how regular individuals utilize financial products such as the opening of deposit accounts or taking out a loan.

In computing for the value of the index, we will adopt UNDP's approach in their computation of the Human Development Index (HDI). The indicators for each dimension is calculated using the following formula:

$$\text{Dimension Indicator (DI)} = \frac{\text{actual value} - \text{minimum value}}{\text{maximum value} - \text{minimum value}} \quad (2)$$

Since Availability and Usage dimensions have two indicators, the value of the dimensions computed by getting the arithmetic mean of each indicator. The FII will then be computed by getting the geometric mean of the three-dimension indices:

$$FII = (DI_{Access} * DI_{Availability} * DI_{Usage})^{1/3} \quad (3)$$

In effect, FII is a number from 0 to 1 where a value closer to 1 indicates a high level of financial inclusion. Sample computation in getting the values for each dimension indicator (Eq.2) is shown in Table 2 using 2017 data from the Philippines. Subsequently, the 2017 Philippine FII is obtained by getting the geometric mean of the values of the Access, Availability, and Usage Dimensions: $FII = (.1509289 * .0607253 * .1107873)^{1/3}$ or 0.1005103. When all three dimensions of financial inclusion are considered, the FII data is available for 107 countries, which is shown in Annex B.

Table 2
Computation of dimension indicators – Philippines (2017)

Dimension	Indicator	Max Value	Min Value	Value	Indicator
Access	Number of bank accounts per 1,000 adults	3,379.81	0	510.11	0.1509289
Availability	Number of bank branches per 100,000 adults	287.24	0.13	9.05	0.0310583
	ATMs per 100,000 adults	313.14	0	28.30	0.0903923
Usage	Bank deposits as a percentage of GDP	972.186	0.53	66.11	0.0674893
	Credit to the private sector as a percentage of GDP	308.98	0.19	47.77	0.1540853

Empirical Results

Using the fixed effects method, Table 3 presents the regression result on the impact of financial inclusion on income inequality. The analysis starts with Model 1 that shows the relationship between the two main variables—Gini coefficient and FII. Model 2 shows the relationship between the two main variables, controlling for the log of GDP per capita. Model 3 extends Model 2 and adds government expenditure and secondary school completion rate as control variables, whereas Model 4 adds population growth from Model 3. Lastly, Model 5 includes all the control variables described in the Theoretical Framework. It could be observed that adding control variables to the model dropped some countries in the model, which reduced the number of observations (N) in the regression.

Accordingly, the estimates show that the coefficient of FII across all models is negative and highly significant after controlling for other variables. This implies that nations with an advanced level of financial inclusion have lower levels of income inequality. The finding shown for FII is consistent with the findings of Herrero and Turegano (2015), Omar and Inaba (2020), Demir et al. (2020), and in some specifications, the results from Park and Mercado (2015).

For the control variables, the log of GDP per capita showed a significant negative relationship with income inequality from Model 2 to Model 5. This result is in line with the notion that as income rises, the increase in the income share of the poor is higher, which lowers the income gap. An increase in government expenditure as a percentage of GDP also showed a statistically significant negative relationship with the Gini coefficient in Models 3 and 4. This confirms the impact of the government's fiscal policies in redistributing income. Moreover, the regression result showed the expected positive sign on population growth in Models 4 and 5, which is statistically significant at the 10% level. Control variables, inflation and trade, produced statistically insignificant results in Model 5.

Interestingly, based on Model specifications 3, 4, and 5, an increase in the secondary completion rate contributes to a higher level of inequality. These findings, which are different from empirical results of Chu and Chu (2018) and Park and Mercado (2015), could be attributed to differences in sample, model specification, measures of financial inclusion, or chosen time period.

Table 3
Effect of Financial Inclusion on Income Inequality (Fixed Effects Estimation)

Variables	M1 Gini	M2 Gini	M3 Gini	M4 Gini	M5 Gini
FII	-18.90*** (1.478)	-10.82*** (2.004)	-9.285*** (2.649)	-9.609*** (2.649)	-7.770** (2.454)
GDP per capita (log)		-2.308*** (0.382)	-2.680*** (0.595)	-2.801*** (0.598)	-2.621*** (0.545)
Government Expenditure			-0.0871*** (0.0278)	-0.0920*** (0.0279)	-0.0357 (0.0256)
Education			0.013* (0.00759)	0.0160** (0.00777)	0.0177** (0.00713)
Population Growth				0.0855* (0.0494)	0.0814* (0.0477)
Inflation					-0.00701 (0.00925)
Trade					0.00182 (0.00317)
_cons	43.36*** (0.0146)	61.53*** (3.003)	64.46*** (4.651)	65.18*** (4.659)	62.37*** (4.219)
N	759	747	471	471	441
R-Squared	0.196	0.243	0.242	0.248	0.218

Note: This table reports the panel fixed effects results for the impact of financial inclusion on income inequality. Standard errors are reported in the parenthesis. The symbols *, **, and *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

Discussion and Conclusion

This paper empirically studied the impact of financial inclusion on income inequality using available panel data from SWID, WDI, and Global Findex databases. In order to have a comprehensive measure of financial inclusion, this paper constructed an index of financial inclusion combining the approaches of Sarma (2008), Omar and Inaba (2020), Park and Mercado (2018), and the United Nations Development Programme (UNDP). The indicators used was designed to expand the number of countries and time period that will be included in this study. As a result, this paper was able to include 107 countries in our analysis using data on the number of accounts, branches, ATM, and the level of borrowing and saving of an economy.

After controlling for key relevant variables related to inequality, the fixed effect estimates show that FII has a statistically negative relationship with the Gini coefficient, which implies that countries with a higher level of financial inclusion have lower income gap levels. The result also showed that higher levels of GDP and an increase in government spending reduce income inequality levels. On the other hand, population growth contributes to increasing the inequality gap.

Interestingly, the statistical result on secondary completion rate is contrary to expectation as the estimates showed that it contributes to a higher level of inequality. Rajan (2015) observed that achieving prosperity is still difficult despite having a good education because it is “still unaffordable for many in the middle class” (p. 5). Additionally, Dabla-Norris et al. (2015) noted that education gains accrue disproportionately to individuals at the higher end of the income distribution or those belonging to a wealthy family.

The result of this paper provides various policy implications. Omar and Inaba (2020) emphasized that financial inclusion can drive inclusive growth, especially in developing countries, by simply providing access to financial services. However, providing access to financial services such as having a formal financial account alone will not be sufficient in accomplishing this goal. This must be complemented by increasing the “availability” (i.e., number of branches and ATM) of financial products, which will consequently result in increased “use” or demand (i.e., savings and borrowing) for these services.

This can be attained if the financial system is relatively stable with healthy competition and strong oversight from central banks. Under this scenario, the infrastructure of financial services is expected to develop, and the network of financial services expands to reach the excluded/unserved by the financial system. Moreover, our econometric result points that the effectiveness of financial inclusion depends on the role of the government institutions. Thus, effective fiscal policy is needed to serve as a vehicle in redistributing income across income quantiles.

As an initial point of analysis, this study adds to the growing literature on the role of financial inclusion in reducing income disparities. However, our results should be treated with caveats given the limited data on financial inclusion and income distribution. The Global Findex database provides a great source of data on financial inclusion variables, but the survey is done only once every three years starting 2011, with the 2020 data still unavailable. As a result, our financial inclusion index was not able to capture the rise of the use of mobile devices and other forms of electronic payments for financial transactions. The inclusion of these factors would theoretically improve and depict a better picture of the current financial inclusion numbers globally. Moreover, the available data also fails to account for the presence of informal financial services such as micro-finance institutions and other quasi-financial institutions, including cooperatives. This can be a subject for future research as the time span for financial inclusion becomes longer.

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Variable	Source	Obs	Mean	Min	Max
Inequality	SWIID	2,452	39.11794	22.6	66.9
Account per 1,000	GFD	1,239	565.8201	0	3,379.81
Bank Branches	GFD	2,437	18.96683	0.13208	287.238
ATM	GFD	2,290	43.00834	0	313.144
Bank Deposit per 1000	GFD	3,183	51.16555	0.534992	972.186
Domestic Credit	GFD	3,205	49.93371	0.18587	308.978
GDP per Capita	WDI	3,600	14,976.45	194.8731	194,368.4
Trade	WDI	3,338	92.41232	0.1674176	860.8
Gov't Expenditure	WDI	3,102	16.82309	.9517466	147.7333
Education	WDI	3,407	77.3448	28.12643	163.9347
Inflation	WDI	3,177	6.192974	-30.24316	513.9068
Population Growth	WDI	3,900	1.410431	-9.080638	17.51095

Rank	Country	FII	Rank	Country	FII
1	Singapore	0.24968	41	Uruguay	0.111364
2	Croatia	0.245988	42	Kazakhstan	0.111185
3	Estonia	0.244035	43	São Tomé	0.10717
4	Malta	0.24026	44	Namibia	0.106157
5	Mauritius	0.237401	45	Maldives	0.102097
6	Thailand	0.237307	46	Dominican Republic	0.094262
7	Ukraine	0.220516	47	Peru	0.090955
8	Israel	0.211826	48	Ecuador	0.083256
9	Chile	0.209541	49	Botswana	0.080047
10	Norway	0.200547	50	Bolivia	0.079935
11	Italy	0.198678	51	Philippines	0.076519
12	Latvia	0.190304	52	Argentina	0.07385
13	Brunei Darussalam	0.188444	53	India	0.073652
14	Malaysia	0.18386	54	Armenia	0.065286
15	United Arab Emir	0.18149	55	Egypt, Arab Rep.	0.062365
16	Cabo Verde	0.180916	56	Eswatini	0.061992
17	Kuwait	0.176685	57	Azerbaijan	0.061131
18	Mongolia	0.174763	58	Solomon Islands	0.060105
19	Poland	0.167373	59	Paraguay	0.057643
20	Lebanon	0.166773	60	Bangladesh	0.05713
21	Turkey	0.157345	61	Nicaragua	0.056298
22	Brazil	0.15435	62	China	0.054674
23	North Macedonia	0.147665	63	Nigeria	0.054506
24	Hungary	0.147094	64	Libya	0.053547
25	Seychelles	0.146525	65	Kenya	0.053506
26	Vanuatu	0.143482	66	Kyrgyz Republic	0.050579
27	Costa Rica	0.143238	67	Ghana	0.045527
28	Suriname	0.14283	68	Pakistan	0.041912
29	Tonga	0.142289	69	Algeria	0.038663
30	Belize	0.141744	70	Lesotho	0.037396
31	Colombia	0.139081	71	Syrian Arab	0.036544
32	Albania	0.137905	72	Togo	0.036242
33	Qatar	0.129167	73	Tajikistan	0.035054
34	Moldova	0.126527	74	Cote d'Ivoire	0.034367
35	Tunisia	0.124929	75	Mauritania	0.034177
36	Saudi Arabia	0.119791	76	Angola	0.034071
37	Georgia	0.117431	77	Senegal	0.032956
38	Samoa	0.116424	78	Djibouti	0.029944
39	El Salvador	0.115255	79	Haiti	0.029614
40	Venezuela, RB	0.111714	80	Benin	0.029547
Rank	Country	FII			
81	Mali	0.029538			

82	Zambia	0.026649
83	Papua New Guinea	0.026335
84	Burkina Faso	0.025568
85	Tanzania	0.024702
86	Rwanda	0.023756
87	Gabon	0.023674
88	Malawi	0.023572
89	Uganda	0.023277
90	Lao PDR	0.021897
91	Comoros	0.017485
92	Myanmar	0.01679
93	Equatorial Guinea	0.016722
94	Guinea-Bissau	0.016658
95	Yemen, Rep.	0.015221
96	Sierra Leone	0.014708
97	Afghanistan	0.014482
98	Congo, Rep.	0.013462
99	Cameroon	0.01317
100	Madagascar	0.012488
101	Ethiopia	0.011896
102	Niger	0.01112
103	Burundi	0.010696
104	Guinea	0.008877
105	Central African	0.008422
106	South Sudan	0.006924
107	Chad	0.004602