Istanbul University Press

*Istanbul Business Research, 51*(2), 583-605
**DOI:** 10.26650/ibr.2022.51.895431
http://ibr.istanbul.edu.tr/
http://dergipark.org.tr/ibr

# Istanbul Business Research

**Submitted:** 11.03.2021
**Revision Requested:** 09.09.2021
**Last Revision Received:** 27.10.2021
**Accepted:** 27.03.2022
**Published Online:** 22.09.2022

RESEARCH ARTICLE

# Will Outbreaks Increase or Reduce Income Inequality? the Case of COVID-19

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**Abstract**
The effects of economic contractions experienced during pandemic periods on different income sectors and country groups in terms of income inequality are not homogeneous. Due to the fact that COVID-19 has deeply affected the lives of the poor, immigrants, refugees, the homeless, seasonal workers and people with no health insurance, the relationship between the pandemic and income inequality is of great significance . This study aims to find an answer to the question of whether the recent pandemic increased or decreased income inequality. In the study, the effect of COVID-19 on income inequality in 38 countries with different income levels is analyzed with the Artificial Neural Networks (ANN) and Linear Regression (LR) method. In this context, Gini index values for 2020 were estimated using unemployment, inflation and growth data, which are determinants of income distribution, for the periods 2000-2019. According to the analysis findings, while COVID-19 reduces income inequality in some countries, it increases it in others. However, in general, the results of our study show that the overall effect of COVID-19 on income levels in both developed and developing countries has been to increase income inequality.

**Keywords**
COVID-19, Pandemic, Income inequality, Gini, Artificial neural networks, Linear regression

## Introduction

Covid-19, which emerged in China's Hubei province in December 2019 and which has shown its impact all over the world, continues to deeply shake both public health and the economic contraction which it has caused. With the effect of strict isolation policies, the social consequences of the pandemic became quite asymmetrical and its negative effects, especially on low socio-economic groups, continued to increase (O'Donoghue et al., 2020).

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**To cite this article:** Isik, E., Ozyilmaz, A., Toprak, M., Bayraktar, Y., Buyukakin, F., & Olgun, M. F. (2022). Will outbreaks increase or reduce income inequality? the case of covıd-19. *Istanbul Business Research, 51*(2), 583-605. http://doi.org/10.26650/ibr.2022.51.895431

COVID-19 has brought about a human development crisis. With the pandemic, some dimensions of human development, such as health, education, individual economy, housing, social participation, human security, social justice, environmental sustainability and social life have regressed, and some of these parameters have fallen to the low levels seen in the mid-1980s. This is because the crisis caused by the pandemic has badly affected all elements of human development. The main affected areas are income (which has seen the biggest contraction in economic activity since the Great Depression), health (the pandemic that has already killed over 1 million 500 thousand people is expected to cause more deaths with the effect of a second wave) and education (which has been affected in regards to restriction of access to the internet, increasing inequality of opportunity in education, and the decline of primary education to the levels of the mid-1980s). The scale of the effects of the outbreak is expected to be yet more devastating, given the deterioration in many parameters, including an increase in gender-based violence (UNDP, 2020).

To control the spread of COVID-19, governments are implementing different degrees of isolation policies that can lead to a sharp contraction in economic activity, a decrease in employment and income, and an increase in poverty and inequality (Lustig et al., 2020). The mentioned income inequality is an issue that needs to be discussed because income inequality and the pandemic are closely related. In this framework, the pandemic, which determines income inequality, is also directly affected by income inequality. The vicious circle between the pandemic and inequality can be explained as follows: With the onset of a health crisis, economic contractions can trigger chronic diseases due to insufficient care and treatment, and this process, which affects productivity in all aspects, increases health care costs and poverty, and this subsequently brings more diseases.

Countries with relatively higher income inequality are likely to report more COVID-19 cases and deaths (Bonacini et al., 2020; Fisher & Bubola, 2020; Clarke & Whiteley 2020). Moreover, disadvantaged groups, which are exposed to high income inequality, have to work to survive, making them vulnerable in terms of the risk of developing the disease and making them more exposed to high treatment costs. This situation is even more brutal for low-income groups which are employed informally without health insurance to survive.

Although many factors act as a driving force in the relationship between the pandemic and income inequality, the prominent factor is the labor markets. This is because, with the COVID-19 crisis, human beings, the dominant factor of the production process, are under a global health threat (Campello et al., 2020). The effect of the pandemic on the workforce differs depending on the parameters of the workforce, such as age, income, gender, and education, and this is determinant in income inequalities. While the majority of the highly skilled workforce has the opportunity to work from home, there is not much opportunity to work remotely for low skilled workers (Neidhöfer, 2020). In addition, the strict isolation policies implemented to control the pandemic have led to a decrease in employment and a significant increase in unemployment rates. This effect is expected to be more devastating, especially in low-income countries. In low-income countries, poor individuals who can only meet their basic needs have had to choose between the pandemic and hunger. For example, although very drastic measures were not taken in Kenya, as a result of the current practices, most of the informal workers who make up more than 80% of the workforce remained unemployed. Recently, Ebola in West Africa, Hurricane Idai in Mozambique, the Desert Grasshopper invasion in Somalia and Ethiopia, and migration waves in these geographies have further weakened these countries economically. Therefore, the expansion of the pandemic in these countries means that poverty and inequality affect the whole society more deeply (Maffioli, 2020). The extent of informal employment in low-income countries also plays an important role in affecting the labor market's income distribution. In these countries, particularly the poor living in rural areas are employed informally, and percentages of informal employment exceed 90 in the agricultural sector.Informal employment mostly means excluding these individuals from social aid and allowances. Therefore, the pandemic is expected to play a significant role in increasing inequality by further affecting the living conditions of these people (FAO & UN, 2020; FAO, 2020; ILO, 2018). However, due to the employment of the poorest in the agricultural and daily life services sector, and due to these sectors being relatively less affected by the pandemic, the poorest households face lower levels of unemployment. On the other hand, it is expected that many households with middle and middle-high income levels who do not have the opportunity to work from home will be deeply affected by the pandemic through the unemployment channel. Therefore, although the pandemic shakes the living conditions of the poorest more deeply, the issue of which households have the greatest income loss differs. Therefore, it remains uncertain how the pandemic will affect inequality through the labor channel.

As important as employment conditions, another factor which plays a part in the pandemic's impact on income inequality is the sectoral effect of the pandemic. In this context, the wealth of billionaires, who are owners or shareholders of digital giants and large pharmaceutical companies, has increased several times due to the increase in stock prices (Van Barneveld et al., 2020). For example, between 1st January , 2020 and 10th April, 2020, 34 of the USA's 170 richest billionaires increased their fortunes by tens of millions of dollars, and eight of these billionaires - Jeff Bezos (Amazon), MacKenzie Bezos (Amazon), Eric Yuan (Zoom), Steve Ballmer (Microsoft), John Albert Sobrato (Silicon Valley real estate), Elon Musk (Tesla and SpaceX), Joshua Harris (Apollo Global Management) and Rocco Commisso (Mediacom) saw a huge increase in fortunes. The wealth increase of Amazon founder and CEO Jeff Bezos is particularly unprecedented in the history of modern finance and is increasing day by day. His wealth has increased by an estimated $ 25 billion since January 2020, as of April 15, which is greater than the Honduras GDP, which was $ 23.9 billion in 2018.

However, although the pandemic has increased the wealth of some billionaires, there was a slight decrease in the total number of billionaires on Forbes' global billionaires' list published on 7 April 2020 (Collins et al., 2020). This situation shows that in countries where companies with relatively high technological power are clustered, income inequality will deepen further.

With the pandemic, working from home has become widespread and the limited opportunity to work from home on an individual or sectoral basis affects inequalities. Compared with high-income individulas, low-income individuals have limited opportunities to work remotely. Also, while high-income individuals can earn a wage bonus by working from home, the earnings of low-income workers are much more limited. For example, in European countries, 74% of employees in the highest wage quintile can work remotely, but this rate is 3% in the lowest quintile. In the UK, 60% of high-income people are able to work from home, but this rate is only 20% for low-income people. Similarly in the USA, the potential for working from home increases as the wage distribution goes up. Therefore, if the rise and spread of working from home becomes the norm, it could be a new vector of inequality (Stantcheva, 2021; Adams-Prassl et al., 2020; Sostero et al., 2020; Bonacini et al., 2020; Van Barneveld et al., 2020).

One of the prominent parameters in explaining the relationship between the pandemic and income inequality is productivity. In this framework, the pandemic affects income inequality by affecting the productivity of different income groups in different dimensions. For example, Etheridge et al., (2020) suggested that women and individuals in low-wage jobs experienced the greatest declines in productivity in the United Kingdom. In the study, the way in which income inequality through productivity was affected by working from home during the pandemic was also discussed. In the study, they found that the level of productivity of homeworkers during the lockdown was related to the intensity of working from home and how it changed from the previous period. Those who used to work at least occasionally from home and then increased the intensity of work from home experienced an increase in productivity. Those who did not increase their frequency of working from home or who had never worked from home before the pandemic reported significant decreases in productivity.

Remittances, another factor in the relationship between the pandemic and income inequality, are an important source of income in low- and middle-income countries, especially in rural households. Although most rural residents have relatively safe access to land, livestock or natural resources, they rely on various sources of income, including wage labor and non-agricultural activities, to survive. For example, about 40% of poor households in Nigeria receive either domestic or international remittances. Therefore, fluctuations in remittances will create a serious income shock for these households. In addition, given the share of remittances, particularly in education spending, a sharp decline in these is expected to reduce investment in human capital development, which is usually financed by remittances (FAO & UN, 2020; World Bank, 2020).

The cost of accessing healthcare is a factor which illustrates how the pandemic will change the income distribution. Particularly in countries where access to healthcare services is costly, healthcare bills can further deepen inequality due to large-scale borrowing on the part of the poor which leads to greater poverty. Individuals with the lowest income do not have health insurance, as they mostly work in the informal employment sector. Hence, high healthcare costs increase income inequality by cutting into a larger share of the budgets of poor households.

COVID-19 is expected to affect inequalities between countries as well as domestic inequalities. For example, Maffioli (2020) emphasized that poor countries could be more affected by the pandemic due to the insufficient infrastructure as well as to insufficient resources to strengthen public health policies. The fact that low-income countries direct their limited resources to health expenditure may further deepen the income differences between developed and underdeveloped countries. FAO & UN (2020) emphasized that COVID-19 could worsen inequalities both between countries and within the country. It is also possible that the consequences of inequalities from the pandemic are long-term because greater inequality weakens the impact of economic growth on poverty reduction. This causes growth to have less impact on the poor and other marginalized groups, and hence the economic recovery is reflected only on a certain part of society. Consequently, the process can lead to greater inequality in society as a whole (FAO & UN, 2020).

In the literature, the effect of the pandemic on income distribution is mostly discussed in developed countries. However, one of the questions waiting to be answered is how the pandemic affects the distribution of income in countries with different levels of development. What is the power of the social support policies implemented by the countries to affect this trend? It is expected that this study will contribute to the literature in this sense. In this study, the effect of COVID-19 on income inequality in 38 countries with different income levels is investigated using ANN and LR simulation methods. The plan of the study is as follows: In the section following the introduction, the literature review is discussed and in the third and fourth sections, the methodology and analysis findings are presented.

## Literature

COVID-19 affects society in many ways, but undoubtedly one of the most controversial issues is its effect on household income. How is the pandemic affecting the income of wealthy households or poor households? It is impossible to talk about a single direct effect on this subject. The epidemic, which affects households with high income levels in some sectors, may affect poor households more strongly in others. It is important to know how the pandemic is affecting households with different income levels. This is because the effectiveness of social assistance policies to be implemented depends on a knowledge of how the epidemic, which has already greatly affected social discontent, has changed income distribution. At this point, public support can minimize the impact of the pandemic, but knowing how it affects or will affect the incomes of households with different incomes can both bring an effective public policy and play an important role in reducing income inequalities by supporting the segment most affected by the epidemic.

Studies focusing on the relationship between COVID-19 and income inequality are mostly limited to specific countries, so this study, which includes both developed and developing co-untries, is expected to contribute to the literature by showing the trend of income inequality to be caused by the pandemic in both developed and developing countries.

Some studies on how COVID-19 will affect income inequality suggest that the pandemic will increase this inequality (Komatsu & Menezes-Filho, 2020; Van Barneveld et al., 2020; Bonacini et al., 2020; Kyyrä et al., 2021). However, other studies emphasize that income inequality will tend to decrease (Lustig et al., 2020; O'Donoghue et al., 2020; Grabka, 2021).

Studies suggesting that the pandemic will affect income distribution deal with the fact that the opportunity to work from home is not offered to the educated and low-educated workforce at the same rate (Bonacini et al., 2020) and with the fact that the lockdown restrictions affect households at different rates (Perugini & Vladisavljević, 2020). Other studies cover the distribution of social support benefits and tax reductions (Kyyrä et al., 2021; Almeida et al., 2021) and the fact that the pandemic affects women and low-income individuals more deeply (Etheridge et al., 2020).

Considering the studies suggesting that the pandemic will increase income inequality, Delaporte et al. (2020) in their study of 20 Latin American and Caribbean (LAC) countries argued that the social distance applied to the pandemic led to an increase in income inequality in many of these countries. Perugini & Vladisavljević (2020) argued that restriction policies applied to control the pandemic in 31 European countries will increase inequality and poverty, and the magnitude of change will be greater in more unequal countries. Bonacini et al. (2020) argued that working from home has increased with the pandemic in Italy, and this practice, which benefits upper-middle income people, may deepen income inequalities. According to Van Barneveld et al. (2020) , a skilled and high-wage workforce that can work from home in the Information Technology (IT) field is more advantageous than the millions of low-wage workers in the low-wage retail and service sectors, and thus the unskilled workforce may be more affected by the pandemic. Therefore, according to the authors, COVID-19 will increase income inequality. Aina et al. (2021) investigated the effect of Covid-19 on wage distribution in Italy. According to the findings of the study, the pandemic affects the wages of all workers, but this effect is higher for those at the lower end of the wage distribution.

In addition, the fact that the fortunes of billionaires affiliated to digital giants and large pharmaceutical companies increase more and more as the stock prices increase is one of the determining factors in the deepening of inequalities. Duman (2020) suggested that isolation policies due to  Covid-19 can increase wage inequality depending on supply shocks in Turkey. Similarly, Bayar et al. (2020), in their study of labor market indicators in Turkey due to Covid-19, reached the findings that low-income groups lost more income than high-income groups. In summary, the findings are based on the argument that the rich lose proportionally less income than the poor.

However, looking at studies suggesting that inequalities will tend to decrease with the pandemic, O'Donoghue et al. (2020) mentioned that the pandemic could play a balancing role in income inequality with the effect of social assistance and taxes in Ireland. According to the study, they claimed that with the pandemic, the highest income losses were seen in high-income individuals, and the poorest part of the society received the least damage from the process with the introduction of tax cuts and social assistance. According to Grabka (2021), income inequality decreased in Germany with the pandemic. According to the study, the reason for the decrease in relative income inequality in Germany is directly related to the income losses suffered by the self-employed because self-employed people in Germany are richer than other labor force groups.

In some studies, the effect of the pandemic on income distribution was  examined by including the process of public support policies. For example, Lustig et al. (2020) argued that the devastating impact of COVID-19 in Argentina, Brazil, Colombia and Mexico was stronger on middle-income households  than on the poorest segment of society. In this framework, the study, in which the expanded social assistance provided by governments in response to the crisis was included in the analysis, revealed that the aid had a low level impact in Colombia and a large balancing effect in Brazil and Argentina. Almeida et al. (2021) investigated the impact of the pandemic in 27 European countries and the effects of the policies implemented due to the pandemic. Accordingly, the pandemic is expected to increase income inequality, but support policies are expected to reduce this effect relatively. According to Angelov & Waldenström (2021), Covid-19 has increased earnings inequality in Sweden because the epidemic has affected low-paid individuals more in the country. In the study, it was emphasized that public support had a positive effect on income distribution, but could not completely eliminate inequality. Kyyrä et al. (2021) suggested that the pandemic increased income inequality in Finland. According to the study, it was emphasized that tax support played a balancing role in these inequalities, otherwise inequality might  be much higher.

## Methodology

In the study, firstly, missing Gini values in 102 countries were calculated based on the available UTIP data, and the values obtained by both the UTIP data and the simulation method are given in Table 2 and Table A1 (see appendix). While the light-colored Gini values in Table 2 and Table A1 show the UTIP data, the dark-colored values are the values obtained by the ANN simulation method based on the UTIP data. The graphics showing the trend and deviation of the real and simulated values of these calculations are also given in Annex 2.

In this study, how the COVID-19 epidemic will affect income inequality in 38 countries is examined using ANN and LR methods.The Gini values for 2020 were estimated using growth, unemployment and inflation data which affect income inequality. For this, the Gini index for 2020 was predicted by using unemployment, growth and inflation for the 2000-2019 period. Here, the effect of the change that these variables will cause in the Gini index is utilized. The inputs and outputs used in the model are given in Table 1.

Table 1

*Input and output variables for ANN and LR Method*

| Inputs | Outputs |
|---|---|
| **lnGDP, Inflation, Unemployment and Year** | Gini index for 2020 |

The development of artificial neural networks (ANN) was formed by combining many simple computing elements, namely neurons, in a highly interconnected system. And so the ANN emerged from an attempt to simulate biological nervous systems, hoping that an "intelligence" would give rise to complex phenomena as a result of self-organization. While artificial neural networks rarely have a few hundred or more than a few thousand neurons, the human brain has about a hundred billion neurons. Resembling a complex human brain, these networks are still far beyond the fastest, highest-capacity parallel computers in existence (Warren, 1995). ANN consists of neuron-like elements which are called nodes. These nodes are arranged in layers as shown in Figure 1. Generally, ANN is used to approximate a nonlinear mapping between system inputs and outputs (Willis et al., 1992).

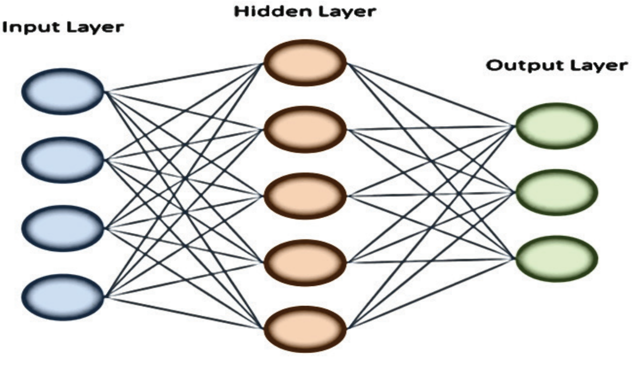


***Figure 1.*** Artificial neural network.

The basic unit of a multilayer perceptron is the neuron, which has the function of subjecting the weighted sum of signals to the input to a transfer function (Kubat, 2017). Where $\sum$ is the weighted sum of the inputs, calculated using the formula:

$$f(\Sigma) = \frac{1}{1+e^{-\Sigma}} \tag{1}$$

The Artificial Neural Network in Fig. 1 is known as the multilayer perceptron, input, output and hidden layers represented by neurons. For two-layer perceptron the formula is as given,

$$y_i = f\left(\sum_j W_{ji}^{(1)} f\left(\sum_k W_{kj}^{(2)} x_k\right)\right) \tag{2}$$

The j-th hidden neuron takes the weighted sum, $\sum_j W_{kj}^{(2)} x_k$, as input and subjects it to the sigmoid function $\left(\sum_k W_{kj}^{(2)} x_k\right)$, with the values $x_k$ multiplied by the weights included with the links. The i-th output neuron then obtains the weighted total of the hidden neurons' values and applies the transfer function to it once more. This is how the i-th output is obtained. Forward propagation is the process of propagating attribute values from the network's input to its output in this manner (Aggarwal, 2018). Artificial Neural Networks are the most well-regarded and widely used machine learning techniques.

Machine learning (Er et al., 2021; Farsad & Goldsmith, 2018; Kubat, 2017) is widely utilized in a variety of fields to address complex issues that are difficult to solve using traditional computer methods. One of the most basic and widely used machine learning methods is linear regression. It is a method for performing predictive analysis that is based on mathematics. Linear regression (LR) allows for projections of continuous/real or mathematical variables. Linear regression (Chen et al., 2019; Maulud & Abdulazeez, 2020) is a typical mathematical research tool that allows you to test and estimate anticipated effects versus numerous input variables. It is a data analysis and modeling technique that develops linear relationships between dependent and independent variables. From the quantitative perspective, machine learning such as ANN and LR often consists of optimum combinations which permit better prediction and more accurate estimations than occur with other types of models. One of the benefits of using ANNs is that it may make models from complex natural systems with massive inputs easier to use and more accurate. The artificial neural network (ANN) has been discovered to be a very new and valuable model for problem-solving and machine learning (Abiodun et al., 2018; Isik et al., 2021).

In the simplest terms, Linear Regression is a supervised Machine Learning model that identifies the best fit linear line between the independent and dependent variables, i.e. it discovers the linear relationship between the two variables. There are two forms of linear regression: simple and multiple. Only one independent variable is present in simple linear regression, and the model must identify a linear relationship between it and the dependent variable. Multiple Linear Regression, on the other hand, uses more than one independent variable to find a relationship. In the equation of simple linear regression, $b_0$ is the intercept, $b_1$ is the coefficient or slope, x is the independent variable, and y is the dependent variable.

$$y = b_0 + b_1 x \tag{3}$$

Multiple Linear Regression Equation, where $b_0$ is the intercept, $b_1$, $b_2$, $b_3$, $b_4$,..., $b_n$ are the coefficients or slopes of the independent variables $x_1$, $x_2$, $x_3$, $x_4$,..., $x_n$, and y is the dependent variable.

$$y = b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + \cdots + b_n x_n \tag{4}$$

The basic goal of a Linear Regression model is to determine the best-fit linear line and the appropriate intercept and coefficient values such that the error is minimized. The discrepancy between the actual and predicted values is called error, and the goal is to reduce it (Chen et al., 2019; Maulud & Abdulazeez, 2020).

ANN and LR models have the ability to learn and can learn with different learning algorithms (Kubat, 2017). They can produce results (information) for unseen outputs. There is unsupervised learning. They can make pattern recognition and classification. They can complete the missing patterns. They have fault tolerance and can work with incomplete or ambiguous information (Chen et al., 2019; Wang et al., 2018). In faulty cases, they show graceful degradation and can work in parallel and process real-time information so are used in this study.

All data is statistically compared for training and testing results once all estimated values are produced with ANN and LR models. To compare the results, the coefficient of determination ($R^2$) and Mean squared error (MSE) approaches are used. The following equations show how to calculate Formulation of MSE and $R^2$.

$$MSE = \frac{\sum_i (Real\ Data_i - Sim_i)^2}{N} \tag{5}$$

$$R^2 = 1 - \frac{\sum_i (Real\ Data_i - Sim_i)^2}{\sum_i (Sim_i)^2} \tag{6}$$

Real data, Sim and N denote to the value of real data, the value of simulated results, and the number of samples in the suggested model, respectively. The coefficient of determination and the MSE are proposed to become around 1 and 0 correspondingly. Although $R^2$ values for the model's training and testing outcomes are around 1, MSE values are greater than 0, notably for the model's testing section (Hecht-Nielsen, 1989). The similarity between experimental and simulation results is 99 % for all of the glow curve data (Lee, 2004; Basheer & Hajmeer, 2000; Willis et al., 1992).

## Results

In this study, ANN and LR models were used to estimate the Gini index for 2020 using Gini index of 38 countries. The growth, inflation, unemployment, which are determinants of income inequality, and years are chosen as input and the Gini index of all years is selected as output for the prediction of the Gini index of 2020. The model findings obtained using these variables are presented in Table 2. The table also includes simulated Gini values based on both UTIP Gini data and UTIP data for the 2000-2019 periods in order to see past trends. The change in the Gini index is analyzed on the basis of the previous year's data and if the change is positive, a (+) sign is placed in front of the value, and a (-) sign is placed in front of the value if it is negative, thus indicating the direction of the change.

Table 2

*Gini index for 38 countries*

| | Countries | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020-ANN | 2020-LR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developed Countries | Australia | 40.77 | **41.55** | 40.75 | 41.84 | 41.79 | 42.08 | **42.76** | **43.37** | **42.50** | **42.52** | **-42.11** | **-42.44** |
| | Austria | 36.36 | **36.86** | 36.97 | 36.81 | 36.61 | 36.49 | **35.95** | **35.64** | **36.59** | **36.58** | **+36.61** | **+36.84** |
| | Belgium | 41.27 | **41.10** | 42.46 | 42.84 | 42.63 | 42.64 | **42.96** | **42.02** | **42.02** | **41.52** | **+41.74** | **+41.80** |
| | Canada | 39.30 | **38.34** | 38.76 | 38.75 | 38.83 | 38.85 | **38.34** | **38.13** | **38.53** | **38.27** | **+41.27** | **+41.82** |
| | Cyprus | 36.18 | **36.81** | 35.56 | 36.94 | 36.98 | 36.91 | **36.80** | **36.98** | **35.28** | **36.18** | **-35.09** | **-35.45** |
| | Czech Rep. | 31.94 | **31.14** | 31.96 | 32.01 | 31.74 | 30.87 | **32.57** | **31.51** | **31.82** | **31.61** | **-31.24** | **-31.38** |
| | Denmark | 37.14 | **36.15** | 34.16 | 34.08 | 34.31 | 34.18 | **34.01** | **33.96** | **34.15** | **33.55** | **+34.48** | **+34.26** |
| | Finland | 36.04 | 35.88 | 36.03 | 35.86 | 36.41 | 35.96 | **35.26** | **36.45** | **36.26** | **36.86** | **-36.84** | **+36.87** |
| | France | 38.15 | 37.57 | 37.33 | 38.03 | 38.00 | 37.94 | **37.91** | **37.46** | **37.78** | **37.13** | **-36.23** | **-36.14** |
| | Germany | 38.51 | **38.86** | 38.31 | 38.37 | 38.29 | 38.22 | **38.44** | **37.54** | **38.55** | **38.25** | **+40.14** | **+39.37** |
| | Greece | 41.23 | 40.88 | 45.11 | 45.51 | 45.47 | 45.44 | **45.41** | **45.41** | **45.51** | **45.91** | **-45.75** | **-44.96** |
| | Israel | 44.37 | **44.69** | 44.27 | 43.88 | 43.47 | 43.41 | **43.04** | **43.79** | **43.58** | **43.28** | **+43.98** | **+43.82** |
| | Italy | 37.08 | 37.06 | 37.37 | 37.36 | 37.33 | 37.23 | **37.16** | **37.23** | **37.42** | **37.62** | **-36.19** | **-37.00** |
| | Japan | 43.88 | **46.50** | **43.45** | 43.83 | **43.02** | **43.87** | **44.91** | **43.79** | **43.38** | **43.78** | **+44.45** | **+44.30** |
| | Latvia | 42.50 | **42.62** | 41.84 | 41.04 | 40.93 | 40.67 | **40.81** | **40.71** | **40.60** | **41.70** | **+41.94** | **+41.81** |
| | Lithuania | 44.25 | **43.21** | 42.48 | 41.43 | 41.11 | 40.69 | **40.62** | **41.92** | **41.23** | **41.83** | **-41.17** | **-41.59** |
| | Netherlands | 38.42 | **39.65** | 39.16 | 39.13 | 38.89 | 38.88 | **39.56** | **39.39** | **37.38** | **37.58** | **+38.43** | **+38.70** |
| | Norway | 36.81 | 36.79 | 37.24 | 37.15 | 34.42 | 37.16 | **38.35** | **38.81** | **39.08** | **39.20** | **+39.57** | **+39.42** |
| | Portugal | 43.11 | 42.77 | 42.76 | 42.83 | 42.57 | 42.45 | **42.62** | **42.46** | **42.21** | **42.14** | **-41.56** | **-41.99** |
| | R. of Korea | 38.90 | 39.19 | 39.02 | **39.80** | **39.07** | **39.54** | **39.25** | **39.21** | **39.06** | **39.37** | **+39.68** | **+39.88** |
| | Singapore | 39.02 | **39.81** | 39.14 | 39.20 | 40.42 | 40.84 | **40.35** | **40.44** | **39.50** | **39.93** | **-39.82** | **-39.11** |
| | Slovakia | 36.85 | **36.67** | 36.89 | 37.36 | 37.03 | 36.4 | **37.08** | **37.56** | **37.72** | **38.00** | **+39.58** | **+39.69** |
| | Slovenia | 34.70 | 34.55 | **34.10** | **34.46** | **33.39** | **33.36** | **33.59** | **32.35** | **31.34** | **32.04** | **+32.76** | **+32.37** |
| | Spain | 40.90 | **40.9** | 41.52 | 42.04 | 42.35 | 42.21 | **42.00** | **41.83** | **40.92** | **40.81** | **+41.93** | **+42.49** |
| | Sweden | 33.77 | 33.11 | 34.28 | 34.46 | 34.44 | **32.82** | **33.48** | **33.40** | **33.10** | **33.20** | **-33.13** | **-32.83** |
| | UK | 38.42 | 40.33 | 38.53 | 41.27 | 39.81 | 39.87 | **40.68** | **38.87** | **37.30** | **37.08** | **+38.69** | **+40.14** |
| | USA | 42.20 | 42.31 | 42.08 | 42.02 | 42.00 | 41.98 | **41.94** | **41.93** | **41.93** | **41.93** | **+42.08** | **+42.46** |

| | Countries | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020-ANN | 2020-LR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Developing Countries** | Brazil | 47.70 | **47.48** | 47.15 | 47.06 | 47.16 | 47.58 | **47.39** | **47.51** | **47.12** | **47.22** | **+47.28** | **+47.40** |
| | Bulgaria | 43.12 | **42.18** | 42.69 | 42.45 | 41.88 | 41.56 | **41.37** | **42.35** | **41.85** | **42.15** | **+42.31** | **+42.18** |
| | China | 38.78 | **38.99** | **37.68** | **37.53** | **37.42** | **38.26** | **38.47** | **38.94** | **38.25** | **38.56** | **+41.20** | **+41.38** |
| | Colombia | 42.44 | **41.76** | 41.47 | 45.15 | 44.81 | 44.8 | **44.84** | **44.73** | **44.99** | **43.73** | **+43.87** | **+43.83** |
| | Croatia | 42.29 | **42.37** | 42.73 | 42.82 | 41.68 | 41.76 | **42.01** | **42.01** | **42.01** | **42.03** | **-39.73** | **-39.07** |
| | Hungary | 41.45 | **41.11** | 40.86 | 40.43 | 40.49 | 39.87 | **40.34** | **39.42** | **40.42** | **40.42** | **-38.27** | **-39.63** |
| | Malaysia | 39.70 | **39.38** | 39.31 | 39.29 | 39.62 | 39.42 | **40.47** | **40.67** | **40.87** | **39.07** | **+39.85** | **+39.73** |
| | Philippines | 47.68 | **47.63** | 48.46 | 49.74 | 49.68 | 49.67 | **49.84** | **49.91** | **50.02** | **50.42** | **-50.34** | **-50.06** |
| | Poland | 40.32 | **40.49** | 40.27 | 39.97 | 39.73 | 39.43 | **38.41** | **37.75** | **37.35** | **37.18** | **+38.00** | **+38.02** |
| | Romania | 42.56 | **42.66** | 42.35 | 44.09 | 41.78 | 42.52 | **42.78** | **43.86** | **43.90** | **43.52** | **-42.92** | **-43.19** |
| | Turkey | 47.16 | 46.61 | 45.74 | 45.13 | 44.78 | 44.70 | **45.91** | **46.97** | **46.67** | **46.07** | **+46.57** | **+46.65** |

**Note:** Light colored values show UTIP data, while dark-colored values show Gini values obtained by a simulation method based on UTIP data.

When the Gini index values and changes estimated by the ANN and LR simulation method in Table 2 are examined, it is seen that the results vary from country to country. Therefore, it becomes difficult to make a preliminary judgment that the pandemic increases or decreases income inequality. However, in general, it can be said that the pandemic increases the income inequality mainly in developed countries and in developing countries, but this effect is more uncertain.

It is observed that inequality is increasing, especially in countries such as the USA, Germany, UK and China, where leading vaccine producing countries are located. In these countries where digital giants and large pharmaceutical companies are strong, inequality is expected to increase. The lack of strong transnational companies in sectors with increased profit margins in developing countries with the pandemic and the deterioration in living conditions of households with middle-income levels are the main parameters that can lead to a decrease in inequalities. According to Forbes's list of billionaires for 2021 (Dolan et al., 2021), it can be seen that the pandemic has led to a significant increase in the number of billionaires. According to the report, the USA is the country with the most billionaires with 724 and China comes second with 698 billionaires. As can be seen from Table 2, the mentioned countries are among the countries where inequalities have increased. Similarly, inequalities are expected to increase in Brazil, which has the highest number of billionaires in Latin America. According to the Forbes report, the USA ranks first in the number of billionaires emerging with the pandemic in the world, followed by Canada. As can be seen in Table 2, the increase in inequalities is expected to be higher in Canada.

The size of social assistance programs is undoubtedly as important as the sectoral shares of the countries in the formation of these results. For example, is the support provided by governments mostly to the poor or to big companies? However, when the social assistance policies of these countries are examined, it can be seen that, contrary to expectations, these policies are limited in most of these countries. On the other hand, it is expected that the relative inequalities will decrease or show a slower increase in countries that implement a relatively strong and fairer social policy. For example, Germany is one of the countries where the big global technology companies and the vaccine-pharmaceutical industry that benefit from the pandemic are strong, and therefore the number of billionaires is increasing rapidly. However, the increase in inequality is expected to be lower than expected. Because Germany has been successful in its social aid policies, it provides for the society in general. According to the ILO (2020) report, the main social support policies implemented by Germany to reduce the effects of COVID-19 are: i) continuation of benefit for workers from short-term work allowance even if they work in additional jobs, ii) support for single parents who are caring for children, iii) reduction of VAT rates , iv) suspension of bankruptcy applications due to excessive indebtedness, v) provision of privileges to seasonal workers in addition to the support provided in the agricultural sector, vi) income support for low-income households and individuals working alone, vii) Family Premium Payment per child for all parents, viii) free one-off support payment to those who have a profession, ix) provision of financial support to companies that are particularly severely affected by the pandemic (ILO, 2020). All of this has allowed support against the effects of COVID-19 to be distributed throughout the entire community.

France and Italy, which are among the countries with the highest number of COVID-19 cases, are expected to balance inequalities by maintaining support for low-income households and by implementing policies to prevent unemployment. For example, France mostly prioritizes employment sustainability in its policies to reduce the effects of the pandemic. Some of these policies include cash assistance within the framework of unemployment guarantees, solidarity funds provided to companies in the sectors that experience a very sharp decline in their activities, and giving a certain percentage of monthly turnover as compensation. Italy, on the other hand, has focused directly on low-income individuals. For example, bonus supports for low-income workers, mortgage repayment (for residency house) for low and middle-income households, income support to companies during periods of temporary or permanent interruption of production (80% of gross salary and full social security contribution) to minimize unemployment. Support provided to low-income households, such as the provision of services, and policies to reduce unemployment may be effective (ILO, 2020).

When we look at Turkey, which has a relatively high number of cases, inequalities are expected to show an increasing trend. Some of the support provided in Turkey included a delay in payment of taxes, configuring the taxes and interest owed, a delay for trade credit, and low income cash assistance to households. The strongest policy used by the government in minimizing the impact of the epidemic on households was the prohibition of layoffs for a certain period of time and support of this with short-time work allowance. Thus, it is aimed to partially control unemployment.. However, the higher level of benefits provided to medium and large-scale companies caused small tradesmen to be more severely affected by the epidemic. Therefore, an improvement in income distribution is not expected. On the other hand, the sharp increase in exchange rate and gold prices led to a significant increase in the wealth of households with foreign currency and gold deposits in their accounts. This is one of the determining parameters in income inequality. In summary, although the aim was to minimize the destructive effect of the epidemic, the effect of the increase in gold prices in exchange rates in addition to the economic contraction experienced all over the world, has meant that the support provided in the country was insufficient to mitigate the impact of the epidemic.

## Conclusions

Income inequality is an important area of discussion within the framework of the effects of the COVID-19 crisis, which has affected the whole world with its health and economic dimensions. Countries that want to reduce the number of pandemic-related cases and patient and mortality rates due to the pandemic turn to strict isolation policies. This situation leads to problems such as a serious decrease in the production process and the loss of employees' jobs and income. COVID-19 affects all segments of society, albeit in different forms and degrees. The pandemic has caused changes in the income level of the skilled workforce as well as the unqualified workforce. Again, the continuation of the employment of a significant portion of the unskilled labor force who work in the agricultural sector and daily casual jobs, and the opportunity to work from home to the educated qualified workforce, makes it difficult to reveal which segment is affected relatively more by the pandemic. Thus , the pandemic affects the employment of both the qualified and unqualified workforce in multiple ways. Every segment of society is affected by this process, though in different dimensions.

In this study, an ANN and LR simulation method was used to study the effect of COVID-19 on income inequality in 38 countries. The results obtained in this study, which deals with the effects on income inequality of parameters such as unemployment, inflation and growth, differ by country. According to this study, inequality is generally expected to increase in developed countries and this effect is more uncertain in developing countries. Although the pandemic has deeply affected the living conditions of the poor, the relative decline in the wealth of individuals in middle and upper-income levels may be higher. Because there are rich people whose wealth has increased exponentially due to the pandemic, there is also a segment whose wealth is rapidly disappearing. Therefore, a single argument that suggests that inequality will decrease or increase around the world would not be realistic. At this point, many parameters, from the social assistance policies of countries to the shares of sectors in the national economy, will be decisive in how far the pandemic will affect inequality.

Another parameter that determines inequalities is the number of billionaires in the country increasing with the pandemic, because in countries where the number of billionaires has increased due to the pandemic, inequalities are expected to increase. When Table 2 is examined, it is seen that inequalities have increased in most of the countries that are at the forefront in the number of new billionaires after pandemic in the Forbes list (for example USA, Canada, Germany, Japan and Spain, Brazil).

Our findings show that inequalities may show an increasing trend, especially in developed countries where billionaires have increased after the pandemic. In addition, the findings also support the limited number of studies that focus on the impact of the pandemic on inequalities, mostly in developed countries. (Kyyrä et al., 2021; Adams-Prassl et al., 2020; Almeida et al., 2021; Brewer & Tasseva, 2020; Clark, 2021)

In conclusion, it is important to design social policies in a way that prioritizes basic rights to life such as housing, nutrition and health. In this context, the following policies are important to reduce income inequality: (i) Providing access to free health services for those who have to work informally in order to survive and who are not under the umbrella of social security. (ii) Providing tax cuts to companies, tax restructuring, financial assistance to sectors directly affected by COVID-19 in order to prevent income losses due to unemployment. (iii) Additional taxation of companies whose profitability has increased due to the pandemic process, to be transferred to the households most affected by this process. (iv) In order to prevent isolation policies from locking the economy, arrangements should be made for flexible and different time schedules such as shift systems and different working hours so as to  to reduce human density.

**Peer-review:** Externally peer-reviewed.
**Conflict of Interest:** The authors have no conflict of interest to declare.
**Grant Support:** The authors declared that this study has received no financial support.
**Author Contributions:** Conception/Design of study: A.Ö., E.I., Y.B., M.T., F.B.; Data Acquisition: M.F.O, E.I.; Data Analysis/Interpretation: E.I., M.F.O.; Drafting Manuscript: A.Ö.; Critical Revision of Manuscript: M.T., Y.B., F.B., A.Ö., M.F.O., E.I.; Final Approval and Accountability: A.Ö., E.I., Y.B., M.F.O.

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# APPENDIX

Table A1

*GINI Index for 1963-2019 in 102 Countries*

| Countryname | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Afghanistan | | | | | | | | | | | | 42,1028 | 41,8141 | 43,2278 | 44,8407 | 45,8263 | 43,6659 | 43,9347 | 43,3174 | 41,5353 | 41,4159 | 42,1128 | 45,2887 | 44,3130 | 38,2300 | 37,1448 | 37,4104 | 37,9781 |
| Albania | | | | | | | | | | | | | | | | | | | | | | | | | | 31,9998 | 31,8038 | 33,3741 |
| Algeria | | | | | 42,0685 | 41,6521 | 42,3312 | 42,3874 | 41,9943 | 41,7789 | 42,5491 | 41,7476 | 41,9198 | 40,6339 | 39,8088 | 40,1550 | 37,8871 | 38,0266 | 39,8625 | 39,7770 | 39,5668 | 38,3125 | 37,6512 | 39,6917 | 39,6661 | 40,7704 | 39,5329 | 39,0656 |
| Argentina | | | | | | | | | | | | | | | | | | | | | | 43,7255 | 44,7186 | 44,9314 | 45,8647 | 46,6160 | 47,8416 | 47,1804 |
| Armenia | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Australia | 31,2151 | 31,4177 | 31,3097 | 31,2111 | 31,3808 | 31,6486 | 31,4827 | 31,5249 | 31,4886 | 31,7094 | 31,6316 | 31,4854 | 31,5488 | 31,1374 | 31,3297 | 31,9573 | 32,2109 | 32,5786 | 32,7808 | 33,2864 | 33,8733 | 34,3236 | 34,5855 | 35,0919 | 35,6458 | 35,2276 | 36,5112 | 36,3369 |
| Austria | 34,4596 | 34,8814 | 34,9176 | 34,8024 | 35,0302 | 35,3355 | 35,3486 | 34,4873 | 34,4716 | 34,1462 | 33,2880 | 33,6136 | 34,3913 | 34,1517 | 33,7705 | 33,6115 | 33,9124 | 34,0276 | 34,3103 | 34,6971 | 34,8890 | 34,9520 | 35,0444 | 35,0167 | 35,2647 | 34,8971 | 35,2985 | 35,8656 |
| Azerbaijan | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bangladesh | | | | | 41,0824 | 41,7562 | 42,3406 | 40,1612 | 41,8288 | 42,1357 | 44,2686 | 42,1010 | 43,0211 | 44,7669 | 45,9056 | 44,2644 | 43,0907 | 42,4366 | 43,5482 | 44,3872 | 45,0936 | 43,9343 | 45,2699 | 46,1034 | 45,8832 | 46,4415 | 47,8048 | 47,7196 |
| Belgium | 35,3096 | 35,0344 | 34,6463 | 34,9008 | 35,3102 | 35,2114 | 34,6169 | 34,1057 | 34,2920 | 34,6871 | 35,2796 | 35,2723 | 35,5969 | 35,7987 | 36,2863 | 36,3466 | 37,1891 | 37,4233 | 37,8789 | 37,9739 | 38,1093 | 38,2616 | 38,5393 | 38,4432 | 38,8170 | 38,8577 | 38,9916 | 37,5272 |
| Bolivia | | | | | | | | 42,9800 | 42,0196 | 44,9485 | 43,0895 | 44,1014 | 46,9394 | 47,5301 | 48,9321 | 45,3988 | 44,4438 | 44,0333 | 44,6699 | 46,0843 | 49,6614 | 53,2503 | 51,7034 | 50,3882 | 51,0372 | 48,5107 | 49,0368 | 48,8393 |
| Botswana | | | | | | | | | | | | | | | | | | | 48,8956 | 48,2672 | 48,0208 | 47,3242 | 47,4402 | 47,5699 | 48,1033 | 48,3498 | 48,9120 | 48,2107 |
| Brazil | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bulgaria | 32,5438 | 32,1482 | 30,8509 | 31,3830 | 31,1949 | 30,7323 | 31,2061 | 30,5373 | 30,5834 | 30,4449 | 29,6111 | 29,5375 | 29,6996 | 29,7957 | 30,0315 | 29,9148 | 30,3754 | 29,5838 | 29,6122 | 29,5985 | 29,9376 | 29,7425 | 29,6027 | 29,7673 | 30,2699 | 29,4422 | 29,1056 | 29,2562 |
| Burundi | | | | | | | | | 53,8430 | 53,0366 | 52,6768 | 51,0939 | 49,5476 | 47,8044 | 47,8403 | 47,4923 | 46,2799 | 47,9983 | 48,7240 | 49,0223 | 49,7838 | 49,1909 | 49,1689 | 48,8233 | 46,7194 | 47,5886 | 51,0863 | 52,5074 |
| Cameroon | | | | | | | | 49,0196 | 46,7410 | 45,5414 | 46,6454 | 45,9266 | 45,6862 | 47,8429 | 47,2479 | 45,6552 | 46,9285 | 47,3276 | 48,0375 | 49,5425 | 51,3549 | 52,9524 | 52,4439 | 52,5879 | 53,6789 | 53,8271 | 54,5367 | 51,6787 |
| Canada | 36,0431 | 35,7057 | 35,3967 | 34,8734 | 34,7884 | 35,1957 | 35,1186 | 35,4312 | 35,5429 | 35,6549 | 35,4055 | 35,1559 | 35,1837 | 35,3083 | 35,6009 | 35,1998 | 34,5562 | 34,6915 | 35,2001 | 36,5716 | 37,2414 | 37,3361 | 37,3465 | 37,3438 | 37,0226 | 36,7063 | 36,9222 | 37,1370 |
| Chile | 47,0319 | 45,6020 | 45,5722 | 44,8637 | 43,6185 | 44,9408 | 42,6491 | 44,4383 | 43,1200 | 40,7273 | 40,3411 | 41,5432 | 42,2839 | 44,3806 | 44,7825 | 44,7712 | 45,3490 | 45,6956 | 46,5425 | 47,3523 | 48,9374 | 49,4581 | 49,5790 | 49,9633 | 49,1476 | 48,2828 | 47,3792 | 47,1366 |
| China | | | | | | | | | | | | | | | 31,9427 | 32,5568 | 33,0574 | 32,9348 | 32,5336 | 33,9087 | 34,1983 | 34,8635 | 35,7450 | 35,6713 | 37,1081 | 37,7794 | 38,2221 | 38,7949 |
| Colombia | 43,5832 | 44,5858 | 44,9798 | 44,9111 | 44,7885 | 45,0797 | 45,0597 | 45,1214 | 45,5282 | 45,7735 | 45,3719 | 45,2081 | 46,1302 | 45,5172 | 46,3074 | 45,0274 | 44,2117 | 43,7625 | 44,2887 | 44,4959 | 45,3583 | 45,4082 | 45,9786 | 45,7224 | 45,8576 | 45,4409 | 45,6439 | 45,8482 |
| Congo | | | | | | 50,4973 | 51,0988 | 51,0493 | 52,0723 | 52,3087 | 53,4516 | 53,0518 | 53,0359 | 52,1181 | 52,0469 | 52,2822 | 51,4508 | 50,1489 | 49,1465 | 46,8659 | 46,5761 | 46,4549 | 46,4382 | 47,6882 | 47,4350 | 47,2738 | 47,4439 | 47,5533 |
| Costa Rica | 42,8224 | 43,4573 | 45,8617 | 45,8618 | 45,8682 | 44,5970 | 45,4640 | 45,2725 | 45,1754 | 44,9644 | 44,5391 | 43,5613 | 43,3922 | 42,5280 | 43,7477 | 43,3949 | 42,6509 | 42,7547 | 43,2371 | 43,0713 | 44,2455 | 44,5999 | 44,4361 | 44,6035 | 45,3159 | 43,5860 | 43,7167 | 43,2846 |
| Croatia | | | | | | | | | | | | | | | | | | | | | | | | 32,9183 | 33,5482 | 34,8761 | 36,2727 | 37,9448 |
| Cuba | | | | | | | | | | | | | | | 34,2940 | 34,0301 | 34,5758 | 35,7749 | 35,5844 | 36,0320 | 35,6254 | 34,9920 | 34,7426 | 34,6481 | 33,9214 | 33,6241 | 34,9120 | 35,4829 |
| Cyprus | 46,1638 | 45,1092 | 44,5227 | 44,4691 | 43,8937 | 43,5202 | 43,3022 | 42,5527 | 42,3824 | 41,0394 | 41,0302 | 43,4611 | 44,7682 | 43,2762 | 42,2389 | 41,7478 | 40,8952 | 40,8466 | 39,2972 | 39,3398 | 39,3184 | 39,1383 | 38,9663 | 39,3141 | 39,0294 | 38,8907 | 38,5690 | 39,0207 |
| Czech Republic | 22,7686 | 22,9578 | 22,9578 | 22,6193 | 22,2509 | 21,5341 | 21,1757 | 21,1757 | 21,3648 | 21,4046 | 21,2852 | 21,2653 | 21,1358 | 21,2155 | 21,1558 | 21,1159 | 21,0462 | 21,0761 | 20,8571 | 20,8969 | 20,8969 | 20,8272 | 20,5783 | 20,7276 | 24,5987 | 24,1721 | 24,4135 | 24,9240 |
| Denmark | 31,1557 | 30,9341 | 30,7926 | 31,2021 | 31,5990 | 31,8064 | 31,3081 | 30,9826 | 31,2207 | 31,1967 | 30,6210 | 31,0385 | 32,3660 | 32,0705 | 31,7293 | 32,0340 | 32,0335 | 32,1328 | 31,9091 | 32,2987 | 32,2193 | 31,6642 | 31,3128 | 30,9118 | 31,1702 | 31,3874 | 30,8686 | 31,4860 |
| Dominican Republic | 46,8935 | 43,5669 | 44,7975 | 47,7905 | 51,0502 | 50,0134 | 49,2465 | 50,2152 | 51,0126 | 50,3095 | 53,1614 | 52,7895 | 48,3845 | 48,4707 | 49,5230 | 49,6215 | 49,7019 | 51,0297 | 50,3990 | 49,2170 | 50,0103 | 50,7856 | 50,8010 | 51,6593 | 51,3009 | 50,2446 | 52,0335 | 49,3912 |
| Ecuador | 45,7876 | 48,6085 | 49,7134 | 48,8791 | 48,2077 | 46,7490 | 48,3129 | 46,5973 | 46,7497 | 46,1736 | 45,1415 | 43,5421 | 43,1243 | 42,7353 | 42,6999 | 41,1876 | 44,0585 | 45,1466 | 44,8489 | 45,7737 | 45,8689 | 46,4117 | 46,3609 | 46,7716 | 46,8100 | 47,6034 | 46,9967 | 46,0775 |
| Egypt | | 46,3400 | 44,0021 | 42,7376 | 42,7830 | 43,8658 | 43,9529 | 42,6975 | 44,6381 | 42,9207 | 41,8398 | 41,0220 | 41,1369 | 41,3559 | 41,6440 | 40,5718 | 42,7250 | 42,1180 | 43,6260 | 45,5734 | 45,1499 | 45,5459 | 43,3334 | 43,7334 | 43,7489 | 44,9426 | 46,1808 | 46,4569 |
| El Salvador | 52,2048 | 50,6051 | 50,1094 | 49,7404 | 49,6889 | 48,7065 | 48,5681 | 47,9047 | 47,3300 | 48,0220 | 47,0540 | 46,7754 | 47,3604 | 46,5118 | 45,2918 | 45,7463 | 45,9763 | 45,1186 | 44,8786 | 45,0599 | 45,0327 | 46,3393 | 47,1413 | 46,7064 | 46,3899 | 47,9548 | 47,5130 | 47,8751 |
| Eritrea | | | 51,2267 | 47,5212 | 49,0051 | 50,4652 | 50,6919 | 51,6576 | 51,1009 | 51,6883 | 52,2666 | 51,6757 | 51,0310 | 51,2663 | 49,4413 | 48,2873 | 47,8288 | 48,1096 | 46,8471 | 46,3467 | 47,2700 | 49,7178 | 49,2396 | 46,9004 | 46,8637 | 47,1718 | 47,7253 | 47,8617 |
| Estonia | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fiji | | | | | | 42,8559 | 41,1863 | 40,8087 | 42,8885 | 42,1554 | 42,4106 | 41,0803 | 40,9423 | 41,2550 | 42,6262 | 43,2232 | 43,1521 | 44,6317 | 45,4011 | 46,1388 | 47,3182 | 46,7506 | 47,0019 | 44,7650 | 47,4868 | 49,3461 | 50,2257 | 49,7564 |
| Finland | 33,5976 | 33,7081 | 33,6223 | 33,8235 | 33,9482 | 34,0938 | 33,4765 | 33,0094 | 32,0520 | 32,0426 | 31,5272 | 31,2879 | 31,6828 | 31,3662 | 31,6511 | 31,8342 | 31,6915 | 30,7901 | 30,9187 | 30,9430 | 31,1860 | 31,6450 | 31,7722 | 32,1290 | 32,1224 | 32,0405 | 32,5332 | 32,7984 |
| France | | | | | | | | | | | | | | | 32,9736 | 33,1776 | 33,0769 | 33,2665 | 33,7900 | 33,9287 | 33,6475 | 33,8498 | 34,7352 | 34,9000 | 34,9139 | 35,0672 | 35,2986 | 35,8386 |
| Georgia | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Germany | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ghana | 48,8515 | 49,6710 | 49,3128 | 49,7006 | 51,2542 | 51,5826 | 50,9867 | 50,2709 | 49,9213 | 51,1119 | 49,9463 | 49,0655 | 49,7114 | 50,3179 | 49,6886 | 49,4122 | 47,8944 | 46,1461 | 47,7814 | 46,8430 | 50,9462 | 49,6011 | 50,4783 | 50,7949 | 49,0310 | 48,7535 | 48,4810 | 50,6808 |
| Greece | 44,2167 | 44,9648 | 45,4629 | 44,8704 | 44,0543 | 43,7078 | 43,3518 | 43,5351 | 43,3331 | 43,1276 | 43,0040 | 43,2275 | 43,2320 | 42,6068 | 42,7222 | 43,2067 | 43,5916 | 43,7852 | 44,0039 | 42,9874 | 43,2220 | 43,5016 | 43,1099 | 42,3372 | 42,6792 | 42,8020 | 43,7106 | 44,1966 |
| Guatemala | | | | | | 46,6992 | 46,4655 | 46,2074 | 45,4540 | 47,7128 | 46,1197 | 45,3049 | 45,4965 | 44,9442 | 44,5953 | 43,6891 | 45,8094 | 46,5677 | 44,1560 | 45,1758 | 45,7788 | 46,1356 | 45,6792 | 47,2093 | 47,8116 | 48,0848 | 49,0780 | 53,3630 |
| Honduras | 48,8607 | 48,0564 | 47,7007 | 49,2885 | 48,0966 | 47,9985 | 46,7159 | 46,4858 | 46,8497 | 46,9367 | 46,6546 | 46,2985 | 46,4952 | 43,0914 | 41,3345 | 41,6857 | 43,2096 | 42,6850 | 43,8017 | 44,5404 | 48,7053 | 49,3266 | 47,7500 | 45,5918 | 44,5709 | 45,9225 | 45,0713 | 49,1911 |
| Hungary | 31,0047 | 30,3682 | 30,6341 | 30,0351 | 29,9715 | 29,2746 | 28,5351 | 28,1171 | 28,2397 | 27,6059 | 27,6033 | 27,1934 | 27,3946 | 26,7263 | 27,0320 | 26,8760 | 26,9332 | 27,3082 | 27,4019 | 27,6269 | 28,2802 | 28,6953 | 28,9160 | 28,7182 | 29,2706 | 30,9627 | 32,0491 | 33,0804 |
| India | 47,5443 | 47,6528 | 47,6406 | 47,4890 | 47,9022 | 48,5565 | 48,4004 | 48,7846 | 49,1111 | 49,2322 | 50,2323 | 51,4646 | 51,3283 | 52,1197 | 51,9884 | 51,6064 | 51,3488 | 52,0979 | 52,4128 | 51,3188 | 50,3888 | 50,3060 | 50,0533 | 50,4727 | 50,5366 | 50,2961 | 50,7083 | 50,3842 |
| Indonesia | | | | | | | | 52,0218 | 52,4271 | 51,2602 | 50,1660 | 51,5208 | 51,4519 | 52,4471 | 51,9669 | 51,9049 | 51,7320 | 51,7314 | 51,1474 | 50,9707 | 50,8962 | 51,0312 | 51,5901 | 51,6906 | 51,8428 | 50,7623 | 50,2587 | 48,3929 |
| Iran | 48,9982 | 50,3834 | 50,9876 | 50,4077 | 50,1660 | 50,6728 | 51,7619 | 49,9498 | 48,9161 | 48,0240 | 46,8441 | 48,2469 | 48,4996 | 47,8968 | 48,1797 | 48,2709 | 46,8413 | 42,3829 | 39,6511 | 38,7912 | 38,3896 | 38,1272 | 37,2784 | 37,4640 | 38,7822 | 37,4731 | 39,4222 | 41,1782 |
| Ireland | 36,8300 | 37,1002 | 36,8867 | 36,8425 | 37,0491 | 36,7913 | 37,2921 | 36,7871 | 37,0764 | 36,9026 | 35,7767 | 35,8819 | 36,5107 | 36,9590 | 37,0201 | 36,9833 | 36,9413 | 36,6680 | 36,6123 | 37,2236 | 37,7279 | 38,3229 | 38,3330 | 38,7908 | 38,8700 | 39,0302 | 38,7236 | 38,4435 |
| Israel | 36,2130 | 36,3350 | 36,6986 | 37,5602 | 37,4245 | 36,9305 | 36,0315 | 36,8415 | 36,6960 | 37,7048 | 37,1000 | 37,1618 | 37,8895 | 39,5632 | 39,0534 | 39,1540 | 40,8706 | 41,6058 | 40,7364 | 39,3612 | 40,1356 | 42,1777 | 41,7284 | 41,5043 | 40,9857 | 41,4597 | 41,2632 | 41,7175 |
| Italy | | | | | 40,9620 | 40,5263 | 39,8862 | 40,1207 | 39,0801 | 38,9577 | 38,4005 | 37,4728 | 37,4450 | 37,0276 | 36,4807 | 36,4512 | 35,7631 | 35,4063 | 35,4309 | 35,8828 | 36,5943 | 37,7569 | 36,7939 | 37,6330 | 37,4696 | 37,4382 | 37,9797 | 37,1086 |
| Jamaica | 48,8867 | 49,8754 | 49,2339 | 49,4445 | 49,1157 | 48,6206 | 48,6069 | 50,7777 | 50,4042 | 48,7004 | 48,5795 | 50,5303 | 50,5265 | 50,9494 | 48,3812 | 47,6278 | 48,4309 | 48,0129 | 47,0653 | 47,3515 | 46,7724 | 46,2599 | 51,0925 | 52,0399 | 50,9150 | 53,3111 | 53,5790 | 53,5924 |
| Japan | 38,8018 | 38,5784 | 37,5421 | 37,0950 | 36,9957 | 36,6332 | 36,0538 | 35,8489 | 36,1507 | 35,6451 | 35,4297 | 36,1723 | 36,6945 | 36,6300 | 36,8258 | 37,0311 | 36,9964 | 36,9569 | 36,8863 | 37,1560 | 37,0522 | 36,9310 | 36,9781 | 37,1571 | 37,2713 | 37,2096 | 37,2985 | 37,5662 |
| Jordan | 44,3907 | 46,6513 | 40,9751 | 43,9348 | 46,3431 | 46,0398 | 45,3992 | 46,8536 | 41,1510 | 46,0687 | 48,0391 | 47,7870 | 47,1708 | 48,8557 | 49,5634 | 48,0579 | 44,2754 | 42,9905 | 45,1714 | 44,3984 | 47,0040 | 47,2766 | 47,8913 | 49,4214 | 48,7209 | 48,9621 | 48,5214 | 48,5746 |
| Kazakhstan | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kenya | 54,1125 | 53,5616 | 53,2591 | 53,1835 | 52,9997 | 52,0690 | 52,1485 | 52,2661 | 52,0531 | 50,5769 | 51,1363 | 51,9720 | 51,4983 | 51,5367 | 50,8620 | 50,7241 | 51,6998 | 50,4756 | 50,9888 | 50,8262 | 50,2785 | 51,9047 | 52,0386 | 51,7798 | 51,2255 | 50,6709 | 51,2454 | 50,7691 |
| Kuwait | | | | | 51,3316 | 52,2050 | 53,4242 | 52,6654 | 52,3806 | 52,9282 | 54,7581 | 54,4326 | 53,7903 | 51,5955 | 51,3776 | 51,5605 | 51,3030 | 50,9886 | 51,5241 | 51,2191 | 51,1910 | 52,6670 | 52,9132 | 54,7785 | 54,1611 | 54,5608 | 54,4934 | 59,2336 |
| Kyrgyzstan | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Latvia | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lesotho | | | | | | | | | | | | | | | | | | | | 48,0031 | 50,0003 | 48,3450 | 51,4755 | 52,2592 | 51,7659 | 51,5750 | 51,6036 | 51,9662 |
| Lithuania | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Luxembourg | 31,7587 | 30,5640 | 30,7233 | 28,7321 | 28,9412 | 29,2399 | 29,9766 | 31,9777 | 31,1315 | 30,4744 | 30,0861 | 30,6735 | 29,7178 | 29,3793 | 29,4888 | 30,4645 | 31,7388 | 31,9877 | 30,9423 | 32,1171 | 31,9080 | 31,9578 | 32,7037 | 32,4640 | 32,3499 | 34,0156 | 34,3054 | 34,0658 |
| Macao | | | | | | | | | | | | | | | | 28,3919 | 27,5306 | 25,8259 | 24,8842 | 23,9705 | 24,8994 | 23,7816 | 24,2285 | 23,2042 | 23,5433 | 23,8080 | 24,6049 | 25,4459 |
| Macedonia | | | | | | | | | | | | | | | | | | | | | | | | | 30,8025 | 34,7920 | 33,6071 | 35,9126 |
| Madagascar | | | | | 48,8901 | 48,2441 | 48,1911 | 47,4046 | 44,4647 | 45,5420 | 47,3349 | 46,3821 | 44,9828 | 44,7770 | 46,6087 | 46,4384 | 43,9888 | 41,3955 | 42,5079 | 40,5442 | 46,1477 | 47,7322 | 45,9193 | 43,7756 | 44,9430 | 44,4055 | 42,2808 | 44,1592 |
| Malawi | | 47,3689 | 47,8725 | 46,0118 | 43,1599 | 47,4572 | 47,4805 | 47,6175 | 46,5367 | 49,8602 | 48,5647 | 47,7438 | 48,3043 | 49,9201 | 48,8193 | 47,2764 | 49,8702 | 47,5819 | 49,2759 | 48,7342 | 50,0885 | 49,0000 | 50,2728 | 53,5594 | 56,4655 | 55,7058 | 56,5816 | 52,5549 |
| Malaysia | | | | | | 46,6320 | 47,0163 | 46,4621 | 46,7302 | 45,7827 | 44,7619 | 43,6464 | 43,6592 | 43,0848 | 43,4340 | 42,8795 | 41,4827 | 40,8549 | 40,5841 | 41,7064 | 42,7336 | 42,5732 | 43,8291 | 44,8996 | 44,5516 | 44,2876 | 42,7072 | 41,5638 |
| Malta | 42,0271 | 40,2421 | 39,3249 | 38,3424 | 37,8946 | 39,3079 | 37,7826 | 37,3380 | 38,2024 | 39,4544 | 38,4552 | 37,9095 | 35,4426 | 35,2756 | 33,5119 | 33,1333 | 33,2028 | 32,6040 | 32,3415 | 31,0285 | 32,1833 | 32,7217 | 33,3139 | 33,0940 | 32,6242 | 33,1172 | 33,0633 | 33,8341 |
| Mauritius | | | | | | 42,0901 | 40,9536 | 39,7905 | 42,5423 | 46,8185 | 47,3572 | 47,9272 | 48,1436 | 46,9978 | 45,6840 | 46,8082 | 46,3268 | 46,1813 | 46,8849 | 46,6197 | 45,9858 | 43,8459 | 41,9684 | 39,1578 | 37,9385 | 36,8751 | 37,2076 | 36,7561 |
| Mexico | | | | | | | | 42,2920 | 42,4513 | 42,4413 | 43,0586 | 42,2123 | 41,9535 | 42,0829 | 41,7046 | 42,0431 | 42,0630 | 42,2223 | 42,2123 | 41,7942 | 42,4214 | 43,5336 | 43,4607 | 43,7946 | 44,4958 | 45,1748 | 45,0091 | 45,3258 |
| Mongolia | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Morocco | | | | | | | | | | | | | | 51,3261 | 50,6329 | 50,2036 | 50,5278 | 51,0065 | 50,5977 | 50,2324 | 50,0131 | 47,5913 | 47,6672 | 48,4175 | 49,3175 | 49,6235 | 50,2015 | 50,9603 |
| Myanmar | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nepal | | | | | | | | | | | | | | | | | | | | | | | | 48,2888 | 51,4330 | 51,1604 | 50,8841 | 52,8681 |
| Netherlands | 31,9313 | 31,8309 | 31,9348 | 31,8455 | 32,1952 | 31,9817 | 33,1845 | 33,7379 | 33,6861 | 33,9292 | 33,7264 | 33,4756 | 33,4564 | 33,3423 | 32,3502 | 32,1630 | 32,1603 | 32,0382 | 33,3741 | 32,9115 | 34,8658 | 34,6852 | 35,1519 | 34,9963 | 34,3709 | 34,8841 | 35,1840 | 35,1512 |
| New Zealand | 33,9335 | 33,7998 | 33,6264 | 33,7713 | 33,6707 | 33,6899 | 33,4969 | 33,7928 | 33,5287 | 33,6994 | 33,3006 | 32,2535 | 31,4253 | 31,7197 | 31,9522 | 31,6239 | 32,3992 | 32,8972 | 32,0103 | 32,6105 | 32,4566 | 32,5665 | 32,9745 | 37,8162 | 37,7617 | 39,0675 | 39,2395 | 38,7000 |
| Nigeria | 45,2723 | 42,4912 | 45,3767 | 43,9054 | 45,9018 | 46,2576 | 44,9563 | 46,0059 | 46,4315 | 47,7048 | 48,4666 | 48,2831 | 46,6237 | 46,4075 | 45,9879 | 45,9866 | 44,7854 | 42,4971 | 39,9427 | 42,0636 | 46,1638 | 41,6102 | 44,2096 | 45,2685 | 46,3018 | 46,8899 | 47,2064 | 47,4959 |
| Norway | 32,0411 | 32,1590 | 32,1879 | 32,1082 | 32,2446 | 32,0350 | 32,1094 | 31,7969 | 31,8837 | 31,7702 | 31,5708 | 31,7710 | 32,6001 | 32,1147 | 31,7298 | 32,1642 | 32,3720 | 32,3307 | 32,5671 | 32,9249 | 32,9182 | 33,2104 | 33,4555 | 33,1100 | 33,2222 | 33,5845 | 33,9787 | 34,0636 |
| Oman | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pakistan | 45,6248 | 44,4985 | 44,5980 | 45,3371 | 45,1290 | 46,6073 | 44,7221 | 45,2128 | 48,8376 | 48,9543 | 48,3892 | 47,4513 | 46,7755 | 46,3591 | 47,8840 | 48,5991 | 49,6050 | 48,2651 | 47,8150 | 49,1183 | 49,2225 | 49,8796 | 49,0084 | 48,6875 | 49,2832 | 48,8004 | 49,2947 | 49,8156 |
| Panama | 44,0500 | 45,8319 | 44,9732 | 44,6059 | 43,5066 | 43,9389 | 44,0788 | 43,9985 | 43,5340 | 45,2957 | 44,9347 | 45,7892 | 44,9422 | 46,1625 | 45,1429 | 44,4381 | 44,8312 | 43,8980 | 44,1563 | 44,5980 | 45,2274 | 44,3473 | 45,1811 | 45,9718 | 46,8852 | 48,6312 | 47,7462 | 48,6316 |
| Peru | | | | | | | | | | | | | | | | | | | | 48,7930 | 45,7416 | 49,0764 | 49,4869 | 47,8585 | 47,0084 | 47,6651 | 52,2815 | 53,5474 |
| Philippines | 47,4868 | 47,3596 | 47,1538 | 47,0402 | 50,4113 | 47,7058 | 47,8894 | 48,7855 | 47,3002 | 46,2499 | 47,7615 | 48,6926 | 47,6834 | 48,4130 | 49,0183 | 47,8078 | 46,3944 | 45,1479 | 46,4208 | 46,3065 | 48,2091 | 47,3635 | 47,6953 | 48,6728 | 49,0637 | 49,0027 | 48,8098 | 49,3373 |
| Poland | | | | | | | | 31,8574 | 31,6797 | 31,3466 | 31,1298 | 31,3499 | 31,6399 | 31,6846 | 31,0620 | 31,0963 | 31,3467 | 31,4137 | 29,5597 | 29,5388 | 29,8835 | 30,5316 | 31,1236 | 31,7642 | 31,2694 | 30,9764 | 31,6481 | 34,8701 |
| Portugal | 40,9158 | 40,1990 | 38,8748 | 39,4025 | 39,4822 | 39,5518 | 40,2985 | 40,7764 | 37,8992 | 37,1525 | 36,9434 | 37,0529 | 34,3350 | 34,6834 | 34,3250 | 34,6038 | 34,2653 | 34,1359 | 34,7730 | 35,1414 | 35,1215 | 35,5297 | 36,3062 | 36,2465 | 36,0673 | 37,2919 | 37,4611 | 36,2964 |
| Qatar | | | | | | | | | | | | | | | | | | | | | | | | 52,9039 | 53,3857 | 55,7467 | 54,7934 | 56,1565 |
| Republic of Korea | 44,2485 | 43,9320 | 44,7589 | 44,8071 | 44,0192 | 45,2967 | 44,5298 | 44,6690 | 45,3536 | 45,4862 | 43,2481 | 43,4729 | 43,6281 | 42,5179 | 42,1895 | 41,3836 | 40,1862 | 40,9408 | 41,5667 | 41,0035 | 41,4652 | 40,2146 | 39,9969 | 39,3557 | 38,3231 | 38,1428 | 38,2208 | 38,7784 |
| Republic of Moldova | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Romania | 34,2891 | 33,7064 | 33,1346 | 33,6083 | 33,6781 | 33,4466 | 31,8753 | 31,5076 | 33,6880 | 32,5919 | 31,0149 | 32,8751 | 33,4862 | 34,9536 | 33,6646 | 31,1770 | 32,1955 | 31,9327 | 30,1173 | 31,2334 | 32,9792 | 30,3941 | 31,1795 | 32,9851 | 31,0056 | 30,4560 | 31,9369 | 29,5756 |
| Russian Federation | 28,9269 | 28,4978 | 27,6685 | 26,9168 | 26,3792 | 25,6213 | 25,3792 | 25,3962 | 25,4852 | 25,4891 | 25,3634 | 25,1977 | 25,0029 | 24,6158 | 24,4942 | 24,2287 | 24,1863 | 24,3963 | 24,5274 | 24,7953 | 24,1233 | 24,8003 | 24,7998 | 24,9333 | 24,8543 | 24,8385 | 26,1072 | 27,1326 |
| Senegal | | | | | | | | | | | | 40,5458 | 39,6364 | 42,0529 | 42,3026 | 40,4665 | 40,6641 | 40,6972 | 48,2508 | 49,1788 | 48,1251 | 47,7959 | 37,4088 | 40,6520 | 43,0004 | 47,6477 | 46,5661 | 44,9197 |
| Singapore | 44,3716 | 45,4346 | 46,6196 | 46,4379 | 46,0827 | 46,1137 | 46,0881 | 45,9468 | 44,8312 | 42,8927 | 40,6839 | 39,7039 | 39,3402 | 39,2471 | 38,7900 | 37,6062 | 36,3038 | 35,4537 | 35,4849 | 35,8758 | 36,1459 | 35,7858 | 36,9581 | 37,6119 | 36,5829 | 34,7725 | 34,8383 | 34,7585 |
| Slovakia | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Slovenia | | | | | | | | | | | | | | | | | | | | | | | | | 24,2269 | 24,7894 | 26,6950 | 28,6671 |
| South Africa | 43,4474 | 43,1480 | 42,9635 | 43,3325 | 43,2556 | 43,2871 | 43,1272 | 43,2361 | 43,2041 | 44,1323 | 43,0592 | 43,2238 | 43,4235 | 42,6243 | 42,9924 | 43,3702 | 43,9403 | 44,2760 | 44,1500 | 44,1659 | 44,1656 | 44,1972 | 44,9858 | 44,6814 | 44,6855 | 44,6139 | 44,9363 | 45,1341 |
| Spain | 42,5660 | 42,3132 | 41,8622 | 42,6689 | 42,4072 | 42,4397 | 42,7068 | 42,7073 | 42,4095 | 42,2893 | 42,3323 | 42,4937 | 41,5003 | 41,6325 | 41,7704 | 38,4713 | 38,9809 | 38,5728 | 39,0555 | 39,2474 | 39,2667 | 39,4799 | 40,1999 | 40,5463 | 40,5581 | 41,0360 | 41,3068 | 41,2027 |
| Sri Lanka | | | | 52,1441 | 52,7331 | 50,1510 | 49,8766 | 52,3130 | 50,2551 | 49,5967 | 50,3330 | 49,4635 | 48,2829 | 49,5281 | 51,0117 | 50,1811 | 48,7728 | 48,5524 | 50,1156 | 48,6365 | 46,9671 | 48,1666 | 48,2545 | 45,9682 | 49,1549 | 47,8511 | 46,0011 | 47,0774 |
| Swaziland | | | | | 55,6978 | 54,8510 | 52,6391 | 51,0135 | 50,9392 | 50,9475 | 54,1951 | 53,5508 | 52,4443 | 50,5430 | 54,9266 | 52,9771 | 49,4375 | 52,1941 | 50,6310 | 50,3800 | 51,3322 | 48,9464 | 48,7408 | 46,5292 | 52,7062 | 54,1247 | 53,6588 | 52,2561 |
| Sweden | 29,8522 | 29,3452 | 29,0233 | 28,9668 | 28,9478 | 28,9452 | 28,1993 | 28,3620 | 28,2067 | 27,9859 | 28,0769 | 27,7693 | 27,6759 | 27,8108 | 27,8249 | 27,8713 | 27,7993 | 27,7726 | 28,1070 | 28,6791 | 29,0495 | 29,0773 | 29,2028 | 29,3525 | 29,1908 | 29,3981 | 29,3987 | 29,3065 |
| Syrian Arab Republic | 47,2206 | 46,9228 | 46,9342 | 46,7275 | 46,6515 | 45,9018 | 46,5386 | 44,9010 | 44,6212 | 44,3029 | 43,9444 | 43,5438 | 43,2794 | 43,8792 | 45,2386 | 45,1839 | 45,3618 | 49,4213 | 49,8377 | 49,4830 | 37,5561 | 42,3820 | 39,4167 | 41,4167 | 39,7397 | 41,9927 | 41,9202 | 40,5579 |
| Taiwan | | | | | | | | | | | 35,3629 | 36,3947 | 37,1539 | 34,7551 | 33,8050 | 33,8785 | 34,0699 | 32,8633 | 32,2671 | 32,1301 | 31,3461 | 30,1042 | 30,2714 | 29,6079 | 29,2314 | 29,8731 | 30,9852 | 31,4347 |
| Thailand | | | | | | 50,0251 | 50,2108 | 48,4744 | 49,9962 | 50,7179 | 50,8668 | 50,9674 | 50,9115 | 50,7807 | 52,4333 | 52,1143 | 51,3745 | 51,1343 | 50,0872 | 49,0008 | 47,7855 | 48,5221 | 46,3774 | 45,5796 | 45,8731 | 48,7669 | 50,9233 | 47,8958 |
| Tunisia | 47,8515 | 49,0199 | 48,4348 | 48,4433 | 47,3618 | 47,4286 | 46,9935 | 46,7787 | 46,7587 | 46,8578 | 47,1477 | 48,1744 | 47,5790 | 47,7219 | 46,0115 | 45,7703 | 45,1993 | 45,1261 | 44,9188 | 44,4396 | 45,8157 | 45,4219 | 46,1147 | 45,8431 | 45,5814 | 46,8469 | 46,7477 | 47,5264 |
| Turkey | 45,7005 | 46,4344 | 45,6168 | 45,2477 | 44,8863 | 44,7979 | 44,2866 | 43,8871 | 44,7766 | 45,5540 | 43,7711 | 43,3937 | 44,3085 | 43,4065 | 44,1097 | 45,1447 | 47,9168 | 46,5122 | 45,9297 | 45,2035 | 44,5641 | 44,7504 | 44,5231 | 44,3704 | 44,9698 | 45,1591 | 46,9923 | 47,9175 |
| Uganda | 48,4148 | 48,9192 | 49,8235 | 50,0781 | 49,9983 | 50,3295 | 50,9255 | 49,2067 | 51,3594 | 54,0440 | 54,2050 | 52,1739 | 49,1361 | 49,7205 | 54,7037 | 52,7639 | 50,6061 | 49,6979 | 45,4555 | 43,6895 | 47,7686 | 49,1971 | 49,1926 | 49,1022 | 52,6800 | 51,6734 | 53,3535 | 50,5904 |
| Ukraine | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| United Kingdom | 29,0943 | 28,5038 | 29,8239 | 29,0587 | 30,7810 | 29,0244 | 29,1201 | 29,2540 | 29,3058 | 30,0031 | 29,8810 | 29,6194 | 30,0869 | 30,1038 | 29,8213 | 30,2197 | 30,3602 | 31,0383 | 32,1831 | 32,9132 | 33,4184 | 33,6910 | 34,2174 | 34,4358 | 34,6898 | 34,6303 | 34,9325 | 35,5295 |
| United Republic of Tanzania | | | 49,7954 | 53,2094 | 52,8348 | 52,5679 | 52,8645 | 52,1076 | 52,2303 | 53,3677 | 52,2660 | 49,7976 | 46,1339 | 46,4806 | 50,8493 | 47,1585 | 47,0878 | 45,9836 | 46,4291 | 45,4529 | 48,2230 | 47,1819 | 47,1322 | 51,8146 | 51,8392 | 52,3595 | 51,5558 | 48,3759 |
| United States of America | 37,2737 | 37,1273 | 36,7680 | 36,2218 | 35,7107 | 35,6435 | 35,5064 | 35,9626 | 36,5196 | 36,6536 | 36,4741 | 36,6119 | 37,3910 | 37,6837 | 37,5059 | 37,2971 | 37,1854 | 37,5536 | 37,9434 | 38,2214 | 38,6116 | 38,5533 | 38,6377 | 38,8472 | 38,5203 | 38,5407 | 38,6426 | 38,8419 |
| Uruguay | | | | | | 40,7636 | 40,9968 | 40,6643 | 40,2806 | 39,1612 | 37,7562 | 38,9123 | 40,0000 | 39,0942 | 38,1142 | 38,3483 | 37,6770 | 40,3462 | 40,4380 | 41,5159 | 42,0030 | 41,8966 | 41,6447 | 41,8668 | 41,4502 | 41,5715 | 41,4229 | 41,9046 |
| Venezuela | 46,4833 | 47,4568 | 46,5986 | 45,1850 | 44,5583 | 44,4487 | 44,4290 | 43,2723 | 43,7621 | 42,8634 | 42,3688 | 40,8782 | 41,1602 | 40,3784 | 40,4865 | 39,9291 | 39,1496 | 39,2786 | 39,5324 | 41,4751 | 42,3334 | 41,9359 | 41,3175 | 42,0218 | 42,6774 | 42,2888 | 42,5135 | 44,4668 |
| Yemen | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Zimbabwe | 46,1150 | 45,6869 | 45,5674 | 46,3938 | 45,8661 | 45,4878 | 45,6272 | 45,0497 | 45,1791 | 45,4181 | 45,1493 | 44,9004 | 44,2533 | 44,3229 | 44,7212 | 44,9004 | 45,4579 | 44,5818 | 43,0088 | 43,2079 | 43,5265 | 44,7013 | 44,1238 | 43,7555 | 43,7156 | 44,7909 | 44,4524 | 45,2190 |

| Countryname | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Afghanistan | **39,7091** | **42,8846** | **44,3668** | **46,8231** | **48,6035** | **42,9142** | **43,2873** | **44,0565** | **44,0420** | **46,3409** | **47,8398** | 43,6100 | 36,2701 | 36,5353 | 34,8394 | 31,5270 | 40,8136 | 36,7312 | 43,9563 | 44,2617 | **44,1817** | 43,2219 | 43,5146 | **43,5843** | **43,2825** | **42,7813** | **42,2933** | **41,9969** | **41,8645** |
| Albania | **34,1394** | **33,8425** | 35,0978 | 57,8951 | 51,7785 | 45,1261 | 42,3734 | 43,0461 | 44,0224 | 45,9884 | 44,5173 | 43,8975 | 49,6820 | 48,0036 | 48,4716 | 47,4532 | 47,1012 | 47,8125 | 46,9058 | 46,8274 | **44,7641** | 43,4393 | 42,7200 | 44,1345 | 43,9274 | **42,9555** | **42,2201** | **43,2320** | **44,2325** |
| Algeria | 38,4970 | 39,8167 | 39,5924 | 39,4686 | 44,1515 | **39,3661** | **39,6514** | **40,3611** | **41,6933** | **43,2363** | **44,2443** | **44,5668** | **44,2869** | **43,2860** | **41,6935** | **40,3327** | **39,6526** | **39,4413** | **39,4997** | **39,7811** | **40,1627** | **40,3693** | **40,2325** | **39,7020** | **38,9953** | **38,5117** | **38,3026** | **38,2301** | **38,2070** |
| Argentina | **47,7231** | **46,5660** | 46,7293 | 46,6930 | 46,7177 | 47,1906 | 45,7619 | 48,6425 | 48,4616 | 48,7400 | 49,5270 | 50,2793 | **50,1231** | **48,4822** | **46,7531** | **46,7567** | **48,9674** | **49,8197** | **48,7159** | **46,6057** | **44,8666** | **43,5559** | **43,5899** | **43,1050** | **42,7808** | **45,8585** | **45,7159** | **46,7095** | **46,7092** |
| Armenia | | | | 47,8971 | 55,2644 | 57,2357 | 57,2655 | 47,3893 | **47,4417** | **48,0431** | **51,8535** | **55,4979** | **50,6276** | **48,5228** | **48,6450** | **52,0170** | **51,2504** | **55,7847** | **53,2598** | **50,3595** | **48,2960** | 46,7853 | 47,3037 | 46,7389 | **46,3522** | **45,6088** | **45,1250** | **44,8337** | **47,7039** |
| Australia | **35,9768** | **35,9664** | **36,5611** | **37,2816** | **37,2955** | 36,7075 | 36,2915 | 37,2949 | 36,6300 | 36,8320 | 36,7161 | 37,9195 | **38,2453** | **38,6575** | **37,8680** | **37,9452** | 39,5032 | 40,4697 | 40,2879 | 40,7733 | **41,5479** | 40,7514 | 41,8423 | 41,7922 | 42,0838 | **42,7621** | **43,3696** | **42,4984** | **42,5152** |
| Austria | 35,6848 | 35,8062 | 35,8369 | 35,8270 | 35,0822 | 35,2731 | 35,6405 | 35,6196 | 35,7693 | 36,2112 | 35,4973 | 35,5397 | 35,7414 | 35,4732 | 35,9783 | 35,8322 | 35,5322 | 35,5134 | 36,0035 | 36,3618 | **36,8623** | 36,9670 | 36,8111 | 36,6108 | 36,4908 | **35,9505** | **35,6410** | **36,5858** | **36,5789** |
| Azerbaijan | | | 42,1134 | 47,7253 | **48,7908** | **49,4470** | 50,8084 | 51,6388 | 54,2875 | 55,7682 | 54,9015 | 56,4938 | 56,5631 | 54,7491 | 53,5039 | 53,3072 | 51,5452 | 51,2924 | 51,0078 | 48,2752 | **45,6519** | 48,9638 | 47,3276 | 46,6688 | **45,7572** | **48,7962** | **49,6258** | **47,6108** | **49,6096** |
| Bangladesh | 48,8789 | 49,2394 | **48,0709** | **47,8068** | **47,8223** | **48,0393** | **48,6601** | 50,1643 | **49,2925** | **48,0775** | **48,7130** | **47,9691** | **49,7579** | **49,7680** | **50,5117** | **49,8649** | **48,9552** | **49,8665** | **48,6283** | **49,3381** | **47,1332** | **48,0436** | **49,0402** | **48,1231** | **47,3303** | **49,6582** | **48,9747** | **50,1666** | **49,2522** |
| Belgium | **38,2361** | **38,1200** | **38,2895** | **38,0917** | 38,0585 | 38,6493 | 39,0895 | 38,8383 | 38,4337 | 38,4986 | 38,9725 | 39,0865 | 40,0039 | 40,0823 | 40,4997 | 40,3052 | 40,0340 | 40,7533 | 41,3960 | 41,2744 | **41,1015** | 42,4561 | 42,8364 | 42,6310 | 42,6372 | **42,9642** | **42,0158** | **42,0224** | **41,5232** |
| Bolivia | 50,8697 | 50,4755 | 50,9059 | 51,0686 | 51,0842 | 50,8397 | 50,0583 | 50,6675 | 50,8631 | 51,4207 | 51,6984 | **51,3824** | **51,2463** | **51,1869** | **51,1635** | **51,3425** | **51,9844** | **52,3257** | **51,6347** | **49,8028** | **48,9538** | **48,7813** | **48,7686** | **49,3678** | **52,0952** | **52,1958** | **52,0093** | **51,8969** | **51,8469** |
| Botswana | 48,1009 | 48,8558 | 48,1587 | 47,9851 | 49,4027 | 49,7005 | 48,2940 | 51,4220 | **50,9228** | 49,9664 | 49,6521 | 46,1681 | **47,0587** | **45,7798** | **44,3338** | **45,1772** | **47,6047** | **48,8359** | **51,0241** | **52,2644** | **48,7473** | **45,9129** | **46,2593** | **46,4346** | **46,4973** | **46,5782** | **46,2499** | **46,0510** | **45,9622** |
| Brazil | | | 48,6951 | 49,1545 | 49,0197 | 48,8222 | 48,6785 | 49,2757 | 49,6876 | 49,6170 | 49,9312 | 49,6135 | 49,4757 | 49,6234 | 49,3961 | 49,7706 | 48,6710 | 48,0436 | 47,9996 | 47,6954 | **47,4776** | 47,1534 | 47,0635 | 47,1555 | 47,5752 | **47,3880** | **47,5123** | **47,1232** | **47,2242** |
| Bulgaria | 32,9517 | 36,9348 | 38,5776 | 41,3599 | 39,5714 | 40,5341 | **40,9117** | 41,0759 | 41,4458 | 42,5678 | 42,5858 | 42,4939 | 42,4793 | 42,6218 | 42,5166 | 42,0385 | 42,6228 | 43,0604 | 42,5492 | 43,1212 | **42,1808** | 42,6872 | 42,4489 | 41,8849 | 41,5564 | **41,3715** | **42,3520** | **41,8506** | **42,1505** |
| Burundi | 52,1029 | **52,9832** | **53,2611** | **53,8922** | **52,3233** | **51,2474** | **50,5323** | **50,0137** | **50,0619** | **52,8473** | **53,5241** | **52,2941** | **51,1292** | **52,8574** | **50,3589** | **55,8591** | 56,8885 | 56,0050 | 58,0404 | 57,4785 | **56,4213** | 56,2013 | 55,4092 | **55,6217** | **56,7617** | **57,4544** | **56,2197** | **56,4826** | **57,1563** |
| Cameroon | 54,8261 | 55,5225 | 55,2974 | 55,2847 | 56,8971 | 56,6102 | 56,2390 | 56,7137 | 56,4421 | 55,8857 | 54,4579 | 55,1299 | **53,8976** | **52,4467** | **50,8368** | **53,2656** | **55,3026** | **55,3072** | **55,5401** | **55,9264** | **55,2791** | **54,5203** | **53,1145** | **55,6368** | **55,0971** | **55,8614** | **56,0811** | **56,0910** | **56,0914** |
| Canada | 37,5950 | 37,5662 | 38,3057 | 38,3385 | 38,1697 | 37,9467 | 38,1168 | 37,8897 | 38,1394 | 38,4729 | 38,5232 | 38,5660 | 38,5385 | 38,4711 | 37,9647 | 37,8978 | 38,4575 | 38,9568 | 38,9381 | 39,3034 | **38,3433** | 38,7589 | 38,7547 | 38,8266 | 38,8513 | **38,3433** | **38,1289** | **38,5262** | **38,2699** |
| Chile | 46,9572 | 46,5505 | 46,4149 | 46,2907 | 46,5519 | 46,7574 | 47,0583 | 48,8014 | 48,2128 | 47,7307 | 48,5959 | 48,9103 | 48,8874 | 49,8697 | 50,3217 | 47,9969 | **47,1912** | **48,3736** | **48,3590** | **47,9460** | **48,0332** | **48,9411** | **49,6049** | **49,8689** | **49,9507** | **47,9849** | **48,7496** | **48,7809** | **48,7830** |
| China | **38,8434** | **42,3640** | **40,7309** | **39,5001** | **41,7957** | **39,8188** | **38,6445** | **38,3301** | **38,0241** | **38,8162** | **39,6422** | **39,3642** | 42,6938 | 41,6262 | 40,9967 | 40,7280 | 40,0308 | 38,8695 | 39,9983 | 38,7789 | **38,9917** | **37,6775** | **37,5286** | **37,4162** | **38,2562** | **38,4680** | **38,9352** | **38,2537** | **38,5645** |
| Colombia | 45,8802 | 47,1317 | 46,9046 | 46,8184 | 46,7499 | 46,6133 | 46,5918 | 46,8607 | 47,2819 | 47,0725 | 47,6000 | 47,5060 | 47,6665 | 46,9945 | 46,8754 | 46,4573 | **44,7761** | 44,2018 | 43,8690 | 42,4379 | **41,7555** | 41,4729 | 45,1461 | 44,8083 | 44,8036 | **44,8388** | **44,7294** | **44,9867** | **43,7286** |
| Congo | **48,4919** | **48,2560** | **46,1936** | **47,6153** | **48,1021** | **48,6085** | **48,2818** | **47,1514** | **47,1658** | **47,1205** | **47,4804** | **48,0771** | **50,5800** | **50,0331** | **48,7838** | **49,1600** | **49,3661** | **48,5202** | **48,0003** | **48,2567** | **47,9249** | **47,8347** | **48,4980** | **48,6558** | **47,7954** | **48,6162** | **49,7876** | **48,4871** | **48,7968** |
| Costa Rica | 44,3337 | 44,0162 | 42,9838 | 44,6501 | 41,5176 | 44,7195 | 42,6455 | 42,4887 | 43,8232 | 43,8328 | 43,9672 | 44,6039 | 44,7708 | **44,6291** | **44,6472** | **43,4663** | **43,2268** | **42,8797** | **42,4150** | **44,7777** | **43,2382** | **44,7939** | **44,6956** | **43,8651** | **44,9883** | **43,1858** | **43,0780** | **44,0702** | **43,0697** |
| Croatia | 38,3060 | 30,9201 | 33,3689 | 36,8390 | 37,8540 | 39,4767 | 39,5069 | 41,3469 | 41,8431 | 42,3106 | 42,8677 | 42,9098 | 42,7189 | 42,6211 | 42,7218 | 42,7175 | 42,1178 | 41,7250 | 41,6142 | 42,2906 | **42,3716** | 42,7317 | 42,8168 | 41,6813 | 41,7608 | **42,0132** | **42,0133** | **42,0148** | **42,0309** |
| Cuba | **35,5203** | **35,4213** | **34,6242** | **33,3239** | **33,9307** | **32,8271** | **32,6870** | **32,6514** | **32,5263** | **32,6663** | **33,4132** | **33,1592** | **32,7756** | **32,9808** | **33,6026** | **33,7744** | **33,8089** | **34,6769** | **32,9850** | **32,4857** | **33,8597** | **35,0114** | **34,7830** | **34,6128** | **33,9320** | **33,6221** | **34,9120** | **35,4829** | **35,5203** |
| Cyprus | 39,1407 | 39,3001 | 39,6192 | 38,9641 | 39,3479 | 39,7906 | 39,7702 | 39,7175 | 40,5581 | 38,4183 | 38,3879 | 37,5459 | 38,7079 | 38,6224 | 36,4649 | 36,5535 | 36,5672 | 36,8464 | 35,8993 | 36,1816 | **36,8108** | 35,5616 | 36,9426 | 36,9794 | 36,9105 | **36,7976** | **36,9781** | **35,2766** | **36,1765** |
| Czech Republic | 26,9376 | 28,5493 | 29,6252 | **29,3104** | 29,3595 | 29,6906 | 29,9145 | 30,4044 | 30,9709 | 31,1198 | 30,7155 | 30,6912 | 31,0832 | 30,3206 | 30,6110 | 30,5785 | 29,9059 | 30,2942 | 31,9585 | 31,9414 | **31,1444** | 31,9620 | 32,0113 | 31,7406 | 30,8710 | **32,5650** | **31,5098** | **31,8180** | **31,6115** |
| Denmark | 31,3462 | 30,6374 | 30,3259 | 30,6696 | 30,7686 | 31,3563 | 29,8636 | 30,8726 | 31,0786 | 31,8077 | 31,3681 | 32,5201 | 32,9575 | 31,7880 | 32,8959 | 33,7872 | 33,2248 | **33,2055** | 36,0305 | 37,1394 | **36,1508** | 34,1560 | 34,0767 | 34,3130 | 34,1764 | **34,0150** | **33,9559** | **34,1508** | **33,5504** |
| Dominican Republic | **48,6107** | **50,3985** | **50,4073** | **50,0099** | **50,3628** | **52,9788** | **51,6593** | **51,3009** | **50,2446** | **52,0335** | **49,3912** | **48,6107** | **51,1561** | **51,2387** | **51,6004** | **51,4169** | **50,0037** | **50,8187** | **50,3985** | **50,4073** | **50,0099** | **50,3628** | **52,9788** | **51,6593** | **51,3009** | **50,2446** | **52,0335** | **49,3912** | **48,6107** |
| Ecuador | 48,4089 | 49,0535 | 49,5487 | 50,6801 | 48,6084 | 51,1338 | 50,8882 | 50,3570 | 50,3978 | 48,7518 | 45,7473 | 44,4664 | 43,9490 | 48,6682 | 49,9533 | 48,0803 | 47,0529 | 46,8302 | 46,8860 | **46,5266** | **46,9359** | 46,1062 | 47,2313 | 47,7345 | 47,7742 | **46,1279** | **46,9054** | **46,4893** | **46,6882** |
| Egypt | 47,4070 | 47,6519 | 48,4286 | 48,8065 | 48,8170 | 49,5737 | 50,1984 | 49,1249 | **50,4961** | **50,7699** | **50,9993** | 52,9214 | **52,0495** | 53,3187 | 53,4030 | 53,4930 | **53,9801** | **53,5138** | **52,6072** | **52,5620** | **53,8280** | 53,6214 | 53,8353 | 53,7209 | **53,2365** | **52,9768** | **52,8191** | **52,9738** | **52,0624** |
| El Salvador | **46,4305** | **48,0370** | **49,9199** | 50,6389 | **49,8651** | 49,4088 | 47,0741 | 48,3504 | **50,5838** | **50,0545** | **50,2481** | **48,6815** | **49,6042** | **49,9473** | **50,0133** | **50,2664** | **50,8749** | **50,1110** | **49,0539** | **50,2685** | **47,8957** | **46,2163** | **46,0395** | **49,4131** | **50,3995** | **49,7075** | **49,0531** | **49,5237** | **49,9225** |
| Eritrea | **46,2573** | 46,3487 | 45,9951 | 45,6978 | 48,4158 | 45,6791 | 47,5244 | 45,6569 | 48,6300 | 50,3944 | 50,8386 | 45,3735 | 44,8533 | 46,7199 | 46,7730 | 46,6861 | 46,1854 | 48,7299 | 49,6591 | 54,1226 | **52,8486** | 51,9597 | 52,6108 | 52,0672 | **52,2502** | **51,0111** | **50,6584** | **49,6426** | **51,6419** |
| Estonia | | | 44,4731 | 43,7433 | 42,6018 | 43,6197 | 44,4796 | 42,8902 | 38,5702 | 37,0083 | 37,9787 | 37,6895 | 37,4433 | 37,0705 | 36,9124 | 36,5495 | 36,5590 | 36,0311 | 37,0000 | 37,2032 | **36,9989** | 36,8217 | 36,7138 | 36,2577 | 36,2785 | **36,0541** | **36,1550** | **36,7550** | **36,0550** |
| Fiji | 51,4571 | 49,4626 | **48,0910** | **47,8097** | **46,8167** | 43,6669 | 41,6599 | 46,0510 | **44,1203** | 42,4120 | 45,2455 | 41,3587 | 40,4692 | 42,2570 | 46,7088 | 44,2821 | 44,8802 | 47,4191 | 45,7598 | 45,2215 | **45,4827** | 45,2421 | 45,9428 | **45,0816** | **45,6450** | **45,4827** | **45,5895** | **45,1689** | **46,2437** |
| Finland | 34,5565 | 33,5780 | 33,8744 | 33,3906 | 33,1726 | 32,9787 | 33,1858 | 33,1868 | 32,7314 | 32,8658 | 33,2685 | 33,1641 | 33,6531 | 34,2578 | 33,7815 | 34,1897 | 34,1939 | 34,2094 | 35,6922 | 36,0371 | 35,8753 | 36,0303 | 35,8597 | 36,4096 | 35,9552 | **35,2599** | **36,4462** | **36,2634** | **36,8648** |
| France | 36,3837 | 36,9003 | 37,5524 | 37,8754 | 37,8527 | 36,3393 | 36,4971 | 36,6073 | 36,7468 | 36,9391 | 36,6535 | 36,9629 | 36,9956 | 36,2435 | 37,2039 | 37,4539 | 37,3873 | 35,9760 | 37,7834 | 38,1459 | 37,5739 | 37,3274 | 38,0298 | 37,9971 | 37,9398 | **37,9110** | **37,4577** | **37,7840** | **37,1285** |
| Georgia | | | | | | | | 48,9490 | 47,5495 | 52,4865 | 50,3510 | 50,7547 | 50,2689 | 49,8806 | 48,2135 | 48,1024 | 47,3584 | 46,8598 | 45,9544 | 45,4066 | **44,5263** | **44,7280** | **45,4137** | **47,1939** | **47,3454** | **46,5766** | **45,2774** | **45,0179** | **44,9968** |
| Germany | | | 33,0006 | 33,7481 | 34,2608 | 35,5964 | 35,9036 | 35,3751 | 34,9611 | 36,5194 | 35,9019 | 36,2706 | 36,9739 | 37,2363 | 37,8040 | 38,0888 | 37,7032 | 37,6689 | 37,8226 | 38,5056 | **38,8606** | 38,3148 | 38,3704 | 38,2915 | 38,2236 | **38,4397** | **37,5427** | **38,5516** | **38,2523** |
| Ghana | **50,8912** | **50,9054** | 49,3209 | 49,3175 | 49,3118 | **48,3773** | **48,8664** | **48,0773** | **47,2420** | **47,1400** | **47,1655** | **47,6388** | **47,7171** | **47,4338** | **47,3943** | **47,2429** | **48,9081** | **49,3360** | **50,5668** | **50,6253** | **50,9661** | **46,4810** | **50,6808** | **50,8912** | **50,9054** | **50,7572** | **49,0069** | **50,2641** | **50,1643** |
| Greece | 44,7204 | 44,7819 | 43,9292 | 43,9291 | 44,2915 | 44,8490 | 44,1161 | 44,1763 | 43,9766 | 43,9408 | 45,3388 | 45,3595 | 45,0179 | 45,0365 | 45,1541 | 44,2302 | 44,2801 | 44,4090 | 44,5744 | 41,2291 | 40,8831 | 45,1096 | 45,5105 | 45,4743 | 45,4353 | **45,4066** | **45,4086** | **45,5088** | **45,9088** |
| Guatemala | 55,1736 | 54,5451 | 55,2533 | 54,3145 | 53,5328 | **49,8683** | 48,9984 | 50,0040 | **50,2699** | **51,3077** | **53,1299** | **55,6704** | **55,6617** | **52,6050** | **51,0273** | 49,2215 | 50,2699 | 51,3077 | 53,1299 | 55,6704 | 55,6617 | 52,6050 | 51,0273 | 52,6050 | 51,0273 | **50,2589** | **50,1055** | **49,0930** | **49,8921** |
| Honduras | 50,5025 | 49,1743 | 50,2727 | 50,7390 | 48,1843 | **45,2342** | **46,0281** | **48,1540** | **48,2702** | **46,8477** | **45,5337** | **46,0645** | **46,0783** | **45,2620** | 44,7832 | 49,5004 | 50,7775 | 50,7437 | 48,1679 | 45,2342 | 46,0281 | 48,1540 | 48,2702 | 46,8477 | 45,5337 | **46,0645** | **46,0783** | **45,2620** | **44,7832** |
| Hungary | 34,3944 | 36,6121 | 39,1539 | 39,6676 | 39,6450 | 40,2401 | 40,5020 | 40,2096 | 40,1798 | 39,3761 | 39,8858 | 39,9577 | 40,2075 | 40,7123 | 41,6635 | 40,5788 | 40,2043 | 39,9150 | 41,0937 | 41,4515 | **41,1119** | 40,8598 | 40,4304 | 40,4907 | 39,8730 | **40,3407** | **39,4168** | **40,4222** | **40,4226** |
| India | 50,0995 | 50,5398 | 50,2465 | 50,7340 | 50,9104 | 50,4405 | 51,0466 | 50,9748 | 51,0859 | 51,9401 | 52,1760 | 52,3457 | 52,7767 | 52,2028 | 51,9454 | 51,7154 | 51,8158 | 51,7211 | 50,8496 | 50,8534 | **50,8103** | 50,6678 | 50,4595 | 50,4481 | 50,4396 | **50,1977** | **50,4447** | **50,7480** | **50,5483** |
| Indonesia | 48,2103 | 47,8126 | 46,6497 | 47,4748 | 49,9268 | 48,2102 | 48,2307 | 51,4419 | 50,4402 | 47,8817 | 52,9578 | 47,1586 | 50,5296 | 48,8693 | 49,8274 | 47,7762 | 46,5993 | 51,1336 | 50,3000 | 50,6019 | **45,9982** | 47,9994 | 48,7734 | 48,6927 | 48,6362 | **49,7329** | **48,7289** | **48,7286** | **49,1286** |
| Iran | 41,4069 | 44,1965 | 45,5415 | 43,8682 | 42,5182 | 44,6355 | 45,4586 | 46,1608 | 46,2513 | 46,9371 | 46,3407 | 46,1789 | 46,6744 | 46,8589 | 46,6255 | 48,3568 | 48,4630 | 46,8498 | 46,5126 | 46,3967 | **46,9751** | 47,0403 | 48,4323 | 48,3521 | 48,3365 | **48,4505** | **48,1461** | **48,7242** | **48,4227** |
| Ireland | 37,4593 | 37,5218 | 37,4652 | 37,0499 | 37,5714 | 37,0260 | 36,3939 | 35,8899 | 35,2548 | 34,5055 | 34,8224 | 34,8764 | 34,5166 | 34,6791 | 36,5165 | 36,3832 | 36,7274 | 37,9009 | 39,2674 | 39,5264 | **39,7100** | 39,7444 | **39,6105** | **39,7090** | **38,7097** | **38,6284** | **38,7461** | **39,6545** | **38,7551** |
| Israel | 42,4391 | 42,6019 | 42,4653 | 41,8308 | 42,0368 | 42,2784 | 42,3955 | 42,6981 | 42,9763 | 43,3270 | 42,9224 | 43,4171 | 43,4226 | 44,3725 | 44,2843 | 44,9878 | 44,2806 | 43,6657 | 44,1243 | 44,3653 | **44,6950** | 44,2674 | 43,8758 | 43,4660 | 43,4142 | **43,0424** | **43,7904** | **43,5790** | **43,2786** |
| Italy | 37,9998 | 38,6464 | 38,7431 | 38,5941 | 37,3852 | 36,4351 | 37,7487 | 37,1461 | 37,1256 | 36,9696 | 36,6897 | 36,7715 | 36,8192 | 36,5645 | 37,0002 | 36,8740 | 36,6335 | 36,6641 | 36,4255 | 37,0803 | 37,0556 | 37,3724 | 37,3622 | 37,3349 | 37,2270 | **37,1581** | **37,2292** | **37,4192** | **37,6159** |
| Jamaica | **51,8740** | **49,4993** | **48,8050** | **48,1572** | **47,9646** | **47,7982** | **48,1255** | **49,8091** | **50,6369** | 51,2460 | 51,2935 | 51,4049 | 49,9721 | 50,6851 | **51,1216** | **49,6950** | **47,7374** | **46,3767** | **48,2537** | **49,5663** | **46,8440** | **47,5530** | **47,6773** | **48,0914** | **50,8608** | **51,3918** | **49,7160** | **48,7393** | **51,7408** |
| Japan | 37,3631 | 37,1894 | 37,1754 | 41,4007 | 41,5018 | 41,7025 | 41,8411 | 42,1241 | 42,3831 | 42,6004 | 43,5021 | 44,2901 | 44,4699 | 44,5042 | 44,4471 | 44,4255 | 44,2188 | 43,9836 | 43,7878 | 43,8795 | **46,5039** | **43,4463** | 43,8262 | **43,0224** | **43,8747** | **44,9144** | **43,7918** | **43,3830** | **43,7824** |
| Jordan | **49,4530** | **47,4117** | 46,2498 | 48,8865 | 46,2129 | 46,5209 | 46,6365 | 47,1931 | 52,2649 | 48,8949 | 50,7465 | 48,5860 | 50,4366 | 50,1804 | 50,2051 | 50,2630 | 49,6624 | 49,0450 | 48,9879 | 50,8910 | 52,1415 | 52,1650 | 52,6778 | 51,3032 | 51,5731 | **50,8908** | **50,2646** | **50,6640** | **51,8640** |
| Kazakhstan | | | | | | | | 47,7383 | 49,5539 | 50,1520 | 49,4539 | 48,5441 | 47,6018 | 46,4295 | 44,9585 | 44,0846 | 43,2597 | **43,5352** | 45,0465 | 45,7512 | **45,8475** | 46,0587 | 48,0084 | 47,0681 | **48,1245** | **47,0343** | **46,9886** | **45,9607** | **46,0483** |
| Kenya | 50,8946 | 50,4742 | 49,8212 | 49,4930 | 49,9583 | 47,8117 | 47,5723 | 49,4499 | 50,9690 | 49,6556 | 48,7083 | 53,1468 | 48,0015 | 50,6520 | 50,6457 | 50,6471 | 51,4618 | 54,1746 | 51,7979 | 51,9891 | 52,0077 | 52,3483 | 52,6019 | 52,5923 | 52,8169 | **51,4312** | **50,9924** | **52,9585** | **51,9561** |
| Kuwait | 59,7598 | 56,1794 | 55,6486 | 55,3701 | 55,2334 | 54,5676 | 54,5432 | 55,5210 | 55,5835 | 54,6519 | 55,9796 | 57,2756 | 57,5550 | 56,8953 | 57,2520 | 57,4977 | 58,2337 | 57,8633 | 58,7382 | 58,9187 | **59,8141** | 60,5013 | 61,1190 | 61,5411 | **60,9488** | **59,6003** | **58,8801** | **57,9769** | **58,0078** |
| Kyrgyzstan | | | 40,2758 | 45,5322 | 45,7940 | 45,3693 | 46,8153 | 44,3047 | 49,7428 | 47,9377 | 48,2987 | 58,5295 | 56,3892 | 61,4183 | 61,2868 | 61,8363 | 59,9966 | 60,6185 | 62,4198 | 62,2826 | 62,8504 | 60,8292 | 61,8698 | 62,3284 | **60,7524** | **59,4837** | **60,9336** | **60,4110** | **61,7367** |
| Latvia | | | 43,9346 | 41,7549 | 41,7909 | 42,1144 | 41,6523 | 38,7079 | 39,5133 | 39,0992 | 38,1164 | 37,6633 | 37,1163 | 37,4458 | 37,8849 | 38,5360 | 38,1401 | 40,1322 | 42,1628 | 42,4988 | **42,6171** | 41,8381 | 41,0353 | 40,9314 | 40,6668 | **40,8125** | **40,7083** | **40,5992** | **41,6984** |
| Lesotho | **52,5826** | 52,8379 | 52,5106 | 53,3517 | **51,8326** | **49,8573** | **48,1207** | **49,5360** | **49,9589** | **49,3228** | 51,9618 | 52,1415 | 52,0199 | 48,7366 | 51,0742 | 52,0275 | 50,8400 | 52,5486 | 54,3167 | **52,7774** | **51,7540** | **51,3553** | **51,9259** | **53,5330** | **52,0044** | **48,7662** | **52,5653** | **51,5562** | **52,5559** |
| Lithuania | | | 35,8468 | 39,2448 | 39,8813 | 41,8060 | 41,8027 | 42,0657 | 42,5485 | 43,7070 | 44,2978 | 43,1175 | 43,1547 | 42,0190 | 42,2143 | 41,2286 | 40,9680 | 41,3882 | 44,0662 | 44,2533 | **43,2076** | 42,4824 | 41,4313 | 41,1076 | 40,6885 | **40,6207** | **41,9162** | **41,2295** | **41,8300** |
| Luxembourg | 34,3065 | 34,3659 | 35,0949 | 35,4534 | 35,4792 | 35,2565 | 35,3318 | 35,2216 | **35,3728** | 36,2876 | 34,3876 | 34,6878 | 36,2900 | 36,9705 | 36,5190 | 37,5537 | 37,1818 | 41,0965 | 38,9601 | 39,6895 | **39,4974** | 39,2260 | 39,7231 | 40,0332 | **39,9200** | **39,5749** | **39,1030** | **39,5665** | **39,8640** |
| Macao | 25,2686 | 27,0633 | 31,9975 | 32,4000 | 32,9592 | 33,6054 | 33,7491 | 33,4966 | 34,1920 | 34,2537 | 34,5996 | 35,6894 | 36,8408 | 36,5056 | 39,2363 | 41,4606 | 42,5770 | 41,9351 | 43,0201 | 43,1611 | **43,8733** | 44,1262 | 44,6569 | 44,5482 | **44,9670** | **44,5789** | **44,2523** | **44,2359** | **43,2351** |
| Macedonia | 38,9495 | 36,7112 | 37,4281 | 38,3822 | 39,5350 | 41,3584 | 41,2600 | 41,7711 | 41,0095 | 42,3892 | 42,9005 | **43,8486** | 45,1465 | 44,7658 | 44,9407 | 45,8420 | 44,9077 | 44,1563 | 44,7886 | 44,9299 | **44,9707** | **44,2962** | **45,8422** | **45,7388** | **45,7580** | **44,7720** | **44,8467** | **44,9501** | **44,0502** |
| Madagascar | **45,6510** | **46,9112** | **46,7373** | **47,5438** | **46,9614** | **46,2982** | **45,8839** | **40,0154** | **47,8242** | **46,9350** | 43,0954 | 44,8864 | 45,1550 | 47,0000 | 45,9825 | 45,9236 | **45,3785** | **44,7936** | **43,4193** | **40,5552** | **46,7552** | **43,8647** | **42,2198** | **44,9847** | **46,8724** | **45,2565** | **45,8080** | **46,8328** | **47,8338** |
| Malawi | 52,9250 | 54,7653 | 54,7727 | 52,6096 | 53,5139 | 52,7910 | 54,7720 | 55,2904 | 56,0764 | 56,5437 | 55,0489 | 55,0891 | 53,7541 | 54,3023 | 55,9823 | 54,6266 | 52,8932 | 56,1792 | 56,6473 | 56,0172 | **55,1142** | 56,0243 | **56,0509** | **55,3414** | **56,8882** | **57,7064** | **56,4767** | **55,9362** | **56,1396** |
| Malaysia | 40,8596 | 39,8613 | 39,1866 | 39,3101 | 38,9170 | 39,1344 | 39,4303 | 39,7663 | 39,6160 | 38,8526 | 40,9089 | 40,7370 | 40,8167 | 40,8263 | 40,4799 | 39,9822 | 39,9730 | 40,0214 | 40,4011 | 39,7015 | **39,3804** | 39,3089 | 39,2895 | 39,6249 | 39,4231 | **40,4658** | **40,6673** | **40,8674** | **39,0674** |
| Malta | 34,6105 | 34,4531 | 35,3557 | 35,2472 | 37,3952 | 35,6712 | 36,6968 | 36,1399 | 38,0745 | 37,7333 | 37,3794 | 37,7342 | 38,0669 | 38,0992 | 37,3524 | 42,2930 | 41,0299 | **40,9978** | **39,3456** | **39,7736** | **41,1101** | **39,8800** | **38,5861** | **38,9344** | **41,8702** | **39,7506** | **38,5458** | **37,8263** | **37,5076** |
| Mauritius | 37,4306 | 36,2882 | 36,3262 | 36,6998 | 37,1447 | 37,1862 | 38,9502 | 38,9944 | 37,8619 | 37,3632 | 37,3785 | 36,8153 | 38,4152 | 40,2186 | 40,5695 | 39,3977 | 42,1910 | 41,7119 | 40,2079 | 40,2714 | **38,4983** | 38,5840 | 39,0639 | 38,9387 | 38,7291 | **38,5410** | **39,5211** | **40,5198** | **40,8198** |
| Mexico | 45,3874 | 46,4863 | 46,6917 | 45,2497 | 46,3570 | 46,9990 | 47,4335 | 47,3077 | 47,2865 | 47,2343 | **46,8036** | **46,5478** | **47,6686** | **48,8326** | **47,6988** | **49,7219** | **49,2776** | 49,3345 | 48,3895 | 48,0450 | 48,5000 | 47,8679 | 47,7700 | **48,1692** | **49,2558** | **49,9514** | **48,9406** | **49,5314** | **48,7931** |
| Mongolia | | | 47,4941 | 49,7361 | 51,7828 | 51,1350 | 49,7740 | 46,3975 | 48,0234 | 44,7854 | **43,8549** | **45,5602** | 49,4958 | 52,9575 | 50,3993 | 49,2621 | 53,8176 | 52,0506 | 46,5557 | 56,1441 | 47,8388 | 51,9064 | 56,6017 | 52,9116 | **48,5919** | **51,5798** | **52,5910** | **53,5911** | **52,5911** |
| Morocco | 49,7360 | 48,7272 | 48,5934 | 48,5250 | 47,7827 | 47,5506 | 48,1922 | 49,0255 | **50,0962** | 51,1718 | 51,3493 | 51,5794 | 51,9864 | 51,3896 | 52,3178 | **53,4998** | 53,1041 | 52,6569 | 52,4890 | 53,4499 | **54,9488** | **55,5800** | **55,9349** | **55,9997** | **56,1366** | **56,2261** | **56,6358** | **56,8365** | **57,2365** |
| Myanmar | | | 40,9489 | 48,9002 | 44,2445 | 44,8406 | 52,0606 | 51,0645 | 51,9390 | 51,2116 | 48,1758 | 47,5613 | 48,2037 | **45,0994** | **46,5728** | **49,1901** | **49,2667** | 48,3925 | **47,4632** | **44,9517** | **45,9043** | **45,5607** | **49,3849** | **49,4763** | **49,7363** | **48,8189** | **48,3616** | **49,4904** | **49,1044** |
| Nepal | 50,2060 | **49,8354** | 48,4841 | 45,8687 | **45,2736** | 46,6952 | **47,7420** | **45,9139** | **47,9431** | **51,6102** | 53,0568 | **53,7997** | **54,4095** | **54,1565** | **53,5706** | 50,8807 | **42,5623** | 42,9826 | **42,0616** | **43,7200** | **48,1515** | **50,2385** | **52,9968** | **49,0650** | **50,8917** | **52,5919** | **53,6777** | **49,6838** | **51,6842** |
| Netherlands | 35,0861 | 35,2015 | 35,4165 | 35,3342 | 34,9186 | 35,1998 | 37,6073 | 37,8372 | 36,2649 | 36,7094 | 36,3617 | 36,7107 | 37,5432 | 36,2866 | 36,9552 | 38,9599 | 39,3875 | 36,4101 | 39,2582 | 38,4202 | **39,6526** | 39,1597 | 39,1316 | 38,8934 | 38,8819 | **39,5551** | **39,3887** | **37,3812** | **37,5809** |
| New Zealand | **39,8328** | **40,4776** | 38,8858 | 36,7695 | 37,9677 | 38,3355 | 38,3711 | 38,2553 | 39,9214 | 38,0321 | 36,9971 | 37,0805 | 36,4983 | 35,8417 | 36,8403 | 36,8863 | 37,4531 | 37,0511 | 40,2793 | 39,4728 | 39,7751 | 39,8730 | 39,8867 | 39,8565 | 39,8366 | **39,3210** | **38,1941** | **37,1851** | **37,5844** |
| Nigeria | 47,2659 | 48,0259 | 50,1263 | 50,1965 | 49,4088 | 49,0465 | **48,8396** | **48,7757** | **48,7426** | **48,6955** | **48,5794** | **48,2944** | **47,7396** | **47,0383** | **46,5229** | **46,3133** | **46,3635** | **46,6982** | **47,3522** | **48,0927** | **48,5744** | **48,7398** | **48,6436** | **48,2506** | **48,5653** | **48,8727** | **48,4489** | **50,2625** | **49,3926** |
| Norway | 36,1567 | 36,1034 | 35,7963 | 34,2424 | 34,5898 | 34,1007 | 34,0191 | 34,3291 | **34,5268** | **35,0103** | 35,3002 | 35,5496 | 35,9963 | 36,6739 | 36,5815 | 36,5250 | 36,6920 | 36,3951 | 36,9787 | 36,8106 | 36,7875 | 37,2388 | 37,1541 | 34,4212 | 37,1630 | **38,3540** | **38,8101** | **39,0823** | **39,2028** |
| Oman | | | 51,1495 | 52,0324 | 52,2381 | 53,0509 | 51,8797 | 51,4263 | 50,9682 | 52,7580 | 52,4116 | 54,4350 | 54,5424 | 49,4683 | 52,0274 | 50,5045 | 51,4590 | 47,2249 | 50,5632 | 47,1413 | **47,8843** | 48,5577 | 50,8625 | 49,7116 | 50,1717 | **50,3151** | **49,2655** | **50,2611** | **50,8608** |
| Pakistan | 50,3556 | **50,6197** | **50,7113** | **50,6907** | **50,9440** | 51,2052 | **51,4985** | **52,1923** | **52,3016** | **52,8416** | 52,9665 | **52,6746** | **52,8511** | **51,9225** | **50,0455** | 50,7643 | **52,0025** | **52,5664** | **52,7524** | **52,8522** | **53,2644** | **53,3335** | **53,0735** | **52,9429** | **51,6198** | **51,3655** | **51,2688** | **50,6133** | **50,3230** |
| Panama | 47,8749 | 51,2820 | 50,5076 | 50,3440 | **50,2253** | 51,7804 | 50,6871 | 50,5787 | 50,6914 | 50,2506 | 46,2949 | **48,8311** | **51,4639** | 43,4184 | 44,3949 | **48,9623** | **47,8132** | **50,5674** | **44,1235** | **44,3335** | **42,2611** | 41,4959 | 42,4320 | **43,9287** | **46,7074** | **42,2556** | **42,8682** | **43,2133** | **48,2127** |
| Peru | 49,1479 | 48,7088 | **49,4645** | 51,2521 | 52,1314 | 50,9578 | **50,0501** | **52,5953** | **53,2672** | **54,6386** | 54,9235 | 55,3916 | 55,6804 | 55,4981 | 55,5486 | 55,1495 | 54,8702 | 54,7415 | 55,2968 | 54,6438 | 54,1867 | 54,3625 | 53,3616 | 53,7152 | 53,9120 | **53,1420** | **53,3793** | **54,1810** | **54,4811** |
| Philippines | 49,3434 | 49,2713 | 49,6369 | 49,6203 | 49,2370 | 47,6858 | 47,4219 | 46,7225 | 47,1782 | 47,1965 | 47,4520 | 47,4966 | 47,5577 | 47,5894 | 48,9433 | 47,7604 | 47,8237 | 48,6707 | 48,3292 | 47,6760 | **47,6288** | 48,4565 | 49,7350 | 49,6764 | 49,6673 | **49,8363** | **49,9144** | **50,0200** | **50,4204** |
| Poland | 33,7375 | 35,8462 | 36,5844 | 37,8467 | 38,6467 | 37,0954 | 37,9120 | 38,4072 | 41,7789 | 41,4862 | 42,9291 | 42,3515 | 41,5356 | 42,0785 | 41,7398 | 41,4888 | 40,5603 | 40,1139 | 40,2919 | 40,3169 | **40,4859** | 40,2718 | 39,9725 | 39,7325 | 39,4288 | **38,4135** | **37,7489** | **37,3523** | **37,1767** |
| Portugal | **36,9009** | **37,7582** | **38,8649** | **39,4025** | **40,1301** | 40,4176 | 40,4907 | **40,5093** | 40,5854 | 41,0864 | 41,4652 | 41,3701 | 41,6576 | 42,1398 | 41,7174 | 42,2503 | 42,4421 | 42,1034 | 42,6112 | 43,1109 | 42,7677 | 42,7552 | 42,8290 | 42,5694 | 42,4489 | **42,6167** | **42,4628** | **42,2111** | **42,1438** |
| Qatar | 54,0306 | 54,3122 | 55,7692 | 54,0622 | **55,1680** | **55,5372** | **56,9936** | **55,5039** | **54,6295** | 53,9876 | 54,0972 | 53,6040 | 55,3264 | 51,5479 | 51,7258 | 51,1652 | 50,5216 | 50,2324 | 52,2166 | 56,4026 | **56,8980** | 57,7542 | 56,4685 | 56,7486 | **56,3410** | **57,7194** | **57,8370** | **57,9423** | **57,4425** |
| Republic of Korea | 37,9589 | 38,2591 | 38,0448 | 38,3582 | 37,7143 | 38,2257 | 38,1676 | 39,4986 | 38,8747 | 39,1738 | 39,3204 | 38,9056 | 39,5921 | 39,9967 | 40,0429 | 39,4495 | 41,3384 | 40,3922 | 39,8077 | 38,8980 | 39,1896 | 39,0197 | **39,7999** | **39,0736** | **39,5354** | **39,2477** | **39,2060** | **39,0647** | **39,3687** |
| Republic of Moldova | | | 47,4745 | 49,4841 | 50,3827 | 47,0870 | 44,4312 | 44,5131 | 48,2783 | 51,1924 | 46,6314 | 38,7927 | 42,0634 | 40,9435 | 40,4532 | 39,6870 | 39,3617 | 37,8628 | 41,8013 | 43,3091 | **45,7244** | **46,5387** | **43,9482** | 41,8482 | **42,9359** | **40,1893** | **40,8337** | **39,2376** | **42,2379** |
| Romania | 31,4202 | 33,6578 | 33,0093 | 34,4256 | 35,6809 | 36,3083 | 38,9826 | 38,1088 | 38,5106 | 40,3890 | 41,2587 | 41,6294 | 41,1046 | 40,9261 | 40,5670 | 40,7671 | 40,2739 | 40,0701 | 42,1365 | 42,5641 | **42,6600** | 42,3541 | 44,0949 | 41,7796 | 42,5187 | **42,7822** | **43,8576** | **43,9023** | **43,5220** |
| Russian Federation | **34,9464** | **37,8171** | 38,7885 | 40,6835 | 42,0271 | 42,8402 | 42,8684 | 42,8905 | 44,2304 | 45,0309 | 44,1457 | 42,7809 | 43,3780 | 43,1299 | 42,6023 | 42,0089 | 41,6616 | 41,0273 | 42,0944 | 42,0012 | **42,9160** | 43,1055 | 43,2621 | 43,4518 | 43,6656 | **43,7822** | **43,8576** | **43,4023** | **43,9220** |
| Senegal | 49,0320 | 48,3001 | 46,4501 | 50,9900 | 48,4107 | 48,6666 | 49,6811 | 50,0501 | 48,4607 | 47,0406 | 48,6942 | 50,5062 | **51,2133** | **49,5009** | **48,3320** | **46,2035** | **48,9974** | **47,5199** | **49,3618** | **50,1702** | **47,0132** | **49,1724** | **47,3958** | **48,0404** | **50,9250** | **48,8057** | **49,4249** | **48,5469** | **47,5681** |
| Singapore | 34,8407 | 34,6452 | 34,9094 | 34,3396 | 33,9629 | 34,0480 | 34,6319 | 35,7564 | 36,6733 | 36,7019 | 37,4990 | 37,7304 | 38,0488 | 38,0455 | 37,6157 | 37,6269 | 37,7558 | 37,7248 | 38,4409 | 39,0226 | **39,8139** | 39,1444 | 39,1972 | 40,4198 | 40,8414 | **40,3473** | **40,4434** | **39,5007** | **39,9260** |
| Slovakia | | | 35,1482 | 36,3965 | 35,9037 | 36,6212 | 36,2684 | 36,4980 | 36,8796 | 36,9496 | 37,2855 | 37,7869 | 37,8454 | 37,9598 | 38,4376 | 37,9872 | 37,0382 | 35,9209 | 36,3563 | 36,8541 | **36,6707** | 36,8934 | 37,3647 | 37,0298 | 36,3981 | **37,0776** | **37,5565** | **37,7231** | **37,9969** |
| Slovenia | 31,3106 | 31,6331 | 31,9993 | 32,3600 | 32,6109 | 32,8994 | 33,2596 | 33,5166 | 32,7906 | 32,9847 | 33,1077 | 32,8802 | 33,9906 | 34,3186 | 34,4885 | 33,5749 | 33,4108 | 33,6505 | 35,2195 | 34,6953 | 34,5479 | **34,0989** | **34,4590** | **33,3916** | **33,3644** | **33,5883** | **32,3515** | **31,3408** | **32,0404** |
| South Africa | 45,4265 | **45,4158** | 45,5849 | 46,1955 | 46,2068 | 46,4313 | 46,6278 | 45,6704 | 45,5451 | 46,4571 | 47,1709 | 47,0074 | **47,6797** | 47,5308 | 46,7133 | 46,9063 | 45,1248 | 45,2725 | 45,8575 | 46,9917 | 47,1675 | 47,2868 | 47,6586 | 48,0154 | 48,1219 | **49,4538** | **49,1821** | **49,9615** | **49,0601** |
| Spain | 40,9642 | 40,9612 | 41,9682 | 42,0325 | 41,3891 | 41,1986 | 41,0255 | 40,9209 | 40,8096 | 40,6624 | 40,2674 | 39,9066 | 39,8639 | 39,8201 | 39,6602 | 39,5949 | 39,3997 | 39,5671 | 40,3646 | 40,8964 | **40,8964** | 41,5207 | 42,0428 | 42,3470 | 42,2120 | **41,9986** | **41,8255** | **40,9209** | **40,8096** |
| Sri Lanka | 44,9725 | 43,1084 | 44,1465 | 44,4704 | 45,1793 | 45,4767 | 45,6680 | 47,1320 | 47,3097 | 47,3731 | 48,1862 | **47,6680** | **46,6453** | **47,3097** | **47,3731** | **48,1862** | 49,4445 | 44,4161 | 45,1153 | 43,7929 | 44,9550 | 44,6823 | 44,7303 | 44,5867 | **43,7929** | **44,2496** | **44,6823** | **44,0248** | **44,5867** |
| Swaziland | 45,0284 | 48,6587 | 49,6035 | 51,7702 | 47,9650 | **48,5728** | **50,5842** | **48,5985** | **52,6335** | **52,6628** | **53,7045** | **52,7426** | **50,7665** | **48,7793** | **51,7918** | **50,7975** | **50,8350** | **51,8106** | **50,7452** | **50,7179** | **49,6685** | **51,6639** | **52,7042** | **50,7297** | **48,7464** | **52,7860** | **53,7921** | **51,7924** | **50,7924** |
| Sweden | 29,7084 | 30,2390 | 30,8030 | 30,5611 | 29,7524 | 29,5838 | 31,9263 | 31,1276 | 30,6725 | 31,1046 | 30,5274 | 32,5653 | 32,5837 | 33,1382 | 33,3487 | 33,4195 | 33,4612 | 32,7833 | 33,2005 | 33,7677 | 33,1107 | 34,2807 | 34,4573 | 34,4364 | **32,8183** | **33,4807** | **33,4003** | **33,0967** | **33,1965** |
| Syrian Arab Republic | **40,2332** | **43,1390** | 50,0683 | 57,7333 | 57,3394 | **51,4774** | **46,8167** | 46,2113 | 46,2072 | 47,6390 | 48,0846 | 48,3731 | 48,2914 | 48,6518 | 49,3076 | 48,9566 | 47,6987 | 47,1532 | 47,5981 | **47,9585** | **48,1600** | **48,2000** | **46,5076** | **44,4823** | **43,7852** | **47,2929** | **47,8645** | **48,2062** | **48,3576** |
| Taiwan | 31,7512 | 32,0882 | 31,8521 | 31,4871 | 31,7181 | 32,0151 | 38,8083 | 38,7405 | 38,8738 | 38,5835 | **39,3490** | 39,3747 | 39,0236 | 38,5545 | 38,7108 | **38,5697** | 38,4953 | 38,5950 | 39,3601 | 39,0824 | **38,6196** | 38,5516 | 38,3150 | 38,2681 | **38,1723** | **38,8148** | **38,9012** | **39,1074** | **39,5078** |
| Thailand | 47,8212 | **46,7028** | 46,9308 | 43,5852 | **43,1938** | 42,9373 | **42,4374** | 43,7917 | **43,9679** | 41,0917 | **41,8106** | 41,6753 | **41,9749** | **39,2962** | **38,0491** | 36,5552 | **37,4636** | **39,5521** | **36,6584** | **37,8116** | **35,8515** | **39,8640** | **35,4015** | **34,3806** | **39,3798** | **38,3798** | **36,4082** | **35,4223** | **34,4230** |
| Tunisia | **48,8567** | **49,8680** | 51,9272 | 53,1270 | 49,3147 | 49,9459 | 53,0653 | 53,2169 | 53,5157 | 53,6151 | 54,4442 | 55,2077 | **54,9461** | **52,9213** | **50,0863** | **47,7680** | **45,2599** | **44,2700** | 42,4500 | 42,1734 | **42,3782** | 42,2503 | 42,6427 | 42,5534 | **42,4834** | **42,3032** | **42,9430** | **42,7377** | **42,2373** |
| Turkey | 48,1359 | 49,7286 | 49,4757 | 50,2840 | 50,0637 | 49,0482 | 48,8062 | 49,3414 | 49,4045 | 50,3866 | **50,3219** | 50,7567 | 50,5227 | 48,6603 | 47,9191 | 47,9684 | 47,5834 | 47,2159 | 47,6915 | 47,1589 | 46,6135 | 45,7407 | 45,1295 | 44,7787 | 44,6966 | **45,9123** | **46,9673** | **46,6743** | **46,0746** |
| Uganda | **49,0972** | 47,1555 | 43,3345 | 42,6666 | 48,1089 | 50,6588 | 50,8590 | 50,7157 | 51,0288 | 51,4296 | **52,2810** | **50,4007** | **48,6004** | **48,7673** | **49,0787** | **48,9785** | **47,8803** | **46,5563** | **45,5330** | **46,1335** | **46,0668** | **46,2691** | **46,9035** | **45,4863** | **46,9083** | **45,9123** | **46,0673** | **46,9743** | **46,7746** |
| Ukraine | | | 35,3514 | 35,1968 | 40,6386 | 43,6949 | 44,3347 | 44,2483 | 44,7603 | 43,5966 | 43,1546 | 42,6182 | 43,0499 | 42,9428 | 42,6706 | 41,9380 | 42,8117 | 41,9360 | 43,4018 | 43,1166 | **42,5906** | 42,6470 | 42,9321 | 43,9084 | 44,3212 | **44,7720** | **44,8467** | **44,9501** | **44,1502** |
| United Kingdom | 35,7476 | 36,0781 | 37,6598 | 35,6390 | 35,9184 | 35,7405 | 35,4955 | 35,7389 | 36,6787 | 37,0319 | 36,5952 | 36,8801 | 37,1859 | 37,3597 | 36,9343 | 37,9092 | 37,7674 | **39,0519** | 39,4243 | 38,4151 | 40,3266 | 38,5294 | 41,2703 | 39,8147 | 39,8656 | **40,6781** | **38,8727** | **37,3011** | **37,0836** |
| United Republic of Tanzania | 49,5650 | **48,1968** | **50,4676** | 50,0409 | 50,0371 | 50,0539 | 50,0486 | 50,0519 | 50,0392 | **52,3477** | **51,0845** | **52,4238** | 53,4112 | 51,0234 | 51,3690 | 54,7315 | 54,7471 | **54,4710** | 52,0076 | 49,7838 | 51,0343 | 50,4283 | 51,5077 | **49,6514** | **49,4226** | **50,2153** | **50,1993** | **51,1903** | **51,7864** |
| United States of America | 39,0366 | 39,0119 | 39,1651 | 39,3686 | 39,3195 | 39,3970 | 39,2894 | 40,2275 | 40,3477 | 40,6086 | 40,7001 | 41,5306 | 42,2608 | 40,3864 | 40,7034 | 40,6175 | 40,6170 | 40,6645 | 42,0615 | 42,1967 | 42,3099 | 42,0794 | 42,0231 | 41,9969 | 41,9816 | **41,9374** | **41,9314** | **41,9310** | **41,9310** |
| Uruguay | 42,6285 | 42,4945 | 43,4193 | 43,7978 | 44,7147 | 45,2238 | 46,1584 | 46,0315 | 45,7576 | 45,4932 | 45,4974 | 46,3241 | 45,4153 | 45,7564 | 46,0722 | **46,0345** | 45,2329 | 44,1889 | 45,4569 | 43,4988 | **43,0086** | 43,4729 | **44,0739** | **42,1590** | 41,2049 | **42,0954** | **42,7668** | **42,5707** | **42,4839** |
| Venezuela | 46,1386 | 43,8153 | 45,1277 | 44,3582 | 45,9520 | 47,8101 | 46,8264 | 48,3953 | **47,6205** | **47,5847** | **47,4891** | **46,9900** | **46,4006** | **44,9213** | **44,2894** | **44,1926** | **43,8695** | **44,1899** | **47,1226** | **46,4078** | **42,5277** | **38,2567** | **39,3438** | **38,6034** | **39,8323** | **42,3834** | **41,4065** | **40,8230** | **40,5647** |
| Yemen | | | | | | | | 54,5838 | 53,7809 | 53,7271 | 53,1260 | **53,4171** | 53,4050 | 53,0512 | 52,3087 | 52,3951 | 51,4050 | 50,4109 | 49,8493 | 50,2529 | **51,4249** | 52,7953 | 49,5097 | **50,6664** | **52,8329** | **50,9972** | **50,0205** | **49,0222** | **51,0224** |
| Zimbabwe | 44,8108 | 52,5465 | 45,2787 | 46,7721 | 47,0309 | 47,3495 | 48,1858 | 47,5686 | **47,4478** | **47,5415** | **48,3247** | **48,5581** | **48,1185** | **49,2163** | **50,1756** | **50,6429** | **50,4084** | **49,8505** | **47,9239** | **45,1147** | **45,8007** | **46,6807** | **48,5242** | **51,6136** | **51,0040** | **50,8793** | **50,8216** | **49,8173** | **48,8170** |

**Note:** Light colored values show UTIP data, while dark-colored values show Gini values obtained by a simulation method based on UTIP data.

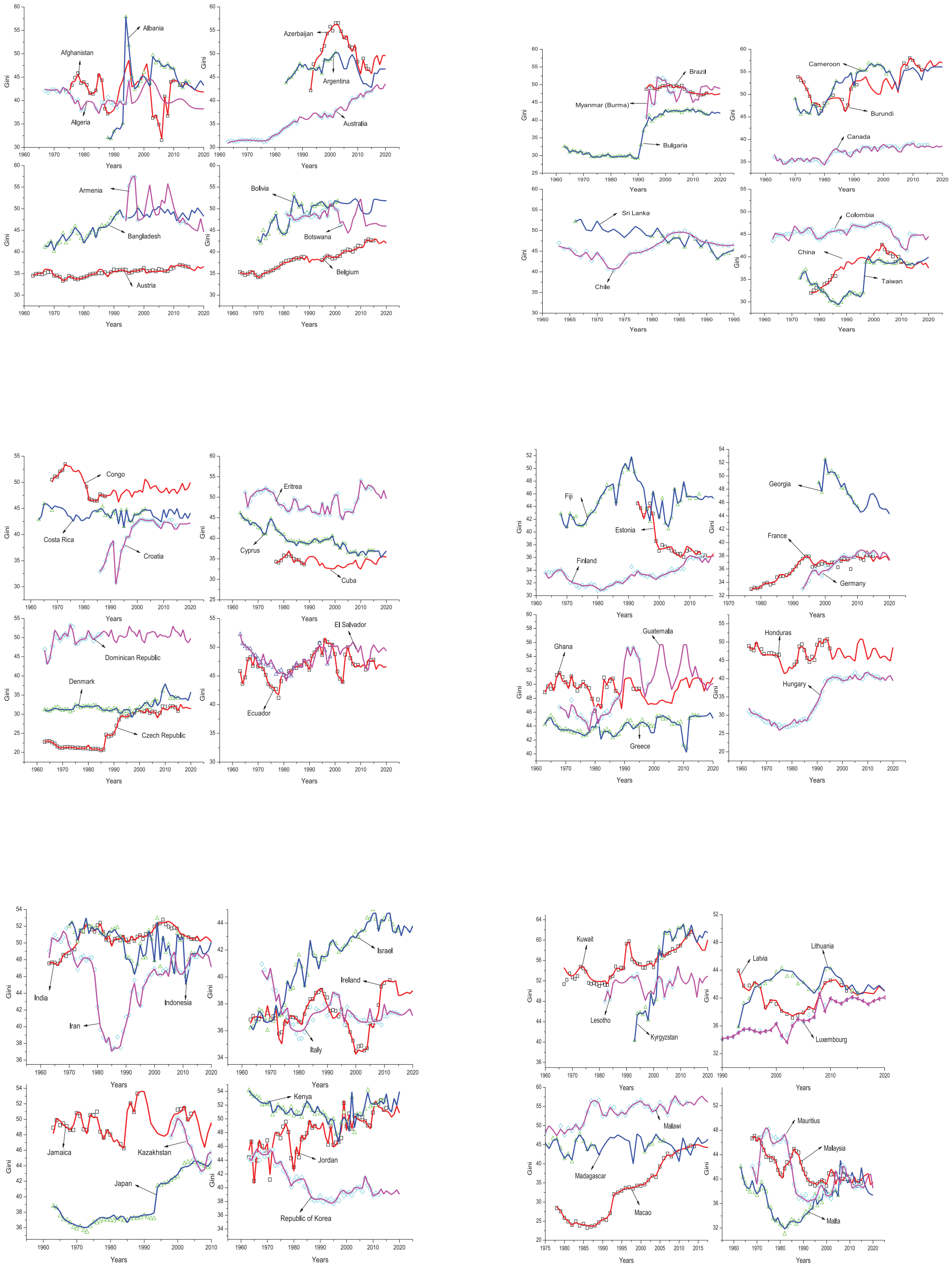


***Figure A1.*** Simulation and real data for GINI for 102 Countries

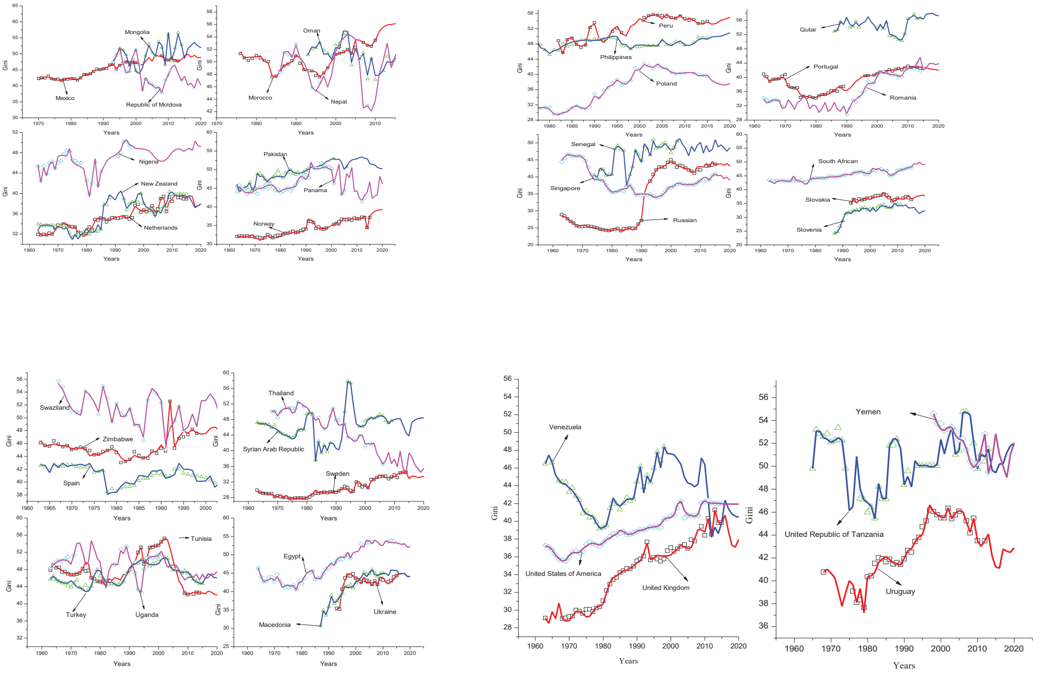


***Figure A1.*** Continued