The Relationship between Country Characteristics and Ideological Polarization

Xiaohan Xiong and Penghao Jiang

***Abstract*—This article uses data from World Value Survey (WVS), World Bank and Polity IV to explore the relationship between country characteristics, which include economic situations and political systems, and the polarization of citizens' ideology on confidence in government. Through the scatter diagram and regression analysis, we assume that the degree of democracy and citizens' confidence in government have an inverted U-shaped relationship, and the GDP level is the same. The GDP level and confidence in government-related are negatively correlated. Moreover, both the GINI index and the preference headcount ratio and the confidence in government-related are positively correlated.**

***Index Terms*—Economic situation, political system, ideology polarization.**

I. Introduction

There is an increasing trend of ideological polarization everywhere in the world, as indicated by the decreased trust in governments and government's attitudes toward immigrants [1]. In this article, we aim to explore the relationship between country characteristics, such as the countries' economic situation and political system, and the polarization of citizen's ideologies.

We select the data from three statistical surveys: World Value Survey, World Bank, and Polity IV. The time range of the data covers from 1981 to 2019, and the spatial range covers 264 countries in the world. A variety of data content topics are included, such as the political systems and the economic development degrees.

To analyze the relationship between the country characteristics and people's ideology polarization, we construct a series of scattering figures with national characteristics as independent variables and posture measurements as dependent variables. Firstly, we analyze the linear relationship between GDP and ideology. In order to further improve the analysis, we also analyze the square term relationship. Secondly, we analyze the square term relationship between democracy and ideology. Furthermore, we analyze the linear relationship between the Gini index, wealth headcount ratio and ideology polarization. We also use regression analysis to supplement the scatter figures. The regression analysis focuses firstly on the linear regression of four core variables, then adds square regression, and finally adds two fixed effects of year and country to prove the influence of year and country on the results.

First, we use GDP as an independent variable and country characteristics as dependent variables for a series of analyses of GDP and confidence in government. The scatter chart's linear relationship analysis shows that GDP is negatively correlated with both confidence in civil service and confidence in government. Additionally, the value of the significance level in the regression table is 10%. The result shows that when the GDP level is lower, people have higher confidence in civil servants and the government; when the GDP level is higher, people have lower confidence in civil servants and the government.

Then we analyze what will happen if the independent variable GDP and the dependent variable country characteristics are unchanged, but they become a quadratic relationship. The conclusion shows that the relationship between the two variables changes from a negative correlation relationship to an inverted U-shaped relationship, and the significance level of the two variables in the regression table is 1%, which means that when GDP is at a medium level, people have higher trust in the government; when GDP is at a low or high level, people want more rights and have lower trust in the government.

Next, we use democracy as the independent variable to explore the quadratic relationship between democracy and country characteristics. We find that be similar to GDP and country characteristics, democracy and country characteristics also have an inverted U-shaped relationship. And the significance level in the regression table is 1%. This result means that when degree of democracy is moderate, people have greater confidence in the civil servants, government, and judicial system. When the degree of democracy is low, the centralized government may restrict the political freedom of citizens, and people's trust in civil servants, the government, and the judicial system will be reduced. When the degree of democracy is high, citizens may have a higher degree of freedom and participation in government or public events, but their trust in civil servants, the government, and the judicial system will also decrease.

However, in a scatter chart with the independent variable as the GINI index, when the dependent variable is country characteristics, and the independent variable is linearly related to the dependent variable, the independent variable has a positive correlation with the dependent variable. The significance level in the regression table is 1% or 5%. It shows that when the GINI index level is lower, people have lower confidence in the civil servants, the government, and the judicial system, and the government should take less responsibility; when the GINI index level is higher, people have higher confidence in the civil servants, the government, and the judicial system, and the government should take more

Manuscript received May 20, 2022; revised August 23, 2022.

Xiaohan Xiong was with the School of Humanities and Social Sciences, Beijing Institute of Technology, China (e-mail: Xiaohan_Xiong@outlook.com).

Penghao Jiang was with Guangdong University of Foreign Study. He is now with The Chinese University of Hong Kong, China (e-mail: phjiang99@outlook.com).

doi: 10.18178/ijssh.2022.12.4.1098

responsibility.

When other conditions do not change, the independent variable is poverty headcount ratio, the dependent variable is government responsibility, and the independent variable has a linear relationship with the dependent variable, there is a positive correlation between the two variables, and the significance level in the regression tableis 10%. The result shows that when the poverty headcount ratio is lower, people think the government should take less responsibility; when the poverty headcount ratio is higher, people think the government should take more responsibility.

Most previous papers only studied one of the two levels of economic situation or political system. For example, Torben Iversen and David Soskice divided different countries into two types according to inequality and mass polarization [2], Stephen Knack and Philip Keefer found trust and civic norms are stronger in nations with higher and more equal incomes [3], Romain Lachat suggested that the role of citizens' left–right orientations increases with party system polarization [4], Christopher Hare and Keith T. Poole described how the modern polarization trend emerged and its implications for mass political behavior and public policy outcomes [5], Delia Baldassarri and Andrew Gelman discussed the consequences of partisan realignment and group sorting on the political process [6], and Bernard Caillaud and Jean Tirole analyzed the impact of political polarization and inter-party competition on party political choices [7]. However, they did not study both levels simultaneously. Our paper studies both the economic situation and the political system, with a more comprehensive research perspective.

From the perspective of data statistics, most previous studies focused on the United States [1], [8], European countries, and Asian countries with a single perspective. For example, Matthew Gentzkow and Jesse M. Shapiro used individual and aggregate data to ask how the ideological segregation of the American electorate is changed [9], Torben Iversen and David Soskice purposed that mass polarization is negatively related to income inequality in advanced democracies [10], Christopher D. Johnston considered ideological divergence on size-of-government issues between Democrats and Republicans in the United States [11], and Russell J. Dalton selected data from World Values Survey (WVS) that covers over 70 nations [12]. However, we select data from 264 countries, including both developing countries and developed countries, and both capitalist countries and socialist countries.

The paper is organized as follows. Section II describes the data used in the analysis, while Section III outlines the empirical strategy. Section IV presents the baseline results. Section V offers concluding remarks.

II. Data

We select three main databases for our analysis: World Bank, World Value Survey and Polity IV. The counted countries span a large span, with economic levels ranging from developed to developing countries, and covering different political systems. We make two summary statistics tables (Table I and Table II) for these problems.

A. Attitude Variable: World Value Survey

World Value Survey is a global research project that explores people's values and beliefs, how they change over time, and their social and political impact. Since 1981, a worldwide network of social scientists has conducted representative national surveys as part of World Value Survey in almost 100 countries and regions. These countries and regions contain 90% of the world's population. Additionally, the World Value Survey is the only academic research that covers all global changes from impoverished countries to prosperous countries in all major cultural regions of the world.

The World Value Survey data is divided into six World Value Survey waves according to the different years, which are 1981-1984, 1989-1993, 1994-1998, 1999-2004, 2005-2009, 2010-2014. We define the data between 1981-1984 as the 1st wave, the data between 1989-1993 as the 2nd wave, the data between 1994-1998 as the 3rd wave, the data between 1999-2004 as the 4th wave, the data between 2005-2009 as the 5th wave, and the data between 2010-2014 as the 6th wave. Furthermore, use these six waves as the time scale to divide the data of World Bank and Polity IV into six categories for the next step of data collation and analysis.

Several political attitude variables were selected as core variables in the World Value Survey for further analysis, including *confidence in civil services*, *confidence in the government*, *confidence in the justice system*, *government responsibility*, and *priority to that nation's people*.

The *confidence in civil services* variable, the *confidence in the government* variable, and the *confidence in the justice system* variable divide the survey results into four categories. The confidence in civil services, the government and the justice system are inversely proportional to the representative number, the highest degree of confidence; the representative number is 1, the lowest degree of confidence, the representative number is 4, and so on. The *priority to nation people* variable measures whether employers should give priority to that nation's people rather than immigrants. Specifically, "agree" is 1, "disagree" is 2, and "neither" is 3.

Then, we calculate the standard deviation of the four core variables as the outcome variable of this survey.

B. Country Characteristics

We not only study the economic situation, but also the political system, with a more comprehensive research perspective.

C. Economic Status: World Bank

We select data related to economic development from World Bank. We divided the data into different tables according to different variables. Each table contains the data of a certain variable in each country and each year. A total of 264 countries are counted from 1960 to 2019.

In this analysis, we mainly use *GDP per capita growth annual percentage*, *GINI index*, and *poverty headcount ratio at $1.90 a day (2011 PPP)*(% of the population) these three core variables.

Among them, the *poverty headcount ratio at $1.90* variable standard is that the daily income per person is less than 1.9. Most of the data are concentrated between 0 and 10, a few are between 10 and 40.

D. Political System: Polity IV

Polity IV continues the Polity research tradition of coding the authority characteristics of states in the world system for purposes of comparative and quantitative analysis.

We mainly use the core variable of *Institutionalized Democracy*, whose period is from 1800 to 2018, with 194 countries and regions participating. The democracy indicator is an additive eleven-point scale from 0 to 10. The operational indicator of democracy is derived from codings of the competitiveness of political participation, the openness and competitiveness of executive recruitment, and constraints on the chief executive.

III. Empirical Strategy

We primarily use two types of data analysis methods, namely, scatter analysis and regression analysis. First, we use scatter figures to get the distribution range and trend of the data, and then the regression tables are used for further verification.

A. Scatter Analysis

We present a series of scattering figures with country characteristics as independent variables and attitude measurements as dependent variables.

The Fig. 1 and Fig. 2 take the GDP in country characteristics as the independent variable and five attitude measurements as dependent variables. The relationships between the independent variable and the dependent variables are fit through the linear relationship and the quadratic relationship, then we compare the differences between the results of the two fit methods.

The Fig. 3 takes democracy in country characteristics as the independent variable and five attitude measurements as the dependent variables, and fits the relationships between the independent and the dependent variables through a linear relationship.

The Fig. 4 takes the Gini index in country characteristics as the independent variable and five attitude measurements as the dependent variables, and fits the relationships between the independent variable and the dependent variables through a linear relationship.

The Fig. 5 takes the poverty headcount ratio in country characteristics as the independent variable, and the five attitude measurements are taken as the dependent variable. The relationships between the independent variable and the dependent variables are fitted through a linear relationship.

B. Regression Analysis

We take country characteristics as independent variables and attitude measurements as dependent variables to explore the regression relationship between them, as shown by,

$$Y_{it} = b_0 + b_1 GDP_{it} + b_2 GINI_{it} + b_3 Demo_{it} + b_4 PH_{it} + e_{it} \quad (1)$$

Equation (1) is the regression of the linear relationship between country characteristics and attitude measurements. The *i* indexes countries and *t* indexes the WVS periods, which are 1981-1984, 1989-1993, 1994-1998, 1999-2004, 2005-2009, 2010-2014. The *GDP*, the *GINI*, the *Demo*, and the *PH* in the formula represent independent variables, and Y_{ict} index represent the dependent variables, including citizens' attitudes toward the government, political actions, and immigrants.

$$Y_{it} = b_0 + b_1 GDP_{it} + b_2 GDP(sq)_{it} + b_3 GINI_{it} + b_4 GINI(sq)_{it} + b_5 Demo_{it} + b_6 Demo(sq)_{it} + b_7 PH_{it} + b_8 PH(sq)_{it} + e_{it} \quad (2)$$

Equation (2) adds the regression of the quadratic relationship of country characteristics and attitude measurements to the linear regression of (1), such as the *GDP(sq)*, the *GINI(sq)*, the *Demo(sq)*, and the *PH(sq)*.

$$Y_{it} = b_0 + b_1 GDP_{it} + b_2 GDP(sq)_{it} + b_3 GINI_{it} + b_4 GINI(sq)_{it} + b_5 Demo_{it} + b_6 Demo(sq)_{it} + b_7 PH_{it} + b_8 PH(sq)_{it} + g_i + e_{it} \quad (3)$$

Equation (3) adds a country-fixed effect (γ_i) to the regression of the linear relationship and quadratic relationship between country characteristics and attitude measurements in (2). At this time, the significance level of the quadratic regression of GDP to civil services has changed from 5% to greater than 10%. The significance level of the linear regression of the GINI index to government responsibility changes from more significant than 10% to 10%, but the significance level of the regression of the GINI index to government confidence changes from 5% to greater than 10%.

$$Y_{it} = b_0 + b_1 GDP_{it} + b_2 GDP(sq)_{it} + b_3 GINI_{it} + b_4 GINI(sq)_{it} + b_5 Demo_{it} + b_6 Demo(sq)_{it} + b_7 PH_{it} + b_8 PH(sq)_{it} + d_i + e_{it} \quad (4)$$

Equation (4) adds a year-fixed effect (δ_i) to the regression of the linear relationship and quadratic relationship between country characteristics and attitude measurements in (2). Except for the significance level of the linear regression of democracy to government responsibility, which changes from 10% to 5%, the significance level of other results becomes larger.

$$Y_{it} = b_0 + b_1 GDP_{it} + b_2 GDP(sq)_{it} + b_3 GINI_{it} + b_4 GINI(sq)_{it} + b_5 Demo_{it} + b_6 Demo(sq)_{it} + b_7 PH_{it} + b_8 PH(sq)_{it} + g_i + d_i + e_{it} \quad (5)$$

Equation (5) adds both a country-fixed effect (γ_i) and a year-fixed effect (δ_i) to the regression of the linear relationship and quadratic relationship between country characteristics and attitude measurements in (2). Except for the significance level of the linear regression of democracy to

government responsibility, which changes from 10% to 5%, the significance level of other results becomes larger.

IV. Results

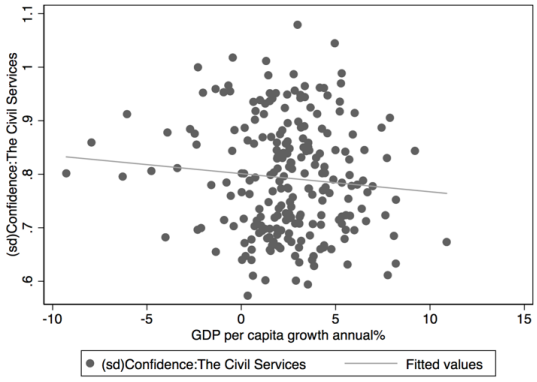
From the above data analysis, we can draw two main conclusions from both macro and micro background level.

A. Country Macro Background

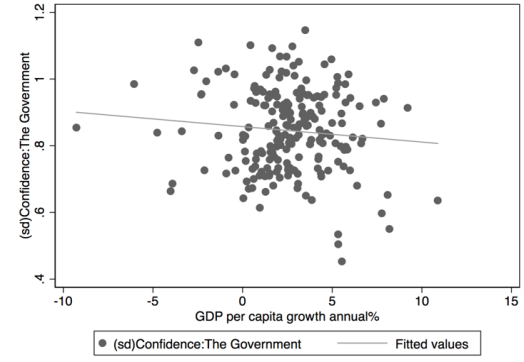
At the macro level, we study the GDP and the degree of democracy as the data support of the economic situation and political system.

B. GDP

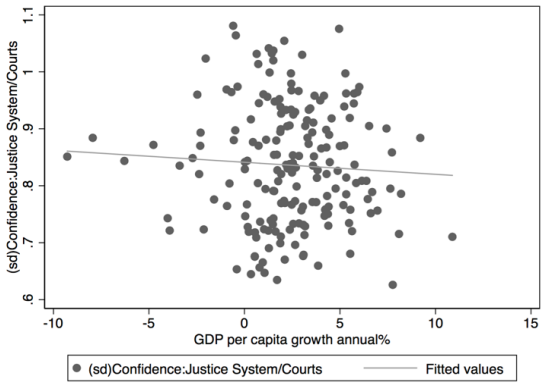
In order to explore the correlation between gross national product (GDP) and citizens' attitudes, we made a series of scatter plots and regressions for analysis. In the scatter plot where the independent variable is the *GDP*, when the dependent variable is *confidence in civil services* and *confidence in government*, and the independent variable and the dependent variable have a linear relationship, the two variables are in a negative correlation conclusion. Among them, when the dependent variable is *confidence in civil services*, every time when the *GDP* increases by 1 unit, the *confidence in civil services* will decrease by 0.006 units (Fig. 1 (a)). When the dependent variable is *confidence government*, the *GDP* will increase by 1 unit every time, and *confidence in government* will be reduced by 0.008 units (Fig. 1 (b)). The value of the significance level in the regression tableis 10%. The results show that when the GDP level is lower, people have higher confidence in civil servants and the government; when the GDP level is higher, people have lower confidence in civil servants and the government.



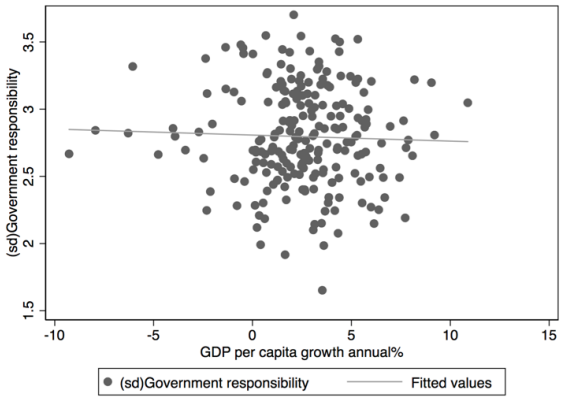
(a) Confidence in Civil Services (Linear-in-standard deviation)



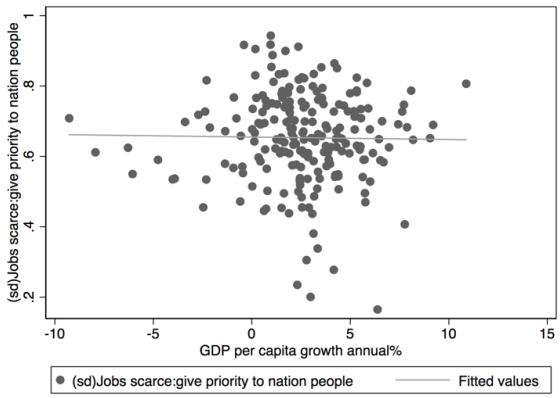
(b) Confidence in Government (Linear-in-standard deviation)



(c) Confidence in the Justice System (Linear-in-standard deviation)



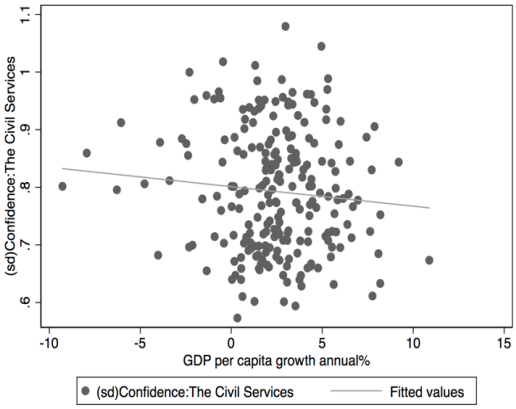
(d) Government responsibility (Linear-in-standard deviation)



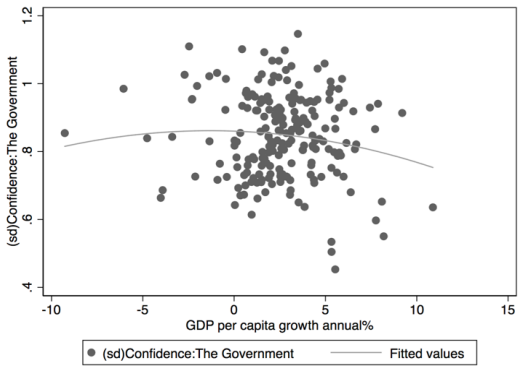
(e) Priority to Nation's people (Linear-in-standard deviation)

Fig. 1. The relationship between GDP and citizens' attitudes (Linear-in-standard deviation)

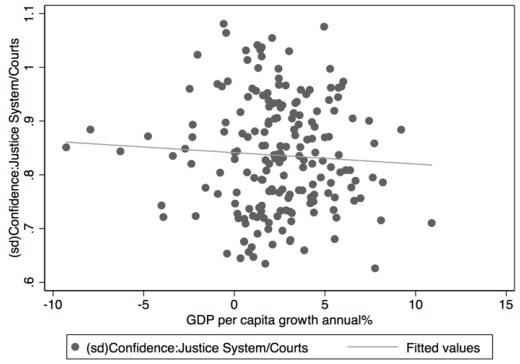
Note: These five figures plot core variables that have little linear correlation with GDP per capita growth annually.



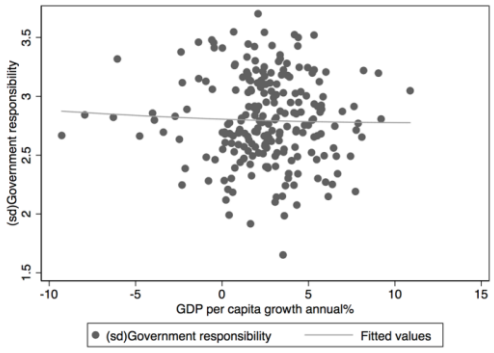
(a) Confidence in Civil Services (Quadratic-in-standard deviation)



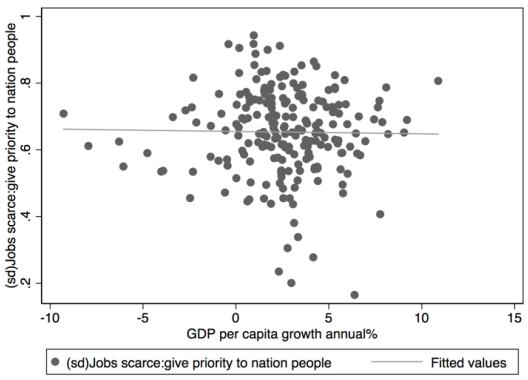
(b) Confidence in Government (Quadratic-in-standard deviation)



(c) Confidence in the Justice System (Quadratic-in-standard deviation)



(d) Government Responsibility (Quadratic-in-standard deviation)



(e) Priority to Nation's People (Quadratic-in-standard deviation)

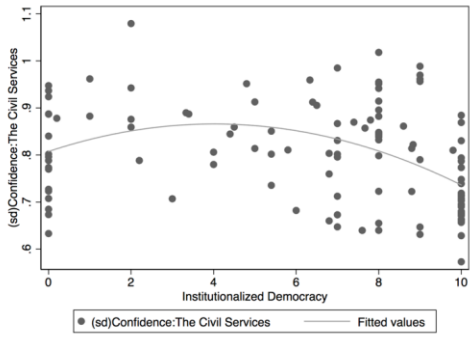
Fig. 2. The relationship between GDP and citizens' attitudes (Quadratic-in-standard deviation)

Note: The graphs plot the quadratic correlation between the standard deviation of core variables (attitude) and GDP. *Confidence in Civil Services*, *Confidence in Government*, and *Confidence in the Justice System* all show that at a moderate level of democracy, the attitudes are the most significant. As the levels of democracy are higher/lower, the significance gradually decreases. *Government responsibility* and *Priority to Nation's People* have little quadratic relationship with GDP per capita growth annually.

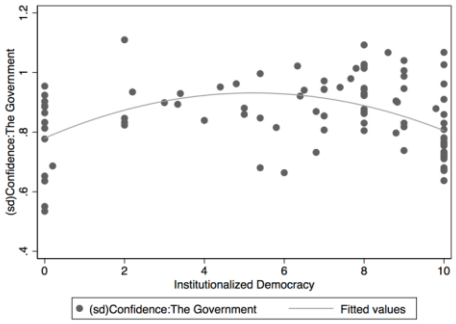
C. Democracy

However, because the linear relationship analysis is partial and hypothetical, we assume that the independent variable the GDP and the dependent variable citizen attitudes are quadratic relationships to explore how the results will change.

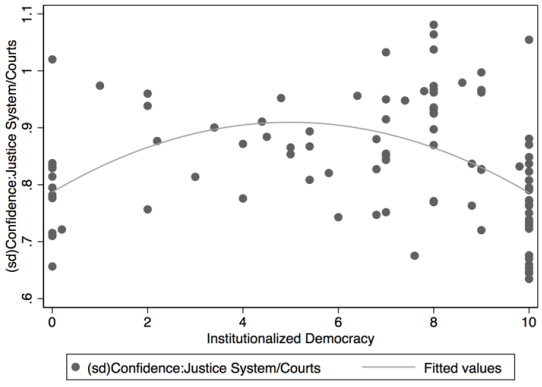
When the GDP and citizen attitudes become a quadratic relationship, the relationship between the two changes from a negative relationship to an inverted U-shaped relationship. In the scatter plot with the independent variable as *GDP*, when the dependent variable is *confidence in government* and the independent variable has a quadratic relationship with the dependent variable, the relationship between the two variables is an inverted U-shape, with the highest point at approximately 0.85, the lowest point at approximately 0.75 (Fig. 2 (b)). The significance level of the two in the regression table is 1%, which means that when the GDP is at a medium level, people have higher trust in the government; when the GDP is at a low or high level, this may be because the country as a whole is in a relatively impecunious or affluent economic stage, resulting in people want more political rights and have lower trust in the government.



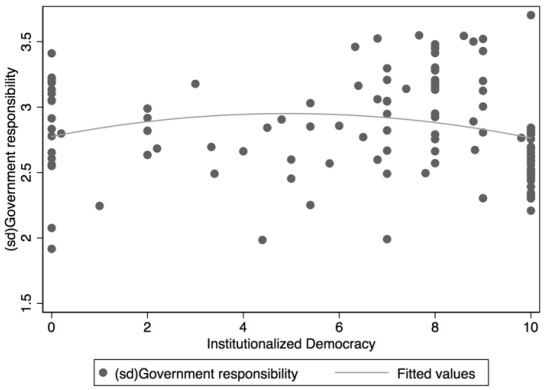
(a) Confidence in Civil Services (Quadratic-in-standard deviation)



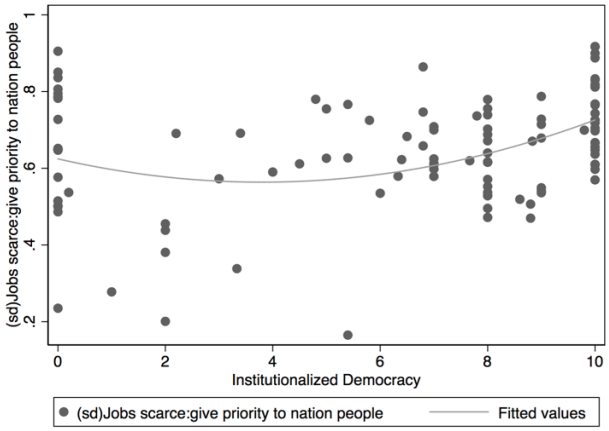
(b) Confidence in Government (Quadratic-in-standard deviation)



(c) Confidence in the Justice System (Quadratic-in-standard deviation)



(d) Government Responsibility (Quadratic-in-standard deviation)



(e) Priority to Nation's People (Quadratic-in-standard deviation)

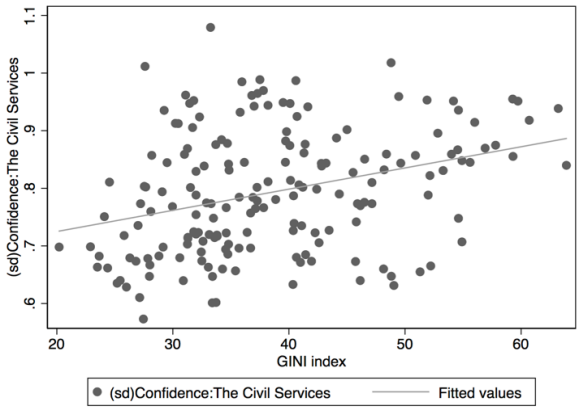
Fig. 3. The relationship between democracy and citizens' attitudes (Quadratic-in-standard deviation)

Note: The graphs plot the quadratic correlation between the standard deviation of core variables (attitude) and Democracy. *Confidence in Civil Services*, *Confidence in Government*, *Confidence in the Justice System* and *Government Responsibility* all show that at a moderate level of democracy, the attitudes are significant. As the level of democracy is higher/lower, the significance gradually decreases. *Priority to Nation's People* is different from the other four attitudes. It shows that when the degree of democracy is moderate, employees should give less priority to the nation's people than to immigrants. As the level of democracy is higher/lower, this desire gradually rises (which means employers should give more priority to the nation's people than to immigrants).

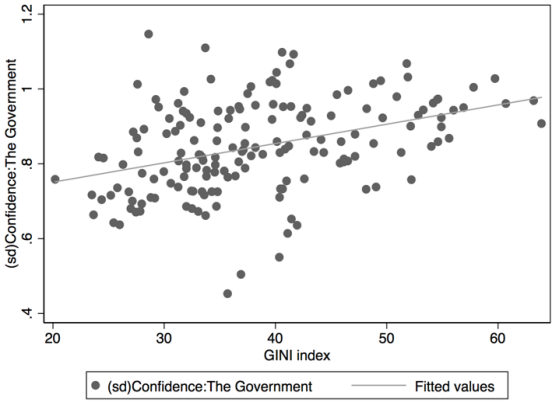
Under normal circumstances, democratic countries have relatively higher GDP. We explore the relationship between GDP and democracy. In the scatter plot where the independent variable is *institutionalized democracy*, when the dependent variable is *confidence in civil services*, *confidence in the government* and *confidence in the justice system*, the independent variable and the dependent variables are in a quadratic relationship, they all show the inverted U -shape trend. Among them, when the dependent variable is *confidence in civil services*, the highest point is about 0.85, and the lowest point is about 0.75 (Fig. 3 (a)). When the dependent variable is *confidence in government*, the highest point is about 0.9 and the lowest point is about 0.78 (Fig. 3 (b)). When the dependent variable is *confidence in the justice system*, the highest point is about 0.9 and the lowest point is about 0.8 (Fig. 3 (c)). Their significance levels in the regression table are all 1%. These results mean that when the democracy is moderate, people have greater confidence in the civil service, government, and judicial system. When the degree of democracy is low, the political freedom of citizens may be restricted due to the centralized government, and people's trust in civil servants, the government and the judicial system will be reduced. When the degree of democracy is high, citizens may have a higher degree of freedom and participation in government or public events, and their trust in civil servants, the government and the judicial system will also decrease.

D. Distribution Within the Country

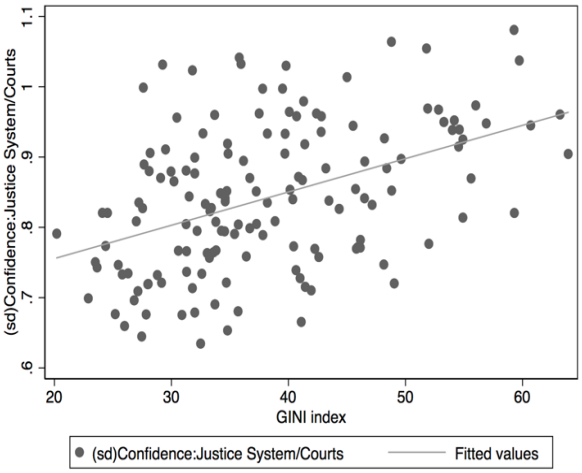
At the micro background level of the country, we mainly study the Gini coefficient and poverty headcount ratio as further data supplement to help us find problems from a deeper level.



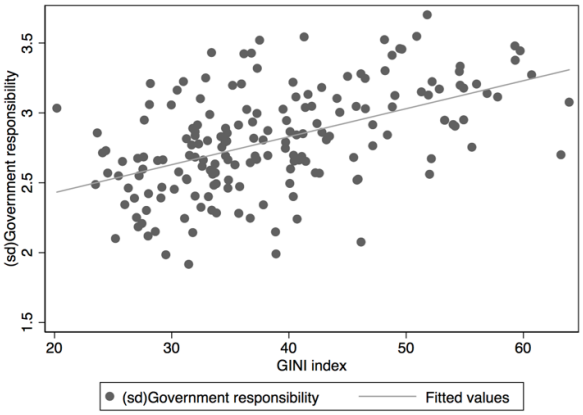
(a) Confidence in Civil Services (Linear-in-standard deviation)



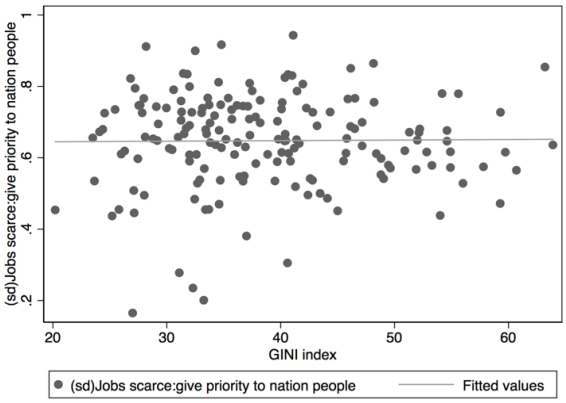
(b) Confidence in Government (Linear-in-standard deviation)



(c) Confidence in the Justice System (Linear-in-standard deviation)



(d) Government Responsibility (Linear-in-standard deviation)



(e) Priority to Nation's People (Linear-in-standard deviation)

Fig. 4. The relationship between GINI index and citizens' attitudes (Linear-in-standard deviation)

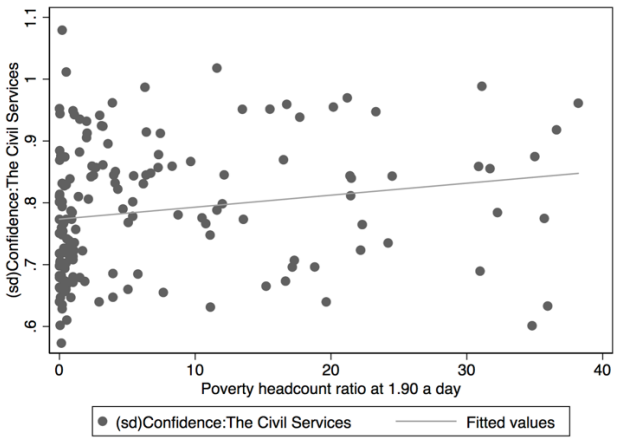
Note: The graphs plot the linear correlation between the standard deviation of core variables (attitude) and GDP. Except for *Priority to Nation's People*, the other four altitudes all have significant positive linear correlations with GINI index.

E. GINI Index

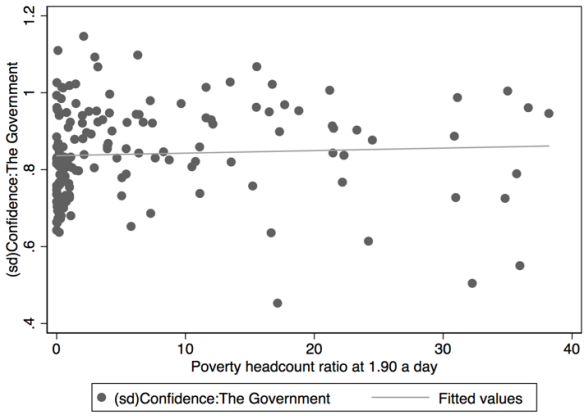
In a scatter chart with the independent variable as *GINI index*, when the dependent variables are *confidence in civil services*, *confidence in the government*, *confidence in the justice system* and *government responsibility*, and the independent variable is linearly related to the dependent variables, the independent variable has a positive correlation with the dependent variables. Among them, when the dependent variable is *confidence in civil services*, every time *GINI index* increases by 1 unit, the *confidence in civil services* increases by 0.002 units (Fig. 4 (a)). When the dependent variable is *confidence in government*, *GINI index* increases by 1 every time unit, and the *confidence in government* increases by 0.005 unit (Fig. 4 (b)). When the dependent variable is *confidence in the justice system*, every time *GINI index* increases by 1 unit, *confidence in the justice system* increases by 0.005 unit (Fig. 4 (c)). When the dependent variable is *government responsibility*, every time *GINI index* increases by 1 unit, *government responsibility* increases by 0.022 unit (Fig. 4 (d)). The significance level in the regression table is 1% or 5%. These findings show that when the GINI index level is lower, people have lower confidence in the civil servants, the government and the judicial system, so the government should take less responsibility; when the GINI index level is higher, people have higher confidence in the civil servants, the government and the judicial system, and the government should take more responsibility.

F. Poverty Headcount Ratio

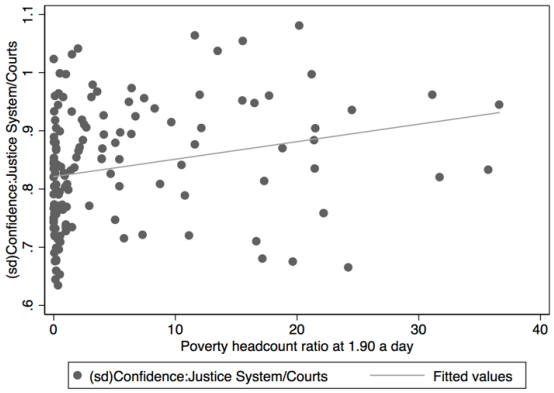
When other conditions do not change, the independent variable is *poverty headcount ratio*, the dependent variable is *government responsibility*, and the independent variable has a linear relationship with the dependent variable, there is a positive correlation between the two variables. For every increase in *poverty headcount ratio* by 1 unit, *government responsibility* increases 0.004 unit (Fig. 5 (d)). The result shows that when the poverty headcount ratio is lower, people think the government should take less responsibility; when the poverty headcount ratio is higher, people think the government should take more responsibility.



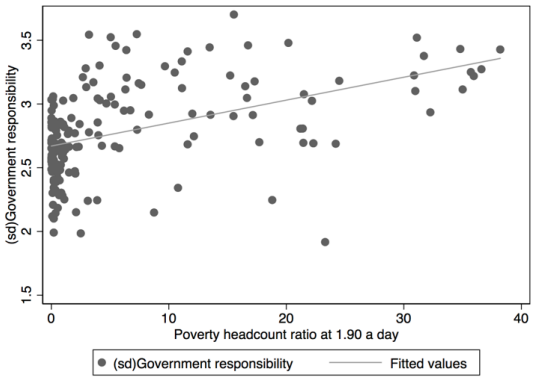
(a) Confidence in Civil Services (Linear-in-standard deviation)



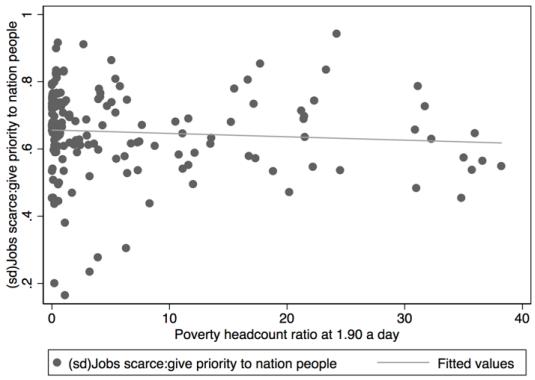
(b) Confidence in Government (Linear-in-standard deviation)



(c) Confidence in the Justice System (Linear-in-standard deviation)



(d) Government Responsibility (Linear-in-standard deviation)



(e) Priority to Nation's People (Linear-in-standard deviation)

Fig. 5. The relationship between poverty headcount ratio and citizens' attitudes (Linear-in-standard deviation)

Note: The graphs plot the linear correlation between the standard deviation of core variables (attitude) and poverty headcount ratio. Except for *Confidence in Government* and *Priority to Nation's People*, the other three altitudes all have significant positive linear correlations with GINI index.

TABLE I: SUMMARY STATISTICS (MEAN)

Variables	N	mean	sd	min	max
Institutionalized Democracy	121	6.353	3.611	0	10
GDP per capita growth annual%	237	2.657	3.796	-9.277	41.86
GINI index	184	38.44	9.395	20.20	63.90
Poverty headcount ratio at 1.90 a day	184	10.34	16.65	0	86
Important in life politics	229	2.676	0.291	1.848	3.350
Priority to nation's people	219	1.410	0.212	1.019	2.200
Signing a petition	226	2.141	0.418	1.110	2.935
Joining in boycotts	222	2.545	0.243	1.846	2.950
Lawful demonstrations	225	2.343	0.232	1.780	2.904
Joining unofficial strikes	166	2.667	0.189	1.909	2.972
Self position political	222	5.667	0.713	2.708	9.090
Government responsibility	229	6.282	0.998	3.476	8.206
Confidence in Press	235	2.593	0.298	1.568	3.285
Confidence in Labour Unions	231	2.736	0.304	1.579	3.454
Confidence in Police	232	2.446	0.385	1.285	3.357
Confidence in Civil Services	233	2.596	0.353	1.457	3.487
Confidence in Government	214	2.594	0.389	1.218	3.407
Confidence in the Justice System	195	2.457	0.360	1.410	3.376
Immigrant policy	141	2.443	0.272	1.699	3.068
Tax rich people and subsidize poor people	113	6.403	0.942	4.273	8.638
Number of children	236	2.690	0.620	1.397	4.731
Social class subjective	208	3.314	0.336	1.615	4.397

TABLE II: SUMMARY STATISTIC (STANDARD DEVIATION)

Variables	N	mean	sd	min	max
Important in life politics	229	0.931	0.101	0.646	1.153
Priority to nation's people	219	0.652	0.132	0.165	0.943
Signing a petition	226	0.684	0.0977	0.300	0.851
Joining in boycotts	222	0.579	0.110	0.240	0.836
Lawful demonstrations	225	0.684	0.0945	0.340	0.884
Joining unofficial strikes	166	0.539	0.125	0.168	0.869
Self position political	222	2.232	0.354	1.443	3.474
Government responsibility	229	2.791	0.368	1.652	3.702
Confidence in Press	235	0.785	0.102	0.551	1.041
Confidence in Labour Unions	231	0.825	0.0986	0.586	1.038
Confidence in Police	232	0.842	0.121	0.545	1.143
Confidence in Civil Services	233	0.791	0.106	0.573	1.079
Confidence in Government	214	0.844	0.124	0.453	1.147
Confidence in the Justice System	195	0.833	0.105	0.626	1.081

Immigrant policy	141	0.781	0.109	0.522	1.132
Tax rich people and subsidize poor people	113	2.789	0.345	2.004	3.477
Number of children	236	1.425	0.419	0.507	2.494
Social class subjective	208	0.919	0.126	0.523	1.326

TABLE III: THE IMPACT OF NATIONAL CONDITIONS ON CITIZENS' ATTITUDES (LINEAR-IN-STANDARD DEVIATION)

Dependent Variable:(sd)	priority to nation	Government responsibility	Civil Services	Government Confidence	Justice System
GDP per capita growth annual	0.001	-0.001	-0.006*	-0.008*	-0.005
	(0.005)	(0.011)	(0.004)	(0.004)	(0.003)
Institutionalized Democracy	0.013***	0.015	-0.006*	0.001	0.002
	(0.005)	(0.011)	(0.004)	(0.004)	(0.004)
GINI index	-0.000	0.022***	0.002**	0.005***	0.005***
	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)
Poverty headcount ratio	0.001	0.004*	0.001	0.001	0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Observations	93	98	97	89	83
R-Squared	0.085	0.344	0.129	0.183	0.247

Note: These numbers are the linear regression results of the country's conditions on the ideology of citizens (such as *priority to nation's people*, *government responsibility*, *confidence in civil services*, *confidence in the government*, and *confidence in the justice system*). The result variables in the first to fourth rows are the impact of GDP, democracy, GINI index, and poverty headcount ratio on citizen's ideology. ***significant at 1 percent level, ** significant at 5 percent level, * significant at 10 percent level.

TABLE IV: THE IMPACT OF NATIONAL CONDITIONS ON CITIZENS' ATTITUDES (LINEAR AND QUADRATIC-IN-STANDARD DEVIATION)

Dependent Variable:(sd)	priority to nation	Government responsibility	Civil Services	Government Confidence	Justice System
GDP per capita growth annual	-0.003	-0.001	-0.002	-0.001	-0.001
	(0.005)	(0.011)	(0.004)	(0.004)	(0.003)
GDP per capita growth annual(sq)	0.001	0.000	-0.001**	-0.002***	-0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Institutionalized Democracy	-0.019	0.071*	0.026**	0.050***	0.043***
	(0.018)	(0.039)	(0.013)	(0.013)	(0.012)
Institutionalized Democracy(sq)	0.003*	-0.005	-0.003***	-0.005***	-0.004***
	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)
GINI index	0.016	0.041	0.007	0.023**	0.003
	(0.014)	(0.031)	(0.010)	(0.011)	(0.009)
GINI index(sq)	-0.000	-0.000	-0.000	-0.000*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Poverty headcount ratio	-0.000	0.028***	0.005**	0.005*	0.006***
	(0.003)	(0.007)	(0.002)	(0.003)	(0.002)
Poverty headcount ratio(sq)	0.000	-0.000***	-0.000*	-0.000	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	93	98	97	89	83
R-Squared	0.162	0.451	0.276	0.394	0.457

Note: These numbers are the linear and quadratic regression results of the country's conditions on the ideology of citizens (such as *priority to nation's people*, *government responsibility*, *confidence in civil Services*, *confidence in government*, and *confidence in the justice system*). The result variables in the first to fourth rows are the impact of GDP, democracy, GINI index, and poverty headcount ratio on citizen's ideology. ***significant at 1 percent level, ** significant at 5 percent level, * significant at 10 percent level.

TABLE V: THE IMPACT OF NATIONAL CONDITIONS ON CITIZENS' ATTITUDES (LINEAR AND QUADRATIC-IN-STANDARD DEVIATION) (WITH YEAR-FIXED EFFECT)

Dependent Variable:(sd)	priority to nation	Government responsibility	Civil Services	Government Confidence	Justice System
GDP per capita growth annual	-0.007	0.006	-0.004	-0.003	-0.002
	(0.005)	(0.011)	(0.004)	(0.004)	(0.003)
GDP per capita growth annual(sq)	0.001	-0.000	-0.001	-0.002***	-0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Institutionalized Democracy	-0.022	0.071*	0.030**	0.050***	0.040***
	(0.018)	(0.040)	(0.013)	(0.013)	(0.013)
Institutionalized Democracy(sq)	0.004**	-0.005	-0.004***	-0.005***	-0.004***
	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)
GINI index	0.004	0.062*	-0.002	0.015	0.002

	(0.015)	(0.034)	(0.011)	(0.012)	(0.009)
GINI index(sq)	-0.000	-0.001	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Poverty headcount ratio	0.002	0.026***	0.005**	0.005**	0.007***
	(0.003)	(0.007)	(0.002)	(0.003)	(0.002)
Poverty headcount ratio(sq)	-0.000	-0.000***	-0.000*	-0.000*	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
WVS wave FE	Yes	Yes	Yes	Yes	Yes
Observations	93	98	96	89	82
R-Squared	0.279	0.476	0.316	0.436	0.476

Notes: These numbers are the linear and quadratic regression results of the country's conditions on the ideology of citizens (such as *priority to nation's people*, *government responsibility*, *confidence in civil services*, *confidence in government*, and *confidence in the justice system*). The result variables in the first to fourth rows are the impact of GDP, democracy, GINI index, and the poverty headcount ratio on citizens' ideology. Specific control for WVS wave fixed effects illustrate the influence of different years on the regression results. ***significant at 1 percent level, ** significant at 5 percent level, * significant at 10 percent level.

TABLE VI: THE IMPACT OF NATIONAL CONDITIONS ON CITIZENS' ATTITUDES (LINEAR AND QUADRATIC-IN-STANDARD DEVIATION) (WITH COUNTRY-FIXED EFFECT)

Dependent Variable:(sd)	priority to nation	Government responsibility	Civil Services	Government Confidence	Justice System
GDP per capita growth annual	-0.000	0.003	0.002	-0.002	-0.004
	(0.006)	(0.014)	(0.003)	(0.005)	(0.003)
GDP per capita growth annual(sq)	-0.000	-0.000	0.001	-0.000	0.000
	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)
Institutionalized Democracy	-0.027	0.197**	-0.008	0.022	0.048*
	(0.035)	(0.077)	(0.018)	(0.023)	(0.025)
Institutionalized Democracy(sq)	0.002	-0.008	-0.000	-0.002	-0.004**
	(0.003)	(0.007)	(0.002)	(0.002)	(0.002)
GINI index	0.025	-0.065	-0.005	0.013	-0.020
	(0.029)	(0.062)	(0.015)	(0.018)	(0.015)
GINI index(sq)	-0.000	0.001	0.000	-0.000	0.000
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Poverty headcount ratio	-0.002	0.010	-0.001	0.003	-0.005
	(0.006)	(0.013)	(0.003)	(0.006)	(0.004)
Poverty headcount ratio(sq)	-0.000	-0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
country code FE	Yes	Yes	Yes	Yes	Yes
Observations	82	85	86	75	69
R-Squared	0.678	0.750	0.839	0.853	0.861

Notes: These numbers are the linear and quadratic regression results of the country conditions on the ideology of citizens (such as *priority to nation's people*, *government responsibility*, *confidence in civil services*, *confidence in government*, and *confidence in the justice system*). The result variables in the first to fourth rows are the impact of GDP, democracy, GINI index, and the poverty headcount ratio on citizens' ideology. Specific control for country code fixed-effects illustrate the influence of different countries on the regression results. ***significant at 1 percent level, ** significant at 5 percent level, * significant at 10 percent level.

TABLE VII: THE IMPACT OF NATIONAL CONDITIONS ON CITIZENS' ATTITUDES (LINEAR AND QUADRATIC-IN-STANDARD DEVIATION) (WITH YEAR-FIXED EFFECT AND COUNTRY-FIXED EFFECT)

Dependent Variable:(sd)	priority to nation	Government responsibility	Civil Services	Government Confidence	Justice System
GDP per capita growth annual	-0.004	0.004	0.003	-0.002	-0.002
	(0.006)	(0.015)	(0.004)	(0.005)	(0.004)
GDP per capita growth annual(sq)	0.001	0.000	0.001	-0.000	0.000
	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)
Institutionalized Democracy	-0.002	0.203**	-0.002	0.024	0.048*
	(0.031)	(0.078)	(0.019)	(0.024)	(0.025)
Institutionalized Democracy(sq)	-0.001	-0.008	-0.001	-0.002	-0.004*
	(0.003)	(0.008)	(0.002)	(0.002)	(0.002)
GINI index	0.009	-0.074	-0.005	0.011	-0.015
	(0.026)	(0.065)	(0.017)	(0.019)	(0.016)
GINI index(sq)	-0.000	0.001	0.000	-0.000	0.000
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Poverty headcount ratio	0.006	-0.001	-0.001	0.003	-0.003

	(0.006)	(0.015)	(0.004)	(0.007)	(0.004)
Poverty headcount ratio(sq)	-0.000	-0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
WVS wave FE	Yes	Yes	Yes	Yes	Yes
countrycode FE	Yes	Yes	Yes	Yes	Yes
Observations	82	85	85	75	68
R-Squared	0.781	0.776	0.846	0.866	0.875

Notes: These numbers are the linear and quadratic regression results of the country conditions on the ideology of citizens (such as *priority to nation's people*, *government responsibility*, *confidence in civil services*, *confidence in government*, and *confidence in justice system*). The result variables in the first to fourth rows are the impact of GDP, democracy, GINI index, and poverty headcount ratio on citizen's ideology. Specifications control for WVS wave and countrycode fixed-effects illustrate the influence of different years and countries on the regression results. ***significant at 1 percent level, ** significant at 5 percent level, * significant at 10 percent level.

V. Conclusion

Our research focuses on the relationship between ideology polarization and country characteristics, including two perspectives: the economic situation and the political system. We extract vital data from three databases: World Value Survey, World Bank, and Polity IV, and analyze them through scattering figures and regression analysis.

Through data analysis, we draw the following key conclusions: when the degree of democracy and confidence in government-related are in a quadratic relationship, they have an inverted U-shaped relationship, meaning the GDP level is the same. When the GDP level and confidence in government-related are linear relationships, they are negatively correlated. When the GINI index and preference headcount ratio and confidence in government are linear relationships, they are positively correlated.

There are three main contributions of our article. The first is to use not only the political system, but also the level of economic development to make a more comprehensive analysis. The second point is to use the standard deviation to analyze the data, which method is not widely used in other papers. The third point is that the survey data range is larger, covering 264 countries in all regions of the world.

Author Contributions

Xiaohan Xiong and Penghao Jiang conducted the research and analyzed the data together; Xiaohan Xiong wrote the paper and approved the final version.

Acknowledgment

Xiaohan Xiong thanks her team partner Penghao Jiang, Zihan Hu, and Becky. She also thanks her professor Chao Zhang to give her many advices about the paper.

Penghao Jiang thanks his team partner Xiaohan Xiong, Zihan Hu, and Becky. He also thanks his parents for supporting him to do the research.

References

[1] J. Voorheis, N. M. Carty, and B. Shor, "Unequal incomes, ideology and gridlock: How rising inequality increases political polarization," *Ideology and Gridlock: How Rising Inequality Increases Political Polarization*, 2015.

[2] T. Iversen and D. Soskice. "Information, inequality, and mass polarization: ideology in advanced democracies," *Comparative Political Studies*, vol. 48, no. 13, 2015, pp. 1781–1813.

[3] S. Knack and P. Keefer. "Does social capital have an economic payoff? A cross-country investigation," *The Quarterly Journal of Economics*, 1997, pp. 1251–1288.

[4] R. Lachat, "The impact of party polarization on ideological voting," Electoral Studies, 2008, vol. 27, no. 4, pp/ 687-698.

[5] C. Hare and K T. Poole, "The polarization of contemporary American politics," *Polity*, 2014, vol. 46, no. 3, pp. 411-429.

[6] D. Baldassarri and A. Gelman, "Partisans without constraint: Political polarization and trends in American public opinion," *American Journal of Sociology*, 2008, vol. 114, no. 2, pp. 408-446.

[7] B. Caillaud and J. Tirole, "Parties as political intermediaries," *The Quarterly Journal of Economics*, 2002, vol. 117, no. 4, pp. 1453-1489.

[8] S. Krasa and M. Polborn, "Social ideology and taxes in a differentiated candidate's framework," *American Economic Review*, vol. 104, no. 1, 2014, pp. 308–22.

[9] M. Gentzkow and J M. Shapiro, "Ideological segregation online and offline," *The Quarterly Journal of Economics*, 2011, vol. 126, no. 4, pp. 1799-1839.

[10] T. Iversen and D. Soskice, "Information, inequality, and mass polarization: ideology in advanced democracies," *Comparative Political Studies*, 2015, vol. 48, no. 13, pp. 1781-1813.

[11] C D. Johnston, "Authoritarianism, affective polarization, and economic ideology," *Political Psychology*, 2018, vol. 39, pp. 219-238.

[12] R. J. Dalton. "Social modernization and the end of ideology debate: Patterns of ideological polarization." *Japanese Journal of Political Science*, 2006, pp. 1–22

Xiaohan Xiong was born in Xiangyang, Hubei in 2000. Xiong received her bachelor's degree in economics from Beijing Institute of Technology in 2021.

Penghao Jiang was born in Guangzhou, Guangdong in 1999. Jiang received his bachelor's degree in economics from Guangdong University of Foreign Study in 2021, and he is now studying for a Master's degree at the Chinese University of Hong Kong.