Table 4.8 Changes between 1980s and 2000s

Country Name	Δ UDS	Δ Agriculture (% on GDP)	Δ Industry (% on GDP)	Δ Services (% on GDP)	Δ Gini
Australia	0.339998	-4.245632	-10.558830	14.804459	-8.40
Austria	0.463425	-2.101212	-3.407548	5.508760	-4.60
Belgium	-0.627250	-1.206506	-9.695919	10.902425	1.40
Brazil	0.982776	-5.132884	-15.987536	21.120419	0.39
Bulgaria	1.599163	-1.053536	-28.603127	29.656663	7.38
Chile	1.939634	-1.139918	0.952596	0.187417	2.01
China	-0.246665	-15.111290	-2.306012	17.417302	9.53
Colombia	-0.368814	-10.972475	-3.018936	13.991410	-0.40
Costa Rica	-0.051855	-4.423597	-0.396110	4.819707	-0.61
Finland	0.821348	-5.184732	-3.320443	8.505175	0.40
France	0.216708	-1.767484	-6.341611	8.109095	-0.80
Greece	0.212123	-5.496426	-9.236788	14.733214	-7.50
Ireland	-0.015004	-8.270345	6.287024	1.983321	-6.60
Italy	0.082776	-3.223221	-9.645271	12.868492	-7.70
Kenya	0.518827	-9.567153	-1.182862	10.750011	5.80
Luxembourg	-0.176193	-1.363686	-11.364938	12.728624	-0.20
Malaysia	-0.150445	-9.136990	7.931998	1.204990	-7.20
Mauritius	0.497038	-5.818968	4.979374	0.839593	1.90
Mexico	0.926333	-5.224174	-6.921554	12.145728	5.00
Netherlands	-0.093733	-1.603324	-7.990416	9.593740	-2.80
New Zealand	0.119350	-1.198675	-6.410569	7.609244	-0.80
Norway	0.005778	-1.614111	7.316285	-5.702174	6.20
Philippines	0.900865	-8.812545	-2.802168	11.614713	3.94
Spain	0.502492	-2.870256	-7.354823	10.225079	-2.70
Sri Lanka	-0.103443	-7.653626	-2.359895	10.013521	16.50
Sweden	-0.087955	-2.638755	-2.793572	5.432327	-3.40
Thailand	0.668745	-12.333959	11.891810	0.442149	-3.50
United Kingdom	-0.148448	-1.136403	-13.406051	14.542454	6.30
United States	0.408763	-1.706963	-10.092051	11.799014	11.00

Changes in some typical countries can be observed from the dataset. From 1980s to 2000s, the UDS of Australia increased by 0.339998; correspondingly its Agriculture (% on GDP) decreased by 4.245632, its Services (% on GDP) increased by 14.804459, and its Gini decreased by 8.40. The UDS of China decreased by

0.246665, resulted from that its Gini increased by 9.53, though its Agriculture (% on GDP) decreased by 15.111290, and its Services (% on GDP) increased by 17.417302. From 1980s to 2000s, Italy received a decrease of 3.223221 on Agriculture (% on GDP), and an increase of 12.868492 on Services (% on GDP), and a decrease of 7.70 on Gini, resulting its UDS increased by 0.082776.

Applying the model, the regression resulted is illustrated below:

Table 4.9 Regression Result on the Changes between 1980s and 2000s

Variables	***Coefficient***	***Std. Error***	***t-ratio***	***p-value***	
const	0.309506	0.315911	0.9797	0.33661	
Agriculture (%)	0.0196747	0.0325867	0.6038	0.55144	
Services (%)	0.00993057	0.0211316	0.4699	0.64247	
Gini	0.00951668	0.0140786	0.6760	0.50527	

Mean dependent var	0.315046		S.D. dependent var	0.575509
Sum squared resid	8.840569		S.E. of regression	0.594662
R-squared	0.046725		Adjusted R-squared	-0.067668
F(3, 25)	0.341103		P-value(F)	0.795788
Log-likelihood	-23.92402		Akaike criterion	55.84804
Schwarz criterion	61.31723		Hannan-Quinn	57.56092

None of the variables present significance. The value of R^2 is as low as 0.046725. This is possibly resulted from the heteroskedasticity shown in the test results of the regressions on 1980s and 2000s data.

CHAPTER V

CONCLUSION

This chapter is to discuss the results of the regressions and to conclude how they verify the hypotheses.

The Relationship between the Variables

The results of regression show that there is a certain correlation among GPD composition by sector, Gini coefficient of income, and the forms of government. From the equation (4.6) and (4.10), it could be concluded that a higher percentage of services in GDP could raise the value of the UDS, meaning that the corresponding country is more democratic, as hypothesized in Chapter III; vice versa. Besides, the results show that a rising Gini coefficient would reduce the UDS, meaning that the corresponding country is more non-democratic; vice versa.

Further, according to equation (4.10) and Table 4.2, Agriculture (% on GDP) has a negative effect on UDS even though when it presents no significance in the regression result. It recognizes the hypothesis in Chapter III that the society of which the economy focuses on agriculture would present more non-democratic. However, whether or not is there a strong influence from Agriculture (% on GDP) on the forms of government is still uncertain.

The Difference in Regression Results

According to Chapter IV, there is an obvious difference between the regression results on 1980s data and 2000s data. For the 1980s data, there are only two significant variables: Services (% on GDP) and the Gini coefficient. But for the 2000s data, one more variable, Agriculture (% on GDP), is also significant.

There are couple possible reasons for the difference.

First, it might be resulted from the limitation of sample size. There are 266 countries, dependent areas, and other entities on the world nowadays (https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html), each of

which might have a unique value of UDS (representing a unique form of government). But in this paper, there are only 39 sample countries contained in each dataset. When collecting data, I found that there are countries that has data on Gini coefficient only for one year, say, 1965; there are countries of which the Gini coefficient of every year are all calculated from consumption; there are counties which has relative complete records on annual Gini coefficient but lacks data on GDP composition by sector or the UDS. The deficiency in the data has the sample size shrank, restricting the explanatory power of the regression model. In this case, there are two possibilities. One is that Agriculture (% on GDP) certainly has no correlation with the forms of government; the data defect in 2000s makes it wrongly significant in regression. The other one is that Agriculture (% on GDP) certainly has correlation with the forms of government; the data defect in 1980s makes it wrongly insignificant in regression. If the sample size could be large enough, this problem may be avoided.

Second, it might be resulted from the structure of the 1980s dataset. Also due to the limitation in data record, most of the data of 1980s has to be picked from nearby years. The distribution of the sample countries in 1980s data are displayed in Table 3.1 and Figure 5.1.

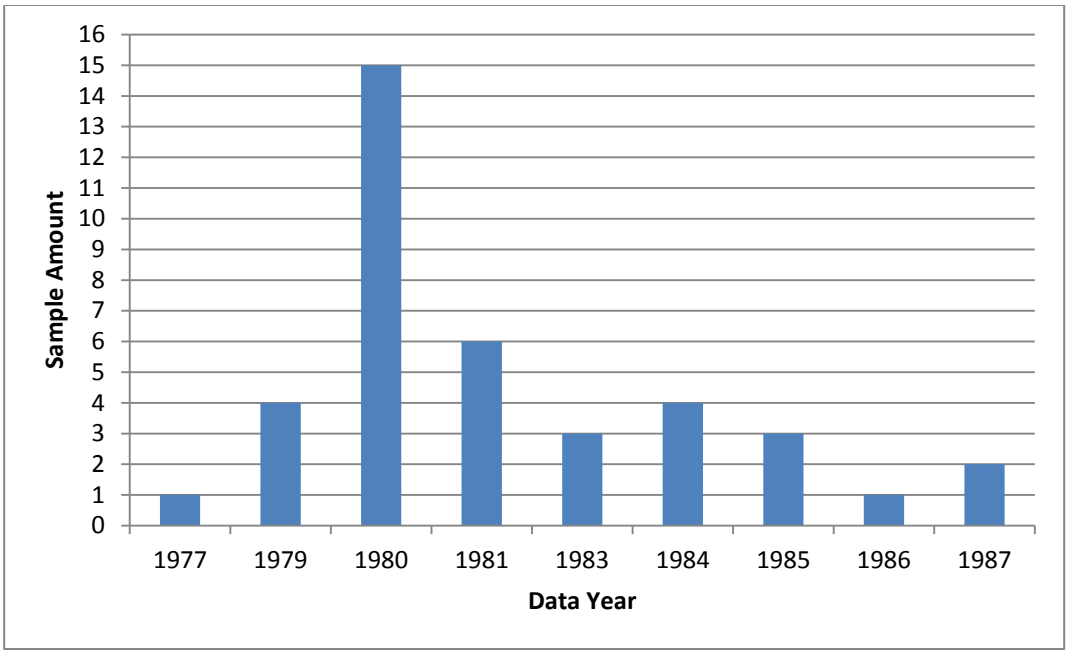

Figure 5.1 Distribution of 1980s Sample

According to the figure, for the 1980s data, the earliest data year is 1977, while the latest one is 1987, with a time span as long as ten years. Contrasting to the 2000s data which almost has all of the samples from the same year (Table 3.2), such a long time span could be a disturbance in regression. Although data of each indicator of a certain sample country should be from the same year, changes on economy or political institutions of the world from 1977 to 1987 might exist, making Agriculture (% on GDP) insignificant in the regression result.

The Values of R^2

According to the final regression results, the R^2 of the 1980s data is 0.683451, and the R^2 of the 2000s data is 0.667461. It means that more than 30% of the variations in the UDS in each of the two datasets cannot be explained by the GDP composition by sector or the Gini coefficient of income.

It may indicate that there are other economic indicators, which are not included in the regression model, are influencing the forms of government. However, it is also possible that the results are due to non-economic factors.

A form of government is characterized by the interlock of political, economic and cultural factors (Heywood, 2007). Therefore the 30% of UDS which cannot be explained by GDP composition by sector or Gini coefficient could be derived from political factors or cultural factors. It might due to the political tradition, ideology of the society, culture, or religion. However, this is beyond the subject of this paper.

The Linearity of Gini Coefficient to the Forms of Government

It is hypothesized in Chapter III that the inequality is non-linear to the form government: when the inequality is either extremely low or high, the Safety-satisfied Class would be too weak to afford a democracy; only when the inequality is on a proper level, the Safety-satisfied Class is strong enough that the society is likely to have a democracy.

But the results of regression show that Gini Coefficient, the indicator used in this paper to represent inequality, is absolutely linear to UDS, which represents the forms of government. In both of the regressions for 1980s data and 2000s data, the squared term of the Gini coefficient is the first term to be removed from the regression model.

There are several possible reasons for such a result:

1. The hypothesis is wrong; the inequality has only a linear effect on forms of government.

2. The hypothesis could be right, and the deviation between it and the regression results is due to the limitation from the sample size.

3. The hypothesis could be right, and the deviation between it and the regression results is due to the limited interval of data distribution. The facts are that, among the 1980s data, the lowest value of Gini coefficient is 22.60 (Norway); among the 2000s data, the lowest value of Gini coefficient is 23.70 (Austria). Neither of the two datasets has an “extremely low” Gini coefficient. Thus what is observed from the regression is the process that the inequality raises from the “proper level” to “extremely high level”. In this case, how the UDS would change as the inequality

raises from “extremely low” to the “proper” level is unknown. Therefore it is possible that available data is insufficient to verify the hypothesis, but not that the hypothesis is wrong.

4. The hypothesis could be right, and the deviation between it and the regression results is caused by that the Gini coefficient does not fit in explaining the effects on forms of government from needs class. There are couple ways to describe the inequality. Gini coefficient is derived from Lorenz Curve, which graphs the cumulative distribution of wealth for every n% of poorest population. It classifies the society (by percentage of population) to express the inequality. It is possible that problems pop up when using one classification (Gini coefficient) to explain another classification (needs class) of population. Theil index, another measurement on the inequality, might be a better way to explain the relationship between inequality and forms of government. It values the wealth of each subject (household or person) by its place with respect to the mean. But as Theil index is not as popular as Gini coefficient, and as there is no data in Theil index available on a worldwide scale, it cannot be applied in this paper.

Conclusion

Due to the data and the regression results, the form of government of a country is certainly correlated with the percentage of GDP from services and the Gini coefficient of income. The higher is the percentage of GDP from services, or the lower is the Gini coefficient, the higher the value of UDS would be, representing that the country is more democratic; vice versa. It verifies the hypothesis that when the inequality is on a proper level, and when the GDP contains a high percentage on services, a democracy would be afforded by the safety-satisfied class which is strong enough.

However, there is couple of uncertainties. The first one is that the percentage of GDP from agriculture is not significant in 1980s data, but is significant in 2000s data. It might come from the limitation in data. The second one is that the Gini

coefficient expresses linearity to the forms of government in regressions, differing from the hypothesis. It might indicate that the hypothesis is partly wrong; while it is also possible that such a result is due to the limitation on data; further, it may indicate that the Gini coefficient is not suitable in explaining needs class.

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APPENDIX A

RESIDUAL PLOTS

The residual plots of the regression results in Chapter IV are illustrated below.

1980s data

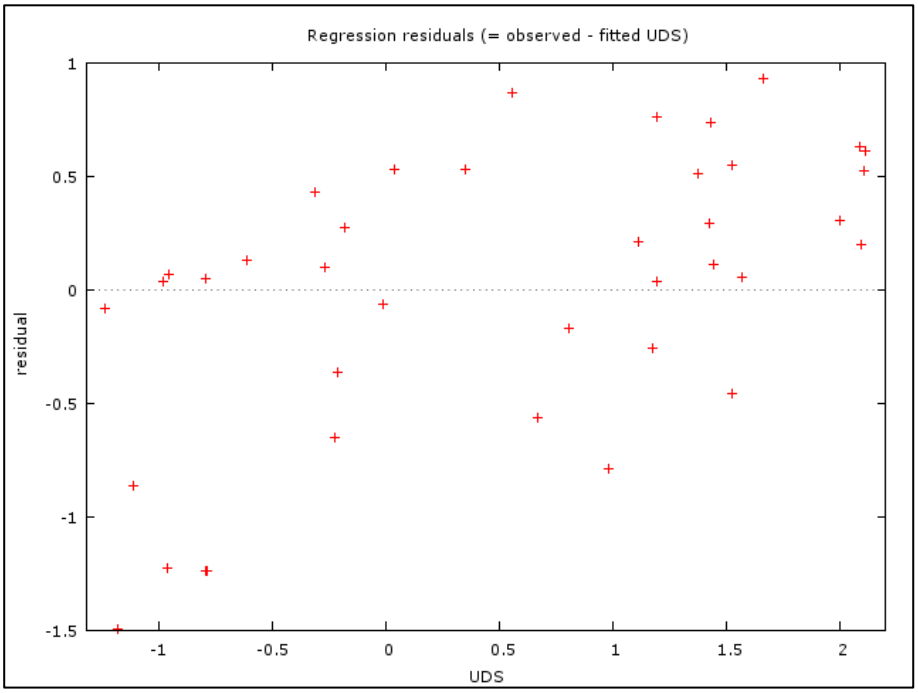

Figure A.1 Residual Plots against UDS (1980s)

As same as the regression result of 1980s data, all of the three variables present significance and have negative effects on the UDS. Every 1 increase in Industry (% on GDP) has the UDS decreased by 0.0287773. The effect is smaller than that of Agriculture (% on GDP). Every 1 increase in Agriculture (% on GDP) would have the UDS decreased by 0.0557493.

It is interesting that Industry (% on GDP) presents different influences to the UDS respectively in model (B.2) and (B.3). When Industry (% on GDP) and Services (% on GDP) are regressed together, Industry (% on GDP) affects positively on the UDS. But on the contrary, when Agriculture (% on GDP) and Industry (% on GDP) are regressed together, Industry (% on GDP) affects negatively on the UDS.

The absolute values of estimated coefficient of Industry (% on GDP) are always smaller than those of Agriculture (% on GDP) and Services (% on GDP) in each model. Therefore it could be inferred that comparing to Services (% on GDP), Industry (% on GDP) has a negative effect on UDS; and comparing to Agriculture (% on GDP), Industry (% on GDP) has a positive effect on UDS.

To conclude, the percentage of GDP from industry also influences the forms of government, but its influence is not as decisive as agriculture and services. With respect to the percentage of GDP from services, the lower it is, the more democratic is the government; with respect to the percentage of GDP from agriculture, the higher it is, the more democratic is the government.

The reason, that Industry (% on GDP) shows no significance in the regression on the 1980s data, is possibly due to the limitation in the sample size. It has been discussed in Chapter V.