

The Impact of Governance on Poverty and Unemployment Control before and After the Covid Outbreak in the United States

Marzieh Ronaghi (✉ ronaghim@msu.edu)

Michigan State University

Eric Scorsone

Michigan State University

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Abstract

Covid-19 presents many social and economic challenges and exacerbates existing ones. One of these challenges is global poverty. Prior to the epidemic, poverty affected the rural population traditionally. Global poverty can spread to urban areas now with COVID-19 outbreak. Poverty increased in the United States in 2020 as the coronavirus outbreak, affecting the economy and rising unemployment. New figures confirm that the recession may have widened the gap between rich and poor, with those at the bottom of the economic ladder suffering the most, such as the rural population. In this study, we examine the relationship between Covid outbreak, governance and economic performance and its impact on number in poverty. To this end, data from the Center for American Progress is analyzed over 10 years (from 2011–2020) among the 49 states in America through spatial econometric techniques for panel data. The effect of each state's condition was examined on neighboring states. The results showed that the governance index (with a negative sign) and Income inequality variable (with a positive sign), have the greatest impact on poverty. The unemployment, Gender wage gap, Hunger and food insecurity, Health insurance, Population and Higher education also have an impact on poverty. The policy recommendations of this study are that because the variable of governance (accountability and responsibility of the government to compensate for the damage caused by the covid outbreak) is one of the most effective variables to control poverty.

JEL: I13, I18, I23, I28

Introduction

The recently emerging coronavirus (COVID-19) has been recognized by the World Health Organization (WHO) as an epidemic that has affected all economic, social and political spheres. This epidemic is a great crisis for countries (Chathukulam et al 2021).

While the focus is on the health and socio-economic impact of Corona, COVID-19 also has a significant impact on governance, peace and security. It can affect accountability, service delivery, and efforts to improve governance in countries. The crisis that has arisen in many societies can have different effects on relations between the main political parties. COVID-19 can lead to tensions between the government and opposition parties, especially when political reform is hampered (Shammi et al, 2020).

The health and socio-economic impact of COVID-19 has had many effects on governance in countries so far, but if the effects of the epidemic worsen over time, governance could be more affected (Veare et al, 2021).

The slowdown in the global economy and social distancing measures during the outbreak of COVID-19 disease have affected the effectiveness of government in most countries. Political transfers, the provision of public services, and the effectiveness of the judiciary were all distorted elements during the Corona, but the most important one was severe economic effects. Measures to curb COVID-19 reduce economic

activities and cause the greatest harm to the poor, especially those living in rural areas (Mahler et al, 2021).

During 2020, as the epidemic spread around the world and economic growth forecasts deteriorated, the impact of this epidemic increased global poverty. COVID-induced poverty is calculated as the difference between poverty in a world with and without an epidemic. Pandemic poverty estimates were obtained using the latest global economic perspective (GEP) forecasts, and pre-epidemic estimates were obtained using the January 2020 GEP forecasts. In January 2021, it was estimated that the epidemic has severely impoverished 119 to 124 million people worldwide by 2020 (World bank, 2021).

Globally, the increase in COVID-induced poverty continued in 2020 and the COVID-induced poverty population reached 97 million in 2021. If global poverty had declined at the rate predicted before the epidemic, tens of millions of people would still be living in poverty each year because of the primary consequences of the epidemic. As the epidemic began, many developed and developing countries responded in similar ways by restricting major sectors of their economies. These quarantines reduced income and employment and increased extreme poverty (World bank, 2021).

The United States holds the record for the highest number of COVID-19 patients in the world. In recent years, many Americans have lost their jobs due to the outbreak of the Corona virus. The unemployment rate in 2021 was 14.7%, the highest figure since the Great Recession (World Bank, 2021). Figure 1 shows that the current recession has hit people of color the hardest. It is noteworthy that the share of the elderly population living on low-income incomes increased, which was more for blacks and Latins than for whites (Center on budget and policy priorities, 2020).

Unfortunately, even if many people are re-employed, this loss of collective income will have catastrophic effects on their economy and personal lives. These predictions are based on an analysis by Dr. Brendan O'Flaherty of Columbia University. His model uses historical trends, which shows that for every 1 percent increase in the unemployment rate, homelessness increases by 0.65 per 10,000 people (Flaherty, 2021).

The survey by Bankrate and YouGov found that nearly half of American households lost income due to the coronavirus epidemic. Only 49% of respondents in the survey in late June said their family income was not negatively affected, while 6% declined to answer (Bank rate/Gov, 2020). As shown in Chart 1, California, Texas, and Florida have the highest number in poverty in the United States.

While the corona virus infects people regardless of wealth, the poor will suffer the most in terms of income and race, reduced economic mobility and the high cost of medical care. Low-income communities are more exposed to the Corona virus, have higher mortality rates, and suffer more economically. In times of economic crisis, these vulnerabilities become more apparent to marginalized rural groups. Good governance plays an important role in reducing poverty and improving economic conditions in societies (Ferrannini et al, 2020; Hossein et al, 2021). The government must take immediate actions to address the rights of millions of people suffering from the complex economic and social effects of the epidemic (Mohammadi et al, 2017). The US government has made little progress in curbing

rising poverty and inequality during the COVID-19 epidemic (Human Rights Watch, 2021). As can be seen in Chart (2), in most US states, the impact of governance on the control of COVID-19 has been negligible.

Good governance has three characteristics:

1. Supports good relations and cooperation between the government, civil society and the private sector.
2. Respects the principles of participation, clarity of decision, accountability, justice, predictability, democracy, civil liberties, and free access to information.
3. Determines a set of norms and values that are desirable for governmental and international institutions and organizations (Janssen and vander Voort, 2016).

Governance indicators include transparency and accountability, political stability, violence, government effectiveness, quality of regulation, rule of law, and corruption control. One of the reasons that good governance is important is its impact on the quality of life and well-being of the people. Improving any of the factors of governance, such as increasing civil liberties, can make a huge difference in the well-being of the people (Stead, 2015). The benefits of good governance are the reduction of corruption (due to transparency and accountability), the realization of democracy (by providing elements such as participation and the rule of law), and the increase of international cooperation (through trust and compliance with international law). It is important to have good governance throughout the country so that the economy can develop faster (Ronaghi et al, 2019.).

An efficient government plays an important role in the economic and social development of society. Without good governance, economic growth creates gaps in the social and economic sectors of society (Lio et al, 2008).

Interest in and research on good governance (the role of effective government) is more common these days because of the many development challenges that countries face in the COVID-19 outbreak. Developed and developing countries are looking for solutions to reduce the gap between rich and poor within their own country and improve the economic situation of their country compared to others (Luciano, 2020).

As the charts show, the epidemic has made Americans more vulnerable to poverty in the United States, and these vulnerabilities will become more apparent to marginalized and rural groups during times of economic crisis.

The questions that arise now are as follows:

- How does governance affect rural household poverty before and after the COVID-19 outbreak?
- In addition to governance, what other factors exacerbated poverty during the COVID-19 outbreak?

To answer these questions, this study seeks to examine the role of governance and other important factors in reducing poverty before and after the COVID-19 outbreak in the United States. In addition, this

study seeks to provide solutions to the problem of lack of proper governance during the COVID-19 outbreak in rural communities.

Literature review

The COVID-19 epidemic has had devastating effects around the world, from civil unrest in response to severe inequalities caused by the crisis, to declining levels of trust in government in the face of severe security reactions. Controlling this catastrophic crisis can pave the way for a more resilient future. This crisis provides an opportunity for any government to think about the type of public institutions and governance mechanisms that should exist Matteis (2013) so that societies can withstand similar shocks in the future and institutions that serve the people fairly meet the needs of all. Institutions that operate with transparency and honesty should prevent the rise of poverty (GOVERNANCE STATISTICS IN THE COVID-19 ERA, 2020). Reliable governance statistics can play an important role in informing the appropriate response to the epidemic and identifying and mitigating potential side effects. They can also be used for government auditing (United Nations, March 2020). In addition, targeted surveys of vulnerable groups, such as those living in informal settlements or slums, informal sector workers, and individuals without legal identities, can assess whether government assistance, services, and benefits are suitable in reducing the financial harms of COVID-19, such as transfers of cash, insurance, food, or free health care available to those most in need (Asra et al, 2005).

Burnside and Dollar (2000) and Collier and Dollar (2001, 2002) show how governance can lead to economic progress in a favorable political environment. These positive conditions require governments to develop macroeconomic policies in line with market-oriented perspectives. Similarly, Mosley et al. (2004) and Gomanee et al. (2003) look at the adaptability of aid to the poor and concluded that financial aid can only increase welfare if it increases the budget allocated to the poor. Chauvet and Guillaumont (2004) suggests that helping a poor person is associated with political stability, and Kosack (2003) concludes that the potential to help improve human well-being is effective only in a democratic political environment.

Despite the new international perspective on development, which has shifted from a focus on growth to poverty reduction, Heltburg (2004) argues that economic progress is "in practice a key tool in the fight against poverty." From this perspective, economic development remains an essential link between aid and poverty or its various dimensions. In other words, the main focus is on reducing poverty and recognizing that different types of economic growth have different effects on inequality and thus poverty reduction.

Matteis (2013) also argues that poverty reduction can contribute to growth, and shows that the share of the government budget for social services increases the income elasticity of poverty and in addition, reducing the poverty rate tends to increase this share of the budget. In addition, Nunanal (2020) shows that governance and macroeconomic policies are effective in reducing poverty.

In another study, Hannan (2014) provides a way to understand the links between participatory governance and poverty reduction in developing countries. He examines the effect of balance on the

economic and social goals of the regions that lead to the impact on poverty. He also shows that social capital has an important place in cooperative governance.

In this regard, Minogue (2008) seeks to establish how to analyze the relationship between regulatory governance and poverty reduction in the context of the prevailing economic assumptions about the relationship between competition, regulation, economic growth and poverty. A critical examination of these assumptions shows that a more complex set of relationships must be considered that also addresses non-economic factors. One solution is to develop practical definitions of "poverty reduction" and "regulatory governance" that include non-economic features.

According to studies, good governance plays an important role in improving economic conditions by increasing economic growth, reducing investment risk, increasing production, adopting appropriate policies, increasing public participation, enforcing laws and preventing corruption. Achieving this progress requires good governance. Since 2019, most countries around the world have been affected by the COVID-19 epidemic and questioned the long-term economic, social and potential health consequences and the consequences of governments' approach. Critics of the current recession consider it with rising inequality, 14.7% unemployment rate, and 45% poverty rate (Center for American Progress, 2020). For this reason, despite many studies on poverty and governance, there is no comprehensive study to determine how the outbreak of coronavirus affects governance and poverty. For this reason, this paper examines the impact of the COVID-19 epidemic on increasing poverty in rural households and the role of government in improving it at the US level.

This article shows the positive relationship between reducing poverty and improving governance in the US states.

Based on the studies, the null hypotheses of this research are:

As governance increases, poverty number will decrease.

As income inequality increases, poverty number will increase.

As higher education increase, poverty number will decrease.

As hunger and food security increase, poverty number will increase.

As unemployment increases, poverty number will increase.

As gender wage gap increases, poverty number will increase.

As health insurance increases, poverty number will decrease.

As unemployment insurance increases, poverty number will decrease

Methodology

This research uses the Spatial Panel model following Elhorst, (2017); Lee, (2010), and Belotti et al, (2013). This model considers different geographic regions, such as states, as a spatial panel and considers the correlation between these regions in the regression analysis. This area included all US states. The main advantage of working with the spatial panel model is that spatial and time specific effects can be controlled (Elhorst, 2017).

According to the studies reviewed in the literature review, the most important economic variables are unemployment, Income inequality, Higher education, Gender wage gap, Hunger and food insecurity, Unemployment insurance, Health insurance, Population, race African and White. Because of the important role of governance in reducing poverty, the governance index is also used as an effective explanatory variable (Alvarez et al., 2016; Ferrero et al., 2016; and Stead, 2015). Due to sound governance or good government responsiveness (related to government accountability to help and to compensate in Covid-outbreak) were low in most states during the coronation, this variable could play an important role in controlling poverty. Government livelihood support policy is to help those affected by the Covid outbreak, for this reason, in this study, the voice and accountability index (government assistance to the rural population during the Covid outbreak) is considered as the most important indicator of good governance.

The Panel Spatial Model

Spatial Econometrics deals with establishing relationships between economic units in space by econometric techniques, where space is physical or economic in nature (Lee et al., 2009). The most attention in economics for a cross-sectional model is the Spatial Autoregression (SAR) model by Ord and Cliff (1973). Spatial Econometrics is concerned with spatial panels, where panel data (Anslin, 1988; Elhurst, 2003) contain time series observations of a number of spatial units (postal codes, municipalities, regions, jurisdictions, states, countries, and etc.).

Panel data allow researchers to provide more comprehensive modeling than single-equation cross-sectional models, which the spatial econometric literature has long focused on. Unlike cross-sectional data, panel data have more complex behavioral hypotheses that cannot be performed with cross-sectional data (Hsiao, 2005). Elhorst (2010) provides a list of estimation problems for four panel data models that are commonly used in applied research, involving the autocorrelation of spatial error or a spatially lagged dependent variable: fixed effects, random coefficients models, fixed coefficients, random effects.

Baltaggi et al. (2003) consider testing for spatial dependence in a panel model where spatial dependence is allowed in the disturbances. In addition, Baltaggi et al. (2007b) consider serial and spatial dependence tests in an extended model, where serial correlations over time are also allowed in the disturbances. Kapoor et al. (2007) provide a theoretical analysis for a panel data model with SAR disturbances and error components. To allow for different spatial effects in the random component and disturbance conditions, Baltaggi et al. (2007) extended the panel regression model in Kapoor et al. (2007). When we

use different geographic regions such as countries, the disturbance terms are spatially autocorrelated. We have two stages in the spatial model:

First, the spatial autocorrelation disturbance components show that the errors are not independent, so the estimation of the regression parameters through normal regression analysis is biased and statistical deductions are not reliable due to biased and inconsistent standard errors. Therefore, the appropriate method is spatial Econometrics because common econometric methods are not applicable. In the recent decades that spatial autocorrelation has been known, various tools have been proposed to measure it. The most common statistical tool is I-Moran (Cliff and Ord, 1981; Moran, 1950):

$$I = \left(\frac{n}{\sum_{i=1}^n \sum_{j=1}^n W_{ij}} \right) \left(\frac{\sum_{i=1}^n \sum_{j=1}^n W_{ij} (X_i - \bar{X})(X_j - \bar{X})}{\sum_{i=1}^n (X_i - \bar{X})^2} \right) \quad (1)$$

Where X is a dependent variable, I and j are indicators of spatial locations, and n is the number of observations or areas. W_{ij} is a binary weight matrix of general cross-product statistics, so that $W_{ij} = 1$ if the locations i and j (two different cells or points) are adjacent and zero for all cells, points or areas that are not adjacent and are zero according to the $W_{ii}=0$ When a cell or area is not adjacent. This matrix shows the structure of neighborhood locations. C_{ij} is given by $(x_i - \text{mean}(x))(x_j - \text{mean}(x))$ or by multiplying the distance by the value of x_i at the location i and x_j at location j by the global average of the values of z. The counter $(x_i - \text{mean}(x))(x_j - \text{mean}(x))$ means that "Take the value of the cell in question, i, the mean of all the values of z (mean(x)) less than this i (cell a) and then multiply it by the mean value subtracted from cell j "(Sawada, 2009). Spatial classification is indicated by a positive sign on the I-Moran statistic. The maximum and minimum values for this statistic are not necessarily in the range (1, 1) (Bailey and Guttler, 1995; Griffith, 2003).

Second, spatial effects should be included in the model when there is significant spatial autocorrelation, and should be estimated using the maximum likelihood method or moment generalization. (Anselin, 2000: 5; Anselin and Bra, 1998; Kelejian and Prucha, 1997). There are two types of spatial dependence on data in spatial econometric literature: 1) Spatial error dependence: Error components are correlated with different spatial units. 2) Spatial lags dependence: The dependent variables of the locations I and j affect the dependent variable Y in location i.

In this research, considering the spatial dimension of panel data, the spatial panel pattern has been used. The spatial panel pattern is as follows (Belotti and Hughes, 2013):

$$y_{it} = \alpha + \tau y_{it-1} + \rho \sum_{j=1}^n w_{ij} y_{jt} + \sum_{k=1}^k x_{itk} \beta_k + \sum_{k=1}^k \sum_{j=1}^n w_{ij} x_{jtk} \theta_k + \mu_i + \gamma_t + \vartheta_{it}$$

$$v_{it} = \lambda \sum_{j=1}^n m_{ij} v_{jt} + \epsilon_{it} \quad i = 1, \dots, n, t = 1, \dots, T$$

[If $\tau \neq 0$, then the model is dynamic and if $\tau = 0$, then the model is static.

Spatial Durbin model (SDM) when $\lambda = 0$.

Spatial autocorrelation (SAR) when $\lambda = 0$ and $\theta = 0$.

Spatial error model (SEM) when $\rho = 0$ and $\theta = 0$.

Generalized spatial panel with random effect (GSPRE) when $\rho = 0$ and $\theta = 0$ and $\mu = \varnothing \sum_{j=1}^n w_{ij} \mu_j + \eta_i$.
 .](Ronaghi et al, 2019).

Empirical Model

In this study, the dependent variable a number of poverty and independent variables are the unemployment, Income inequality, Higher education, Gender wage gap, Hunger and food insecurity, Unemployment insurance, Health insurance, Population, race African and White and the governance index (related to government accountability in helping to compensate for coronation and good governance) in the unites states in 2011–2020. The states have a spatial dimension. Based on the Wald test and the Lm test, all independent variables were selected with a significance level of 5%. Therefore, removing any of the variables reduces the fitting power of the model, and all the independent variables included in the model cause significant explanatory power. Based on the Bruschi-Pagan test, the hypothesis of random effects is rejected, so the empirical model is as follows:

Using matrix notation the SDM ($\lambda = 0$) is derived from an SEM model:

$$POV = x \beta + u$$

$$x \beta = \beta_1 UE + \beta_2 II + \beta_3 HE + \beta_4 GW + \beta_5 HFI + \beta_6 UI + \beta_7 HI + \beta_8 GOV + \beta_9 RA + \beta_{10} RW + \beta_{11} POP$$

$$u = \lambda W u + \epsilon$$

$$u(1 - \lambda W) = \epsilon \quad \longrightarrow \quad u = \frac{\epsilon}{(1 - \lambda W)}$$

$$POV(1 - \lambda W) = x \beta(1 - \lambda W) +$$

$$POV = \lambda W y + x \beta - \lambda W x \beta +$$

If: $\Theta = -\beta \lambda \rightarrow$ the model is a SDM

$$POV = \lambda W y + (UE + II + HE + GW + HFI + UI + HI + GOV + RA + RW + POP$$

) $\beta - \Theta w$ (UE + II + HE + GW + HFI + UI + HI + GOV + RA + RW + POP) +

Spatial panel data models need the $n * n$ matrix of spatial weights.

The camera spatial model (SDM) has a special place among spatial models in the dynamic spatial econometric method. The feature of this model is the inclusion of the spatial lag of the explanatory variables as a new explanatory variable and the simultaneous inclusion of the spatial lag of the dependent variable in the model, which makes this model superior compared to other spatial models (SEM, SAR). In spatial models, we need to quantify the spatial aspects before the variance of spatial heterogeneity and spatial dependence.

There are two sources of information for spatial quantization. First, adjacency matrices should be used to reflect the relative position in the viewing area. Second, use the adjacency matrix based on the distance. Because in econometric models, the hypothesis is that each spatial segment is not its neighbor. In the first method, the numbers on the main diameter are zero. Other matrix numbers are equal to zero or one depending on the neighboring or non-neighboring states.

Next, the adjacency matrix must be standard. By standardizing the weighting matrix and then multiplying it by the dependent variable vector, a new variable is obtained that represents the average of the observations of adjacent areas. This variable is called the spatial lag variable. To show the effect of the explanatory variables of other states on the dependent variable in the Spatial Durbin Model (SDM), in addition to the spatial lag, the product of the standard weight matrix in the vector of the explanatory variables creates a new variable that shows this effect. (Akbari and Moalemi, 2005).

According to the first law of geography, "everything affects something else" (Tobler, 1970). Spatial dependence was considered as an important factor in the spatial panel model. A weight matrix in the model is the relationship between states.

The concept of spatial lag means a set of spatial neighbors in many studies where the data have a spatial dimension. In this case, the lag factor includes the weighted average of neighboring observations.

Spatial methods take into dependence between the disturbed conditions and the spatial heterogeneity variance observations. When we use geographically diverse regions such as states, the error terms are spatially autocorrelated. In this model, adjacent units show a degree of spatial dependence in the analysis.

Data Description

This study uses annual data from the US states except Alaska and Hawaii because they have no neighbors with other states. Due to the increase in poverty in recent years during the Covid 19 outbreak (USDA, 2016), panel data is a collection of data by a large number of cross-sectional variables (N) in a period of time (T), from 2011–2020.

A balanced panel is a condition where the number of cross-sectional observations is constant in time intervals. Our study is based on balanced panels. In the spatial panel, the observations are related to a specific position in space. Data can be collected in different locations (such as countries, regions, states, cities). A spatial weight matrix is used to represent the structure of interactions between each pair of spatial units (Millo, 2012). Table 1 shows the descriptive statistics of the variables.

Table 1
Summarizes the data for the period 2011–2020 in USA (on the panel)

Variable	Mean	Standard Deviation	Min	Max
Unemployment	0.05	0.020	0.02	0.14
Income inequality	14.99	3.15	0.11	35.80
Gender wage gap	79.60	4.79	64	91
Hunger and food insecurity	0.13	0.02	0.06	0.22
Unemployment insurance	0.27	0.09	0.09	0.57
Health insurance	0.21	0.08	0.04	0.42
Governance(accountability)	2.27	18.20	-39	75.8
Population	6125445	6938178	551120	3.88e
Race African	0.25	0.07	0.05	0.52
Race white	0.12	0.06	0.05	0.51
Higher education	0.42	0.08	0.15	0.76
Source: Research Findings				

Considering the use of the spatial panel model, we have to confirm the model and the spatiality of the model using the relevant tests. First, stationary tests are performed with Fisher's generalized unit root test (Zranzhad and Anvari, 2005). In the Fisher test for panel data, the null hypothesis of a unit root is rejected at the 5% significance level (Table 2). The cross-sectional correlation test is performed with freeze test (Table 2). The null hypothesis of no correlation is rejected at the 5% level of significance.

Table 2
Fisher unit root and Freeze test

Method	Value	P value
Chi-square of Fisher Dickey Fuller	159.32	0.002
Freeze Cross-Section Correlation	61.4	0.001
Source: Research Findings		

We also use the Hausman test to examine fixed versus random effects:

$$h = (\beta_f - \beta_r) (\text{var}_f - \text{var}_r)^{-1} (\beta_f - \beta_r) \quad (10)$$

The constant effect coefficient is shown with the β_r and random effects is shown with β_f . Also the variance-covariance matrix of fixed effects is shown with Var_r and random effect is shown with Var_f . As can be seen from Table 3, the null hypothesis of no fixed effects is rejected, so the fixed effects model is used.

Table 3
Hausman test

Test Hausman	P value
F-Limer panel ols1	0.03
Hausman FE1 RE	0.00
Breusch Pagan test probability distribution p = 0/00	
Source: Research Findings	

Empirical Results

The first step is the test of autocorrelation in the spatial model. The Moran statistic is 4.02, which is significant at the 0.001 probability level. The LM lag (Robust) and LM error (Robust) statistics also reject the null hypothesis of no autocorrelation.

Table 4
Moran and Lagrange coefficient tests results

Test	Moran I-statistic	Lm error	Lm Lag	Lmerror_robust	Lmlag_robust
Statistic	4.02	431.50	622.07	621.44	1073.62
Probability	0.001	0.003	0.00	0.00	0.00
Source: Research Findings					

In this research, we evaluate the impact of economic factors and governance index on number of poverty by employing the Spatial Panel model. The results are shown in table (5). Also, we report the sign of the coefficients and their elasticity in Table 6.

Unemployment has a positive relationship with poverty number. It shows that poverty number will increase by increasing Unemployment. If the labor force is unemployed, their level of income will decrease and the unemployed people will not be able to meet their living needs and will lead to poverty

(Hicks, 2013). Also, since they are malnourished and are in the poor condition, they are unable to work productively and as a result become poorer (U.S. Census Bureau, 2020).

Increase human capital development through better access to health insurance and unemployment insurance, education and nutrition (hunger and food security, especially for children). Infrastructure development and financial sector development (income equality and No gender wage gap) are all key drivers of poverty reduction and inclusive growth. Specific policies include providing the infrastructure to connect people to opportunities. Quality, cost-effective educational and health services increase human capital; And implement programs to strengthen the financial sector and expand access to financial resources. The paper's findings suggest that good governance should be included in that list (Dolumbia, 2020).

The good governance indicator has a negative and significant impact on poverty number. Improving each of the governance indicators, such as the accountability index that relates to the government's financial supports, improves the poverty number of each state (Stead 2015). The combination of political, economic, and institutional features of good governance, especially the accountability and responsibility, improves the income of the poor people and reduces poverty. Good governance, as embodied, for example, in the design and implementation of effective regulatory policies, significantly improves the ability of the poor to participate in and benefit from economic growth (Stead 2015).

Being different from zero in the RHO (Table 5) indicates accurate spatial performance. The highest coefficients in the weight matrix are related to the governance index. As mentioned earlier, the interpretation of the coefficients in Table 5 should be converted using spatial results. In Table 6, different results of spatial analysis are obtained by considering the influence of adjacency matrix.

Table 5. Spatial panel estimation result

Variables	Coefficients	Z statistics	Standard deviation
Unemployment	0.46 ^{***}	15.34	0.03
Income inequality	2.32 ^{***}	2.01	1.15
Gender wage gap	0.36 ^{**}	2.57	0.14
Hunger and food insecurity	0.58 [*]	1.81	0.32
Unemployment insurance	-0.80 ^{***}	-3.34	0.24
Health insurance	-0.005 ^{**}	-2.58	0.002
Governance(accountability to compensate)	-0.68 ^{***}	-34.02	0.02
Population	0.32 ^{**}	2.66	0.12
Race African	0.28 ^{**}	2.55	0.11
Race white	0.42 ^{**}	2.1	0.20
Higher education	-0.84 ^{**}	-2.63	0.32
Spatial rho	0.34 ^{***}	4.25	0.08
*, **, ***Statistical significance, at least at the 10%, 5%, and 1% levels, respectively			

In the spatial panel model, direct and indirect proximity to a place is considered. The effect of an explanatory variable in a spatial environment affects not only that unit, but also its neighbors (LeSage and Pace 2009). The direct adjacency means a percentage change in an independent variable at the location *l* on poverty number in location *my*. The indirect proximity effect means the effect of one percent change in an independent variable in place *i* on the number of poverty in location *j*. An indirect adjacency effect shows the difference between direct and total adjacency that is due to spatial lags. The results of adjacency are presented in Table 6. The total effect of governance has the highest effect on poverty number (Hannan et al, 2014).

The total effect for governance indicator is -2.90, so a 1% increase in governance will reduce poverty number by 2.90%. This is an important effect. Of this reduction, 2.14% is related to direct poverty number under the influence of the governance indicator for the state, and - 0.76 percent of poverty numbers are indirectly under the influence by the lack of proper governance in other states of the region. This means that weak governance in other states is accompanied by the increase of the poverty number, and affect the state in the USA. For this reason, the performance of a state affects other states indirectly (Minogue, 2008).

The total elasticity for unemployment is equal to 1.21, so if the unemployment rate increases by 1%, poverty number will increase by 1.21%. Of this increase, 0.56% is related to direct poverty number under the influence of unemployment in each state and 0.65% percent of poverty number is indirectly under the influence of unemployment in other states of the region. This means that unemployment in other states is accompanied by low income and lack of access to basic necessities that these causes the poverty. This poverty affects the states in the region (Kiaušienė, 2015).

The total elasticity for the gender wage gap is equal to 1.40, so if the gender wage gap increases by 1%, poverty number will increase by 1.40%. Of this increase, 0.68% is related to direct poverty number due to the gender wage gap of the state and 0.72% percent of poverty number are indirectly due to the gender wage gap in other states of the region (Ramos et al, 2020).

Total elasticity for hunger and food insecurity is 1.18. So if hunger and food insecurity increase by 1%, poverty number will increase by 1.18%. Of this increase, 0.52% is related to direct poverty number due to hunger and food insecurity in the state and 0.66% percent of poverty number is indirectly due to hunger and food insecurity in other states of the region. Hunger and food insecurity in other states will increase illness and inability to work throughout the region and these causes a more poverty number (Headey et al, 2022).

Total elasticity for health insurance and unemployment insurance are - 1.14 and - 1.12, so a 1% increase in health insurance and unemployment insurance will reduce poverty number by 1.14% and 1.12%. Of this reduction, 0.67% and 0.74% are related to direct poverty number due to health insurance and unemployment insurance in the state, and - 0.47, -0.38 percent of poverty number are indirectly due to health insurance and unemployment insurance in other states of the region (Molnar et al, 2015).

The total elasticity for income inequality is equal to 1.55, so if the income inequality increases by 1%, poverty number will increase by 1.55%. Of this increase, 0.88% is related to direct poverty number due to income inequality of the state and 0.67% percent of poverty number is indirectly due to income inequality in other states of the region. This means that income inequality in one state affects other states as well (Luo et al, 2022).

The total effect of higher education is -1.29, so a 1% increase in higher education will reduce poverty number by 1.29%. This is a significant impact. Of this reduction, 0.62% is related to direct poverty number under the influence of higher education for the state, and - 0.67 percent of poverty numbers are indirectly under the influence by the lack of proper education in other states of the region. This means that low education in other states is accompanied by the increase of the poverty number, and affect the state in the USA (Silva et al, 2020). For this reason, the performance of a state affects other states indirectly. Higher education leads to better jobs and higher incomes and reduces poverty (Hofmarcher, 2021).

The African race has a greater impact on poverty than the white race. Racial discrimination and lack of access to some facilities in some areas has increased poverty among this population (BY THE ANNIE E. CASEY FOUNDATION, 2020). The total elasticity for race African is equal to 1.17, so if the race African

increases by 1%, poverty number will increase by 1.55%. Of this increase, 0.34% is related to direct poverty number due to race African of the state and 0.83% percent of poverty number are indirectly due to race African in other states of the region. This means that race African in one state affects other states as well. Statistics show that the attitudes of people and cultures of other states can have a significant effect on changing the attitudes of people in one state(SDGs, 2021).

Table 6
Spatial Panel Results Including the Impact of the Adjacency Matrix

Variable	Coefficients	Z statistic	Standard deviation
Direct			0.04
Unemployment	0.56	14.01	0.06
Governance(accountability)	-2.14	-35.66	0.04
Gender wage gap	0.68	17.02	0.02
Hunger and food insecurity	0.52	26.03	0.03
Unemployment insurance	-0.74	-24.70	0.02
Health insurance	-0.67	-33.51	0.05
Income inequality	0.88	17.61	0.03
Population	0.36	12.01	0.01
Race African	0.34	34.02	0.05
Race white	0.22	4.40	0.04
Higher education	-0.62	-15.51	
Indirect			
Unemployment	0.65	21.67	0.03
Governance(accountability)	-0.76	-15.02	0.05
Gender wage gap	0.72	14.04	0.05
Hunger and food insecurity	0.66	16.51	0.04
Unemployment insurance	-0.38	-12.67	0.03
Health insurance	-0.47	-9.04	0.02
Income inequality	0.67	13.05	0.05
Population	0.35	8.75	0.04
Race African	0.83	13.84	0.06
Race white	0.79	15.90	0.05
Higher education	-0.67	-16.75	0.04

Source: Research Findings

Variable	Coefficients	Z statistic	Standard deviation
Total			
Unemployment	1.21	60.57	0.02
Governance(accountability)	-2.90	-48.33	0.06
Gender wage gap	1.40	46.67	0.03
Hunger and food insecurity	1.18	16.67	0.07
Unemployment insurance	-1.12	-22.41	0.05
Health insurance	-1.14	-19.03	0.06
Income inequality	1.55	38.76	0.04
Population	0.71	23.67	0.03
Race African	1.17	58.51	0.02
Race white	1.01	50.52	0.02
Higher education	-1.29	-25.81	0.05
Source: Research Findings			

Conclusions

The COVID-19 pandemic created a global economic crisis, in which few countries survived. The World Bank (2020b) had previously estimated that 119 of the 128 countries would experience declining GDP per capita by June 2020. Even so, such predictions potentially obscure the true scale, scope, and speed of the crisis, which often involves shutting down large parts of the economy. Case studies of the effects of COVID-19 using matrices predict that economies can shrink by 20 to 40 percent during quarantine periods. However, even when precautionary measures are reduced, the fear of transmission can still suppress consumer demand and have adverse multiplier effects on the rest of the economy.

The purpose of this research was a particularly interesting case study with the aim of quantifying the impact of governance and some economic factors on rural poverty households in the COVID-19 outbreak in the states of America. America's economy was booming prior to COVID-19, but USA effectively experienced a distinct economic shock in 2020.

The implementation of quarantines led to job losses and rising unemployment, resulting in increased poverty in the United States. According to the research findings, one of the most influential variables in poverty control is the governance variable (accountability and responsibility of the government to

compensate for the damage caused by the COVID outbreak). There are suggestions for improving governance:

- Encouraging civil society and increasing personal and legal freedoms in order to have more interaction with the government and create a suitable environment for expression lead to the accurate accountability of the government and other governing institutions.
- Policymakers will have to respond more timely and better if civil society expects them to do so and the people have the power, freedom and ability to express their views and opinions.
- Increasing the number of inspection and monitoring institutions in each state to reduce corruption in government (including governing bodies: government, judiciary and parliament) and private affiliated institutions and increasing the rule of law are among the appropriate factors for proper governance.
- Allowing the widespread activity of media and associations in order to promote transparency in the community and increase the accountability of officials about the policies that have been implemented or are being implemented.
- Focus on the effectiveness of the government in performing the assigned tasks as well as the supply of goods and providing public services and physical infrastructure to reduce transaction costs for firms, increase the competitiveness of the economy, and improve employment conditions

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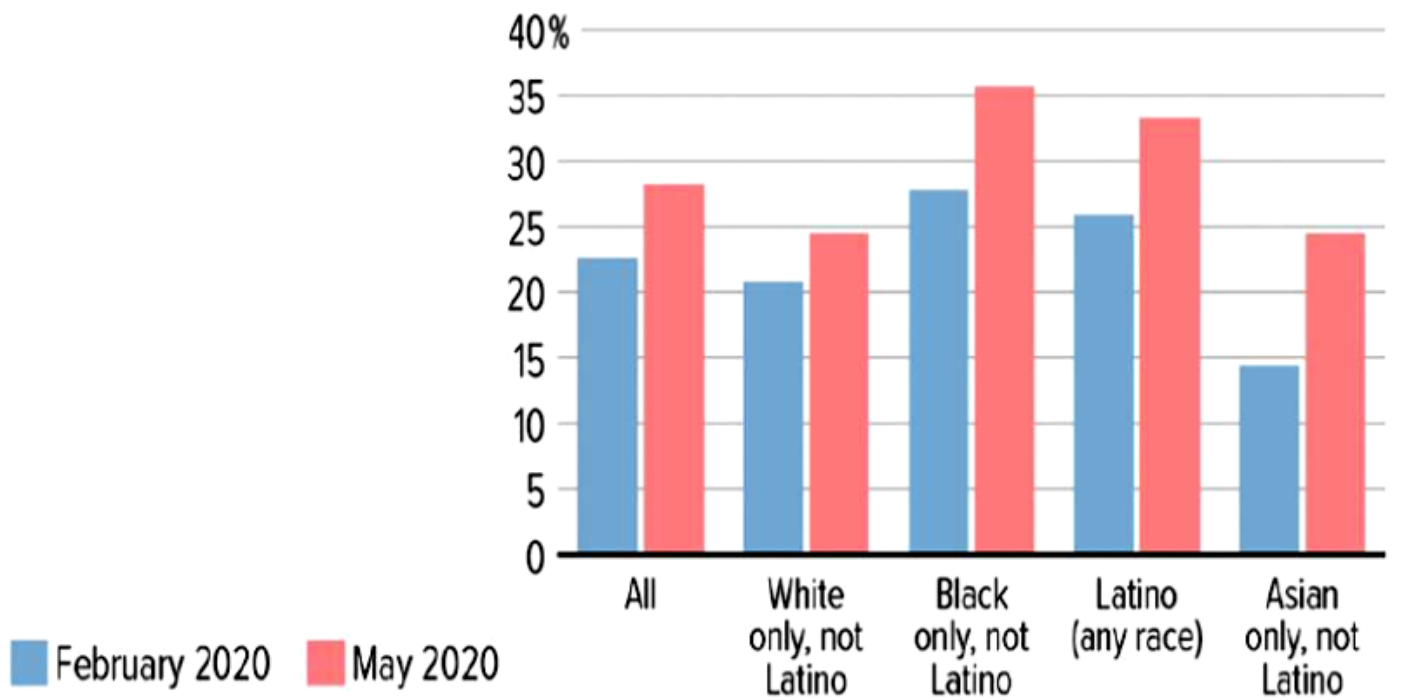
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Figures



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Figure 1

The pandemic has left Americans more vulnerable to poverty (2020)

Source: Center on budget and policy priorities